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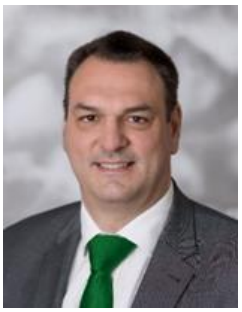
Günter Riegler is passionate about making the City of Graz a vibrant hotspot for creative minds, businesses, research centers and educational institutions. As the current City Councilor for Economics, Tourism, Culture, Arts and Science in Graz he can help to shape the future of this city. Before taking on political responsibility, he did his PhD in Business Administration and Finance at the University of Graz and was Senior Consultant for industry audits and corporate finance at KPMG AUSTRIA. In 2011 he became Managing Director and CFO of the university of applied sciences FH JOANNEUM where he saw how great research and education can transform businesses and make them more competitive as well as strengthen an entire region. His love for urban development he discovered during his tenure as head of the Independent Court of Audit of Graz (2004-2011) gaining insights into government operations and planning.



Wolfgang Gressel After more than 15 years working in tourism management Wolfgang Gressel became a teacher in fields of tourism and economy at different Vocational Schools in Austria. Later he moved to the University of Teacher Education Carinthia. There he was lecturer in mediation at the Institute for Educational Governance and manager of leadership education.
Since 2020, he is headmaster of the Vocational School Bad Gleichenberg/Styria. In this school, at maximum 1.500 apprentices a year can be educated in tourism industry, restaurant-, confectionery-, bakery- and butchers' business. Furthermore, his responsibility is doing leadership for 52 teachers and 30 members of staff.



Armin Breinl - physician, member of the Austrian AntiAging Society, inventor, and CEO of the functional drinks 2B.
Healthy nutrition with added value is a very important topic for the developer of the fruity lifestyle drinks. To avoid having to swallow capsules and pills every day, the doctor developed these refreshingly tasty drinks - which contain valuable vitamins and ingredients - naturally without added sugar. The 2B Drinks meet the spirit of the time and taste of the consumers and are an important contribution to increase the quality of life. 2B Drinks consist of more than 50% fruit content combined with inspiring, vitalizing and relaxing vital substances and active ingredients.



Andreas Cretnik is CEO of the ALWERA AG, located in Wollsdorf (Styria/Austria). The ALWERA group deals with the three areas of agriculture, food and technology. In the pumpkin sector, the ALWERA Group covers the entire value chain from the pumpkin seeds over harvesting technology to producing as a food. The 100% subsidiary Estyria Naturprodukte GmbH is the largest producer of Styrian pumpkin seed oil p.g.I. and number one for pumpkin seeds in Europe. As CEO of the ALWERA Group, Mr. Cretnik is responsible for the areas of finance, accounting, controlling, law, quality management and purchasing raw materials.
Since 2016 Mr. Cretnik is also CEO of the service organization for geographical protected products in Austria.

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Accounting Automation: An Experimental Study

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Abstract

Accounting automation and especially robotic process automation (RPA) has received notable attention from researchers in the past few years. This technology is known as the use of software bots to perform rule-based tasks, which are normally performed by people, such as bookkeeping. Drawing on the theory of reasoned action (TRA) and changing management, the present paper investigates the accounting practitioners' behavior toward bookkeeping automation through RPA and the extent to which the work experience is a factor that influences this change. Data is collected through experimental cases, having accounting practitioners from Romania as participants. Results show that employees in the accounting sector are more open to automation in comparison to manually working, but the work experience is not an influential factor. Some of the explanations could be related to the respondents' age and the companies where participants perform their activities. The originality of the study comes from the method used which is rarely used at the level of accounting research, although it could provide objective findings and leaves no room for interpretation. Findings could be of interest to practice as it shows that accounting practitioners are not an obstacle to automation, instead, they are willing to embrace the digitalization changes.

Keywords
accounting, automation, RPA, work experience, experiment, Romania

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Introduction

Advance in technology is likely to change many jobs around world in the upcoming years and accounting jobs are not set aside of this discussion. According to World Economic Forum (2020) report, accounting, and bookkeeping jobs, among others, rank second in the ten redundant job categories that are likely to disappear due to automation in the future. RPA represents one of the new automation tools for accounting industry being a good substitute for people in performing repetitive and routine tasks (Deloitte, 2017a). Nowadays, large accounting companies adopt this technology for enhancing the efficiency and effectiveness (Cooper et al., 2019).

Although previous studies discuss about the implementation of RPA, about its impact on companies and how companies benefit from this change (Kokina and Blanchette, 2019, Cooper et al., 2019, Lacurezeanu et al., 2020), there are relatively few studies discussing the employees' opinion regarding this change and whether they are a driving factor (Gotthardt et al., 2020). Thus, the present paper contributes to accounting automation research by showing whether the accounting practitioners are willing to embrace the automation and whether the work experience is also a factor that influences this change. Using a case-based experiment with 2 x 2 between subjects and a full factorial design and drawing on the TRA and change management theory, this study seeks to answer the following research questions: *How does the accounting practitioner react to changes in the accounting field due to automation? To what extent the work experience of the accounting practitioner is a factor that influences this change?*

Findings show that accounting practitioners are more attracted by automation and feel more comfortable with it in comparison to manually working, but the work experience is not an influential factor. One of the reasons is related to the fact that participants in the present study are young or work in large companies where the environment encourages the automation and employees got already used to it. This research contributes to the accounting automation literature in the following ways. First, as stated above, there are relatively few studies regarding the role of accounting practitioner toward automation and their reaction to

this change. Second, this study uses the experiment as a research method to see how accountants react to automation, while other studies use different methods such as case studies (Fernandez and Aman, 2018; Gotthardt et al., 2020) or interviews (Kokina and Blanchette, 2019).

The reminder of the paper is structured as follows. The first section gives and overview on the most recent studies about RPA and discusses the theory for developing the hypotheses. In the second section the methodology of the paper is presented, while the third section discusses the main results. In the last part, the main conclusions and limitations are presented as well as implications and directions for future research.

1. Review of the scientific literature

1.1. Backgrounds

A relatively new trend in accounting automation is RPA which represents the use of software bots to execute, in an automated manner, tasks that are normally performed by people. This enables a faster handling time, less errors, lower costs, and processes higher volume of data (Deloitte, 2017b). Also, RPA can improve the total business value, helps in obtaining a greater service quality and improves employees' satisfaction and motivation (Dumitru and Stănculescu, 2020). With respect to accountants' jobs, Kokina and Blanchette (2019) found that repetitive, labor intensive, rule-based and high-volume tasks that use structured data and more than one system are appropriate for RPA implementation. Lacurezeanu et al. (2020) highlights in their review regarding RPA in auditing and accounting tasks that are suitable for RPA implementation. Among them, can be recalled the acquisition of inventories and their payments, month closing and reporting, the management of accounts payable and accounts receivable, suppliers, customers, creditors, debtors' accounting, raising the invoices, invoice receiving, approving, validating, and making payments, processing database updates, issuing payment notes, etc.

Many studies in the last few years focus on RPA and its impact on accounting jobs. As an example, Kokina and Blanchette (2019) state that there is a lot of incertitude with regards to accountants' jobs due to automation and it can potentially bring the practitioners into non-accounting functions. Other studies suggest that, as the robots are taking humans' place in performing routine and repetitive tasks, it is expected for accountants to lose their jobs in the nearest future (Auerswald, 2012; Frey and Osborne, 2017). Some authors may suggest that humans could be thought as an obstacle for the accounting industry growth (Tschakert et al., 2016) because employees are afraid that they may lose their jobs due to RPA implementation (Gotthardt et al., 2020). On the other hand, Cooper et al. (2019) found that, according to the opinion of lower-level employees in Big 4 accounting firms, RPA has a positive influence on changing the work performed by them and improves their career prospects.

1.2. Theory and hypotheses development

Over time, researchers have developed many theories regarding people's technology acceptance such as TRA, theory of planned behavior, theory of interpersonal behavior, technology acceptance model, extended technology acceptance model, Igbaria's model, social cognitive theory, diffusion of innovations theory, perceived characteristics of innovating theory, motivational model (Taherdoost, 2018). The theory that best suits the present study is TRA which was developed by Fishbein and Ajzen (1975) and it has been developed to study the behaviors of individuals based on the impact of attitude. According to TRA, an individual's intention to engage in a certain behavior best foretell whether the individual engages in the respective behavior, while intentions are predicted by subjective attitudes and norms. The attitude toward behavior represents a positive or negative feeling of an individual for performing a certain behavior, whilst the subjective norm refers to the perception of the individual that people around him consider that he should or not perform that behavior. In this paper's case, if the accountant practitioner has a positive feeling about automation, he will be more attracted and comfortable with it and vice versa. Also, if he thinks that people important to him believe that he should accept the automation, he will be more attracted and more comfortable with it and vice versa.

Another theory that suits this study is the change management. In conformity with Burdus (2000), people resistance to change could be explained by several reasons such as selective attention and memory, employee habits, addiction to other people's opinions, fear of the unknown, economic reasoning and lack of security. In this study employee habits will be explained more to show whether the work experience is a factor that could drive the change. Organizational changes that demand changes in employees' habits shall be met with resistance having that any change in personal habits needs effort and make people exit form their comfort zone Burdus (2000). This makes us understand that the more a person is used with a certain way of doing the work, the more difficult is for that person to change it. Habit narrows the predictive power of intention on usage behavior given that past behaviors could have a significant influence on continued usage (Limayem et al., 2007). If this is the case, it is expected that employees with less work experience

will be more attracted by automation and will feel more comfortable with it comparing with high experienced employees. Therefore, the three hypotheses are stated in alternative form as follows.

H1: *Automation of bookkeeping increases the level of attractiveness and comfortability for accounting practitioners.*

H2: *Less work experience increases the level of attractiveness and comfortability of accounting practitioners for automation.*

H3: *There is an interaction effect such that the positive effect of bookkeeping automation on attractiveness and comfortability is stronger for practitioners with less work experience.*

2. Research methodology

2.1. Design

In doing the research, a case-based experiment method with 2x2 between subjects and full factorial design has been chosen. Pontiggia and Virili (2010) and Tadesse and Murthy (2018) also used experimental methods in technology related studies. The four possible cases of the research are presented in the *Figure 1.* Study participants have been randomly assigned to one of the experimental groups. The variable that was manipulated was automation of the bookkeeping process and it has been operationalized through its presence or absence in the case-scenarios.

2x2 Design		Accountant's experience	
		Low	High
Automation	Yes	Low experience and automation	High experience and automation
	No	Low experience and no automation	High experience and no automation

Figure no. 1. Factorial design
Source: Authors' own research.

In conducting the study, two hypothetical cases related to management decision about RPA implementation on the bookkeeping process automation have been created. In the first instance, the management decides to automate the bookkeeping process and in the second one the management decides not to do it for at least two or three years.

The dependent variable of the study is represented by the level of *Attractiveness* or *Comfortability* of the accounting practitioner toward the given case (automation or manually working). The two independent variables are *Automation*, which is the manipulated variable, and *Accountant's work experience*. The idea of the study is to find out whether the accounting practitioner is more attracted and feel more comfortable with automation and whether this result is higher for less experienced accountants.

2.2. Participants

Study participants are employees working in accounting companies in Romania. This country has been chosen having that it is placed among the last countries in the European Digital Economy according to the European Commission study (2020) and the authors wanted to find out to what extent this matter is also valid at the accounting practitioners' level. The process of collecting the data was done during January – February 2021 and the participants were retrieved from the top accounting companies in Romania by turnover using the site "Top Firme". Subsequently the authors searched for a contact person in each company and sent the link for the participation via e-mail, asking the respective person to share it among the employees in the accounting and bookkeeping department. After one week of waiting, the number of responses was only 22 and a second e-mail was sent. After another one week, the number of participants increased with 34. To gain more observations for the study, the sample of companies has been extended with another 10 and the authors followed the same procedure. The companies are presented in the Appendix 1. Two weeks later, the total number of observations reached to 148. From the total sample, we removed 37 observations due to incompletion, and the final sample consisted in 111 observations.

The population distribution on demographics is shown in *Table 1* below. From the total number of 111 observations, 81.1% were female participants while 18.9% were male participants. The situation is not surprisingly given that in Romania the accounting profession is mostly performed by women (Istrate, 2012) in comparison with more developed European countries where accounting is a male profession. The highest percentage of the participants is given by the participants between 25 and 30 years old (38.7%) and the

lowest one is given by the participants over 45 years old (8.1%). 79 participants (71.2%) finished their Master studies, 28 participants (22%) finished their Bachelor studies and only 4 participants (3.6%) finished their PhD studies. Furthermore, 54.1% of the participants were working in a multinational company and the remaining 40.2% of the participants were working in a Romanian company. Moreover, with regards to the professional certification, only 36.9% owe one, and the remaining part of 63.1% not.

Table no. 1. Population distribution by demographics

Gender			Age			Level of studies			Company type			Certification		
	n	%		n	%		n	%		n	%		n	%
f	90	81.1	< 25	20	18.0	Bachelor	28	25.2	M	60	54.1	Y	41	36.9
m	21	18.9	> 45	9	8.1	Master	79	71.2	R	51	45.9	N	70	63.1
			25 - 30	43	38.7	PhD	4	3.6						
			30 - 35	16	14.4									
			35 - 40	11	9.9									
			40 - 45	12	10.8									
∑	111	100	∑	111	100	∑	111	100	∑	111	100	∑	111	100

Source: Authors' own research.

Where:
f – Female
m – Male
M – Multinational
N - No
R – Romanian
Y – Yes

2.3. Tasks

The experiment was created on Qualtrics with two different blocks randomized for having an equal number of participants for each of the two cases. The average time for filling in the questions was about 4 minutes excepting the outliers. The case consisted in three main parts. In the first part, participants were given few demographic questions such as gender, work experience age, level of studies, professional certifications, whether they work in Romanian or multinational company. The question about work experience was one of the most important having that the study seeks to find out whether there is a difference in technology acceptance between less experienced and more experienced accountants. On this respect the sample was split in two groups depending on the work experience using the median, thus obtaining a relatively equal number of observations.

In the second part of the experiment, participants were given a hypothetical case about a Romanian accounting company, where management decides to automate the bookkeeping process by using RPA, in the first case, and to not do it in the second case. Each participant had to read only the case that they were assigned to. After reading the case, respondents had to answer two questions on a 5-points Likert scale based on it. In the first instance, they were asked how attracted they are by that company, assuming they are taking into consideration a position there, and in the second instance they were asked how comfortable they feel with the management's decision, assuming they already work for that company.

The last part of the experiment was represented by the manipulation checks which were necessary to see if participants understood the case and the answers were based on it. The question was whether, in the case, management's decision was to automate or not the bookkeeping process using RPA.

3. Results and discussions

3.1. Main results

Table 2 shows the descriptive statistics for the analyzed variables on each experimental group, first for the dependent variable *Attractiveness* and second, for the dependent variable *Comfortability*. As shown, overall, participants are more attracted by automation (M = 3.88; SD = 1.07) in comparison with manually working (M = 2.77; SD = 1.05), but further analyses are needed to find out the significance of these results. Furthermore, less experienced accountants are more attracted by automation (M = 3.92; SD = 1.04) than manually working (M = 2.78; SD = 0.94), but also, high experienced accountants are more attracted by automation (M = 3.83; SD = 1.13) than manually working (M = 2.77; SD = 1.17).

Table no. 2. Descriptive statistics

Panel A. Dependent Variable: Attractiveness (mean [SD])						
Automation	**n**	**High experience**	**n**	**Low experience**	**n**	**∑**
No	30	2.77 (1.17)	32	2.78 (0.94)	62	2.77 (1.05)
Yes	24	3.83 (1.13)	25	3.92 (1.04)	49	3.88 (1.07)
∑	54	3.24 (1.13)	57	3.28 (1.13)	111	3.26 (1.19)
Panel B. Dependent Variable: Comfortability (mean [SD])						
Automation	**n**	**High experience**	**n**	**Low experience**	**n**	**∑**
No	30	2.70 (1.09)	32	2.75 (0.98)	62	2.73 (1.03)
Yes	24	4.00 (1.10)	25	3.96 (1.06)	49	3.98 (1.07)
∑	54	3.28 (1.27)	57	3.28 (1.22)	111	3.28 (1.22)

Source: Authors' own research.

When it comes to comfortability, the results for the accountants with a longer work experience show to be lower in the case of no automation (M = 2.70; SD = 1.09) than for automation (M = 4.00; SD = 0.10). In the case of less experienced accountants, the situation looks similar, in the sense that, they tend to feel more comfortable with automation (M = 3.96; SD = 1.06) compared to manually working (M = 2.75; SD = 0.98). Overall, accountants feel more comfortable with automation (M = 3.98; SD = 1.07) than manually working for the bookkeeping process (M = 2.73; SD = 1.03). As well as in the previous case, further analyses are needed to conclude the findings.

Table no. 3: Hypotheses testing

Panel A. Results of ANOVA on dependent variable Attractiveness					
Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	33.444	3	11.148	7.553	.000
Automaton	27.504	1	27.504	20.997	.000
Experience	.124	1	.124	.738	.742
Automation * Experience	.001	1	.001	.967	.978
Error	121.980	107	1.140		
Panel B. Results of ANOVA on dependent variable Comfortability					
Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	43.082	3	14.361	12.884	.000
Automation	43.078	1	43.078	38.649	.000
Experience	.001	1	.001	.001	.980
Automation * Experience	.055	1	.055	.050	.824
Error	119.260	107	1.115		

Source: Authors' own research.

Table 3 displays the ANOVA results for both analyses, first on *Attractiveness* and then on *Comfortability* as dependent variables. The results indicate that, overall, accountants put automation in front of manually working and the result is statistically significant (p-value < .01), thus, providing evidence for the first hypothesis for both dependent variables. Furthermore, the results regarding the work experience were not statistically significant, neither in terms of attractiveness (p-value = .742), nor in terms of comfortability (p-value = .980) and therefore, the second hypothesis needs to be rejected. Also, the level of interaction between automation and experience provides no statistical evidence for both attractiveness (p-value = 0.978) and comfortability (p-value = 0.824), thus, the third hypothesis is rejected as well.

3.2. Analysis of the manipulation checks

As discussed in the previous section, after filling in the study related questions, respondents had to answer on whether the management in the given case decided or not to automate the bookkeeping process. To provide stronger results to the present study, the authors removed the manipulation checks failures, and the final sample consisted in 86 respondents.

Table 4 displays the descriptive statistics for the analyzed variables on each experimental group, first for the dependent variable *Attractiveness* and second, for the dependent variable *Comfortability* after excluding the manipulation checks failures from the sample. Overall, accounting practitioners are more attracted by automation (M = 3.95; SD = 1.01) comparing to manually working (M = 2.52; SD = 1.00). Moreover, less experienced accountants show to be more attracted by automation (M = 4.00; SD = 0.86) than manually working (M = 2.40; SD = 0.82) and the results are similar in the case of high experienced accountants. As shown in the table, high experienced practitioners are more attracted by automation (M = 3.91; SD = 1.15) than manually working (M = 2.62; SD = 1.14).

Table no. 4: Descriptive statistics excluding manipulation failures

Panel A. Dependent Variable: Attractiveness (mean [SD])						
Automation	**n**	**High experience**	**n**	**Low experience**	**n**	**∑**
No	24	2.62 (1.14)	20	2.40 (0.82)	44	2.52 (1.00)
Yes	22	3.91 (1.15)	20	4.00 (0.86)	42	3.95 (1.01)
∑	46	3.24 (1.30)	40	3.20 (1.60)	86	3.22 (1.23)
Panel B. Dependent Variable: Comfortability (mean [SD])						
Automation	**n**	**High experience**	**n**	**Low experience**	**n**	**∑**
No	24	2.63 (1.06)	20	2.40 (0.75)	44	2.52 (0.93)
Yes	22	4.00 (1.11)	20	4.05 (1.05)	42	4.02 (1.07)
∑	46	3.28 (1.27)	40	3.22 (1.23)	86	3.26 (1.25)

Source: Authors' own research.

In relation to comfortability, the results for the practitioners with a longer work experience is lower in the case of no automation (M = 2.63; SD = 1.06) than for automation (M = 4.00; SD = 1.11). In the case of less experienced accountants, the situation looks similar, in the sense that, they tend to feel more comfortable with automation (M = 4.05; SD = 1.05) compared to manually working (M = 2.40; SD = 0.75). Overall, results show that accounting practitioners feel more comfortable with automation (M = 4.02; SD = 1.07) than manually working (M = 2.52; SD = 0.93).

Table no. 5: Hypotheses testing excluding manipulation failures

Panel A. Results of ANOVA on dependent variable Attractiveness					
Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	44.559	3	14.853	14.458	.000
Automaton	44.452	1	44.452	43.269	.000
Experience	.096	1	.096	.094	.761
Automation * Experience	.533	1	.533	.519	.473
Error	84.243	82	1.027		
Panel B. Results of ANOVA on dependent variable Comfortability					
Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	48.997	3	16.332	16.063	.000
Automation	48.902	1	48.902	48.096	.000
Experience	.164	1	.164	.161	.689
Automation * Experience	.404	1	.404	.397	.530
Error	83.375	82	1.017		

Source: Authors' own research.

Table 5 shows the ANOVA results for both analyses, first on *Attractiveness* and then on *Comfortability* as dependent variables after eliminating the manipulation checks failures from the sample. The results indicate that, overall, accountants are more attracted by automation and feel more comfortable with it in comparison to manually working and the result is statistically significant (p-value < .01), providing support for the first hypothesis. More than that, results regarding the work experience did not show to be statistically significant, neither in terms of attractiveness (p-value = .761), nor in terms of comfortability (p-value = .689) and rejects the second hypothesis. Furthermore, the level of interaction between automation and experience provides no statistical evidence for both attractiveness (p-value = 0.473) and comfortability (p-value = 0.530), and the third hypothesis needs to be rejected as well.

Conclusions

This study has investigated whether the accountants' behavior and their work experience are factors that influence the automation pace for bookkeeping processes by using RPA. In conducting the study, an experimental method with 2 x 2 between subjects and full factorial design has been used. Findings show that accounting practitioners are more attracted by automation than manually working and feel more comfortable with it. The results could be interpreted in line with the (Fishbein and Ajzen (1975)'s theory of reasoned action. Employees in the accounting field have a positive attitude toward the using of automation tools and they believe that people important to them think that they should use it.

Furthermore, there was no statistical evidence for the work experience factor. Although less experienced accountants are more attracted by automation and feel more comfortable with it than manually working, the results for high experienced accountants turned out to be similar. Even though past behaviors could have a significant influence on continued usage (Limayem et al, 2007) and it was expected for employees with more work experience to be more reticent to automation, an explanation could be related to the fact that participants in the present study are young and work in big companies where automation is already put

in place. Young generation of accountants represents the millennial generation (White et al. (2020) and it has as a defining characteristic which is the affinity to the digital world (PwC, 2020). Also, an interaction effect between automation and work experience factor was not found.

This paper contributes to accounting automation literature as follows. First, previous studies discuss automation and digitalization in general from different perspectives, such as companies (Kokina and Blanchette, 2019, Cooper et al., 2020, Lacurezeanu et al., 2020), professional regulation (Troshani et al., 2018), accounting education (Vincent et al., 2020; Novak et al., 2021), while the present study discusses it from the accounting practitioners' perspective. Second, this paper uses an experimental method, whilst previous studies in accounting automation field use methods as interviews Kokina and Blanchette (2019) or case studies (Fernandez and Aman, 2018; Gotthardt et al., 2020).

The present study should be of interest for companies as it shows the accounting practitioners' willingness toward the use of automation regardless their work experience in the accounting field. Also, the results could be of interest for researchers as it tries a different method which is rarely used in accounting and especially in Romania. Its analysis is objective and leaves no interpretation room. The results of the study should be taken in line with some limitations. First, as stated above, participants are young and work in large accounting firms. Future studies could extend the study on older accountants and small companies. Second, this paper uses Romania as a study context, and it would be interesting to find out how accountants in other countries behave to automation and whether there are differences between countries at the level of accounting practitioners.

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Appendix 1

Top companies

Ref. no	Company name
1	ERNST AND YOUNG
2	PRICEWATERHOUSECOOPERS
3	KPMG
4	DELOITTE
5	BDO
6	MAZARS
7	TMF ROMANIA SRL
8	Fin Expert Consulting SRL
9	VULPOI & TOADER MANAGEMENT SRL
10	TPA
11	ROEDL AND PARTNERS
12	SOTER SRL
13	CONTEXPERT CONSULTING SRL
14	BOSCOLO AND PARTNERS CONSULTING SRL
15	RSM ROMANIA
16	ACCACE OUTSOURCING
17	TAXHOUSE SRL
18	NESTOR NESTOR DICULESCU KINGSTON PETERSEN CONSULTANTA FISCALA SRL
19	NOERR FINANCE AND TAX
20	APEX TEAM INTERNATIONAL SRL

Source: authors' processing using https://www.topfirme.com/caen/6920/cifra-de-afaceri/

Community's Willingness Behavior to Support Community-Based Enterprises

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Abstract

Entrepreneurship plays a significant role in socio-economic development not only at the national level but also at the community and individual level. Individuals always have the goal of becoming an entrepreneur to enrich themselves. However, there are still challenges and difficulties for individuals when they become entrepreneurs, such as their business environment. Choosing to become community-based entrepreneurs is one of the solutions to limit the bad effects of the business environment. Besides, it can help entrepreneurs and enterprise development in the best way with the necessary support. This article aims to analyze the community's contribution as well as behavior towards entrepreneurship, especially for an overseas community where there are many differences in the business environment, lifestyles, as well as policy regulations. Therefore, a quantitative study was carried out at the end of December 2021 for the Vietnamese community in Romania. The study was conducted on 169 members of the Vietnamese community in Romania. The analysis results show that the Vietnamese community in Romania actively participates in supporting these community-based enterprises. In addition, the results show that the gender, age, and time of stay in Romania of the members of the community are related to the community's support activities for community-based enterprises, such as support for relationships, using services or buying goods, and support in promoting products or services. Besides, members of the community are always ready to support businesses to develop. The study contributes to better understanding the behavior of the community in supporting community-based enterprises, especially in the specific case of the Vietnamese immigrant community in Romania. The research results will contribute to supporting research on the role of the community in community-based enterprises. The paper ends with a discussion and meaningful results of the research.

Keywords

Community-based entrepreneurship, community behavior, community, Romania, Vietnam.

DOI: 10.24818/BASIQ/2022/08/002

Introduction

Currently, entrepreneurship is always focused on developing for each country and locality. Entrepreneurship plays an important role in the economic and social development of localities. Studies show that individuals have the desire to become entrepreneurs, thereby enriching themselves and society. However, entrepreneurs and entrepreneurship are always subject to risks and challenges (Priede-Bergamini et al., 2019; Păunescu and Molnar, 2020). These risks and challenges have a significant impact on entrepreneurship. These risks and challenges can include the business environment and internal and external factors of the entrepreneur (Păunescu and Mátyus, 2020). Currently, there are many new forms of entrepreneurship that are focused on developing to limit risks and challenges for entrepreneurs, including community-based entrepreneurship. The development of community-based entrepreneurship will help to reduce the difficulties that entrepreneurship and entrepreneurs face with the support and help of communities. In addition, the community is also a solid base for businesses to grow stronger (Lyons et al., 2012). It is a mutually beneficial relationship that is the community and community-based entrepreneurship. From there, it is possible to accelerate the economic growth of the locality, promote the start-up process,

and contribute to the existence and development of entrepreneurship as well as that of businesses and the community (Lyons et al., 2012; Collins et al., 2016).

This article summarizes the relationship between entrepreneurship and community. In addition, the identification of supporting roles and community benefits for entrepreneurship is also presented. After that, the article continues to conduct discussions and evaluation studies on the supportive behavior of the community towards community-based entrepreneurship for a particular community, the Vietnamese immigrant community in Romania, for these community-based enterprises. The conclusions obtained will contribute to deepening the understanding of the behavior and the supportive role of the community in entrepreneurship. Finally, there are suggestions to improve the role of community support for Vietnamese community-based enterprises in Romania. The paper is organized as follows: the first section provides a brief literature review of the studies, the second section explains the methodology used by the authors in this paper, the third section covers the research findings, and the final section concludes and discusses the results of the research.

1. Literature review

1.1. Immigration entrepreneurship research

Nowadays, with globalization and a connected world, immigration and immigrant entrepreneurship represent a topic of high social and academic significance (Schuetze and Antecol, 2006; Fairlie and Lofstrom, 2015; Dabić et al., 2020; Ozmen et al., 2021). Topics covered by immigrants start and develop a business in the host country (Basu, 2006; Dabić et al., 2020; Ozmen et al., 2021), and immigrant entrepreneurship is the focus of a growing number of scientific studies (Schuetze and Antecol, 2006; Fairlie and Lofstrom, 2015; Dabić et al., 2020; Ozmen et al., 2021). Current studies on immigrant entrepreneurship mainly focus on issues of immigrant entrepreneurial intentions (Baycan, Sahin and Nijkamp, 2012); needs, motivations, and potentials of immigrants (Kerr and Kerr, 2016); start-up orientation and business performance; recommendations and policy implications for immigrant entrepreneurship (Jones et al., 2019), etc.

As for the current research in Romania on immigrants, there is little research on this issue (Ozmen et al., 2021). Nearly research is mainly related to religion (Grosu, 2015), immigrant women's entrepreneurship (Sharbek and Grosu, 2018), etc. Considering the framework of this paper, the author wishes to provide a contribution from a practical perspective to the development of the scientific literature on the topic of community-based entrepreneurship, in general, the topic of community-based entrepreneurship of the immigrant community in Romania in particular.

1.2. The role of community in community-based entrepreneurship

Currently, the role of entrepreneurs is being demonstrated by promoting economic growth and job creation worldwide (Gruidl, Stout and Markley, 2014). Entrepreneurs, therefore, play an essential role in the economy of every society and country. In reality, enterprises are a socio-cultural phenomenon. Furthermore, their establishment and operation (success or failure of enterprises) are linked and dependent on the environment in which the enterprise is operating (Păunescu, Popescu and Duennweber, 2018; Priede-Bergamini et al., 2019; Păunescu and Mátyus, 2020; Păunescu and Molnar, 2020). In different environments, circumstances and times, entrepreneurial behavior and intentions will also be different (Ambad and Damit, 2016; Maresch et al., 2016). Among the factors affecting entrepreneurship, community as a consideration affects all forms and processes of entrepreneurship (Hindle and Moroz, 2010). More specifically, Collins et al. (2016) determined that there are many paths to entrepreneurship, in which the community plays an essential role in the formation of entrepreneurship. Local communities are not only rich in natural resources and resources but also form an effective foundation for business (Johannisson, 1990; Martin, McNally and Kay, 2013).

Besides, currently, there have been studies by some researchers confirming that entrepreneurship has a close connection with the community. Entrepreneurship relies on the community for developers to pursue the common goals and interests of both the community and entrepreneurship (Peredo, 2001; Lyons et al., 2012). The aspects and characteristics of the community have had a strong influence on any entrepreneurial process and the entrepreneurship of entrepreneurs and business processes (Hindle and Moroz, 2010). Therefore, it can be seen that entrepreneurship and community have a significant relationship with each other (Lyons et al., 2012; Darwish and Van Dyk, 2018; JMIGE, 2021).

In fact, communities support entrepreneurship by forging culturally supported relationships to share information opportunities, collaborate for the benefit of the community or region, and create ecosystems that support businesses (Julien, 2007; Fortunato and Alter, 2011). In addition, communities (or communities' ecosystems) support entrepreneurs and entrepreneurship not only at a functional level (For example, local taxes and land use policy, availability of financing options) but also at the relational level (Wilkinson, 1991), as well as supporting the production and marketing of products and services (Peredo, 2014). From there, the community contributes to promoting an enabling environment that supports entrepreneurship and entrepreneurship (Wilkinson, 1991; Peredo, 2014; Galappaththi, Galappaththi and Kodithuwakku, 2017).

More specifically, researchers consider community support as a catalyst for entrepreneurial ventures (Korsching and Allen, 2004). The community provides significant services aimed at supporting start-ups (Darwish and Van Dyk, 2018) and through various measures and subsidies (Prijon, 2012). The more supportive the community, the greater the number of potential entrepreneurs who will start new businesses (Gruidl, Stout and Markley, 2014). Communities also have other contributions, especially providing a role model for young people, providing goods and services and donations (Collins et al., 2016), providing experiences and knowledge (Galappaththi, Galappaththi and Kodithuwakku, 2017). In addition, entrepreneurs need each other, and they need others from other sectors of the economy and society (Fortunato and Alter, 2011). Therefore, it can be seen that the greater the level of trust between individuals in the community, the better the chances of entrepreneurs starting a successful business (JMIGE, 2021). In addition, the communities also support the links between entrepreneurs through networks and social relationships (Ketilson and MacPherson, 2002; Manyara and Jones, 2007). Therefore, it can be said that community-based enterprises depend on the participation and support of the community, from which businesses can develop in the best way. In other words, community participation and support are the foundation for the success and sustainable development of community-based enterprises (Peredo, 2014; Galappaththi, Galappaththi and Kodithuwakku, 2017).

2. Research methodology

The aim of the study is to understand the supportive behavior of the community towards Vietnamese community-based entrepreneurship in Romania.

The subjects surveyed here are members of the Vietnamese community in Romania. However, to ensure the accuracy of the data, we think it's important that community members know their communities well and take the time to learn and understand the characteristics of the Vietnamese community in Romania so that their behavior can be related to the community. Therefore, the subjects surveyed are people in the Vietnamese community in Romania who have lived and worked in Romania for more than one year.

The data are collected through an online questionnaire, and the Google Docs platform is used for the investigation. The survey period was carried out in November and December 2021 for members of the Vietnamese community in Romania. The sampling method was convenient, non-probabilistic. Finally, 169 complete and valid questionnaires were used to conduct the analysis.

The data will be retrieved from the results of the questionnaires collected from the Google Docs platform. Next, statistical analysis methods will be used to evaluate the supportive behavior of the community towards Vietnamese community-based enterprises in Romania. The main statistical analysis method is descriptive statistics (percentage, frequency, etc.). Furthermore, the Pearson Chi-Square test method is also used to consider the difference in the assessment of the groups of surveyed respondents following the given criteria. If the Sig. value of the Pearson Chi-Square test is statistically significant (Sig.value < 0.05), meaning that there is a difference in the assessment between the groups of respondents. The results will be collected using Microsoft Excel software and SPSS 23.0 software.

3. Results and discussion

The statistical results in Table no. 1 show descriptive statistics about the surveyed subjects from the Vietnamese community in Romania. The results show that out of a total of 169 respondents to a complete and valid questionnaire used for analysis, 91 are female (46.2%), and 78 are male (53.8%). Among them, 16 people have lived in Romania for less than three years, 34 people have lived in Romania for 3-5 years, 87 people have lived in Romania for 5 to 10 years, and 32 people have lived in Romania for more than ten years. In addition, for age groups, there are 46 people under 25 years old, 47 people from 25 to 35 years old, 33 people between 35 and 50 years old, and 43 people over 50 years old.

Table no. 1. Descriptive statistics of data collected

	Number	Percent		Number	Percent		Number	Percent
Gender			**Age**			**Year in Romania**		
Male	78	46.2 %	<25	46	27.2 %	<3	16	9.5 %
Female	91	53.8 %	25-35	47	27.8 %	3-5	34	20.1 %
			35-50	33	19.5 %	5-10	87	51.5 %
			>50	43	25.4 %	>10	32	18.9 %

Source: Author's own research results.

Our first analysis is an assessment of community support behavior for community-based enterprises. The results are shown in Figure no. 1. The results show that the majority of respondents are involved in activities to support community-based enterprises (the rate is 85.2%), compared to not participating in support activities (the rate is 14.79%). It shows that the Vietnamese community in Romania has a strong spirit of solidarity and helps each other to run a business in Romania.

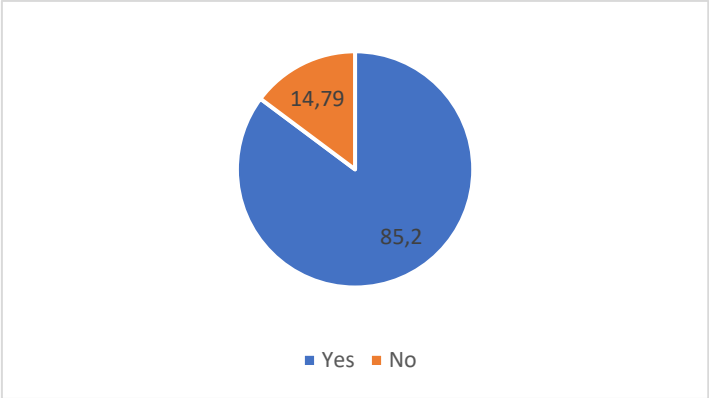


Figure no. 1. Supportive behavior towards community-based enterprises.
Source: Author's own research results.

To assess the frequency of participation in supporting community-based enterprises for those who rate them as having supportive behavior towards community-based enterprises, the author used a 5-level scale (from 1 for "Rarely" to 5 for "Usually"). In general, the evaluation in Figure no. 2. shows that the frequency of participation in supporting community-based enterprises is quite high. In more detail, the rating with the highest rate is "Sometimes" (40.97%).

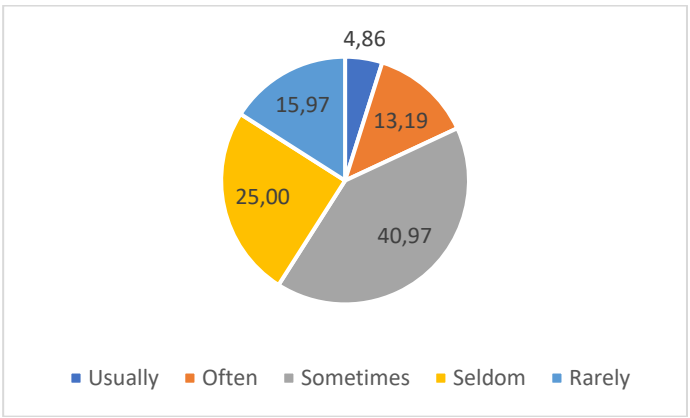


Figure no. 2. Frequency of participation in supporting community-based enterprises.
Source: Author's own research results.

Next, the author identifies supportive activities for community-based enterprises that community members are willing to participate in. Respondents were asked to indicate the support activities they participate in supporting community-based enterprises. Table no. 2. shows a list of behaviors that respondents support the community-based business. These community support activities are based on the analysis of the theoretical basis mentioned earlier.

Table no. 2. Activities in which respondents are willing to participate in supporting community-based enterprises.

No.	Support activities	% of respondent
1	Support for relationships	88.2
2	Using services or buying goods	77.5
3	Support in promoting products or services	76.3
4	Regularly encourage enterprises	67.5
5	Support for labor	40.2
6	Financial support or giving loan	23.1
7	Participate in events and exchange activities organized by enterprises	21.3
8	Support for business knowledge and information	14.8

Source: Author's own research results.

Statistical results show that most members of the community are willing to support community-based enterprises by "Support for relationship". In addition, "Using services or buying goods" as well as "Support in promoting products or services" for these enterprises are also focused on implementation. Activities such as "Financial support or giving loan", "Participating in events and exchange activities organized by enterprises" and "Support for business knowledge and information" have a relatively low level of agreement compared with assessments for other activities.

Then, analyzing specifically the community's willingness to support behavior for community-based enterprises, The author examined whether there is a relationship between support activities and respondents' characteristics in terms of gender, age, and time in Romania. The results of this relationship are examined by the Pearson Chi-Square test. The results are shown in Table no. 3.

Table no. 3. Pearson Chi Square Test of association between „Support activities" and „Gender", „Year", and „Age"

No.	Support activities	Cross tabulation with		
		Gender	Year	Age
1	Using services or buying goods	Pearson: 0.323 Sig: 0.570 Df: 1	Pearson: 4.302 Sig: 0.231 Df: 3	Pearson: 5.590 Sig: 0.133 Df: 3
2	Support for labor	Pearson: 0.258 Sig: 0.611 Df: 1	Pearson: 0.791 Sig:0.852 Df: 3	Pearson: 5.624 Sig: 0.131 Df: 3
3	Support in promoting products or services	Pearson: 0.849 Sig: 0.357 Df: 1	Pearson: 2.298 Sig: 0.513 Df: 3	Pearson: 5.753 Sig: 0.124 Df: 3
4	Support for business knowledge and information	Pearson: 1.217 Sig: 0.270 Df: 1	Pearson: 1.707 Sig: 0.635 Df: 3	Pearson: 7.658 Sig: 0.053 Df: 3
5	Financial support or giving loan	Pearson: 2.146 Sig: 0.143 Df: 1	Pearson: 3.898 Sig: 0.273 Df: 3	Pearson: 4.313 Sig: 0.230 Df: 3
6	Support for relationships	Pearson: 0.346 Sig: 0.557 Df: 1	Pearson: 7.543 Sig: 0.056 Df: 3	Pearson: 1.614 Sig: 0.656 Df: 3
7	Participate in events and exchange activities organized by enterprises	Pearson: 0.272 Sig:0.602 Df: 1	Pearson: 1.291 Sig: 0.731 Df: 3	Pearson: 1.845 Sig: 0.605 Df: 3
8	Regularly encourage enterprises	Pearson: 0.742 Sig: 0.389 Df: 1	Pearson: 2.861 Sig: 0.414 Df: 3	Pearson: 9.502 Sig: 0.023 Df: 3

*Note: *significance level for p-value: 0.05*

Source: Author's own research results.

The results in Table no. 3 show a relationship between age and the incentive behavior of community-based enterprises (with a Sig value that has statistical significance at 0.023 compared to 0.05). The distribution of responses shows that the proportion of respondents with a younger age actively supports and encourages community-based enterprises ("Regularly encourage enterprises"). It is contrary to the conventional wisdom that older people are more encouraging and motivating than young people. However, this is quite consistent with the characteristics of Vietnamese people that adults often think of being more stable. They prefer to work in government agencies instead of doing business like community-based enterprises.

Therefore, it can be seen that the young people of the community appreciate and actively provide spiritual support to community-based enterprises through encouragement and motivation.

In addition, it can be observed that, just above the critical value for the test (0.05), two possible associations can be stated: The relationship between "Age" and "Support for business knowledge and information", and "Years" in Romania and "Support of relationships". First of all, about the relationship between "Age" and "Support for business knowledge and information", it has a Sig value = 0.053. The distribution of answers shows that people of working age account for a higher proportion than other subjects because they have exposure to business practices in their day-to-day lives.

Another association was the association between years in Romania and "Support for relationships" (Sig value = 0.056). The distribution showed that the longer they spent in Romania, the higher their "Support for relationships" were compared to those with less time in Romania. It is understandable because the longer you live in Romania, the more relationships you will have, so it is best to introduce business relationships to community-based enterprises. In addition, the study found no other association between other support activities and gender during the year studied.

Finally, in Figure no. 3 the result presents the community members' willingness to participate in supporting community-based enterprises in the future. The results show that the majority of respondents said that they are willing to participate in supporting Vietnamese community-based enterprises in Romania in the future (90.53%). In addition, the investigation shows that the number of people who are not participating in supporting because of geographical distance and time for their plans. Some people have plans to return to Vietnam or move to other countries.

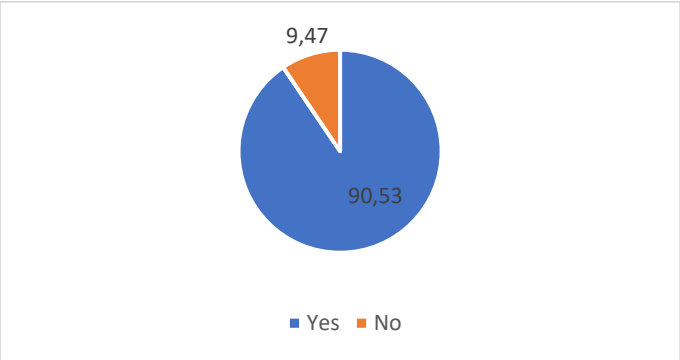


Figure no. 3. The willingness to participate in supporting community-based enterprises in the future

Source: Author's own research results.

Conclusions

The development of community-based enterprises for immigrant communities is essential. This not only contributes to creating jobs but also contributes to the development of the community in general and community-based enterprises in particular. For community-based enterprises, the support of the community plays an essential role in the development of the businesses themselves. Community support throughout all stages of business development (from the start of the business to the growth of the business). Therefore, the present paper aims to investigate the supportive behaviors of the community towards Vietnamese community-based enterprises in Romania today, especially in the context of the severe impact caused by the Covid-19 pandemic from 2019 to 2022.

Research results have shown that the majority of respondents who are members of the Vietnamese community in Romania participate in activities to support community-based enterprises. In addition, the community also often supports community-based enterprises quite often, with a fairly high rating. For activities to support community-based enterprises, "Support for relationships", "Using services or Buying goods" are the activities that the community has the most frequency. "Financial support or giving loans" and "Support for business knowledge and information" are not behaviors that are strongly supported by the community. In addition, it was found that there is a relationship between "Age" and "Support for business knowledge and information" as well as "Regularly encouraging enterprises", and the relationship between "Years" and "Support for relationships". More specifically, the proportion of young respondents actively supporting and encouraging community-based enterprises. In addition, people of working age have a higher percentage of supporting business knowledge than other age groups.

The study also has inherent limitations on the sample. The number of study samples was small. Besides, the sample selection method is a convenient, non-probabilistic sampling method. The analytical method also only explores the relationship between the supportive behaviors of the community and the demographic characteristics of the community. Therefore, the study has many limitations. However, the research results have also confirmed the role of the community for community-based enterprises. In addition, the study also showed supportive behaviors of the community. It is consistent with the purpose of the research in this paper. Further research can be mentioned to deeply analyze the supportive behaviors of the community towards community-based enterprises using specific scales and other analytical methods. In addition, the measurement of specific cases of community-based enterprises and the change of community support behavior in different stages of development of community-based enterprises are interesting future studies. From there, it is possible to have timely and accurate assessments of current community support policies aimed at adjusting and supporting community-based enterprises in the best way.

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Analysis of the Influences of Training and Personal Development Programs on Organizational Results

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Abstract

As organizations grow in size and complexity, the challenges they face and the number of employees needing training and personal development (TPD) programs increase. The research in this paper focused on analyzing employees' perceptions of training and personal development (TPD) programs and the effects that training, vocational training, and personal development have on performance in four public domain organizations. The paper aims to analyze the perceived impact of TPD on organizational results. The relationship between TPD and performance in the public sector has not been an intensively researched field in Romania, especially in terms of the impact perceived by TPD employees on individual and collective performance. The analysis was conducted among 327 employees of Romania's public and private sector organizations. The determination of the influences between the variables was performed by research based on multiple regressions. The results show that TPD programs significantly influence the organizational outcomes in the perception of the employees selected in the study. TPD programs for employees are an integral part of the organization's strategy. The need to invest in the workforce is stronger than ever, as the ability to compete depends on knowledge development.

Keywords

training and personal development; organizational results; individual and organizational performance; labor productivity; profitability.

DOI: 10.24818/BASIQ/2022/08/003

Introduction

The link between training and personal development (TPD) programs and organizational performance is yet a problem in the discussion. Moreover, companies tend to assimilate TPD to an expenditure more willingly than an investment that can bring profit by increasing labor productivity. Therefore, an essential asset in TPD programs does not repeatedly induce a comparative enhancement of performance and gains because of the inefficient management of TPD programs. On the other hand, the practical evaluation of TPD programs allows the organization to determine the efficiency or extent to which the desired expectations have been met. Therefore, TPD should be measured based on performance measures and outcomes, as this allows an assessment of the level of success and overall impact of TPD programs (Pollitt, 2007). However, the relationship between training and organizational results is not entirely clear. Various authors (Molina and Ortega, 2003; Vărzaru and Vărzaru, 2009; Nguyen, Truong, and Buyens, 2011) have empirically evaluated the relationship between training and organizational performance in various forms but still need empirical work to better describe this relationship, in many ways. That is why it is necessary to research the employees' perception of TPD programs and their confidence in these programs.

The paper pursues the proposed purpose over six sections. There is an exposition of the research topic in the first section, and in the second section presents a short review of the specialized literature. Section three

and section four present the methodology and results of the research. Finally, the last two sections bring the discussions and conclusions of the study.

1. Literature review

In contrast, Wills (1998) states that the relationship between TPD and the organization's results is very complex, as the results are affected by different influences. Glaveli and Karassavidou (2011) suggest an indirect relationship between TPD and organizational performance. They argue that a formal, structured, and long-term approach to training and certain pre- and post-TPD conditions and activities will create positive perceptions of TPD value. Higher levels of job satisfaction stimulate employee loyalty, creating value for the organization (Vărzaru and Vărzaru, 2015, Vărzaru and Vărzaru, 2016). This value is reflected for customers through better quality of services and reciprocally through greater customer satisfaction and loyalty, which leads to improved profitability. Nguyen, Truong, and Buyens (2011) investigate the role of training and its impact on sound performance in some Asian economies; they suggest that TPD is positively related to organizational performance. In addition, Smith and Smith (2007) argue that TPD could play an essential role in human resource management practices. Costen and Salazar (2011), contained in TPD programs, are more loyal and willing to stay in their organizations. The need for companies to focus on building employee capacity and employee development to achieve job satisfaction can be highlighted.

While many organizations acknowledge the skills shortage in the labor market, there is a reluctance on their part to engage in TPD. However, they are aware that the results are significantly positive (Iancu et al., 2022). The main motive is a lack of information about the importance of TPD for organizations. In addition, organizations are interested in raising labor productivity and profitability in the shortest possible time (Vărzaru et al., 2012; Vărzaru and Vărzaru, 2013).

2. Research methodology

The empirical study underlying the research was conducted among 327 private and public organizations employees in Romania. A questionnaire was applied to employees, and the results were analyzed using multiple regression equations. Multiple regression analysis is used to determine the extent to which several different variables, namely running a TPD program and relying on the effects of TPD programs, help predict another variable, namely the results of organizing them. The formula behind multiple regression analysis is:

$$\rho_i = \propto + \beta x_i + \sigma y_i \tag{1}$$

where:

α – parameter of external variables,
β, σ- parameters of independent variables,
x_i, y_i- independent variable,
ρ_i – dependent variable,
i – the number of cases in the sample.

3. Results

The analysis model involves defining variables that illustrate organizational outcomes (labor productivity, profitability, overall individual performance, overall organizational performance) as dependent variables, running a TPD program, and trusting its effects as independent variables. Table no. 1 summarizes the resulting linear regression model with dependent labor productivity as a dependent variable and independent variables as the completion of a TPD program, and confidence in the effects of TPD as independent variables.

Table no. 1. Multiple linear regression model applied to variables on labor productivity and vocational training and personal development

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,831a	0,691	0,686	0,68294

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129,472	2	64,736	138,797	0,000
	Residual	57,835	124	0,466		
	Total	187,307	126			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,853	0,282		-3,028	0,003
	TPD	1,458	0,205	0,477	7,108	0,000
	Confidence in TPD	0,682	0,106	0,433	6,440	0,000

Note: a. Dependent variable: labor productivity

Source: Developed by authors

Table no. 2 presents the resulting linear regression model synthetically having as dependent variables the profitability and the completion of a TPD program and the confidence in the effects of TPD as independent variables.

Table no. 2. Multiple linear regression model applied to variables on profitability and vocational training and personal development

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,774a	0,599	0,592	0,73870

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101,013	2	50,507	92,558	0,000
	Residual	67,664	124	0,546		
	Total	168,677	126			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coef-ficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,635	0,305		-2,084	0,039
	TPD	1,382	0,222	0,477	6,231	0,000
	Confidence in TPD	0,552	0,115	0,369	4,818	0,000

Note: a. Dependent variable: profitability

Source: Developed by authors

Table no. 3 presents the resulting linear regression model synthetically having as dependent variable the overall individual performance and the completion of a TPD program and confidence in the effects of TPD as independent variables.

Table no. 3. Multiple linear regression model applied to variables on overall individual performance and training and personal development

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,843a	0,711	0,707	0,69048

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145,637	2	72,819	152,735	0,000
	Residual	59,119	124	0,477		
	Total	204,756	126			

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1,096	0,285		-3,848	0,000
	TPD	1,997	0,207	0,625	9,628	0,000
	Confidence in TPD	0,471	0,107	0,285	4,395	0,000

Note: a. Dependent variable: overall individual performance

Source: Developed by authors

Table no. 4 presents the resulting linear regression model synthetically having as a dependent variable the overall organizational performance and the completion of a TPD program and confidence in the effects of TPD as independent variables.

Table no. 4. Multiple linear regression model applied to variables on overall organizational performance and training and personal development

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,818[a]	0,669	0,664	0,70130

ANOVA

Model		Sum of Squares	df		Mean Square	F	Sig.
1	Regression	123,534	2		61,767	125,590	0,000
	Residual	60,985	124		0,492		
	Total	184,520	126				

COEFFICIENTS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,882	0,289		-3,048	0,003
	TPD	1,609	0,211	0,531	7,638	0,000
	Confidence in TPD	0,566	0,109	0,362	5,207	0,000

Note: a. Dependent variable: overall organizational performance

Source: Developed by authors

It can be seen from the analysis of the four linear regression models that the completion of TPD programs and confidence in the effects of these programs have significant positive results on organizational results, external factors of the model have negative values, and the significance of the models is increased.

In figure no. 1, we presented a hierarchy of the impact that the completion of TPD programs has on the different categories of organizational results.

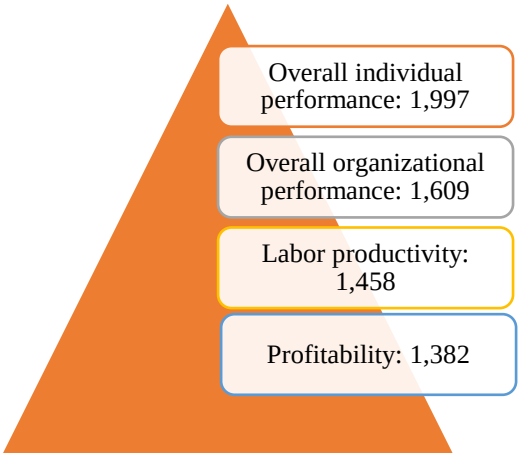


Figure no. 1. Ranking the impact of the TPD programs on the organizational results

Source: Developed by authors

From the analysis of figure no. 1, it can be seen that the completion of a TPD program has a significant influence primarily on individual and organizational performance, labor productivity, and profitability.

Figure no. 2, which illustrates the impact of confidence in TPD programs on organizational outcomes, shows a different hierarchy of influences. First of all, the confidence in TPD programs influences the labor productivity the most, then the general organizational performance, the hierarchy being concluded by the profitability and the general individual performance.

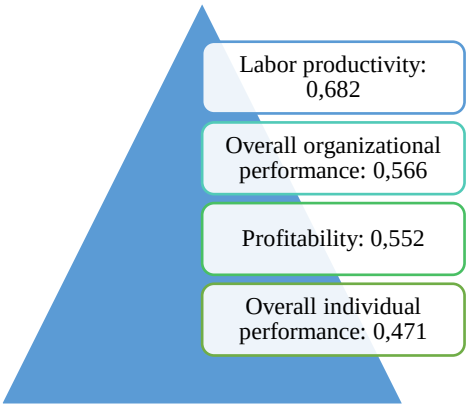


Figure no. 2. Ranking the impact of confidence in TPD programs on organizational outcomes
Source: Developed by authors

4. Discussions

Well-trained employees increase the organization's productivity, and labor productivity increases production through better performance. The relationship between TPD and productivity can be traced to Becker's classic study (1993). Following the empirical research, we found that training improves the ability of organizations to perform and promotes better performance results. In addition, Senge (2006) argued that learning in an organization (through TPD) leads to knowledge acquisition, resulting in more knowledge exchange in the team, better motivation, and raised creativity. Therefore, improving knowledge and professional skills will positively influence productivity and performance (individual and organizational).

In the paper, we investigated the impact of TPD and confidence in TPD on organizational results in the perception of Romanian employees. Due to the research, we found that the completion of TPD programs and confidence in the effects of these programs have significant positive results on organizational results. Completing a TPD program has a considerable influence primarily on individual and organizational performance, while confidence in TPD programs mainly affects labor productivity. Other researchers highlight a positive relationship among TPD, confidence in TPD results, productivity, and workplace performance (Vărzaru and Vărzaru, 2009). In addition, Molina and Ortega (2003) have demonstrated that TPD exerted positive effects on organizational performance by raising employee satisfaction.

Conclusions

Following the empirical study, the analysis of the four linear regression models investigating the relationship between TPD and organizational outcomes leads to the conclusion that TPD programs and confidence in the effects of these programs have significant positive results on organizational outcomes, external factors of the model having negative values, and the degree of significance of the models is increased. Effective completion of TPD programs significantly influences individual and organizational performance in particular, while confidence in TPD programs has a particularly significant influence on labor productivity and overall organizational performance.

TPD programs have made a substantial contribution to improving employee performance. The most critical performance vector in an organization is to increase productivity. The best way to achieve this is through TPD. In addition, TPD plays an essential role in competitiveness, reducing the waste of time and resources.

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The New Trend Model of Change Planning for Post-pandemic Adaptation

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Abstract

The problem analyzed through this study reflects the national crisis situation of the Romanian educational system, against the allergic background of powerless political influences in a context in which many other systems, such as economic, health, tourism and not only are in a state of collapse. This aspect brings to attention the issue of paradoxes which, from the perspective of other researchers, characterize the process of changing the school organization. In order to better understand the nature of the contradictions of the current change, the experience of experts is relevant through the power of example. If post-pandemic changes mean misalignment, then there is a risk of imbalances and chaos. Therefore, the post-pandemic is becoming an insecure world that is exacerbated with the use of information and communication technology tools. In this case, the nostalgia of educational institutions for the past should probably not be surprised, especially since the change sometimes concerns only external demands, like a wound healed from the outside, leaving the inside in a greater suffering. Among the methodological activities used by the authors are the diagnostic analysis of the managerial documentation and of the quality assurance commission in the Romanian public educational institutions, the exploratory evaluation of the specialized literature. Finally, the result of this research generates analysis criteria for organizational adaptation and processing the stages of the planned institutional change process. These results can help the human resources that need this meticulous process of change and adaptation through the patterns of behavior provided by the authors.

Keywords

post-pandemic organizational adaptation, diagnosis of changing, institutional philosophy, crystallization of change

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Introduction and theoretical background

Regardless of whether they have their source individually or at the organizational level of the school, resistance to change must not be ignored, but the most effective ways to improve them must be sought, as they risk affecting the achievement of change objectives and ability to respond appropriately to social requirements. They cause moral and psychological wear and tear, although there are cases when their manifestation is fully justified. It is the case of unplanned changes or, more precisely, those that are not appropriate to the context of each organization, their needs and demands. Organizational development is beginning to gain more and more importance for the individual as lifelong learning, as the main solution for adapting to the requirements of society. If initially the pace of change was slow, allowing the progressive evolution of ideas and values, it can be said that today the social environment and educational organizations are in a permanent dynamic, causing sudden changes that require anticipation. Achieving performance,

development, adaptation of human resources require a knowledge effort aimed at acquiring knowledge, skills, but especially attitudes conducive to change (Tsiuniak at al., 2020)

The educational organization has become the paradigm of modern organizations, being structures in which people have the ability to create the results they want by stimulating new ways of thinking, each having the freedom to aspire and learn how to adapt with others. Most of the time, the content of the change is varied and complex, requiring sustained efforts, but also the recourse to a set of strategies that facilitate the correct acquisition of the change or its real production at a practical-applicative level. The role of the managers of the educational organizations is particularly important in this direction, as they are responsible for carrying out the strategic analyzes and applying the change at the level of the guided organization. Adopting changes in education involves changing the institutional philosophy, the model of its operation, assuming responsibilities, but also an effort to penetrate the risks that lie in maintaining a bankrupt educational reality (Vărzaru and Vărzaru, 2013). Although it has clearly set goals, it has often been found that change has a mobile, non-linear trajectory, which is why "learning to change" would generate a vital experience to deal with the unpredictable.

The real content of this type of learning at the level of the educational organization is given by the concrete ways in which it can cope with change, namely the promotion of strategies to facilitate the improvement of personal and organizational performance, to reduce resistance to change, to develop prospective capacity or training pro-active skills (Vărzaru, and Vărzaru, 2009). For this reason, it is important to reiterate the need for education through and for change, both at the individual level and at the level of the organization as a whole. If change cannot be avoided, it is important that we at least learn to deal with it. The ways in which the organization can learn are among the most diverse. There is no need for a clear announcement of the moment from which the learning begins, not for a triumphant recitation of the content of this approach. Change must gradually creep into the lives of the organization and its people, without blatant leaps and bounds and through the adoption of compensatory mechanisms designed to mitigate "shocks".

The relationship between centralization and decentralization at the level of the educational organization is also a possible paradox. The fact that at the level of the Romanian education system there is talk of an autonomy of the educational institutions, the relativity of this concept cannot be overlooked (Iancu et al. 2022). It manifests itself at the internal level of the organization, in the sense that any manager, respectively teacher has the freedom to design according to the needs of the beneficiaries, to use those managerial and educational strategies that prove to be effective for achieving the proposed objectives.

1. Methodology

When faced with innovation, a doubt or a feeling of helplessness can sometimes arise. For this reason, dealing with change in education becomes a professional task, seemingly impossible when faced with psychological barriers or extreme solutions. In the opinion of the authors, there is a need to get rid of inefficient practices, critical reflection and reconsideration of socio-educational realities, as well as effective involvement in promoting change at this level. To this end, the social sector must take responsibility for the assistance of change when it is requested and facilitate the integration of trained young people, and the school organization must assume responsibility for coherent change and the quality of the managerial and educational act. The issue of organizational development and the process of change at the level of educational organizations bring into discussion two essential aspects. It is about the need for a diagnostic analysis to support the planning / design and effective implementation of change.

The results obtained from the diagnosis are relevant in drawing up a forecast of the evolution of the respective organization. For the realization of a viable project for the development of the school organization, the diagnosis has a crucial importance, being made by the headmaster in organizational development. In the case of the school organization, the task of diagnosis lies with the school manager and the management team at the organization level. The diagnosis should address the internal and external environment of the educational institution. (Table no.1)

In order to make a diagnosis to promote change, at the level of the educational organization it is necessary to identify the attitude of teachers towards change, the direction of change, as well as the problems that change raises. These are the first and most important steps in planning for educational change. Planned organizational change is another concept that has recently been promoted by organizational development specialists.

It can be generated from within, in which case it subsumes a set of activities aimed at changing individuals, groups, structure or organizational processes, or from outside, as a result of changes in technology, legislation or as a result of increasing competitiveness.

Table no. 1. Analysis criteria for organizational adaptation

Nr. crt.	The internal environment of the organization	The external environment of the organization
1	mission, objectives	timely
2	type of culture and organizational climate	existing threats at the local community level
3	the quality of the human resource and the degree of its motivation	competing organizations
4	quality of material resources	the requirements of the society
5	the organization's ability to financially support change	how school-community interactions are established
6	type and managerial efficiency	competing organizations
7	the organization's ability to develop and implement institutional development projects	partnerships and projects
8	the quality of institutional processes	legislation and new technologies

Source: Authors' concept based on the diagnosis of the two organizational environments

Upon a careful analysis of the existing specialized theories regarding the process of change, through their comparisons and revisions, the authors generate predictions that involve going through some stages, described in Figure no.1, which are at some point in true models of implementation of change.

Although relevant from the objective perspective it offers in understanding the moments of change, the staging proposed by Lewin and Schein overlooks the need for rigorous planning. In order to realize the importance, but also the complexity of this process, it is necessary to analyze its essential elements, described in stages of the intervention process for change and which are perfectly valid for the school organization of the change process, the diagnostic phase, the planning phase, the implementation phase and the effects assessment phase. The preparation of the change process involves concerns in the direction of analyzing and clarifying some issues related to identifying the problem and defining the conditions, specifying the goals and eliminating false goals, as well as verifying the feasibility of the change.

Very often, the resistance to change is due to the ambiguity of the problem and the contractual conditions, which is why it is necessary to identify the important aspects of the problem. It is the time when the most frequently asked questions are related to the nature of the activity. Analyzing most of the attempts to stage the planned organizational change, we find that we can speak of three basic moments: the beginning of change which involves preparation for change and diagnostic analysis, an intermediate moment, the implementation of innovative measures and a final moment, with a role evaluation of the quality of the results obtained. Although no infallible rules can be established to promote change, nor can immanent models, at the level of any school organization, it is necessary to go through additional moments that escape the cited authors.

2. Finding of theory and results

The planned organizational change, considered as the intention of managers and employees to improve the functioning of groups, departments or the whole organization, in its important phases, is necessary to be based on specific goals (Figure no. 2) and is oriented towards two fundamental objectives:

- improving the organization's ability to adapt to changes in the environment in which it operates;
- changing the behavioral patterns of employees.

Although both are important for change, the priority of its planning must be to change the attitude and behavior of individuals.

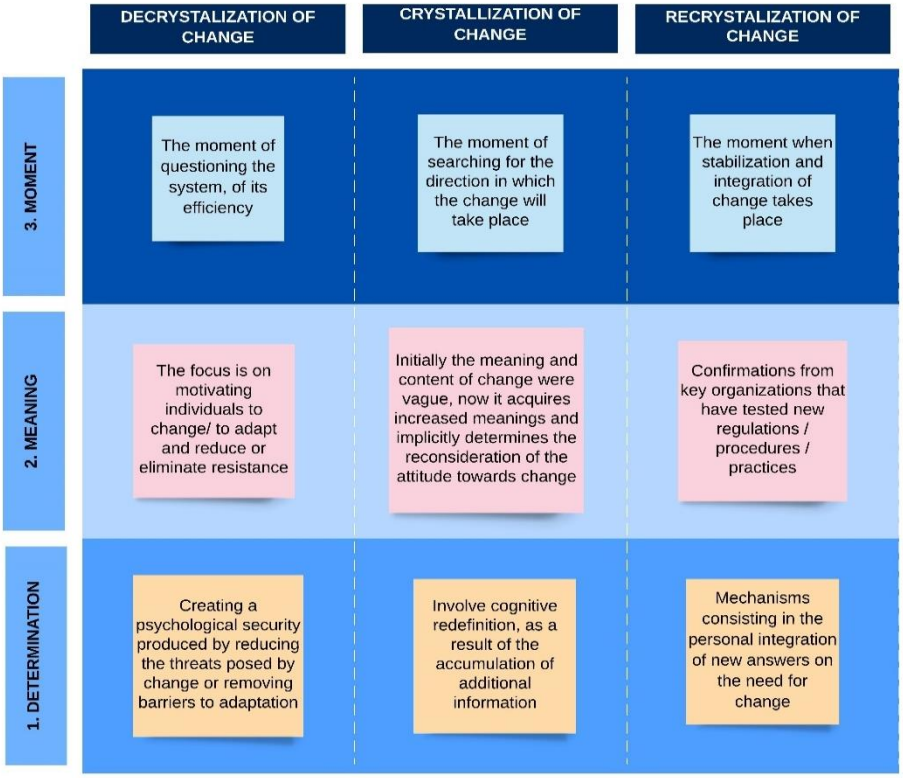


Figure no. 1. The stages of the planned organizational change process / adaptation
Source: Adaptation and processing of authors afterK. Lewis and E. Schein

Promoting change in the presence of change-resistant behaviors is nonsense, because changing strategy, which facilitates the adaptation of the organization to the environment, becomes effective only under conditions of proactive behavior. In other words, the success of the process depends fundamentally on the achievement of the second goal.

The conclusion that emerges from the analyzes performed by the authors is the following: at the level of educational organizations, the adaptation process has a multi-determined character (the internal needs of the organization, which may target the administrative, instructional-educational, managerial or social environment), multidimensional (change having strong psychological, educational, social, strategic influences), multilevel (targeting both the individual and the organizational level).

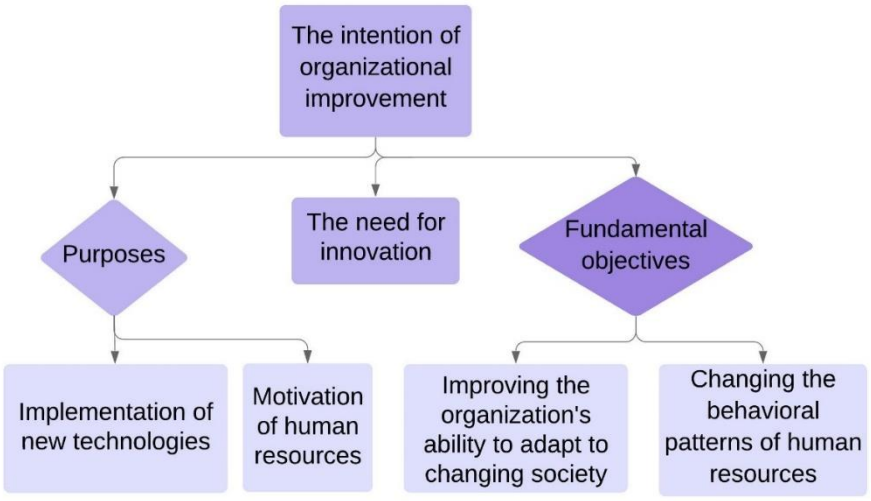


Figure no. 2. The new trend model for planning efficient organizational structures
Source: autors concept

Although rigorous planning of the changes needed for adaptation does not guarantee absolute success, it is preferable to unplanned, unanticipated change that runs the risk of failing in derision as a result of resistance to change. One of the justified reasons for an interrogative attitude regarding the sincerity of the acceptance of change by the educational organization as a whole is the finding of a major gap between the scenarios and adaptations promoted, on the one hand and the concrete aspects of organizational reality, on the other. In other words, change is not objectified in mentality and organizational practice.

In an attempt to analyze the characteristics of human resources refractory to change, the authors concluded that resistance to change is directly proportional to its volume, to the amount of change required, as shown in (Figure no. 3), a prediction that has among its motives the forces of change resistance.

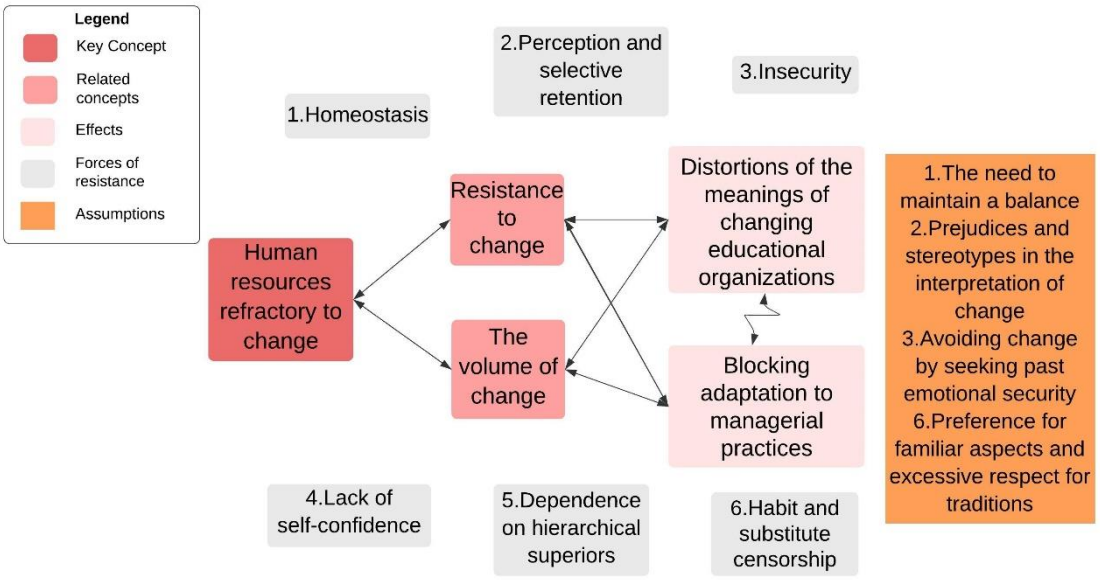


Figure no. 3. Behavioral patterns of human resources that need change and adaptation
Source: autors concept

To these forces the authors consider pertinent to add four individual variables, mentioned in Guskin's studies and which are common in the period of accommodation and adaptation of the educational system to the economic one. These are the sense of competence and vanity (fear of failure), authoritarianism and dogmatism, the feeling of threat and fear, self-fulfilling prophecies. The manifestation of these resistances, even if not in all the described forms, is unfortunately also found at the level of educational organizations. To these can be added eight reactions of refusal identified by the authors in specialized studies (Ibrahim and Aslinda), namely: refusal out of ignorance, refusal out of whim, refusal to maintain a status quo, refusal out of conformity to social grouping, refusal generated by interpersonal relationships, refusal by substitution, refusal due to lack of utility, refusal motivated by experience.

Although human resources reluctant to change are not willing to openly acknowledge the fear of failure, lack of confidence or vanity or active learning and superficialize the activity of educational management, they betray either ignorance, habit or insecurity. These can be considered psychological variables according to which individuals function and which manifest themselves in explicit behaviors.

3. Discussions

Regardless of whether they have their source individually or at the organizational level of the school, resistance to change must not be ignored, but the most effective ways to improve them must be sought, as they risk affecting the achievement of change objectives and ability to respond appropriately to social requirements. They cause moral and psychological wear and tear, although there are cases when their manifestation is fully justified. It is the case of unplanned changes or, more precisely, those that are not appropriate to the context of each organization, their needs and demands.

Organizational development begins to gain more and more importance for the individual as lifelong learning, as the main solution for adapting to the requirements of society (Vărzaru et al., 2013). If initially

the pace of change was slow, allowing the progressive evolution of ideas and values, it can be said that today the social environment and educational organizations are in a permanent dynamic, causing sudden changes that require anticipation. Achieving performance, development, adaptation of human resources require a knowledge effort aimed at acquiring knowledge, skills, but especially attitudes conducive to change.

The educational organization has become the paradigm of modern organizations, being, as stated by Spielberger, structures in which people have the ability to create the results they want by stimulating new ways of thinking, each having the freedom to aspire and learn how to adapt with others.

Most of the time, the content of the change is varied and complex, requiring sustained efforts, but also the recourse to a set of strategies that facilitate the correct acquisition of the change or its real production at a practical-applicative level. The role of the managers of the educational organizations is particularly important in this direction, as they are responsible for carrying out the strategic analyzes and applying the change at the level of the guided organization.

Adopting changes in education involves changing the institutional philosophy, the model of its operation, assuming responsibilities, but also an effort to penetrate the risks that lie in maintaining a bankrupt educational reality. Although it has clearly set goals, it has often been found that change has a mobile, non-linear trajectory, which is why “learning to change” would generate a vital experience to deal with the unpredictable.

The real content of this type of learning at the level of the educational organization is given by the concrete ways in which it can cope with change, namely the promotion of strategies to facilitate the improvement of personal and organizational performance, to reduce resistance to change, to develop prospective capacity or training pro-active skills. For this reason, it is important to reiterate the need for education through and for change, both at the individual level and at the level of the organization as a whole. If change cannot be avoided, it is important that at least, we learn to deal with it.

The ways in which the organization can learn are among the most diverse. There is no need for a clear announcement of the moment from which the learning begins, nor for a triumphant recitation of the content of this approach. Change must gradually creep into the lives of the organization and its people, without blatant leaps and bounds, through the adoption of compensatory mechanisms designed to mitigate "shocks".

Conclusions

In carrying out the process of adaptation at the level of the educational organization, it must be borne in mind that, above the requirements, principles or quality and necessity of innovations in education, change is made by human resources that can often show defensive attitudes towards of an aspect that they consider a real danger for their professional stability. These defensive attitudes need to be known and evaluated in terms of their intensity in order to anticipate the chances of adaptation, and consequently, of real implementation of change. Individual resistances become, by extrapolation, a mechanism of defense of the organization against transformative actions.

The perspective of systemic analysis is verified, the organization, tending to maintain its balance. For this reason, any transformation that occurs in this system involves the installation of a state of chaos or uncertainty until the restoration of balance. It can be said that the biggest paradox of change is the change itself, the fact that promoting the coherence of the system means nullifying the initial coherence. Also, the tensions manifested at the psychological level are often doubled by the nostalgia of the past, attitudinal conservatism, a real barrier to organizational change and adaptation.

Therefore, strategies to promote change must start from locating the motivation for this resistance. The important thing is that change is the expression of a voluntary behavior of individuals and the school organization as a whole, and not an added task, something imposed from the outside.

At the level of Romanian educational organizations, it is necessary to overcome the stimulus-response learning model. The demands of postmodernity force us to challenge change, to plan it rigorously and not to simply react to an external stimulus.

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Enterprise Strategy in the Area of Value Creation for Its Stakeholders

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Abstract

For the enterprise's existence, it is necessary to respond to fundamental changes and development trends in the world economy, especially at the strategic level. Strategic management is the intellectual performance of top management. The enterprise's strategy for creating value for stakeholders is gaining in importance. The identified problem in the paper is the absence of the inclusion of value creation in the enterprise's strategy. Previous research has shown that value management principles are applied in enterprises and create value for enterprise stakeholders. However, these principles are not systematically, holistically elaborated in the strategy. The paper aims to link enterprise strategy issues with the creation of value for enterprise stakeholders to synergy the principles of value management with strategic management. The goal was fulfilled by creating the substantive content of three phases, namely the formulation, implementation, control and evaluation of the strategy in value creation for the stakeholders of the enterprise and the sequence of individual activities. A verbal-graphic model has been developed because management practice strives to use universally valid models. Their processing was also based on a survey conducted through controlled, structured interviews (Pen and paper interviews) with competent managers of selected industrial enterprises. The paper's contribution is to provide new and unexpected perspectives on linking value creation for stakeholders with strategy, propose practical steps to solve the problem through modelling within the enterprise's strategy and open new directions for future research.

Keywords

value, value management, strategy, stakeholders

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Introduction

At the current stage of development of the economic environment, enterprises are looking for new ways to gain and maintain a competitive advantage. These include the application of the principles of value management. The initiatives of the European Union also confirm the timeliness of their use through the adoption of standards EN 1325: 2014 - Value Management - Glossary - Terms and definitions and EN 12973: 2020 - Value Management. Value management is applied at the operational and strategic levels. Its part focused on creating value for enterprise stakeholders at both levels is applied. Linking value management principles with the enterprise's strategy brings a synergistic effect. A formal approach will be ensured based on the deployment of specific processes, goal setting, the use of value management methods to apply management principles through the elaborated part of the strategy.

1. Value and value management in the context of creating value for stakeholders

Based on given international standards, *value* is defined as a measure that expresses how well a product, project, or organization satisfies the needs of stakeholders concerning the resources consumed. *Value management* is a management style focused primarily on people, gaining skills and promoting synergies and innovation to maximize the organization's overall performance. According to Levdokymov, Valinkevich and Zavalii (2018) and Sroufe and Gopalakrishna-Remani (2019), it is a process through approaches and

methods used at different levels of value-oriented business management. It focuses on linking new knowledge with existing knowledge (Shephard and Egan, 2018, Ďurišová, Kušnírová and Malichová, 2020). Based on previous research, value research and solutions, together with value creation and value management, focus primarily on customer value (Ďurišová, 2017, Ďurišová, Kušnírová and Malichová 2020). According to the survey so far, only partial conclusions are available, without a sufficient number of scientific contributions, case studies and other relevant resources. (Potkanová and Ďurišová, 2017), (Malichová, Ďurišová and Tokarčíková, 2017). Currently, corporate activities' importance is valuable to all stakeholders, not only customers (Saipol et al., 2017). Enterprises' stakeholders are persons, groups or organizations that impact the enterprise's existence or their activities affect it retroactively. These include owners, creditors, employees, customers, suppliers, competitors, government, local government, NGOs and communities, and the media. Stakeholders defined in this way are related to the value orientation of the business. The common goal of all stakeholders is the long-term existence of the enterprise. It is necessary to manage relationships with them. The strategy can be focused on all or only selected stakeholders. It uses the stakeholder concentration index (Obeng, 2019). It is insufficient to monitor and manage only the economic value added (EVA). It is necessary to simultaneously confront efficiency and value-added processes, calculated based on the value-added index (VAI), which maps the actual value stream in complex business processes (Rajnoha, Sujova and Dobrovic, 2012).

Value management aims to find the optimal relationship between the satisfaction of needs and the resources used. The manager's ability to perceive the value depends on his ability to search for and use opportunities to grow the enterprise's value and the awareness of the value of people in the work process (Kucharčíková, Mičiak and Hitka, 2018). In managing value, the expectations of individual stakeholders must be aligned. (Schulze and Zellweger, 2021), (Thiry, 2013). Defining a profit criterion for owners, investors, employees, customers, suppliers, and creditors is necessary. Increasing value results from the optimal combination of several activities and factors that need to be monitored, analyzed, designed solutions and then selected as the optimal option. (Davies, 2016). Satisfaction of needs can only be assessed considering the reference functions that define the anticipated needs or services provided and the constraints to be met. This logic fundamentally distinguishes the value management approach from any other approach to optimization, design, or more general problem-solving. Resource consumption represents everything required to meet needs (Kamodyova, Potkany and Kajanova, 2020). Resources include costs (short-term and long-term) and time, materials and other inputs, whether physical or abstract, such as human capital and intellectual property, sustainability and impact on society. The resources used include start-up and operating costs and other aspects such as environmental impacts.

2. Enterprise strategy focused on creating value for stakeholders

The strategy generally includes a comprehensive approach to achieving the set objectives. Goal setting itself is the focus of long-term planning. A common feature is a focus on long-term goals. The strategy looks at long-term goals from a broader perspective than achieving them (Fotr, 2012). The principles of strategic thinking are formulated in the enterprise. The process is determined from the decision through the development of the strategy to its implementation and update (Souček, 2015).

One of the functional areas of the enterprise's strategy is the strategy of creating value for stakeholders. It can be used in three phases:

- Formulation (creation) of strategy: a set of goals and conditions and procedures to achieve them.
- Implementation of the strategy: setting tasks, communication, and introducing administrative support systems.
- Control and evaluation of the strategy: measurement, comparison of the goal with the achieved results, analysis of deviations, conclusions.

Formulation (creation) of strategy

Strategy development is based on the identification and selection of stakeholders. Strategy makers need to select essential stakeholders. The selection criteria can be the importance and benefit to the enterprise and the power to influence the operation and existence. For important stakeholders, value goals need to be set. Strategy development continues by defining the means (resources) to achieve the goals. They can be defined in terms of work, material, capacity, finance and others. The implementation of the strategy is laborious and financially demanding, but the material and capacity resources are negligible. The last part of creating a strategy is determining how to achieve goals. In creating value for stakeholders is adequate to use the

term management activities. They can be defined as methods, procedures, and techniques to create value for selected stakeholders of the enterprise.

Strategy implementation

The implementation of the strategy leads to its realization. It includes a set of activities that implement the established strategy. It includes specific tasks for specific employees with deadlines. The set of tasks can be presented through programs. The role of the programs is to specify which measures will be implemented according to functional areas. On the formal side of the task, they should be in writing. In addition to responsible employees and managers of individual functional areas, strategy developers are also part of the implementation team. Implementing the strategy is a demanding process in which communication, the introduction of administrative support systems, the creation of coordination mechanisms, the localization of decision-making processes and the establishment of control systems play an important role. It may require the creation of remuneration and incentive schemes, a reformulation of corporate culture and possibly a change in organizational structure.

Strategy monitoring and evaluation

The strong competitive environment in which enterprises currently develop their activities must constantly improve their processes (Tokarčíková, Falát and Malichová, 2016). One way to achieve this is to implement a regular ongoing review of the stakeholder value strategy. Quantitative control checks the achieved results and values (Chalastra et al., 2019). Qualitative control and evaluation focus on ensuring compliance with the set objectives in the area and monitoring the contribution of individual employees and managers. The control process's fundamentals are monitoring the actual course (Kajanová, 2015) of the monitored activities, finding out the actual situation, comparing the set goals in the strategy, finding out deviations and their analysis, drawing conclusions for further analysis decision-making.

Determining the actual state of implementation of the value creation strategy for stakeholders is carried out based on observation, measurement, statistical data, various types of databases, imaging, written or oral reports. Inspectors must have sufficient information about the object of inspection, but on the other hand, they must be able to determine the causes of deviations from the required conditions. By comparing the actual situation with predetermined criteria, it is possible to show a match, representing an ideal, unrealistic situation and deviations in the enterprise. A low level of deviations is to be expected in business practice, as the company is a dynamic system, evolving over time, an incalculable number of factors influences the processes taking place in it. Significant deviations arise when there are discrepancies between the objectives and the tasks derived from them and the possibilities for their implementation. Once identified, it is necessary to perform a thoroughgoing analysis (Průša et al., 2020) and then take measures to eliminate them. Deviation analysis has an irreplaceable place in evaluating and monitoring the value strategy for stakeholders. The quantified deviations are de facto or ideologically decomposed into elements (Malichová et al., 2020). At the same time, the relationships between the elements and the impact of production factors on the enterprise's productivity (Chodasova, Kucharcikova and Tekulova, 2015) are examined to know the nature of the investigated phenomenon. The analysis proceeds from the whole to the parts (to the principles), from the result to the causes. The individual causes that affected the result are identified, and the properties of these causes are determined (external and internal, primary and secondary, objective and subjective, desirable and undesirable). These do not always have to be structural elements. The initial task of the analysis is to reveal and know the factors and relationships that affect the phenomenon. The analysis of deviations examines the degree of variability, seasonality (periodicity), the cycle of development, and the length of time shifts. An important position in control has a causal analysis, which deals with comparing causation and detecting factors that are causally related to the phenomenon. It is always better to deal with identified discrepancies as soon as they are identified. Their longer duration causes several consequences and the possibility of further problems and accumulation. Data reporting plays an important role (Tokarčíková, Poniščiaková and Bartošová, 2016). The success of a strategy depends on the ability to overtake others in thinking - to see what others do not see and to understand sooner than others what is the base of the future success. The success of strategic management depends on the ability to overtake others in the proceedings (Papula and Papulová, 2015).

3. Material and methods

The paper focuses on linking the principles of value creation for stakeholders with the enterprise's strategy. This connection results in systematic, holistically integrated value management principles focused on creating value for stakeholders in the enterprise's strategy.

The primary basis for fulfilling the goal was implementing a comparative analysis of theoretically processed data in the field of value creation for stakeholders and strategies.

Additional data were obtained from the survey through guided, structured interviews (Pen and paper interviews) with competent managers of selected industrial enterprises in the Slovak Republic. According to previous research in these enterprises, they are engaged or interested in value management. The chosen form of quantitative research was based on the need to obtain information about opinions, interests, attitudes, knowledge, preferences. They serve as a starting point for the prepared questionnaire survey for small and medium-sized industrial enterprises in the Slovak Republic. A similar questionnaire survey will be conducted in other European countries in the following research phase. The structured interview included closed questions for obtaining standardized answers and open-ended questions for the possibility of obtaining unforeseen information.

4. Results and discussion

By processing the primary data, results from applying the enterprise's strategy for the areas of value creation for the enterprise's stakeholders were created.

The first area concerns the level of value provision and the application of value management principles in business conditions. The interviewed managers expressed their subjective opinions on a verbal evaluation scale with numerical values from 1 to 10. The higher the number, the higher the level of providing value and applying value management principles is.

Table no. 1. Results of the demand for the application of value management principles

Demand item	Verbal rating scale									
	1	2	3	4	5	6	7	8	9	10
	Number of responses									
Value delivery level	0	2	3	2	5	5	0	3	0	0
Application of value management principles	0	3	5	4	5	3	0	0	0	0

Source: Own authors' elaboration.

The level of value provided in the surveyed enterprises is considered by managers to be standard to average. The application of value management principles shows a relatively low to an insufficient level. It is necessary to consider that the survey was conducted in enterprises dealing with value management or are interested in this area.

The second area deals with aspects of strategy formulation. Managers stated on which they pay attention in the formulation of the strategy and to what extent (Table no. 2). Subsequently, they expressed their opinion on the importance of the aspects of strategy formulation that we defined (Table no. 3). A verbal rating scale with numerical values from 1 to 10 was used. The higher the number, the higher the level of importance from their subjective point of view is. According to the results in business conditions, the factual expression of goals is most often used to formulate the strategy, and the determination of managerial activities to achieve the goals is low.

Table no. 2. Results of the inclusion of the value management principles in the formulation of business strategy

Aspects of strategy formulation	Verbal rating scale									
	1	2	3	4	5	6	7	8	9	10
	Number of responses									
Identification of stakeholders	0	0	1	2	5	1	2	5	4	0
Definition of criteria selection	0	0	0	2	4	4	7	1	1	1
Selection of important stakeholders	0	0	0	0	3	4	6	3	2	2
Substantive expression of objectives	0	1	0	2	3	0	4	1	4	5
Definition of resources	0	2	3	3	2	4	2	0	2	2
Determining managerial activities to achieve goals	2	2	0	4	3	1	3	3	2	0

Source: Own authors' elaboration.

Table no. 3. Results of the importance of value management principles in the formulation of business strategy

Parts of the strategy formulation	Importance									
	1	2	3	4	5	6	7	8	9	10
	Number of responses									
Identification of stakeholders	0	2	3	2	5	5	0	3	0	0
Definition of criteria selection	0	0	0	0	4	3	8	1	2	2
Selection of important stakeholders	0	0	0	0	3	4	6	3	2	2
Substantive expression of objectives	0	0	0	0	0	0	5	6	4	5
Definition of resources	0	1	2	3	5	4	2	1	1	1
Determination of managerial activities to achieve goals	0	0	0	2	4	5	3	3	2	1

Source: Own authors' elaboration.

The third area of a systematic approach to the implementation, control and evaluation of the strategy contains results on the use of the elements that make up these processes. The interviewed managers expressed whether individual elements are used in their enterprises (Table no. 4, Table no. 5).

Table no. 4. Results of using the elements of strategy implementation

An element of strategy implementation	Application in business conditions (number of responses)		
	Yes	Sometimes	No
Definition of specific tasks	11	5	4
Determination of the procedure (method) of implementation	4	8	8
Definition of responsible employee	12	6	2
Assignment of competencies to the responsible employee	4	6	10
Determination of the time schedule	6	6	8
Establishment of a coordination mechanism	2	4	14

Source: Own authors' elaboration.

Based on the respondents' answers, the most applied elements from the strategy implementation are the definition of the responsible employee and the determination of specific tasks. The least used elements are creating a coordination mechanism and the assignment of competencies to the responsible employee.

Table no. 5. Results of the elements of the strategy monitoring and evaluation process

An element of control and evaluation of the strategy	Application in business conditions (number of responses)		
	Yes	Sometimes	No
Determination of the quantitative control procedure	7	8	5
Determination of the qualitative control procedure	6	7	7
Definition of the real situation	15	5	0
Comparison of the actual situation with the set target values	13	4	3
Detection and analysis of deviations	8	7	5
Determination of conclusion for further decision-making	4	5	11
Determination of the time schedule	7	8	5
Establishment of a coordination mechanism	3	3	14

Source: Own authors' elaboration.

Based on the respondents' answers, the most used element in the strategy's control and evaluation is defining the actual situation with the most numerous answer (15 respondents). The second most used element is comparing the actual situation with the set target values (13 respondents). The least applied element is creating a coordination mechanism (3 respondents) and concluding further decision-making (4 respondents).

In conclusion, in the results section, it can be stated that a systematic approach is not applied in the business conditions, which would include all elements of formulation, implementation, control and evaluation of the strategy for the creation of value for the stakeholders of the enterprise.

The benefit of using the quantitative method of the structured interview was acquiring other important information, which was not defined in advance. In particular, the need of:

- development of model solutions for strategy components,
- setting up coordination mechanisms,
- introduction of administrative support systems,
- a creation of a database of information,
- localization of decision-making processes,
- a creation of structured information on the control object,
- elaboration of the procedure for the cause of deviations from the required state and their quantification.

The research results could be clearly expressed through a verbal-graphical model (Figure 1 Model of value creation strategy for stakeholders). It depicts and transparently presents its course based on a logical arrangement. It contains a substantive content of 3 steps - formulation, implementation, expression, control, and evaluation in value creation for the enterprise's stakeholders. It is a universal model that can be used in practical applications in various enterprises regarding the subject of activity. The model consists of activities specified in more detail in the text. The model eliminates the inadequacy of structuring problems in this area.

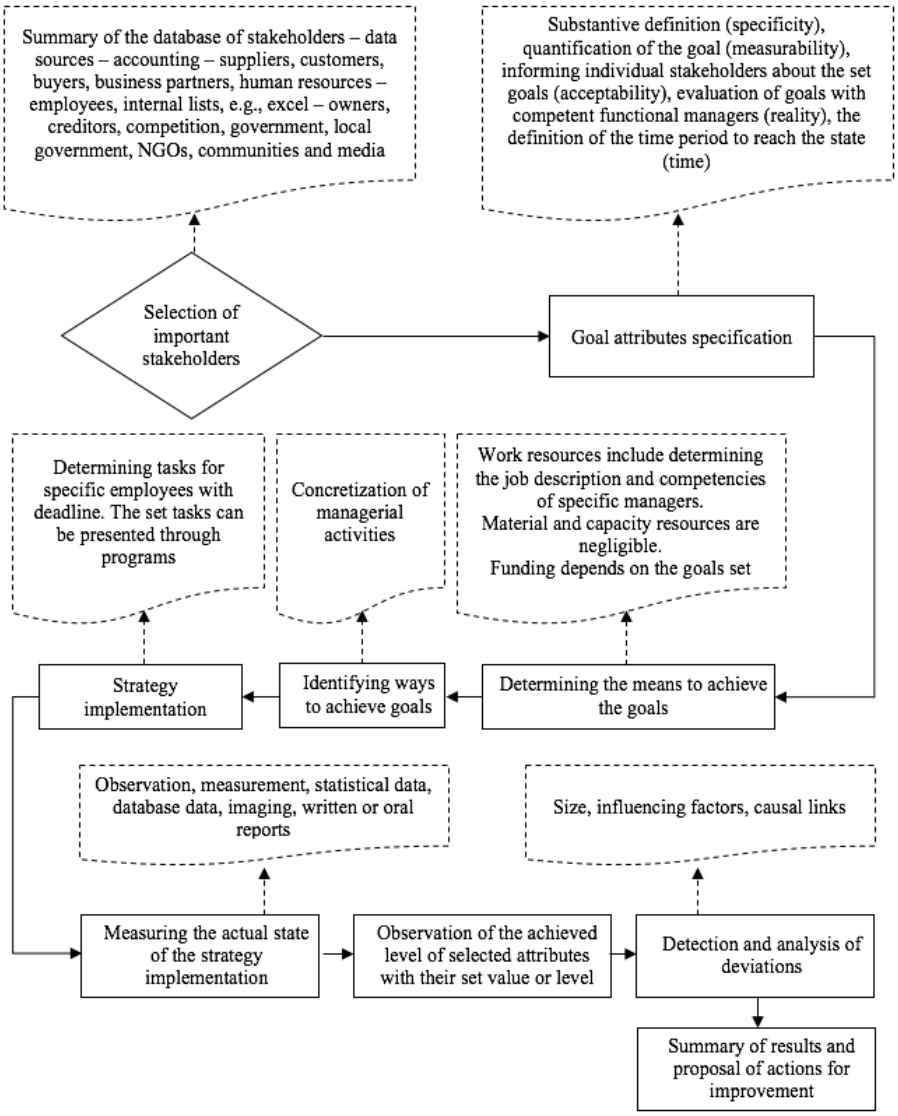


Figure no. 1. Stakeholder value strategy model
Source: Own authors' elaboration

Conclusions

A systematic approach to solving the enterprise's current state of various functional areas can be included among the innovative methods (known procedures applied in another, new way). It is crucial in the enterprise's strategy for creating value for stakeholders. Here they find the application of value management principles, which focuses on people's knowledge and skills, promoting synergies and innovation. The paper aims to link enterprise strategy issues with the creation of value for enterprise stakeholders to synergy the principles of value management with strategic management. It was fulfilled by creating the content of three parts of the strategy: formulation, implementation, control and evaluation, and the sequence of individual activities. The value management principles focused on creating value for stakeholders were systematically and holistically incorporated into the enterprise's strategy and clearly expressed through a verbal-graphic model.

The primary basis for fulfilling the goal was implementing a comparative analysis of theoretically processed data in the field of value creation for stakeholders and strategies.

Additional data were obtained from the survey through guided, structured interviews (Pen and paper interviews) with competent managers of selected industrial enterprises in Slovakia. Based on the synthesis of the results by processing the data obtained from the structured interviews, it is possible to draw the following conclusions:

- In the formulation of the strategy, the factual expression of goals is most often used, and the determination of managerial activities to achieve the goals is low.

- The most applied elements from implementing the strategy are the definition of a responsible employee and the creation of a coordination mechanism. The least used elements are creating a coordination mechanism and the assignment of competencies to the responsible employee.

- When checking and evaluating the strategy, the most numerous answer was to use the fact-finding element. The second most used element is comparing the actual situation with the set target values. The least applied element is creating a coordination mechanism and concluding further decision-making.

By processing the results, it can be stated that a systematic approach is not applied in the business conditions, which would include all elements of formulation, implementation, control and evaluation of the strategy for the area of value creation for the enterprise's stakeholders.

The paper's conclusions are incorporated into the existing state of knowledge and are illustrated through modelling. The theory will be expanded by revealing new concepts and knowledge.

Acknowledgement

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Rising Energy Prices: The Impact on Inflation, Economic Activity and the Results of the Fight Against Global Warming

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Abstract

Energy is an indispensable resource for carrying out daily activities, whether we are thinking of the population as an end consumer, whether we are referring to the economic operators, and consequently at the entire economics chains. Return to global activity, as restrictions imposed by pandemics and the complete recovery of economic activities to the precedent level, has led to the rapid growth of energy demand, specifically for the natural gas used in electricity generation. In the summer months, there was a strong pick of electricity demand, exacerbated during the background of heatwaves, simultaneously with the reduction of energy coming from alternative sources (hydro and wind) and the manifestation of some constraints at the level of the offer, determined by the events extreme weather or prolonged maintenance. The originality of this paper consists in identifying the causes that have generated such growth in the gas and electricity market and their nature (structural or transitional), as well as to quantify the impact that these increases will have on the future dynamics of prices and economic growth in EU. In order to brig arguments, we used the comparative analysis which allowed us to understand the gas storage evolution during 2021 or EU energy mix progression in the last two decades. We also used descriptive analysis, for highlighting the mechanism of uniform pricing on the wholesale electricity market but also for bringing evidence on haw the fluctuations in the quotations of electricity and natural gas are transmitted in the inflation rate.

Keywords
energy prices, inflation, economic activity, global warming, fossil energy.

DOI: 10.24818/BASIQ/2022/08/006

Introduction

After a difficult period characterized by numerous lock-dawns due to the pandemic, the global economy resumed its growth. Some countries even succeeded to recover the loss suffered because of the Covid-19. Unfortunately, the prices for electricity, gas, and even oil reached unseen levels. It is known since 1970 (Painter, 2014), that every unpredicted increase of prices regarding the energy market would create volatility and disturbance on the market (Price-Smith, 2015). Still, compared with oil shocks that the global economy was confronted specifically in 1973 and 1979, today it appears the causes of this situation are even more profound. Usually, after reaching a certain peak the prices used to go back to more or less acceptable levels (Bodislav et al, 2020). The actual situation is a bit different because the society decided to take actions against global warming and so it may imply that the prices for fossil energy to remain high to reach the CO2 target accepted in COP21 (OECD, 2015).

In this paper, we will try to analyze the issues that such a proposal of reducing the greenhouse gases produced by fossil fuels may have in a macroeconomic context, especially from fiscal, inflation, and monetary policies perspectives. The debate comes from the necessity of governments to push some "green" measures further on and advance with the ecological transition programs while there is a significant number of a person (in some countries the size is larger than others) that needs to be protected from energy poverty

(European Commission, 2018). On the other side, Central banks will have to analyze if the transition to clean energy will not too much influence the general rise of prices and so their target of inflation will not be missed by these policies. Price stability is one of their concerns so there is a very thin line between the government's policies and the established mandate.

1. Rising energy prices: impact on inflation and economic activity

Energy is an indispensable resource for carrying out daily activities, whether it is about the population, whether we are referring to economic operators. Thus, growth of its prices in recent times at the European level is likely to reflect sooner or later on the dynamics of consumer prices, the general increase in inflation rates at the Community level may signal the onset of such adjustments (Angheluta et al, 2019)). At the same time, concerns began to mount on the potential effects on medium and long-term of these shocks (Diaconu et al., 2019). There is also the incertitude regarding the inflation expectations of economic operators and consequently the worries concerning the recovery of economic activity at a slower pace. We consider it will be interesting to identify the causes that have generated such growth in the gas and electricity market and their nature (structural or transitional), as well as to quantify the impact that these increases will have on the future dynamics of prices and economic growth (Sarbu et al, 2021).

2. What has happened in the energy market since the second half of 2021 and how persistent is this shock?

The return of global activity, as the restrictions imposed by the pandemic, were lifted and the reopening of economies started to happen, has determinate a pressure from the demand side, specifically for natural gas, used mainly for electricity generation but for other industrial activities as well. The last summer months were characterized by an increasing demand for electricity, there was a strong pick of demand in this sector, exacerbated during the background of heatwaves, simultaneously with the reduction of energy coming from alternative sources (hydro and wind) and the manifestation of some constraints at the level of the offer, determined by the events extreme weather, prolonged maintenance work (given the postponement of some of the latter in the acute phases of the pandemic).

Concerning the European market, the most influential argument that contributed to the quick ascension of natural gas prices (up to historical highs, as opposed to what happened in other parts of the world) was a circumstantial situation. If we compared the level of gas stock that EU had in October 2020 (which was 95%) with 77% (what could be found in storage, on the same month in 2021), we can understand how a longer winter, with temperatures below the seasonal average, may influence the short-term situation.

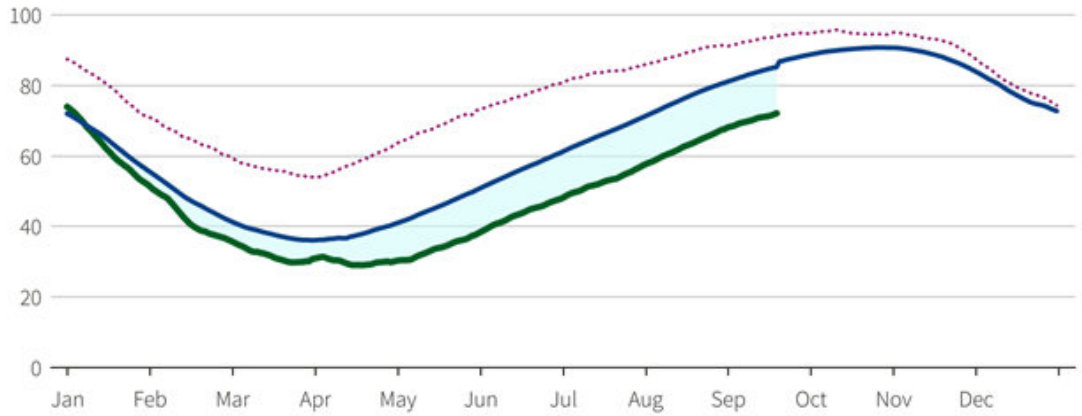


Figure no. 1. EU Gas storage
Source: Buli and Chestney, 2021

Gas storage is a real buffer used during times with high demand or peak prices. Usually, the winter gas season is starting from October 1st till 31st March and is characterized by higher prices and larger withdrawing of gas quantities.

The effect was exacerbated by the impossibility of refilling the stocks during the summer, amid the supply of limited quantities of natural gas by major players, either due to structural causes (natural decline in production, the tendency to abandon coal-fired power plants and, restricted investment in fossil fuels) in the context of the decarbonisation process, the initiation of procedures to shut down the extraction from the

main gas field from Netherlands – which is the largest EU producer. In the same time there was also observed a higher competition concerning the liquefied natural gas coming from Asian countries, as a consequence of the EU greenhouse gas emissions reduction plan. We cannot forget the geopolitical issue – the historical dependence of the EU on Russian gas. At the same time, the structure of the European market also played a role in increasing quotations, in which the dominant share (80 % in 2020) belongs to contracts with prices established according to the ratio between demand and supply of natural gas (to the detriment of contracts indexed to the oil price), this feature favouring the faster transmission of market-specific pressures.

In addition, there is a natural decline in production (although that some new sources were found, man others were closed), which has led to increasing imports in recent years, thus larger exposure to external shocks.

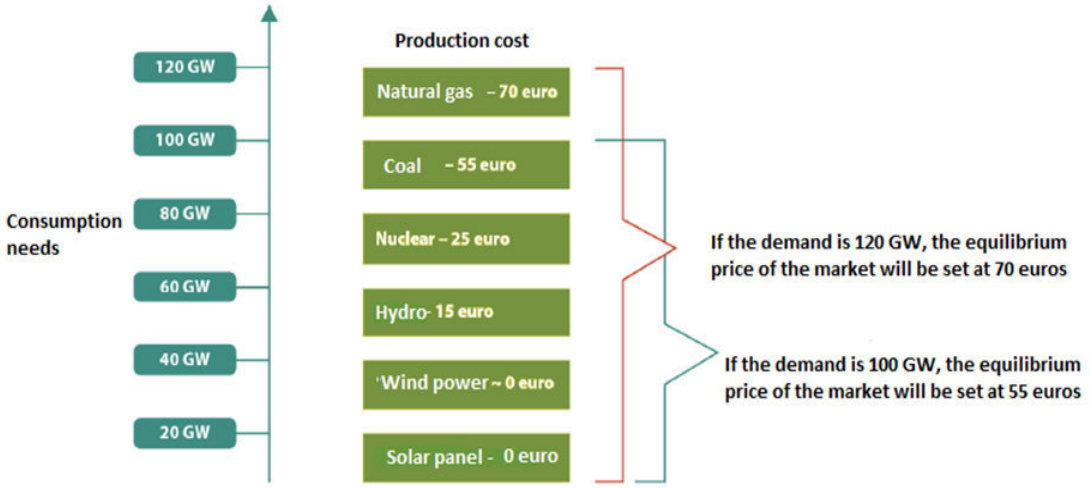


Figure no. 2. Illustration of the mechanism of uniform pricing on the wholesale electricity market
Source: Zinglersen, 2021

The price offered by each producer is located at the specific level of its marginal cost of production, each of them receiving, in the end, the equilibrium price of the market, dictated by the last unit of production necessary to satisfy the demand.

Regarding the advance of energy quotations, in the second half of 2021 on European markets, an important factor is also the major increase of costs of operations for fossil power plants. The result is a major bounce of natural gas prices to around 5 times, comparing the last year at the same time. Consequently, the coal quotation is also going up by 3 times – there is a contagious effect on prices.

There is also another impact derived from the measures taken by the EU in order to speed up the transformation of the economy through a green one: the permanent increasing prices of CO2 emissions, for example, greater lowering of carbon emission or faster removal of unused certificates from the market (Bua et all, 2021).

To these influences was added the decrease in electricity production of hydropower and wind farms due to a short number of rainy or/and windy days. This lack of green energy had to be replaced in the national electric system by fossil energy, specifically by power plants, but this sector was already confronted with high production costs.

Nevertheless, the increases of megawatt price are due also to the specificity of how the pricing mechanism is settled in this area. Finally, all prices of different electrical energy sources have to be equal, and they will be levelled up at the marginal cost of the most expensive sources, which are needed in the system in order to fulfil the demand (Blume-Werry et al., 2021). Concerning the EU zone, despite the fact during the last decades there was a permanent willingness to replace the pollutant electricity sources with cleaner ones and real progress was achieved still, the power plant using fossil fuels are significant.

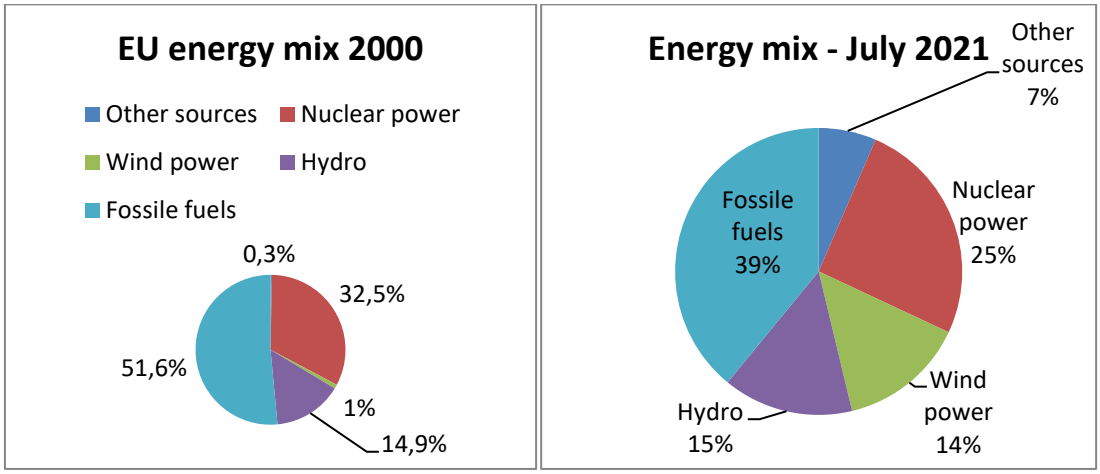


Figure no. 3. EU Energy mix progression
Source: Data from European Commission, 2021

The progress concerning the energy mix, in the sense of the higher presence of non-pollutant sources of energy, is eloquent. The energy coming from fossil fuels diminished in 20 years from more than 50% to 39%. Other sources of clean energy (solar and wind) have increased a lot. Nuclear energy, despite its sensible problems, became to be seen as a non-pollutant source also in some countries, but this is another subject to analyze.

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Starting with the spring of 2022, after the end of the cold season, the markets anticipate a certain correction of prices at the European level, in anticipation of an improvement of the acute imbalance between supply and demand that is manifesting at this moment. For example, the futures quotations of the TTF2 natural gas index show for the second half of next year a halving of prices compared to the maximum recorded in October 2021 on the spot market. But, as it is already known, these quotations are only previsions. If other events (like an invasion of Russia in Ukraine will occur, the situation will dramatically change and probably the price of energy will reach unseen levels). A similar picture emerges on the electricity market, with futures quotations in some representative European economies (Germany, France, the Netherlands, Italy, Spain) hovering around 100 euros / MWh next year, compared to current levels of on the spot market, by about 200 euro / MWh in October 2021. However, in the case of both natural gas and electricity, delivery prices for 2022 continue to be significantly higher than in 2019 (values of 2,5-3 times higher), thus indicating the importance of factors with more persistent action. The extension of the unfavourable influence of the conjuncture factors cannot be excluded, in the scenario in which the cold season 2021-2022 will be longer and colder than normal.

Over the longer term, European energy prices could stabilize at lower levels, under the dominant action of a structural factor, namely accelerating the transition to a green economy at the EU level. The process involves a rapid switch of energy production from fossil to green sources. At the same time, it is required that all houses have an electrified central heating system (European Commission, 2021). This new policy will have as a final result a lower importance of the costly production costs of fossil energy prices in final customers' electricity bills (European Commission, 2021).

It is expected that the transition would not be smooth, given the commitment of European Commission (a policy that will be put into practice by national governments) to diminish the level of GHG emissions in the EU area much faster (by 55 % by 2030 compared to 1990 levels - the prior target being established at 40 %). The strategy involves a faster abandonment of fossil energy, especially the one coming from coal. We should see a switch between fossil and clean energy sources (specifically wind and solar) in global recipes. The final objective is to accelerate the low-carbon sources so higher importance will be given to nuclear plants construction. Hydro is also important and it will benefit from larger attention but we have to admit that there is an issue - the permanent debate between the huge investment necessary to produce clean energy and the destruction of biodiversity, so not everyone is convinced that this is the way to go further in the renewable energy sector.

The main problem of all green energy sources remains the volatility, the incertitude of production that may fulfil the demand at all times. The precariousness will likely lead to high energy price variability during the next years. The solutions might come from developing much faster storage reliable and reasonably priced renewable electricity, respectively increasing the energy efficiency of final consumers.

3. Impact on the inflation rate

Fluctuations in the quotations of electricity and natural gas are transmitted in the inflation rate directly, through the prices paid by final consumers, but also indirectly, through the production costs of other goods and services in the consumer basket. These first-level effects are considered transient, with their impact persisting at the annual rate of inflation for four quarters in the case of direct effects and sometimes a longer period in the case of indirect effects because the transmission of rising costs production in prices does not always occur immediately or linearly. Furthermore, in the absence of a monetary policy response, long-term price increases have the potential to affect the medium-term inflation expectations of economic agents, influencing their future pricing and wage behaviour. These effects, of the second round, have a more persistent nature, being able to mark the trajectory of prices on a longer horizon compared to those of the first round.

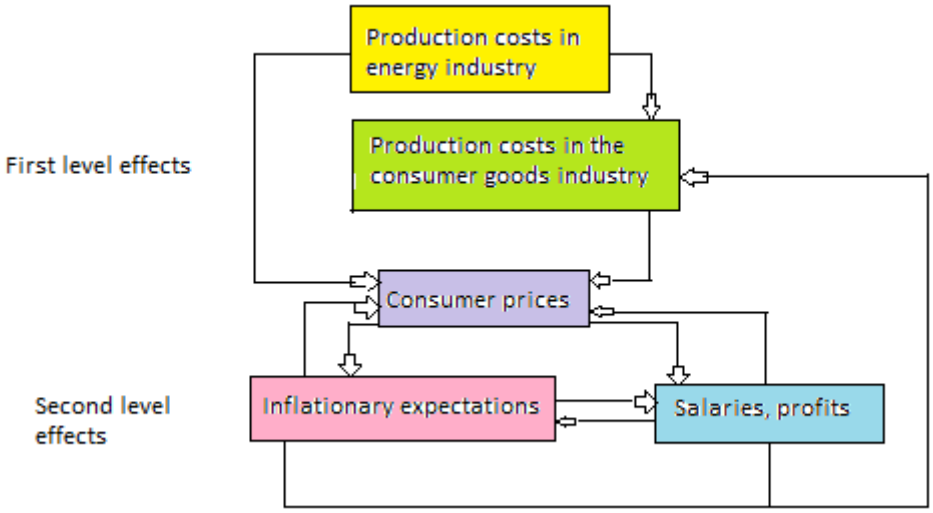


Figure no. 4. Transmission channels of the variation of production prices of the energy industry in the variation of consumer prices.
Source: own representation

In addition to the direct effects, proportional to the share of energy components in the CPI basket, the shock in the energy market will be transmitted on the annual rate of inflation and through production costs, with energy being input into the manufacturing process, along with raw materials, materials, labour. The impact will be even greater as the production process is more energy-intensive, with the most exposed branches being those that produce intermediate or capital goods. In the case of industries directly producing consumer goods for final prices, the share of energy expenditure varies between 1 % and 3%. However, the approach is incomplete as it does not take into account the energy consumption used along the production chain to manufacture the other factors of production. Nevertheless, if direct energy consumption is added to the indirect one, made by the upstream sectors of the production chain, the weights vary from less than 5% in the production of food and clothing to about 7% for pharmaceutical goods and furniture production, respectively over 8% in the case of appliances (Asian Development Bank, 2021).

4. Impact on economic activity

The rise of energy bills, together with the increase of the prices for all raw materials, will be reflected in the next years and we will see how the GDP will be affected, probably for longer periods. Among the relevant channels of transmission of these shocks are those of the available real revenue of every family

and the resources available for investment by firms, given that energy inputs are difficult to replace with other factors of production, at least in the short and medium-term.

The aggregate consequence of increasing energy values on GDP evolution cannot be other than negative, the magnitude of this impact being conditioned by the assumptions adopted and the set of information available. The related shocks are projected to reflect both the cyclical component (GDP gap), mainly as a result of the attenuation of aggregate domestic demand, and the dynamics of potential GDP. The evolution of household consumption, already marked by uncertainties regarding the perspective of the medical situation, is expected to be burdened by the impact on the disposable income of households from price increases.

The deterioration of the investment trajectory, which has nevertheless shown notable resilience in a pandemic context, translates into lower capital accumulation and inefficiencies in the use of factors of production, with an impact on potential GDP dynamics. The latter will be influenced by the lower capacity of the economy to generate new jobs. The impact on investment can be analysed related to a deterioration of activity in several key sectors of the economy (for example industrial production), including rising production costs generated by the prices of energy goods. At the same time, the exports of goods and services are already affected by the persistence of problems related to the supply chains are expected to reflect the difficulties of exporting firms caused by rising production costs (with an impact on external price competitiveness) and declining investment resources (with adverse effects on productivity). The dynamics of imports of goods and services are also considered to be affected by the shocks of domestic demand and, respectively, those on exports of goods and services. However, imports could gain market share in certain segments of goods where domestic producers would be more affected by higher energy prices than external competitors (with access to more energy-efficient technologies).

5. Consequences of rising energy prices on global warming

The rising of prices will affect the results of the fight against global warming. Some of the ancient fossil energy might become more interesting despite the political recommendations. There is a contradiction between what is happening in Brussels and what is decided by each country. The price of the energy bill is quite important for each citizen and every business, the national vote is matters for every nation, and so what the EU decides may not be followed strictly by national governments.
If we have a look at the next graphic, we can see that actually in the times of expensive clean energy, the price of energy produced by coal became accepted because is cheaper.

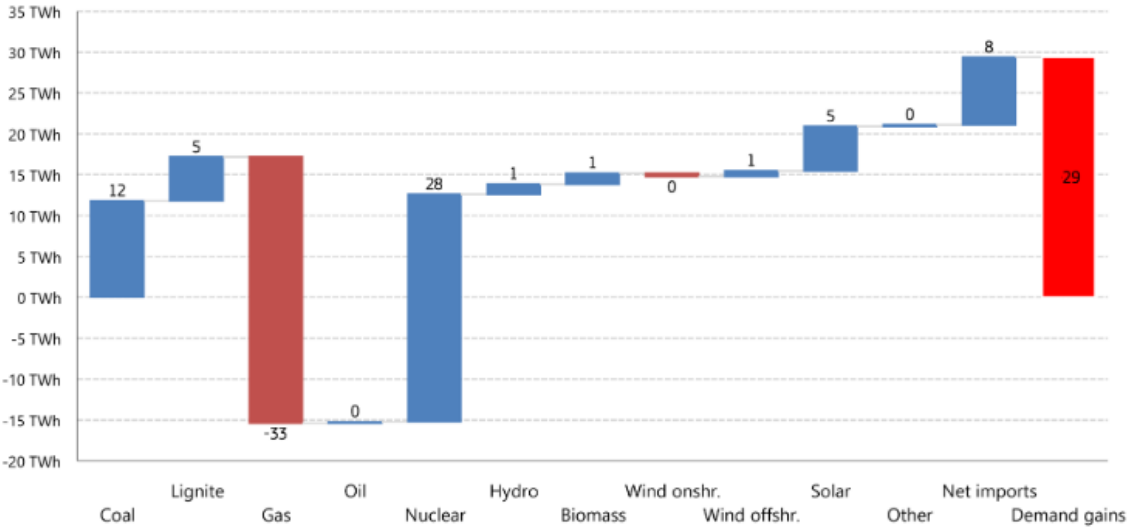


Figure no. 5. Evolution of energy sources, inside the EU, Q3 2020 against Q3 2021.
Source: European Commission, 2021

As we could see, there is a decrease of 33% of energy coming from gas power plants while fossil fuels are growing consistently while nuclear power plants became more and more seriously being considered as the first source of energy. To deal with these two contradictory concepts (encouraging green energy at a lower price) the EU Commission decide that nuclear energy is cleaner (Anett, 2022) – but how clean that could be?

Conclusions

The rise in energy prices, as well as the prices of other commodities and materials, will be reflected in the coming periods in the dynamics of real GDP, in a contractionary manner, with the expected effects of persisting for at least a period. Among the relevant channels of transmission of these shocks are those on the real revenue per family and the resources available for investment by firms, given that energy inputs are difficult to replace with other factors of production, at least in the short and medium-term.

The evolution of household consumption, already marked by uncertainties regarding the perspective of the medical situation, is expected to be burdened by the impact on the disposable income of households from increases in energy prices. The deterioration of the investment trajectory, which has nevertheless shown a notable resilience in a pandemic context, translates into a lower accumulation of capital and a loss of efficiency in the use of factors of production, with an impact on the potential GDP dynamics. The latter would also be influenced by the lower capacity of the economy to generate new jobs.

The impact on investment can be compounded by a deterioration in activity in some key sectors of the economy (for example industrial production), including rising production costs generated by the prices of energy goods. In turn, exports of goods and services, already affected by persistent disconnections over the supply chains are expected to reflect the difficulties of exporting firms in increasing production costs (with an impact on external price competitiveness) and declining investment resources.

Nevertheless, it is more and more complicating to put in practice green energy policies while the price of fossil energy is well below. In the end, the energy budget for energy and other direct consequences are limited and cannot be extended indefinitely.

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The Efficiency of the Energy Transition – Doubts and Clarifications

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Abstract

Decarbonization of energy represents a key goal of the fighting against global warming and in particular of the European "Green Pact", the Green Deal, proposed by the European Commission (EC) on 14 July 2021 to achieve carbon neutrality in 2050. This strategy will lead to the implementation of an energy system in which "clean" energy, the production and use of which do not emit CO2, would play a major role, in particular the electricity generation sectors (hydraulic, solar, and wind). Nevertheless, some people doubt the efficiency of this energy transition. The novelty of this paper consists in the analysis of the vulnerabilities in several areas of different technologies and raw materials that are essential in the strategic development of the energy infrastructure and economy. The practical objective is to understand what the new challenges are deriving from the implementation of the last environment strategy. We used comparative analysis to present the global renewable energy capacity storage in different parts of the world, as well as the descriptive analysis to emphasize the global energy investment in 2018, or the estimation of the world electric vehicles sales, by 2050. Considering the actual European geostrategic evolution, it looks like the EU's "green pact" as well as national strategies for the energy transition has not yet updated to the new realities concerning the renewable energy.

Keywords

global warming, renewable energy, "clean" investments, fossil fuels.

DOI: 10.24818/BASIQ/2022/08/007

Introduction

More and more often we hear the commitment of the European Community authorities to reduce CO2 pollution and increase the generation of energy from green sources. On the 14th of July 2021, the Commission announced a new objective regarding the EU energy mix: by 2030, 40% of necessary energy should come from renewable sources (European Commission, 2021). The consequence of this purpose is to reduce greenhouse gas emissions by at least 55% by 2030, compared with 1990 levels. In the document, there are mentioned other sectorial targets (buildings, electrical cars, aviation, industry, etc.). Political ambitions are also supported by technological developments that seem to further advance the generation of green sources (Sarbu et al., 2021). However, at the same time, we notice the popularization of some arguments in the media space, which come to contradict the feasibility of the energy transition (Diaconu et al., 2019). Whether it is about price or the stability of the renewable energy system, should these arguments be discussed in order to understand whether it is possible to have a successful energy transition or whether our social, political, and environmental goals are just unattainable ambitions?

1. Research methodology

To analyze what are the doubts are expressed in different public media regarding the "clean energy" performances and expectations, as research methodology, we use the methods the comparative and

descriptive analysis. We have collected and confronted information from different databases and public sources.

2. Renewable energy cost

First, we have to see if we do not pay too much for renewables. To answer this question, we will start with the most frequently cited "problem" related to renewables, focusing on scientific arguments to see if these problems are or are not insurmountable obstacles to the energy transition (Angheluta et al., 2019).

An argument that challenges the feasibility of the energy transition has to do with price (Bodislav et al., 2020). To analyze this issue, we started from the data found in a paper published in the journal Energies between 2011 and 2018, $ 3.666 billion was spent globally on climate change projects. Of this amount, 55% ($ 2.030 billion) was spent on the implementation of solar and wind energy. According to global energy reports, the contribution of wind and solar to global energy consumption increased from 0.5% to 3% during that period. At the same time, coal, oil, and natural gas provided 85% of global energy consumption, the rest of 12% being covered by hydro and nuclear energy (ÓhAiseadha et al., 2020).

At first glance, these costs seem high and unjustified, given that they have increased the contribution of renewable energy to the global mix by only 2.5%. If we were to divide these investments over the 8 years (2011-2018), it would be about $ 250 billion spent annually on the implementation of renewable energy.

There is a debate since these numbers do not differentiate between capital expenditures and operational expenditures. An energy system totally based on fossil fuel-specific technologies would need to buy these fuels in order to function (so other expensive operational costs will be added in the final bill). On the other hand, investments in renewable energy are generally CAPEX-type, once the investment is made, they produce energy with low operating costs because those fuels come from solar or wind energy, respectively have an OPEX close to zero.

For a better understanding of how much that OPEX means for fossil fuel-based technologies, Overseas Development Institute and Climate Action Network - CAN (Whitley, Gencsu and Worall, 2020) shows that only 11 countries of the European Union spend around € 112 billion per year for production and consumption of the necessary fuels. If we extrapolate the number it means that about 1 billion EUR/ year is paid to companies that sell these fuels, in general, to non-EU countries (such as Russia, the US or Saudi Arabia, major oil producers). This EU-specific amount is almost double that of all annual global renewable energy investments.

It is important to understand the context of global energy spending. According to the International Energy Agency, total energy investments in 2018 were $ 1.850 billion. Of this amount, approximately $ 1 trillion has been invested in projects related to the extraction, refining, and construction of new thermal power plants dedicated to fossil fuels. Only $ 300 billion has been invested in renewable energy.

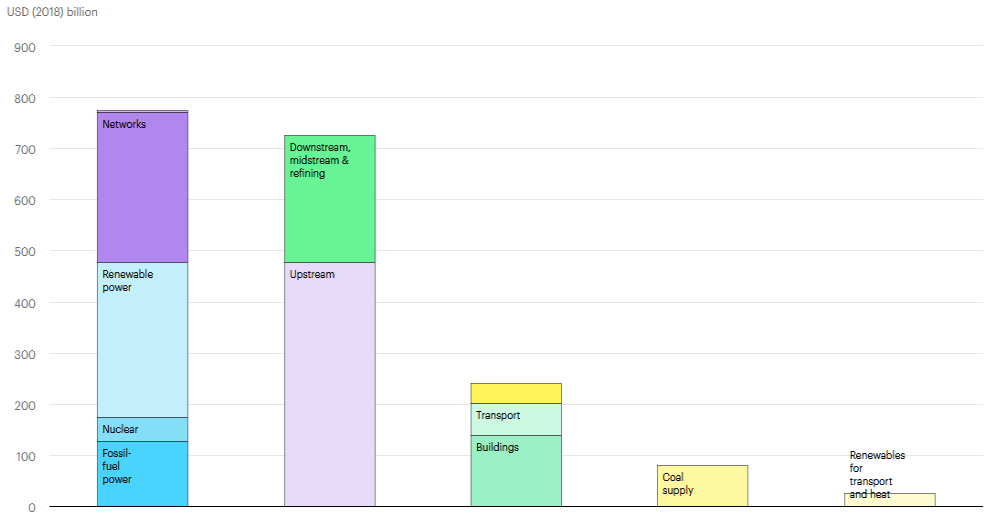


Figure no. 1. Global energy investment in 2018
Source: International Energy Agency, 2019

Moreover, according to the researchers from the International Monetary Fund (Coady and International Monetary Fund, 2019), the countries of the world subsidized in 2018 with approximately $ 5 trillion the

purchase of fossil fuels. And this money represents just subsidies; the total cost of purchased fossil fuels is therefore much higher. Annual investments in renewable energy were $ 300 billion in the same year, about 20 times lower (if we include the $ 1,000 billion dedicated to investments in fossil fuels).

Therefore, saying that the cost of investment and producing green energy is too high omit the fact that we don't see the full side of the picture, namely that we cannot talk about the price of renewables without understanding how much we spend on fossil fuels and energy in general.

3. Renewable energy density

Another issue highlighted by the opponents of "clean energy" is the density of renewable energy, which requires more space than equivalent fossil fuel systems. Do we lose useful space?

Wind, solar, or biomass have low spatial densities, in other words more space is needed to install "clean energy" capacities. But the versatility of renewable solutions must be emphasized. For example, solar panels can be installed on the roofs of buildings, requiring virtually no additional dedicated space. Moreover, they can be installed in spaces that are not used for other purposes, such as in the desert, swampy areas, or even on the surface of the water. Wind turbines can be placed offshore, which cannot be done with a coal-fired power plant. Such systems can be distributed in many locations in different capacities, which cannot be said of a nuclear power plant. Distributing energy production among smaller or larger producers over a more diverse geographical area means lower costs of energy production and transportation, as well as access to energy for disadvantaged communities, which can help solve the problem of energy poverty (Simon, 2021).

Biomass, in sustainable quantities, can be an important resource, despite its low energy density. Currently, these resources, such as forest and agricultural waste, are stored or incinerated without energy recovery and with high greenhouse gas emissions. For example, the production of biogas from animal or human manure is a method of treating waste that captures methane gas, which would otherwise be released into the atmosphere (methane being a strong greenhouse gas). Dry forest residues can be converted to liquid or gaseous fuels in processes that can even store carbon in the soil or be used as fertilizer (Mohammed, Kabbashi and Alade, 2018).

In other words, although they have lower spatial densities than fossil fuel systems, renewable solutions can mostly use those surfaces or resources that would otherwise be wasted, and can be a step forward in streamlining the way we exploit them. It is too simplistic to talk about the fault of renewables in the exploitation of useful space, when the non-use of these resources could even limit our useful space in some situations, leaving room for more fossil fuel exploitation.

4. Renewable energy variability

Another criticism of renewable energy is its variability – the problem when the wind is not blowing. Specifically speaking, it is about the discrepancy between electricity production and consumer energy demand, and the lack of the so-called "base load" (Matek and Gawell, 2015). In other words, how do we produce the energy we need from the solar panel if we don't have sun during the night or from the wind when we don't have wind?

Renewable energy is variable because it is dependent on the movement of air masses (the presence of wind), or the number of hours of sunshine for solar. Numerous studies (Brown et al., 2018) have already demonstrated the feasibility of energy systems with a high degree or even 100% penetration of wind and solar energy. For example, Denmark already has an average of 50% of its electricity from wind sources, and on many days of the year, more wind energy is produced than total electricity demand. Currently, this energy is exported to neighboring countries, but in the future, it can be stored in batteries, as thermal energy, or in the form of alternative fuels. The issue of energy storage is covered in the next section.

However, the is one thing that is often overlooked or misunderstood by critics of renewable energy is that renewable energy systems will not work like they do today. Specifically, in a classical energy system, such as today, fossil fuels deliver the energy needed for each sector. One part of fossil fuels will be used for electricity production; another side of fuels will count for heating production, other fuels for industry, and other fuels for transportation. Future renewable energy systems will be more integrated and efficient because they will not waste as much energy as current ones. This maximizes the use of renewables and makes feasible systems based on 100% renewables. Somehow, this situation should reassure most of the developed countries that are afraid of electricity shortages. For example, the highest risk perceived

Switzerland experts is power shortage, as great as the risk of pandemic (Swissinfo, 2015). It was calculated that in such a situation, the economy will suffer a loss of 105billion USD; for a better understanding the GDP of Switzerland in 2020 was 752 billion.

The variability of renewable energy is often understood as a factor of instability as if we will have to accept that in the future we will live in a continuing power outage if we make this transition. There is no basis for this statement; on the contrary, experience so far indicates that future energy systems maybe even more stable than existing ones. The example comes again from Denmark, which, although it has the highest penetration of renewable energy, also has the fewest power outages in Europe (Danish Ministry of Climate Energy and Utilities, 2019).

5. Renewable energy storage

Another criticism of renewable energy is that of energy storage. Can we produce enough batteries? This criticism says that huge storage capacities in batteries or storage lakes are needed to cope with only a small part of the current energy demand.

Unquestionably, fossil fuels have the advantage of being stored in solid (coal), liquid (oil), or gaseous (natural gas) form at minimal costs for an indefinite period. On the other hand, renewable energy, mainly represented by wind and photovoltaics, is more difficult to store because it comes under an electrical form, which requires batteries or hydropower, and this type of storage is a very expensive solution, unsustainable and dependent on the geographical area, requiring enormous storage capacity.

Today, according to Bloomberg, it is estimated that global energy storage can grow from 942 GW in 2018 to 2,857 GW by 2040. It is also believed that this can be achieved by an investment of 620 Billion USD over the next 22 years. So it is obvious that there is a huge potential investment into the storage capacity during the next decades.

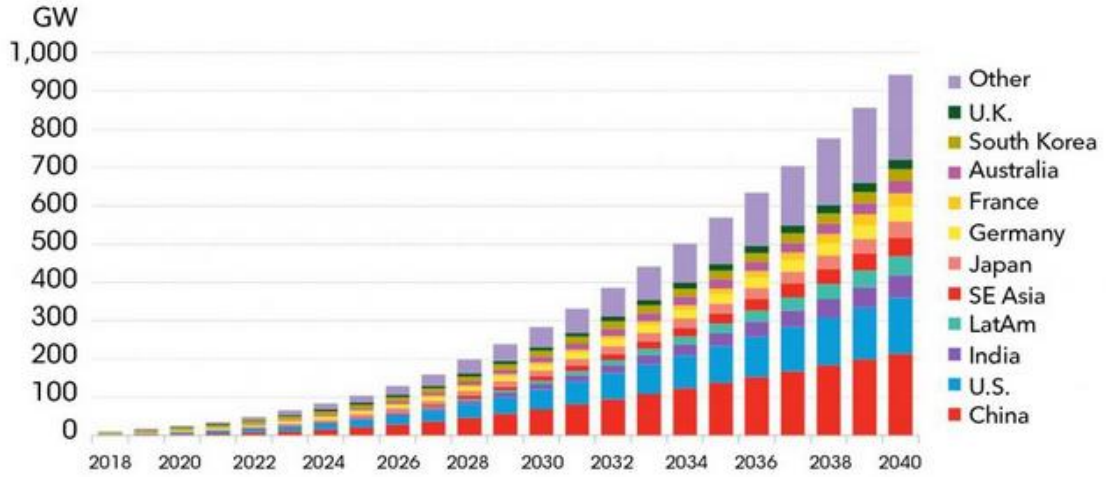


Figure no. 2. Global renewable energy capacity storage
Source: Henze, 2018

However, what is not explained is that no one will make the transition to renewable energy just by installing batteries and wind turbines. Although batteries are imported in some situations, such as electric vehicles, there are other technological solutions to store this energy, which can be cheaper and more feasible. Electricity from wind and photovoltaics can be converted into thermal energy or liquid or gaseous fuels. This is also desirable, as thermal or gaseous or liquid fuel storage media are cheaper than direct electrical storage.

6. Battery production

In the previous section, we mentioned that in some cases batteries are needed to store renewable energy. Do we have enough resources? The most discussed method of storing electricity in batteries is in electric vehicles. However, an issue that is often debated when it comes to electric cars is the resources used to produce these batteries, which would make electric cars more harmful to the environment than internal combustion engines.

Rightly so, battery production is not the most environmentally friendly, at least not yet. Concerns are mainly about the need for cobalt, lithium, nickel, or copper but also about carbon dioxide emissions.

However, this approach is not the real truth, and all these difficulties are often exploited by oil companies as a way to increase distrust in the potential of electric mobility. A recent report by the Transport & Environment think-tank in Brussels indicated that in fact most of the materials used in the production of batteries can be recycled. They estimate that only 30 kg of material is practically unusable after the end of the life cycle of a battery (which continues even after the machine is taken out of use). On the other hand, the materials lost during the life of an internal combustion vehicle are 300-400 times larger, an internal combustion engine using no less than 17,000 liters of fuel during the period of use (Mathieu, 2021).

On the energy consumption side, studies show that over the throughout a lifetime, an electric car uses 58% less energy than its gasoline-equivalent. Even with current production methods and the existing energy mix at the EU level, which is still based on fossil fuels, an electric vehicle emits an average of 63% less lifetime CO2 than its fossil fuel equivalent (Choudhury, 2021).

The current dependence on petroleum products to meet EU transport demand is several times higher than the demand for battery-powered materials even in the scenario where all cars in Europe become electric by 2035. The report also indicates that in the future, fewer raw materials will be needed to produce batteries as a result of improved production processes. By 2030 alone, the amount of lithium can be halved, that of cobalt can be 4 times lower, and that of nickel can be one-fifth less.

The number of electric cars is predicted to grow extremely fast. It is predicted that sales of EVs will exceed the combustion engine cars in 2033 (Europe, China, and the U.S.). Europe will tip the scale in favor of electric cars in 2028 (Bloomberg, 2021). The lithium-ion batteries that equip the vast majority of electric cars, use a dozen materials that, in addition to lithium, graphite (in the anodes), cobalt (in the cathodes), and possibly titanium, silicon, and niobium are considered critical; manganese and nickel could be used in new anodes.

Other studies found that 1 billion of batteries electric cars will be on the roads by 2050.

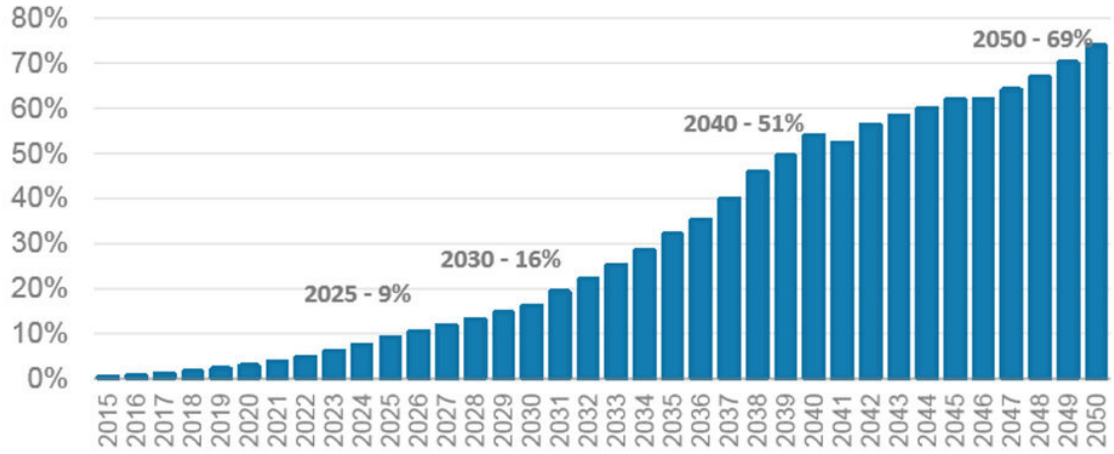


Figure no. 3. World EV sales
Source: Mirhaydari, 2017

Year after year we find out that the numbers of EVs are expected to grow in a faster path. The International Energy Agency (IEA) estimates that metal ore reserves can meet demand, but their concentration would decrease (this is already the case for copper and lithium) so an increase in production costs is likely (with higher consumption), unless new metallurgical processes increase extraction yields and metal recycling makes progress - currently very limited for rare-earth (Papon, 2021).

It is also good to know that not only batteries use cobalt, but many other industrial processes, even the production of fossil fuels. Batteries use only a portion (true, and most) of cobalt production, but batteries are already used in many other products. However, companies such as Tesla already use much less cobalt in the production of their batteries, and will even remove this material from their composition in the future.

In other words, there is a lot of room to improve the production process, but only and only combined with high battery recycling rates. The environmental impact of battery and vehicle production is still high, but the potential for reducing this impact is much greater than for internal combustion vehicles.

Conclusions

It is important that when debating future energy solutions, we balance all aspects of them. It is also important to be informed about all technical advancements because the choices made today will remain with us for decades to come.

This paper does not pretend to be considered complete or to present optimal solutions but seeks to present a more objective and scientifically based perspective on future energy solutions. In this regard, it is important to make sure that the information we read is sufficiently contextualized and based on multiple studies and scientific arguments. Unfortunately, we are increasingly faced with criticisms regarding the renewable solutions that are intentionally misled, presenting only half-truths and avoiding the broader context. Or if we are to have an effective dialogue, it needs to be transparent and inclusive.

The "zero-carbon" strategy makes it necessary: investment planning to ensure the security of supply, a policy to promote technical innovations, especially in metallurgy and for metal recycling.

The EU's "green pact" as well as national strategies for the energy transition has not yet taken into account the new geopolitical situation of the rise of renewable energy: access to "critical" materials will be a major geopolitical issue, as the risk of market dominance by producers cannot be ignored.

It is also necessary that responsible public institutions improve their communication, in order to not let the snowball of mistrust roll too much; otherwise, at some point, it will be complicated to get all people on the same boat. To produce fast results, having all parties pulling in the same direction is a must.

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The Age of a Moral and Ethical Artificial Intelligence

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Abstract
This paper provides an overview of today's values for building and using Artificial Intelligence in day-to-day operations, but the focus of the research is on the judgment values developed to create a more moral and ethical AI that is in line with today's macroeconomic needs and aims to achieve the goal of sustainable economic development. This research follows the concept of a case study combined with a qualitative research regarding our actual status quo in offering moral and ethical value to machines and to software that could one day replace informal social institutions. Also, the main focus of this research paper is to highlight if we could use or insert Artificial Intelligence as guidance tool to our general wellbeing and also to empower automatization as mechanism for a sustainable future, because today's automated corporate governance is based on standardized processes for performance management, standardized processes for advanced analysis.

Keywords

Artificial Intelligence, economic development, evolution, morality, ethics

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Introduction

The majority of current research on the ethical and social nature of Artificial Intelligence (AI) has concentrated solely on establishing ethical principles and general measures to program the machine learning sector and its influential one, namely the programming of AI algorithms. Although these elements are important in understanding the relationship between social norms and the actual intrusion of AI, there is still no dedicated and direct analysis of what can lead to widespread use of AI or the risks of developing machine-based solutions (Bodislav et al., 2020). Learning without objectives to cover the evolution of society and potential intersections with scenarios for the development of population ideology over 20-30 years (Burlacu et al., 2020). This article seeks to provide a direct perspective on the usefulness of moral values found in AI, which may provide some insight into the antithesis between using AI in building the functional pillars of future democracies or allowing access to decision-making for people without dedicated qualities. phenomenon.

1. Artificial Intelligence, where to?

The advancement of AI as a technical and social phenomenon goes hand in hand with the development of machine learning and provides us with a perspective on the evolution of humanity in the last 15 years (Bodislav et al., 2020), because only in the last 5 years has the potential of AI been realized because the hardware area has (re)begun to make significant leaps toward the introduction of the current generation of quantum computers (Rădulescu et al., 2020). These computers have such a high level of analytical capabilities that they can't be evaluated on the same scale as old-fashioned computers, a simple example being the leap made by the new Apple M1, M1 Pro, M1 Max and M1 Ultra processors, which have succeeded since launch to match and surpass Intel's high-performance processors (i7 and i9), and this leap was not necessarily due to a revolutionary hardware architecture, but to a way of transposing neural

networks and hardware mechanisms for building and understanding AI, and of machine learning processes (Bodislav et al., 2021).

After the comprehensive decoding of the genetic code at the beginning of this millennium, the race to duplicate the human brain by a hardware solution was the next objective targeted, but the technique was complex (Popescu et al. 2021). The development of solutions aimed at replicating the brain did not meet expectations, but there is now a fresh hope - the quantum computer tackles the hardware problem by processing information considerably quicker than a human brain (Burlacu et al., 2021). However, the language and work processes required to emulate neural activity do not exist, demonstrating one of the side effects of technological development, namely the reduction of the capacity for general analysis of the steps required to solve a problem, the conclusions of which must be drawn during the development of work processes (Pazzanesse, 2020). The sector is appealing to huge organizations since we are dealing with a market that will achieve a turnover per branch of more than 17 trillion dollars in a maximum of ten years. And, from a research standpoint, it can be stated that the emphasis was solely on functioning, rather than the component of social complexity and its influence on sustainable development (Belostecinic et al., 2022). An important factor that has influenced AI is that it has invested heavily in companies, particularly start-ups, that are dedicated to the real economy through infusions of technical and evolutionary know-how in the fields of transportation, health, production, and government decision analysis over the last five years.

However, as a result of the intersection of applied AI and everyday economics, the algorithms found behind AI tend to generate either positive or negative output, beginning with algorithms that can generate a discriminatory order of an AI (for example, it has been observed that solutions used for facial recognition do not work optimally for people who are racial minorities or members of the LGBTQ + spectrum), or situations where the purpose of the AI is unclear. To avoid such impacts, the UN Universal Declaration of Human Rights has become the text of the law for corporations creating self-driving AI-based solutions in crucial industries (especially among self-monitoring and smart weapons). Another example of using AI to outperform the stock market is the usage of solutions that are accessible on the market but are not meant to outperform the system, but rather to outperform the market. to the least technically talented, and the required legislation are expected to be developed over the next 3-5 years. The more we understand about AI's positive and harmful possibilities, the more pressing the need for a worldwide regulating agency becomes. For example, when it decides to murder a human subject, the moral criteria of the choice to create smart weapons must be developed, but this can just be the beginning of a complicated process dedicated to the "humanization" of AI that can evolve over time. a situation in which an autonomous drone can decide not only to kill a subject, but also to target a family or a school, regardless of the number of collateral victims, and this can be done without direct psychological impact, effectively removing you from the cognitive process that "brakes" human nature, that is, what good you are.

We have a responsibility to promote and educate ourselves, to consider potential consequences, and to use our moral compass because we are in the midst of a race to gain wisdom, and the impact of technology may increase proportionally as it advances. Big, either good or negative, influence, and when the impact is negative, difficulties occur. To mitigate the negative consequences, we must grow smarter both personally (as a set of ideals we apply throughout our lives) and collectively (as a set of regulations, legislation, policies developed and implemented at the company level). Unfortunately, technical advancement in hardware has expanded AI and grown at a quicker and stronger rate than the present rate of progress in wisdom at the individual and social levels, preparing the path for those who do not desire multilateral and sustainable development but have planned repercussions. Massive large-scale destruction This is akin to a scenario in which nuclear bombs are widely available and utilized by immature individuals, potentially leading to a global nuclear war, and the whole active nuclear arsenal of industrialized countries is linked to intelligent solutions to counter the adversary. It is also quite likely that it will become self-sufficient in the near future.

2. Research methodology for further understanding Artificial Intelligence

In these days of technological progress and positive development of human behavior aided by primary A.I. (Artificial Intelligence), we stress concerns related to economic growth generated by data analysis of existing challenges. Many challenges are non-technical in origin and may be filtered using business intelligence elements extrapolated at general AI level. To go beyond the strictly technological perspective and its manifestation in traditional economic vision, we list the following potential issues (Bodislav, 2015):

1. Undefined metrics for the success of a created policy applied at the macroeconomic level;
2. The political class and culture are defocusing the executive vision;

3. Direct implementation and functional connections between properties of SAAS (software as a service) or BI (Business Intelligence) technologies are nonexistent;

4. Solutions used at the macroeconomic level are not connected and have low coverage at extremely high costs.

This is why in this research we follow the concept of a case study combined with a qualitative research regarding our actual status quo in offering moral and ethical value to machines and to software that could one day replace informal social institutions.

This manner, there is no direct value of the investment, as there is with Return on Investment. If traditionalist principles are violated, the second element of the problem, that of losing track of AI services and so reducing efficiency and increasing costs, is achieved. Macroeconomic policies are viewed as undertakings that grow to be effective via the convergence of numerous aspects, such as people, technical tactics, and technology. The society reproduced in a corporation or a ministry may lead to the rejection of assentimental AI solutions, thereby canceling any government-guided admissions into the macroeconomic sector.

3. Ethics and morality in Artificial Intelligence

Numerous initiatives in the last years have taken two major paths to promoting the ethical practice of AI (Luccioni, 2020): a) proposing principles to guide the sustainable development of AI or b) evaluating issues regarding the social impact of AI.

In recent years, the topic of research and ethical and moral practice in technology has grown in various parts of the IT community, and the various initiatives that have been proposed reflect the interest and concern that many members share. In the United States, for example, the Association for Computing Machines (ACM) has proposed a Code of Ethics and Professional Conduct to be used by all ACM members and to guide them in the use of computer science. The Montreal Declaration contains the most important analysis of AI's ethical and moral responsibility.

The Montreal Declaration on the Sustainable Development of Artificial Intelligence, developed in 2017-2018, is one of the most notable approaches to establishing guidelines for AI implementation. It was created with the idea that AI would eventually affect all sectors of society, and that it would require principles to guide its development in order to ensure its adherence to human core values and the advancement of society. The declaration contains ten principles, from the protection of privacy to equal representation, some of which directly concern accountability and ethics; for example, the precautionary principle states that *"Everyone involved in the development of Artificial Intelligence must be cautious, anticipating, as far as possible, the negative consequences of using Artificial Intelligence systems and taking appropriate measures to avoid them."* (Montreal Declaration of Sustainable Development of AI, 2017-2018). The declaration's overarching goal was to raise awareness of the ethical and moral issues surrounding AI development and to enable all members of society on a global scale to participate in the enhancement of its development framework.

The Montreal Declaration, on the other hand, goes beyond theoretical ethical principles by including recommendations for an ethical digital transition that includes the entire society and all its layers, from researchers to decision makers (Luccioni, 2020). It includes a proposal, for example, to audit and validate the use of AI systems through mechanisms and accreditations designed to prevent discrimination and unfair or biased behavior. Specific methods for strengthening democracy and reducing the negative environmental impact of AI are also included. This is significant because AI will become a part of everyday life at the individual level and will have an impact on society as a whole, whether they are programmers, politicians, students, lawyers, or even companies whose primary goal is the development of AI.

4. Ethical and moral behavior in Artificial Intelligence

AI-based video surveillance technology, for example, can improve public safety by detecting real-time crime using surveillance cameras - but there is a catch: security functions can be abused to track people and establish a status in which confidentiality is threatened by those that own and control the technology.

A similar technology can be found in military autonomous drones that use computer vision to analyze and identify their target, being a serious threat to global security and democracy due to a lack of human influenced type of surveillance. Aside from the security risk, such weapons would pose a moral and legal risk: AI technology isn’t yet capable of understanding and redefining in its own terms the dynamics found

in the psychological and social context in which such a targeted attack could occur - in a direct, sufficient, and consistent manner with international law defining situations of war or general morality. Unfortunately, the most common argument in favor of the development of autonomous weapons is that they are required as a precautionary measure and technological advancement, respectively, in order not to fall behind other countries and companies developing similar technical capabilities. In reality, weapons designed to defend against assault drones differ significantly from standard assault drones and should not be lethal stand-alone weapons because they are designed to destroy other weapons, a perfectly functional solution used in Israel under the name Iron Dome.

Another prevalent argument is that an international treaty would be worthless since certain nations would refuse to sign it, as proven by climate change sustainability and awareness conferences such as the one held in Paris in 2015. The false argument is that regulating deadly autonomous weapons might imperil AI innovation, despite the fact that it has been developed with tremendous success in a civilian environment (especially in university and major technological businesses – Serafimova, 2020).

Another potential threat to democracy posed by AI development could be increased ability to monitor and target individuals, as well as more subtle power to influence them, such as through the AI-based advertising sector, automation of online trolls, and other types of psychological manipulation using the internet and social networks. Using artificial intelligence to influence political campaigns, such as the 2016 US election or Brexit, is just the beginning of what may be done when a self-replicating software teaches us how to transform our online environment in a customized yet devoted manner. a third party who has a direct involvement This is due to the fact that micro-targeting enables advertising to be fully individualized, depending on people's political beliefs, social networks, and personal histories (including incognito or private). Although it may not bother people when it comes to selecting a brand of fast food products, when the goal is consistent with certain sources of profit or political power-play at the level of a corporation or political organization, but the effect obtained is detrimental to individual and collective interests, it becomes necessary to outline social norms, laws, and regulations to protect the individual and even the concept of democracy from such psychological manipulation. Where is the line drawn between education and manipulation? Although a basic quantitative solution may be offered by examining internet advertising expenses, the quality found in value judgements that are still tied to human nature cannot be recreated. Value judgements indicate the ethical and moral aspect of human character and give a semi-objective answer for striking a balance of power between the autonomy allowed to AI and the well-being attained by employing it as a socioeconomic advancement solution. Aside from the moral hazard of psychological manipulation, it is questionable if tailored advertising is advantageous to society from a merely economic viewpoint, as it tends to benefit financially wealthy corporations, perhaps holding down innovation via misappropriation of funds intended for it. We find the new segment of manipulation and deception known as deep-fake, a concept that presents images, videos, and fake news generated by AI, strongly associated with the misuse of online advertising and political manipulation through the use of AI. It is now possible to synthesize images and sounds in a controlled manner, for example, using deep-fakes to make a video with a president caught in an intimate pose or declaring war on a temperamental enemy, thanks to rapid progress on generative neural networks (to which is added on the hardware side, the availability at an increasingly low price of processing systems that allow the large-scale generation of deep-fake solutions).

Other elements discovered in connection with the implementation of AI include the effect on the labor market and not the perception that hundreds of millions of people will lose their jobs. This has been demonstrated to be flawed in principle in the case where, a century ago, the tractor was introduced as the primary tool for processing agricultural crops, and, despite the world's reservations about its introduction on the premise that many jobs would be lost (Bodislav and Bran, 2017), it came as a mechanism to increase productivity, with the role of functional annex of the individual in agricultural work, this being the role of AI in the next 20-30 years.

5. The competitive advantage had by Artificial Intelligence compared with traditional solutions

Neural networks are known as "black box technology" because the mathematics behind them is still a research topic, with world-renowned researchers working on it. AI is what the wheel was to Mesopotamian builders 7,000 years ago. Modern statistical analysis applications are utilized by economists and financiers all around the world, but their breadth is dwarfed by the use of artificial intelligence (AI) for risk assessment, macroeconomic forecasting, and financial market monitoring.

Statistical analysis should be viewed as a supplement to AI in financial and economic analysis. While the former excels at problem solving with aggregated data, the latter can help with examining the value of the dataset in granular, diversified, unstructured, and high-volume ways. The data set's granularity, in

particular, allows us to reveal hidden patterns and actions of economic agents. Another advantage of AI is that it enables real-time design: the use of different data sets to produce real-time economic projections; this near-instantaneous reaction provides us with a competitive edge. Machine learning algorithms take techniques from long-standing statistical approaches in addition to being utilized to investigate current, real-time big data sets. Because of nonlinearity and impacts, several aspects are difficult to model during crises. AI algorithms are executed without any prior assumptions and are capable of adding qualitative information, such as textual data, for gauging risks and agents' expectations.

The following are the main distinctions between statistical analysis and AI automation (Bodislav, 2022):

• Automated AI is based on data and focuses on algorithm design, not traditional theory;

• Instead of statistical tests, AI uses a different and complex mechanism, creating a high degree of quality, dedicated to matching data sets;

• The key issues of automated AI are the selection and regularization of the features needed to validate and filter the values it pursues.

6. Discussion and overviewed results

The main focus of this research paper is to highlight if we could use or insert Artificial Intelligence as guidance tool to our general wellbeing and also to empower automatization as mechanism for a sustainable future, because today's automated corporate governance is based on standardized processes for performance management (financial analysis, planning, budgeting, forecasting (Boyer et al., 2011), standardized processes for advanced analysis (predictive analysis, data mining), and standardized processes for information management (data profiling, data quality testing, data warehousing and data integration – Bodislav, 2015). The alignment of business strategy with economic or national strategy shapes the efficient execution of proposed goals and with step-by-step adhering for members of the organization or the population by absorbing the organization's or national behavior, which should be optimized depending on the existent or developed risk, and everything automated by using business intelligence principles.

Conclusions

These concluding thoughts will not focus on elements resulting from AI that can be directly influenced by the "cause-effect" principle, such as those found in the fields of energy, transportation, education, and health, where AI involvement will lead to significant savings, even to the point of saving lives, and this direct cause-and-effect aspect can also be less extended in the case of environmental protection and combating climate change. The direct implications of AI will generate solutions that can be applied as a recipe prepared in the kitchen, propelling these areas to new heights, provided we recognize that the main winner, in addition to society, the environment, and reducing the burden on the state budget, is AI in itself and its creator.

Technology in general, and more specifically machine learning and its functional effect, AI, is currently the most powerful agent of paradigm shift since the Industrial Revolution; however, the innovative disruptor can also become a disruptive factor if its developers do not follow through (Bodislav, 2022). The true potential of AI is that it will make the world a better place in any form, but the moral character and ethics in its evolution can be the key to seeing if the future developed is sustainable for all cohabitants of Earth and possibly in the next 25 years. as well as for the planet Mars At the moment, there is a need to hold AI creators accountable and to provide them with a pre-ideological framework in which to develop AI's moral and ethical aspirations, which can be accomplished by putting established industry players on the same playing field as politicians or experts who understand the case in question.

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Municipal Waste Management in the European Union

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Abstract
From a numerical point of view, in the European Union, the population in the urban area has an increasing trend. Their desire to benefit from ever-increasing welfare has led to an increase in industrial production. Under these conditions, the quantities of waste generated also increased. The reuse and recycling of waste contributes to maintaining the quality of the environment. Technologies that allow the efficient use, in the highest possible share of raw materials, have beneficial effects on natural resources. The article presents a comparative analysis of the distribution of municipal waste generation and treatment in the Member States of the European Union. In production processes, the efficiency with which natural resources are used influences the degree to which they can be depleted. Low efficiency leads to an increase in the amount of waste that results. Environmental degradation is also influenced by climate change. From this point of view, the application of efficient waste management is becoming increasingly important. Thus, the article presents an analysis of the quantities of recycled municipal waste. The analysis presented shows that, at European level, compared to 2000, in 2020 the amount of waste generated per capita decreased and the amount of waste treated per capita increased. On the other hand, in terms of total quantities, there is an increase in both the waste generated and the waste treated. The importance of waste management has led to an increase in interest in municipal waste recycling. Thus, at the level of the member states of the European Union, there is an increase in the quantities of recycled waste.

Keywords

municipal waste, waste management, European Union.

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Introduction

Human industrial activities are gaining momentum (Balu et al., 2021). In this way, a high consumption of resources negatively influences the quality of human life and leads to the depletion of planetary resources (Sarbu et al., 2021). Climate change also has a negative influence. High amounts of waste can be prevented by sustainable flows of materials and energy, as desired in the circular economy (Radulescu et al., 2020).. The application of waste reuse measures can lead to the creation of additional value, respectively to the activation of the circular economy (Velenturf and Jopson, 2019). Through the circular economy, the European Union aims to reduce the amount of waste generated, but also to recover as much of it as possible (Magazzino et al., 2021).

In the urban environment, there is both an increase in population and a desire to increase welfare (Profiroiu et al., 2020). At the same time, urban development has led to an increase in the amount of municipal waste (Bodislav et al., 2020). Municipal solid waste management is a major challenge for human communities (Iyamu et al. 2020). Due to urban development, there is a need for proper sanitation systems in cities (Burlacu et al., 2020). Thus, the importance of waste management increases (Saxena et al., 2019). Knowledge of the factors that influence waste collection is a component of waste management (Bran et al., 2020). Not all waste can be reused. In the production process, those wastes that are unusable can be identified and it is desirable to intervene in their reduction. Improving waste recycling leads to an unpolluted environment (Otto et al., 2018). In terms of the environment, it is desirable that the benefits of

the current generation be preserved and passed on to future generations. In other words, waste management should consider the generation and treatment of as many types of waste as possible (Wisnubroto et al., 2021).

1. Review of the scientific literature

The way in which waste is collected, as well as the infrastructure for collecting it, can influence the waste management strategy (Mogos et al., 2021). There may be some shortcomings in the implementation of this strategy (Radulescu et al., 2020). Thus, certain unsustainable practices may occur that lead to high emissions and influences on sustainable development (Fuldauer et al., 2019). Food is very important for people's daily lives. But large amounts of food are thrown away. Food waste can be prevented by closely monitoring and intervening in the food production process (Bodislav et al., 2021). The reduction of food waste has beneficial effects for the economy, but also beneficial effects for people, in terms of social and environmental issues (Caldeira et al., 2021). Reducing food waste, but also the application of measures to avoid food waste, brings economic and environmental benefits (Jeswani et al., 2021). The importance of reducing food waste is also given by the fact that the production of raw materials needed for food involves the use of large areas of agricultural land (van Herpen et al., 2019). Some waste has been found to contain heavy metals. These materials increase the toxicity of the waste. An example is food waste. They contain both food waste and other associated materials. In these cases, the cost of the various treatments applied may be high (Chu et al., 2019). The location of landfills, together with local climatic conditions, can influence the efficiency of waste collection (Lee et al., 2017).

Plastic waste management has an impact on soil and water quality. High concentrations of microplastics produce negative effects on agricultural land and can affect water quality. It is desirable that plastic waste management does not lead to plastic contamination (Corradini et al., 2019). Reducing the amount of plastic waste can be achieved by people manifesting a more responsible individual behavior (Kedzierski et al., 2020). The circular economy offers the possibility for natural raw materials to be replaced by certain wastes resulting from the production flow (Russo et al., 2019). Poor waste management can lead to pollution of urban areas. Thus, the pollution of green spaces is considered to influence people's lives (Elmqvist et al., 2015). Human health is affected by the effects of waste pollution (Toscano and Murena, 2021).

Reducing the amount of waste can be achieved by applying solutions related to sustainable waste management. Such applicability can be given by the circular economy. For example, the revaluation of food waste that results in the technological flow of food production. Such an approach may be the basis for circular economy strategies (Garcia-Garcia et al., 2019). The life cycle of certain products leads to their transformation into waste. Recycling efficiency can be increased by applying measures to recover certain reusable components from these products (Ardente et al., 2019). Thus, the efficiency of resource use can be increased by measures to implement a management that leads to both the improvement of natural capital and its protection (Zorpas, 2020).

2. Research methodology

The purpose of this research was to assess the evolution of the quantities of waste generated or treated in the Member States of the European Union, for the period 2000-2020. The article presents a comparative analysis of the distribution of municipal waste generation and treatment in the Member States of the European Union. Due to the interest in waste recycling, the article presents the comparative situation of the quantities of municipal waste recycled. The analyzes took into account both the quantities of waste per capita and the total quantities of waste.

3. Results and discussion

Waste generation is characteristic of all production processes that use materials. In all sectors of activity, the realization of a finished product also involves waste. Municipal waste is mainly produced by households, including similar waste from other sources, such as: offices and public institutions, trade. The table no. 1 presents the comparative situation of generation of municipal waste per capita (kilograms per capita). It is observed that, compared to 2000, in 2020, at European level, the amount of waste generated decreased by 8 kilograms per capita. Also in 12 countries the values fell, including: Belgium (-55 kilograms per capita), Bulgaria (-205 kilograms per capita), Spain (-198 kilograms per capita), Hungary (-82 kilograms per capita), Estonia (-70 kilograms per capita), Romania (-68 kilograms per capita). On the other hand, there were increases: Czech Republic (+172 kilograms per capita), Denmark (+181 kilograms per capita), Croatia (+156 kilograms per capita), Latvia (+207 kilograms per capita), Slovakia (+179 kilograms

per capita). In 2020, some countries also showed an increase compared to 2010: Czech Republic (+189 kilograms per capita), Latvia (+154 kilograms per capita), Slovakia (+114 kilograms per capita), Finland (+126 kilograms per capita). But compared to 2010, in 2020 a number of 14 countries recorded decreases in the amount of waste generated. The most significant decreases were recorded in: Bulgaria (-147 kilograms per capita), Ireland (-69 kilograms per capita), Cyprus (-86 kilograms per capita), Spain (-55 kilograms per capita), Italy (-44 kilograms per capita), Belgium (-40 kilograms per capita).

In 2020, over 600 kilograms per capita were: Denmark (845 kilograms per capita), Germany (632 kilograms per capita), Cyprus (609 kilograms per capita), Luxembourg (790 kilograms per capita), Malta (643 kilograms per capita). Also, under 400 kilograms per capita had: Estonia (383 kilograms per capita), Hungary (364 kilograms per capita), Poland (346 kilograms per capita), Romania (287 kilograms per capita).

Table no. 1. Comparative situation for generation of municipal waste per capita (kilograms per capita)

Countries	2000	2010	2020	Countries	2000	2010	2020
European Union	513	503	505	Latvia	271	324	478
Belgium	471	456	416	Lithuania	365	404	483
Bulgaria	612	554	:	Luxembourg	654	679	790
Czechia	335	318	507	Hungary	446	403	364
Denmark	664	:	845	Malta	533	623	643
Germany	642	602	632	Netherlands	598	571	534
Estonia	453	305	383	Austria	580	562	:
Ireland	599	624	555	Poland	320	316	346
Greece	412	532	:	Portugal	457	516	513
Spain	653	510	455	Romania	355	313	287
France	514	534	537	Slovenia	513	490	487
Croatia	262	379	418	Slovakia	254	319	433
Italy	509	547	:	Finland	502	470	596
Cyprus	628	695	609	Sweden	425	441	431

Source: own processing according to data published by Eurostat (2022)

The evolution of waste generated in the European Union is shown in figure no. 2. From the data presented in figure 2, there is a decrease in values for the period 2010-2014. In the next period (2014-2020), the values increase from 478 kilograms per capita to 505 kilograms per capita, a value almost identical to that recorded in 2010 (503 kilograms per capita).

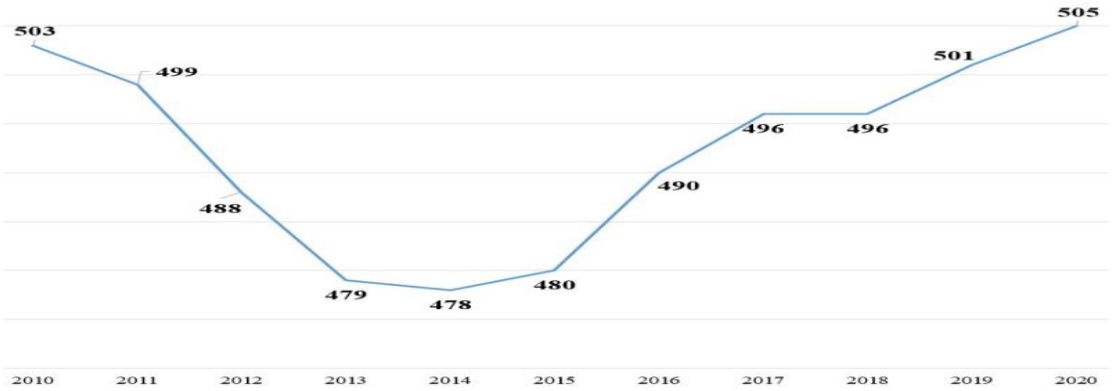


Figure no. 2. Evolution of waste generated in the European Union
Source: own processing according to data published by Eurostat (2022)

The table no. 2 shows the comparative situation for waste treatment (kilograms per capita).

Table no. 2. Comparative situation for waste treatment (kilograms per capita)

Countries	2000	2010	2020	Countries	2000	2010	2020
European Union	486	490	495	Latvia	252	324	455
Belgium	484	436	416	Lithuania	346	369	428
Bulgaria	495	547	:	Luxembourg	654	679	790
Czechia	317	304	493	Hungary	407	403	364
Denmark	664	:	845	Malta	533	600	599
Germany	642	602	632	Netherlands	510	571	534
Estonia	441	256	331	Austria	633	548	:
Ireland	621	575	546	Poland	320	264	346
Greece	412	532	:	Portugal	457	516	473
Spain	491	510	455	Romania	295	279	269
France	514	534	531	Slovenia	433	393	385
Croatia	:	373	376	Slovakia	249	309	433
Italy	497	515	:	Finland	526	470	596
Cyprus	628	676	518	Sweden	425	441	427

Source: own processing according to data published by Eurostat (2022)

It is observed that, compared to 2000, in 2020, at European level, the amount of treated waste increased by 9 kilograms per capita. Also in 12 countries the values fell, including: Belgium (-68 kilograms per capita), Bulgaria (-88 kilograms per capita), Estonia (-110 kilograms per capita), Ireland (-75 kilograms per capita), Cyprus (-110 kilograms per capita). On the other hand, there were increases: Czech Republic (+176 kilograms per capita), Denmark (+181 kilograms per capita), Greece (+112 kilograms per capita), Latvia (+203 kilograms per capita), Slovakia (+184 kilograms per capita). In 2020, some countries also showed an increase compared to 2010: Czech Republic (+189 kilograms per capita), Latvia (+131 kilograms per capita), Slovakia (+124 kilograms per capita), Finland (+126 kilograms per capita). But compared to 2010, in 2020 a number of 16 countries recorded decreases in the amount of waste treated. The most significant decreases were recorded in: Bulgaria (-140 kilograms per capita), Ireland (-29 kilograms per capita), Cyprus (-158 kilograms per capita), Spain (-55 kilograms per capita), Italy (-53 kilograms per capita).

In 2020, over 600 kilograms per capita of treated waste had: Denmark (845 kilograms per capita), Germany (632 kilograms per capita), Luxembourg (790 kilograms per capita). Also, less than 400 kilograms per capita of treated waste had: Estonia (331 kilograms per capita), Croatia (376 kilograms per capita), Hungary (364 kilograms per capita), Poland (346 kilograms per capita), Romania (269 kilograms) per capita), Slovenia (385 kilograms per capita).

The evolution of waste treated at EU level is shown in the figure no. 3. By 2013, there will be a decrease in values from 490 kilograms per capita to 468 kilograms per capita. Starting in 2014, the amount of waste treated increases to 495 kilograms per capita (2020).



Figure no. 3. Evolution of treated waste in the European Union
Source: own processing according to data published by Eurostat (2022)

The table no. 3 shows the comparative situation of the quantities of waste generated, respectively treated, at the level of the European Union, as well as of the member countries (in thousand tons).

Table no. 3. Comparative situation of the quantities of waste generated and treated, respectively (thousand tonnes)

Countries	Waste generated			Waste treatment		
	2000	2010	2020	2000	2010	2020
European Union	220.073	222.009	225.732	208.655	216.136	221.193
Belgium	4.831	4.972	4.800	4.959	4.746	4.800
Bulgaria	4.998	4.094	:	4.046	4.044	:
Czechia	3.434	3.334	5.419	3.250	3.186	5.272
Denmark	3.546	:	4.927	3.546	:	4.926
Germany	52.810	49.237	52.567	52.810	49.236	52.567
Estonia	633	406	509	616	340	440
Ireland	2.279	2.846	2.768	2.364	2.622	2.724
Greece	4.447	5.917	:	4.447	5.917	:
Spain	26.505	23.774	21.529	19.905	23.774	21.529
France	31.232	34.609	36.154	31.232	34.609	35.745
Croatia	1.173	1.630	1.693	:	1.604	1.523
Italy	28.959	32.440	:	28.279	30.505	:
Cyprus	436	576	543	436	561	462
Latvia	642	680	909	597	680	865
Lithuania	1.276	1.253	1.350	1.209	1.143	1.197
Luxembourg	285	344	498	285	344	498
Hungary	4.552	4.033	3.545	4.157	4.033	3.546
Malta	208	258	332	208	249	309
Netherlands	9.529	9.484	9.321	8.121	9.483	9.321
Austria	4.646	4.701	:	5.069	4.582	:
Poland	12.226	12.032	13.117	12.226	10.040	13.117
Portugal	4.705	5.457	5.279	4.705	5.457	4.866
Romania	7.961	6.343	5.534	6.611	5.645	5.179
Slovenia	1.020	1.004	1.024	861	805	809
Slovakia	1.369	1.719	2.366	1.340	1.666	2.362
Finland	2.600	2.519	3.296	2.724	2.519	3.296
Sweden	3.773	4.140	4.460	3.773	4.140	4.422

Source: own processing according to data published by Eurostat (2022)

It is observed that high values of waste generated were registered in: Germany (52567 thousand tons), France (36154 thousand tons), Spain (21529 thousand tons), Poland (13117 thousand tons). Also, high values of treated waste were registered in: Germany (52567 thousand tons), France (35745 thousand tons), Spain (21529 thousand tons), Poland (13117 thousand tons). For many countries the quantities generated and treated, respectively, coincided: Belgium, Germany, Spain, Luxembourg, Netherlands, Poland, Finland.

At the level of the European Union, for the year 2020, the amount of treated waste was lower than the amount of waste generated by -4539 thousand tons. The countries where the differences were significant are: Portugal (-413 thousand tons), France (-409 thousand tons), Romania (-355 thousand tons), Slovenia (-215 thousand tons), Croatia (-170 thousand tons).

The importance of waste management has led to an increase in interest in recycling. Reanalyzing the technological flow of a product can lead to solutions such as recycling waste from intermediate processes. Thus, the intervention in each stage of making a product can lead to the conservation of natural resources.

The figure no. 4 shows the evolution of the amount of recycled waste in kilograms per capita, for the year 2020.

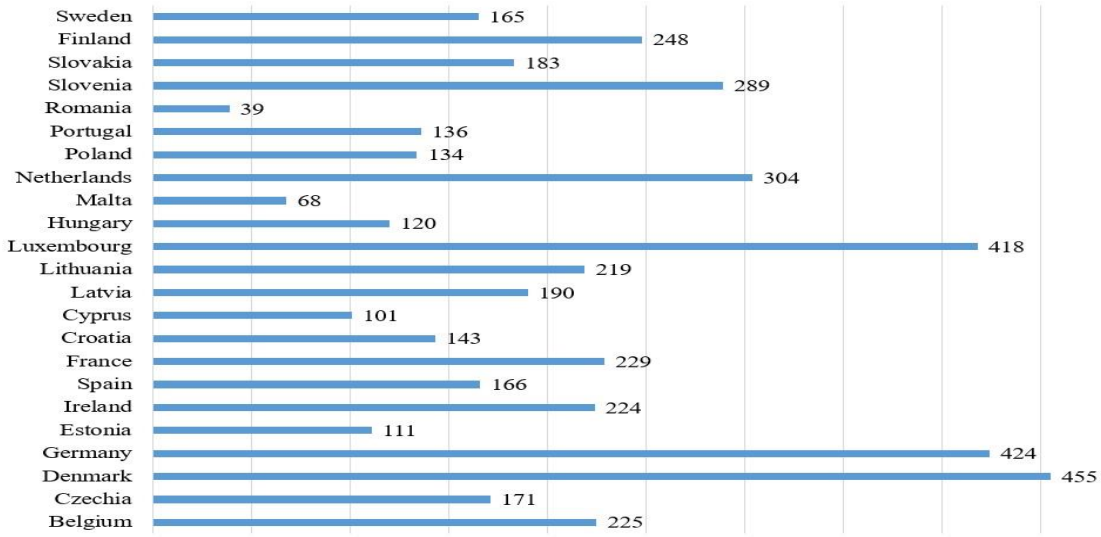


Figure no. 4. The evolution of the amount of recycled waste, 2020 (kilograms per capita)
Source: own processing according to data published by Eurostat (2022)

From figure no. 4, it is noted that Denmark (455 kilograms per capita), Germany (424 kilograms per capita), Luxembourg (418 kilograms per capita), the Netherlands (304 kilograms per capita) had the highest amounts of waste recycled in kilograms per capita. At the same time, the lowest amounts of waste recycled in kilograms per capita were recorded in: Romania (39 kilograms per capita), Malta (68 kilograms per capita), Cyprus (101 kilograms per capita), Estonia (111 kilograms per capita).

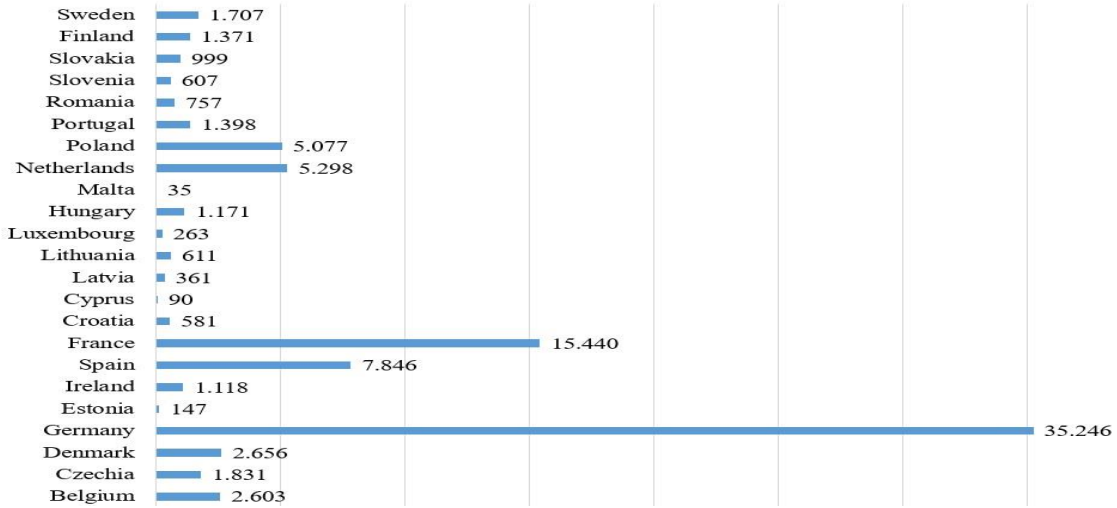


Figure no. 5. The evolution of the amount of recycled waste, 2020 (thousand tonnes)
Source: own processing according to data published by Eurostat (2022)

Also, in terms of the quantity recycled in thousand tons, from the data shown in Figure no. 5, it is observed that the highest values were recorded in: Germany (35246 thousand tons), France (15440 thousand tons), Spain (7846 thousand tons), Netherlands (5298 thousand tons), Poland (5077 thousand tons). Very small quantities were: Malta (35 thousand tons), Cyprus (90 thousand tons), Estonia (147 thousand tons).

Conclusions

From the analyzes presented, it is observed that compared to 2000, in 2020, at European level, the amount of waste generated in kilograms per capita decreased and the amount of waste treated in kilograms per capita increased. In the case of waste generated in kilograms per capita, the largest decreases were recorded in: Bulgaria and Spain. In 2020, the highest amounts of waste generated in kilograms per capita were: Denmark, Luxembourg and Malta, and the lowest: Romania and Poland. For waste treated in kilograms per capita, the largest increases were in: Latvia, Slovakia and Denmark. In terms of quantities expressed in thousand tonnes, in 2020, Germany, France, Spain and Poland had the highest values for both generated

and treated waste. Also, in 2020, Denmark and Germany recycled the largest amounts of waste in kilograms per capita, and in a thousand tons: Germany and France. It can be concluded that all countries in the European Union are concerned with waste management, but some of them are more concerned with this area, which affects our environment.

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Aspects of Education and Employment in the European Union

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Abstract
Changes in technological flows lead to changes in the labor market. The share of the young people has a certain influence on the degree of employment. Identifying and accessing jobs is very difficult for people with low levels of education. As the level of education of the population increases, so does the quality of jobs. Based on the information available on the Eurostat website, the article has the advantage of presenting the level of education of the population in the Member States of the European Union. Thus, it is analyzed from the perspective of two age groups. The participation of adults in education and training programs is becoming more and more necessary, even vital. The article presents a comparative situation on this topic. Aspects of employment rates of recent graduates are also addressed. The analysis presented shows that, at European level, compared to 2000, in 2020, for most countries in the European Union the share of people aged between 25 and 34 with a level of education 0-4 has decreased. In contrast, the share of people with a 5-8 level of education has increased for all countries. It is also found that the share of people aged 55 to 64 with an education level of 3-8 has increased for almost all countries. At the same time, compared to 2010, in 2020, it is found that the employment rate has decreased in some countries, regardless of the level of education of people aged between 25 and 29 years. Given the need for economic development, the results of these analyzes are important for the labor market both at the country level and at the European level

Keywords

European Union, adults, level of education, employment rates.

DOI: 10.24818/BASIQ/2022/08/010

Introduction

The requirements imposed by new technologies also bring changes to the level of education systems (Burlacu et al., 2021). Adults have the opportunity to participate in education and training programs (Rădulescu et al., 2020). Thus, this involvement leads both to an increase in the level of education and to social development and economic growth (Webb et al., 2020). Current demographic changes make it possible to apply intergenerational educational mobility measures (Gabay-Egozi and Yaish, 2019). The participation and active involvement of older people in the workforce can be based on improving educational prospects. It is believed that professional life can be extended through investment measures in education (Lorenti et al., 2020). Increasing the degree of automation of technological flows may lead to the application of staff reduction measures (Bodislav et al., 2020). In these situations, certain reorganization processes are needed. Compared to large enterprises, small enterprises are less prepared for such processes. Identifying people with the skills needed to take on new jobs in small businesses is more difficult to achieve (Negescu et al., 2020). Retraining and acquiring new skills remains a solution that these companies can apply (Rangraz and Pareto, 2020). Adult participation rates in education and training programs can be increased by creating supportive environments that require equitable resources and intensive training (Darling-Hammond et al., 2020).

1. Review of the scientific literature

It is important that, in today's economy, we know the level of education of the population (Androniceanu et al., 2017). Different demographics can influence economic outcomes and employment. The interest in vocational training of adults can be imprinted by parents since childhood (Prix and Erola, 2017). In production processes, information technology will be used more and more often. This will further affect people with a low level of education. Under these conditions, adult education is one of the solutions that can be applied (Van Nieuwenhove and De Wever, 2021). For adults in the workplace or for people performing certain family tasks, the application of blended learning can provide the premises for the application of education and training programs (Gjestvang et al., 2021). To a large extent, job resizing is due to automation and globalization (Androniceanu and Burlacu, 2017).

In terms of skills development, it is found that formal and informal learning, through a mixed approach, can lead to sustainable manifestations (Cebrián, Junyent and Mulà, 2020). The transformation of today's societies is based on the skills and knowledge needed to apply new technologies (Stoica and Burlacu, 2017). Adult education is thus influenced (Costache et al., 2015). Identifying viable solutions for both technological and environmental issues and for social issues can be achieved by developing creativity in education systems (Gulliksen, 2018). In an increasingly globalized economy, maintaining competitiveness is a challenge that requires measures to identify solutions (Burlacu et al., 2013). The level of skills, knowledge and competences of people in the labor market can be raised through education and training systems (Burlacu and Jiroveanu, 2012).

Facilitating access to information technology brings with it new learning opportunities. Thus, higher skill levels can be achieved by using the computer (Ertl, Csanadi and Tarnai, 2020). Increasing employment capacity can also be achieved through digital literacy measures (Peacock and Bacon, 2018). Proactive change management allows for the setting of goals and priorities that lead to flexibility and adaptability to new jobs (Glover, Law and Youngman, 2002). Skills mismatches arise from differences in employment structure and qualification requirements (Burlacu, 2011). Thus, changes in the demand for skills directly influence the skills, knowledge and abilities that graduates acquire in the OECD (2016).

The existence of a balance between the skills and abilities required by the labor market and the skills and abilities held by any person is a necessity of each (Cedefop, 2018). Also, in order for people to develop and broaden their perspectives, measures are needed to improve their knowledge, skills and competences.

Adults with a low level of education are negatively affected by changes in the labor market. This leads to situations of inability to access well-paid and secure jobs. Completing a level of education, even at university, does not provide the assurance that those skills are sufficient in the labor market. Due to technological changes, it is necessary to complete the baggage of knowledge and skills throughout the life.

Access to innovative learning opportunities, which provide a high degree of flexibility, leads to increased employment and social inclusion. Due to the reluctance with which adults treat the subject of returning to an education program, measures are needed to make these adult programs more flexible. In this way, people will be able to meet the growing demands of employers and will be able to benefit more easily from the opportunities offered by the labor market (OECD, 2021). The implementation of new vocational education and training programs, as well as adequate infrastructure, can be solutions for vocational education and training institutions.

2. Research methodology

Through this article, an analysis was made of the situation regarding the level of education of the people from the member countries of the European Union. At the international level, an international classification - ISCED (International Standard Classification of Education) is used to organize education programs and the qualifications related to these programs (Eurostat, 2020). Thus, in the first part, the comparative situation of the level of education of the people in the age groups 25-34 years, respectively 55-64 years, for the period 2000-2020 is presented. In the second part, the evolution of participation rate in education and training is presented. In the second part, the evolution of the participation rate in education and training is presented. At the same time, the comparative situation of the influence of the level of education on employment rates is presented in the article.

3. Results and discussion

From the point of view of economic activities, but also of education systems, it is important that the level of education of people is known. The level of education of the people can influence both the economic

results and the employment. Table 1 shows the comparative situation (2000-2020) of the share of the level of education of people for the age group 25-34 years. It is observed that, for persons aged between 25 and 34 with a level of education less than primary, primary and lower secondary (levels 0-2), compared to the year 2000, in the year 2020 in 5 countries the share of the population increased: Czech Republic (+0.2%), Denmark (+2.7%), Estonia (+1.9%), Romania (+7.4%), Slovakia (+1.0%). For the other countries, the share of the people with an education level of 0-2 has decreased. The most significant decreases were: Malta (-45.7%), Portugal (-47.5%). In 2020, high values of the share of the people aged between 25 and 34 and level of education 0-2 were recorded in: Spain (28.3%), Italy (22.6%), Malta (24.0 %), Portugal (21.0%). Shares below 5% were recorded in: Slovenia (4.4%), Croatia (3.9%). At European level, in 2020, the share was 14.7%.

Table no. 1. Comparative situation of the share of the level of education of the people for the age group 25-34 years (%)

	Levels 0-2			Levels 3-4			Levels 5-8		
Countries	**2000**	**2010**	**2020**	**2000**	**2010**	**2020**	**2000**	**2010**	**2020**
European Union	:	19,4	14,7	:	48,4	44,8	:	32,2	40,5
Belgium	24,7	17,9	14,2	39,4	38,3	37,3	36,0	43,8	48,5
Bulgaria	23,9	18,8	17,9	57,3	53,7	49,1	18,9	27,5	33,0
Czechia	7,4	5,8	7,6	80,9	71,6	59,4	11,7	22,6	33,0
Denmark	14,8	20,8	17,5	56,3	41,6	35,4	28,9	37,6	47,1
Germany	15,4	13,3	13,2	62,1	60,6	51,7	22,4	26,0	35,1
Estonia	9,1	13,1	11,0	62,5	48,7	45,9	28,4	38,2	43,1
Ireland	26,4	14,2	6,5	43,0	36,2	35,1	30,6	49,6	58,4
Greece	28,4	24,5	8,2	48,4	45,0	48,2	23,3	30,6	43,7
Spain	44,5	34,7	28,3	21,6	25,0	24,3	33,9	40,3	47,4
France	23,6	16,3	11,9	45,0	41,1	38,6	31,4	42,7	49,4
Croatia	:	10,4	3,9	:	63,9	59,5	:	25,8	36,6
Italy	40,7	28,9	22,6	48,7	50,3	48,5	10,6	20,8	28,9
Cyprus	20,6	16,7	10,9	46,8	35,2	31,3	32,7	48,1	57,8
Latvia	11,3	16,3	9,1	71,4	49,0	46,7	17,3	34,7	44,2
Lithuania	8,8	11,7	5,8	51,3	42,0	38,0	39,9	46,3	56,2
Luxembourg	31,8	16,0	11,7	45,3	39,8	27,7	22,9	44,2	60,6
Hungary	18,9	13,6	12,4	66,6	60,2	56,9	14,6	26,1	30,7
Malta	69,7	50,8	24,0	21,5	24,9	35,8	8,8	24,3	40,1
Netherlands	24,8	17,6	10,6	48,3	42,1	37,1	26,9	40,3	52,3
Austria	:	12,2	10,9	:	67,1	47,7	:	20,7	41,4
Poland	10,6	6,4	6,2	75,1	56,5	51,4	14,3	37,1	42,4
Portugal	68,5	47,5	21,0	18,7	27,1	37,1	12,8	25,5	41,9
Romania	13,3	23,9	20,7	77,5	55,4	54,4	9,2	20,7	24,9
Slovenia	14,5	6,5	4,4	66,2	62,2	50,2	19,3	31,3	45,4
Slovakia	6,3	5,9	7,3	82,6	70,1	53,6	11,1	24,0	39,0
Finland	14,1	9,2	7,4	48,1	51,6	48,7	37,8	39,2	43,8
Sweden	12,8	12,6	11,2	54,1	45,1	39,6	33,1	42,3	49,2

Source: own processing according to data published by Eurostat, 2022

For people aged between 25 and 34 with upper secondary and post-secondary non-tertiary education levels (levels 3-4), compared to 2000, in 2020 in 4 countries the share of the people increased: Spain (+2.7%), Malta (+14.3%), Portugal (+18.4%), Finland (+0.6%). For the other countries, the share of the people with an education level of 3-4 has decreased. The most significant decreases were: Latvia (-24.7%), Poland (-23.7%), Romania (-23.1%), Slovakia (-29.0%). In the year 2020, high values of the share of the people aged between 25 and 34 and education level 3-4 were recorded in: Czechia (59.4%), Croatia (59.5%), Hungary (56.9 %). Weights below 35% were registered in: Ireland (35.1%), Spain (24.3%), Cyprus (31.3%), Luxembourg (27.7%). At European level, in 2020, the share was 44.8%.

With regard to people aged between 25 and 34 with a level of tertiary education (levels 5-8), compared to 2000, in 2020 in all countries the share of the people has increased. The most significant increases were: Luxembourg (+37.7%), Malta (+31.3%), Poland (+28.1%), Portugal (+29.1%). The smallest increases in values were recorded in Finland: +6.0%. In 2020, high values of the share of the people aged between 25 and 34 and education level 5-8 were recorded in: Ireland (58.4%), Cyprus (57.8%), Lithuania (56.2 %), Luxembourg (60.6%), Netherlands (52.3%). Weights below 30% were registered in: Italy (28.9%) and Romania (24.9%). At European level, in 2020, the share was 40.5%.

Table 2 presents the comparative situation (2000-2020) of the share of the level of education of the people for the age group 55-64 years. It is observed that, for people aged between 55 and 64 with less than primary,

primary and lower secondary education levels (levels 0-2), compared to 2000, in 2020 in in all countries the share of the people has decreased. The most significant decreases were: Lithuania (-42.3%), Hungary (-41.3%), Romania (-40.9%). In 2020, high values of the share of the people aged 55 to 64 and level of education 0-2 were recorded in: Spain (49.8%), Italy (48.8%), Malta (65.2 %), Portugal (65.0%). Shares below 10% were recorded in: Slovakia (9.4%), Estonia (7.3%), Czech Republic (7.2%), Lithuania (2.5%), Latvia (4.8%), Poland (9.6%). At European level, in 2020, the share was 28.1%.

Table no. 2. Comparative situation of the share of the level of education of the people for the age group 55-64 years (%)

	Levels 0-2			Levels 3-4			Levels 5-8		
Countries	**2000**	**2010**	**2020**	**2000**	**2010**	**2020**	**2000**	**2010**	**2020**
European Union	:	39,3	28,1	:	42,8	48,3	:	17,9	23,6
Belgium	61,6	45,5	31,1	21,6	28,9	36,7	16,8	25,6	32,2
Bulgaria	53,3	29,2	17,7	32,5	51,4	58,4	14,2	19,4	23,9
Czechia	24,2	13,7	7,2	66,2	74,8	75,2	9,6	11,5	17,7
Denmark	32,4	32,3	24,5	48,8	40,8	45,7	18,9	26,9	29,7
Germany	26,1	16,5	14,7	53,4	58,1	57,6	20,5	25,4	27,7
Estonia	29,8	15,1	7,3	43,8	54,4	53,5	26,4	30,5	39,3
Ireland	64,9	49,6	29,9	22,1	28,1	36,7	13,0	22,3	33,4
Greece	74,0	58,4	37,3	18,0	26,0	38,7	8,0	15,6	24,0
Spain	84,2	68,1	49,8	6,0	14,3	22,0	9,8	17,6	28,2
France	56,3	44,4	28,3	30,8	37,3	45,3	12,9	18,3	26,4
Croatia	:	33,9	23,5	:	49,1	59,6	:	17,0	16,9
Italy	76,6	61,9	48,8	17,4	27,5	38,1	6,0	10,7	13,1
Cyprus	63,6	47,7	28,3	24,6	30,0	43,8	11,8	22,4	27,9
Latvia	33,8	15,1	4,8	51,1	62,9	65,9	15,2	22,0	29,3
Lithuania	44,8	13,4	2,5	22,6	63,5	66,2	32,6	23,1	31,3
Luxembourg	51,4	30,9	34,3	35,6	43,8	37,8	13,0	25,3	27,9
Hungary	59,7	25,7	18,4	28,4	58,0	61,3	11,9	16,3	20,4
Malta	90,8	83,1	65,2	6,1	8,9	18,7	:	8,0	16,0
Netherlands	47,0	39,9	29,5	34,3	34,3	38,3	18,7	25,8	32,2
Austria	:	27,2	19,1	:	56,5	55,5	:	16,3	25,4
Poland	43,1	20,8	9,6	47,1	66,4	73,6	9,8	12,9	16,9
Portugal	91,9	84,3	65,0	3,4	6,8	18,2	4,7	8,9	16,9
Romania	63,9	41,1	23,0	29,1	50,4	67,2	7,0	8,5	9,7
Slovenia	37,4	27,8	16,0	50,3	55,9	60,0	12,3	16,3	24,0
Slovakia	37,8	16,7	9,4	54,4	70,6	73,2	7,8	12,7	17,5
Finland	49,3	30,4	13,1	27,4	39,6	44,2	23,3	30,1	42,8
Sweden	37,1	30,4	18,0	40,8	42,4	49,4	22,1	27,2	32,6

Source: own processing according to data published by Eurostat, 2022

For people aged between 55 and 64 with a level of upper secondary and post-secondary non-tertiary education (levels 3-4), compared to 2000, in 2020, in Denmark the share of the people decreased: -3.1%. For the other countries, the share of the people with an education level of 3-4 has increased. The most significant increases were: Lithuania (+43.6%), Hungary (+32.9%), Poland (+26.5%), Romania (+38.1%). In 2020, values of over 70% of the share of the people aged 55 to 64 and education level 3-4 were recorded in: Czechia (75.2%), Poland (73.6%), Slovakia (73.2%). Weights below 25% were registered in: Malta (18.7%), Spain (22.0%) Portugal (18.2%). At European level, in 2020, the share was 48.3%. With regard to people aged 55 to 64 with a level of tertiary education (levels 5-8), compared to 2000, in 2020 only in Lithuania the share of the people decreased: -1.3%. In all other countries, the share of the people has increased. The most significant increases were: Ireland (+20.4%), Spain (+18.4%), Finland (+19.5%). In 2020, high values of the share of the people aged 55 to 64 and education level 5-8 were recorded in: Estonia (39.3%), Ireland (33.4%), Finland (42.8 %). Weights below 15% were registered in: Italy (13.1%) and Romania (9.7%). At European level, in 2020, the share was 23.6%.

The participation of adults in lifelong education and training programs is very important. Thus, another indicator is the participation rate in education and training (last 4 weeks). The table 3 presents the comparative situation of participation rate in education and training for the age groups 25-34 years, respectively 55-64 years, for the period 2000-2020. For the existing data on the EUROSTAT website, from the table 3, there are increases in the values of participation rate in education and training (last 4 weeks) in 2020 compared to 2000. Instead, compared to 2010, in 2020, there are also decreases in values. Thus, for the 25-34 age group, in 10 countries these values decreased. The most significant decreases in the participation rate in education and training were: Denmark (-12.0%) and Slovenia (-13.2%). High increases

were recorded in: Estonia (+7.5%), France (+9.0%), Malta (+7.0%). In 2020, for the 25-34 age group, the highest values of participation rate in education and training were registered in: Denmark (30.6%), Finland (37.2%), Sweden (37.4%). The lowest values were: Bulgaria (5.1%), Poland (6.3%), Romania (2.9%), Slovakia (5.4%).

Table no. 3. Comparative situation of participation rate in education and training for the age groups 25-34 years, respectively 55-64 years (%)

	From 25 to 34 years			From 55 to 64 years		
Countries	**2000**	**2010**	**2020**	**2000**	**2010**	**2020**
European Union	:	14,4	16,1	:	3,4	4,8
Belgium	9,5	11,8	12,5	1,9	4,0	3,7
Bulgaria	:	5,2	5,1	:	:	:
Czechia	:	13,5	9,7	:	2,6	2,8
Denmark	27,5	42,6	30,6	10,3	25,1	13,6
Germany	12,6	17,4	17,5	1,0	3,0	2,9
Estonia	13,3	17,5	25,0	1,8	4,7	9,0
Ireland	:	10,7	15,4	:	3,4	6,9
Greece	2,9	7,7	12,4	:	0,5	0,8
Spain	10,3	18,4	20,2	0,7	5,1	4,9
France	6,5	8,5	17,5	0,4	2,0	8,4
Croatia	:	9,8	9,1	:	:	0,4
Italy	11,7	13,1	14,6	0,7	2,5	4,0
Cyprus	5,0	14,3	9,4	1,0	3,5	1,2
Latvia	:	10,6	11,8	:	1,6	2,7
Lithuania	5,7	10,5	10,5	:	:	4,2
Luxembourg	7,9	20,7	25,6	:	6,1	6,5
Hungary	7,0	7,4	7,9	:	0,3	2,0
Malta	9,2	9,1	16,1	:	3,0	5,7
Netherlands	23,6	28,3	28,9	6,6	8,3	11,6
Austria	14,0	23,0	22,0	2,8	6,7	5,2
Poland	:	11,2	6,3	:	1,0	1,4
Portugal	8,1	11,6	16,6	:	1,2	4,8
Romania	2,5	4,2	2,9	:	:	:
Slovenia	:	29,6	16,4	:	6,4	3,9
Slovakia	:	6,4	5,4	:	0,7	1,3
Finland	25,0	33,7	37,2	7,4	13,0	17,0
Sweden	28,4	34,4	37,4	13,9	16,7	19,1

Source: own processing according to data published by Eurostat, 2022

For the 55-64 age group, in 7 countries participation rate in education and training decreased in 2020 compared to 2010: Belgium (-0.3%), Denmark (-11.5%), Germany (-0.1%), Spain (-0.2%), Cyprus (-2.3%), Austria (-1.5%), Slovenia (-2.5%). More significant increases were: Estonia (+4.3%), France (+6.4%), Finland (+4.0%). Also, in 2020, for the 55-64 age group, the highest values of participation rate in education and training were recorded in: Denmark (13.6%), Finland (17.0%), Sweden (19.1%), Netherlands (11.6%). The lowest values were: Greece (0.8%), Croatia (0.4%), Cyprus (1.2%), Poland (1.4%), Hungary (2.0%), Slovakia (1.3%).

Given the importance of identifying a job and hiring graduates immediately after completing a level of education, it becomes very important to highlight employment rates. The table 4 shows the comparative situation of employment rates for people aged between 25 and 29, depending on their level of education.

It is observed that for all levels of education, at European level, compared to 2010, in 2020, the employment rate for people aged between 25 and 29 years increased by 1.3%. However, in a number of 8 countries the values of this indicator have decreased. Significant decreases were recorded in Greece (-9.8%) and Italy (-4.5%). The countries with significant increases in values are: Ireland (7.2%), Latvia (7.2%), Lithuania (10.9%), Hungary (10.5%), Malta (7.7%). In 2020, the highest employment rates were recorded in: Germany (80.9%), Lithuania (80.0%), Luxembourg (80.6%), Malta (86.8%), Netherlands (84.8%), Slovenia (80.7%). The lowest employment rates were: Greece (58.3%), Spain (63.2%), Italy (54.2%). For people with an education level between 0 and 2, compared to 2010, in 2020, the employment rate decreased in 16 countries. Significant decreases were recorded in: Greece (19.6%), Croatia (21.4%), Finland (14.7%). Important increases were: Estonia (19.5%), Hungary (14.2%), Slovakia (13.1%), Czech Republic (12.5%), Lithuania (10.7%). In 2020, the highest employment rates were recorded in: Estonia (68.0%), Cyprus (65.2%), Luxembourg (71.3%), Malta (75.7%), Portugal (65.0%). The lowest employment rates were: Bulgaria (40.8%), Ireland (33.7%), Croatia (29.6%), Slovakia (35.2%). And for people with an education

level between 3 and 4, compared to 2010, in 2020, the employment rate decreased in 12 countries. Significant decreases were recorded in: Greece (11.4%), Cyprus (7.2%), Spain (6.6%), Italy (6.1%), France (5.9%). Important increases were: Germany (7.4%), Estonia (7.6%), Latvia (9.6%), Hungary (11.2%), Lithuania (14.8%). In 2020, the highest employment rates were recorded in: Czech Republic (80.6%), Germany (83.5%), Netherlands (83.3%), Malta (86.2%), Austria (80.8%). The lowest employment rates were: Greece (55.4%), Ireland (68.5%), Spain (59.2%), Italy (57.0%).

Table no. 4. Comparative situation of employment rates for people aged between 25 and 29 years (%)

	All ISCED 2011 levels		Levels 0-2		Levels 3-4		Levels 5-8	
Countries	**2010**	**2020**	**2010**	**2020**	**2010**	**2020**	**2010**	**2020**
European Union	71,6	72,9	56,1	51,7	72,4	73,7	79,5	79,2
Belgium	77,5	75,7	52,6	46,0	78,1	75,8	87,5	83,8
Bulgaria	66,7	70,4	35,5	40,8	69,8	72,8	81,6	83,3
Czechia	72,4	77,0	42,7	55,2	73,9	80,6	76,0	75,8
Denmark	72,7	72,4	59,9	48,7	76,4	75,1	79,3	79,9
Germany	75,6	80,9	53,7	58,4	76,1	83,5	86,9	85,4
Estonia	70,1	77,0	48,5	68,0	66,8	74,4	82,3	83,3
Ireland	68,5	75,7	40,5	33,7	64,0	68,5	80,8	83,7
Greece	68,1	58,3	65,3	45,7	66,8	55,4	71,9	63,6
Spain	65,6	63,2	58,2	53,3	65,8	59,2	72,5	70,2
France	77,1	74,5	56,4	48,7	77,1	71,2	85,3	83,1
Croatia	68,3	71,3	51,0	29,6	66,6	70,3	77,3	75,8
Italy	58,7	54,2	54,1	45,1	63,1	57,0	53,9	55,3
Cyprus	79,9	76,7	76,7	65,2	78,1	70,9	82,1	82,3
Latvia	69,3	76,5	53,5	58,8	67,5	77,1	78,2	80,0
Lithuania	69,1	80,0	30,3	41,0	60,2	75,0	84,8	89,2
Luxembourg	81,5	80,6	77,8	71,3	80,8	78,7	83,9	83,5
Hungary	65,8	76,3	36,3	50,5	67,4	78,6	77,5	83,4
Malta	79,1	86,8	67,5	75,7	87,2	86,2	90,9	93,6
Netherlands	84,8	84,8	71,0	63,7	85,5	83,3	90,6	90,5
Austria	79,4	79,4	55,0	57,9	82,3	80,8	84,6	82,6
Poland	73,8	77,8	44,4	42,5	70,7	76,9	82,6	85,9
Portugal	74,5	77,2	71,5	65,0	73,9	78,4	80,1	80,4
Romania	71,7	75,7	58,3	58,8	72,6	76,8	82,9	86,9
Slovenia	75,7	80,7	54,8	41,1	75,4	79,1	81,4	86,4
Slovakia	68,1	72,9	22,1	35,2	69,6	75,0	75,6	76,8
Finland	75,3	75,3	57,7	43,0	74,7	72,1	81,9	86,5
Sweden	76,1	77,0	57,1	46,7	77,6	78,4	80,8	82,6

Source: own processing according to data published by Eurostat, 2022

For people with a level of education between 5 and 8, compared to 2010, in 2020, the employment rate decreased in 10 countries. Significant decreases were recorded in: Greece (8.3%), Belgium (3.7%). Important increases were: Lithuania (4.4%), Hungary (5.9%), Romania (4.0%), Slovenia (5.0%), Finland (4.6%). In 2020, the highest employment rates were recorded in: Germany (85.4%), Lithuania (89.2%), Cyprus (65.2%), Netherlands (90.5%), Malta (93.6%), Poland (85.9%), Romania (86.9%), Slovenia (86.4%), Finland (86.5%). The lowest employment rates were: Greece (63.6%), Spain (70.2%), Italy (55.3%).

Conclusions

The analysis presented shows that, at European level, compared to 2000, in 2020, for most countries in the European Union the share of people aged between 25 and 34 with a level of education 0-4 has decreased. In 2020, high values of the weights of the people aged between 25 and 34 and education level 0-2 were recorded in: Spain, Italy, Malta, Portugal, Romania. For education level 3-4, high values were recorded in: Czechia, Croatia, Hungary. In contrast, the share of people with a 5-8 level of education has increased for all countries. In 2020, high values of the share of the people aged between 25 and 34 and education level 5-8 were recorded in: Ireland, Cyprus, Lithuania, Luxembourg, Netherlands. It is also found that the share of people aged 55 to 64 with an education level of 3-8 has increased for almost all countries. In 2020, high values of the share of the people aged 55 to 64 and education level 0-2 were recorded in: Spain, Italy, Malta, Portugal. Values of over 70% of the share of the people aged between 55 and 64 and level of education 3-4 were recorded in: Czechia, Poland, Slovakia. In 2020, high values of the share of the people aged between

55 and 64 and education level 5-8 were recorded in: Estonia, Ireland, Finland. Regarding participation rate in education and training, in 2020, for both age groups (25-34 years and 55-64 years) the highest values of participation rate in education and training were recorded in: Denmark, Finland, Sweden. At the same time, compared to 2010, in 2020, it is found that employment rates have decreased in some countries, regardless of the level of education of people aged between 25 and 29 years. In 2020, the highest values of employment rates were recorded for education levels 5-8; only 3 countries had shares below 75% (Greece, Spain, Italy).

For the labor market, as well as for the education and training system, the level of education of the people is important to know. It can be concluded that knowing the level of education of the adult people is vital for any economy. In the current context of labor market change, participation of the adult people in education and training programs is becoming a necessary option.

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The Effects of Digital Globalization on Economics and Society

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Abstract
In the minds of some scholars, digital globalization is a new kind of globalization, while others see it as a type of globalization that needs to be steered and managed so that institutions and corporations can work together to tackle the challenges of digitalization. All facets of economic and social life have been digitized. Globalization is being spurred on by technical advancements and scientific problems in an increasingly competitive marketplace. Globalization has been argued to have ceased after the 2008 financial crisis because of a decline in global trade in products and a dramatic decrease in cross-border capital flows. Studies demonstrate that globalization is not slowing down, but rather entering a new phase marked by an increase in the flow of data and information. More than a decade later, the new global crisis produced by the COVID-19 pandemic is strengthening the role of information and communication technologies in both the business and social life of the world.
It is the purpose of this study to emphasize the key characteristics of digital globalization that have a significant impact on the economic and social lives of today and tomorrow.
The primary research approaches are document analysis and literature review. These are multiplied by two if we conduct a literature review on IT tools.
A number of characteristics emerged from the documentary research that allow us to conclude that global digitalization can have a significant impact on the economy and society.

Keywords

economics, digitalization, globalization, society.

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Introduction

As more recent studies show, digital globalization represents an entirely different type of globalization, one which will have a significant impact on the way business is done in the near future. Through digital platforms, global economic, financial, and social ties are being strengthened as data and information accumulate. After more than a year since the outbreak of the Covid-19 pandemic, this research suggests that the world economy has been hit by a shock that may have been more severe and swift than the 2008 financial crisis. Even if digital globalization and economy change are being tested by the Covid-19 virus, economists believe the current crisis could lead to a move away from globalization. Globalization and digital economy transformation are under increasing threat from the problem produced by the coronavirus pandemic (Schilir, 2020).

According to current research, the two trends of globalization and digitization are colliding. This is because the massive volumes of data and information that are conveyed every minute, ideas and innovations around the world, can be quantified in large part by trade in products and cross-border financing. Otherwise, businesses should reconsider what it means to be global as these huge digital networks connect everything, anywhere, and at any time. Research like this measures the economic impact of this shift and recommends five key areas, each with their own set of challenges: the new bit trade; open platforms; virtual goods; and "digital packaging" or the foundation of digital dialogue (Bughin, Lund and Manyika, 2016).

Increasing globalization and increased exports have also been cited as a threat to the economic growth of developed economies that import more than they export, like the United States, according to some studies. Due to shifting objectives in social, political, and economic circumstances, several countries have developed distinct forms of "economic nationalism." Both rich and emerging economies have recently seen a rise in economic nationalism. Globalization and economic nationalism, it is said, have made many Asian firms more globally competitive. Western nations like the United States are now using nationalist economic policies in order to promote their own sectors and make them more competitive globally. In other words, economic nationalism is influenced by a country's openness to foreign investment (Chernyshenko, Vertakova and Mkrttchian, 2020).

Labor and the labor market are significantly affected by globalization and digitalization. According to several studies, globalization is changing the model's difficulties with work safety. This group's research focuses on labor market changes caused by new employment technology, interdependence, and labor utilization, rather than the typical interpretation of globalization's influence. Workplace safety may undergo radical transformation because of globalization; therefore, normative standards for non-standard employment arrangements are being proposed (Mandych et al., 2018).

It is also in agreement with the studies conducted before to the COVID-19 epidemic, in which education was considered the link between a continually changing technological field and the forces of globalization. This study analyzes how the socio-economic and political-ideological contexts of teaching and learning influence the effects of education on students and teachers alike. As a result, educational goals have undergone a radical transformation, and the ethical-political significance of education has been recognized as something that is being lost in the process of being modernized by corporate agendas. In the words of Trifonas (2017).

1. Methodology

The primary research approaches include in-depth examinations of primary sources and literature reviews. These are multiplied by a study of IT tools in the literature. Documentary analysis was the principal mode of investigation. The VOS viewer was chosen for use in visual representation analysis because these databases contain a large number of bibliographic references to emphasize the connections between concepts and ideas.

When it comes to developing and analyzing bibliometric networks, the developers of WOSviewer characterize the program as "a software tool." Individual researchers can also be included in bibliometric networks, which is an important distinction to keep in mind. Co-quotation or author relationships can be used to build networks based on quotations and bibliographic activity. Text mining capabilities were considered while picking a software solution because the program will be used to build and visualize co-emergence networks of significant subjects retrieved from a corpus of scientific literature. Several characteristics emerged from the documentary research that allow us to conclude that global digitalization can have a significant impact on the economy and society.

Figure no. 1 shows us that the relationship between digital globalization and economic and social life has found a distinctive location that requires us to study this connection in greater detail. This gap in the literature provides interesting future research avenues for us to explore.

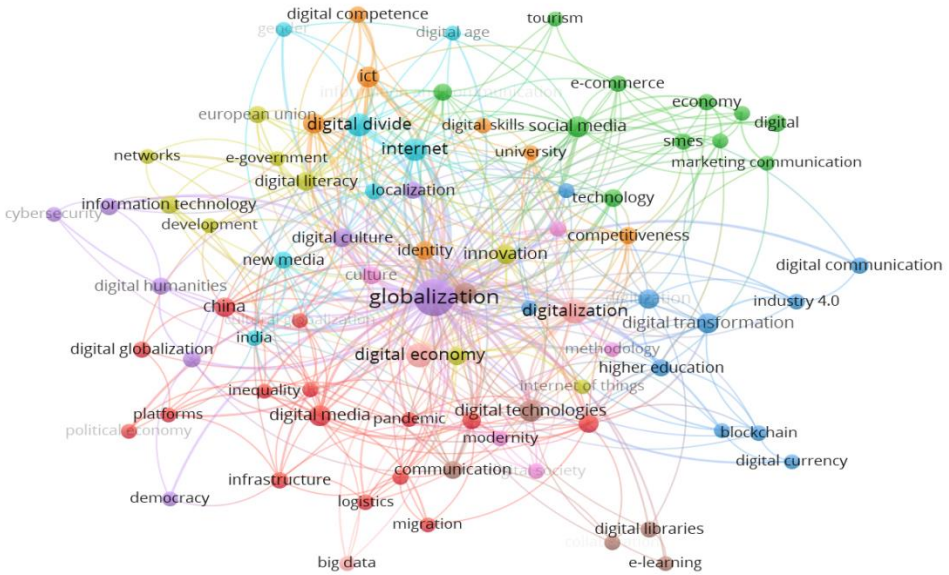


Figure no. 1. A bibliographic reference map
Source: WOSviewer with Web of Science data

2. Product and service globalization is becoming more prevalent

After conducting research and writing a dissertation on globalization of production, Sandhu concluded that the globalization of production will be characterized by two processes: the globalization of production and the globalization of services. The reduction of transportation costs, as well as the development of communication satellites and other information and communication technologies, he believed, would have resulted in further fragmentation of production, which would have resulted in the trans nationalization of production, resulting in the well-trans nationalization of the goods produced. As a result, those things are not considered to be products of a particular national state, but rather global products. Beginning in the 1980s, the second phase of globalization, that of services, would have taken place. The 1980s are seen as a transitional period between two recessions that, at the very least in the United States, would have compressed profit margins of corporations. Because services were far more firmly rooted in the economy and society than manufacturing, he believed that this phase of globalization lagged the era of globalization of production. This means that, although the recession of the early 1980s was characterized by blue collar workers, the recession that followed was characterized by white collar workers under pressure to further decrease labor costs in conjunction with the introduction of new information technology. This resulted in a reorganization of businesses that began in the late 1980s and became more extensive in the 1990s. One forecast would be that the globalization of services would continue to grow, but the globalization of manufacturing would stagnate as transportation costs rise in the future. Take for example, the idea that, because globalization of services will result in lower energy costs, they will be more likely to survive and expand; or the idea that virtual network connections established beneath the oceans could serve as conduits for increased information and data, as more and more work is virtualized. That it makes more sense to have virtualized information and data transported rather than to move individuals or items would be more energy efficient is suggested by the study (Sandhu, 2008).

3. Globalization and decentralization are two terms that are used to describe the same phenomena

At the moment, analysts believe that globalization and decentralization are the most significant factors contributing to the evolution of the nation-state during the last several decades. With the establishment of international organizations and economic integration, they think that power has migrated from central governments upwards as well as downwards, with the worldwide transfer of decision-making capabilities to regional and local governments. He also believed that these two processes occurred at the same time, despite the fact that the study of the literature has not yet produced a clear explanation of how they are related. According to their attempts to shed light on this relationship, which they consider to be one of the most important processes in world politics over the last four decades, states have become increasingly integrated into global markets, allowing power to either migrate to international organizations or simply be

limited by international economic dynamics, with many countries shifting power down and increasing the fiscal authority of regional governments as a result of this integration. As a result of their research, they believe that globalization and decentralization are more than two concurrent processes taking place at the same era, and that they are two positively connected dynamic processes (Jurado and León, 2021).

4. The worldwide workforce

Research reveals that nations throughout the world are reconsidering the circumstances of work in the context of globalization. Recent studies. It has long been known that globalization has a negative impact on the livelihoods of millions of people in developed countries. There is evidence to support the idea that new trade policies should take into account that the new type of digital globalization is more knowledge-intensive than capital-intensive or labor intensive. Basically, this necessitates the use of internet connections instead of conveyor belts. In light of the COVID-19 epidemic, lifelong learning has gone from a catchphrase to a reality much quicker. These studies recommend that mid-career retraining be made available not only to those who have lost their jobs due to foreign competition, but also to those who are facing disruptions in the ongoing process of automation and training programs that can transmit new skills in a few months, not years, and can be supplemented by programs that support workers' incomes during retraining and help them move to more productive work. Most industrialized countries, including the US, have not been able to fully react to those left behind by globalization, therefore addressing these needs has now taken on critical importance (Tyson and Lund, 2017).

Because of their ability to normalize artificial and constructed statements about who's work is worth more (or less) and which body types are best suited for specific tasks, Mills (2003) believes that gender ideologies can support flexible ways of controlling and disciplining work in an increasingly diverse global economy. As a result of global revolutions in production, movement and livelihoods that affect the lives of gendered people, there are tensions and conflicts, but also opportunities. Because of these battles involving people of both sexes (including women), men and women (including employees and employers), communities and states, new forms of action and identity may emerge (Mills, 2003)

Three years later, Freeman worries how a doubling of the global workforce would affect employees. In his view, incomes would decline, and unemployment would grow because of a reduction in the minimum wage. Assuming the nation's capital stock increased simultaneously, he proceeded his study on the premise that labor demand would rise proportionally, and workers' economic positions would be preserved. There will be an increased demand for social assistance for employees in the future when the global workforce doubles in size. At the end of 2006, he concluded that we had begun a protracted and historic transition to an unified global labor market. He assumed that there would be a wide range of challenges and opportunities in the new economic world, but also a wide range of threats, and countries must develop new creative economic policies to ensure that workers do well in this transition and that the next few decades do not repeat the experience of the last twenty or thirty years, in which almost all productivity gains have reached the pockets of a small class of people (Freeman, 2007).

5. Globalization in both the economic and social spheres

According to one recent research, many developing nations have attempted to speed their economic growth by pursuing policies that are outward-looking and geared toward integration into the global economy. If the majority of economic growth studies have tackled the subject from the perspectives of physical capital, human capital, natural resources, and technological knowledge, this is not the case in this study. This research was concerned with globalization and its implications for economic growth. It was the goal of this research to determine if economic, social, and political globalization had an influence on economic growth in the ASEAN (Association of Southeast Asian Nations) region between 1970 and 2008.

According to the findings of the study, economic globalization has a favorable impact on economic growth, however social and political globalization have negative consequences on economic growth. To put it another way, economic globalization is proven to be more effective in stimulating economic growth than political or social globalization in recent years. To promote international commerce and foreign investment, the researchers urge that governments take a more proactive approach. They also recommend that governments pay particular attention to the detrimental impact of political and social globalization on economic progress (Ying, Chang and Lee, 2014).

6. Globalization and the emergence of the COVID-19 pandemic are discussed in detail

Farzanegan, Feizi and Gholipour (2021) conducted research during the COVID-19 epidemic and discovered that while globalization has a positive influence on growth and employment, the impact of the health crisis will disclose the negative effects of globalization. In light of the growing trend of globalization of markets and societies, researchers recommend that policymakers take into consideration the health risks associated with the trend of globalization and the opening of trade borders in countries with low-quality formal institutions and monitoring capacity, as well as low transparency of information and government accountability, as these trends can lead to illicit trade and smuggling. It is asserted that there are certain sorts of commerce that are considered to be part of the hidden economy, and that since they are secret, they are much more difficult to govern in terms of disease transmission. A large amount of evidence, according to the researchers, indicates that COVID-19 was first discovered at a seafood market in Wuhan, where wild animals such as marmots, birds (including owls), rabbits (including bats), and snakes (including snakes) were traded illegally, recalling situations that were relatively similar in previous contagions, such as Ebola viruses and SARs. There would have been a perfect environment for illness in each of these cases if there had been big, unhealthy, and poorly controlled illegal marketplaces in place, and globalization combined with a lack of high-quality institutions would have accelerated the pace with which these outbreaks spread (Farzanegan, Feizi and Gholipour, 2021).

Conclusions

The digitization of globalization is forthcoming (Burlacu et al., 2021), if it has not already occurred as a result of more than a year of worldwide efforts centered mostly on employment and online school to preserve social distance as a fundamental strategy in countering the Covid-19 epidemic (Balu et al., 2021). Amounts in monetary units as well as volumes of commerce or labor might be used to calculate its economic impact (Rădulescu et al., 2021). Also clearly comprehendible is its influence on social or personal life, both in the short and long term (Sarbu et al., 2021). These perspectives may be shaped by variables such as the replacement of direct conversation with distant communication, which severely inhibits emotional transmission. More in-depth study, on the other hand, is required to distinguish between what is regarded useful and what may be harmful, either now or in the future. The expansion of technology was made possible not just by scientific advancement but also, perhaps more importantly, by the excitement with which these advancements were accepted. However, as a result of digitalization, which includes cloud computing, smartphones, enormous data, digital mining, cryptocurrencies, and artificial intelligence, it is now feasible to meet people from all over the world in one location at the same time. Researchers all around the globe are still concerned about the digitization of globalization, which has remained in the forefront of their minds for some time.

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Digital Public Management Governance

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Abstract
People's day-to-day lives have been transformed by the ICT revolution, but so have the relationships between governments and their populations. ICT and web technologies have been used to support and redefine current, new information and transactional interactions with stakeholders (e.g. people and businesses) using ICT, in particular the Internet and web technologies, with the goal of enhancing government performance and operations. When it comes to e-governance, there have been several distinct stages, each with its own unique set of interactions with the public: the first stage is simply the digitization of government information, which serves as a passive presence on the Internet.
Aim study is to discover whether county residents prefer electronic administration over traditional methods (e-governance). E-governance can only be implemented successfully if the people who will be affected by it agree with its implementation and believe it will be beneficial. Prior to implementing any plan for IT governance in public administration, it is critical to determine whether or not people desire or need such governance / administration. We should ask their views and see if we can implement it if they want it to be done thus.

Keywords

governance, public management, digitalization, management.

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Introduction

Public services, government administration, democratic processes, and contacts between people, civil society, business, and the government are all supported using information and communication technology (ICT). As a general phrase, "e-government" comprises a wide range of ICT applications in several settings. When it comes to e-government, this article focuses on five interconnected goals: a policy framework, enhanced public services and governance operations, high-quality and energy-efficient governance operations as well as a policy framework. At a great financial expense is involving the public in democratic processes, as well as administrative and structural reforms. One of the most significant areas of investment and development in the US and local governments' use of e-government is enhancing citizen access to government services and simplifying government processes. While progress has been achieved on several fronts, new policy challenges are continuously being added to an already complicated collection of concerns. An examination of the implications of electronic governance for administrative and institutional change appears to have made just the slightest advance in attempts to reinforce democracy. Technology-based governance will continue to grow soon, creating a dynamic environment for lifelong learning and action in many domains.

Changes brought forth by globalization and new information and communication technologies (NICT) have brought us to this moment in time. With globalization, economic and political interdependencies have become increasingly complicated. It is becoming increasingly difficult or impossible to have a political or economic impact on national governments because of the spread of news, currencies, and political and economic information across borders. Whereas academics and researchers in the public sector once viewed the Internet as a general-purpose tool for research, it has now evolved into a global mass of media thanks to advances in the World Wide Web and navigation technology. As a result, financial and communications systems around the world stand to undergo radical change in the 21st century, with implications for nearly

every aspect of life and work. People need to consider about how they want to be governed in the new century because of forces like those that change how people live, communicate, and work. "External governance" was mentioned in several responses, with some individual responses falling into this category. "Greater connectedness" is made possible by current technologies that are "widespreadly adopted" by a certain kind of government. The term of a "smart community" may be used to describe the economic, social, and political changes that might result from local NICT deployment. Changes in technology and globalization have ushered in a new era of profound transformation. With the rise of globalization, it has become clear that there are complex economic and political interdependencies and that many long-held assumptions about sovereignty and the role of the nation-state are no longer relevant. Governing people in the new millennium is becoming an important topic as digital communication and social networks change the way people live, engage, and work. All of the responses were grouped under the broad heading of "e-government." It demonstrates a movement in governance toward one that places a higher value on community engagement and makes use of cutting-edge technologies to do it. Local economic, social, and political reforms are hallmarks of a smart community movement. New governance structures and community collective intelligence are examined in this article.

If existing promises of digital interdependence fail to persuade skeptics to join them, it is because they lack a clearly defined reform of working methods to align with technology. In their view, critics' jobs have been made easy by the absence of critical information regarding a potential plan to raise tax money for public education. We need more information on the new governance structures, which will allow communities to engage at a higher level of collective intelligence, to address questions like these one. In this article, we'll go over some of the essentials of the subject. To begin, we'll go over the process of developing "smart communities." Greater public participation is seen in these urban areas. Section two asks for the cornerstone of any community governance system to be based on common knowledge.

It should be clear that NICT does not merely provide an administrative or geographical strategy, despite its evident concentration on electronic governance and smart communities. As a part of section three, we examine the Canadian government's strategy to assist the progress of smart cities and explore if any of the points we've presented throughout the paper have been taken into consideration. As a basis for solving the "e-government" dilemma that is vital to digital-age success, the fourth section examines main hurdles to social learning.

In the previous two decades, the fast advancement of ICTs has invaded nearly every element of government, industry, and daily life, and it is expected that this trend will continue. Over the last few years, the volume and diversity of digital data has skyrocketed. Public and private value may be generated by thousands of distinct apps that can be developed, shared, and utilized in many ways. No matter where they are or what time it is, individuals, groups, and organizations may interact with one another. Communication networks bind individuals from every corner of the globe together. Networked society is a different story. It's tightly packed with complexity and ripe for new dangers, such as threats to security and privacy, as well as administrative oversight and oversight itself. The public sector is confronted with a wide range of issues due to the shifting risk and opportunity landscape. From "interesting but progressive change" to "the next American revolution," several terms have been used to characterize its influence on the public sector. In 1993, when the Winter Commission pondered on the future of state and municipal public service, there was no dispute about how profoundly different the government was today than it was then.

1. Methodology

The research methodology is based on a bibliographic study of digital governance in the field of public management. Thus, we analyzed the literature both from a theoretical point of view and from the identification of good practices that allow a detachment of some lessons learned.

The term "e-participation" is often used to refer to people participating in democratic processes via the internet. Accessibility and usefulness of technology, government communication, public discourse, and citizen participation in policymaking are all part of this effort. Reforming government structures and procedures, together with delegating public tasks to the private and non-profit sectors, aims to improve accountability, openness, and trust in the government and the public sector. The government also must change the way it sees its role in controlling the people and society, as well as the way it views and values itself.

There are many ways in which the ICT revolution has influenced people's daily lives, as well as the way governments interact with their citizens. The government has supported its citizens and businesses for a

long time via transaction and information management using the current infrastructure. Modern technology, notably the Internet and Web technologies, was built for e-government to advance these responsibilities.

"E-government is the use of information and communication technologies in the public sector with the goal of improving the provision of information and services, encouraging citizen participation in decision-making, and making government more accountable, transparent, and efficient," says the United Nations Educational, Scientific, and Cultural Organization (UNESCO). It's all part of the growth of e-government: a new leadership style, creative means of discussing policy and investment decisions, new ways of accessing education, and new ways of listening to citizens. Because e-government has the ability to change the way individuals engage with their governments and with each other, it is often considered a larger notion than e-government alone. A new idea of citizenship may be introduced through e-government in terms of the demands and obligations of people. The objective of the organization is to empower and employ residents. E-government may be broken down into five distinct objectives, each of which can be assessed on its own.

For starters, e-trustworthiness government's is based on a foundation of general norms that set criteria for data integrity and decision-making procedures. By creating policy objectives, defining regulations, and establishing policies, the government sets the general direction and rulemaking for all citizens and companies in the acquisition, use, protection, and exchange of information. As a final step, better public services that are tailored to fit the demands of individuals and businesses alike. Performance evaluation and enhanced skills in the workforce may help achieve several goals such as enhancing infrastructure and management, as well as making better use of information. Other than efficiency, government administration is focused on improving infrastructure, improved information management and use and organizational innovation as well as risk management.

2. Literature review

Digital governments' interactions with citizens have been studied in terms of a succession of phases called the "stages of e-government development. On this development, the first stage of e-government, digital governments rely on "digital presence" to give information in passive websites, where digitized data are provided (Burlacu et al., 2021). Interacting with government agencies is made easier by providing a dynamic interactive form that can provide information whenever it is needed, as well as emails to individuals, businesses, and other government organizations (Burlacu, 2004).

Third-stage services include online license renewal, authorisation applications, and tax payments. Making data flow more efficient and facilitating collaborative decision-making will be encouraged by the government (Rădulescu et al., 2020). It is widely accepted that e-government is a process of modernisation of public sector operations and processes (Burlacu, 2010). This is a significant e-governance project that is currently in its third phase (Profiroiu et al., 2020). Government data and administrative processes may be accessed at any time, day or night, thanks to this information distribution strategy that promotes simplicity and automation of services. When it comes to these phases, citizens have very little control on the substance of these stages, which pass from government to the people and back again. E-government 1.0 is the word we use for this version of e-government.

Once individuals and their government have a basic talk, the last transition step is still needed to bring about the change. The government must also be able to hear from the people. Our government has a duty to respond to public concerns in a way that demonstrates their understanding of such issues. To make this sort of change a reality, extensive technological aid will be provided by citizens (Bodislav et al., 2020). There must be a total openness and participation from the public in order to create social cohesion in a nation (Bran et al., 2020). When a new government is inaugurated, it will stoke public debate on the establishment of new policies (Burlacu et al., 2019).

The open government initiative of the US federal government pushes for the application of three governance principles: transparency, participation, and collaboration. Transparency in government may be achieved by providing citizens with information about what the government is doing, and improved accountability can be achieved through increasing accountability (Rădulescu et al., 2020).

Information on government activities and decisions should be always available to the public in an easy-to-use format. Involvement encourages public involvement by giving the general public the opportunity to engage in policymaking and to provide the government with the aggregate knowledge, ideas, and expertise of the general public. Citizens' participation in government improves both efficiency and the quality of government choices (Profiroiu et al., 2019). As a means of improving government efficiency, collaboration requires a wide range of partnerships and cooperation across federal, state, local, and private sector entities.

Everyone has a hand in the creation, organization, editing, combinatorial distribution and evaluation of web information, and they also have a role in the development of a social network through interacting and connecting with one another (Burlacu et al., 2018). Individuals are actively involved in generating, organizing, editing, combining, sharing, discussing, and reviewing web content in a social network that is built using Web 2.0 technology. Websites that have been built using social networks are known as websites that are part of Web 2.0.

Blog platforms, wikis, social networking centers (for example, Facebook, Myspace), web-based communication methods (for example, chat, chat groups), photo sharing (for example, Flickr), video sharing and distribution (for example, YouTube), audio distribution the usage of social media networks by individual users contributes to the development, organization, combining, and dissemination of digital material (Rădulescu et al., 2018).

When data and knowledge are created by a network of individuals outside of a company's walls, it is known as "wisdom from without" or "wisdom from the masses." This contrasts with the "authoritarian knowledge from the inside out" technique that is usually employed. When it comes to Web 1.0, people are viewed as information consumers because the major provider and organizer of content is an organization. Web 2.0 technologies that enable public engagement to make it easy to perform open government services in your town. To put it another way, when an organization adopts Web 2.0 apps, it creates a platform known as Enterprise 2.0, which offers workers with social media tools to improve productivity, customer relationships & communication quality, and overall efficiency.

Search, Links, Authorship, Tags, Extensions, and Signalling are some of the most essential features of Enterprise 2.0, according to McAfee (SLATES). Search tools make it easier for employees to find information and resources (Burlacu, 2004). With the support of coworkers and other employees, employees may develop complex and productive social networks by utilizing their connection talents (Costache et al., 2015). The author function allows employees to write and share their opinions, experiences, and expertise (Burlacu, 2009). Labels and collaborative filtering both aid in the organization and connection of information when it comes to the exchange of knowledge. It is feasible to quickly disseminate fresh information using RSS and Twitter. It is also known as Government 2.0 when social technologies are embraced by government. The above-mentioned services should be available not just to government employees but also to members of the general public who are not affiliated with any particular government agency. It is the use of information and communication technology (ICT) at various levels in government, as well as outside of the public sector, to improve governance and efficiency (Bedi, Singh and Srivastava, 2001; Holmes, 2001; Okot-Uma, 2000). A group's collective actions can be guided or limited by procedures and institutions, formal and informal, according to Keohane and Nye (2000). An important part of the population is the government, which is delegated responsibility for enforcing the law. Governments do not necessarily have to be in charge of governance in order for it to be effective. All non-governmental organizations (NGOs) and NGO associations play a role in the establishment of governance, frequently in conjunction with government authorities but occasionally on their own initiative and without the authority of the government. Indeed, e-government should not be limited to the public sector, according to this concept. There is a need for policies and processes to be administered and managed in the commercial and governmental sectors.

The term "e-government" encompasses more than only e-government, according to certain authors. Politicians and political parties can use the internet to solicit constituent feedback or non-profit organizations can use it to make their positions known to the general public through the medium of social media in order to increase citizen participation in the decision-making processes of public institutions, according to these authors (Howard, 2001 and Bannister and Walsh, 2002).

3. Findings

Digital government can benefit from "disruptive innovation" enabled by social media as a disruptive technology. Enabling technologies may help the government innovate and make significant changes, but only if they are used to supply government services, make decisions, develop policy or run operations.

The Romanian government makes use of social media to keep departments in touch with one another. Most significantly, the government provides information to the public, ensuring that citizens and other stakeholders have access to a wide range of government information. "crowd sourcing" is a term used to describe the practice of soliciting feedback from a large number of individuals. As a result of this innovation, the notions of digital information market and participatory democracy have seen substantial expansion.

In all levels of government, from the municipal to the federal, social networking tools may assist foster cooperation, information exchange, and the interchange of ideas. Using modern social media, governments are urged to become more open and transparent. NGOs, individuals, and the government all have a role in the generation of knowledge, the enhancement of public services, and the formulation of public policy. The word "more democratic" was used to describe this type of circumstance, and it refers to the next step toward a more inclusive digital government model that includes greater engagement from citizens. People of different backgrounds may engage in policy-making, content creation, data collection and knowledge exchange through a new method.

How the individuals in authority care for the lives of citizens is a major contrast between current and older types of government. To access government services in some jurisdictions, residents may be required to present an ID card. Citizens are able to accomplish anything from renewing their licenses to getting married with the use of these ID cards. Additionally, these IDs may be used to make cashless payments through the use of coin-free jukeboxes. For some years, the digitization of processes has been an on-and-off endeavor with the goal of replacing paper-based operations with electronic ones. In this talk, I'll discuss how the public feels about e-governance and what it can do for them.

Technological progress and innovation create new problems in a knowledge-based socioeconomic environment. As towns and areas throughout the world have become more important due to globalization, so has the possibility for public engagement in governance, which has led to the present rise of interest in smart communities. Borders are said to have been dissolved as a result of the city's fast growth, globalization, and the proliferation of NICT. International integration and national dissolution go hand in hand because subnational entities are forced to adapt to their individual circumstances. According to Naisbitt (1994), these dynamics constitute a "global paradox," which has led to a rise in interest in the smart community movement. English-language studies of innovation systems from a regional viewpoint are becoming increasingly popular across the world. It has been used to refer to subnational entities, their coordination and learning models, and the primary causes of socioeconomic growth in their separate areas of responsibility as "industrial and technical clusters," "local industrial systems," and "local innovation systems." Digital and smart communities have benefited greatly from the rising corpus of knowledge in this area.

Silicon Valley's success, according to Saxenian (1994), may be traced to the development of a "network system," which he refers to as a "web of webs." Network systems, as defined by the Saxons, are a type of decentralized industrial system in which production is coordinated by networks of specialized enterprises that compete fiercely while simultaneously working with local institutions such as universities in a formal and informal manner. In this network architecture, both inside and between competitive and collaborative communities, the importance of relationships is paramount. The wealth of social, technological, and productive interactions in Silicon Valley encourages entrepreneurship, experimentation, and collective learning. Consequently, the region's socio-technological and productive infrastructure is as crucial to the success of local firms as their own operations.

Collaborative learning is made possible by a network structure that connects public, private and academic groups, offering Silicon Valley enterprises a regional advantage in today's highly competitive economy. Innovative concepts can be developed and brought to market much more swiftly now than in the past due to the flexibility of the system. Many factors, including the density of communication networks, group affiliations, cooperation between competing companies, fluid organizational structure, labor mobility, local discussion forums, venture capitalist leadership, collaboration with top universities, and international connections, facilitate innovation, according to Saxenian (1994). Since Silicon Valley excelled in each one of these categories, it was able to establish start-ups considerably more swiftly and successfully than any other place in the world.

Thus, a community's capacity to acquire and use information and technology is critical to its prosperity efficiently and effectively. To be able to innovate and increase technical performance, you need to be able to establish close relationships with other people and engage in extensive learning experiences with them. Innovation is the product of a collaborative effort by a variety of organizations and individuals, such as corporations, labs, universities, and everyday customers. Our society is now built of a wide range of network-based governing structures (Stoker, 1996).

In spite of the appeal of electronic networks, placement of government is decided by more sophisticated social networks than electronic networks alone. Smart community movement. When it comes to comprehending the complexity of natural systems, learning and adaption dynamics are increasingly being utilized as metaphors for local government collaborations. Our economies build a considerably more diversified ecosystem of institutions than their counterparts to organize economic activity, produce ideas,

and transform them into goods. New information generation is the most crucial process in this new environment, which will be coordinated by a variety of corporations as well as regional and personal networks. Members of dynamic and sustainable networks may more easily exchange information, risks, and opportunities if they have a sense of mutual trust and reciprocity (Leadbeater, 1999, p. 148).

A rising number of observers now argue that the competitive advantage of city-regions rests in the concentrated variety that is the distinguishing trait of city-regions, including the diversity of intellectual capital, business, and infrastructure. It has also been shown that cities-regions may achieve the critical mass needed to attract high levels of specialization, such as skilled labor and knowledge-based industries, as well as businesses and media. City-regions have a unique and important impact on a company's capacity to respond quickly, innovate, and adapt in the global marketplace because of these distinguishing qualities (Capello, 1999). People and companies all around the globe are beginning to create the first models of "networked" communities because of the increasing demands of globalization and the Internet of Things (NICT). We have already arrived to the future's "smart" communities.

Implementing IT governance in public administration comes at a significant price since it is complex, even for highly experienced programmers, and hence expensive. Even while these pieces that enable e-governance are pricey, they are tremendously helpful, which helps justify their high cost. Even while these expenditures are often partially or totally funded by European and state funding, the fact that the majority of these costs are paid by these sources is remarkable.

A strategy that includes initiatives, and the writing of those projects to convince the commission of the project's usefulness and advantages to European residents, is essential to acquire any form of financing, whether Norwegian or European (those in the country where this e-government is implemented). My next few posts will focus on how difficult it is to find qualified professionals in the subject, which is a major problem in the city. As a result, in many circumstances, securing these finances while simultaneously working on a literary project is practically impossible. Only five cities and two communes in the country have embraced e-governance, but the benefits are clear: shorter lines at counters (or no lines at all), happier citizens, and less red tape.

If you are proposing aspects that will lead to an electronic/digital governance in the legitimate public administration of a city, the first step is to assess the city's level of absorption, and the most significant factor is the demands of its citizens in order to achieve those initiatives.

Conclusions

As new information and communication technologies (NICTs) being created and deployed throughout the world, we have entered a moment of tremendous change. Furthermore, globalization has increased the intensity of economic and political interdependencies, as well as challenged core beliefs about sovereignty and national-state roles, for example. Web and navigation technology have made it possible to transform the Internet from an academic research tool utilized by the government and academics into a worldwide mass medium that will have a profound impact on our lives and work in the twenty-first century.

Skeptics who are not satisfied with a simple plea for a revision of work regulations in accordance with the promise of technology may be put off by present assertions of digital interdependence being too imprecise. People that are skeptical feel that there is a devil lurking in the details, and they believe that the details are not there. To appropriately reply to this sort of information request, it is required to define more clearly how the collective intelligence of communities, such as the new governance structures, will operate. It is the goal of this portion of the essay to produce a rough map of the terrain that has been detailed. As a first step, we highlight two characteristics of spatial governance in the workplace that contribute to the establishment of smart communities: the extension of city areas and the growing prominence of citizen involvement. Here we analyze the link between organizational effectiveness and spatial governance. Collective intelligence is referred to in the second portion of this study as a basis for community governance models.

People's daily lives have been transformed by the rise of new information and communication technology. An e-government, also known as digital governance or as e-government, is a new form of public organization based on the use of Internet and Web technologies to support and redefine existing and new information, transactional interactions with stakeholders (e.g. citizens and businesses), with the goal of improving government performance and processes. It has been observed that the evolution of electronic government has been studied as a series of stages that describe how digital governments interact with their citizens: the first stage is "digital presence" with simple websites that provide passive information, such as government information; the second stage is "digital presence" with simple websites that provide active

information, such as a digitization of government services; and the third stage is "digital presence" with simple websites that provide services.

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Integrated Waste Management in Sector 6 Bucharest

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Abstract
The purpose of the paper is to conduct a study on integrated waste management, highlighting the consequences of non-compliance with legal provisions in the field of municipal waste generation. The objectives pursued are: to carry out a scientific analysis on municipal waste at EU and Romania level; emphasizing the importance of the relationship between the natural environment of Bucharest and the proper management of waste, identifying the main environmental problems caused by proper waste management.
The environmental challenges of the late twentieth century have led to a reorientation of perceptions of how the environment and human society influence each other, with the states of the world making concerted efforts to deal with new challenges: globalization, economic crisis, Climate change, the loss of the diversity of biological and ecological systems and the deterioration of the quality of the abiotic environment.
The article adds value in the ecological field, one of notoriety in the context of globalization by analyzing the problems related to waste management and management in the European Union and Romania. At the same time, the aspects related to the quantitative and qualitative generation of waste sector 6 in Bucharest are analyzed and the identification of the main problems related to them together with the finding of solutions regarding their correct management.
The practical implications of the theme can result from a good management of municipal waste in sector 6 Bucharest. In this sense, several important points can be suggested: identifying economically and ecologically sustainable solutions; waste management planning: reduction, reuse, recycling and disposal; educating the public about environmental issues, involving the municipal community in solving environmental issues; delegation of authority for sectoral public administration in the management of environmental issues

Keywords

Bucharest, environment, management, sustainable development, waste

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Introduction

Traditionally, waste is considered a source of pollution, but if it is well managed, it can become an important source of materials, especially as many of the materials we need become increasingly scarce (Agovino and Garofalo, 2016). The EU economy uses 18 tonnes of materials per capita each year, of which 8 tonnes become waste, half of which ends up in landfills, and many Member States still rely on landfills, even if they are not a sustainable solution (Alpopi, Burlacu and Iovițu, 2018).

The problems we face today are related to the desire for social and economic development, on the one hand, and the maintenance of quality of life, on the other (Bran et al., 2020).

In the development process, the assimilation capabilities of environmental components (air, water and soil) to different types of pollution are rarely taken into account (Di Foggia and Beccarelli, 2021). The problems of environmental pollution thus become complex and create a high environmental risk.

Applying the principles of sustainable development involves a new approach to waste using environmentally friendly concepts to accurately weigh the proposed projects in this field with existing environmental resources (Badea, Apostol and Marculescu, 2013; Murthy and Ramakrishna, 2022).

Renewable and non-renewable resources and services provided by the components of natural capital are the support for the production of goods and services provided to human socio-economic capital, directly influencing the quality of health of the population (Halkos and Kleoniki, 2018).

In global environmental approaches, solid waste is a specific feature: it is distributed according to the laws of fluids and collected according to the laws of solids (Buclet and Godard, 2000). This determines a way of manifestation in the interaction with the 3 fundamental elements of the environment: air, water and soil (Bran, Alpopi and Burlacu, 2018). Waste management must take these particularities into account and generate appropriate solutions (Gunter, 2010).

The negative environmental impact was slower at first, but then accelerated because political actors did not show the slightest vigilance regarding their study and management (Cobo, Dominguez-Ramos and Irabien, 2018). Over time, environmental problems have become so acute that the problem of studying their behavior has not been raised in order to capture those elements with which to link the technical solutions that lead to the solution (Perkins et al., 2014).

1. Design/methodology

The material and methods used for the purpose of these works, consist of research, forays into literature; evaluation through the research and design triangle, analysis and interpretation of data from the literature, as well as statistical calculations. Documentation remains a key element in the area of high environmental issues and the implications of the report on ecosystem conservation for future generations.

The research methods in the research studies in the paper articles are the following: especially the documentary documentation through literature, in this sense being studied many books, especially documents and international ones; statistical methods, such as classification, synthesis, graphical representation of investigated events and phenomena; comparative analysis, used in comparing indicators specific to organic and conventional farms.

2. Municipal waste

Municipal waste is represented by all household waste and similar waste generated in urban and rural areas from households, institutions, businesses and economic operators, street waste collected from public spaces, streets, parks, green spaces, to which is added waste from constructions and demolitions resulting from the interior design of the houses collected by the sanitation operators (Cicconi, 2020).

Municipal waste management involves their collection, transport, recovery and disposal, including the supervision of these operations and the subsequent maintenance of disposal sites (Rojanschi et al., 2008). Currently, as shown in Figure no. 1 at EU level, municipal waste is treated by landfill (38%), incineration (22%), recycling (25%) and composting (15%).

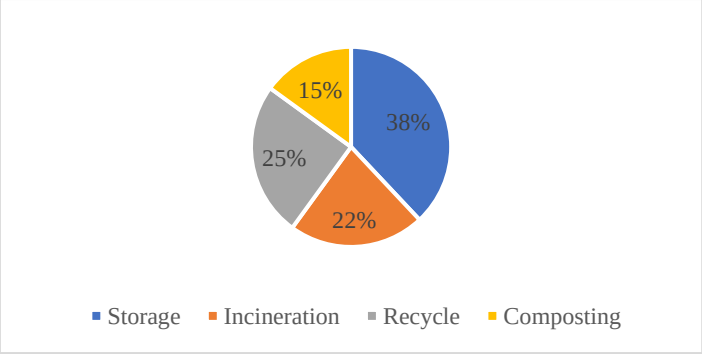


Figure no. 1. Municipal waste treatment methods at EU level
Source: *INSSE*

In Romania, efforts are still being made and some important investments have been made to align with the acquis communautaire, but the main way of disposing of waste is still storage (Bold, 2004).

Romania is part of the category of new Member States in which most of the quantities of municipal waste collected are disposed of by landfill, recycling and recovery operations being used to a very small extent.

In the structure of municipal waste in Romania, as shown in figure no. 1, the largest share has the household waste (about 64%), while the street waste and construction and demolition waste have approximately the same share (10% and 9%, respectively). Over 90% of municipal waste collected is disposed of in landfills.

An important problem of the waste management system in Romania is represented by the low coverage area with collection services (Grigore, 2014). Thus, at national level in 2016 only 63% of the population is served by sanitation services, the share in urban areas being approx. 85% and only 52% in rural areas. It is also noted that there are still quantities of waste that remain uncollected.

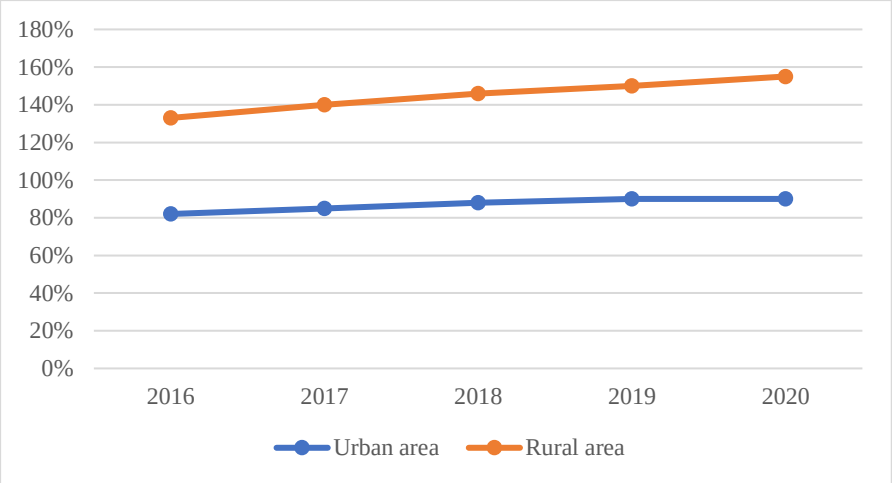


Figure no. 2. The share and quantities of municipal waste generated and collected
Source: ANPM, Environmental Status Report, 2021

National waste management policy must be in line with the objectives of European waste prevention policy and aim at reducing resource consumption and the practical application of the waste hierarchy.

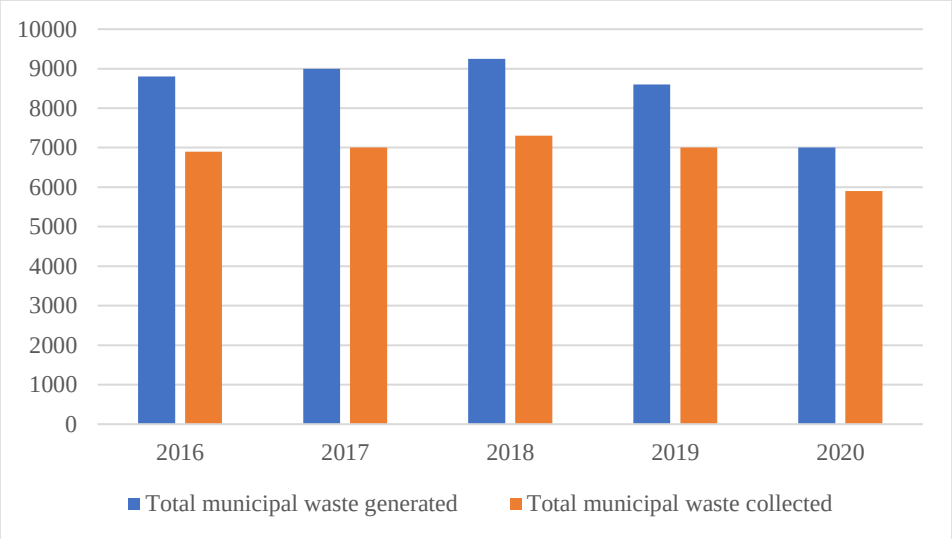


Figure no. 3. Quantities of municipal waste generated and collected
Source: ANPM, Environmental Status Report, 2021

3. Study on integrated waste management in sector 6 Bucharest

Sector 6 is the second largest sector in Bucharest. It is crossed by the Dâmboviţa river, which once flowed from the womb, causing great floods (Negescu et al., 2020). The redevelopment of the Dâmboviţa river, through extensive hydrotechnical works, led to the capture of water in an accumulation lake, called Morii

Lake, with an area of 241.6 hectares. This water tank ensures the clean flow of Dâmboviţa, prevents floods and at the same time represents the energy potential for power plants (Bodislav et al., 2019).

There are currently 9,880 economic agents in Sector 6, which have offset the negative consequences of the market transition. There are a small number of economic agents in the industry, only 10% of the total number, working in the manufacturing industry, the largest share belonging to the food and beverage industry (Bodislav et al., 2020).

In recent years there has been an increase in industrial production indices in Sector 6 by 1.4%, this increase being mainly due to the industrial production of heat and electricity, gas and water, as well as the privatization of the main enterprises in Sector 6, especially those in the military area.

3.1. General aspects regarding waste management in sector 6 Bucharest

In the practice of sector 6, waste management is considered a specific component of public services, which is given the same importance as water supply, energy or transport (Profiroiu et al., 2020).

Waste composition data are of particular importance, defining the potential for waste recovery and helping to establish collection systems. The sectoral waste management plans include data on the composition of urban household waste, determined by measurements, presented numerically and in graphical form. Data provided by URBAN S.A. were used in this study. and SC. SALSERV ECO, where daily determinations of the waste composition were made, collected from sector 6 Bucharest, the monitoring period being one week.

The collection of data on the total quantities generated and the fractional composition of the waste was done by sending forms to the sanitation operators and the online, daily communication of the results accompanied by images from the sorting, weighing, etc. process.

Table no. 1. Sector 6 Bucharest - urban collection area, houses - individuals

No.	Waste fractions	MO	TU	WED	THU	FR	SA	SU	Sum	Total
1	Recyclable paper and cardboard	45	48	36	29	36	26	0	212,00	3,53
2	Contaminated paper and cardboard	77	90	90	102	130	107	0	609,00	10,15
3	Recyclable plastic	121	105	132	124	85	144	0	713,00	11,88
4	Uncontaminated wood	4	8	5	18	19	16	0	73	1,22
5	Glass	48	62	55	45	44	48	0	311,00	5,18
6	Metal	8	4	6	11	17	15	0	66,00	1,10
7	Biodegradable	665	651	644	633	628	611	0	3822,00	63,70
8	Other	32	28	26	38	37	33	0	194,00	3,23
	Total quantity [kg]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**0**	**6000,00**	**100,00**

Source: SC Report. SALSERV ECO

From the analysis of the measured data for Sector 6 Bucharest - urban collection area, blocks, from the measurement analysis forms for 7 consecutive days it is found that from the total waste collected in the mixture, following the sorting process, results: 48.38% biodegradable waste out of the total of 5976 kg, respectively 17.98%; recyclable plastic, recyclable paper and cardboard, 12.4% followed by smaller fractions such as contaminated glass (7.36%) paper and cardboard (6.18%), textile waste 4.66%. Metal waste (1.95%), uncontaminated wood (1.25%) are found in very small quantities and the fractions of impregnated wood and hazardous waste are not present.

Table no. 2. Sector 6 Bucharest- urban collection area

No	Waste fractions	Urban	Urban collection area, blocks of flats	Sum	[%]
1	Paper + cardboard	821	1112	1933	16.14
2	Glass	311	434	745	6.22
3	Plastic	66	115	181	1.51
4	Metals	713	1073	1786	14.92
5	Wood	73	74	147	1.23
6	Biodegradable waste	3822	2889	6711	56.05
7	Other	194	277	471	3.93
	Total quantity [kg]	6000	5974	11947	100

Source: Raport SC. SALSERV ECO

The Sectoral Environmental Action Plan for Sector 6 Bucharest identifies the management of household waste as the main environmental problem with this sector and in general the municipality of Bucharest, due to the annual increase of waste generated by the population and economic agents, their non-selective collection and the long distances of the storage place in a warehouse that meets the standards in force, being an ecological landfill. In recent years, the quantities of household and similar waste generated by the population and economic agents have been in a permanent increase, the average quantities of waste collected by the two accredited companies being 3,905 m3 / month, of which:

Waste generates an impact on the environment, manifested by pollution: soil, air, surface water and groundwater, they are among the objectives recognized as generating impact and risk to the environment and public healt (Rolsky et al., 2019). The main forms of impact and risk determined by municipal and industrial landfills, in the order in which they are perceived by the population, are: changes in the landscape and visual discomfort; the air pollution; surface water pollution; changes in soil fertility and biocenosis composition in neighboring lands (Zapata, 2021).

Another downside is that many recyclable and useful materials are stored along with non-recyclable materials; being mixed and contaminated from a chemical and biological point of view, their recovery being difficult.

3.2. Waste management in Sector 6 Bucharest

The production activity is characterized as a process in which there is a permanent exchange between man and nature, the detachment of resources from nature for their processing into useful products and the return to the environment of materials in the final form of waste (Burlacu et al., 2020). In general, resource use and waste generation continue to increase, as economic development still relies heavily on natural resources (Rădulescu et al., 2020).

High resource consumption creates pressures on the environment, which include the depletion of non-renewable resources, the intensive use of renewable resources, transportation, high emissions of water, air and soil from mining activities, and the production, consumption and production of waste. Waste is a waste of natural resources (such as metals or other recyclable materials they contain or their potential as an energy source). After a certain time, with a greater or lesser delay, some of the waste is integrated in the biological circuit, and another part in the economic circuit (Sarbu et al., 2021).

The most effective course of action is to prevent the formation of waste, because in its absence, environmental threats are eliminated (Bran et al., 2020). Although prevention has the greatest potential to reduce environmental pressures, waste reduction policies have been rare and often not very effective. Separation of waste outside pilot systems is carried out in sorting stations owned by the sanitation operator and landfill managers (Mogos et al., 2021).

The vegetal waste resulting from the municipal waste is handed over to the Plant Materials Processing and Chopping Station of the Bucharest Parks and Recreation Lakes Administration with a capacity of the Bucharest Parks and Recreation Lakes Administration with a capacity of 10,000 t / year.

Lack of infrastructure at sanitation stations means that quantity data is most often based not on weighing but on approximations. In many cases we can certify the falsity of the approximation of the quantities of residues (not weighed) when transforming the estimated volumes into units of weight. In most cases, any form of control at the entrance to the sanitation facilities is also missing. Official waste statistics are

therefore viewed with caution and provide an inaccurate picture of the amount of garbage collected and actually disposed of. This makes the possibility of comparing the waste statistics obtained so far irrelevant.

In order to create a complete and sufficiently secure database for waste management planning and to ensure the possibility of comparing data from the different districts of Sector 6 Bucharest, both a minimum perimeter and a standardized minimum value are required in carrying out the data collection and balance sheet.

Conclusions

In global environmental approaches, solid waste is a specific feature: it is distributed according to the laws of fluids and collected according to the laws of solids. This determines a way of manifestation in the interaction with the 3 fundamental elements of the environment: air, water and soil. Waste management must take these particularities into account and generate appropriate solutions.

The packaging is thrown away for consumption: in the yard, on the street, on the side of the road, on tourist trails, at work, in the trash, on the side of the water. Discipline and ecological attitude towards this waste depends on the level of education, ignorance, repulsion towards legislative regulations, the degree of civilization.

Precipitation, snow melting, floods become carriers of waste in hydrographic dynamics. They reach the minor riverbed or gather in front of natural or artificial dams; or are deposited on meanders. The visible ones attract media attention. If they are close to human settlements, they cause problems for the neighboring households.

The wind is another fateful carrier of waste. It manifests itself in any season, with varying intensities and from different directions. The strongest manifestation is in the area of more or less organized deposits. When the 3 carriers act simultaneously, the negative ecological effect is ensured. It degrades the degradation factors: the sun, microorganisms, temperature and synergistic effects.

Of these, the first two points were achieved in Sector 6. Assessments have been carried out, sectoral waste management plans have been drawn up derived from regional waste management plans, but there are many other multi-page documents with targets in line with the requirements of the European Union, but the reality cannot be monitored, due to lack of definite data.

The third point created a number of tensions, as the funds allocated to actions, as many as they were, went to ad-hoc NGOs, and the NGOs that set up civil society initiatives did not have much access. to the allocated resources. Following the depletion of resources, such initiatives have diminished.

At EU level, waste management is considered a specific component of public services, which is given the same importance as other utility services. Waste management planning is an ongoing process that resumes and adapts over time, with achievements being evaluated periodically.

In this context, we proceed to resume some physical aspects related to the manifestation of municipal waste in relation to environmental factors and their ecological impact in order to find the most appropriate solutions to solve the problems they raise.

Solid waste consists of items removed as unnecessary during the 7 stages of the product cycle: extraction, refining, primary production, transportation, production of goods, consumption, post-consumption. Some of them are strictly controlled and generally do not raise issues from the point of view of waste management. Sensitive points consist of waste from the consumption stage. They mostly consist of packaging, but also parts of goods that become useless over time (wear, partially wear, degrade).

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Unemployment in European Union During the COVID-19 Pandemic. A Cluster Analysis

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Abstract

The present paper tries to identify the dynamics of the unemployment for 27 countries from European Union and which countries have encountered the biggest cluster fluctuations (their behavior in this regard) during the COVID-19 pandemic. In order to obtain the results, a data mining analysis was made, using the specific CRISP-DM methodology. The data analysis is made using the EM and Simple K-Means cluster algorithms. For each analyzed period of time, a cluster analysis is made and each country is distributed in the most appropriate cluster. The main findings of the paper are indicating the dynamics of the unemployment based on the identified clusters and also the behavior of each country related to the movement from one cluster to another. The paper offers an original approach in which a cluster data mining analysis is made in order to identify correlation for pattern behavior in the data about unemployment. Knowing that several countries have a similar behavior when they are exposed to a certain situation, maybe strategies and regulation can be designed for all of them, reducing this way the resources consumption.

Keywords

unemployment, COVID-19 pandemic, cluster analysis, European Union

DOI: 10.24818/BASIQ/2022/08/014

Introduction

The present article tries to identify the changes that have occurred for the European Union regarding the unemployment between the second quarter of 2019 and the third quarter of 2021. In this regard, the authors have tried to find out information about the dynamics of the unemployment for these countries and which countries have encountered the biggest cluster fluctuations (their behavior in this regard). In the first part of the paper a literature review was done regarding the unemployment problem and the effects of the COVID-19 pandemic over the unemployment. In the second part there are presented the main causes that are affecting the unemployment in general. In the third part there are described the research methodology and its phases. In the last part of the paper, the cluster data mining analysis is done highlighting the obtained results. Based on them, it can be identified which countries from EU were prepared to deal with such an extreme situation and how much the labor market was affected. Studies like DellaVigna et al. (2020), Rosca (2020) and Stefan et al. (2020) are debating also this topic. The period of time was selected in such a manner to comprise a period before the pandemic and another one during the pandemic.

1. Review of the scientific literature

The unemployment is the notion used in the situation of the lack of paid employment for properly qualified workforces (Belostecinic et al., 2022). According to Andolfatto (2008), the unemployment may be also defined as being the "percentage of individuals in the workforce (which is the sum of those who work or

are looking for work) who do not have a job (but are looking for one)". There is no mention about necessity of a specific qualification in order a person to be considered as unemployed (Bran, Alpopi and Burlacu., 2018). Another definition of unemployment is given by Topel (2008). Many research papers (like Hall, 2005; Marturano and Vizmuller-Zocco, 2019; Shi and Di Stasio, 2022) and studies (Esmark and Liengaard, 2021; Elsby and Gottfries, 2021) have debated this topic from many points of view, unemployment being a very important aspect of any country from around the world (Balu et al., 2021). In order to understand better the unemployment phenomena, several models were developed. In papers like (Ots et al., 2022; DellaVigna et al., 2020 and Bertarelli et al., 2018) are described some of these models.

In the last two years the COVID-19 pandemic has generated severe economic problems, affecting many countries at every level (Burlacu et al., 2021). The unemployment phenomenon was also affected by the pandemic, phenomenon that has raised growing problems for governments at a large scale. Situations like never before had to be carefully managed by the leaders and special solutions applied. For the last two years, the relation between the unemployment and the pandemic was a very strong one. Research papers like (de Jong and Ho, 2021; Rajput-Ray, 2022; Belostecinic et al., 2022) are describing this relation and influence of the pandemic over the people and the unemployment.

In the European Union (EU) the COVID-19 pandemic has caused a slow down to the economies of the countries. For example, according to Rosca (2020), in Romania, right at the beginning of the pandemic, at the end of march 2020 versus march 2019: 155675 work contracts were closed, the car registrations were less with 32%, less with 15% building authorizations, less with 45,8% in selling clothes market, less with 69,8 arrivals in hotels and guest house, less 6000 companies registrations, unemployment rate was 4,6% versus 3,7% from march 2019. For this reason, for many areas of the economy, a safety plan was made, each plan having its particularities. According to EU (2020), during the pandemic period, between March 2020 and December, as a response to the EU economic crisis, there were spent aprox. 3.7 trillion euro. Some aspects aimed by the EU were: national measures taken under the flexibility of EU budgetary rules (524 bn euro), EIB – European Investment Bank Group financing for business (200 bn euro), European stability mechanism pandemic crisis support for member states (240 bn euro), national liquidity measures (2553 bn euro), direct EU budget support (70 bn euro), SURE – EU funding for short-time work schemes (100 bn euro). Also in this regard the European Central Bank (ECB) has managed 1850 billion euro though the Pandemic Emergency Purchase Programme.

In this context, the jobs, employers, employees and workforces were in many cases well protected and financed in order to overcome the challenges that have appeared (Profiroiu et al., 2020). The main challenge was how to maintain the unemployment at a certain rate and how to keep the existing jobs for the people (Bodislav et al., 2020).

The present article tries to find out the answers to the following research questions: how were the dynamics of the unemployment for the countries from EU during the pandemic and which countries have encountered the biggest cluster fluctuations (behavior)?

In order to find the answers to these questions there were used data expressed in percent from Tempo-online database (*http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table*), for 2019 (quarters Q2, Q3, Q4), 2020 (quarters Q1, Q2, Q3, Q4), 2021 (quarters Q1, Q2, Q3). Selecting this period of time, the impact of the pandemic over the unemployment it can be very easy highlighted because the 2019 represents a post pandemic period and starting with 2-nd quarter (Q2) from 2020 it is the pandemic period.

2. Unemployment and its causes

The unemployment is a component of the labor market, market which has its specific aspects and which can be controlled by the intervention of the government. According to Phillips (2017), the labor market implies demand and supply relations, contractual basis and self-employment, sectorial and territorial constrains, internationalization (which represents the possibility of a person to move free in the EU in order to find a certain job). Also, the government may intervene with tools like creating a legal framework, managing the employees from the public sector, aligning to international treaties and regulations, creating passive and active employment policies (Profiroiu, Burlacu and Sabie, 2019).

In general, most encountered causes of the unemployment are the demand deficient and the supply side. According to Pettinger (2021) the demand deficient is based on high interest rates, financial crisis, negative multiplier effect, and global recession and the supply side is based on frictional unemployment, structural mismatch of skills, geographical immobility, real wage unemployment, and technological change. Also, for the second category supply side it can be elements like no experience, they are to too old, health

condition, not willing to take a job for less money, high population growth in the region (Figure no. 1). Pettinger (2021) describes the causes of unemployment as follows:

- Supply site:
  - Frictional unemployment – this type of unemployment it is represented by the people who spend time between the actual job and the next one;
  - Structural unemployment – this type occurs because of a lake of skills in the labor market and it can be caused by the occupational immobilities (difficulties that occur in learning new skills needed to a new industry), geographical immobilities (the need to move to another area to get a certain job), technological change, structural changes in the economy;
  - Classical or real-wage unemployment – situation when wages in a strong and competitive labor market are situated above the equilibrium.
  - Voluntary unemployment – this unemployment appears when people choose to remain unemployed rather than take the available jobs on the market. Friction
- Demand deficient ("Cyclical unemployment"): occurs when the economy is not at its full capacity. For example, having a decrease in outputs, the companies will employ fewer people because they are making fewer goods.

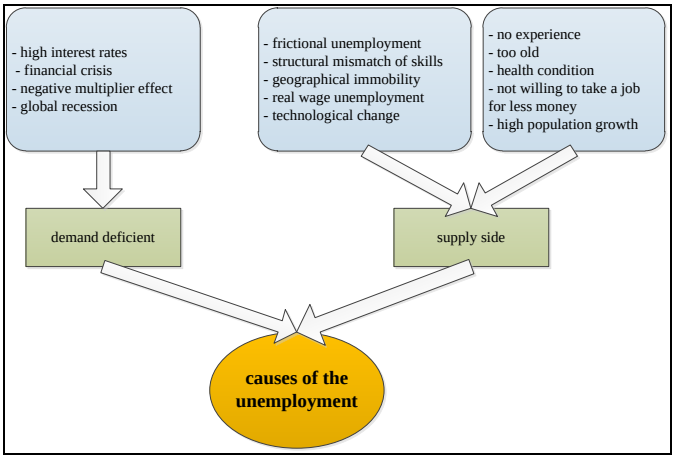


Figure no. 1. Causes of the unemployment
Source: Pettinger, 2021

According to Eurostat [https://ec.europa.eu/Eurostat], the unemployment rate in UE was 7,5% in December 2021 and 8,3% in Euro area. In the same month and year, from the 27 countries of EU, the most highest rates were recorded in Spain (16,2%), Lithuania (10,1%) and Italy (9%) and the lowest ones in Germany (4,6%), Slovenia (4,7%), Bulgaria (4,8%) and Romania (4,9%).

3. Research methodology

For the EU, in the context of the COVID-19 pandemic, despite of all the strategies and policies taken by governments, the unemployment has increased gradually. Because during the pandemic period some results of the taken measures have been seen, the unemployment had fluctuations. In order to identify these fluctuations and which countries have the biggest ones, a data mining analysis based on cluster was realized. There were analyzed the unemployment rates express in percent starting with 2019 (Q2) and ending with 2021(Q3) for 27 European countries. The data source is Tempo online database.

In order to process the data and to obtain the final results, a data mining specific methodology was used, namely DM-CRISP methodology (*https://www.datascience-pm.com/crisp-dm-2/, accessed on March 3, 2022*) which has several steps. These steps are: requirements understanding, data understanding, data preparation, data modeling, results evaluation, and deployment. The dataset obtained after data preparation step contains 11 attributes and 27 records. Main activities made over the dataset were:

- collecting the data from the data source;
- creating the excel file with the needed data
- the excel file was transform into an arff file. This type of file was uploaded in Weka software for the data mining analysis (Figure no. 2.) (Bouckaert et al., 2010; Bodea et al., 2011).

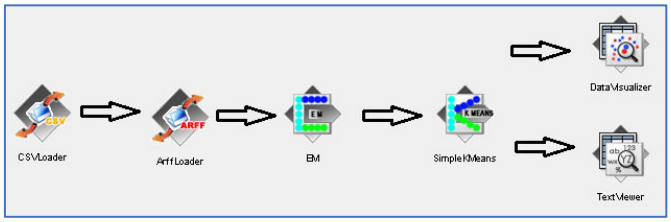


Figure no. 2. Processing steps for data

The algorithms used for the data mining cluster analysis were specific cluster algorithms EM and Simple K-Means. The EM algorithm was used to identify the number of clusters in the dataset for quarters. Then the Simple K-Means algorithm was used in order to identify the cluster of each country for a certain quarter (Q). It can use either the Euclidean distance (default) or the Manhattan distance. If the Manhattan distance is used, then centroids are computed as the component-wise median rather than mean. Manhattan distance MD1 between 2 vectors a and b in a n-dimensional real vector space, having Cartesian coordinates, is the sum of the lengths of the projections of the segments between the points on the coordinate axes.

4. The cluster analysis

The cluster analysis uses an arff file that is uploaded in WEKA software. The data preprocess tab offers the possibility use the arff, to see the number of the attributes (11), the number of the records (27 countries from EU) and also to see the minimum, maximum, mean and standard deviation values for the numerical attributes. One or more attributes may be selected. In this case, each quarter was selected and for it the EM and Simple K-Means algorithms were applied (Bouckaert et al., 2010).

In the tab Cluster, there are applied the two algorithms. For the Simple K-Means algorithms there were used the following parameters: the computed distance (Manhattan), maximum iteration number (500), number of clusters (4 - identified based on the results offered by EM algorithm), preserve instance order (false).

The results for the cluster analysis are mentioned in Table no. 1. For each analyzed quarter, there were identified 4 clusters, and for each one there were mentioned (Table no. 1): the number of countries from that cluster, the most representative country for that cluster, the centroid's value.

Based on the results obtained in Table no. 1 we may conclude that:

- the cluster 0 is the one that has the largest variation for the unemployment rate. The minimum is 3,9% in Q3 of 2019 and the maximum 9,9% in Q1 – 2021. For this cluster, the most representative country is Austria for the entire analyzed period.
- the cluster 1 has a minimum unemployment rate of 5,15% and a maximum of 8,1%. The most representative country is Belgium in most of the quarters.
- the cluster 2 is the most stable one, having values 3,1% and 4%. So, countries that are allocated in this cluster were the least affected during the pandemic period. The most representative country is Czechia.
- the cluster 3 is has a minimum rate of 3,95% and a maximum one of 6,6%, the most representative country being Bulgaria in most of the quarters.

In Figure no. 3 it can be observed the dynamics for each cluster based on the cluster centroid for each period of time.

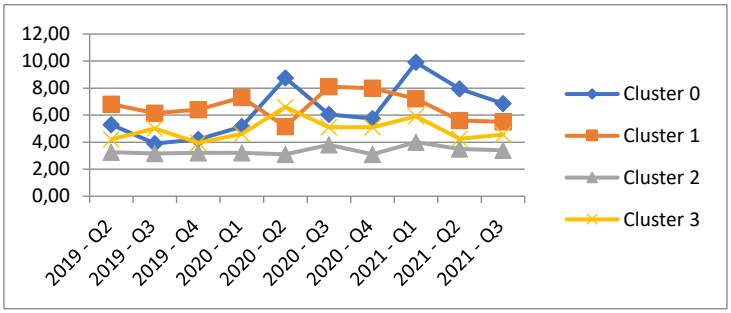


Figure no. 3. Unemployment rates in percent – cluster centroids

Table no. 1. Cluster centroids for unemployment in UE

Year - Q		Clusters			
		0	**1**	**2**	**3**
2019 - Q2	No. of countries within cluster (percent)	5 (19%)	12 (44%)	6 (22%)	4 (15%)
	Country most representative	Austria	Belgium	Czechia	Bulgaria
	Centroid (percent)	5,3	**6,8**	**3,25**	4,2
2019 – Q3	No. of countries within cluster (percent)	4 (15%)	14 (52%)	6 (22%)	3 (11%)
	Country most representative	Austria	Belgium	Bulgaria	Denmark
	Centroid (percent)	3,9	**6,15**	**3,15**	5
2019 – Q4	No. of countries within cluster (percent)	5 (19%)	14 (52%)	6 (22%)	2 (7%)
	Country most representative	Austria	Belgium	Czechia	Romania
	Centroid (percent)	4.2	**6,4**	**3,2**	3,95
2020 – Q1	No. of countries within cluster (percent)	4 (15%)	13 (48%)	6 (22%)	4 (15%)
	Country most representative	Austria	Belgium	Czechia	Bulgaria
	Centroid (percent)	5,15	**7,3**	**3,2**	4,6
2020 – Q2	No. of countries within cluster (percent)	8 (30%)	8 (30%)	4 (15%)	7 (26%)
	Country most representative	Austria	Belgium	Czechia	Bulgaria
	Centroid (percent)	**8,75**	5,15	**3,1**	6,6
2020 – Q3	No. of countries within cluster (percent)	2 (7%)	16 (59%)	6 (22%)	3 (11%)
	Country most representative	Austria	Belgium	Bulgaria	Malta
	Centroid (percent)	6,05	**8,1**	**3,8**	5,1
2020 – Q4	No. of countries within cluster (percent)	4 (15%)	14 (52%)	4 (15%)	5 (19%)
	Country most representative	Austria	Belgium	Czechia	Bulgaria
	Centroid (percent)	5,75	**8**	**3,1**	5,1
2021 – Q1	No. of countries within cluster (percent)	7 (26%)	9 (33%)	5 (19%)	6 (22%)
	Country most representative	Austria	Belgium	Czechia	Bulgaria
	Centroid (percent)	**9,9**	7,2	**4**	5,9
2021 – Q2	No. of countries within cluster (percent)	14 (52%)	5 (19%)	4 (15%)	4 (15%)
	Country most representative	Austria	Belgium	Czechia	Denmark
	Centroid (percent)	**7,95**	5,6	**3,5**	4,25
2021 – Q3	No. of countries within cluster (percent)	14 (52%)	5 (19%)	6 (22%)	2 (7%)
	Country most representative	Austria	Denmark	Czechia	Bulgaria
	Centroid (percent)	**6,85**	5,5	**3,4**	4,55

In the next table (Table no. 2) it was analyzed for each country the cluster to which it belongs for each period of time and a characteristic was marked in the last column. The meaning for the values from the last column is:

- CT (constant cluster variation) – if the cluster was the same for the entire period. In this category are the following countries: Austria, Czechia, Germany, and Poland;
- SV (small cluster variation) - if there are up to 3 different clusters for the entire period. In this category are the following countries: Belgium, Croatia, Cyprus, Finland, France, Greece, Italy, Latvia, Lithuania, Netherlands, Portugal, Slovenia, Spain, Sweden;
- LV (large cluster variation) – if there are up to 4 different clusters for the entire period. In this category are the following countries: Bulgaria, Denmark, Estonia, Hungary, Ireland, Luxemburg, Malta, Romania, and Slovakia.

In Figure no. 4 there is represented the cluster distribution based on the unemployment rate for each country in the first analyzed quarter (Q2 from 2019). In Figure no. 5 there is represented the cluster distribution based on the unemployment rate for each country in the last analyzed quarter (Q3 from 2021).

Table no. 2. Unemployment in UE – cluster dynamics

No	Country	2019 - Q2	2019 - Q3	2019 - Q4	2020 - Q1	2020 - Q2	2020 - Q3	2020 - Q4	2021 - Q1	2021 - Q2	2021 - Q3	Obs
1	Austria	0	0	0	0	0	0	0	0	0	0	**CT**
2	Belgium	1	1	1	1	1	1	1	1	1	0	SV
3	Bulgaria	3	2	0	3	3	2	3	3	1	3	LV
4	Croatia	1	1	1	1	3	1	1	0	0	0	SV
5	Cyprus	1	1	1	1	3	1	1	0	0	0	SV
6	Czechia	2	2	2	2	2	2	2	2	2	2	**CT**
7	Denmark	3	3	0	0	1	0	0	3	3	1	LV
8	Estonia	0	0	0	0	3	1	1	1	0	1	LV
9	Finland	1	1	1	1	0	1	1	1	0	0	SV
10	France	1	1	1	1	3	1	1	1	0	0	SV
11	Germany	2	2	2	2	2	2	2	2	2	2	**CT**
12	Greece	1	1	1	1	0	1	1	0	0	0	SV
13	Hungary	2	2	2	2	1	2	3	2	3	2	LV
14	Ireland	0	3	0	3	1	1	0	1	0	1	LV
15	Italy	1	1	1	1	0	1	1	0	0	0	SV
16	Latvia	1	1	1	1	0	1	1	1	0	0	SV
17	Lithuania	1	1	1	1	0	1	1	1	0	0	SV
18	Luxembourg	0	1	1	1	3	1	0	3	1	1	LV
19	Malta	2	0	2	2	1	3	3	2	2	2	LV
20	Netherlands	2	2	2	2	2	2	2	3	3	2	SV
21	Poland	2	2	2	2	2	2	2	2	2	2	**CT**
22	Portugal	1	1	1	1	1	1	1	1	1	0	SV
23	Romania	3	0	3	3	1	3	3	3	1	1	LV
24	Slovakia	0	1	1	0	3	1	1	1	0	0	LV
25	Slovenia	3	3	3	3	1	3	3	3	3	3	SV
26	Spain	1	1	1	1	0	1	1	0	0	0	SV
27	Sweden	1	1	1	1	0	1	1	0	0	0	SV

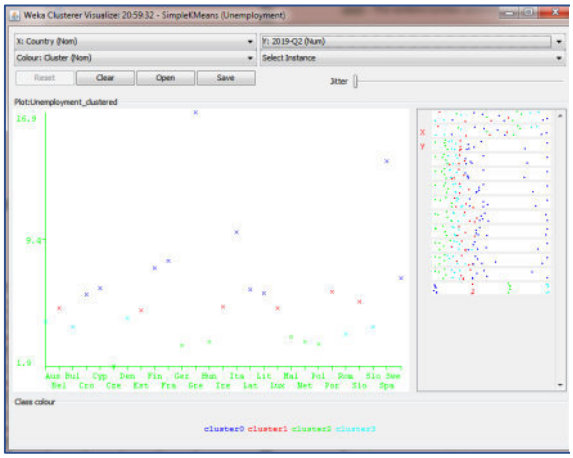


Figure no. 4. Unemployment rate (in percent) in Q2 from 2019

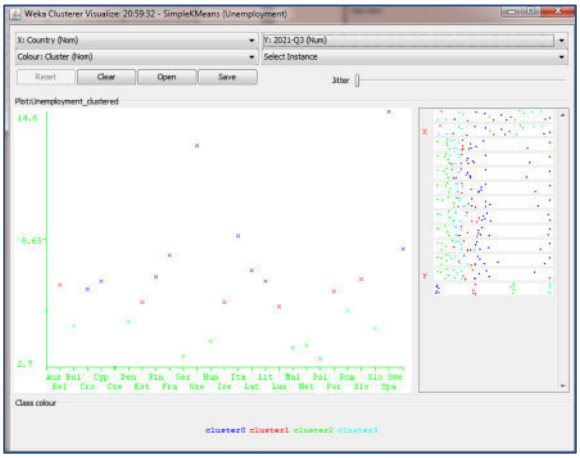


Figure no. 5. Unemployment rate (in percent) in Q3 from 2021

5. Results and discussions

The results of the data mining analysis indicate that the COVID-19 pandemic had a big influence from the unemployment point of view for all the 27 EU countries. However, not all of them have had the same behavior. Based on the policies and strategies that the governments have implemented, some countries have had a large fluctuation (countries as Austria and all of the other countries from luster 0), medium fluctuation (like those countries from cluster 1 and 3) and small fluctuation (like those from cluster 2 where the Czechia is the most representative one).

For the answers regarding the research questions: "How were the dynamics of the unemployment for the countries from EU during the pandemic?" and "Which countries have encountered the biggest cluster fluctuations?" we may conclude the following:

- The dynamics of the unemployment for the countries from EU before and during the pandemic may follow 4 patterns based on the number of the identified clusters. The countries from the cluster 0 have the biggest unemployment rate variation, around 6%, and the smallest variation was 0,9% for the cluster 2.

- For this situation, if a country is in the same cluster for the entire period means that has the same behavior for the entire period (based on the cluster characteristics) and if it is very different means the behavior is quite unpredictable. Countries like Austria, Czechia, Germany, and Poland have the same cluster distribution for the entire period. On the other hand, countries like Belgium, Croatia, Cyprus, Finland, France, Greece, Italy, Latvia, Lithuania, Netherlands, Portugal, Slovenia, Spain, and Sweden have a small cluster variation. Countries like Bulgaria, Denmark, Estonia, Hungary, Ireland, Luxemburg, Malta, Romania, and Slovakia have a large cluster variation.

Conclusions

The present article tries to identify the changes that have occurred for 27 countries from European Union regarding the unemployment during 2019 and 2021 period. In this regard, the authors have tried to find out information about the dynamics of the unemployment for these countries and which countries have encountered the biggest cluster fluctuations. In the first part of the paper a literature review was done regarding the unemployment problem and the effects of the COVID-19 pandemic over the unemployment. In the second part there were highlighted the main causes that are increasing the unemployment. In the third part it was described the research methodology that was used. In the last part the cluster data mining analysis was done emphasizing on the obtained results. Based on them, it can be identified what countries from EU were prepared to deal with such a situation and how much the labor market was affected. The period of time was selected in such a way to comprise a period before the pandemic and another one during the pandemic. Limitation of this paper may be considered that the values for the unemployment rates (which are expressed in percent) are at a country level. In a future research, an analysis of the unemployment components could offer interesting results.

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The Necessity of Conducting Teambuildings as a Prevention Response to Pandemic and War Times

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Abstract

The CoVid-19 Pandemic with all the imposed rules and restrictions that varied from country to country and even within a country, or from region to region, has resulted in considerable changes for the employees. Furthermore, the armed conflict that has already started to have an effect, not only on those two countries that are in conflict, but also on the other countries. This is due to the fact that both Ukraine and Russia had very intensified economic relations. The shortage of raw materials, petrol, gas and other products delivered by these two countries can generate a greater and long lasting impact that even the pandemic has caused. More than ever, organizations have to build even much stronger relations and do their best to offer their employees a set of skills that in peace times are not needed. Teambuilding is a way by which the organization tries to increase the productivity of their employees and to strengthen the way different individuals, groups, departments interact in order to increase productivity and profitability of the company. Although during the pandemic most events were canceled due to the restrictions or being deployed online, but without having the same impact on the direct audience. We are going to analyze the types of team-buildings that can be used by different types of organizations and the potential outcome resulting after attending them.

Keywords: teambuilding, interactive, motivation, skills, survival

DOI: 10.24818/BASIQ/2022/08/015

Introduction

In the last two years, organizations and employees have faced some peculiar concerns, never witnessed and encountered in modern times (Belostecinic et al., 2022). Firstly, there was the CoVid-19 pandemic that caused (Seijts and Milani, 2021) a worldwide shock, owing to its healthcare emergency causing problems at different levels and economic sectors (Mogos et al., 2021). Secondly, there was the latest armed conflict on the outskirts of the European Union that will affect many countries because we live in a Global World and there are many economic transactions with both of these two countries. One of them is not able to respect their contracts and deadlines as a supplier, being under siege, the other faces many international penalties and restrictions for starting the conflict and targeting even civilians. Furthermore, many multinational companies (Michaud and Audebrand, 2022) have withdrawn from the aggressor country in order not to damage their brand image and to be considered still conducting their business in a country that does not price peace, love as well as communication and understanding. The fear of the uncertainty regarding the future was never grater as, unfortunately, the conflict may also expand engaging other countries in the conflict.

Organizations must conduct teambuildings, as many restrictions related to CoVid-19 Pandemic were lifted (Popescu et al. 2021). Although some companies still allow their employees to work remotely and to choose if they want to return to the offices, or stay in the comfort of their homes. During the pandemic, in companies, changes also occurred, like the layoff of some staff, the resignations of others, hiring others so

the teams have changed and it is imperative to get the teams together, in order to increase the cohesion of the organization (Sarbu et al., 2021).

1. Review of the scientific literature

The employee's motivation (Gustiani, 2020) is the method through which the management ensures that all workers work together to achieve the company's objectives. The notion of engagement is examined in this context. Managers are responsible for motivating their staff, ensuring that they work (Berry, 2021) effectively, and fostering their employees' innovation. The expertise, abilities, and competences of various groups of individuals should be combined to establish teams capable of solving issues, discovering opportunities, and using the massive quantity of information that is already accessible (Balu et al., 2021).

A few years before Maslow introduced the Pyramid of Needs, Australian academic, Elton Mayo captured the attention of many people by discussing people's job behavior and the social requirements discovered a few years later in Maslow's pyramid. Between 1924 and 1932, Mayo was regarded as the "Father of Human Resource Management," conducting an experiment at a Western Electric plant factory in Hawthorne (Mahoney and Baker, 2002). Changing people's behavior, when they believe they belong (Kozlowski, Chao and Fossen, 2021) to a group, may be characterized as a behavior change that matches the expectations of those who founded the organization. The Hawthorne Effect is the name given to this effect. The group heavily influences the individual (Burlacu et al., 2021). From the way an individual behaves in school to the way the same individual behaves at a wedding, the shift in behavior caused by the group's influence may be detected and considered to be very strong. Recognition of an employee's connection and importance, as well as integration into the pack, are regarded as more significant than income and working circumstances. Tuckman proposes (Putro, Rosmansyah and Suhardi, 2020) a five-stage program to build a performant team. The stages can be seen in figure no 1. Effective teams must communicate, listen actively, building ideas, involving everyone from the team and at the same time, to commit to excellence both for the individual.

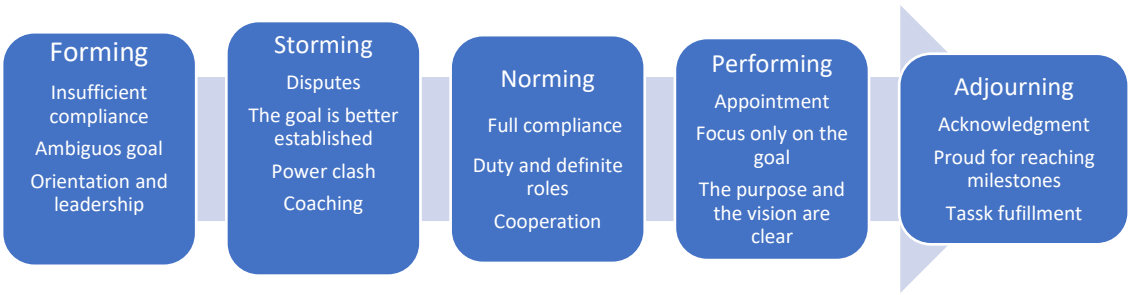


Figure no. 1. Tuckman'S Model – The Five stages of building a performing team
Source: Putro and Suhardi, 2020

The first stage is Forming – is characterized by a low level of productivity, seeking the leaders guidance and evolvement, while the emphasis is on keeping things simple solving the tasks and out of contention. Although the goal is ambiguous and there is insufficient compliance. The second step Storming – appears due to small conflicts that can escalate competition among the team members. The main issues that can appear are caused by those who want to take charge regarding authority and leadership imposing different structures through power. The team members can have two possible reactions, either to comply in silence, or to dominate, by imposing their own ideas and values. It is vital, in this stage, that active listening should be enforced, as power clashes between alphas and betas might occur. High emotions can drive to lack of involvement, or too much involvement.

The third stage, which is Norming, includes reconciliation between the team members, relief, decreased anxiety, members who are active and helpful, and the development of cohesiveness. The group's leadership is split, and the small groups between the team disband, behaving like a whole. This phase's strategies include acknowledging individual and group efforts, offering learning opportunities and feedback to the entire team and in the same manner, to each individual, and moreover measuring (Renz and Posthuma, 2021) the group's 'energy' is very important. The informational flux is at its highest level and creativity can heavily increase. Both personal and tasks information are communicated more freely.

The fourth stage is Performing, starting from this point, the team should be very productive. The authority and the roles are dynamically adjusting. The members of the team are self-confident and they are (Lechner and Mortlock, 2021) not waiting for approval any more. At this point, the group is more united, with high moral and loyal sets towards the organizations. All the members are offering constructive feedback one to

each other, and they are expecting feedback from other groups. Intensive communication is necessary and they should pay respect and be fair one with each other and they have to demonstrate that they are competent. The fifth stage – Adjourning, stands for a planned closing, generally includes praising participation and success, as well as the chance for members to revise the lessons learned. The most successful interventions at this point are those that assist the task's end and the process of relinquishing engagement and recognizing change.

2. Benefits offered by using Teambuilding

Teambuilding refers to the practice of encouraging employees via a series of activities tailored to the specific needs of the team members in order to increase their performance. Team building is critical since it helps to strengthen interpersonal skills such as motivation, communication, and bargaining. Feeling useful, important, and part of a team, the individual will enjoy (Grossman and Johnson, 2017) his or her job and become more efficient and effective in the workplace. The amount of employee motivation is intimately related to an organization's better performance (Rădulescu et al., 2020). Earning, advancement, avoidance of punishments and criticism, and the environment of understanding within the team are all key aspects in professional competence. Work motivation may be classified into three types (Basalamah and As'ad, 2021): 1) Internal motivation- the mood among the team, the direct manager consultation. (Dahlin, Chuang and Roulet, 2017); 2) Good external motivation like self-esteem, wages, and opportunity (Martinez and Hurtado, 2018) for advancement in career; 3) Negative external motivation – like avoiding unconstructive criticism (Graham, 2020), avoiding the possibility of losing the job.

In terms of structure, there is (Hastings, Jahanbakhsh and Karahalios, 2018) teambuilding centered on activities such as skill development, issue resolution, and personality evaluation. Away from the workplace, workers will concentrate on learning new skills, connecting with one another, and defining the organization as a whole (Rădulescu et al., 2021). The majority of the time, firms pick teambuilding activities that take place at sea, in the mountains, or somewhere else away from the company's headquarters. The pandemic obliged most of the companies either to fully stop teambuilding, or as a solution to shift them in an online environment. Of course, the online teambuilding does not have (Reyes, Luna and Salas, 2021) the same impact and effect on the members of the team, as the interaction is done virtually. Also, online (Rapp and Rapp, 2021) platforms, apps or different software are considered interactive online games that can be used when deploying online teambuilding (Bodislav et al., 2020). We can mention thematic teambuilding like (Anon., n.d.): AI2045, Escape the Firm, Xmas Advent Calendar, Festive Social, Xmas Remote Challenge, Hack the System, Bridge the Virtual Gap, Guess the Artist, Comic Strip, Treasure Hunt Digital, Ad makers, Coffe Time, Quiz Wars, Team Bingo, Cocktail Challenge, Funny T-shirt Party, See the big picture, Game Show, The Classified Project, Creative Domino, Imagination, Movie Makers and many more. There are many types of offline teambuilding that can be grouped by the technology used (Pryimak and Faichak, 2017) while deploying them. As they are described in table no. 1, we can mention the Rope course, Active gaming, Interactive teambuilding, Culinary Teambuilding, Filming and City Quest. The main reasons to conduct and to appeal to a teambuilding are finding effective solutions using in the same proportion, rational and interpersonal skills. The participants are also asked to appeal to their knowledge and resources, as well in order to resolve the given tasks.

Table no. 1. Different Types of Teambuilding

Technology	Description
Rope course	The most successful method of personnel evaluation, the main objective of which is the unification of the employee team, where the element of unification is the team's win.
Active-gaming Teambuilding	The tasks take the shape of a game and are solely intended to establish a team.
Interactive Teambuilding	For any situation, that does not need particular effort from participants, board games or brain rings are used.
Culinary Team-building	Team cohesion occurs when members of a team work together to achieve a common objective, despite competition and inter-team rivalry.
Filming	The foremost compelling organize of human association with the prospect of reincarnation and concurrent cooperation within the curiously inventive prepare of both dynamic and conditionally inactive players.
City Quest	Organization of group labor in the form of a competitive battle of enjoyment within the framework of 'urban orientation'. Included are the following components: entertainment, don, and mental element.

Source: Pryimak and Faichak, 2017

Some of the most requested, required and necessary teambuildings, bearing in mind the latest pandemic and the geopolitical conflicts that are going around and which can escalate, are peculiarly: survival and military camp. Both of the themes can be considered wise to be carried on due to the uncertainty of the future. In a survival teambuilding, different real techniques of endurance are thought and applied, but not only for one person but also for the entire group. Of course, not all the group members are going to be asked to endure extreme temperatures or feeding with some unwanted stuff, like bugs or plants that they find them unsavory or even gross. The voluntary participation of an individual in-group activities that appear to him to be the limit of his own possibilities, provides him with the following benefits (Derlogea and Bota, 2011):

- The opportunity to try a seemingly dangerous (Grolleau, Marciano and Mzoughi, 2021) action (for him) in an atmosphere of understanding and help;
- The freedom to give back (Kirkman and Stoveink, 2021) or give up when the stress of performing "performance" or distrust of one's own strength becomes too great, but knowing that he always has the opportunity to try again;
- The ability to do difficult things safely, recognizing that the attempt is more essential than the outcome;
- Respect for the ideas and judgments of others.

Teambuilding instructors can appeal to a variety of themes when the season should also be taken into account (Profiroiu, Rădulescu and Burlacu, 2020). Some of the most common survival situations can be (Human Synergistics, 2022): desert, forest, reef, tsunami, subarctic, cascades, cascades and others regarding the specific of geographical relief. Another successful and useful teambuilding theme can be Military Camps and Self-defense, which can come in very handy in these turbulent times. The team will be taught the most important combat techniques. Following a meticulous and dignified (Team Building 4u, n.d.) training of the Special Forces, a genuine military training with shooting applications, training to avoid the enemy and move on different types of battlefields, like urban and rural ones, and concluding with a military exercise between two teams.

We have used Zelist Monitor to see in what degree terms like teambuilding and survival camps were mentioned in social media platforms and how they analyzed the outcome results. Facebook was the most used social media network platform, with 48% use, where people mentioned and discussed about teambuilding, either to attend or to choose a type of this kind of event. This platform is followed by online press with 21.7%, and Instagram with 17.3%. In forums, it is on the fourth position with 6.7%, as seen in figure no 2 Number of Appearances in social media networking platforms. In Figure no. 3 and 6, we can observe the comparison between the two periods, with a high increase in teambuilding as in survival camps, after the war started. Regarding the time line, as in figure no. 4 and 7, we can draw the conclusion that the interest into teambuilding plunged when the war started, while the survival camps presented a much higher interest. Survival camps were seen as a more important issue, while on Facebook, they had a coverage of 24.2%, while on online press 21.4 and very closely with Twitter 20.7%. Online aggregators had a coverage of 13.1% as shown in Figure no. 5. We have compared the two terms, throughout only one year, as it is revealed in Figure no. 8 Survival Camps vs Teambuilding, demonstrating that survival was considered a more important and useful theme to be talked about.

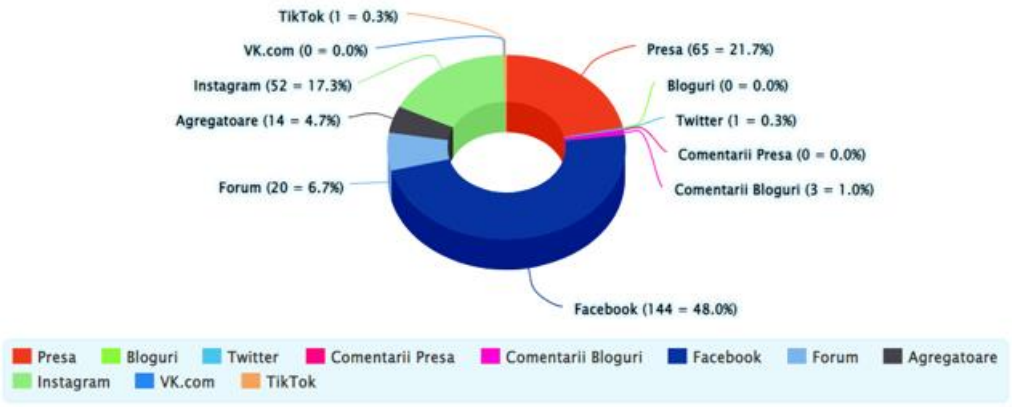


Figure no. 2 Number of Appearances in social media networking platforms

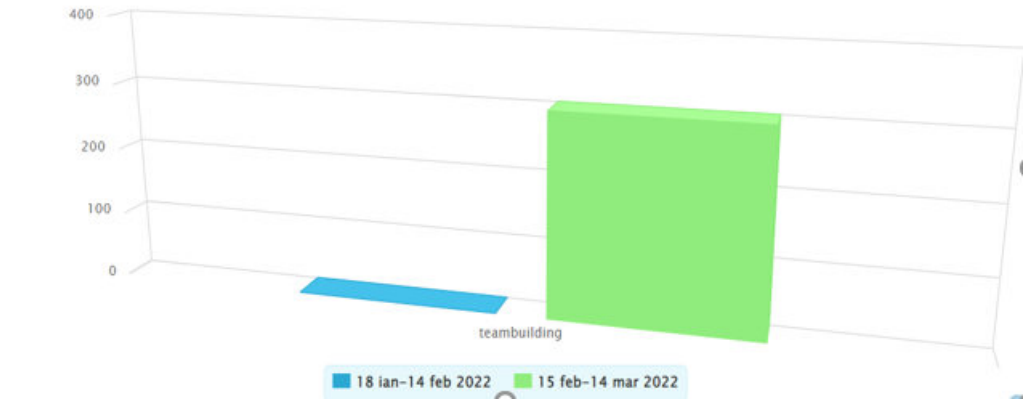


Figure no. 3 Comparison between two periods

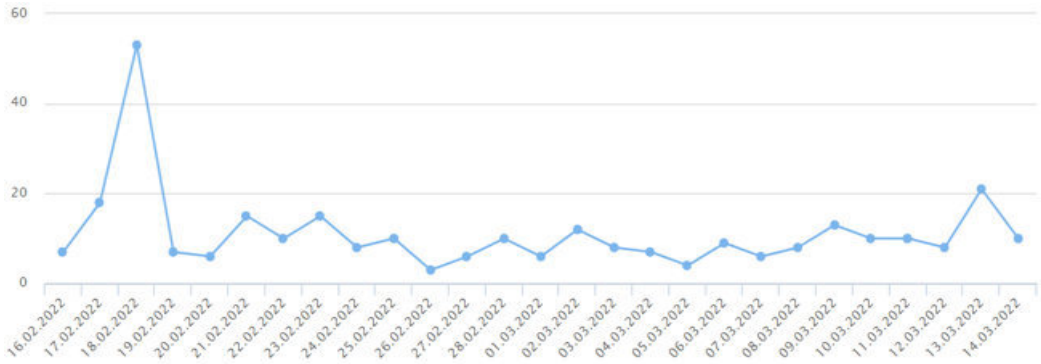


Figure no. 4 Timeline for Teambuilding

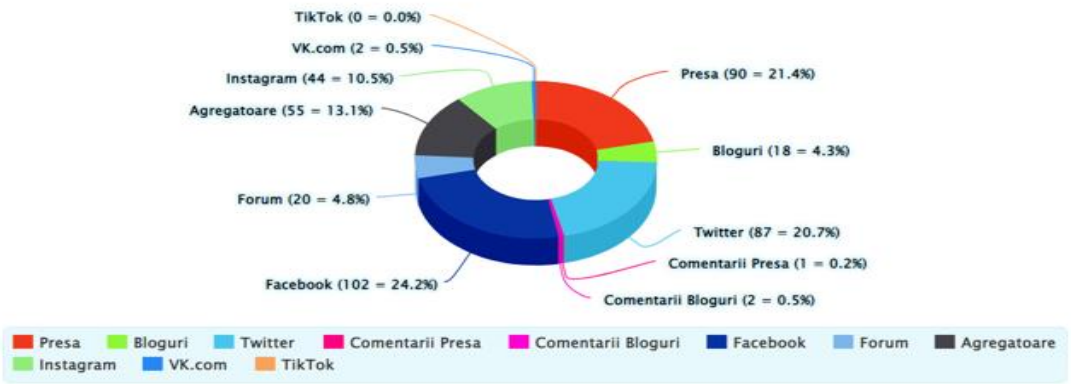


Figure no. 5 Number of Appearances in social media networking platforms

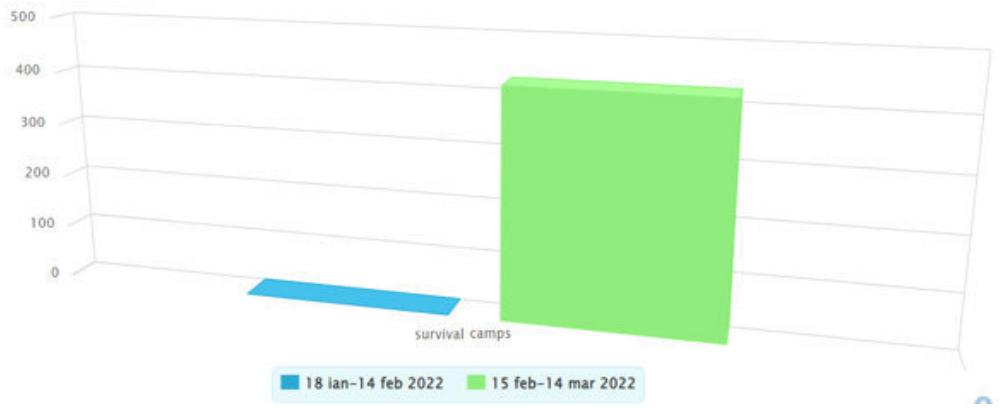


Figure no. 6 Comparison between two periods



Figure no. 7 Timeline for Survival camps

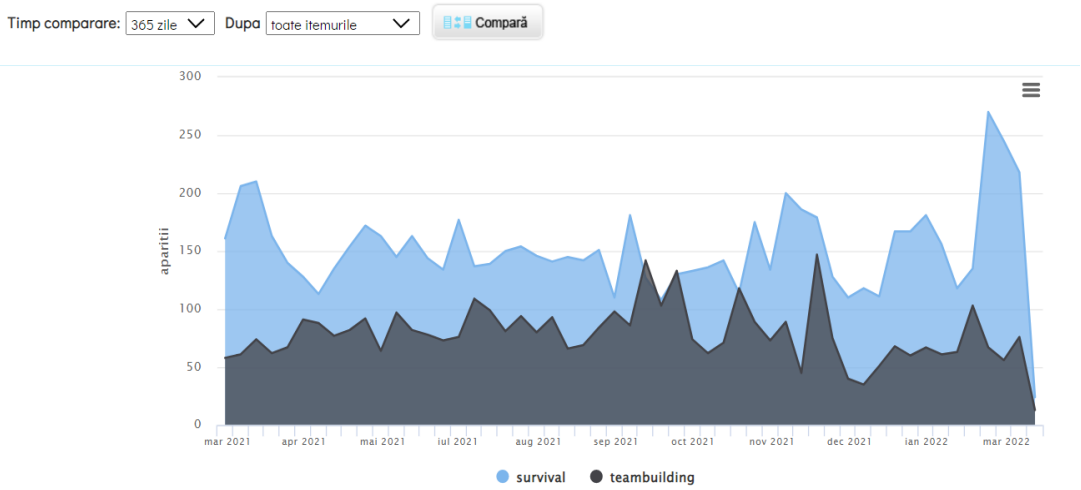


Figure no. 8 Survival Camps vs Teambuilding

Conclusions

In a very turbulent environment, as we witness, feel and live, people and organizations are trying and seeking to gather set of skills in order to overpass these kinds of external threats (Bran et al., 2020). While some are forming long queues at gas pumps in order to purchase fuel for their cars, or buying sunflower frying oil based on a rumor, as well as staying in line either to have their passports issued or renewed for just in case the armed conflict escalates and expands (Negescu et al., 2020). Others are trying to learn and acquire a set of skills that might come in very handy and useful. More organizations should arrange teambuilding, not just to increase the team productivity and cohesion, but at the same time, to offer their employees, skills that they might use just in case. Survival camps, military camps, first aid, self-defense, skills in case of earthquakes, boy scouts and even off-road courses can be considered in our days very important to carry on. This kind of teambuilding should be even mandatory to be conducted especially for youngsters, like undergraduates' students and high school pupils.

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Education for Sustainable Development in the Vocational Education and Training System Facilitated by the European Sustainability Competence Framework. Case Study on Sustainability Competences Integration in Technician in Agriculture Professional Training Standard

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Abstract

The purpose of this paper is to create a methodology for identifying the gap between the sustainability competences (knowledge, skills, and attitudes) and professional training standards from Romania. The authors develop a tool for crosschecking professional training standards with the competences of GreenComp: The Sustainability competence framework. For testing and validating the methodology, the authors used the Professional Training Standard for Technician in agriculture qualification. The methodology can be used by the Romanian authorities to identify what sustainability competences are missing from all the other professional training standards, so the paper may have impact in the VET curriculum redesign in Romania and, subsequently, on the development of the new generation of skilled workers.

Keywords

Vocational Education and Training, Education for Sustainable Development, Technician in Agriculture, The European sustainability competence framework

DOI: 10.24818/BASIQ/2022/08/016

Introduction

The Brundtland Report of 1987 introduced the concept of sustainability to the world. It had three dimensions at first: environmental, social, and economic. Sustainability became a global necessity over time, resulting in the establishment of the 17 Sustainable Development Goals (SDGs) in 2015, making it a public policy of severe urgency. Thirty-five years later, there is a pressing need to broaden the original concept, not as a governmental policy, but as a competency that graduates of any level of education learn, regardless of the program they studied. Several studies and curriculum redesign initiatives have shown that sustainability is a transversal skill that must be integrated in curriculum at all levels. (Membrillo-Hernández et al, 2021)

Societies in the twenty-first century face the difficult task of swiftly transforming towards sustainability while balancing the complicated trade-offs between ecological, social, and economic factors (Raworth, 2012). Deeply rooted learning processes with regard to abilities, knowledge, and values are essential to reconcile human well-being and the integrity of geo-bio-chemical processes necessary for all life on Earth (Sterling, 2016). Education for Sustainable Development (ESD), as defined by UNESCO (2014), advocates for a holistic transformation of education systems in order to support such learning processes. ESD focuses

on "learning content and outcomes, pedagogy, and the learning environment" in order to provide individuals with the skills they need to co-create a sustainable future for all (Burlacu et al., 2018). It accomplishes its goal by changing society." ESD strives to improve reflexivity and critical systemic thinking, participation and cooperation, and a sense of responsibility, among other core competences, enabling individual and team action towards sustainability. (De Haan, 2010)

In early 2000s, most of the Vocational Education and Training Systems in Europe made a major shift towards competencies-based curriculum (Profiroiu et al., 2020). Even if there has been no consensus about this, most of the VET systems have integrated transversal skills in the technical curriculum to different extents (Burlacu et al., 2021). In the professional training standards across Europe, we can find communication skills, teamwork skills, digital skills, entrepreneurial skills, and many others on top of the technical skills that are at the core of the professional training standards (Androniceanu & Burlacu, 2017) (Sarbu et al., 2021).

Recent developments in EDS allow VET systems to harmonize with regards to the sustainability competences that can or must be integrated in the curriculum. The most recent development in EDS in Europe is GreenComp – The European sustainability competence framework (Androniceanu & Burlacu, 2017). GreenComp outlines a collection of sustainability competencies that may be included into educational programs to help students develop knowledge, skills, and attitudes that encourage empathy, accountability, and concern for our planet and public health (European Commission, 2022).

This paper aims at creating a methodology for identifying the gap between the sustainability competences (knowledge, skills, and attitudes) and professional training standards from Romania. For testing the methodology, we will use the professional training standard for Technician in agriculture qualification.

The methodology ca further be used for updating all the current professional training standards from Romania, aligning them to the sustainability competences.

1. Review of the scientific literature

As a result of the focus on abilities for solving problems in a specific context in competency-based education (Lambrechts et al. 2013), key competences have become central to the conceptualization of sustainability education. They conceive education as a reaction to a need for long-term transformation, and as such, they control the whole educational process, including its manner and goal (Lozano et al. 2015). Sustainability education innovations have ramifications for all elements of education, not just for future professionals in school (Radulescu et al., 2021), but also for teacher education and the societal subsectors where companies are situated and where new talent is practiced (Vincent and Mulkey 2015).

When an innovation, such as sustainability competences framework, is spread throughout a social system like VET, it is called diffusion (Rogers, 1962). The adoption or rejection of an innovation is determined by diffusion (Spence, 1994).

Adopters are classified as "innovators," "early adopters," "early majority," "late majority," and "laggards" in the diffusion of innovation (Rogers, 1962). The phrase "laggards" has been replaced with "conservatives" in the curricula since this term better represents the level of engagement or contribution to sustainability (Lozano, 2010). According to Lozano (2006), innovators get the gratification of being the creators of the idea, but they must suffer the burden of early blunders and test-trial concerns. Early adopters, in conjunction with innovators, can act as sustainability multipliers by persuading other adopter groups. The late majority and conservatives are the most resistant to change, yet they may finally adopt the innovation (Lozano et al, 2021).

In general, the individual has been used as the unit of analysis in the diffusion of innovation models (Bodislav et al., 2020). The RAPID model. The RAPID model was created as a result of a sustainability assessment of one HEI's curricula and has the following steps (Lozano, 2010) that can be also transferred to VET:

1. Recognition: The course's aims and objectives expressly include sustainability or some of its topics.

2. Addition: Sustainability is mentioned explicitly in the objectives and is covered in one or more lessons; however, it is treated as an afterthought.

3. Pedagogy: The course goals make sustainability obvious, and its teaching is a key component.

4. Intertwine: Sustainability is stated explicitly in the objectives and is incorporated into teaching and grading.

5. Cross-discipline: The teaching subject connects with other disciplines in addition to the Intertwine step's activities, becoming more inter-disciplinary and trans-disciplinary.

The implementation of ESD is a complicated enterprise that transcends all system layers, from (inter)national governance for ESD across state politics, regional educational landscapes, particular institutions and instructors, and individual moments of transformational learning. As a result, effective diffusion necessitates the availability of both system- and process-specific information among all stakeholders.

Attempts to study or systematically monitor associated educational processes and policy activities have therefore become a critical component of (inter)national ESD implementation progress. (Tilbury et al, 2006)

However, the evidence produced frequently lacks critical preconditions for an unbiased and thorough, yet differentiated and supporting, evaluation of ESD implementation (Radulescu et al., 2020).

GreenComp is a paradigm for analyzing sustainability skills. It gives learners with a common ground and educators with direction, as well as a consensus understanding of what sustainability as a competency comprises. It is intended to assist lifelong learning education and training programs. It is written for all learners, regardless of age or educational level, and it may be used in any learning context – formal, non-formal, or informal. Sustainability competencies may help students become more systemic and critical thinkers, as well as build agency, and provide a knowledge base for everyone concerned about the current and future status of our world. (European Commission, 2022)

2. Research methodology

Considering the purpose of this paper, the authors developed a tool that allows professionals in education, teachers, companies interested in VET and others to analyze any professional training standard from Romania through the perspective of GreenComp, identifying which sustainability competences already exist in the training standard and which don’t exist.

For testing the tool, the authors took the Professional Training Standard (PTS) for Technicians in Agriculture Specialization as a case study. The National Center for TVET Development, which is part of the Ministry of National Education and Scientific Research, established the Professional Training Standard for Technicians in Agriculture Specialization as part of a European Social Fund Project named "Revised Curriculum in TVET." The Standard was developed by a working group of 12 agriculture VET teachers, with the help of two curriculum specialists. OMENCS nr. 4121/13.06.2016 authorized the Professional Training Standard, which has been in effect since 2016 (Dumitrache et al, 2020).

The following are the characteristics of an agricultural technician as defined by the Standard: Under the supervision of an agronomist engineer, the agricultural technician is responsible for planning, organizing, and carrying out the agricultural work required for the growth and harvesting of various types of field crops for the purpose of selling or delivering them on a regular basis to buyers or specialized organizations, or in markets.

The standard establishes a framework within which students may get technical and specialized knowledge about plant cultivation methods, production and work planning and organization abilities, activity coordination, and quality control of works and products on agricultural farms.

The following are the 12 Learning Outcomes Units: 1) Using agropedological features, 2) Animal husbandry, 3) Agricultural and livestock machinery, 4) The farm and the market, 5) Farm management, 6) Protection of the environment, 7) Driving tractor and car, 8) Protection of the plants, 9) Organizing field plant cultivation works, 10) Organizing horticulture plant works, 11) Animal husbandry and feed production, 12) Organizing mechanization works from agricultural exploitation.

Each learning outcome is assigned a three-digit code, as follows: x.y.z, where x is the learning results unit number, y is the type of result (1 is for knowledge, 2 is for abilities, 3 is for attitudes), and z is the number of outcomes of a kind under a certain learning results unit. For example, 2.2.10 Daily control of animal health is the tenth ability listed under learning outcomes unit number 2, Animal husbandry, while 11.3.3 Daily control of animal health is the eleventh ability listed under learning results unit number 2, Animal husbandry. The third attitude in the list of attitudes under the learning results unit number 11, Animal husbandry and feed production, is collaborating with team members for proper animal breeding planning.

In order to conduct the analysis, only the codes were used as in column 4 of table no. 1 were used.

3. Results and discussion

Synthetic description of the Table no. 1:

- 1st column – area of the GreenComp Framework
- 2nd column – competence as in GreenComp Framework
- 3rd column – short description of the competence as in EntreComp Framework
- 4th column – correspondence between competences from the Professional Training Standard and competences from the Sustainability Competences expressed in knowledge, skills and attitudes.

We can assess the extent to which the Professional Training Standard addresses each of the 12 sustainability competencies by looking at column 4. Marked with Kx, Sx and Ax we can observe the sustainability knowledge, skills and attitudes (as can be found in GreenComp) that have a corresponding knowledge, skill or attitude in the Professional Training Standard.

Table no. 1. Professional Training Standard Analysis

Green-Comp area	GreenComp competence	Short description	GreenComp KSA and corresponding PTS learning outcomes
1. Embodying sustainability values	1.1 Valuing sustainability	Reflect on personal values; identify and describe how values change over time and across individuals, as well as critically evaluate how they connect with sustainability ideals.	n/a
	1.2 Supporting fairness	Promote equality and justice for current and future generations, as well as to learn from past generations in order to ensure long-term sustainability.	n/a
	1.3 Promoting nature	Recognize that people are a part of nature, and to respect the needs and rights of other species, as well as the needs and rights of nature itself, in order to repair and regenerate healthy and resilient ecosystems.	K1 – 6.2.3; 6.2.5 K4 – 6.1.10; S1 – 6.2.6 – 6.2.24; A1 – 6.3.14
2. Embracing complexity in sustainability	2.1 Systems thinking	Takes a holistic approach to a sustainability issue, taking into account time, geography, and context in order to comprehend how elements interact within and across systems.	S1 – 5.2.5; 5.2.12;
	2.2 Critical thinking	Evaluates information and arguments*, identify assumptions, challenge the current quo, and consider how one's personal, social, and cultural origins impact one's thinking and conclusions.	S2 – 6.3.13
	2.3 Problem framing	Formalize present or projected obstacles as a sustainability problem in terms of complexity, people involved, time, and geographic extent, in order to find appropriate techniques for forecasting and preventing problems, as well as reducing and adapting to problems that have already occurred.	n/a
3. Envisioning sustainable futures	3.1 Futures literacy	To imagine alternative sustainable futures through imagining and designing alternative scenarios, as well as determining the procedures necessary to reach a desired sustainable future.	n/a
	3.2 Adaptability	In complicated sustainability scenarios, handle transitions and difficulties, and make future decisions in the face of uncertainty, ambiguity, and risk.	n/a
	3.3 Exploratory thinking	Exploring and connecting diverse fields, employing imagination and experimenting with innovative ideas or methodologies to adopt a relational way of thinking.	n/a
4. Acting for sustainability	4.1 Political agency	Negotiates the political system, recognize political responsibility and accountability for unsustainable behavior, and demand sustainable policy.	n/a
	4.2 Collective action	Acting together with others for change	S4 – 1.3.2; 1.3.5; 1.3.14; 1.3.20; 1.3.22; 1.3.25; 2.3.5; 4.3.1; 4.3.9; 5.3.2; 5.3.5;
	4.3 Individual initiative	Recognize one's own capacity for sustainability and to actively contribute to bettering the community's and planet's prospects.	S2 – 1.1.3; 5.3.7

For example, K4, an element of knowledge from *Promotig nature* is described as following: "(the learner) knows that humans shape ecosystems and that human activities can rapidly and irreversibly damage ecosystems". This element of knowledge corresponds with 6.1.10 from the Professional Training Standard, which is: knowing the effects of pollutants on the ecologic equilibrium.

Analyzing table 1 we can observe that the Professional Training Standard for Technician in Agriculture specialization covers to some extent only 5 of the 12 sustainability competences defined by the GreenComp.

Considering the purpose of the article, we can say that table 1 is an effective tool to assess the inclusion of sustainability competences in the professional training standards in Romania.

The tool helps professionals in education, teachers, company representatives and other interested stakeholders to identifying which sustainability competences already exist in the training standard and which don't exist.

Conclusions

The authors developed a tool for crosschecking professional training standards with the competences of GreenComp: The Sustainability competence framework. For testing and validating the methodology, the authors used the Professional Training Standard for Technician in agriculture qualification.

The methodology can be used by the Romanian authorities to identify what sustainability competences are missing from all the other professional training standards, so the paper may have impact in the VET curriculum redesign in Romania and, subsequently, on the development of the new generation of skilled workers.

Further research can focus on the analysis of the sustainability competences that are missing from the Professional Training Standard for Technicians in Agriculture and on solutions on how to integrate them in the standard.

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Digitization of Sustainable Economic Development in the Actual European Condition

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Abstract
In the current conditions of economic development, and of an unprecedented global experience of the COVID-19 pandemic crisis, many activities have changed, both economic and educational, medical, administrative. A special place, played by the accelerated digitization process that has taken place in recent years. In this study, we set out to focus this article we aim to focus on digitizing sustainable economic development in the current conditions of the whole of Europe. We reviewed the current state of sustainable development in the EU and the evolution of the digitization process. We discussed the issue of building a digital model of sustainable development. We reviewed the bibliographic study in the field; We came up with methodological proposals for the construction of the digital model of sustainable development.

Keywords

Digitalization, sustainable development, sustainable economy

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Introduction

For the next strategic cycle of the Strategic Agenda UE 2019-2024 digitalization and sustainability must go hand in hand, capitalizing on digital technologies as important factors for sustainability, ensuring sustainable digitalization (Popescu et al., 2021). Digital technologies are leading to increased energy efficiency, overall reduction in greenhouse gas emissions and material efficiency (Burlacu et al., 2021).

The concept of Sustainable Digitization emphasizes medium-and long-term synergistic partnerships between digital SMEs and traditional innovations, which aim at the long-term direction of the investment and digitization effort (Bodislav et al., 2021). Investments need focused on building European industry, capacity in strategic areas and supporting the long-term transition of digital business models (Balu et al., 2021). Artificial intelligence systems can successfully applied in the precise management of information and data to the digitization of products with the help of intelligent sensors. Sustainable digitization emphasizes long-term synergistic partnerships between innovative digital and traditional SMEs, aiming at long-term guidance in digitization efforts and investments. Investments need to focus on building European industry, capacity in strategic areas, supporting the long-term transition to digital business models, rather than supporting, purchasing digital off-the-shelf solutions. Digitization is promising for support in combating climate change, improving environmental sustainability, through digitization to address some of the issues of sustainability but also of a social nature (Radulescu et al., 2021). Climate change and digitalization are two global mega-trends that will in the long run shape EU policy in the long run (Radulescu et al., 2020). The European Green Pact and the Von der Leyen Commission have introduced policy changes in the EU in these areas, the two being more explicitly linked at the political level.

In this article we aim to review the evolution of digitalization in EU countries, but also the evolution of sustainable development in the EU. Digitization will be an excellent support in sustainable management and economics, in support of digitized technologies and engineers. Decision-makers need to pay close attention to the effects of digitization in different sectors and policy areas, to prevent unwanted consequences. For example, in mobility policy, digitization can lead to a more efficient flow of traffic and help consumers share resources and find sustainable options. It can also lead to potential private actors to attract consumers to high profit but less sustainable options, such as taxis and public transport, while neglecting more sustainable but less profitable options, such as transportation. public transport or non-motorized transport. Integrated tickets risk putting public sector actors aside if the right legislative conditions are not set. Policy makers should ensure that sustainable options are not marginalized. In this article, we aim to review the evolution of digitalization in EU countries, but also the evolution of sustainable development in the EU. Digitization will be an excellent support in sustainable management and economics, in support of digitized technologies and engineers.

1. Review of the scientific literature

The digital economy is characterized by the following characteristic features (Ciobanu, Pană and Diaconu, 2015): 1. The infrastructure of the digital economy. 2. Electronic markets. with features: new agents, new types of products and services, new business relationships, new models of communication and organization. 3. Products based on information and knowledge. Most products on the electronic marketplace are intangible products. 4. Agents present on the markets: consumers, intermediaries. 5. Macroeconomic transformations and globalization processes. 6. The progressive and aggressive penetration of the digital economy in the economic and social development of the society.

In the opinion of the authors (Negrea et al., 2019): "currently, the information society is facing a number of key issues, which characterized by a good level of training of specialists in the field. Given the gap in economic development in the regions of economic development." The authors are of the opinion that an important issue is the provision of regional information through digitization, only in this way can we lay the foundations for the construction of society and the knowledge economy. We can ensure regional development if we can build networks. Another problem for Romania is the severe gap in digital skills (Profiroiu et al., 2020).

According to the authors (Burlacu et al., 2021) E-government has started from the opportunities of new technologies, by providing electronic services to citizens, and has expanded in many areas, including communication, budget management, macroeconomic forecasts, etc. Given the definition: "E-Government is the applicability of information technologies for the provision of administrative services, information exchange, communication transactions, integration of various electronic systems and autonomous services between government and citizen (G2C), government and business environment (G2B), government - government (G2G), for processes, the interaction of administrative staff in the administration infrastructure, through e-government, government services are available to citizens in a convenient, efficient and transparent way. If we consider the objectives of the Europe 2020 Strategy are embedded in three mutually reinforcing priorities - Smart Growth, Sustainable Growth, Inclusive Growth. Online commerce is on the rise in both the horizontal expansion of big players and emag.ro, and by the emergence and consolidation of new niche stores (Bodislav et al., 2020). Author considers: "IBM research, companies looking for opportunities in the era of permanent connectivity with customers, focus on complementary activities: reshaping value propositions for customers and transforming operations, using digital technologies for customer interaction and collaboration. "The author asks some research questions: (1) How, have digital transformations (DT) evolved in business and management development? 2. What directions have studied in the profile literature (existing business and management) regarding digital transformation? The study divided into two parts: (1) mapping the thematic evolution of DT research in the fields of business and management; (2) Based on the findings of the first part, the synergistic framework linking the existing research in DT with the fields of business and management is proposed.

For the construction of a functional digital economy a fundamental role of the economy of the production of high-quality complex software products, which are based on the traditional principles and methods of the economy of development of complex technical systems (Lipaev, 2011).

The creation of software products associated with high costs determines the need for strict planning, formalization and standardization of their production processes, as well as economic control and maintenance, similar to those used in the production of other large industrial products (Negescu et al., 2020). The processes of creating the digital economy at the regional level are described with a greater number of indicators than at the national level (Gorlov et al., 2021). This is because, for the comparison of

countries in the world economy, universal indicators of expert analysis are used - which are similar for all countries, of which the best known and most used: IMD Digital Competitiveness Ranking (2020). Unacceptability of the large number of absolute indicators - due to differences in national statistical accounting systems. At the regional level, generalized / relative indices provide surface data, instead the absolute indicators of basic statistics are used.

In the current business and living conditions, everyone seems to be involved in the process of digital transformation. If you are interested in digital transformation, then you may have heard a lot of noise about it. One of the goals of digital transformation is to eliminate the need for a physical office, to eliminate the needs of a large number of full-time employees, to substantiate fewer suppliers for services or materials. The goal of digital transformation - a high level of automation, the delegation of a larger number of external people and the profitable preservation of processes that can be carried out anywhere in the world. Many organizations are eager to develop a digital platform (Androniceanu et al., 2017). However, it is not clear how to achieve this ambition, especially for large companies with existing complex structures. This study demonstrates how the growing trend of "Internal Source" (adopting internal open-source / crowdsourcing practices in large organizations) can help companies become more platform-based (Panwar, Pinkse and De Marchi, 2022). Supply chain disruptions caused by the COVID-19 pandemic are unparalleled due to a confluence of circumstances: a sharp increase in demand for some products, unforeseen changes in demand points, supply shortages, a logistical crisis and a recovery. unprecedented rapid growth in major economies. This article outlines the changes that will take place in supply chain planning and management in a post-COVID-19 world.

Rapid changes in technology - including advances in augmented and artificial intelligence, machine learning and mobile - pave the way for significant changes not only in the channels through which education is delivered, but also in the way education itself is structured. This article identifies eight ways in which educational technology can change the way learning is facilitated and who will facilitate that learning (Lyons, 2017). Today's managers are under tremendous pressure to discover the factors that influence customer attitudes and behavior. Unfortunately, traditional methods suffer from well-known limitations and have remained largely unchanged since their introduction decades ago. As a result, there is a growing interest in brain-based approaches, which can allow managers to directly investigate customers' basic thoughts, feelings, and intentions (Hsu, 2017).

The main purpose of this study is to evaluate an advanced feature selection technique, the artificial bee colony (ABC) algorithm; to reduce the number of auxiliary variables derived from a digital elevation model (DEM) and remote data (e.g. Landsat images). A combination of depth functions and miner data methods (artificial neural network: ANN and support vector regression: SVR) were applied for three-dimensional mapping of soil organic matter (SOM) in the basin (Taghizadeh-Mehrjardi et al., 2017).

Due to rapid urbanization and growing energy consumption, human society is putting increasing pressure on the surrounding ecosystems on which it depends (Lin et al., 2016).. As a result, the assessment of urban development should look at cities as complex ecosystems, including human and natural elements (Pricop et al., 2016). This paper establishes a carbon balance index (CBI) for an urban ecosystem based on its socio-economic development and land use change and land cover in Xiamen, a rapidly urbanizing coastal city in southeast China Bank, L. C., Thompson, and McCarthy (2011). The aim of the research described in this article is to improve the measurement, prediction and optimization of the performance of sustainable construction materials by integrating a decision-making framework for the sustainable selection of construction materials with a construction information modeling tool (BIM). The integration of a BIM model with a decision-making tool and the selection of sustainable materials addresses the difficulties of decision-making earlier in the design / construction process and allows for specific sustainability compromise analyzes, using current building conditions and characteristics (Ionita and Burlacu, 2009).

The dynamic development of the Fourth Industrial Revolution, focused on the implementation of Industry 4.0 technologies, has raised concerns among governments and society about the dehumanization of industry in the future (Saniuk, Grabowska and Straka, 2022). At present, sustainable development and the crucial role of man in the future development of industry need to be taken into account. Concerns about the implementation of the technology of the fourth industrial revolution have become the basis for building the assumptions of Industry 5.0 (Pricop et al., 2016). The article aims to identify the social and economic expectations of the development of the Fourth Industrial Revolution in the context of developing the sustainability, humanization and resilience of Industry 4.0.

The circular economy, as a guiding model for business processes, attracts interest because of its potential to align business and societal goals, as it offers companies the opportunity to simultaneously focus on creating economic value and mitigating environmental damage. It is becoming increasingly clear that digital

technologies are an essential component of this model, as they enable transparency and efficiency in closing material and energy cycles (Langley, 2022).

Baranauskas and Raišienė (2022) states that the recent results of the Digital Economy and Society Index (52, 45%) and the European Digital Entrepreneurship Systems Index (EIDES) (48%) illustrate the improved level of digital performance in EU countries, and significant progress in unlocking productivity. co-creation of digital value and collaborative networks.

The rapid digitalization of the economy, the approach to digital entrepreneurship, supports the transition from traditional business models to business models with integrated digital and networked platforms.

Despite the well-known benefits of digital entrepreneurship and the digital business ecosystem, the application of emerging technologies and modern business models also brings inevitable challenges to sustainable management. The main negative results are disruption, exposure of vulnerabilities in collaborative organizational and social networks, additional socio-technical pressure for both network and incumbent supervisors, and asymmetry of information and digital resources, etc.

2. Current situation in the field of sustainability in the EU

The objectives of developing (Commissioner Gentiloni's statement on the 2021 report on sustainability) all our policies, including the European Environment Pact, the Digital Strategy and the Action Plan for the European Pillar of Social Rights. The reforms and investments supported by Next Generation EU will also make a major contribution to achieving the SDGs in the EU. Eurostat Report on the Sustainable Development Goals 2021 it gives us reliable data and statistics that we need to track progress towards achieving the SDGs in the EU. The number of young people aged 15 and 29 who are unemployed and not even in work, education and training has increased from 12.6% in 2019 to 13.7% in 2020. Part-time work schemes, supported by the SURE program, have helped to mitigate the impact of COVID-19 on the labor market, with unemployment rising by only 0.4 percentage points in 2020 compared to 2019. Electricity consumption has fallen by more than 4 percentage points. % in 2020 compared to 2019. The decrease in energy consumption reflected in carbon dioxide emissions from fossil fuels, which fell by about 10% between 2019 and 2020. The share of the EU population reporting crimes, violence, vandalism in neighborhoods fell by 13.6% in 2014 to 11.0% in 2019. Public spending on EU courts increased by about 16%. "Clean and affordable energy", energy consumption increased slightly between 2014 and 2019, indicating that the EU needs to do more to meet its 2030 target of increasing energy efficiency by at least 32.5% (Europe Sustainable Development Report 2021).

Table no. 1. People at risk of poverty or social exclusion by age and sex (Cumulative difference from 2008, in thousands)

	2011	2013	2015	2017	2019	2020
European Union - 28 (2013-2020)	**3,467**	**5,461**	**1,847**	**-4,474**	**-10,898**	**:**
European Union - 27 (from 2020)	**3,493**	**3,944**	**919**	**-4,729**	**-11,952**	**-6,549**
Romania	**-849**	**-723**	**-1,680**	**-2,074**	**-3,041**	**-3,242**

Source: www.eurostat.ue

The last decades have brought a new dimension to the attention of public opinion and decision makers - the ecological dimension. This new dimension has become important because of situations of environmental imbalance, which have led to dramatic effects, with multiple economic and social costs.
Thus, the concept of "Green Economy" debated, initially, in specialized media with reference to environmental economics, has increasingly penetrated the international issue of sustainable development and political discourses on environment and development.

3. Recovery and resilience of EU Member States in the field of digitization

Under this mechanism, EU Member States have allocated at least 20% of the national allocations under the recovery and resilience plan to the digital sector; In terms of digital skills, 56% of people in the EU have basic digital skills. A slight increase in the number of IT specialists in the field of employment: in 2020, EU countries had 8.4 million IT specialists, compared to 7.8 million as against to 2019. 55 % of companies reported difficulties in recruiting IT specialists in 2020, lack of employees with advanced digital skills, a factor in slowing down the digital transformation of companies in many EU Member States. The digital

decade for skills, which predicts that 80% of the population will have basic digital skills, and the fact that there are 20 million IT specialists.

Significant improvements are expected in the coming years due the fact that 17% of digital investment in recovery and resilience plans. Connectivity data show that "high-capacity networks" (HCVs), which are available in 59% of households in the EU. Networks in 2021 were 50% available, far from universal coverage with gigabit networks, given the goals of the digital decade for 2030). Rural HCV coverage has increased from 22% in 2019 to 28% in 2020. In 2021, 25 EU Member States allocated in the 5G spectrum, compared to last year's allocations, for 16 EU Member States. 5G technology has launched commercially in 13 EU member states, covering urban areas.

The integration of digital technologies has increased the use of cloud technologies (from 16% of enterprises in 2018 to 26% in 2020). Large companies have used digital technologies to a fairly, high degree: Electronic exchange of information through enterprise resource planning (ERP) systems and software in the *cloud* (80% vs. 35% for ERP and 48% vs. 25% for *cloud* technologies). Very few companies use advanced digital technologies (14% use large volumes of data, 25% - AI and 26% - cloud technologies). The goals of the digital agenda are still far from being, achieved: the EU's 2030 targets are for 90% of SMEs to have at least a core level of digital intensity, compared to the 60% target in 2020, and at least 75% of enterprises to use advanced digital technologies by 2030. The use of large volumes of data used by a small number of enterprises, compared to the target of 75%. Approximately 15% of the digital investments in the recovery and resilience plans provided by the Council, of which almost EUR 18 billion out of EUR 117 billion, were for digital capabilities and research in the development of the digital sector. The development of e-government services not reflected in the data of digital public services. The pandemic has contributed to accelerating the development of the digitization of these services. 37% of digitization investments in recovery and resilience plans adopted by the Council (approximately EUR 43 billion out of a total of EUR 117 billion) dedicated to digital public services, it is expected to make significant improvements in the coming years. The budget of EUR 723.8 billion for the recovery and resilience mechanism, adopted in February 2021 - the largest program in the Next Generation EU instrument.

Table no. 2. Level of internet access

Households - level of internet access [isoc_ci_in_h] (%)						
	2012	**2014**	**2016**	**2018**	**2020**	**2021**
EU- 27 (from 2020)	75	80	84	88	91	92
EU - 28 (2013-2020)	76	81	85	89	:	:
Euro area	76	81	85	89	92	92
Romania	54	61	72	81	86	89

Source: www.eurostat.eu

Table no. 3. Households - level of internet access, Percentage of households

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
EU 27	75	77	80	81	84	86	88	90	91	92
EU 28	76	79	81	83	85	87	89	90	:	:
Romania	54	58	61	68	72	76	81	84	86	89

Source: www.eurostat.eu

Table 4. E-commerce sales, Enterprises with e-commerce sales, Percentage of enterprises,

GEO/TIME	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
EU 27	16	16	17	19	20	20	19	20	21	22
EU 28	16	17	18	19	20	20	20	21	:	:
Romania	5	10	8	8	7	8	9	12	19	13

Source: www.eurostat.eu

4. Building the digital model of sustainable development

Sustainable renewal covering all relevant contexts - individual, organizational, local-regional and global. It should support humanity to realize the future of the evolution of society, economy and ecology, to united in an evolutionary process based on multiple symbiosis. Opportunity development of the integrated concept

of sustainable renewal, based on Beer's Viable System Model (VSM). The core of the concept is the recursive structure, which organizes the tasks necessary for such a renewal. In order to build a digital model of sustainability, it is important to consider the following principles: (1) Building the infrastructure of the sustainable digital economy; (2). Sustainable electronic markets for green products and services; (3) Products based on information and knowledge for sustainable development. (4) Agents present in the markets: consumers, business people, intermediaries. Sustainable Digital Marketing (5) Macroeconomic transformations and globalization processes (6) The progressive and aggressive penetration of the digital economy in the economic and social life of modern society.

The large number of converging groups of information spaces, the entropy inside them is constantly decreasing. The authors reveal the content of the digital concept, define the general principles, the criteria of sustainable development indicators.

The model includes sustainable development, organizational, economic, institutional mechanisms, used for measurement, implementation efficiency at the time of transfer to the digital economy (e-neural network). Digitization provides access to the integrated network of untapped and untapped big data, with benefits for society and the environment. Technologies are designed as tools that change the rules of the game, whereby integration will benefit the three key elements of the food-water-energy link: (i) sustainable food production; (ii) access to clean and safe drinking water; and (iii) the generation and use of green energy. The author (Schwaninger, M., 2015) argues**:** "The strongest approach is to choose the model that targets viability, and allow efforts for sustainability in this search for viability. Organize sustainability measures in such a way as to increase the viability of a system. A social body is viable if it has a structure of regulatory units whose functions and interrelationships are specified in theory, reflected by the generic structure of the model. System 1: It is the ability to regulate the largely autonomous and mutually adaptive basic operational units, tasked with optimizing the business in progress. System 2: It is the coordination function, which reduces oscillations and improves self-regulation. System 3: In a company we would have corporate executive management here. 4: represents the long-term orientation towards the future and the general environment.

The digitalization process of the sustainable economy will bring a positive and efficient impact in the functioning of the mechanisms of sustainable development. We aim to focus on digitizing sustainable economic development in the current conditions of the whole of Europe. We reviewed the current state of sustainable development in the EU and the evolution of the digitization process. We discussed the issue of building a digital model of sustainable development.

Conclusions

Following the study carried out for the development of a sustainable digital economy, it is necessary to consider the following aspects. Factors that determine the economy of technology for the creation of software components and complexes, the main modern methods for predicting work intensity, duration and the number of specialists needed to design and produce high quality software products, considering their characteristics and resource constraints, are presented.

The existing scientific, methodological approach to the study of the digital economy does not allow the use of the described opportunities, because it aims to determine the current level, in the dynamics and competitiveness of the regional digital economy. The values of the indicators are studied, the contribution to the general process of digitalization of the region's economy is not determined. The contribution determined by the institutional approach developed in the study of the digital economy. The goal of digital transformation - a high level of automation, the delegation of a larger number of external people and the profitable preservation of processes that can be carried out anywhere in the world.

Digital transformation requires different things depending on the business. The digital transformation looked different for each company and enterprise taken separately. It is important to understand that DT is not just about changing processes. Digital platforms will be everywhere and will operate in interconnected ecosystems. Every organization will need a digital platform strategy. Not every organization should take the lead in a business ecosystem; every organization needs a digital platform strategy. For the characteristic of sustainable development, a series of indicators are used, considered by different hierarchical levels: global, national, regional, local, industry-specific indicators.

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The Resilience of Agricultural Comparative Advantage During the COVID-19 Pandemic

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Abstract

The agricultural sector is crucial for economies around the world, not only due to its role in ensuring food security, but also for capitalizing on the competitive advantages in a profitable and sustainable manner. The competitiveness of the agricultural sector has been highly debated in the literature. There are many well-developed methods for quantifying the different facets of agricultural competitiveness, most of which have a strong economic valence. One of the facets of competitiveness is resilience, the capacity to withstand the challenges that occur during periods of crisis while maintaining initial functions, if not improving them. Although the competitiveness of the agricultural sector has caught the attention of scholars, the literature is not abundant in studies dedicated to the analysis of the resilience of the agricultural sector's competitiveness. Thus, this study was aimed at bringing its contribution to the literature by tapping into the resilience of the agricultural comparative advantage in the context of the COVID-19 pandemic. The objective of this research was to assess Romania's agricultural comparative advantage and its associated resilience levels in the face of the negative effects of the SARS-CoV-2 pandemic on the global agri-food supply chains by resorting to the Balassa index. Data were extracted from the International Trade Center INTRACEN database and used to calculate the revealed comparative advantage for two different periods: before and during the COVID-19 pandemic. Findings showed that tobacco-based products were the most resilient and not only did those products maintain their level of competitiveness, but they also managed to become more competitive. On the other hand, although Romania is highly competitive in terms of exporting cereals, the resilience of this agri-food category proved to be poor during the COVID-19 pandemic. The same was observed in the case of oil seeds and oleaginous fruits. The drought from 2020 significantly contributed to these unfavorable results for Romania. This paper provides support and assists decision makers in the process of adopting measures aimed at increasing the resilience and competitiveness of the Romanian agricultural sector.

Keywords: revealed comparative advantage, Balassa index, resilience, food security, agricultural economics, trade flows, SARS-CoV-2 pandemic.

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Introduction

Identified in March 2020, the COVID-19 pandemic has had a prompt and noteworthy impact on peoples' lives and the global economy, materialized by restrictions in the movement of people, goods and services. This situation had repercussions in all the economic sectors as labor availability was affected, together with all the markets and logistical chains. In the context of the COVID-19 crisis, resilience in the agriculture sector is linked to the production and processing system, the economy, institutional activities, social interactions, and the environment. Resilience could be defined as the capacity to recover from long-term adversity, bringing into discussion endurance (Darnhofer, 2021). The resilience of the agriculture sector is often associated with using high technology in enterprises, having a prior experience of shocks, benefiting from subsidies offered by the government for people working in the agriculture sector and developing a

well-organized logistical system (Muricho et al., 2019). On the other hand, competitiveness represents a country's advantage or disadvantage in commercializing its goods and services in the global markets (Popescu et al., 2017). In addition to this, Porter Diamond considers that competitive advantage at the microeconomic level is offered by the factor conditions, the demand, the supporting industries, the enterprise strategy, and competition. In regards to the macroeconomic level, Porter Diamond adds two more variables, respectively the public institutions and the unpredictability of markets (Herciu, 2013). There are numerous instruments for measuring competitiveness. The Revealed Comparative Advantage (RCA) or the Balassa index is used to calculate the relative advantage or disadvantage of a country for a certain class of goods or services by commercial flows. The Balassa index measures the degree of specialization of export products. Thus, if the Balassa index equals more than one, it indicates that the product involves specialization (Balassa, 1965). In the opposite case, if the index is less than one, there is no specialization for that product. Although agricultural activities continued during the quarantine of the COVID-19 pandemic, they have been affected by many variables such as: the depletion in the availability of inputs, the unavailability of the labor, the difficulties encountered in order to deliver the agricultural product from the farm to the processing or selling points, the decrease of the processing capability of the factories due to social distancing and nonetheless, the changes in the market demand.

There are numerous countries with an abundance of factor endowments and agricultural potential that should be harnessed in an economic-efficient and sustainable manner. Romania is such a country. The Romanian agricultural sector plays an important role in the national economy and in ensuring high levels of food security – not only nationally, but internationally, considering Romania's intensity of international trade flows for agri-food products. Thus, exploring the changes in Romania's agricultural comparative advantage becomes important in the context of the COVID-19 crisis, considering both the economic and food security aspects at national and international levels.

Taking all these aspects into account, the objective of this research was to assess Romania's agricultural comparative advantage and the associated resilience levels in the face of the negative effects of the SARS-CoV-2 pandemic on the global agri-food supply chains. The objective of this study was met by resorting to the Balassa index (revealed comparative advantage), which was calculated and approached for two different periods: 2016-2019 (before the pandemic) and 2020 (during the SARS-CoV-2 pandemic). In order to assist decision makers in the process of adopting strategic decisions for the agricultural sector, it is necessary to perform constant monitoring and evaluation of the Balassa index, as well as to identify potential threats to food security through the Balassa index resilience analysis.

1. Review of the scientific literature

Since the COVID-19 pandemic started, the agriculture sector has encountered many difficulties, mainly caused by the movement restrictions of people, goods, and services. Even though agriculture is one of the most important sectors in the global economy, assuring food safety for the entire population, lack of inputs for agriculture, issues regarding labor mobility and logistics management have led to problems that expanded to the entire food chain (Moon, 2011). In this context, resilience and competitive advantage in agriculture could be built by using labor-saving technologies, training people in the rural areas, developing performant manufacturing sectors at the national level, improving enterprise flexibility, and focusing more on human welfare (Fielke et al., 2018). Resilience comes hand in hand with the competitive advantage. This is the reason why agricultural competitiveness, as an essential part of economic competitiveness, has to focus more on land use (Chivu et al., 2021). In this way, by acknowledging agricultural competitiveness, farmers could develop inland agriculture, by using crops that have the highest productivity (Popescu et al., 2017). When referring to resilience and competitive advantage during the COVID-19 pandemic, there are also brought into discussion robustness, exposure, and sensitivity of the agriculture sector. Thus, the robustness of the agriculture sector represents a balance between vulnerability and stability (Bečvářová, 2008). Moreover, robustness represents the capacity of a system to maintain its functionality despite any kind of perturbation. Related to robustness comes exposure which represents the extent of the perturbation that affects a system. Nonetheless, sensitivity, representing the intensity with which the system is affected by the perturbation, plays an important part in building up the resilience of agriculture (de Goede, Gremmen, and Blom-Zandstra, 2013). According to Herciu (2013), the main factors that influence the competitive advantage of a country's agriculture are the inadequate supply of agricultural inputs, tax regulation, inefficient government bureaucracy, access to financing, and corruption. As a solution for increasing the competitiveness of agriculture, exports could be sustained by a reduction in production costs and an increase in the quality of products together with encouraging exporting enterprises to access new markets. Another approach to increasing agricultural resilience during the pandemic refers to climate-smart agricultural practices which contribute to the mitigation of climate change and increase crop yields and

incomes (Istudor et al., 2019). On top of that, resilience, as a dynamic concept, focuses more on long-term adaptation strategies rather than on short-term solutions for managing risks (Petrescu et al., 2022; Arslan, Belotti, and Lipper, 2017). According to other authors, by developing the agricultural trade balance, both the resilience and competitiveness will increase (Andrei et al., 2021). From another point of view, resilience could be understood as the capacity of agricultural systems to adapt to any kind of perturbation, in the present scenario of the COVID-19 pandemic, in order to transition to sustainable development (Beia et al., 2020). Moreover, resilience could represent the ability to rapidly recover from adversity, by absorbing the shocks caused by a perturbation and reorganizing in the same manner the system was organized before (Alexander, 2013).

When considering resilience – persistence, adaptability, and transformation capacity represent important factors of analysis. Persistence represents the capability of the agricultural system to absorb shocks caused by internal or external perturbations. At the same time, adaptability refers to the ability of the agricultural system to reorganize after suffering a shock. Nonetheless, transformation capacity approaches a system's ability to transform into a new system, if the existing one is unstable (Walker et al., 2004; Folke, Colding and Berkes, 2002). Regarding the dynamics of agricultural resilience, there has been identified a set of social variables that have a high impact on it: considering uncertainty as an opportunity to evolve, promoting innovation, and lifelong learning (Smutka and Burianová, 2013).

Adaptive and preventive measures represent an effective way to consolidate resilience and competitiveness in the agriculture sector. For this to happen, trust, transparency, and participation are required (Ion, Dobre, and Soproni, 2019). From other author's point of view, agricultural competitiveness was influenced by globalization and specialization. The reason why the agriculture sector is more resilient than other economic sectors is that it has a higher capacity to withstand a crisis because of the low elasticity of demand for agro-food products (Smutka and Burianová, 2013). In this context, it could be said that regardless of the crisis, food demand will continue to increase (Pawlak, 2018). According to another study, there is a link between productivity, efficiency, and competitiveness in agriculture. Thus, the agriculture sector could be economically inefficient but competitive, or it can be economically efficient but not competitive. Competitiveness in agriculture could also come from the sustainable management of water, as it is a scarce resource, with high demand in other economic sectors at the same time (Fuglie, 2018).

A different approach to increasing agricultural competitiveness refers to modifying the structure of production taking into account economic efficiency and crop performance (Hong et al., 2019). In Porter's view (1990), agricultural competitiveness is linked to productivity, as it is produced more output with the same resource input. In this regard, Porter's diamond model for the assessment of competitiveness has seen a viable and practical application in the agricultural sector (Constantin et al., 2022). Agricultural competitiveness could be measured by taking into consideration costs, prices, the quality of the commodities commercialized, as well as their suitability as input for other production processes in different, yet connected economic sectors (Cepoi, Bran and Dinu, 2020).

Moreover, an alternative factor that influences the competitiveness of the agriculture sector is land productivity, as it measures the output generated by a specific surface of the land. A further study comes in front with three approaches regarding competitiveness. The first approach links competitiveness to economic performance and competition throughout the market. The next approach refers to the quantity of inputs used during production and their price, as a potential way to increase productivity. Nevertheless, the last approach brings into discussion the conversion of competitive advantage into competitive performance (Bruce, Jackson and Lamprinopoulou, 2021).

Furthermore, the resilience and competitiveness of agriculture could be increased if it is taken into consideration the degree of predictability of what happens with the crops during the agricultural year: production/hectare, cost, price, and processing costs. In a different study, it is claimed that competitiveness represents the situation in which an economic sector competes with other economic sectors (Milanović, Nikitović, and Garabinović, 2020). Thus, competitiveness in the agriculture sector is influenced by technological advancements, production costs and selling prices, changes in the demand, and environmental issues. The distribution of the agro-food products also has a high impact on the competitiveness in agriculture.

2. Materials and methods

Data used in this conference paper were extracted in March 2022 from the International Trade Center (INTRACEN) database. In accordance with the research objectives, two different periods were analyzed: before the pandemic (timeframe: 2016 – 2019) and during the pandemic (the year 2020). Data regarding the year 2021 was not available at the moment of carrying out this study. Considering that this study was focused specifically on the agri-food sector, only the categories specific to this sector were included in the analysis, as described in Table no. 1.

Table no. 1. Major Agri-food Product Categories Analyzed

Category Code	Full Name of the Agri-food Product Category Codes	Category Code	Full Name of the Agri-food Product Category Codes
1	Live animals	13	Lac; gums, resins and other vegetable saps and extracts
2	Meat and edible meat offal	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included
3	Fish and crustaceans, molluscs and other aquatic invertebrates	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin	16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
5	Products of animal origin, not elsewhere specified or included	17	Sugars and sugar confectionery
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	18	Cocoa and cocoa preparations
7	Edible vegetables and certain roots and tubers	19	Preparations of cereals, flour, starch or milk; pastrycooks' products
8	Edible fruit and nuts; peel of citrus fruit or melons	20	Preparations of vegetables, fruit, nuts or other parts of plants
9	Coffee, tea, maté and spices	21	Miscellaneous edible preparations
10	Cereals	22	Beverages, spirits and vinegar
11	Products of the milling industry; malt; starches; inulin; wheat gluten	23	Residues and waste from the food industries; prepared animal fodder
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit	24	Tobacco and manufactured tobacco substitutes

Source: International Trade Center INTRACEN, 2022

Taking into account the objective of this research, the Balassa index (revealed comparative advantage) was calculated for two different periods: 2016-2019 (before the pandemic) and 2020 (during the SARS-CoV-2 pandemic). Equation 1 described how the Balassa index was calculated in the case of each agri-food product category. Afterward, the absolute change of the Balassa index was calculated. The absolute values were determined by resorting to the difference between the Balassa index per product category scored in the year 2020 and the average value of the Balassa index specific to a period before the SARS-CoV-2 pandemic (2016-2019), thus aiming at observing the degree of resilience during times of crisis. Based on the results, the agri-food product categories were classified as: (a) resilient – those with positive absolute change, and (b) poorly resilient categories – those that scored negative absolute changes of the Balassa index. Finally, the share of the absolute change was calculated per type of agri-food product categories: resilient and poorly-resilient.

$$RCA_{ij} = \frac{X_{ij}}{X_{ik}} \Big/ \frac{X_{nj}}{X_{nk}} \quad (1)$$

Where: *X* represents the export value, *i* represents Romania, *n* represents the world, *j* represents the analyzed group of agri-products (from 1 to 24), *k* represents all the agri-food traded goods. Balassa index values below one justify no comparative advantage. If the value is between one and two, then the advantage is considered weak. If the value is situated between two and four, then the one can consider this advantage medium and if the value exceeds four, then this signals a strong comparative advantage.

3. Results and discussions

The Balassa index was calculated as explained in the methodology section: for a period of time before (2016-2019 and an average was calculated, *n*=four years) and during (2020) the COVID-19 pandemic. Results were graphically represented in Figure no. 1. Moreover, the resilience of the agricultural comparative advantage based on the Balassa index was calculated in Table no. 2.

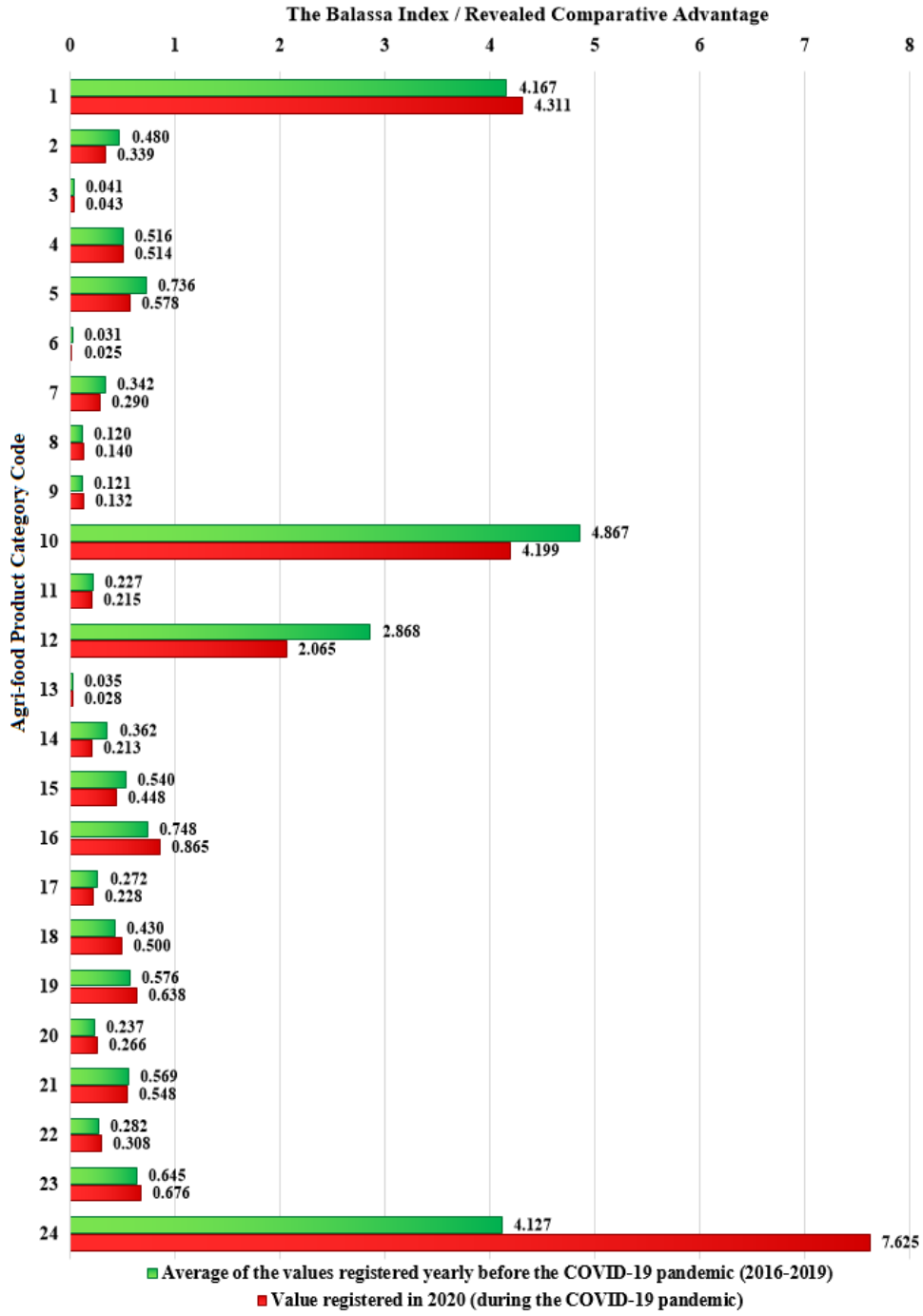


Figure no. 1. The Balassa index before and during the COVID-19 pandemic, per category
Source: Authors' own calculations based on International Trade Center (INTRACEN) database (2022)

Findings show that the most resilience agricultural comparative advantage was noticed in the case of agri-food category 24: tobacco and manufactured tobacco substitutes. The Balassa index scored a value almost double in 2020 (7.625) than the one registered on average during 2016-2019 (4.127), thus making this category one of the most competitive Romanian at export. Romania's trade balance registered a surplus of one billion EUR in 2020 in the case of tobacco and manufactured tobacco substitutes, making it the second category in the ranking of the agri-food product categories with the highest trade balance surplus.

Table no. 2. The resilience of agricultural comparative advantage based on the Balassa index

Agri-food Product Category Code	Absolute Change of the Balassa index (scored in the year 2020 vs the 2016-2019 average)	Share of the Absolute Change (%)	
		High Resilience based on Positive Change Results	Poor Resilience based on Negative Change Results
1	0.144	3.586%	—
2	−0.141	—	6.537%
3	0.003	0.072%	—
4	−0.001	—	0.065%
5	−0.157	—	7.289%
6	−0.006	—	0.300%
7	−0.053	—	2.439%
8	0.020	0.509%	—
9	0.012	0.298%	—
10	−0.668	—	30.976%
11	−0.012	—	0.550%
12	−0.804	—	37.250%
13	−0.008	—	0.353%
14	−0.149	—	6.926%
15	−0.093	—	4.289%
16	0.116	2.902%	—
17	−0.044	—	2.053%
18	0.070	1.745%	—
19	0.061	1.528%	—
20	0.029	0.725%	—
21	−0.021	—	0.973%
22	0.026	0.659%	—
23	0.031	0.773%	—
24	3.498	87.203%	—
TOTAL		**100.000%**	**100.000%**

Source: Authors' own calculations based on International Trade Center (INTRACEN) database (2022)

Regarding the ranking of the agri-food product categories with the highest trade balance surplus, the first place is held by class 10 – cereals, with 1.7 billion EUR on average during 2016-2020. On top of that, the Balassa index is above the threshold of four in the case of cereals, making Romania a net exporting country of raw materials, highly competitive in this regard. However, regarding class 19 – preparations of cereals, flour, according to the registered Balassa index values (0.576 on average and 0.638 in 2020), Romania is not competitive at all. Consequently, findings justify that: (a) Romania is 'highly competitive' through exporting raw materials with little added value, (b) Romania is not able to capitalize on its raw materials in order to increase its profitability through exporting processed foods (class 19 – preparations of cereals) with higher degrees of added value and improving its competitiveness in this regard. Thus, one can question the nature of competitiveness when approaching the high levels of exporting raw materials.

Regarding the resilience of the comparative advantage of cereals, the decrease of the Balassa index was 0.668, but the value scored in 2020 was still high (4.867). This decrease could have been caused by multiple factors: (a) the major drought that occurred in Romania in 2020, (b) an inefficient irrigation infrastructure, (c) the resulted low level of production, which also led the generation of the smallest surplus of trade balance with cereals (1.4 billion EUR) during the 2016-2020 period. Agri-food product category 10 – cereals registered the second most major decrease of the Balassa index, immediately after the category 12 – oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit, which held the first place in the ranking of the most non-resilience agri-food products. With a decrease of the Balassa index of 0.804, the degree of competitiveness was still high in 2020: 2.065 and the trade balance scored a surplus of half billion EUR. Overall, the SARS-CoV-2 pandemic has caused the diminishment of the comparative advantage of the raw materials produced by Romania. More investments in the processing of raw materials are needed in order to Romania to become competitive in the case of the processed agri-food product categories and thus making Romania more profitable through efficient agricultural trading.

Conclusions

The COVID-19 pandemic has led to many changes in international trade flows for agri-food products. As a result of the divergent and dynamic actions in the global agri-food chains, agricultural comparative advantage has also been the subject of various changes with economic and food security implications. This research was aimed at exploring the resilience of the Romanian agricultural comparative advantages in the context of the COVID-19 pandemic by resorting to the changes of the Balassa index values.

In the case of Romania, results showed that the most resilient agricultural comparative advantage was that of the tobacco and manufactured tobacco substitutes. In this direction, Romania's competitiveness has almost doubled based on the Balassa index result and the trade balance surplus that registered a peak during the COVID-19 pandemic in 2020. On the other hand, the resilience of the comparative advantage regarding cereals, oil seeds, oleaginous fruits; miscellaneous grains and seeds was the weakest during the COVID-19 pandemic, despite Romania's tradition and competitiveness in this regard, which did not only cause food security vulnerabilities at the national level, but also at the level of the European Union.

This research has its limitations: the resilience of the agricultural comparative advantage was only approached through the lens of the change of the Balassa index values and did not focus on the specific causes that determined the outcome. Thus, future research avenues can be dedicated to exploring the exact causes that caused the decrease in competitiveness during times of crisis. Moreover, the research can be expanded at the level of other countries and the linkage analysis between resilience and agricultural comparative advantage can be further improved by including more indicators into the equation.

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Can Fake News About Companies Lead to an Increased Social Media Usage? An Empirical Investigation

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Abstract

The purpose of this study is to examine the relationship between users' optimal experience while surfing SNS, the sharing behavior of fake news about companies, online trust, and increased social media usage. Our theoretical framework enhances flow theory, which is conceptualized as a sequential process, involving social media users' intrinsic interest, concentration, perceived control, enjoyment, and time distortion. Relevant studies from fake news literature, online trust, and social media usage were also included to develop the hypothesis and conceptual model. We conducted an empirical investigation through a questionnaire-based online survey among social media users of the most popular SNS. A convenience sample was chosen, and 922 valid responses were obtained. Using structural equations modeling we tested the research hypothesis and the proposed conceptual model. The findings show that the optimal experience of social media users can be viewed as a sequential process that influences sharing fake news about companies: intrinsic interest influences concentration, concentration influences perceived control, perceived control influences enjoyment, enjoyment influences users time distortion, and time distortion influences sharing fake news about companies on SNS. Moreover, online trust has a positive influence on sharing fake news. Also, the results of this study indicate that sharing fake news about companies while browsing SNS has a positive influence on social media usage. The paper extends the theoretical understanding of the flow theory in the social media context of an emerging market. Marketers can benefit from the results of this study when designing communication strategies via social media, as to know what content to post, how to avoid the spread of fake news, and which aspects to consider enhancing optimal experience among SNS users.

Keywords: social media usage (SMU), fake news, intrinsic interest, concentration, perceived control, time distortion, online trust

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Introduction

As Internet users have increased strongly in recent years, at over 4.95 billion in January 2022, to almost two thirds of the worldwide population, active social media users are also more than ever, reaching about 4.62 billion users. All internet users have spent 12 trillion hours online in January 2022, setting a new milestone for social networking sites and social media usage (DataReportal, 2022). Social media usage is nowadays one of the most popular online activities that have driven researchers and practitioners to develop a better understanding of designing effective online marketing communication strategies. SNS are web-based platforms that enable users to create a public or semi-public profile, generate a list of other users with whom they interact and connect, exchange information and opinions, post comments and share news (Boyd and Ellison, 2007). SNSs are revolutionizing how we "consume" news, since users may nowadays share their own stories and advocate for various causes and events (Shu et al., 2017). 53% of the US population gets their news from social media, such as Facebook (36%), YouTube (23%), Twitter (15%), Instagram (11%), Reddit etc. (Pew Research Center, 2021). Individuals may use social media to keep informed, share experiences, interact with peers, but also to influence cognitions, attitudes, and behaviors of their friends and followers towards companies (Obadă, 2019). On social media, a vast amount of information is shared

as news. In some cases, news seems to be doubtful and deliberately deceptive. Such content is usually referred to as fake news (Zhang and Ghorbani, 2019). Organizations can become victims of the quick dissemination of fake news via social media (Berthon et al., 2018), being drawn into brand crisis, suffering reputational harm, and incurring massive financial losses (Obadă, 2019). Social media attention may be bad for businesses since customers may share negative brand experiences and various brand-related concerns (Hennig-Thurau et al., 2013), thus social media may either help or hurt a company (Kohli et al., 2015). Although literature studied the outcomes of fake news in social media, more research is needed in this area. Given the importance of social media as a communication channel, there is a deficit in our understanding of fake news from consumer perspective (Domenico et al., 2021). Literature is lacking studies regarding the relationship between users' optimal experience while browsing social media, sharing fake news about companies, online trust, and social media usage. The current study aims to fill that gap by proposing optimal experience (Csikszentmihalyi, 1975; 1990) from positive psychology, conceptualized in this paper as a sequential process (i.e., involving social media users' intrinsic interest, concentration, perceived control, enjoyment, and time distortion), as an antecedent of sharing fake news about companies, which leads to an increased social media usage. The study is unique, as it examines the relationship between users' optimal experience while surfing social media platforms, the sharing behavior of fake news about companies, online trust and increased social media usage. These associations have not been examined previously, and to best of our knowledge, no other study of fake news or optimal experience used structural equation modeling (SEM).

The paper is structured as follows: Section 1 provides the hypothesis and conceptual model development based on the optimal experience involving social media users' intrinsic interest, concentration, perceived control, enjoyment, and time distortion, sharing fake news about companies, online trust and social media usage. The research hypotheses based on an extensive literature review are also presented. Section 2 describes the research methodology, while section 3 contains the results and discussions. The paper ends with theoretical and managerial implications, research limitations and future research suggestions.

1. Hypothesis and conceptual model development

According to Csikszentmihalyi (1975, p. 36), flow is the "holistic sensation that people feel when they act with total engagement", being an *optimal experience* because it represents "a psychological state in which the person feels simultaneously cognitively efficient, motivated, and happy" (Moneta and Csikszentmihalyi, 1996, p. 277). Individuals who feel such an experience engage in activities that interests them intrinsically, concentrating on the task at hand and perceiving both a sense of control and enjoyment. Furthermore, they are unconscious of the passing time (Csikszentmihalyi, 1975). The most common *five characteristics of optimal experience* are: *intrinsic interest, concentration, perceived control, enjoyment, and time distortion* (Celik and Uslu, 2022). In the online environment, flow transforms into a subjective human-computer-mediated interaction experience that reflects the user's perception of the site's interaction as playful and exploratory (Novak et al., 2000).

Social media users may engage in a task while browsing SNS being intrinsically or extrinsically motivated. As flow represents a theory of intrinsic motivation, individuals experiencing it are often driven by satisfying internal rewards rather than relying on external pressures or extrinsic benefits (Csikszentmihalyi, 1975). *Intrinsic interest* has been acknowledged as an important feature of optimal experience (Csikszentmihalyi, 1975; Huang, 2003; Huang et al., 2012) because, in flow, individuals find the action intrinsically interesting and engage in it for the sake of enjoyment rather than for utilitarian goals (Hoffman and Novak, 2009). This allows social media users to concentrate on the task at hand to such an extent that they have little attention left to consider anything else (Novak et al., 2000). Therefore, we propose the following hypothesis:

H_1: *The intrinsic interest of social media users has a positive influence on concentration while browsing SNS.*

Concentration is described as the degree to which one is focused on or paying attention to the task at hand, thus representing another major component of optimal experience (Huang et al., 2012; Pelet et al., 2017). When browsing SNS, users select a specific range of information that is transposed into awareness, and "that's all that matters...." (Csikszentmihalyi, 1975, p. 58). Due to SNS displaying new and relevant information to users on a screen, this allows them to focus on the activity and to interact with the computer, perceiving a high level of control. Therefore, we posit that:

H_2: *The concentration of social media users has a positive influence on perceived control while browsing SNS.*

Csikszentmihalyi (1975) argues that optimal experience occurs when an individual perceives he best controls own actions, being "the masters of his own fate" (Csikszentmihalyi, 1990, p. 3). *Perceived control* represents an important characteristic for enhancing customer experience (Huang, 2003; Huang et al., 2012). For social media users', control refers to how individuals perceive their ability to navigate successfully online and how the web responds to their actions (Ghani and Deshpande, 1994). SNS predisposes users to perceive a sense of control by offering responsive interactive elements, such as chat, comment, poke, likes, shares etc. (Pelet et al., 2017), which they know how to use (Novak et al., 2000), thus allowing them to sign in and out. As a result, users' optimal experience is fun (Privette, 1983), pleasant, and exciting (Pelet et al., 2017). Therefore, we hypothesize that:

H_3: *The perceived control of social media users has a positive influence on enjoyment while browsing SNS.*

Enjoyment occurs during an activity when a person perceives a balance between their skills and the challenges of the performed tasks (Csikszentmihalyi, 1990). Social media users experience a sense of enjoyment, as virtual environments are more enjoyable, regardless of the performance repercussions (Lu et al., 2009). Enjoyment represents a key characteristic for enhancing customer experience (Pelet et al., 2017). Enjoyment is linked to the joy of discovery, of finding, learning, or observing something for the first time (Pace, 2004), so individuals in flow spent actively more time on social media (Hoffman and Novak, 2009). Therefore, we hypothesize that:

H_4: *The enjoyment of social media users has a positive influence on time distortion while browsing SNS.*

While having an optimal experience, individuals are unconscious of time passing and a *time distortion* occurs (Csikszentmihalyi, 1975). Due to the immersive and rewarding nature of online platforms, social media users spent a significant amount of time browsing on them (Pelet et al., 2017). Flow literature (Pelet et al., 2017; Obadă, 2019) considers time distortion as a major characteristic of optimal experience. In flow, hours pass in minutes, and minutes might expand to appear as hours. As a result of the optimal experience, social media users can engage in sharing information, including fake news about companies (Obadă, 2019; Obadă and Dabija, 2022). Therefore, it is reasonable to propose the following hypothesis:

H_5: *Time distortion experienced by social media users has a positive influence on sharing fake news about companies while browsing SNS.*

Optimal experience of SNS users can influence sharing fake news about brands (Obadă, 2019; Obadă and Dabija, 2022). Fake news is considered as one of humanity's greatest concerns, having negative effects on society and the economy (Gray et al., 2020). Although fake news is not a new phenomenon, it has grown in popularity in recent years due to its fast dissemination on social media (Obadă, 2019). Social media platforms such as YouTube, Twitter, Facebook, Instagram, or WhatsApp are popular SNS for the rapid transmission of content (Balakrishnan et al., 2021). Opposite to *news*, considered as "independent, reliable, accurate, and comprehensive information" about a context or organization (Kovach and Rosenstiel, 2007, p. 11), fake news is understood as inaccurate, false, or grossly distorted information presented as the "real deal", but aimed to deceive the audience (Figueira and Oliveira, 2017). Researchers agree that a solid conceptualization of fake news should incorporate the intentionally false and fabricated stories (Allcott and Gentzkow, 2017), yet perceivably realistic (i.e., consistent with an individual's previous beliefs) and presented in a journalistic format (Obadă, 2019).

Online trust of social media users has proven to be an important antecedent of sharing fake news on SNS (Obadă and Dabija, 2022). Trust included the willingness to believe someone based upon positive expectations from past behavior (Mayer et al., 1995). Trust is built in online settings through successful information exchange (Grabner-Kräuter and Bitter, 2013) and is often regarded as a critical component within information sharing process (Lin and Liu, 2012). People may feel secure spreading any news they get from reputable sources, even if it appears to be fake being driven by its speed and popularity (Talwar et al., 2020), or not having time to double check its accuracy. Online trust predicts fake news sharing among social media users (Obadă and Dabija, 2022). Therefore, we posit the following hypothesis:

H_6: *Online trust has a positive influence on sharing fake news about companies while browsing SNS.*

Fake news like *parody* (using sarcasm and exaggerations for comic effects rather than to harm audiences), *misleading content* (alter information to portray an issue or individual in a distorted light), *imposter content* (claiming to be someone else), *fabricated content* (intentionally spreading completely false content to deceive and inflict harm), *false connection* (news item's headline, aesthetic elements, and/or factual content do not make logical sense), *false context* (combining accurate and erroneous contextual information), *manipulated content* (falsifying authentic data or graphics in intended to mislead others) can be exploited in different ways on social media, aiming at influencing users cognitions, attitudes and behaviors (Wardle and Derakhshan, 2017; Fârte and Obadă, 2021), and, particularly, their social media usage. Fake news can

increase web traffic (Mills et al., 2019) and, thus, could influence social media usage. Therefore, we infer that:

H7: *Sharing fake news about companies while browsing SNS has a positive influence on social media usage.*

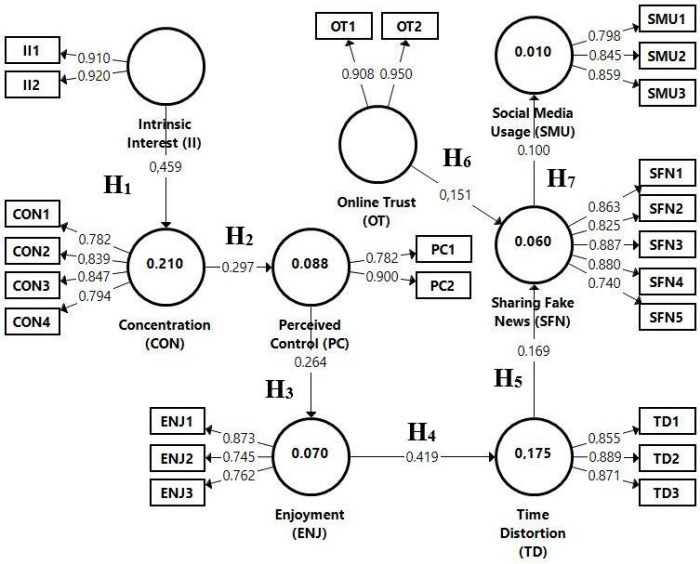


Figure no. 1. Structural model: Prerequisites of Social Media Usage
Source: own development in SmartPLS

2. Research methodology

This paper aimed to determine the prerequisites that influence social media usage by considering users' optimal experience (i.e., intrinsic interest, concentration, perceived control, enjoyment, and time distortion while browsing SNS), online trust and sharing fake news about companies on SNS to be an important antecedent of users' behaviour (see figure 1). The data was collected in November 2021 through a questionnaire-based online survey among social media users. A convenience sample was chosen, and invitations were sent to the users of the most popular Social Network Sites (SNS) sites, such as Facebook, Instagram, LinkedIn, etc. The initial set of 986 responses was assessed considering data quality, and, after this procedure, 922 were retained. About 55.7% of social media users are females and 44.25% males. Most social media users are educated: 6.0% from gymnasium, 7.6% from ten classes, 6.3% from vocational school, 40.6% from high school, 28.4 % from university, and 11.2% from postdoctoral studies. Moreover, 45.8% of respondents were under the age of 30, 44.1 % were between 30 and 50 years old, and 10.1% were above 50 years old. The mean age of the participants was 32.36 years. Furthermore, 43.5% of respondents reported having a low income, 47.6% state having a middle income, and 8.9% reported having a high income. The questionnaire was operationalized as recommended by the literature (Robinson, 2018), scales being adapted from various sources. All items were measured on a five-point Likert scale (ranging from total disagreement to total agreement).

The constructs were measured reflective, containing between two and five items. Intrinsic Interest (II), adapted from Huang (2003) contained two items ("Using social media bored me"; "Navigating the website was intrinsically interesting"), both loadings having above 0.9. Concentration (CON) was adapted from Pelet et al. (2017), the items with loadings between 0.782 and 0.847 referred to the feelings encountered by respondents when using social media (engrossed, absorbed, attentive, concentrated). Perceived Control (PC) was adapted from Jackson and Marsh (1996), consisting of two items with loadings of 0.782 and 0.900 regarding "While using social media, I felt in total control of what I was doing" and "While using social media, I had a feeling of total control". Enjoyment (ENJ), adapted from Kwak et al. (2014) was measured with three items ("I have fun interacting with social media", "Using social media provides me with a lot of fun" and "I enjoy using social media"), the loadings varying between 0.745 and 0.873. Time Distortion (TD) was also adapted from Kwak et al. (2014) and was measured with three items with loadings varying between 0.855 and 0.889. They referred to the speed time flies when being on social media, the increased frequency of spending more time on social media than intended and on the fact that "Time appears to go by very quickly when I am using social media". Online Trust (OT) was adapted from Fang et al. (2016) and consisted of two items (loadings above 0.9) regarding the trust in information and in news about companies shared on social media. Sharing Fake News on Social Media (SFN) was adapted from Chadwick and Vaccari (2019) and consisted of five items with loadings between 0.740 and 0.887. The construct refereed to the accuracy and exaggeration of news shared on social media about companies, the fact that shared news

looked initially as being correct, but also of the fact that respondents were aware that they shared fake news. Social Media Usage (SMU) was also adapted from Chadwick and Vaccari (2019) and was based on three items (loadings of 0.798 to 0.859). The construct referred to the average time spent on Facebook, Instagram and TikTok.

3. Results and discussions

The conceptual model from figure 1 was analyzed using SmartPLS 3.0 with structural equations modeling (SEM). The reflective constructs (see table 1) were checked for validity and internal consistency. All loadings > 0.7, average variance extracted (AVE) > 0.7, reliability indicators, and discriminant validity are computed in Table 2. The loadings fulfil the requested minimum thresholds, suggesting that the measures have convergence validity (Hair et al., 2010). The minimum and maximum values range between 0.740-0.950, thus minimum thresholds being fulfilled. We tested reliability using Cronbach α > 0.7 (Henseler and Sarstedt, 2013). As the items loadings exceeded 0.7, the model has internal consistency; all AVE values are over 0.5, so the model is adequate (Chin, 1998) and supports the convergent validity of the constructs. The Composite Reliability (CR)>0.7 indicates the reliability of the constructs (Hair et al., 2010). We computed the discriminant validity for each construct (see table 1), with the Fornell-Larcker. For each latent variable, the AVE value must be higher than the correlation coefficient between the competent and all distinct variables (Henseler et al., 2014), the threshold value must be under 0.9.

Table no. 1. Discriminant validity analyses

CON	ENJ	II	OT	PC	SFN	SMU	TD	Construct	Cronbach α>0.7	AVE>0.5	CR>0.7
0.816								**CON**	0.833	0.666	0.888
0.507	**0.795**							**ENJ**	0.711	0.632	0.837
0.459	0.681	**0.915**						**II**	0.806	0.838	0.912
0.272	0.310	0.246	**0.929**					**OT**	0.846	0.864	0.927
0.297	0.264	0.245	0.119	**0.843**				**PC**	0.702	0.710	0.830
0.109	0.132	0.134	0.179	-0.006	**0.841**			**SFN**	0.895	0.707	0.923
0.202	0.165	0.116	0.053	0.026	0.100	**0.835**		**SMU**	0.784	0.696	0.873
0.538	0.419	0.367	0.168	0.099	0.194	0.270	**0.872**	**TD**	0.842	0.760	0.905

* Note: II: Intrinsic Interest; CON: Concentration; PC: Perceived Control; ENJ: Enjoyment; TD: Time Distortion; OT: Online Trust; SFN: Sharing Fake News; SMU: Social Media Usage; AVE: Average variance extracted; CR: Composite reliability.

We also assessed the level of collinearity of all items in the measurement model. The highest value is 3.411 (SFN3) <5 (Sarstedt et al., 2017), indicating no multicollinearity. We employed next a bootstrap procedure to test the hypotheses and highlight the relationships between latent variables. All hypotheses were accepted with a significant, positive relationship based on t-statistics. The collinearity of the constructs in the structural model was analyzed. The highest VIF value of the inner model is 1.029 (OT→SFN), below the threshold value, so there is no multicollinearity. The goodness of fit of the saturated model is also acceptable. The square root mean residual (SRMR) has a value of SRMR=0.054<0.08 (Sarstedt et al., 2017).

Table no. 2. The path coefficients of the structural equation model

Paths	Path Coefficients	Standard Deviation	T-Value	CI[1]	*P*-Value	Hypotheses
II→CON	0.459	0.031	15.024	0.395-0.512	0.000***	H_1-Supported
CON→PC	0.297	0.035	8.508	0.223-0.358	0.000***	H_2-Supported
PC→ENJ	0.264	0.032	8.212	0.192-0.320	0.000***	H_3-Supported
ENJ→TD	0.419	0.030	13.840	0.357-0.474	0.000***	H_4-Supported
TD→SFN	0.169	0.032	3.044	0.107-0.228	0.000***	H_5-Supported
OT→SFN	0.151	0.034	4.436	0.079-0.211	0.000***	H_6-Supported
SFN→SMU	0.100	0.033	3.044	0.036-0.159	0.002**	H_7-Supported

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; II: Intrinsic Interest; CON: Concentration; PC: Perceived Control; ENJ: Enjoyment; TD: Time Distortion; OT: Online Trust; SFN: Sharing Fake News; SMU: Social Media Usage. [1]CI=Confidence Interval (2.5%-97.5%).

H_1 assumed that the intrinsic interest of social media users has a positive influence on concentration while browsing SNS. The results (β=0.459; T-value=15.024; p<0.001) indicate a positive and strong influence, so, **H_1** is supported. **H_2** presumed that the concentration of social media users exerts a positive influence on perceived control while browsing SNS. The results (β=0.297; T-value=8.508; p<0.001) confirm the strong and positive influence, so, **H_2** can be accepted. **H_3** inferred that the perceived control of social media users has a positive influence on enjoyment while browsing SNS. The obtained results (β=0.264; T-value=8.212; p<0.001) also highlight a strong and positive influence. That is why, **H_3** is to be validated. **H_4** posited that

the enjoyment of social media users influences positively users time distortion while browsing SNS. Our results (β=0.419; T-value=13.840; p<0.001) pinpoint a strong and positive influence between the two constructs, so therefore, **H_4** is supported. **H_5** presumed that time distortion experienced by social media users has a positive influence on sharing fake news about companies while browsing SNS. The results (β=0.169; T-value=3.044; p<0.001) confirm the positive and quite strong relation, so, **H_5** can be also accepted. **H_6** supposed that online trust has a positive influence on sharing fake news. The results (β=0.151; T-value=4.436; p<0.001) show a moderate, but high significant relationship. That is why, **H_6** is to be validated. **H_7** presumed that sharing fake news about companies while browsing SNS has a positive influence on social media usage. The results (β=0.100; T-value=3.044; p<0.02) pinpoint a moderate influence of moderate significance, but **H_7** is supported.

SMU represents an important marketing construct due to its consequences, at an organization's internal and external level. The most important consequences of SMU at the internal level refer to developing internal communities and connections to foster collaboration, knowledge sharing, organizational learning, and innovation (Hanafizadeh et al., 2021). At an external level, SMU can enhance customer relations, service activities, improvement in information accessibility, cost reduction, business process performance, crowdfunding performance, and innovation performance (Scuotto et al., 2017). Therefore, understanding the antecedents of SMU is critical for marketing communication specialists to achieve these objectives. This research suggests that users' optimal experience (i.e., intrinsic interest, concentration, perceived control, enjoyment, and time distortion while browsing SNS), online trust and sharing fake news about companies on SNS are antecedents of social media usage.

Conclusions

From a theoretical perspective, our research expands the flow theory by providing new insights into the outcomes of optimal experience, particularly sharing of fake news about companies on SNS and social media usage. Additionally, our study's findings have significant theoretical input to the literature on fake news by indicating that social media users' optimal experience is a predictor of sharing behavior. Among the managerial contributions of our paper, we can highlight that marketing communication specialists could gain deeper insights into the process that leads to an optimal experience among social media users. This knowledge could be used by practitioners to facilitate social media flow among users and to better understand the possible negative outcomes, such as sharing fake news about companies, products and/or brands. This could allow them to detect problematic information that affects their visibility and/or image, and east to adopt real-time reactive communication strategies to reduce potential negative consequences. Marketing communication specialists should consider online trust as a key factor in determining sharing fake news about their brands in SNS. Marketers should also consider that sharing fake news on social media sites enhances social media usage. This could lead to the quick spread of misleading content about companies on social networking sites and the occurrence of a possible communication crisis.

Among the limitations we can highlight the use of convenience sampling. Future studies could employ probability sampling. The research was conducted in Romania, thus from a cultural perspective, the results can hardly be generalized. Future studies could focus on assessing the proposed model in different countries and/or among different ethnical groups or among consumers from European versus other markets. Respondents were asked about companies in general, with no specification of certain sectors like retail, agriculture, construction, education, etc. Future studies could extend the model by gathering data between different industries and/or by considering sustainable/green versus unsustainable companies/brands but could also replicate the model among consumer generations of social media users, such as Zers or Millennials. Such comparisons could highlight important differences regarding optimal experience, online trust, sharing fake news about companies, and social media usage.

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Enhancing the Attractiveness and Readability of Central Bank Reports: An Experiment

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Abstract

Central banks can use their communication with the citizens as a tool to increase the efficiency of their monetary policy objectives. A forerunner in this sense is the Bank of England (BoE), who has already started layering its publications, by enhancing their readability, making the texts easily understandable and attractive visually, so that they can address an audience as broad as possible. Using the BoE approach, the text of one Monetary Policy Report (MPR) of the European Central Bank (ECB) has been layered in one control condition (the Monetary Policy Decision of December 2018) and four treatment groups, consisting of the same text, written in four different ways (the Objective and the Subjective Visual Summary, the Objective and the Subjective Relatable Summary). The citizens' comprehension and trust levels of every text were then tested, to find the best writing and visual text presentation technique that would enhance the efficiency of the ECB's communication strategy. In this way, the entire MPR was made more understandable for the citizens, making it more user friendly and logic, thus increasing the visibility of the organization and allowing it to be more friendly perceived. It is well known that communication and monetary policy are linked: if the recipients of a central bank message understand and trust it, they will act accordingly and thus develop a unique contribution in helping the ECB positively support the economy and the entire banking system and indirectly help it properly implement its monetary policy goals. The results of an empirical investigation conducted on the above-mentioned texts among European citizens showed that citizens tend to trust texts that are easily understandable and visually attractive and that they like objectively and simple presented information. The results of our study could be also replicated by national banks of the European Union and/or other public institutions that could benefit from enhanced trust, a better image and develop a proper binding towards citizens.

Keywords: online communication, marketing communication, central bank communication, central bank policy, citizens, European Central Bank (ECB), Monetary Policy Report (MPR).

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Introduction

Central bank communication has changed intensively in the last decades. While thirty-forty years ago, central banks did not even think of being citizen centred and explaining in detail their operations and strategies, decisions being mostly taken behind closed doors, nowadays, as any other public organization, central banks have to communicate and be very detailed about their actions (Juhro, 2022). Over the years, central banks have become more transparent and started relying on external communication to implement their monetary policy, especially following the financial crisis from 2008-2009, when many of them, including the ECB, started to share publicly what their intentions regarding future interest rates were (this policy is called "forward guidance") (Juhro, 2022). Written, oral and online communication by the ECB is not equivalent with an increase in terms of accessibility to citizens. Central bank publications are difficult to read and understand because they are quite technical: a reader must be skilled in business and economics, to

easily understand them. Texts might be so complex, that citizens need to have the literacy level of university graduates in business/economics to fully comprehend them (Fullwood, 2016; Huang, 2021).

To the best of our knowledge, citizens' perception of central bank communication has not been intensively studied. Hayo and Neuenkirch (2015) assess the influence of "central bank communication on citizens" perception towards the visibility and image of central banks. From their perspective, the most citizen-oriented communication is that of the US Fed communication, followed by the BoE, the ECB, and Bank of Japan. They argue that central bank communication positively impacts "how central banks are perceived and understood", because communication boosts credibility and enhances the perceived organizational independence. Central bank publications are not accessible to around 90% of the public if they are measured according to the Flesch-Kincaid reading procedure for linguistic complexity, compared to political speeches which are usually easy to understand by 30% to 50% of the population (Schoonvelde, 2019).

No assessment of the visual attractivity and readability of the monetary policy publications has been made so far for the ECB. We base our research on the principles of the stakeholder theory, which emphasizes the interconnected relationships between a company and its customers, employees, investors, customers, communities, and all other interest groups. Therefore, our paper aims to study how the communication strategy of the ECB can be improved, thus ensuring a better understanding of its reports by citizens.

In implementing the research scope, the authors conducted an empirical investigation among different citizen groups to pinpoint how the ECB could communicate more effectively with them, thus improving their trust and enhancing their perception about ECB communication reports. The results show that by including different visual aspects, ECB reports might very easily become more friendly and citizen oriented.

The paper is structured as follows: section 1 presents the literature review on central bank communication strategies and their effectiveness and section 2 draws the research methodology and the research design of the investigation. While section 3 contains the results and discussions, section 4 continues with the conclusions and recommendations for further research.

1. Literature review

Only 12% of the participants in a European wide study consider that media and politicians present various information in an easily understandable manner (Bholat et al., 2018). This is quite a low percentage, especially as 21st century citizens are actively engaged in debates about politics, societal developments, environmental protection, social movements, terrorism and/or migration. Political institutions register a strong deficit in citizens trust, as only 42% of the Europeans trust them (Eurobarometer, 2018). In a world characterized by digital transformation, EU institutions and central banks like the ECB can work on increasing citizens' trust by enhancing their communication with the public (Dabija and Băbuț, 2014; Dabija et al., 2018) and adapting the design of official reports.

Therefore, central bank communication and its effectiveness to reaching out citizens has been largely examined in recent years, literature also highlighting its impact on financial markets and their stability, market developments, companies' inflation expectations or the evolution of the purchasing power among households (Blinder, 2009; Jansen and De Haan, 2010; Allard et al., 2013; Bholat et al., 2017; Ehrmann and Talmi, 2017). Citizens' trust in European institutions has declined recently, while their responsibilities have increased since the 2008-2009 financial crisis. These means that it is more important than ever to increase public understanding of central bank reports and trust in them.

Surveys performed in the euro area among citizens found that central bank actions are not properly understood, participants with higher education degrees being more likely to understand the ECB monetary policy correctly. The most common problems of such reports are that their formal and technical language raise high understanding difficulties for simple citizens, although they often represent current developments of either the public central banks strategies or its theories and monetary policies (Borio, 2013; Calvo, 2013).

Haldane and McMahon (2018) found that the content published by the BoE was easily understandable and could improve citizens' outlook on the UK economy, their findings proposing directions to improve the understanding and perception of the BoE and the outlook on the UK economy, by aligning the readers' views with the bank's approach. Bholat et al. (2018) measured citizens' comprehension levels of BoE publications and examined central bank communication and its effectiveness by tying it to its impact on financial markets and to the ways in which it is correlated to the inflation expectations of firms and households. Other studies show that the communication policy of the ECB reports impacts strongly financial markets and increases the interest rate of decisions' predictability (Fratzscher, 2007; Blinder et al., 2008; Konhäusner et al., 2021), thus insuring a high trust level in the content. The communication strategies of

the Reserve Bank of Australia (Huang, 2021), of the BoE (Haldane, 2020) have also been analysed and guidance has been provided to increase citizens' engagement, understanding and expectations. However, one size does not fit all, and numerous challenges remain.

2. Research methodology

Our research draws on previous findings, being oriented towards measuring and verifying whether a design change of the Monetary Policy report would lead do a better understanding of its content by citizens, thus also improving the trust in and comprehension of the bank's policy message. In this sense, we relied on the text of the Monetary Policy decision from the 13th of December 2018 of the ECB as testing material (see Figure 1), to check whether the model used by Bholat (2018) could be properly replicated. The text of the ECB Monetary Policy decision report was rephrased and rewritten in four different ways as (simplified versions of the initial text with different visual designs and readability scores. As an improvement to the used model, we analysed if the messenger effect is applicable for central banks reports. This was achieved by presenting the first batch of participants with labelled and subjective information, showing clearly that the data source is the ECB, while the other batch was given unlabelled and objective information. This represents an addition to the experiment settle of Bholat (2018) where the authors tested whether comprehension and trust increase if the amount of information decreases and whether making the information more relatable has similar effects. The goal is to make monetary policy reports more comprehensive, this being the case if information is easier to understand, thus increasing its credibility. The research design also draws on Glazebrook et al. (2017), which found that individuals' engagement increases, the less information they need to process.

The control condition was a text published on the ECB website of only 210 words (see Figure 1), containing information about the future development of the ECB key interest rates, and announcing the end of the asset purchase programme (APP) in highly technical terms. According to the Flesch-Kincaid readability metrics (Kincaid, 1975), the text required the literacy level of university students, with a level of 14.42.

PRESS RELEASE Monetary policy decisions *13 December 2018*

At today's meeting the Governing Council of the European Central Bank (ECB) decided that the interest rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 0.00%, 0.25% and -0.40% respectively. The Governing Council expects the key ECB interest rates to remain at their present levels at least through the summer of 2019, and in any case for as long as necessary to ensure the continued sustained convergence of inflation to levels that are below, but close to, 2% over the medium term.

Regarding non-standard monetary policy measures, the net purchases under the asset purchase programme (APP) will end in December 2018. At the same time, the Governing Council is enhancing its forward guidance on reinvestment. Accordingly, the Governing Council intends to continue reinvesting, in full, the principal payments from maturing securities purchased under the APP for an extended period of time past the date when it starts raising the key ECB interest rates, and in any case for as long as necessary to maintain favourable liquidity conditions and an ample degree of monetary accommodation.

The President of the ECB will comment on the considerations underlying these decisions at a press conference starting at 14:30 CET today.

Figure no. 1. Monetary policy decision of the ECB. Press release from the 13th of December 2018

The first two versions of the initial text contained the same message, presented differently. They included in a simple and smooth language the ECB Objective Relatable Summary and the ECB Subjective Relatable Summary. Proof of it is the ranking of 6.2 on the Flesch-Kincaid scale, making it easy to read by citizens from the age of 12 onwards. These versions were visual and relatable, as image-based information was presented in a way that resonated with the readers. Relatability was also achieved in terms of increasing the number of pronouns in the first-person plural ("we") and in the second person singular ("you", "your"). The next two versions contained the same message, presented in a different way They were named as the ECB Objective Visual Summary and the ECB Subjective Visual Summary. Both summaries had a ranking of 8.8 on the Flesch-Kincaid scale, also having a stronger visual component than the relatable ones, meaning that the whole text was presented in the form of a story and that the explanations were based on images illustrating the ideas (see Figure 2). The other three versions were created with a similar design and readability. Table 1 shows the word count and readability of the five texts used in the study. To compute the readability score from table 1 we used the Flesch-Kincaid grade level formula: 0.39 x (words/sentences) + 11.8 x (syllables/words) - 15.59 (Kincaid, 1975).

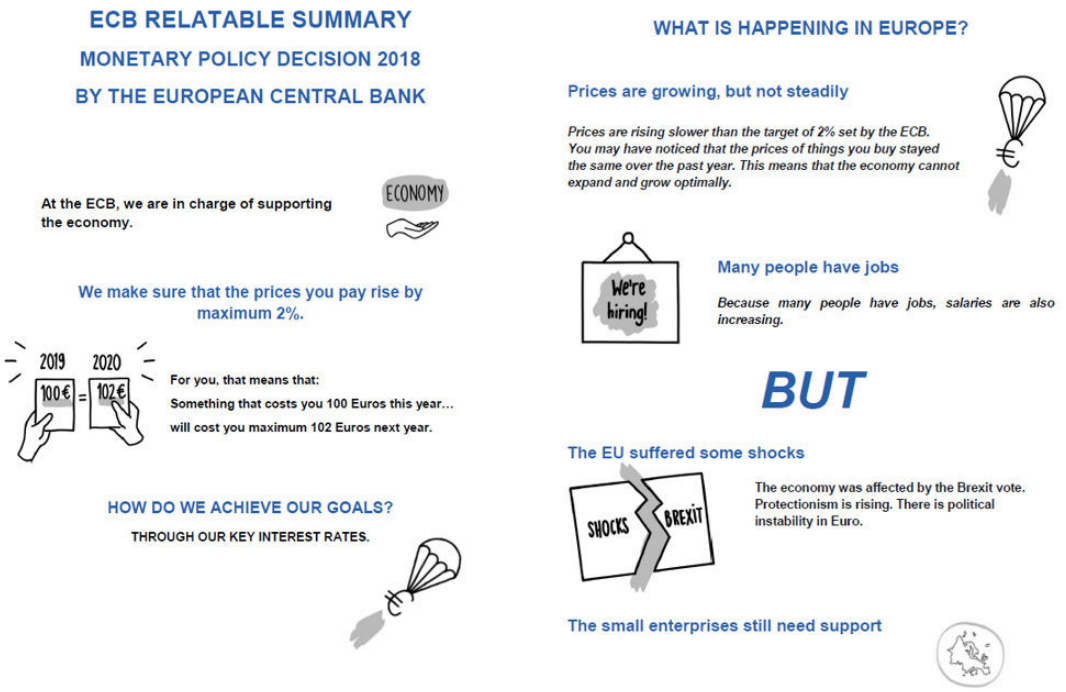


Figure no. 2. Extract from the ECB Relatable Summary

Table no. 1. Word count and readability of the texts

Text	Word count	Flesch-Kincaid grade level	School level	Comprehension
Monetary Policy Summary	210	14.42	College	Difficult to read
ECB Subjective Visual Summary	301	8.80	8th & 9th Grade	Conversational English
ECB Objective Visual Summary	309	8.80	8th & 9th Grade	
ECB Subjective Relatable Summary	269	6.20	6th Grade	Easy to read
ECB Objective Relatable Summary	269	6.20	6th Grade	

The five texts were distributed online to 250 randomly chosen German citizens (50 per condition), as the ECB has its headquarters in Frankfurt am Main. The participants had to assess the five modified versions of the initial ECB report. They were aged between 18 and 54 years old, the sample being fairly split between females and males. The participants were targeted using social media such as Facebook, Instagram, Twitter, LinkedIn etc.

Following the text lecture, the participants were invited to complete an online questionnaire. It consisted of a self-reported comprehension question, followed by four direct comprehension questions, a trust question, two questions regarding the economic background and interest in economic news and some more enquiries regarding his/her socio-demographic characteristics (age, gender). The self-reported comprehension questions were included to ease comparisons with previous findings of Haldane and McMahon (2018). We also employed such a reporting as people tend to overestimate their capacity for understanding texts, thus understanding becoming more accurate (Loewenstein et al., 2013). To ease comparisons with previous findings we also relied on similar questions, adapted to our research design: *To what extent were you able to understand the content of the read text?* With this question we were able to whether people over-estimated their understanding capacity (Loewenstein et al., 2013). Next came four direct comprehension questions, needed for the proper understanding of the text. The participants were given a choice of three or four possible answers, out of which they were only able to choose one (see Figure 3).

What will the ECB do to reach its target?	What are the ECB key interest rates?
a. It will partly reduce the support offered to the economy. b. It will continue offering full support to the economy. c. It will stop all support measures used to boost the economy. d. It will increase the support to the economy.	a. The rates used when banks want to borrow money from the ECB or to deposit money with it. b. The rates used to calculate inflation. c. The rates used when banks want to borrow money overnight from the ECB. d. The rates used when banks want to deposit money weekly with the ECB.
Which statement is true based on the text?	**How does the ECB support the economy?**
a. Prices are rising at a fast pace. b. Prices aren't changing at all. c. Prices are rising, but the rise is not steady.	a. The ECB tries to make sure that prices do not rise by more than 2%. b. The ECB tries to keep the price increase as high as possible. c. The ECB tries to keep the prices as low as possible. d. The ECB tries to keep the prices stable.

Figure no. 3. Assessment question of the self-reported questionnaire

Next came perception and trust questions, in which participants were asked how the summary they had read affected their perception of the ECB, before being asked to assign a trust rating on a scale from 1 (distrust completely) to 10 (fully trust) to the information presented (see Figure 4).

How has the summary you have just read affected your perception of the ECB (if this is the case)?	
a. Worsened significantly b. Worsened slightly c. My perception stayed the same	d. Improved slightly e. Improved significantly
How would you rate the information you have just read in terms of trust, on a scale from 0 to 10, where 0 = distrust completely and 10 = trust fully?	

Figure no. 4. Perception and trust questions of the self-reported questionnaire

3. Results and discussions

The experiment was conducted in Spring 2019, 311 randomly selected voluntary participants being approached. As some participants dropped out or did not fill in all questions from the self-administered questionnaire, we obtained in the end 281 valid answers. No personal information enabling participants' identification was collected during the experiment. The participants also did not know how many different versions of the inflation report existed. When reaching the experiment cover, they only saw 5 numbers (1 to 5) and had to click on any of them to access the survey. Participation did not receive any financial compensation for their involvement (see Table 2 for the completion rate).

Table no. 2. Completion rate across conditions

Condition	Started	Completed	Target	Completion rate	% of target fulfilment
Monetary Policy Report	60	51	50	85%	102%
ECB Visual Summary – subjective	69	67	50	97%	134%
ECB Visual Summary – objective	60	53	50	88%	106%
ECB Relatable Summary – subjective	62	58	50	93%	116%
ECB Relatable Summary – objective	60	52	50	87%	104%

The performance of the four alternative texts were compared against the control condition (the Monetary Policy Decision), by analysing the self-reported comprehension scores. Table 3 presents the self-reported comprehension scores for the original report versus the four modified versions.

The control condition (MPR) ranks last, with a self-reported comprehension score of 56.86%. Compared to the MPR, the subjective ECB Relatable Summary improved the average comprehension score by 13%. The highest self-reported comprehension scores rank for the objective versions of the ECB Relatable Summary (participants replied to have understood around 86% of its content) and the ECB Visual Summary (self-reported comprehension score of 83.40%). It seems that participants who read objectively presented information also evaluate it positively, but often participants tend to over-appreciate their understanding

capacity (Druckman and Bjork, 1994). To overcome this possible challenge, we tested the self-reported comprehension scores for each condition against the actual comprehension scores.

Table no. 3. To what extent were you able to understand the content of the material you just read?

Monetary Policy Report	ECB Visual Summary – subjective	ECB Visual Summary – objective	ECB Relatable Summary – subjective	ECB Relatable Summary – objective
56.86%	76.60%	83.40%	70.10%	84.60%

The difference between the self-reported comprehension scores and the actual comprehension scores are visible in Table 4. The original text results in the least number of correct answers (on average, participants had 30.20% of the questions answered correctly). The number of correct answers more than doubled, amounting to 63% for the objectively written Visual Summary and to 70% for the objectively written Relatable summary. The subjective summaries of the simplified versions also ranked better than the original text, with 52.5% correctly answered questions for the subjective Visual Summary and 45% for the subjective Relatable Summary. This makes it clear that texts which are more readable are also more understandable for the public.

For each text, the self-reported comprehension scores were higher than the actual comprehension scores, findings with stand in accordance with Druckman and Bjork (1994) who demonstrated that subjects often tend to over-appreciate their understanding capacity. The smallest difference between perception and reality is noticeable in the ECB Objective Relatable Summary.

Table no. 4. Self-reported comprehension versus actual comprehension across conditions

Monetary Policy Report	ECB Visual Summary – subjective	ECB Visual Summary – objective	ECB Relatable Summary – subjective	ECB Relatable Summary – objective
56.86%	76.60%	83.40%	70.10%	84.60%
30.20%	52.5%	63%	45%	70%

As for trust, the control condition scored lowest (MPR), with an average score of 6.84, followed by the subjective Visual Summary with an average score of 7.37 and the subjective Relatable Summary with an average score of 7.49. The objective versions scored best once again, but this time, the objective Visual Summary ranked higher than the objective Relatable Summary, with an average score of 7.89 compared to 7.69.

Our results are in line with previous findings from the BoE summaries of the Inflation Report (see Haldane and McMahon, 2018), by relying on self-reported comprehension questions. As according to Loewenstein et. al (2013), people overestimate their text understanding capacity, tested understanding is thus more accurate than self-reported understanding. We also adapted our questions to previous literature (Bholat, 2018), to ease results comparison. The control condition (MPR) ranks last, with a self-reported comprehension score of 56.86%. Compared to the MPR, the subjective ECB Relatable Summary improved the average comprehension score by 13%. The findings also confirm the results of Bholat (2018) and Haldane and McMahon (2018) who obtained the highest scores for the Relatable Summary. Participants' text perception highlights the fact that texts are easier readable and visually attractive texts improving citizens' perception compared to the original one (the Monetary Policy decision), for which 56% of the participants stated that their perception remained unchanged, 24% of the participants stating that their perception worsened, no participants noting any perception improvement. The best performing text versions in terms of perception were the objective versions, with the Objective Relatable Summary having the best effect. This is in line with the findings of Bholat (2018).

Conclusions

From a theoretical perspective the paper enhances the stakeholder theory, usually applied to businesses, but also possible to be used for EU institutions like the ECB. Citizens represent probably the largest and most sensitive stakeholder group for the ECB and any other central bank, and although they do not actually are primary stakeholders, their opinion always count indirectly. Citizens' opinions are increasingly vocal due to increased digitalisation. Increased communication efficiency is directly proportional to improved citizen trust and understanding, mirroring similar studies done for the BoE and reproducing them for the BCE.

From a managerial perceptive, this paper highlights the necessity of improving citizen oriented central bank reports, like Monetary Policy decisions, Quarterly Statements, Annual Reports texts, increasing their visual attractiveness and understandability, regardless of citizens education background. Central banks should always rely on objectively presented information as such text versions performed better than subjective ones according to our findings. This is probably due the fact that citizens who read economic or financial news can easier understand a text best if the information is presented in a clear, clean, concise, and objective manner. When comparing different text versions, the relatable version scored better in terms of self-reported comprehension and actual comprehension levels: the text was the easiest one to understand according to the Flesch-Kincaid metrics, as it relied on simple words, plain English, and short sentences. Relatability was measured in terms of using pronouns to help participants relate to the information (readers being referred as "you"), but also on explaining ECB decisions in a smooth and simple way, so that participants can more simply relate to (for example, the change in inflation was explained by giving the example of the yearly change in prices).

Among the study's limitations, we can highlight the fact that the research was conducted only on German citizens, future studies should also investigate participants from different countries. We also refer to participants from one cultural context, but other studies could make cross-generational and/or cross-cultural comparisons of central banks official reports understand levels. Furthermore, it would be interesting to investigate the understanding of ECB reports compared to national central bank reports. Another limitation regards the fact that we tested our idea on a relatively small sample of 50 participants per condition. Future studies could both increase the number of participants per condition, as well as ensure an even participants distribution in terms of age, location, income, or education level.

Future studies could also investigate why participants tend not to trust information coming directly from the ECB as much as information coming from a different, unlabelled, and ungiven source. This might be due the fact that citizens of contemporary society tend to rely on more messages via social media and press and not access them directly from the central bank website. Therefore, we consider that further research is needed to explore how the messenger effect (according to which people assign different importance to information, based on its sender) can be used to favour the central banks communication strategies.

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Mapping the Research Agenda of Small Business Risks

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Abstract

The paper's objectives were to determine, from a statistical viewpoint, the core research papers on the subject of small business risk, and to elaborate the mapping of the principal types of risk discovered. In order to achieve the stated result, a bibliometric analysis was performed on the topic of small business risk, and all the forms considered by the authors. The query generated 508 articles, identified in the WoS database. The mapping of the keywords was realized with the help of Vosviewer. The interest in the topic has grown since 1990, reaching a maximum of 51 papers in 2021**.** The literature was split into two clusters, one covering the impact of the markets and the financial risk, the second one focusing on the entrepreneurial and strategic risk. The originality resides in finding the risk associated with a small business, generating a mapping of the possible uncertainty facing a firm. The usefulness of the paper could be found in the compact display of risks that might be encountered by a small business, from which business owners or managers can prepare a strategy, especially in unpredictable environments induced by the Covid pandemic and the high level of inflation.

Keywords: small business, risk, bibliometric analysis, keywords analysis, financial risk.

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Introduction

A small business is the type of enterprise that employs a maximum of 50 people and has a revenue of no more than 10 million euros; or does not exceed the limit of 10 million euros for the asset owned (European Commission, 2019). The definition is applicable if the firm operates in the European Union. According to the U.S. Small Business Administration, the criteria change for an American enterprise. The classification takes into account the sector of the firm, to better differentiate the organizations. The ranges for the numbers of employees or the revenue varies, but as a general rule, the revenue cannot exceed 41.5 million dollars, and the number of workers cannot be greater than 1,500; the financial institutions have a particular distinction, with the limit capped at 600 million dollars in assets. The same complex type of definition can be found in the legislation of the Peoples Republic of China. The upper limit value ranges for revenue could be between 1 and 4 billion yuan, with the number of employees between 100 and 400 people (Yang, et al., 2006). It can be noted that a unified definition across the globe does not exist; each country or union of states prefers a different approach, based on the economical particularities of the region.

Fairlie (2020) discovered that in the first months of the Covid pandemic, the number of active business owners of small firms has drop by 22%, suggesting that the businesses were not prepared for such risk. Despite the unique character of the 2020 economic situation, the data shows a lack of capability to react in the face of the unknown. Taking into account that small business managers have only worked for one or two firms over their carrier (Harel, 2021), a deficit in the risk management techniques is more likely to be present, given the lack of diversity regarding other organizations experiences. Therefore, understanding the risks is essential for increasing the chance of survival of the firm.

The business risk could be defined as the chance of a firm not meeting the sought result due to internal or external elements, endangering the firm profitability and even the prospects of the organization (Paino, et

al., 2014). Another definition was suggested by ACCA, in which the business risk would be represented by significant conditions, actions, events, or inactions that would negatively influence the firm's ability to meet the set objectives. The same approach could be encountered in the ISO 31000 standard, where the business risk could be found as the effect of uncertainty on objectives. Estimations from Eurostat suggest that over 99% of all businesses in the European Union are small and medium enterprises (SMEs), and almost 66% of the working population is employed by an SME (Papadopoulos, et al., 2018). Identifying the risks for the SMEs becomes a matter of economic and social interest; a systemic failure at the level of SMEs could have a crippling effect on the entire economy.

The objectives of the bibliometric analysis presented in the following chapters are to elaborate a keyword analysis, in order to identify the risks associated with the smaller firms and to study the highest cited papers on the topic, to determine the types of risks that prove to be specifics to small business.

The paper is structured as follows: after the introduction, a review of the papers with similar topics is conducted, to establish the current state of knowledge on the subject. The third chapter presents the objectives of the paper and the methodology for the techniques utilized. The fourth part represents the data analysis, with the last chapter being the conclusion of the study.

1. Review of the scientific literature

The undiscovered risks for the small business could create the perfect environment for the failure of the firm, so an understanding of the subject is essential. On the topic of small business risk, only this research discovered around 900 related works, therefore the study of each paper would assume a considerable allocation of time. Therefore, a bibliometric analysis is used to speed up the process and create a map of the research agenda on the proposed topic. A bibliometric review can be defined as the statistical analysis of several published papers with the purpose of underling the trends for a particular topic (Ferreira, et al., 2021), therefore a bibliometric analysis is a quantitative technique with the objective of identifying, describing and evaluating the research published (Bretas & Alon, 2021). Haustein and Larivière (2015) mentioned that a bibliometric analysis is predisposed to certain alterations of the database. Techniques such as increasing the number of publications, by publishing fragments of the same research across multiple journals, self-plagiarism, ghost or honorary authorship, explained by the authors as listing a researcher that does not meet the authorship criteria or not mentioning the researchers that do, could impact the result of the bibliometric research.

In the analysis of the papers regarding the topic of the small business particularities and risks, it has been found that some of the articles are reviewing only the familial enterprise. The interest in the topic of family business is growing, particularly between 2010 and 2019, with a concentration of around 75% of the total 116 papers analyzed being published in the mentioned period. (Casprini, et al., 2020). Ferreira et al. (2021) identify the same distribution as the analyzed area, with the majority of the publication on the topic of family business sustainability being published between 2013 and 2019. The bibliometric study showed that four clusters appeared, the groups being the family business capital, family business strategy, family business social responsibility and family business succession. Abbas et al. (2021), have found risks for SMEs in chemical outputs of the manufacturing process, in climate-related threats, or in the rapid change of the economic and social environments. As previous research points out, the interest in the subject of SME and risk management is picking up momentum, especially after 2015.

The most studied risk management areas have been enterprise, financial and supply chain-related, while disaster and engineering avenues were ignored. (Lima, et al., 2019). According to the same study, at the level of SME, risk management is performed by utilizing reactive types of tools and techniques, as opposed to a more preventive approach. Da Silva, et al. (2021) hint at a lack of availability for start-ups' historical financial data, arguing that for the gathering of information, questionnaires and alternative methods are needed, which could lead an outside analysis to a potentially misleading conclusion. Syed and Bawazir (2021) have discovered that the financial crisis is the most used in the publication on a topic of financial risk. The keyword is used in conjunction with concepts such as credit risk and entrepreneurship. Entrepreneurship, together with web services and poverty, are considered factors of failure for a business (Farias, et al., 2021). Research on the topic of small business risk is scarce (Abbas, et al., 2021; Ferreira, et al., 2021), therefore future development in the area is necessary for a better understanding of the uncertainty. It was observed that the majority of the papers are from 2019-2021, indicating a shift in the general interest of the researchers, considering the higher density in the analysis. Regarding the specificity of the problems facing a small business, the majority of publications treating the risk factors for the smaller firms group together the small and medium organizations.

2. Research methodology

The objectives of the paper are to elaborate a keyword analysis to identify the risk trends for the smaller firms and to realize a mapping of the types of risks that are specific to small businesses. The Web of Science (WoS) database was selected as the source for the bibliometric data. The reasons behind the choice were represented by the fact that the database is covering a larger period and the focus of the journals included are science, technology, social sciences, arts and humanities (Falagas, et al., 2008). The lower percentages of duplicated entries, as shown by Pranckute and Raminta (2021), were also a factor taken into consideration.

The query was conducted on December 12, 2021. The criteria for the filtering of the data are presented next, in order of application. The parameters "Small business", "Small organization", "Small firm", and "Small enterprise", in conjunction with "Risk", "Uncertainty", "Danger", "Threat" and "Hurdle" were selected as the first filter. The parameters are considered the most significant in order to meet the theme of the paper. The output generated was represented by 889 initial results. Regarding the type of document, only articles were selected, due to a greater level of quality perceived. As a result, only 726 documents were retained. The WoS categories chosen were "Business", "Management", "Economics", "Business finance", and "Operation Research Management Science". The selection of the categories was made on the basis that the classifications represent the focus area of the research. The final query result was 508 articles. The generated results were downloaded as a Plain Text file, the following processing being realized with the use of Microsoft Excel, VOSViewer, version 1.6.17 and Publish or Perish 8.

3. Results and discussion

To present the finding of the analysis, the following chapter is divided into three subsections, the statistical data regarding the dataset, the keyword analysis, and the risk factors identified by studying the highest twenty cited works.

3.1 . Statistical data

From a quantitative perspective, the journal Small Business Economics was identified as the most prolific, contributing with 42 papers, representing approximately 8%. By analyzing the topic covered by Small Business Economics, the phenomenon can be explained. The papers published in the journal cover themes such as entrepreneurship, new-venture creation, family firms, and small and medium enterprises. Small Business Economics was identified as the most prolific, if the whole data set is considered, based on the number of citations. If only the most prolific papers, ranked by citations, are analyzed, it can be noted that the Journal of Business Venturing participated with five papers, with themes regarding the risk of the small business.

The average number of citations per article was 33.81, but from the perspective of the most cited papers, twenty articles account for more than half of the total citations. By analyzing the titles and the abstracts of the articles, it can be noted that the central topic was the finances of the small business, either from the lending perspective or from a stock market perspective. United States of America, United Kingdom and Nederland were dominating the geographical distributions, with a combined 276 articles. If from a pure quantitative distribution the disparities were not big, from the perspective of the number of citations the distribution was dominated by the top three countries, accounting for 18% of the citations. In order to better understand the impact of the papers, the h-index (Hirsch, 2005) was calculated for the data set. For the index to be calculated, the query results were imported to the software solution Publish or Perish (PoP) (Harzing, 2007). The index h was 66 for the papers analyzed, meaning that 66 papers have at least 66 citations each. It can be noted that the g-index for the data set calculated by PoP was 138. If the h-index and the g-index were analyzed together, it appears that the most cited papers amount to a higher percentage of the total citation.

The distribution in time can be seen in Figure no**.** 1. In order to realize the chronological evolution, 16 papers were considered to belong to the 2020-2021 interval. One paper was available in 2020, the rest being published in 2021. The 16 papers were not registered with a publication year in the data set available from WoS. Analyzing Figure no**.** 1, a rise in the number of papers was identified, with a sharp decline around 2006, with only two papers published. On average, in the period between 1990 and 2021, 29.88 publications per year were available.

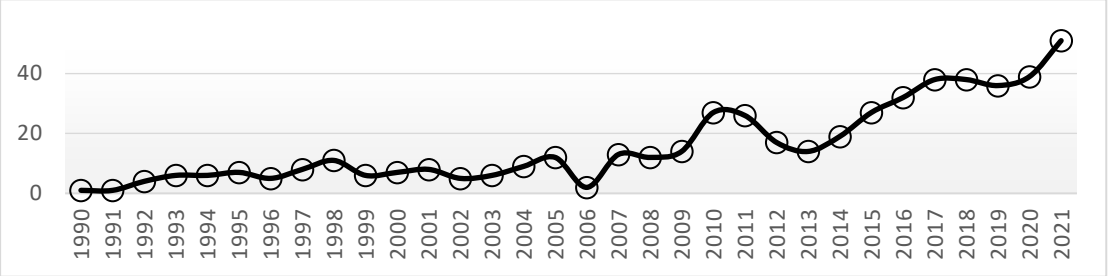


Figure no. 1. Distribution of publications over time
Source: made by the authors

3.2 Keywords analysis

In order to realize the analysis of the keywords, the data generated from WOS was processed with the help of the software VosViewer. For a better representation of the keywords, the keywords plus parameter was utilized in the analysis. The initial result of the processing was 1171 keywords. Given the large volume generated, only those keywords that were present in at least 20 articles were considered. Taking into consideration the aforementioned restrictions, 26 keywords were considered.

The following list of keywords was removed from the analysis, with the purpose of a more accurate representation. Risk, determinants, small business, impact, firms, model, uncertainty, and SMEs were thereby eliminated from the analysis The similar meaning to the parameters of the query of the keywords represent the justification for the exclusion. It has to be expected that the words used as initial filters were going to appear in the abstract or body of the articles selected. The keywords market and markets were discovered, but since the second is the plural form of the first, they were merged. The graph generated as a result consisted of 18 nodes, grouped in two clusters, as shown in Figure no**.** 2.

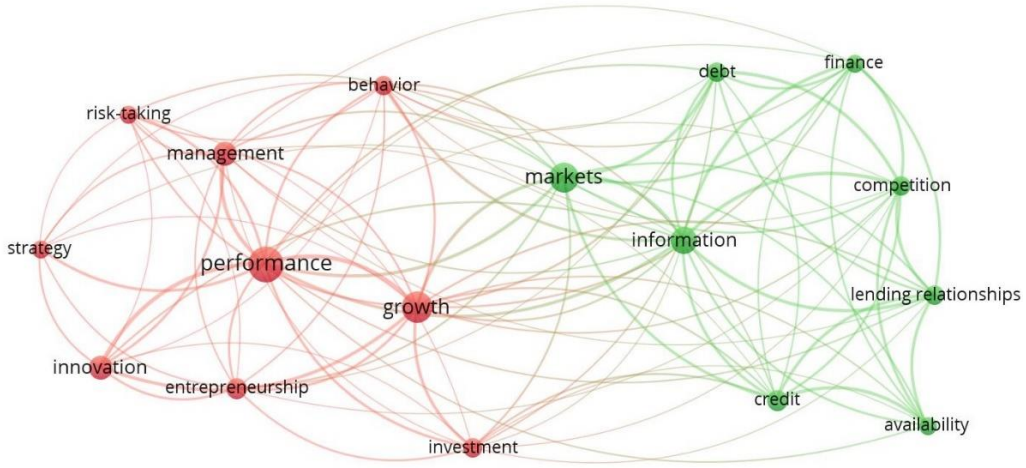


Figure no. 2. Keyword graph
Source: made by the authors with VOSviewer

The most occurring keyword was performance, appearing in 83 articles from the total of 508 papers, being utilized in approximately 16% of the articles. The following keywords, sorted by the number of occurrences were growth, information and markets. The red cluster is comprised of nine nodes, with the central focus on performance. The cluster has a theme related to the weak points that might appear in the economic life of a small business. Concepts such as innovation, entrepreneurship, management or risk-taking hints at a source of risk in the attitude of the firm or the talent and skills of the entrepreneur. The green cluster is formed by eight nodes, with the most important being markets. The focus of the cluster is the threats that a small company can encounter. The markets in which the firm is operating can be considered a risk. An unpredictable or hostile market, in correlation with a lack of information, can damage the growth potential of a small business, or even create the condition for bankruptcy. As a secondary avenue of thought, the financial element can be identified. In a competitive environment is paramount that a business, especially

a small one, have access to sources of financing in order to mitigate the effect of the competition or to fuel its own innovation.

From a chronological perspective, the centre of interest is switching from strategy and markets to a more entrepreneurial focus as time moves forward, as seen in Figure no. 3.

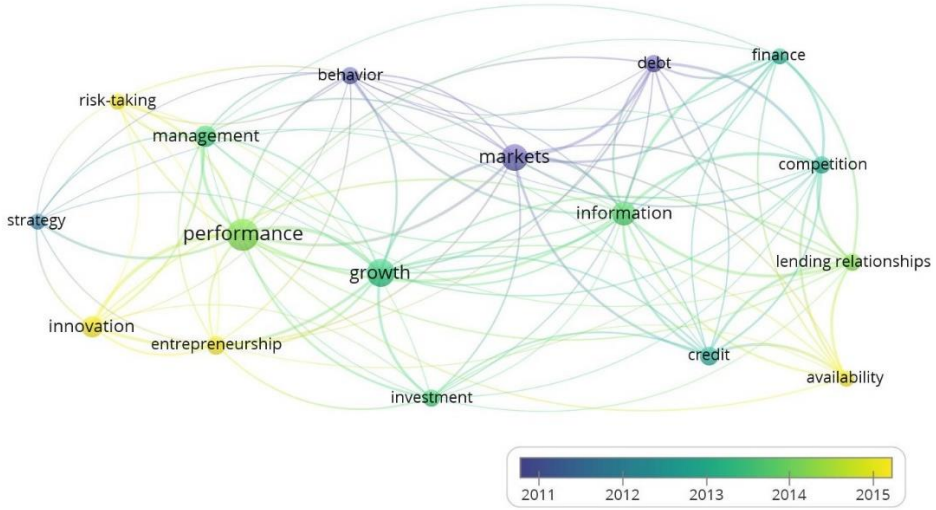


Figure no. 3. Keyword occurrence over time
Source: made by the authors with VOSviewer

3.3 Risk factors

In order to better understand the risk associated with the small business, the most cited 20 articles were analyzed. The selected articles represent 52% of the total citation of the papers selected for the analysis.

Small businesses are in general assimilated to the bigger category of SMEs, and subsequently, the risk is considered similar. The difference in size could lead to different manifestations or varied impacts on the business, therefore only those risks which affect the small firms, or have a greater impact, were selected. Market liquidity, as proven by Amihud (2000), affects in a greater proportion the small businesses, in an illiquid period, a bigger capitalization stock is preferred to a small-cap company. As demonstrated by Kroner and Ng (1998), the performance of a large company, regarding stock price, is a direct factor in the expected return of a small business. Contractionary policies are shown to have a higher impact on the activity of a smaller capitalized bank (Kishan & Opiela, 2000), and therefore fewer options of financing are going to be available for a small business in periods of economic downturn.

Information opacity, define as the absence of the firm's data, was identified as a risk factor. A transparent organization has a greater chance of securing financing from financial institutions or angel investors, as opposed to a more undisclosed competitor (Berger & Udell, 1998). Taken in correlation with the tendencies of market focus on bigger cap companies during periods in which the money is scarce in the economy, a lack of financing opportunities can damage the survival prospect of the firm.

Financing sources appear as the central theme of the most cited three articles. Berger and Udell (1995) consider bank defaults as risks for small borrowers, a failure in the financial system could create a shortage of available money. Berger and Udell (2002) identify that a smaller bank is more likely to lend to a small business. Even if a financial institution develops in size and is more inclined to terminate the agreements with small businesses, the dropped arrangement between the bank and the small firm is picked by other, less financially potent, banks. As proven by Kishan and Opiela (2000), smaller banks are more likely to have financing difficulties when the market is unfavourable, with fewer options being available for small firms. Continuing on the idea that a small business is more affected by the financial market as a whole, a financing opportunity is more costly for a smaller enterprise compared to a mature firm in a business relationship that has no prior contacts (Bharath, et al., 2011). In periods characterized by a lack of financing sources, the financial capacity of the shareholders can be a decisive factor in the rate of success of a small firm, especially in the earlier stages of the business (Romano, et al., 2001). Keeping the theme of money availability, a firm with a higher fixed asset ratio is more likely to receive financial support from a bank in the form of a long-term loan, as opposed to a more inventory-focused enterprise (Michaelas, et al., 1999).

Mixed strategies are proven as an inefficient way of running a small business. As shown by Ebben and Johnson (2005), the cumulative use of both efficient strategies and flexibility strategies is detrimental to

the well-being of the organization. There is no particular type of strategy to be preferred; a small business should focus on either one or the other and maintain the choice. Regarding small business strategy for innovation, a small firm, which was emulating the comportment regarding innovation of a large enterprise, was likely to fail to discover or develop a new product (Berends, et al., 2014). Instead of trying to predict from the start the path of innovation, a small firm should approach the development with a more open-ended mentality, keeping a new path of exploration open in every step of the process.

Access to large markets is considered a risk-inducing phenomenon. The lack of systems that allow small businesses to penetrate markets in largely populated areas can affect the propagation and development of new ideas. In addition, the collaboration between governments, business leaders, universities and other public institutions is paramount, in order to establish a more entrepreneurial-friendly environment (Venkataraman, 2004).

Occupational health represents a risk for a small business, 77% of small firms do not have a designated employee that was responsible for occupational health and safety management, other than the owner (Champoux & Brun, 2003). The cost of prevention is not the primary reason for the lack of occupational health management, but instead the lack of recognition by the owners. The tendency to underestimate the risk potential of a particular venture of an entrepreneur was also discovered by Palich and Bagby (1995).

The methods used for the data collection for the most cited papers were consultation on the publicly available data, mailed questionnaires or interviews. In order to analyze the collected data, techniques and methods such as principal components analysis, confirmatory factor analysis, structural equation modelling or ANCOVA were used. In general, statistical analysis was performed in order to interpret the data.

The focus of the papers was on particular aspects of the economic life of a small business, but analyzed at the level of the entire economy. In the cases where innovation or entrepreneurship was the topic, the analysis was performed as a case study. The primary interest was the impact of money availability on the operation of the small business. In general, the purpose was to identify the factors that can create risk for a small enterprise.

Conclusions

The purpose of the paper was to elaborate a keyword analysis in order to identify the risk trends and to realize the mapping of the principal types of risk discovered by the academic world. The query result, and the base for the paper, was represented by 508 articles.

From a statistical point of view, Small Business Economics was discovered to be the most prolific journal, in both the number of publications and the volume of the citations. Researchers from U.S., U.K. and Nederland provided the most articles with topics related to small business risk.

The keyword analysis identified performance as the most used concept. Two clusters emerged, with the biggest referring to the attitude of the firm towards risk, the other having a financial central theme.

In the pursuit of better identification of the risk associated with small business, the most cited twenty papers were studied. From the selection, a list of risks emerged, such as market liquidity, information opacity, financing sources, contractionary policy or mixed strategies. The underlining trend appears to hint at the financial aspect of a business as the primary risk. Access to financing or the capacity of the firm to manage the financial resource appear to have the biggest impact on the rate of success of a small firm.

In the process of realizing this paper, a surprisingly low number of publications appear with topics tangent to small business risk. It seems as if the subject is understudied, but as mentioned in the introduction, the focus of the researchers seems to be shifting towards the smaller firms.

As future research avenues which can be developed, the risk that a crisis, either a financial one (as the housing crisis of 2008) or a health-related one (such as the current Covid situation), could pose to a small business should be considered. Also, is to be investigated if the liquidity of the market is affecting the more digital business environment as much as traditional ways of conducting business.

The application of this paper resides in the summary of the most encountered risks in the academic world, in order for the business owner or managers to better understand the uncertainty. Given that most enterprises are SMEs, risk management is one of the more important activities to be undertaken by a firm. Therefore, understanding what types of risks a business can encounter would give the management of the business some guidelines on the actual or future dangers, permitting them to have more time to prepare if these risks would appear.

The lack of specific analysis in the field of only the small business area is showing the tendency of grouping the smaller firms with medium size ventures under the umbrella of SMEs. Is to be determined if there are major differences between the types of risks encountered by the two particulars typology of firms.

The limitation of the paper resides in the selection of the keywords, which could not account for all the different aspects regarding small business risk. The use of one database (WoS) and the category selections are representing other limitations. Papers that are not included in WoS or are categorized under a different label from the four used were not taken into consideration.

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Task-Based Language Teaching – Problems with Oral Communication in English for Specific Purposes

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Abstract

The goal of task-based language teaching which is a student-centered perspective is to use, rehearse and polish authentic language to accomplish meaningful tasks. During task-based teaching the focus is no longer on teaching grammar or vocabulary, but rather on producing spontaneous, creative spoken or written language using interaction activities. Differently stated, communication plays an important role since students realize that language is a tool to master and (re)solve real-life situations. During the 1980s, the communicative approach focussed mainly on developing skills in which conversation was believed to be synonymous with practicing the grammar, vocabulary, and functions students have learned so far. Most teachers are used to the P(resent) P(ractice) P(roduce) pattern and are also aware of the serious setbacks for the PPP. This method is a very simplified, accessible approach to language teaching/ learning. The drawbacks of such a method outline the fact that we cannot foretell or even grant what our students will learn, because constraining their skills, proficiency, and participation to single chunks of the target language is abnormal and artificial and that ultimately, high exposure to the target language is the best possible solution to make sure that students will learn, develop and use it efficiently and effectively. The purpose of this paper is to examine the suitability and usefulness of task-based language teaching applied to English for Specific Purposes. The research makes use of the descriptive, exploratory content analysis methods, namely critical/rhetorical and creative, performance studies. The research results will enhance the importance and relevance of task-based language teaching. Remarks from this scientific paper may be an outset source for furthermore detailed research.

Keywords: English for Specific Purposes (ESP), Present Practice Produce (PPP), task-based language teaching, Know Want Learn (KWL).

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Introduction

How is task-based teaching defined over the years?

Here are some examples of how scientists in the field have defined the concept “task”. According to Nunan (1989, p.10), a task is “a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is primarily focused on meaning rather than form”. From this point of view, students will bring into play their prior knowledge to achieve their goal; whereas the teacher will provide all the information needed, namely linguistic forms or vocabulary.

For Willis (1996, p. 23) a task is defined as an activity “where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome”. Differently stated, in this meaning-based approach students are encouraged to express their thoughts/ideas/feelings even though some of the language used is inaccurate.

Currently, the most broadly used and widely accepted definition is that of Van den Branden (2006, p. 4) according to which a task is “an activity in which a person engages in order to attain an objective, and which necessitates the use of language” which means that the language activity will focus on meaning, as the language is the means, not the end.

Teaching oral communication to ESP students entails a mixture of activities ranging from formal presentations to participating in meetings. Oral communication activities can have many configurations, ranging from an informal talk that occurs spontaneously and impulsively and for which the content cannot be usually forecast, to participation in meetings, which arise in an organized environment, regularly with a prearranged agenda.

Now ask yourselves: how many times have you allowed your ESP students to chat about things they are interested in, which are connected to their life experiences or find appealing? Synchronous communication or chatting has proven over the years to ensure a more efficient task performance by reducing learners' anxiety and establishing trust.

1. Literature review

Nowadays, the conversation/ talk/ speaking should be described as "a time when two or more people have the right to talk and listen without having to follow a fixed schedule. In everyday life, we refer to a conversation as a chat" (Nolasco and Arthur, 1987, p.12).

The concept of task-based language teaching has been given an excessive amount of definitions over the years (see also Ellis, R., 2003, pp. 1-22 or Samuda and Bygate, 2008, pp. 62-70, Rahman, M., 2010, pp. 1-11), but we agree with Van den Branden's definition (2006, p. 4) because to attain successful communication when dealing with real-life communicative situations you as a teacher will have to design your lessons, not just class activities, for genuine communication.

According to Rahman, (2010, p. 4), since the mid-1980s, the concept of "task-based language learning and teaching" has suffered a tremendous evolution (Willis, 1996; Skehan, 1998a; and Bygate, Skehan and Swain, 2000a). The term 'task' plays an important role to second language acquisition (SLA) researchers and language teachers (Pica, 1997) because it is regarded both as a method of rationally withdrawing patterns of learner language for research purposes (Corder, 1981) and as a means for systemizing the content and methodology of language teaching (Prabhu, 1987).

According to Willis, (1996, pp. 35–6), there are at least eight purposes related to task-based language teaching. They are all meant:

- to build and give learners confidence in trying out and testing whatever language they know; you need to remember that training and mastering their confidence as well as mastering the language forges with time, practice, and patience.

- to offer learners experience of spontaneous interaction; interaction helps learners enhance their language learning and social skills, which means that the teacher's role is fundamental in maximising interaction by means of pair and group work, collaboration, and socialisation tasks. For instance, information gap activities are good examples of a motivating, stimulating, and collaborative approach that supports both realistic language use and interaction.

- to allow learners to profit from noticing how others convey similar meanings; noticing and outlining what's going well during the lecture can have a powerful, positive outcome, and eventually, students will feel much safer, more respected, confident, appreciated, and excited about language learning.

- to offer learners the opportunities for negotiating turns to speak; negotiation skills involve much more than open-ended questioning and can be regarded as a stream of communication back as well as forth that occurs between students concerning the relevance of the things they will be negotiating or exchanging.

- to engage learners in using language purposefully and cooperatively; this means that the teacher will select the appropriate topics and materials that satisfy their skills, competencies, and interests, whereas students will be offered equal chances to use the language.

- to make learners participate in a complete interaction, not just one-off sentences; since oral communication is mainly seen as a person' s ability to act reciprocally with their colleagues by means of spoken words while engaged in personal, formal, or informal discussions, fruitful, high-yielding oral presentations, telephone conversations, and interviews, students are supposed to share and exchange ideas, thoughts, feelings, and information or the long and the short of it to communicate, as well as exert influence on others through verbal and nonverbal body language.

- to give learners chances to try out communication strategies; whether they are dealing with verbal, non-verbal, or written communication, students should be able to express and communicate information both efficiently and effectively.

- last, but not least, to develop learners' confidence and trust that they can achieve communicative goals; bear in mind that settling the appropriate goals will help you establish the pace required to get there, giving you the enthusiasm and motivation to try harder each day.

The purposes mentioned above are associated with two main goals, namely communicative effectiveness, and second language acquisition. Only one of the eight purposes is basically related to communicative effectiveness; the rest of them are correlated with second language acquisition. Hence, the widespread belief among language teachers that task-based teaching is predominantly focusing on strengthening students' abilities and competencies to practice and use the target language rather than on assisting them to acquire new linguistic skills (Samuda, 2000).

2. Methodology

The research was carried out using the descriptive and exploratory content analysis methods, namely critical/rhetorical and creative, performance studies focusing on texts. Broadly speaking, the term texts refers to any communication artifact, ranging from films to photos or new stories used by this author to support the debate that the text plays an important role in the construction of student's comprehension of the world or in getting students involved in performing everyday life tasks.

3. Case study: Problems with oral communication in ESP

Moreover, the role of the teacher remains vital in the design of appropriate tasks that not only meet learner needs but also stimulate their active participation in the learning process. In general, you have a task like this one: *Talk to your partner and discuss which hand tools would construction workers use to build a house? You have 5 minutes to try to agree or disagree* (Ionitiu, 2020, p. 5). Now picture yourselves trying to perform this task and ask yourselves the following question: Why would you have little to say? Because this is actually what would happen to most of your ESP students. Even if speaking is generally left at the end of your lecture, many times students may not find these things appealing to talk about.

After 18 years of teaching and after consulting my colleagues about the problems they have with speaking activities the answers provided were basically the same:

- Students don't want to participate and get involved in the activity because they are afraid of public speaking and that their colleagues might judge them. In other words, the solution to getting students to engage in a vibrant discussion is to create a truly safe space by erasing any assessment of their performance.

- Students make a lot of mistakes and they worry that an incorrect answer will question their intelligence. Therefore, you need to pay attention to what, how often, and how much you are correcting them because otherwise if you keep correcting them all the time, students will feel overcome by their mistakes and eventually will stop talking and getting involved in any task. Thus, by creating a friendly atmosphere that focuses on discussion rather than on perfection, your students' anxiety levels will drop and they will feel less frightened to speak in front of the class.

- Students prefer to use their L1.

- Students speak or use at least one or two words like I agree/ disagree, which is neither productive nor encouraging because this is not verbal interaction.

- Students don't speak because they have nothing important or valuable to say or share with their peers. You need to encourage them by telling them that their opinions, reflections, or judgments are gladly received even though they disagree with yours or their colleagues'.

Why would they experience all these? There are some possible reasons:

- Maybe they are unacquainted with the program or the task and, in most cases, they don't want to take any risks to make any mistakes.

- They lack awareness of what it takes to speak in L2.

- They are afraid of being ridiculed – for instance, they don't speak because other people would make fun of them because of their pronunciation, grammar, and vocabulary.

- They lack adequate preparation – you can't simply tell them to talk, you need to give them time to prepare.

- The purpose of the task is unclear or unrealistic.

- They lack the proper scaffolding – that is to say as a teacher you will assist and enable your students to become more independent, more autonomous language users.

When you design your lecture or even coursebook, to progressively transfer control over speaking to your ESP students, bear in mind that your activities should focus on meaning at all times. However, you should offer opportunities to practice both forms (which means that you will have to teach the grammar that students need for that specific topic in that communicative situation or context) and focus on implicit knowledge without disregarding explicit knowledge. Focus on forms is extremely useful for sustained L2 development because students are at the stage of consciously noticing linguistic elements, but do not design your speaking activities as a further practice of grammar and vocabulary.

Furthermore, during the lecture remember to expose your ESP students to a wide range of naturally occurring language which is fundamental altogether with offering them the chance to use it, to interact with their peers. Most of the oral communicative activities are done in pairs. For instance: Talk to your partner about ground conditions. This is an imposed theme, giving students no opportunity of being spontaneous. Moreover, conversation in real life happens in groups and perhaps we should explore and design our speaking activities based on this reality and instead of using pair-work activities we should design group-work activities that are more productive, motivated, and fruitful.

Apart from focusing on your ESP students' Learning needs and goals, there are several questions to address while selecting a topic:

- What should students be able to do with the topic?

- What can students bring to this topic? – in our case current communicative ability or articulating and producing authentic language by means of verbal interactions.

- What can students learn from the topic? – learning the language through the topic: grammar, vocabulary, pronunciation; learning the skills. Bear in mind that we are no longer training our ESP students for what we want them to be able to do, but we are preparing them to be remarkable, successful, and appreciated in their future careers.

So, how do I get my students to speak productively? Are there any methods to inspire conversation or to practice and stimulate my ESP students to engage in a conversation/ debate? Simply, by following the *A-B-C of communication* which means:

- *Activate* what your students already know, so they can move one step further. This means you will have to stimulate their prior knowledge by drawing out from your students what they know and forging the initial knowledge that they need as a means of approaching the forthcoming content. There are many ways of tapping prior knowledge such as K(now)W(ant)L(earn) charts focusing on what they know, what they want to know, and what they have learnt, anticipation guiding activities which could be a list of statements students will have to agree or disagree on.

- *Bridge* activities to take them where they need to go. At this stage, you can focus your teaching on problem-solving activities, strategic team-building activities, and creative or even virtual team-building activities to proactively engage your team in a speaking task. The advantages of team-building activities would be to strengthen their trust and constructive criticism by speaking up without being afraid of the repercussions.

- *Communication* for real. To boost your students' self-esteem or trust and to improve their decision-making or problem-solving skills, you need to bear in mind that effective communication is more than just exchanging information, is also about being an engaged listener. Learning how to communicate effectively and efficiently is a long process that doesn't take place overnight. It is a continuous and sustained learning process, which is worth developing, no matter how long it lasts.

4. Results and discussion

How to implement this approach?

Now that we have the theoretical background, here is an example of a lecture I have designed in my coursebook English for Civil Engineering. Part II, 2020. The course, focusing on task-based activities, also trains my ESP students to handle and make the most of the language in real-life settings or contexts whether they are involved in professional, social, or academic circumstances. The purpose of the course is to enhance

learners' communication skills, namely interpersonal communication skills such as negotiation skills, decision making, problem-solving skills, assertiveness, and teamwork.

To activate what my ESP students already know, here is a set of activities I have proposed (Figures 1,2).

"Group work activity. Conversation (5 minutes). Look at the pictures below and try to identify/list as many construction tools as possible. Compare your lists.



https://www.google.com/search?source=univ&tbm=isch&q=tools+and+equipment+used+in+civil+engineering+pictures&sa=X&ved=2ahUKEwiqysTj-u3qAhVosYsKHTduD54Q7Al6BAgHECw&biw=1366&bih=657#imgrc=tCZeGm4TkeAUzM."

Figure no. 1. Prediction activities. Making suggestions and decisions. Displaying/ sharing pictures.

Source: Ionitiu, 2020, p.17

This activity is utterly student-led, which means that students will assume all the roles, acting either as a leader, group presenter, observer, or participating members. This type of activity that is labeled a "discussion/debate" activity incorporates both debates and group discussions, together with a little bit of oral presentation.

a. Can you arrange the following words into the correct category: electric tools, masonry tools, protective gear, heavy machinery:

chisels, gloves, pliers, helmets, wrenches, tape measure, trowels, earmuffs, saws, pickaxes, drill, concrete mixers, levels, flat-headed screwdrivers, cranes, paint rollers, shovels.

b. You are refurbishing an old mansion and you need to buy some tools from a nearby local store. Fill in the following equipment purchase request:

requested items	reasons for request/ buying

Figure no. 2. Pre-task. Group-work activity. A classification task

Source: Ionitiu, 2020, p.25

This could be an effective and efficient way of eliciting negotiation of meaning by focusing on new vocabulary. Use at least 3 words in the Pre-task to explain the functions of those tools. Using their own language, giving them time for planning and working in groups, will be a challenging activity as they will have to present their work to the rest of the class. As a teacher, you will have to guide them and decide who will present which part. For instance, you can tell them that one of the groups should talk about electric tools and explain why those tools are suitable for that particular job; another group will talk about masonry tools; the third group about protective gear, and the fourth group about heavy machinery. You could help them by asking additional questions such as (see Table 1):

Table no. 1. Additional questions

What tools could be used for cutting metal and sawing wood? What tools will you use to break up a concrete slab? What safety equipment allows workers to climb on a building?

Source: Ionitiu, 2020, p. 28

To round the A-part, you will ask students to prepare and rehearse what they want to say, to remember to speak clearly, and to be enthusiastic. Further on, as part of the bridge activities, you can include into your lecture listening to and/ or reading the dialogue activity. The purpose of this collaborative task in which the learners are engaged in a constructive dialogue would be to compare and notice the differences between what they did and what they should have done and to integrate what they have learned so far (Table 2). Remember to practice focusing on both accuracy and fluency.

Table no. 2. Dialogue activity

"Listening/ viewing. Watch the video and try to perform the tasks: https://www.youtube.com/watch?v=4o0tqF0jDdo *6.1. After viewing the material, mark the following statements as true (T) or false (F):* a. You can use a hammer and a punch to strike with and make a dimple. b. A ratchet is a driver. c. A Philips screwdriver has a flat tip. d. A ball-pin hammer is used for sawing wood. e. There are three different standard drills. *6.2. Answer the following questions:* a. How many tool families are mentioned in the video? b. What is a double-opening wrench? c. What is the difference between a socket wrench and a ratchet? d. What is the difference between a ball-pin hammer and a carpenter's hammer?"

Source: Ionitiu, 2020, p.16

Last but not least, the purpose of the C-part would be for students to actually communicate. With that in mind, you can design cooperative tasks in which the focus is on how to organize the interaction by means of using roleplay assignments to improve their critical thinking (Table no. 3).

Table no. 3. Roleplay assignments

"Pair work activity – roleplay. Imagine you are a tool supervisor. Talk to your partner about what tools are needed to mend a cabinet. Roleplay activity. Imagine you are a construction worker in need of tools. Ask a shop assistant for help or tool options. Roleplay activity. Imagine you are a building contractor. Talk to your construction site manager about the consequences of not wearing PPE."

Source: Ionitiu, 2020, p. 34

In between the discussion/debate activity, the ESP students are required to prepare, carry out, and present in front of the class an assigned topic. Remember that at the end of the lecture you can assign them relevant homework, as a logical follow-up activity. They might write a reflective, self-critique essay based on their in-class activities.

Conclusions

The tasks illustrated in this paper were widely accepted by most of the ESP students. They found the exposure to real-life situations to be enriching, profitable, rewarding, intrinsically motivated, and educationally useful. If you want to refine your students' oral communication skills, you should design assignments, tasks, and activities that encourage students to communicate, convince, strengthen current attitudes or behaviours, engage and exert influence on others' emotions by using various types of activities, exercises, and practices that stimulate, persuade and inspire the students to use the language in relevant and purposeful situations. Moreover, ESP students should be actively engaged in choosing and sorting out the teaching materials that are suitable for their needs and interests, especially when talking about learning ESP.

To conclude, the task-based approach to teaching oral communication has much potential, but it has a long way to go before it can claim empirical success in the field of second language instruction.

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Sustainability Measures Implemented in the Hotel Industry. Case study: Romania

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Abstract

The paper aims to identify the main quality strategies applied in the accommodation units and discover the opinions, attitudes and perceptions of Romanian tourists regarding the quality strategies and sustainability measures applied in the Hotel Industry. In order to achieve the purpose of the paper, the authors combined an exploratory analysis with a qualitative market research based on a semi-directive in-depth interview. The exploratory analysis aimed to identify the quality strategies and sustainability measures implemented in the Romanian Hotel Industry in recent years. Following this analysis the results show that the most used quality strategies in the hospitality industry are: quality diversification strategy; continuous improvement strategy; quality differentiation strategy and quality certification strategy. The paper shows that sustainability is an important factor for the future of the Hotel Industry, but not all hotels have the resources to implement this concept. An unexpected result of qualitative research shows that most of the interviewed tourists (64.29%) stated that they do not know the concept of quality management. Further, the research results show that although many of the interviewed tourists have heard about sustainability and consider it important, they do not know this concept very well. The majority of respondents (73.81%) defined sustainability as a method of rationally using resources so that they can be used for as long as possible. In the end, based on the results of the paper, the authors recommend that the authorities, as well as the accommodation units, become more involved in the adoption of appropriate sustainable development measures that support the local community and protect the environment. At the same time, actions are needed to educate tourists about the concept of sustainability.

Keywords

Sustainability measures, Quality management, Hotel Industry, Quality certification, Strategy

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Introduction

Tourism is a driving force for some regions (which is behind economic growth). The rapid increase in the number of tourists has both positive and negative consequences in the future. Therefore, the issue of sustainability is frequently discussed in connection with the tourism industry (Jurigová1, Tučková, Kuncová, 2016). The development of unsustainable tourism can lead to serious damage both to the environment, to the entire society, but also to the entire tourism industry (Dutescu et al., 2014). Sustainability is a long-term process and involves the development of medium and long-term strategies and involves increasing the responsibility of companies towards people and the planet (Bratucu et al., 2017).

Quality assurance has become a major priority at both the microeconomic and macroeconomic levels, with more and more companies in the hospitality industry (especially hotel chains) developing their own service standards and implementing various quality strategies. The quality standards were created by the hotel chains out of the desire to ensure a unitary system of facilities, services and staff in order to promote and maintain a brand image. These standards, although they have common elements, differ from one chain to

another, while in the case of independent hotels only some of them have developed their own standards (Cristea, 2009).

The paper aims to identify the main quality strategies applied in the accommodation units and to discover the opinions, attitudes and perceptions of Romanian tourists regarding the quality strategies and sustainability measures applied in the hotel industry. To this end, the authors combined an exploratory analysis with a qualitative market research such as a semi-directive in-depth interview. The procedure used to collect the data in the research was the semi-structured interview, and the interview guide was used as a tool.

In order to achieve its objectives, the paper is organized as follows: a brief review of the literature, research methodology, research results and discussions. The paper ends with the conclusions.

1. Review of the scientific literature

The COVID-19 pandemic has caused significant disruption to businesses around the world, with travel and tourism severely affected. In response, governments and businesses have implemented drastic responses to reduce the impact of the virus and mitigate appropriate business losses (Kenny and Dutt, 2022). The Covid-19 pandemic has been found to have multiple effects on the hotel industry, leaving behind an *uncertain industry* that has turned its attention to *safety and hygiene concerns* to *regain the trust of its guests* (Heredia-Colaço and Rodrigues, 2021).

As competition in the hospitality industry becomes more intense, accommodation units face the challenge of continuously adapting, improving, changing and renewing the range of services, structure and ways of doing business (Iorgulescu and Ravar, 2013). A research paper (Kumar and Sheoran 2021) highlights that the diffusion of innovation in industry has a significant positive influence on the environmental marketing system.

It is found that the *marketing strategies applied* by the units in the hotel industry remain the *main lifeline* that helps them stay in the market. It is already noticeable that consumers are increasingly demanding sustainable tourism products and requiring companies to comply with specific environmental commitments (Sanchez-Ollero, Cappa, Febrero-Panos, 2016). Thus, hotels are increasingly considering *sustainability issues* in their *business models and strategies* (Sakshi et al., 2020). Sustainability has long been a buzzword and is also now one of the *top priorities* of tourism around the world, including for the hotel industry (Scholz, Linderova, Konecna, 2020). The practices applied in order to increase the level of sustainability of activities in the hotel industry refer to the lowest possible consumption of energy from polluting sources and replacement with renewable resources (solar, wind), installation of water meters and possibly automatic batteries that substantially reduce the consumption of water, the implementation of a system for the selective collection and storage of rubbish, the reuse and recycling of certain materials, the predominant use of cloth napkin or reprocessed paper napkin, the use of sustainable materials for the construction of new buildings, or interior and exterior design, as well as training and educating employees to develop sustainable behavior (Ham and Lee, 2011; Doğan et al., 2015; Iamkovaia et al., 2019). Moreover, the units that apply ecological practices manage to solve much more easily the various economic, social and environmental problems that are directly or indirectly determined by the operations carried out (Iamkovaia et al., 2019).

It is observed that sustainability has multiple significant positive effects on the improvement of the activity planning in the Hotel Industry. With the purpose of identify the quality strategies and sustainability measures implemented in the Romanian Hotel Industry, the authors conduct an exploratory analysis. The authors of the article analyzed a number of documents, such as: internal publications and websites of hotel chains and accommodation units, annual reports, industry analyzes and reference materials for the hospitality industry business. Among the analyzed documents are also Romania National Tourism Development Strategy 2019-2030. In this strategy it is estimated that in Romania 75% is business tourism, 6.36% leisure in mountain resorts, 5.34% tours, 2.83% City breaks, 2.48% leisure in seaside resorts. From all the studied materials, the authors identified the most used quality strategies in the hospitality industry, namely:

- The strategy of diversification;
- The continuous improvement strategy;
- The strategy of quality differentiation;
- The certification strategy.

2. Research methodology

The methodology used in this paper combined an exploratory analysis with a qualitative market research such as a semi-directive in-depth interview.

The exploratory analysis aimed at identifying the quality strategies and sustainability measures implemented in the Romanian hotel industry in recent years. For this purpose, internal publications and websites of hotel chains and accommodation units, annual reports, industry analyzes and reference materials for business in the hospitality industry were studied.

The qualitative research aimed at determine the opinions, perceptions and attitudes of Romanian tourists regarding the quality strategies and sustainability measures applied in the Hotel Industry. The procedure used in the research was the semi-structured interview, and the interview guide was used as a tool.

The specific objectives pursued by the research were:

- Determining the opinions and perceptions of Romanian tourists regarding the hotel services market;
- Identify the opinions of tourists regarding the quality strategies applied by the accommodation units;
- Identifying the attitudes and perceptions of tourists regarding the sustainability measures implemented in the Hotel Industry;
- Determining the opinions of tourists regarding the services of the food units within the accommodation units.

The researched population consists of all adults in Romania, who have traveled in the last 5 years at least twice and have used the services of tourist reception units. The sample included 42 subjects selected on the basis of compatibility with the general purpose and objectives of the research. The semi-directive in-depth interview was conducted face to face between January and February 2022. The interviews were conducted based on the interview guide that came out of the purpose of the study and the objectives. The authors sought detailed information on all aspects of the subject under investigation and to achieve the specific objectives. Each interview lasted 40-50 minutes. The answers obtained were recorded and stored in electronic files. Subsequently, these files were transcribed, the information being processed by the technique known as content analysis.

Table 1 shows the demographic characterization of the sample of respondents. It is structured as follows: 57.14% women (respectively 24 people) and 42.86% men (respectively 18 people), of which 59.52% are from urban areas and 40.48% from rural areas.

Tabel no. 1. Descriptive statistics

Percent (%)	Percent (%)
Gender Male 42.86% Female 57.14%	**Age** 25 or below 11.90% 26 - 35 21.43% 36 – 45 23.81% 46 – 60 23.81% 60 or above 19.05%
Place of Residence Rural 40.48% Urban 59.52%	

Source: Authors' own research

3. Results and discussion

Hoteliers, depending on market conditions to gain a competitive advantage, adopt different quality strategies. The authors identified the most used quality strategies in the hospitality industry, namely: quality diversification strategy, continuous improvement strategy, quality differentiation strategy and certification strategy.

The strategy of diversification involves the conquest of new markets and offers superior quality services and superior classes in relation to the competition. An example of an accommodation unit that applies this strategy is *The Hoxton Hotel in Amsterdam*, which, in addition to the standard services offered by any hotel (accommodation, dining, event and conference rooms), also offers services dedicated to guests'dogs. The Hoxton has created a special website dedicated to the four-legged guests, which contains all the information

that "the puppy needs" translated into "dog language" and illustrated by London designer Alice Bowsher (The Hoxton, 2022). In addition, The Hoxton Hotel in Amsterdam (and all other hotels in the Hoxton Chain) offers dogs their own bed, their own bowl, "Please don't bother!" ("Do Not Disturb") and a guide for puppies - Manual Mutt, translated into their language (as Hox Guide, a guide for humans). The guide for puppies includes complete information on: local dog walks, the best parks in the area, pet spas, vets and more. Thus, The Hoxton has managed to diversify its range of services, entering the "niche" tourism market, namely tourism with pets, offering services dedicated to those who want to travel with their four-legged friend.

The continuous improvement strategy was used by the *Accor Hotel Chain* when it decided to partner with Visa to provide superior payment experiences to ALL (All-Accor Live Limitless) loyalty club members. This partnership aims to combine Accor's loyalty program and Visa's global payment capabilities to create the new ALL Visa card.

The strategy of quality differentiation is based on the knowledge of the forms of manifestation and the level of achievement of the quality characteristics of the products or services. *The Mera Hotel Group* on the Romanian Coast applies this quality strategy. Mera Group includes: Mera Resort in Venus, Mera Onix in Cap Aurora and Mera Brise in Mangalia. Mera Resort in Venus (which includes the Mera Blue, Mera Sky 4 * and Mera Villas 4 * hotels) is the largest All-Inclusive Resort in the south of the Romanian Coast. Through the quality and diversity of services, oriented towards satisfying the highest requirements of the modern tourist, as well as through the comfort offered by the accommodation spaces, the Mera group has gained its prestige on the market of tourism services in the area. The Mera hotel group has applied the strategy of differentiating according to the tourist segments, thus creating Mera Onix for couples, Mera Resort for families with children and Mera Brise Mangalia for business tourism, the latter hotel having a business event room with a view to the Black Sea. Another example is the *Ramada Hotel in Brasov*. It differentiates itself from other accommodation units in the area by providing tourists with a Japanese restaurant - Sakura Restaurant, serving live cooking, designed to offer guests a unique experience.

The certification strategy defines procedures and methods in the Quality Manual and in other documents depending on the specifics of the organization, these being effectively applied in practice. Most countries that realized the importance of the quality of services provided to customers, have developed for several years, at the national level, a complex system of service standards in the Hotel Industry that require services to be characterized, in addition to material issues and criteria such as: reactivity, credibility, courtesy, flexibility of staff, respectively, of services. For example, the *Swiss standards* have included, since 1995, the criterion of "welcoming customers" in the norms of classification and implicitly of the quality of services in the hotel field. Currently, the hotel classification rules in Switzerland developed by the Hotel Association are more complex, addressing both quantitative and qualitative issues that aim in particular at diversifying services, personalizing them and improving staff behavior. This Swiss classification system comprises 14 criteria, each consisting of a set of rules which are presented in a data sheet on comfort categories. The criteria underlying the classification are: security rules, perimeter and exterior of the building, reception, common areas, rooms, bathrooms, breakfast service, room service, restaurant service, additional services, quality of leisure and sports facilities (Hotellerieesuisse , 2022). Another representative example is the reference standard of the *HOTELcert brand in France*, which is the result of combining the following approach: the Chamber of Commerce and Industry, the Federation of Tourism Trade Unions, the Quality Certification Body and the French Tourism Directorate. This quality system was developed in 2001 and was tested on 12 hotels in France, being published in February 2002 in the "Official Gazette". Thus, HOTELcert imposes 7 quality commitments, related to: staff smile, cleanliness and hygiene, quality linen, staff availability, peace of mind, practical and tourist information provided to customers and quality controlled (Afnor Groupe, 2022).

The findings of the qualitative research are structured on each topic of the in-depth interview.

Topic 1 - The opinions and perceptions of Romanian tourists regarding the hotel services market

Respondents listed a number of criteria that guide them when choosing a hotel. Thus, the most selected criteria were "location" (28.57%), "distance from tourist attractions" (21.43%), followed by reviews on "hotel cleanliness" (17.86%), "breakfast included" (16.67%) and "changing towels and linen" (15.47%).

Regarding the additional services provided when staying in a hotel by the interviewees, the most important additional service sought by tourists was the provision of car parking (38.10%). In addition, the subjects also identified as important the following aspects: access to Wi-fi (35.71%), the minimum tourist information service (11.90%), foreign exchange services (9.53%) and the preservation of valuables (4.76%).

Topic 2 - The opinions of the tourists regarding the quality strategies applied by the accommodation units

Regarding the quality practices, most of the interviewed tourists (64.29%) stated that they do not know the concept of *quality management*. The rest of the respondents (35.71%) stated that they have some information about this concept and that, occasionally, when they choose an accommodation unit, they are informed about this aspect, checking the information available on the hotel website. For the respondents, the most important quality strategies that are applied by the accommodation units are: the certification strategy and the quality diversification strategy. For respondents, the hotels that apply the certification strategy offer an extra security regarding the products and services offered. Quality standards are of several types: standards developed by the competent administrative bodies of each country (example: standard from the classification of comfort categories - stars), occupational standards and standards developed by organizations (example: standard of facilities, standard procedures, management standard), used mainly by hotel chains. According to the respondents, the accommodation units that implement different quality standards manage to ensure a higher customer satisfaction.

The subjects chose the strategy of diversification through quality because they consider that the implementation of this strategy offers them additional services of superior quality.

Topic 3 – Attitudes and perceptions of tourists regarding the sustainability measures implemented in the Hotel Industry

Although most of the tourists interviewed have heard about sustainability and consider it important, they do not know this concept very well. The majority of respondents (73.81%) defined sustainability as a method of rationally using resources so that they can be used for as long as possible. Other definitions given to sustainability by the subjects were: technical systems / tools / equipment and procedures for saving resources in order to protect the environment (7.14%), environmental protection (11.9%), use of intelligent lighting systems (7.14%) such as LED-based lighting, card-based room power system, motion sensor-based lobby lighting.

Respondents noted that in the hotels where they were accommodated, the administrators implemented various sustainability practices. Thus, the most common practice is the lighting of hallways based on motion sensors (57.14%). Other sustainability measures identified by the subjects were: card operating systems in card-based rooms (16.67%), the use of paper and not plastic cups in water and coffee dispensers (11.91%), the existence of shower faucets which save consumed water (9.52%) and very rarely the selection of waste in the hotel (4.76%). Respondents formulated various sustainable practices that should be implemented in the future by accommodation managers. Thus, the most suggested measures were: rational water consumption by installing special batteries (23.81%), waste selection (16.67%), reuse of certain packaging (14.28%), rational heating system of the building (19.05%), rational consumption of electricity by applying the lighting system with sensors for common rooms and the operation of the electrical system in rooms only on the basis of the card (19.05%). A small number of subjects (7.14%) proposed other sustainability measures, which in their view would have medium and long-term effects: educating and informing customers and educating employees about the role and impact of sustainable development practices.

A large proportion of respondents (80.95%) considered that investing in sustainable practices and activities is an important factor for the future of the Hotel Industry, but the problem is that not all hotels have the financial resources for such actions. On the other hand, 35.71% of the interviewees considered that some managers do not even know the benefits of implementing sustainable practices in their hotel. Several respondents provided as an example of a hotel involved in sustainable development Hotel Vega in Mamaia. It became in 2009 the first hotel in Romania certified Eco-Hotel Management System by Tuv-Rheinland Romania. In addition to the minimal impact on the environment, the Eco-Hotel system guarantees conditions of maximum safety for the health of guests and employees. The Eco-Hotel principles that govern all the processes carried out within the Vega Hotel are (Hotel Vega, 2022):

- Control of energy consumption: starting with March 2013, the Vega Hotel in Mamaia became the first hotel consuming renewable energy in Romania (wind energy, hydropower and solar energy, which significantly supports the reduction of CO2 emissions);
- Control of water and paper consumption, control of waste and hazardous substances management;
- Purchase and use of biodegradable products.

Topic 4 – Opinions of tourists regarding the services of the food units within the accommodation units

The most important aspects that respondents take into account when eating at the hotel where they were: the cleanliness of the location (38.10%) and the freshness of the products (26.19%), the diversity of the menu (21.42%), the number of meals (4.76 %), staff behavior and kindness (9.53%). Regarding the

opinions of the respondents regarding the catering units in the hotels, most of them (76.19%) stated that the services provided met their expectations, and 23.81% of them stated that the menu was poor.

Conclusions

Research has shown that most respondents perceive the concept of sustainability as a method of using resources rationally so that they can be used for as long as possible. They believe that sustainability is an important factor for the future of the Hotel Industry, but not all hotels have the resources to implement this concept. Regarding the concept of *quality management*, most of the interviewed tourists (64.29%) stated that they do not know this concept.

Out of a desire to ensure a unified system of facilities, services and staff in order to promote and obtain a brand image, the hotel chains have created internal standards. Although these standards have elements in common, they differ from one hotel chain to another, while in the case of independent hotels, only some of them have established their own standards. The introduction of a quality system benefits all parties involved (the country, as a destination, direct providers of tourism services, consumers and intermediaries), which involves ensuring an invariable level of quality. At the same time, obtaining quality does not only involve the development of quality standards, but also the implementation of appropriate quality strategies.

Based on the results of the paper, the authors recommend that the authorities, as well as the accommodation units, become more involved in the adoption of appropriate sustainable development measures that support the local community and protect the environment. At the same time, actions are needed to educate tourists about the concept of sustainability.

The authors consider that the paper has academic contributions in the field of the analyzed topic and this should be the starting point for future research. A future direction of study could be a qualitative research among hotel managers, in order to identify their opinions on the advantages but also the barriers to the implementation of quality and sustainable development strategies.

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The Theory of Planned Behavior to Explain the Purchase of Sustainable Food Products

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Abstract

In recent years, the need for people to change their eating habits towards more sustainable models is increasingly pressing. Food preferences, choices and eating habits are often difficult to change, as they are directly related to the personal context of the individual, that is to their lifestyles and socio-cultural environment. Although many people already have positive attitudes towards sustainable nutrition, on the other hand the purchase and actual consumption of more sustainable food products is conditioned by several factors such as: economic, socio-cultural and local traditions. The current study explores the main determinants of sustainable food consumption in Romania. For this, we use the theory of planned behavior (TPB) that predict and explain human behavior in specific context. The questionnaire was applied online on a sample of 365 people. To analyse the data, we've developed a structural equation model in order to determine the relation between intention and current behaviour to buy sustainable food with them possible determinants. From our study that was developed mostly on students we obtained that there is a direct influence of intention to buy sustainable food by people's attitude, subjective norms, perception of availability, perceived effectiveness and perceived value. Moreover, from the study we obtained that perceived effectiveness, perceived value and intention to buy have a direct influence on consumer's current behavior.

Keywords

Sustainable food consumption, theory of planned behavior, Romanian food context, nutritional behavioral changes.

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Introduction

In recent years, various studies have been developed that adopt the Theory of planned behavior - TPB (Ajzen, 1991) as a model, focusing mainly on consumer behavior. According to Ajzen (1991), the TPB provides a theoretical framework that allows to systematically investigate the factors that influence behavioral choices. It has been used in various studies to analyze behaviors such as leisure choice, driving violations, shoplifting, dishonest actions, Fast-Food Consumption (Bîlbîie, et al., 2021), etc.

In the paper we analyzed the intention of people to consume sustainable food products. This intention certainly depends on the psychology of the individual and therefore on the choice of using a behavioral model and therefore the factors and variables that influence their behavior must be analyzed.

Nutrition is a key factor in quality of life, as it is an important determinant of an individual's well-being in a given environment. The growing availability of consumer alternatives has supported irrational consumerism in terms of economic criteria for the usefulness and functionality of products. Consumer motivations represent only one aspect of their behavior and in order to understand them, the social context of individual as well as the internal or external need of individual must be taken into account. Therefore, it

is important to identify the reasons behind certain consumption models that are involved in making specific purchasing decisions (Fabris, 1970).

1. Review of the scientific literature

Recently, models have been developed in the literature to predict and explain buying behavior by placing it in a broader system of common beliefs, values, norms, attitudes and knowledge. In this context, two models based on the assumption of rationality of the actor / consumer dominated: the *theory of reasoned action* and the *theory of planned behavior*.

According to the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen (1975; Ajzen and Fishbein, 1980), behavior is determined by an individual's intention, or rather by the subjective probability, that an individual will perform a certain action, for example, the purchase of a product. The intention depends on the attitude (favorable or otherwise) of specific people or reference groups towards the adoption of a certain behavior by an individual. The model is used to predict how individuals will behave based on their pre-existing attitudes and behavioral intentions.

The theory of planned behavior (TPB) explains the extent to which the purchase of sustainable food is influenced by subjective norms and past behaviors. With the theory of planned behavior, Ajzen and Madden introduced a new predictor of intentions and behavior: perceived behavioral control, defined as "a person's belief in how easy or difficult the performance of behavior is likely to be" (Ajzen and Madden, 1986). This construct is significantly close to Bandura's (1977) notion of self-efficacy, that is, to an individual's confidence in being able to perform a certain behavior. Perceived control varies from situation to situation and differs from the concept of *control locus* (Rotter, 1966), as the latter is a general expectation that remains stable in different situations.

Ajzen and Madden (1986) developed a two-version model. In the first version, perceived behavioral control has an independent effect on intentions and intention is formed only when the person believes he has the means to perform the behavior itself. In the second version, the direct influence of perceived control over behavior is also taken into account, assuming that the latter is a partial substitute for effective control over internal and external factors that may affect behavior. Consequently, the direct path from perceived behavioral control to behavior is a non-volitional determination of action.

The findings of various researches support the validity of the theory of planned behavior, for example the goal of university students to get the highest grade (Ajzen and Madden, 1986) or the weight loss (Schifter and Ajzen, 1985). In both cases, it was found that the perceived behavioral control construct increased the predictive power of the original model of Ajzen and Fishbein (1980).

2. Research methodology

The aim of our research is to verify whether and to what extent the intentions to buy sustainable food products are influenced by subjective norms, perceived behavioral control and by variables such as: past behavior (Fredricks and Dossett, 1983; Caprara, Barbaranelli and Guido, 1998), satisfaction with previous acquisitions (Pierro, Mannetti and Feliziola, 1998; 1999) and desire (Bagozzi, 1999), referring to the theory of planned behavior.

In the research, we built a questionnaire based on the theory of planned behavior, consisting of items that measure the constructs considered in the model and additional variables. In this study we used a sample of 165 respondents (110 women and 55 men). The majority of 80% are 18 – 25 years old; 8.48% are 25 – 30 years old, 3.03% are 30 – 40 years old, 5.45% are 40 – 50 years old and 2.42% are more than 60 years old. Almost 59% of the respondents are from Bucharest, and the rest of them are from other parts of the Romania. About 35% of the respondents have incomes below 2000 lei, around 400 euros.

To verify the objectives of the research, two multiple regressions were performed: one to analyze how much the values of the purchase intention depend on the values of perceived behavioral control, the subjective norms and desire. While the other is to examine whether the intention, in occasional consumers, can be predicted, in addition to independent variables, from past behavior and satisfaction derived from previous purchases.

We use the Theory of Planned Behavior (Ajzen, 1991) in which other factors that influence the intention to adopt a sustainable food consumption are integrated into the conceptual model, giving rise to an extended TPB model.

2.1. The conceptual framework

This study proposes an integration of Ajzen's (1991) Theory of Planned Behavior by inserting additional variables to improve its predictive goodness.

The first conceptual model assumes that factors such as attitude, subjective norms, perception of availability, perceived effectiveness, perceived value could directly and indirectly influence the intention to consume sustainable foods. Also, perceived effectiveness, perceived value and intent could directly and indirectly influence current behavior.

The Theory of Planned Behavior (Ajzen, 1991) hypothesizes that the decision to undertake a certain behavior is directly influenced by the behavioral intentions of the individual. We chose this model because we believe that the choice to adopt a healthy lifestyle can be comparable for students to a planned behavior. The overall assessment of the benefit received by consumer is called *perceived value*. It is measured by: "The quality of sustainable food is reliable", "Sustainable food is valuable to me" and "Sustainable food would make me feel good".

Hypothesis 1 (H1): Perceived value influence intention to buy sustainable food.

Attitude, an individual's favorable or unfavorable assessment to perform a behavior. The attitude is measured with a 7-point Likert scale for the following questions: "I like to eat sustainable foods to balance nature", "It is an advantage for me to eat sustainable food", "I like to eat sustainable food because it seriously affects the human environment" and "I would eat sustainable food because man needs to adapt to the natural environment".

Hypothesis 2 (H2): Attitude influence intention to buy sustainable food.

The *social norm*, is the individual perception of the social pressure to perform or not a behavior. This variable is measured using a 7-point Likert scale and includes three items with the following statements: "People who influence my behavior think that I should buy sustainable food", "People who are important to me think that I should eat sustainable food", "My family thinks I should eat sustainable food", "Society believes that I should eat sustainable food", "My friends think I should eat sustainable food", "The people in my life that I trust buy regular sustainable food on a regular basis" and "Those close to me eat sustainable food".

Hypothesis 3 (H3): Social norms influence intention to buy sustainable food.

Perceived behavioral control (PBC), regard the individual perception of their ability to perform a behavior. This indicator can be divided into two variables: perceived consumer effectiveness that measure how effective perceive consumers them actions and perceived availability that measure the perception of how easily accessible the goods can be (Sparks &Shepherd, 1992; Vermeir & Verbeke, 2008). Perception of availability is measured by the following questions: "I can buy durable food", "It would be easy for me to buy sustainable food from my neighborhood" and "I think sustainable food is easy to buy". Perceived effectiveness is measured by the following questions: "It is important for individual consumers to do something about pollution", "When I buy food, I consider how its use affects the environment and other neighborhoods" and "Every consumer's behavior can have a positive effect on society by buying sustainable food sold by socially responsible producers".

Hypothesis 4 (H4): Perceived availability influence intention to buy sustainable food.

Hypothesis 5 (H5): Perceived effectiveness influence intention to buy sustainable food.

Hypothesis 6 (H6): Perceived availability influence behavior to buy sustainable food.

Hypothesis 7 (H7): Perceived effectiveness influence behavior to buy sustainable food.

Intention is defined by Ajzen as how willing consumers are to have a certain behavior they were asked about (Ajzen, 1991). It is measured by the following questions: "I would like to use sustainable food", "I would buy durable food if I saw it in a store", "I would look for sustainable food in a store to buy it", "Given your lifestyle and / or food preferences, how much is it possible to buy sustainable food in the next 4 months?" and "How much is it possible to buy sustainable food in the next month?".

Hypothesis 8 (H8): Intention influence behavior to buy sustainable food.

Current behavior which is measured by following questions: "I often buy durable food", "I prefer sustainable foods over non-sustainable foods when the quality of the product is similar' and "I buy sustainable foods, even if they are more expensive than unsustainable ones".

2.2. The Structural Equation Model

In table 1 we have the reliability of the measurement. Cronbach's Alpha values are very close to 0.8 or higher, this indicates a good internal consistency. Composite reliability is another way to measure internal consistency. A CR value greater than 0.7 indicates that all items measure the same latent variable. The average variance expected indicates how much variations can be explained for every latent variable by the measured variable (question). For example, in our study, 65.2% variation of attitude is explained by the four questions. We observe that more than 50% of variation of every latent variable is measured by the it's corresponding questions.

Table no. 1. The reliability of measurement

Variable	Composite Reliability	Cronbach's alpha	Average variance expected (AVE)
Attitude	0.882	0.880	0.652
Social norms	0.936	0.922	0.680
Perceived availability	0.808	0.813	0.585
Perceived effectiveness	0.771	0.746	0.530
Perceived value	0.897	0.889	0.749
Intention	0.936	0.935	0.746
Current behavior	0.895	0.893	0.739

Source: our elaboration using R Studio based on questionnaire answers

In table 2, according to p_value corresponding to each measured variable (from q1 to q28) we observe that all of them are statistically significant so we can use them to construct the structural equation model. Also, we can see the estimation value for every measured variable. For example, in case of attitude, q1 has an estimate value of 1.06.

Table no. 2. Latent variables

Variable	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
attitude =~						
q1	1.060	0.084	12.555	0.000	1.060	0.817
q2	1.169	0.086	13.655	0.000	1.169	0.862
q3	1.120	0.089	12.556	0.000	1.120	0.817
q4	1.056	0.097	10.859	0.000	1.056	0.739
social_norms =~						
q5	1.459	0.121	12.021	0.000	1.459	0.789
q6	1.531	0.109	14.004	0.000	1.531	0.871
q7	1.575	0.114	13.835	0.000	1.575	0.864
q8	1.044	0.121	8.661	0.000	1.044	0.619
q9	1.398	0.109	12.800	0.000	1.398	0.823
q10	1.499	0.102	14.665	0.000	1.499	0.895
q11	1.418	0.100	14.167	0.000	1.418	0.877
perceived_availability =~						
q12	1.157	0.097	11.990	0.000	1.157	0.821
q13	1.125	0.113	9.951	0.000	1.125	0.716
q14	1.207	0.111	10.902	0.000	1.207	0.766
perceived_effectiveness =~						
q15	0.900	0.085	10.547	0.000	0.900	0.744
q16	1.051	0.121	8.698	0.000	1.051	0.643
q17	1.041	0.083	12.564	0.000	1.041	0.846
perceived_value =~						
q18	0.997	0.087	11.494	0.000	0.997	0.767
q19	1.450	0.092	15.704	0.000	1.450	0.935
q20	1.346	0.099	13.660	0.000	1.346	0.859
intention =~						
q21	1.305	0.087	15.008	0.000	1.305	0.906
q22	1.264	0.090	14.004	0.000	1.264	0.870
q23	1.408	0.097	14.529	0.000	1.408	0.889
q24	1.151	0.087	13.197	0.000	1.151	0.838
q25	1.245	0.099	12.584	0.000	1.245	0.813
current behavior =~						
q26	1.409	0.099	14.205	0.000	1.409	0.885
q27	1.329	0.103	12.843	0.000	1.329	0.830
q28	1.415	0.104	13.640	0.000	1.415	0.863

Source: our elaboration using R Studio based on questionnaire answers

2.3. The results of the TPB model

To test if the data we have are suitable for factor analysis and implicitly for the construction of a model with structural equations, we will calculate the Kaiser-Mayer-Olkin coefficient (KMO). In the table 3 continues our data processing. Therefore, we find that its value is 0.94 and we can say that based on this test a factor analysis can be built.

Another test that helps us determine if we can build factor analysis from the sample, we have is the Bartlett Sphericity Test. The corresponding p-value is less than 0.05 which indicates that factorial analysis can be performed.

The determinant of the correlation matrix can also be calculated. Its value 3.893384e-13 is positive which also indicates that the factorial analysis can be performed.

The model we will test has 7 latent variables obtained from the 28 questions of the questionnaire – perceived value, attitude, social norms, perceived availability, perceived effectiveness, intention and current behavior. We will first perform confirmatory factor analysis (CFA) to see if our data support the model being tested.

Table no. 3. CFA fitting values for baseline model

Indicator	Expected value	Value in the model
Convergence & number of iterations		Yes, 51 iterations
Observations	As big as possible	164
p-value, Chi-square	< 0.05	0.000
CFI	> 0.95	0.869
TLI	> 0.95	0.850
RMSEA	< 0.07	0.102
90% Confident Interval	(0; 1)	(0.094; 0.110)
SRMR	< 0.08	0.067
AIC	As small as possible	13316.035

Source: our elaboration using R Studio based on questionnaire answers

2.4. Adequacy Test

The root means the square of residuals (RMSR) is 0.067; this is acceptable as this value should be closer to 0. Then, the Tucker-Lewis Index (TLI) is 0.850 an acceptable value considering it's close to 0.9.

We should check the RMSEA (root mean square error of approximation) index. Its value, 0.102 it is not below 0.05 but will not create us any problems, so we can say the value shows the good model fit.

In table 4 we indicate the values corresponding to the regressions used to decide whether above hypotheses are accepted or rejected. For a positive estimate value in table above, we will consider that we have a direct or positive relation between the variable. To determine if the relation between variable is statistically significant, we will compare the p-value for each hypothesis with critical value 0.05 (for p-value is less than 0.05, the relation is statistically significant).

Table no. 4. SEM indices and decision for hypothesis tested

Hypothesis	Estimate	Standard error	z-value	P	Decision
H1	0.907	0.021	42.871	0.000	Accepted
H2	0.894	0.024	37.039	0.000	Accepted
H3	0.639	0.051	12.556	0.000	Accepted
H4	0.685	0.053	12.902	0.000	Accepted
H5	0.783	0.043	18.136	0.000	Accepted
H6	0.716	0.052	13.671	0.000	Accepted
H7	0.694	0.055	12.608	0.000	Accepted
H8	0.885	0.025	35.472	0.000	Accepted

Source: our elaboration using R Studio based on questionnaire answers

Thus, the all 8 hypotheses are statistically accepted. Based on this we will build the model with structural equations (figure 1).

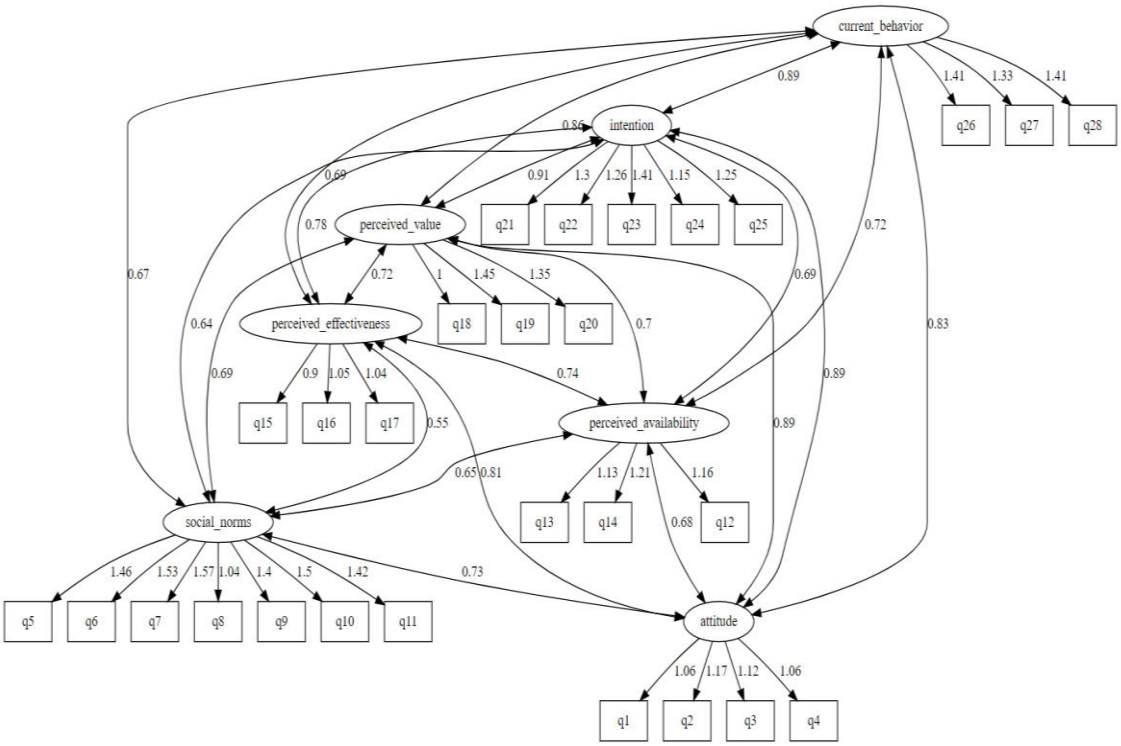


Figure no. 1: Structural Equation Model.
Source: our elaboration using R Studio based on questionnaire answers

3. Results and discussion: the theory of planned behavior to explain the purchase of sustainable food products

The analysis of the answers to the questionnaire defined on the basis of the theory of planned behavior showed that: the attitude of consumers and non-consumers towards the purchase of sustainable food products are of quality, safety (non-consumers agree that food safety is more important) and respect for the environment, are the main advantages. Disadvantages include high costs and not easy supply of these type of products (weak guarantees on the quality of sustainable food products lead to greater distrust of these products by non-consumers).

The reduction of prices and a more widespread distribution on the market are the main factors that can facilitate the purchase of these products. In addition, more and more in-depth information is needed to know these products and their impact on the environment, in order to encourage their purchase by non-consumers as well. The decisive factor that significantly hinders the purchase is once again the price, probably because the sample considered consists of university students with modest incomes. This result also seems to be confirmed by the attitude towards buying, in which the adjective "expensive" proved to be the most appropriate to define the purchase itself, along with "mature" and "careful". In terms of behavioral belief, it turned out that the contact persons who would have approved the purchase were families, friends, society in the case of consumers. Consumers also give more importance to family and friends in their opinions, indicating a greater motivation to respect what these referents think about the purchase. As far as non-consumers, however, no contact person seems to be important in the possible choice to buy sustainable food products.

The intention to buy, considered both in terms of the probability of having the intention to buy and in terms of the probability of actually making the purchase, is determined by social norm, especially those concerning the perception of the opinion of the referents and the behavioral control related to ease of purchase.

The data obtained with the regressions highlighted the greater predictive power of social norms on behavioral control. Furthermore, the importance of the desire to make the purchase emerges, which has the highest coefficient, in line with what is supported by the theory of self-regulation, according to which desires influence intentions due to their motivational load (Bagozzi, 1999). Perceived effectiveness is also a poor predictor of both the likelihood of an intention to buy and the probability of making the purchase.

The predictive power of the Theory of Planned Behavior seems to be confirmed by the results of statistical analysis.

Conclusions

Our survey is limited to examining the buying intentions of a sample of university students, but it would be interesting to include, in future research, a broader target that includes different age groups. As many studies have showed, especially in Europe, in fact, the purchase of sustainable food products is more common in families with children, reflecting the importance of their health aspect. Thus, the act of purchase can be read as a psychological assurance factor for parents, who are more attentive to the relationship between nutrition and the health of their children.

Furthermore, in line with the suggestions highlighted by Bagozzi (1999), there is a need to increase the predictivity of the predictability of purchasing behavior models by inserting both emotional variables to reflect the relationship between the attitude towards the product and intention (desire) to buy it, and the aspects related to the personal and social identity of individuals.

In our research, desire played an important role in predicting intentions, especially those concerning the probability of actually making the purchase. On the other hand, identity has not been taken into consideration, the relevance of which has been confirmed by various studies (Sparks and Guthrie, 1998; Rosengard et al., 2001). In the survey conducted by Bebetsos, Chroni and Theodorakis (2002), identity was, along with the attitude and perception of behavioral control, more related to the intention to eat healthily, especially by students who did sport.

Based on the behavioral beliefs of the research, the aid could come from advertising campaigns aimed at purchasing sustainable food products, with messages designed to emphasize the importance and positive effects of such consumption, such as health safety and respect for the environment.

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Study on Environmental Wellbeing and Its Main Socio-Economic Factors: Evidence from Romania

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Abstract

Sustainability especially targets the process of reconciliation and balance among specific tendencies occurring in its economic, human, and environmental dimensions. This study intends to reveal if salient differences between the levels of each dimension are present across a punctual national context, i.e. the Romanian one, in the 2006-2020 period. It also intends to investigate the effects of economic and social sectors on the main weak points of environmental wellbeing, if these are still significant and negative or, contrary, if sustainable path could be found in these links in the same circumstances of analysis. In this way, we centered our debate on environmental performance, found its main vulnerabilities for observing, on one hand, if Romania follows different environmental paths comparatively with the other two dimensions of wellbeing and, on the other hand, the nature of the effects of society's performance (with its economic and social parts) upon it. Particularly, our study aims to respond to a practical need of research in this country, being also possible to represent a support for the policies addressing sustainable development in the Romanian context. Based on descriptive and path analyses, our results showed that, in the case of environmental wellbeing, the most vulnerable indicators are shown to be the ones regarding renewable energy and energy savings. The main susceptibilities in Romania seemed to be in respect to the relationship between (1) energy savings and safe sanitation, healthy life, population growth, public debt, employment and (2) renewable energy and healthy life, population growth, public debt. Accordingly, the two most sensitive environmental indicators were shown to be affected by these human and economic components of wellbeing, recommendations being formulated in the directions of more careful strategical actions for their improvement in such a way of not highly contributing to the degradation of the environment.

Keywords

environmental performance, natural resources, climate & energy, human and economic wellbeing, Romania, path analysis.

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Introduction

Natural environment should represent a real concern across societies and needs to become a major priority at the individual, organizational, and, also, political levels. In response to this necessity, the academic debate did not take long to appear, integrating it in different domains and areas of applications. In the development theory, sustainability synthetizes the larger perspective in which, besides the human and economic concerns, environmental issues are considered and emphasized as essential for wellbeing and, accordingly, closely linked to the other major societal dimensions (Pohoață *et al.*, 2020; Kowalski and Veit, 2019; Van de Kerk and Manuel, 2008; Collin and Collin, 2015; Springett and Redclift, 2015; Hediger, 1999; Goodland, 1995; Solow, 1993).

Therefore, as Ulman *et al.* (2021a) underlined, sustainability appears to represent the process of reconciliation and balance among different tendencies occurring in its three dimensions. This study intends to reveal if salient differences between the levels of each dimension are present across the Romanian society

in the period between 2006 and 2020. The differences of levels could be able to offer the perspective of the type of model put into practice at the national level, if there were different changes in this regard across the analyzed years or in regard to the priorities granted to a dimension or another or, more detailed, even to different components of these dimensions. In addition, it also intends to investigate the effects of economic and social sectors on the main weak points of environmental quality, if these are still significant and negative or, contrary, if sustainable path is identified. Consequently, our research is intended to analyze the manner in which the effort of improving human wellbeing, next to economic wellbeing, contributes to the status of environmental wellbeing in Romania. In this respect, it firstly tries to analyze the manner in which the model of sustainable development is put into practice in this national context. Secondly, based on our study's results, it opens new areas of research and policy initiatives that need to be fully comprehensive. Detailing, fully aware of the fact that nations differ in their capacity of attaining economic, social, and environmental performances (see, for example, Van de Kerk and Manuel, 2008; but also, Ulman *et al.*, 2021a, 2021b, 2020), the first major aim of this paper was to compare the national levels between 2006 and 2020 in Romania, for establishing: (1) actual national perspective in terms of differences between the performances of the three sustainability dimensions, identifying the major weaknesses in regard to environmental wellbeing and (2) evolution, from the perspective of time, of these three dimensions within this country, during the period between 2006 and 2020. In addition, we observed the effects of human and economic wellbeing upon environmental wellbeing in the case of main identified environmental vulnerabilities. In this way, we centered our debate on environmental wellbeing, found its main weaknesses for observing, on one hand, if Romania follows different environmental paths comparatively with the other two dimensions of wellbeing and, on the other hand, the nature of the effects of society's performance (with its economic and social parts) upon it. As far as we know, there are no other studies focusing on the effects of human and economic components of wellbeing on the main vulnerabilities of environmental wellbeing in Romania, analyzed through similar lenses.

The paper has four sections. After the Introduction, Section 2 comprises the review of the scientific literature, while Section 3 describes the data and the used methodology. The results are presented and discussed in Section 4. The paper ends with conclusions in Section 5.

1. Review of the scientific literature

Although the concept of sustainable development carries with it different epistemological and practical problems, it is considered to be also responsible for an obvious transformation of the environmental discourse (Springett and Redclift, 2015, pp. 6-7). Being a multidimensional phenomenon, simultaneously including economic, social, and environmental dimensions, the trade-offs between the objectives of each of them represents one of its main characteristics (Stoorvogel *et al.*, 2004; Hediger, 1999).

In the academic literature, diverse composite indices were created in order to measure the sustainability at different levels (i.e. national, regional, organizational, or individual). In the case of evaluating sustainability of a country, examples of such indices are as follows: the Environmental Performance Index EPI (Esty *et al.*, 2006), the Human Development Index HDI (UNDP, 2014), the Index of Sustainable Economic Welfare ISEW (Daly and Cobb, 1989), the Sustainable Society Index SSI (Kowalski and Veit, 2019; Van de Kerk and Manuel, 2008), the Ecological Footprint EF (Ewing *et al.*, 2010) etc. In this paper, basing on different reasons, we directed our attention to the Sustainable Society Index (SSI). It comprises a large set of indicators for each of the three dimensions of wellbeing (i.e. human wellbeing, economic wellbeing, and environmental wellbeing), all coming from a large number of reliable sources. Moreover, the SSI was described by the Joint Research Centre of the European Commission as an index: "well-structured and guarantying a control process to ensure transparency and the credibility of the results" (Gallego-Álvarez *et al.*, 2015).

Accordingly, while encapsulating a higher awareness on the approach of living with nature and with each other, imposing a quasi-new perspective regarding the need for a change in the way of living in terms of more simplicity and improved spiritual richness (Worster, 1993, p. 132), groups of components like natural resources (biodiversity, renewable water resources, consumption) or climate and energy (energy use, energy savings, greenhouse gases, renewable energy) became of major interest in the sustainability debate. A unitary perspective on what we now call environmental wellbeing is given by their integration (see Van de Kerk and Manuel, 2008, and also Kowalski and Veit, 2019). The definitions of the components of environmental wellbeing, to which SSI was based, are the following: (1) biodiversity - *The 10-year change of forest areas and the size of protected land areas as % of the total land area of a country*; (2) renewable water resources - *Annual water consumption as % of the total available renewable water resources, including internal and external (flowing in from neighbor countries) water resources*; (3) consumption -

Ecological footprint minus carbon footprint, once it is already included in this index by the emission of greenhouse gases; (4) energy use - *Primary energy usage - Production + Imports - Exports ± Stock changes*; (5) energy savings - *Change in primary energy usage between 2012 and 2016, as %*; (6) greenhouse gases - *Amount of emitted CO2 - other GHG emissions, like CH4, N2O, HFCs, PFCs and SF6, not being included into it*; (7) renewable energy - *Share of energy produced by renewable sources, as % of the total energy (TPES, Total Primary Energy Supply)*.

Consequently, special emphasize is required to be laid on the responsibility of humans in regard to the necessity of an ample understanding of their role in relation to the environment (Costanza *et al.*, 2015, p. 56). As many studies revealed, different environmental components, inclusively the ones selected by us in the present study (i.e. the components of SSI), were linked to diverse social and economic issues in order to understand their implications towards environmental degradation. For example, Ulman *et al.* (2020; 2021) tried to observe the nature of influence among, on one hand, environmental and economic components and, on the other hand, environmental and social components of wellbeing in different contexts, i.e. the European Union and the Central and Eastern European Countries, while also considering the stages of development of the analyzed countries in order to understand the type of development put into practice across these groups of countries. The studies concluded on the fact that specific directions of actions may be the factors that significantly and negatively affect the wellbeing of environment and that these directions may be even particularized in terms of the stage of national development. Moreover, these papers agreed with the results of other studies that emphasized the impossibility of precisely detecting the consequences of different patterns of managing development, while underlining the idea that the economic and social dimension may influence in a negatively, costly and potentially irreversible way the wellbeing of our major commune good, i.e. the environment. These arguments constituted the basis of this present study that intends to observe the links between the components of the three dimensions of sustainability, having the environment into the center of the debate, into a more specific context, i.e. the Romanian one.

2. Research methodology

The analysis was centered on the relationships between aspects referring to the three dimensions of sustainable development in the case of Romania in the 2006-2020 period. Giving its historical background under the communist regime, Romania, as other countries from the Central and Eastern European region, had to face a significant challenge towards a more sustainable path of development. Once the communism crashed, the Ministries of Environment was founded and the environmental policy began to be an important component of the general state policy. However, in the process of transition from communism to democracy, Romania experienced a decade of economic and social instability and decline. In this context, the key to progress in all these respects was represented by the Romania's commitment to join the European Union (EU) in 2007. As a consequence of its admission in the EU, several policies were adopted at the national level for harmonization to the legislation with the European one. Thus, some of the indicators regarding the economic, social, and environmental aspects registered significant changes over time.

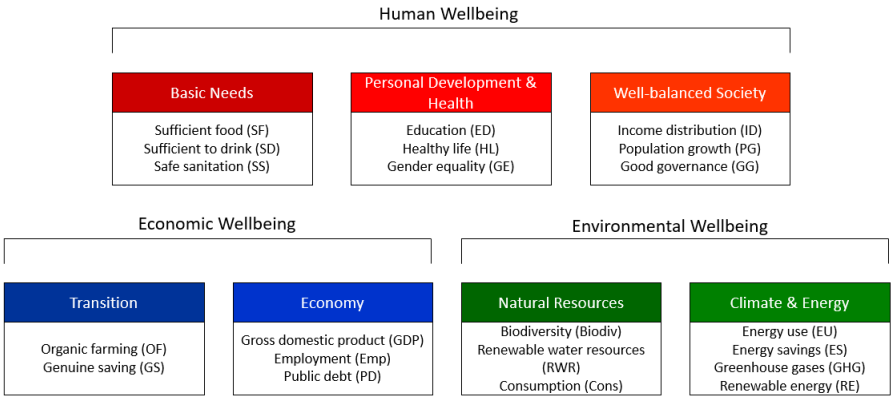


Figure no. 1. The SSI framework
Source: authors' representation, Van de Kerk and Manuel, 2008

In order to capture these variations, we used data for the indicators available on the official website of the Sustainable Society Index (SSI), which, until 2018 reported data every 2 years (2006, 2008, 2010, 2012, 2014, and 2016), and, currently, offers data in progress for the 2019 and 2020 years. In the SSI framework (Figure 1), for each of the three dimensions of sustainability, a series of indicators are included. Each of

these indicators vary from 1 to 10, where 1 refers to the lowest level of sustainability, while 10 to the highest one.

We structured our analysis into two parts. Firstly, giving the SSI framework, we determined the average scores for each of the categories of indicators in the case of Romania in the 2006-2020 period in order to identify the one which needs to be more improved. Secondly, taking into consideration the evolution and scores of the indicators included in the selected category, we further focused on the more problematic ones and we analyzed the relationships between them and the other indicators from the SSI framework using the path analysis. This type o analysis represents one of the statistical techniques which are used for examining the causal relationships between two or more variables. It is superior to classical regression analysis due to the fact that, beyond checking the mathematical correlations among variables, it focuses on the causal effects among those variables by depicting a matematical model that is used to explain the correlations. The path analysis specifies the effects between the variables observed in the theoretical model on the basis of which the path diagram is made (Shumacker and Lomax, 2016). Taking into consideration the decomposition of the path coefficients, the causal effects can be classified in the following categories: direct effects (i.e. studying the relationship between two variables), indirect effects (i.e. analysing the relationship between two variables mediated through a third variable), total effects (i.e. including the sum of all the direct and indirect effects) and unanalyzed correlation and spurious effects (Olobatuyi, 2006). According to our purpose, we studied the sign and significance of the coefficients for each direct effect between the indicators. The path coefficients are derived from a Pearson product moment correlation coefficient and/or a standardized partial regression coefficient (Wolfle, 1977). For validating the results obtained in the path analysis, we used the following indicators: Goodness-of-fit, Adjusted GFI and Normed fit index (Shumacker and Lomax, 2016).

3. Results and discussion

Within the SSI categories of indicators, according to the results presented in Figure 2, in average, the highest scores were identified in the aspects referring to Basic Needs (9.222) and Personal Development & Health (8.163), two of the human wellbeing components; while the ones regarding environmental wellbeing registered, in average, among the lowest scores in the case of Romania in the 2006-2020 period (6.667 for Natural Resources and 3.867 for Climate & Energy).

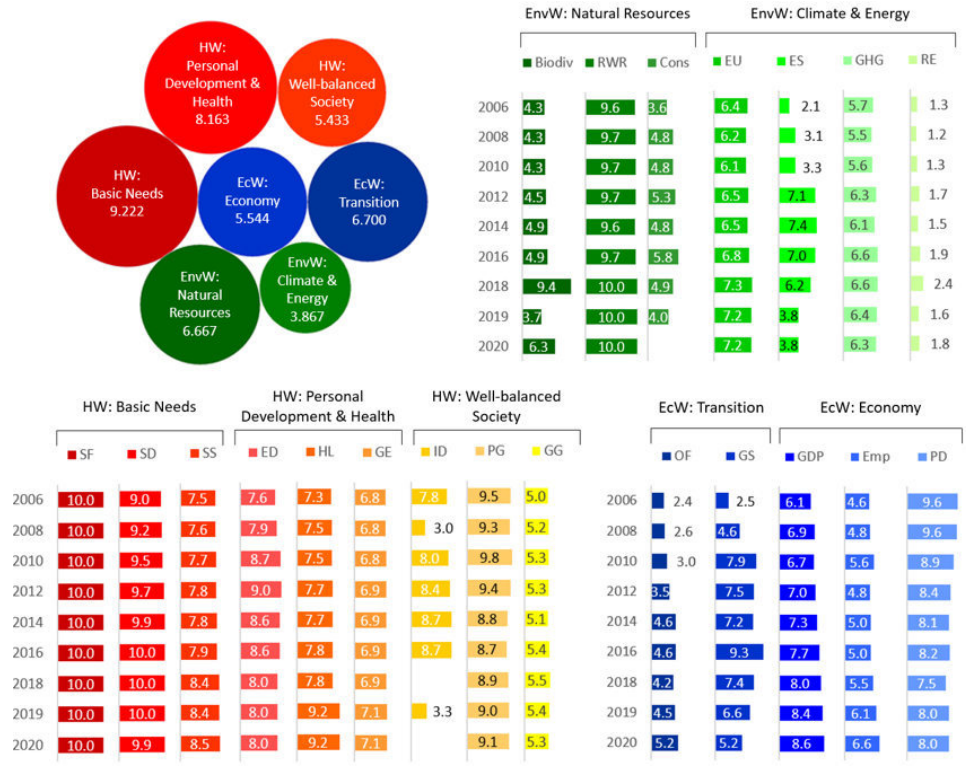


Figure no. 2. Levels of economic, human and environmental wellbeing in Romania in the 2006-2020 period

Source: SSI database, computed in Tableau Public 10.3

In the case of human and economic wellbeing indicators, in general, the dynamics were quite tough, with low variations from a year to another, exception being the Income Distribution (ID) and Genuine Savings (GS) which registered significant disequilibrium. In the Climate & Energy category, which is the most problematic one from the SSI framework, there can be observed significant differences among the evolutions and the levels of the indicators in the analyzed period. On one hand, Energy Use (EU), Greenhouse Gases (GHG) and Renewable Energy (RE) registered a slow tendency of increasing values with a peak in 2018, but with different levels, medium scores in the case of EU and GHG (varying between 6.4 and 7.3 and between 5.7 and 6.6) and low scores for RE (varying between 1.2 and 2.4). On the other hand, Energy savings (ES) registered the highest peak earlier, in 2014 (7.4) and the range of variation was more comprehensive (between 2.1 and 7.4).

Observing the 2020 year, referring to human wellbeing, from the available data, Good Governance (GG) and Gender Equality (GE) seem to have some problems, but not as stringent as the ones from the environmental dimension. However, in 2019, by far, the indicator related to Income Distribution (ID) stands out in a negative way. The major national worriment in terms of Economic Wellbeing (EcW) is in regard to Organic Farming (OF) and Genuine Savings (GS), followed by Employment (Emp). In the case of Environmental Wellbeing (EnvW), the most vulnerable indicators are shown to be Renewable Energy (RE) and Energy Savings (ES), while the Renewable Water Resources (RWR) is observed to register the maximum level of wellbeing.

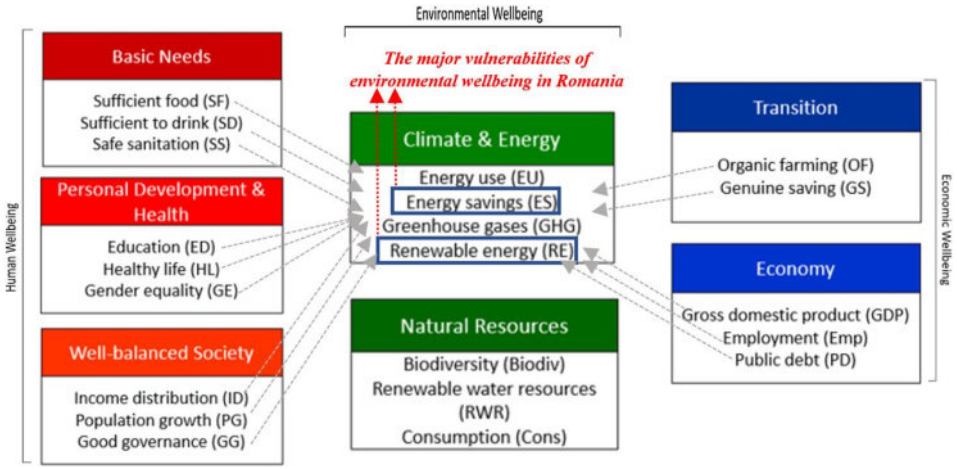


Figure no. 3. Analysis framework based on descriptive results
Source: authors' representation, SSI database

Taking into consideration these evolutions and also the main weaknesses in terms of environmental wellbeing, next, we analyzed in detail the direct effects of the human and economic indicators on the scores of ES and RE, as indicated into the framework of the analysis from Figure 3. In this way, energy savings and renewable energy, evaluated in terms of levels of wellbeing, are put face to face with the indicators of human and economic wellbeing and analyzed from the perspective of their effects on them. More clearly, as shown in previous studies (Ulman *et al.*, 2021a, 2021b; Ulman *et al.*, 2020), positive relationships could be able to reveal a sustainable path of development as human and economic components prove to be able of overcoming the most common way of influence, i.e. a negative one in relation to environment. Thus, only in these circumstances, the process of reconciliation and balancing the three dimensions of sustainability could be categorized as attaining its objective. Moreover, although it is understandable the impossibility of precisely detecting the consequences of different patterns of development in regard to human and economic dimensions on environmental wellbeing, the idea that the sign of influence could be changed in time and, also, that the empirical evidence for it could be found in different studies may encourage both the theoreticians and practitioners of sustainable development. Moving on, Figure 4 emphasizes the sign and signification of the coefficients indicating the relationships analyzed. Regarding ES, we can observe that among the human wellbeing indicators, some of them have a positive direct effect (SD, ED, GE, and ID), while others a negative one (SS, HL, and PG). The significant economic effects on ES are various: positive for GS and negative for Emp and PD. However, in the case of RE, most of the indicators have insignificant direct effects (GS, GDP, Emp, ED, SD, and SS), while others have the same types of effects as in the case of ES (i.e., positive for GE and ID and negative for PG and PD). In addition, GG and OF have a positive and significant effect in this case.

In this way, the main vulnerabilities in Romania seem to be in regard to the relationship between (1) energy savings and safe sanitation, healthy life, population growth, public debt, employment and (2) renewable

energy and healthy life, population growth, public debt. In detail, the number of people, as percentage of the total population with sustainable access to improved sanitation negatively influences the level of energy savings, meaning that, even if safe sanitation should improve or insignificantly influence environmental wellbeing, a high level of this indicator, as it was registered, affects the environment in Romania in regard to the savings of the energy.

The HL indicator maintains the same relation with ES as SS in the context in which the number of years that a newborn is expected to live minus the number of years spent in poor health influences in a negative way the energy savings from this country. This result is also overseen in the case of RE.

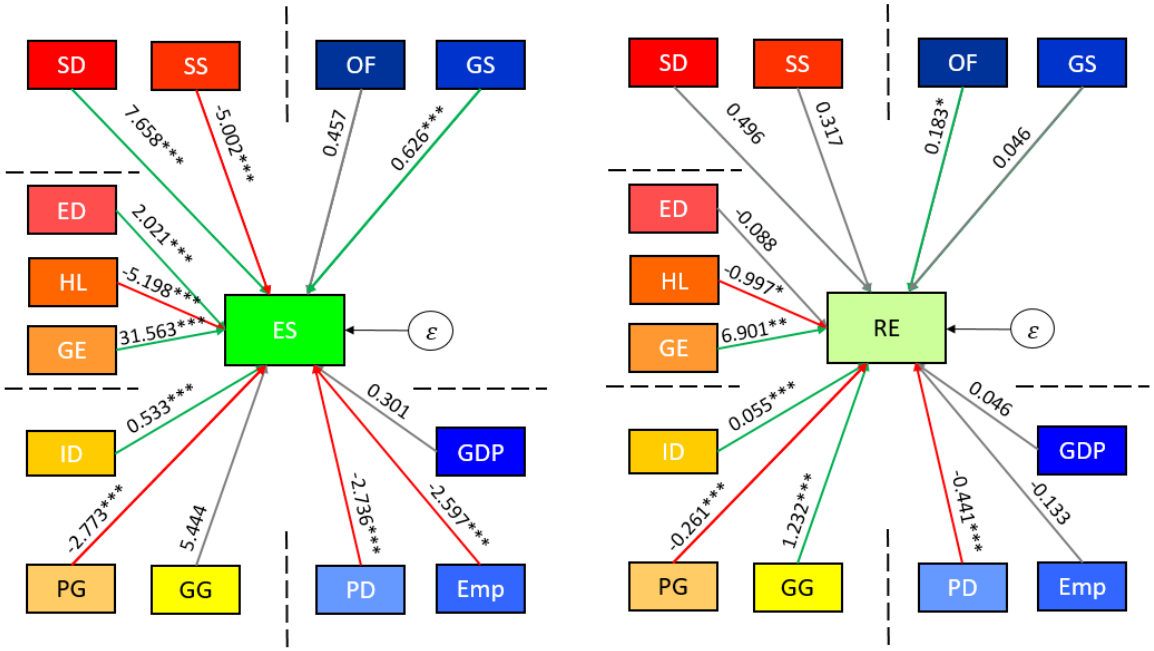


Figure no. 4. The effects of human and economic wellbeing components on main vulnerabilities of environmental dimension

Source: SSI database, computed in Tableau Public 10.3

Moving to the next links, PG also registers negative effects both on ES and RE. This may be explained by the fact that, from a certain threshold of population density, a growing number of people tends to be harmful for environment, putting pressure on both its resources and performance. This result is confirmed in other studies analyzing the same relation, but in a different context, i.e. in the first stage of development, the one in which there are included factor-driven economies (Ulman *et al.*, 2020b, p. 20). In the center of this discussion, the innovation seems to be the key response, more people being translated into higher possibilities of innovating the green actions and processes.

The pressure exerted by higher public debts seems to influence in the same negative way energy savings and renewable energy. As stated by Ulman *et al.* (2021b), this might be another reason for which the nations should escape from the high levels of debt trap. Once established, it is challenging (1) to prioritize environmental protection against economic gains and (2) to direct funds to improve the quality of environment. This finding confirms the ones from other studies revealing that, apparently, a high public debt may be a constraint on environmental preservation (Clootens, 2017; Fodha and Seegmuller, 2014).

Finally, our results emphasize a significant and negative relationship between the level of employment and energy savings. Thus, a higher level of employment seems to be harmful to the environment in this regard. The major concern established within the book of Lawn (2009) in terms of the potential conflict between the goals of ecological sustainability and full employment seems to be observed also in our study. Moreover, although it seems to have a more pronounced character within the developed societies, in Romania, the pressure on energy savings is on the same way.

Conclusions

The perspective of national development analyzed from the lens of sustainability is among the largest concerns of the actual socio-economic studies focusing on development. Accordingly, referring to the Romanian context, we consider that analyzing its state of fact with regard to economic, human, and

environmental wellbeing, as the three major dimensions of sustainability, is of great interest both for citizens and politicians, but also relevant within the academic literature focused on this country. This is pertinent especially in the context in which, to our knowledge, there are no other studies punctually analyzing Romania from this point of view and using similar approach and methodology. Besides the national state of fact, for observing if progress was registered and if this country was able to maintain an ascendant trend in the considered period, the evolution in time was also emphasized. In addition, centering on the environmental dimension and selecting the most critical components of it, the effects of economic and human components on these selected vulnerable environmental issues were investigated.

As observed across the study, the strong points of Romania seemed to be the ones referring to Basic Needs and Personal Development & Health, showing to have very high levels especially in terms of sufficiency of food and available drinkable water, capacity of having a healthy life and population growth. Moreover, these issues registered improvement in the analyzed period, managing to maintain their levels to the path of what supposes to be sustainability. Contrary, the weakest points of this country were shown to be the environmental components, with very low levels especially with regard to energy savings and renewable energy. Unfortunately, these small performances were maintained on the analyzed period, with progress only with regard to the first one, but with a dramatic return to the precedent low levels in the last two years. This was the main reason for opting to go further in our analysis only with these two environmental indicators that appeared to be the most problematic among all the seven ones from the same category. It is known that, in general, the society is constituted as a whole large system, with environmental, human, and economic issues connecting and influencing each other. Putting the environment in the center of our interest, while it was shown that it represents the most vulnerable dimension in Romania, we found that the indicators regarding healthy life, population growth and public debt seemed to be awkward in relation to both environmental issues, while safe sanitation and employment were added as affecting particularly energy savings. On the basis of the obtained results, we may assert that the solutions to be found should assure reducing the pressure of these socio-economic peculiarities upon the environment, while also contributing to improve the environmental concern among both citizens and public servants, who have to show more openness in supporting environmental protection initiatives focusing on these key issues. In this way, a future research endeavor may be the one that deepens these conclusions and investigates them into a more detailed approach, considering the local and regional levels for more preciseness with this regard.

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A Sentiment Analysis Approach for the Cryptocurrency Market and Blockchain Technology Using Naïve Bayes, Support Vector Machine and Random Forest

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Abstract

Virtual currencies or cryptocurrencies are based on Blockchain technology, also known as distributed ledger technology. As of March 2022, there are already over 10k virtual coins, their number being continuously growing since 2013. This paper aims to extract the public sentiment expressed towards the cryptocurrency market and Blockchain technology, two topics widely debated in the last decade. Our research was based on the use of Twitter data, collected with the help of an API in the RStudio environment. To identify the sentiment associated with the 5,000 tweets collected, we used the Bing lexicon approach and three supervised learning algorithms. The three classifiers are the Naive Bayes classifier, a Support Vector Machine and Random Forest algorithm. The accuracy of these algorithms was analyzed through four metrics, finding that the Random Forest classifier proved to be the most accurate, while the SVM algorithm offers the weakest results in terms of classification. The sentiment analysis conducted with the help of the Bing lexicon indicated a predominantly positive sentiment of online users regarding the cryptocurrency market and Blockchain technology. The present paper is structured as follows. The first part highlights a brief introduction to the issue of text mining analysis, as well as the area of supervised learning. Subsequently, a revision of the specialized literature in the approached subject is highlighted, by referring to some pertinent studies in this direction. The methods used as well as the data involved in this study are described in the chapter dedicated to research methodology. The paper continues with the presentation of the main results of the research, as well as with the highlighting of the conclusions and of some future research directions. The study concludes with an exposition of bibliographic sources.

Keywords

sentiment analysis, supervised learning, Blockchain technology, cryptocurrency market, Twitter data.

DOI: 10.24818/BASIQ/2022/08/027

Introduction

An increasing number of scientific researches have been undertaken using sentiment analysis in a wide variety of fields (health, commerce, business, social sciences etc), given that human emotions, feelings and opinions are determinants of the individuals' behavior and psychology. Recognized in the scientific literature under various names (such as sentiment analysis, opinion mining, emotion analysis or opinion extraction) this technique has developed rapidly in the last decade, with the growing popularity of social media platforms (from simple opinion blogs to trending platforms such as Twitter, Facebook or Youtube) and with the interactions manifested through these platforms: comments, reviews, forums etc. Thereby user-generated content is the foundation of this analysis technique, with researchers trying to use that content to discover and extract useful knowledge. Twitter is one of the most popular social media platforms and the opinions and emotions expressed through this platform are key elements for big brands and businesses that are trying to better understand their audience.

A subcategory of machine learning and artificial intelligence, supervised learning is characterized by learning various models to provide the desired outputs. Supervised learning algorithms use labelled data which is a dataset where the observations have already been assigned to different classes. One of the most popular supervised learning algorithms is the SVM (Support Vector Machine) algorithm, used in both classification and regression problems. In the classification problems based on SVM, the concept of hyperplan is used, the algorithm trying to identify a decisional boundary according to which the analyzed entities can be correctly distributed into classes. Another supervised learning algorithm is the Naïve Bayes classifier, which is known to be very effective. Used in classification problems, this algorithm is based on Bayes' theorem and seeks to identify each time the probability of an object or entity or the probability that a particular object or entity falls in a predefined class. One of the most popular and flexible supervised learning methods is the Random Forest algorithm. It works on the principle of combining several decision trees, each being trained on a set of observations. Finally, the prediction is made taking into account the average of the predictions made by each tree.

1. Review of the scientific literature

Cui et al. (2006) study the performance of three classifiers in terms of product evaluation using 100k reviews posted online. The three algorithms analyzed are Passive-Aggressive (PA) Algorithm Based Classifier, Language Modeling (LM) Based Classifier and Winnow, being observed an increased performance of the discriminant algorithm (Passive-Aggressive (PA) Algorithm Based Classifier).

A comparative study of four classification algorithms is performed by Vinodhini and Chandrasekaran (2013). The purpose of the analysis is to compare the performance associated with the KNN classifiers, Decision Trees, Naïve Bayes and Support Vector Machine. Three distinct sampling methods are used, namely the linear sampling, the bootstrap sampling and the random sampling. They conclude that the SVM classifier with bootstrap sampling proves to be the one with the highest accuracy.

Mihalcea et al. (2013) make a comparison regarding the accuracy of the Naïve Bayes classifier, respectively SVM using a number of 140 records representing false and true statements with the help of unigrams from the word model. The two techniques indicate accuracy levels in the range of 52-73%, taking into account or not the stop words.

Abkenar et al. (2021) addresses the issue of detecting spam messages on the Twitter social media platform. They use a hybrid technique based on two strategies, namely Synthetic Minority Over-sampling Technique (SMOTE) and Differential Evolution (DE) which aims to improve spam detection. The technique proves to be useful and effective in increasing the performance of spam detection in the case of unbalanced samples.

Musleh et al. (2022) develop a model with the aim of analyzing the sentiment expressed by Arab users of the Twitter platform. Specifically, they seek to identify depression among users and classify tweet messages into three categories: "depressed", "non-depressed" or "neutral". They use and compare the accuracy of six classifiers, namely Logistic Regression (LR), Random Forest (RF), Support Vector Machine (SVM), K-Nearest Neighbors (KNN), AdaBoost and Naïve Bayes (NB), finding that the highest performance in the classification process corresponds to the Random Forest classifier, of approximately 82.39%.

2. Research methodology

The purpose of this paper is two-fold. On the one hand we will try to capture the sentiment expressed by Twitter users regarding Blockchain technology and the cryptocurrency market and on the other hand we will make a series of comparisons regarding the accuracy of some classification algorithms. In the present research, when we refer to the cryptocurrency market, we actually focus on the top ten cryptocurrencies at the time of writing this article, the ranking being made according to the market capitalization associated with each digital asset. These cryptocurrencies are: Bitcoin (BTC), Ethereum (ETH), Tether (USDT), BNB (BNB), USD Coin (USDC), XRP (XRP), Terra (LUNA), Cardano (ADA), Solana (SOL) and Avalanche (AVAX).

We will therefore use as a starting point a collection of 5000 tweets accessed in March 2022 using an API provided by Twitter platform for the RStudio environment. In order to identify the short tweet messages relevant to our study, we included a number of keywords in the data query section that we provided as parameters for the tweet extraction function.

The primary stage of the research was data preprocessing. Data cleaning involves completing steps such as converting all characters into lowercase, removing punctuation marks, removing extra blanks, deleting numbers or various symbols and removing the stop words. Once the pre-processing stage is completed, the sentiment analysis will be continued, more precisely with the extraction of the public sentiment expressed by Twitter users with the help of the Bing lexicon. Lexicons are the basis for sentiment analysis and represent dictionaries or collections of words, in which each word is associated with a particular feeling. In the case of the Bing lexicon, each term can be associated with either a positive feeling or a negative feeling.

Each analyzed tweet will be associated with a feeling, so each message will be later associated with a label denoting the public feeling: positive or negative. Three models of supervised learning will be built later, in order to make comparisons on the accuracy of classifying messages into positive tweets, respectively negative tweets. The three proposed classification algorithms are Naïve Bayes (NB), Support Vector Machine (SVM) and Random Forest (RF).

The Naïve Bayes classifier is based on Bayes' theorem, which gives the conditional probability of an event A, given another event B, that is:

$$P(A|B) = \frac{\mathrm{P(B|A)} * P(A)}{P(B)} \quad (1)$$

Where:

$P(A|B)$- represents the conditional probability of A, given B;
$P(B|A)$ - represents the conditional probability of B, given A;
$P(A)$- represents the probability of event A;
$P(B)$- represents the probability of event B;
In the case of SVM the goal is to identify a hyperplane in an N-dimensional space that classifies entities in a distinct manner. In the separation of these entities there are many possible hyperplanes that could be chosen, the objective being to identify a hyperplane that corresponds to a maximum distance between the points of the two classes. The example of a SVM classifier with RBF kernel function can be represented as follows:

$$K(A,B) = \exp\left(-\frac{||A-B||^2}{2\sigma^2}\right) \quad (2)$$

Where:

σ is the variance and the hyperparameter
$||A-B||$ represents the Euclidean distance between points A and B.
Used in both regression and classification problems, the Random Forest algorithm is based on the concept of ensemble learning by which several classifiers are combined in order to solve a complex problem and at the same time to improve the accuracy of the model.

3. Results and discussion

This section will highlight on the one hand the results of the sentiment analysis undertaken using the 5,000 tweets collected with reference to the cryptocurrency market and Blockchain technology and on the other hand will present a comparison of three classification algorithms in terms of accuracy.

The dataset consisting of the 5,000 tweet messages was subjected to some preprocessing techniques, so that the URLs, punctuation marks and special characters were removed from the text. At the same time, the content of the text was converted to lowercase and additional spaces were removed. Stop words have also been removed, representing terms that have no meaning in the context of our analysis, so deleting them does not impact this research. Another procedure was tokenization, through which sentences were broken down into separate words called tokens. In the context of NLP, the tokenization procedure proves useful in understanding the meaning of the text by simply analyzing the words that make up the text. Also, the stemming procedure was applied, through which all the words are brought to their root form. Practically, the suffix and the prefix are eliminated, this technique of reducing the dimensionality in the NLP context helping to reduce the associated computations.

The figure below (Figure no. 1.) is a word cloud representation, a key element in the context of sentiment analysis. The word cloud is actually a common visual representation of text data. The highlighted words differ depending on the color and font size, based on how often they are used in the collected tweets. There is a growing interest in digital assets Solana, Tether and Ethereum, given their high frequency of use. The words "solana", "tether" and "ethereum" stand out in the graphic representation below. At the base of this

graphic representation is the concept of term document matrix, a common approach in Natural Language Processing. The term document matrix indicates the relationship between documents and terms and allows the determination of the frequencies of all terms in the analyzed dataset.

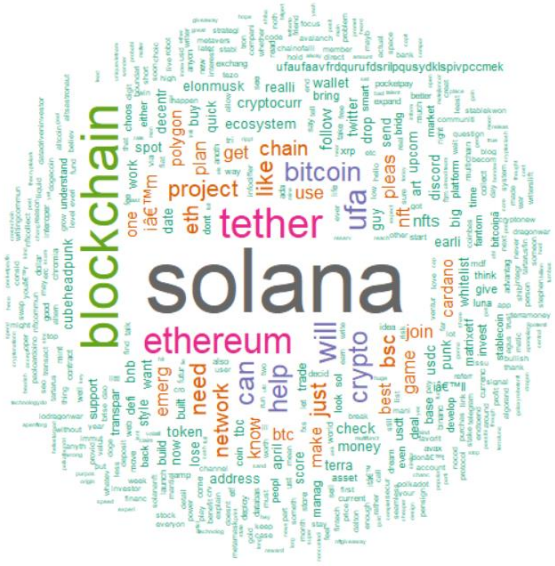


Figure no. 2. Word cloud of the most frequent terms
Source: Authors' processings

The public sentiment expressed about Blockchain technology and cryptocurrencies will be analyzed using the Bing lexicon, which consists of a collection of words associated in a simple way with a positive or a negative sentiment. The contribution of the terms to the negative or positive feeling is highlighted in the following figure. Terms such as "emergency", "lose" or "risk" contribute most to the negative feeling. In terms of positive sentiments, the major contribution is made by terms such as "like", "best", "support" and "work".

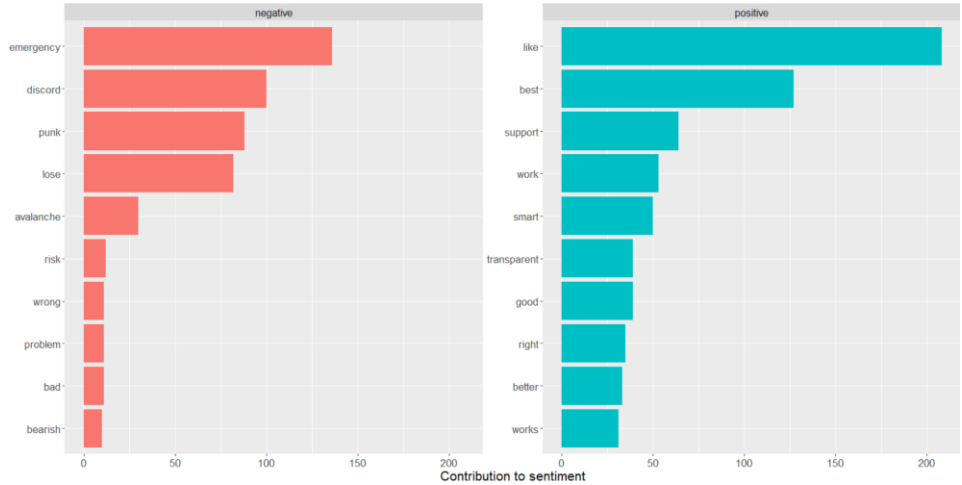


Figure no. 2. Sentiment contribution using the Bing lexicon
Source: Authors' processings

With the help of the Bing lexicon, the collected tweets were classified into negative tweets and positive tweets, a label being assigned to each message. The figure below (Figure no. 3) shows the distribution of the five thousand tweets. It is noticeable that the predominant feeling is positive, so the attitude of online users towards Blockchain technology and the cryptocurrency market is a positive one. Next, using the associated labels, we will proceed to build the supervised learning algorithms.

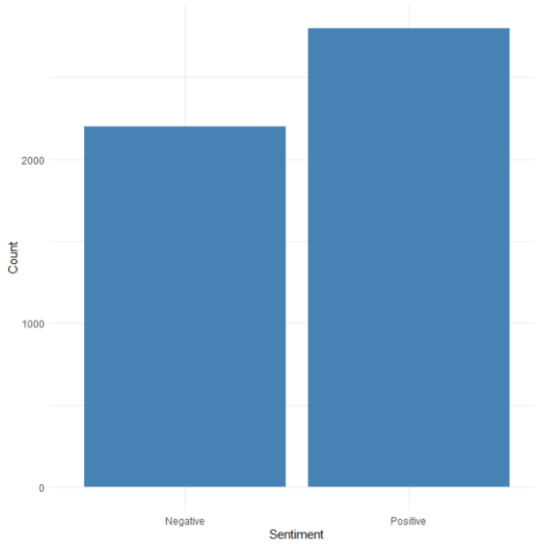


Figure no. 3. The number of positive and negative tweets
Source: Authors' processings

The quality of the classification will be evaluated in terms of Accuracy, Precision, Recall and F1 Score. Accuracy is calculated as the ratio between the number of correctly classified entities and the total number of entities considered.

$$Accuracy = \frac{TP+TN}{TN+FP+TP+FN} \quad (4)$$

Precision of a class is the number of positive entities relative to the total number of items labeled as belonging to the positive class.

$$Precision = \frac{TP}{FP+TP} \quad (5)$$

Another important measure of the classification is represented by Recall, also recognized as true positive rate or sensitivity.

$$Recall = \frac{TP}{FN+TP} \quad (6)$$

The fourth indicator we will focus on is the F1 Score, calculated as the harmonic average between Precision and Recall.

$$F1\ Score = 2 * \frac{Precision*Recall}{Precision+Recall} \quad (7)$$

In order to build the classification algorithms, the dataset was divided into a training set consisting of 70% of the observations and a test set, comprising the remaining 30% of the collected observations. The performance of the classifiers can be assessed based on the metrics highlighted in the table below.

Table no. 1. Accuracy assessment of the three classifiers

Classifier	Accuracy	Precision	Recall	F1 Score
Naïve Bayes	76.32	76.33	77.14	76.73
Support Vector Machine	62.81	62.81	63.01	62.90
Random Forest	81.42	81.43	82.21	81.81

Source: Authors' processings

It is noted according to the results (Table no. 1) that in terms of Accuracy, Precision, Recall and F-Score, Random Forest is the algorithm that offers the best classification solution. The lowest performance is associated with the Support Vector Machine classifier, recording the lowest values for the associated metrics.

Conclusions

Cryptocurrencies and the technology on which they are based, namely the Blockchain technology are innovative compounds of the Fintech industry. Their rapid infiltration on financial markets and the growing

public interest into this subject offer a revolutionizing prospect of these technologies. Sentiment analysis is a popular technique for extracting emotions and feelings expressed through written texts, applied in a variety of fields. This paper aimed to perform a sentiment analysis regarding the cryptocurrency market and Blockchain technology using the approach based on lexicons. Specifically, using Twitter data, we have extracted the public sentiment expressed in the online environment regarding the digital assets market and Blockchain technology. With the help of the Bing lexicon, it was found that the attitude of Twitter users towards the previous mentioned areas is a positive one. The text mining analysis reveals the contribution of terms such as "like", "best", "work", "smart" to the positive feeling, while the negative attitude is denoted by the use of terms such as "emergency", "lose" or "risk", a sign that the prospect of potential losses is discouraging for the Twitter public. Each tweet was later associated with a label denoting the corresponding feeling: negative or positive. Once the labeling was available, we proceeded to build three supervised learning algorithms, namely the Naïve Bayes classifier, Support Vector Machine and Random Forest. The classifiers were then compared in terms of accuracy and the best results were provided by the Random Forest classifier, while the Support Vector Machine was associated with the lowest accuracy. As future research directions, we intend to carry out an extension of the study, taking into account the following elements: the use of a higher number of observations in the dataset as well as the approach of additional classification algorithms. On the other hand, we will also consider performing an intertemporal sentiment analysis in order to identify how public sentiment is changing on the cryptocurrency market and Blockchain technology, identifying at the same time the determinants of these changes.

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Drug Buying Behavior and Quality Strategies Implemented in This Market

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Abstract

The desire of people to live longer and better has led to the large-scale development of the pharmaceutical industry. Being a sector with high profitability, but also with certain restrictions imposed by regulations, the producers did not delay to appear. Thus, this market abounds with an unprecedented diversity of products, which put consumers to the test, especially when buying over-the-counter products. In this case, the sources of information are diverse (friends, family, internet, advertising) which makes the decision to buy a certain product, difficult. On the other hand, as competition in this market is fierce, manufacturers have to resort to various quality strategies in order to stay in the market and attract new consumers. In this article, the authors wanted to highlight, based on an exploratory research, which are the most used quality strategies in this market. On the other hand, based on a marketing research, they identified the opinions, attitudes and behaviors of consumers in Romania on the pharmaceutical market. The results show that the most used quality strategies that manufacturers in this field use are: the strategy of maximum performance, the strategy of domination through quality, the strategy of diversification and the strategy of continuous improvement. Marketing research has shown that most consumers trust and buy medicines based on the recommendations of doctors and pharmacists, do not have more confidence in medicines produced in other countries and are not heavily influenced by advertising. The article contributes to the study of the pharmaceutical market, because we did not find studies on the quality strategies implemented in this market. The results of this research may be the basis for further expanded research into the pharmaceutical market, but may also be used by manufacturers / distributors to formulate competent competitive strategies.

Keywords

buying behavior, quality strategies, pharmaceutical market, and exploratory research.

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Introduction

The production and consumption of pharmaceuticals has had and continues to grow, with some syncope due to unpredictable factors such as the COVID pandemic 19. Being a market with a wide variety of products and manufacturers, consumers may be concerned about the choice of certain products, especially if they are not prescribed by doctors. This concern may be related to product quality, active substance content, compliance with required standards and regulations, but also adverse effects of drug use. These issues are even more pronounced for those who buy these products online without the advice of a doctor or pharmacist (Tran et all, 2013; Alwhaibi et all, 2021). A study by Aljadhey et all, (2015) shows that in Saudi Arabia many consumers buy over-the-counter drugs (mostly antibiotics and painkillers) without knowing if the drug they bought is a prescription or over-the-counter drug.

Under these conditions, producers need to better communicate to consumers the issues they have to take to: ensure the quality of their products, comply with the relevant regulations on the production and marketing, and the possible adverse effects of a product irrational and uncontrolled consumption. In order to better address market segments, producers need to be well aware of their consumer behavior, the factors that influence the purchasing decision and then, to implement quality strategies that give consumers confidence and ensure the competitiveness of producers.

In order to highlight the quality strategies implemented by the producers present on the Romanian market of pharmaceutical products, the authors carried out an exploratory research. This was followed by a marketing research among Romanian consumers to identify consumer opinions, attitudes and behaviors regarding: the factors that influence their purchasing decision, determining the extent to which drug advertisement influence purchasing behavior, and how quality strategies are perceived by respondents.

1. Literature review

The pharmaceutical industry is one of the fastest growing and steady industries, but also one with high profitability. Although the health crisis led to global losses of trillions of dollars in 2020, the pharmaceutical industry recorded increases of $1.22 trillion in 2020 and $1.25 trillion in 2021 (ASTRA ONLINE, 2021). This is also supported by Hole at all, (2021) which shows that the pharmaceutical market had an annual growth rate of 5.8%.

This development shows that the pharmaceutical industry can meet any challenge and will stand by the fact that people will always need these products to heal and maintain their health. Therefore, the quality of medicines must be regulated and controlled very carefully, because, as Sehlstedt at all (2016) argues, the slightest mistake can have consequences on patients' lives, a severe business, legal and reputational impact on the manufacturer. To ensure the quality, purity and potency of medicines, many states have developed Good Practice Guidelines (GMPs) for this industry. For example, in the US, these guidelines are developed by the US Food and Drug Administration (FDA) and cover process validation, data integrity, and a wide range of other areas. In the European Union (EU), GMP inspections are carried out by national regulatory agencies. The European Medicines Agency (EMA) oversees inspections to ensure that these standards are met, and are key players in standardizing GMP activities in the European Union (EU) (Hole at all, 2021). As Haleem et all (2015) states, these guidelines aim to reduce any hazards associated with pharmaceutical production that cannot be avoided by testing the finished product.

There is more and more talk about Industry 4.0 (the fourth industrial revolution), which brings together rapidly evolving technologies such as the Internet of Things (IoT), artificial intelligence (AI), robotics, and advanced computing. Industry 4.0 is characterized by integrated, autonomous and self-organized production systems. In the pharmaceutical industry, the experience gained through digitization and automation determines the possibility of moving to Industry 4.0 and promises progress in both production systems and infrastructure (Arden et all, 2021). In the pharmaceutical industry, this new type of industrial organization can connect external information (patient experience, market demand, supplier inventories and public health emergencies), with internal information (energy and resource management, modeling and simulation results and laboratory data), leading to an unprecedented ability to respond, monitor, control and predict in real time (Markarian, 2016).

The increase in the consumption of medicines and the fact that some of them are dispensed without a prescription, creates the possibility that through an unsupervised consumption side effects may occur in consumers. Brass et all (2011) say that those who buy over-the-counter drugs are responsible for their use, with all that means (dose, frequency, duration of treatment). Therefore, their marketing must be strictly regulated. Also, the quality of the medicines, the composition, the proportion of the active substances as well as the mode of consumption and possible side effects must be well defined and explained to the consumers.

There is a wide variety of products on the market for pharmaceuticals / medicines, from competing companies. In order to face the competition, each producer must better understand the wishes and needs of consumers (Redding et all, 2021) and try to satisfy them by using certain strategies, including quality strategies. It should be known: how consumers buy pharmaceuticals / medicines, whether they consult a doctor, pharmacist or not, the sources from which the consumer is informed about the products, what are the criteria based on which they choose a particular manufacturer and whether they are interested and informed about product and manufacturer certifications. In order to choose the most appropriate strategies, organizations must rely on well-founded forecasts for the development of the industry, which will help to set out policies in this area, to allocate resources, to set future goals (Shnaydman, 2020).

2. The pharmaceuticals market

The drug is the key link between all components of the pharmaceutical market and has the role of curing certain diseases of patients and improving their health.

Increasing competition in this market, the continuous review of product portfolios and the technologies used, require drug manufacturers to make the necessary changes to adapt to the dynamic requirements of consumers.

A study conducted by Euler Hermes in 2019 shows the evolution of the pharmaceutical sector, which is worth approximately $ 1.3 trillion globally. The global market for prescription drugs grew by 5.2% to $ 830 billion in 2018 compared to 2017. This increase was mainly due to the 9% increase in the number of new drugs launched on the US market in 2018, especially in the field of oncology. Because innovative drugs are better than outdated, but also the most expensive, doctors who choose to prescribe these drugs to patients, contribute to increasing the value of the pharmaceutical market (Euler Hermes Study, 2019).

The demand for medicines has increased in volume even in countries where medicines are not easy to obtain. The US, which is the largest drug market with a market value of 35%, has a significant advantage over all others, as drug prices are the highest on average worldwide (Euler Hermes Study, 2019).

The Romanian market seems to follow quite well the trends manifested globally, so that in 2019, the annual volume reached almost EUR 4 billion, with an annual increase of 19% (Euler Hermes Study, 2019).

The Romanian pharmaceutical products market grew by 1.3% in 2020 compared to the previous year, to 18.05 billion lei (3.73 billion euros), according to data from the research company Cegedim, quoted in a report by the company Antibiotice Iasi (Antibiotice, 2020).

The market fluctuated significantly in 2020 due to the Covid-19 pandemic, which affected the release of drugs in certain periods (https://360medical.ro).

The main local producers of medicines - Terapia Cluj, Zentiva Bucharest, Antibiotice Iaşi, worked with pandemic engines, supporting the market demand, by producing medicines such as paracetamol or products such as disinfectants. (Ziarul Financiar, 2021).

There are about 120 companies on the market whose object of activity is the manufacture of pharmaceutical products. These companies generate total business of 2.5 billion lei (Mihalache, 2020).

According to the results of the Pharma & Hospital Report study, Cegedim Customer Information estimates that between April 2020 and March 2021, the volume of medicines delivered to patients in Romania was 605.1 million boxes, down 5.7% from April consumption. 2019 - March 2020. The total number of treatment days increased by 4.4%. Also in the same period, the total market value was 18.16 billion lei, increasing by 1.0% compared to the period April 2019 - March 2020 (Romanian Pharmacists' Review, 2021).

At the end of 2020, the top 5 local pharmaceutical manufacturers looked like this (Economica.net, 2021):

1. Terapia. In 2020, it registered a turnover of 791 million lei and a net result of almost 192 million lei.
2. Zentiva recorded a turnover of 558 million lei and a net result of approximately 66 million lei.
3. Sandoz with a turnover of 427 million lei and a net result of over 10 million lei.
4. Antibiotice, the only company in the top 5 that registered an annual decrease, respectively of -12.7% (with a turnover of 341 million lei and a net result of 26 million lei)
5. Biofarm, registered the largest annual advance in the top 5 (+ 10.8%), with a turnover of 216 million lei and a net result of 54 million lei.

3. Methodology

In this paper, the authors first conducted an exploratory research that aimed to highlight the main quality strategies used by pharmaceutical manufacturers operating in the Romanian market. For this, the authors read studies conducted on the evolution of this market, documents of various market players (analysis, internal reports) that were posted on their websites. A quantitative marketing research was then conducted with the aim of identify consumer opinions, attitudes and behaviors regarding: the factors that influence their purchasing decision, determine the extent to which drug advertisements influence purchasing behavior, and how they are perceived quality strategies by respondents.

In order to achieve the purpose of this research, the following objectives have been established:

O1. Identify the factors that trigger the purchase decision.

O2. Determine the extent to which drug advertisements influence buying behavior.

O3. Identify consumers' perceptions of the quality strategies used by producers in this market.

Taking into account the fact that the research is an exploratory one, it was considered to obtain as many completed questionnaires / answers as possible. The sample consisted of 620 people, of whom 65% were women and 35% were men. Most respondents are between 18 and 60 years old (70% are between 18 and 30 years old, 18% are between 30 and 50 years old, 9% are over 50 years old and 3% are under 18 years old). 53% of respondents come from urban areas and 47% from rural areas.

The data were collected through a questionnaire containing 21 questions, using the CAWI (Computer Assisted Web Interviewing) technique. This involves uploading the questionnaire to the Google Forms app, where it can be completed directly by respondents. Data collection was performed between November 1 and December 30, 2021. Data processing was performed using the IBM SPSS (Statistical Package for Social Sciences) program.

4. Results and discussions

Analyzing the studies and documents that reflect the activity of the main producers in the pharmaceutical industry, the authors identified the following quality strategies most commonly used in this market:

a. Maximum performance strategy - aims to gain supremacy in quality through maximum performance, which can be obtained from the products or services provided. This strategy is visible to the manufacturer ***Antibiotice***, ensuring the company a sustainable growth, by constantly renewing its portfolio of medicines, by optimizing and perfecting manufacturing technologies in accordance with technical progress. The team of over 70 specialists of the Antibiotic Research-Development Center is involved in the activities of pharmaceutical formulation, physico-chemical analysis, technology transfer, bioequivalence studies, regulatory affairs and pharmacovigilance. In the R&D department, ***Biofarm*** conducts studies for the development of new pharmaceutical formulas, develops and validates methods for the evaluation of intermediate and finished products. Given the importance of this sector in the development of the company, Biofarm constantly invests both in the qualification of the research and development team and in the modernization of equipment.

b. Quality domination strategy - involves maintaining a market or market segment and involves a high volume of production and sales. ***Terapia,*** the most important generic drug and OTC company in Romania, has over 300 pharmaceutical forms in its portfolio. It covers a wide range of therapeutic areas, produces 93 million boxes of medicines annually and exports pharmaceutical preparations to 25 countries. ***Biofarm*** has over 200 products in its portfolio and covers over 60 therapeutic areas. On 9 of them, Biofarm is the market leader, a record that honors the company and obliges it to do more. It holds the leading position and positions in the top 3 on most of the categories in which it operates (digestive & metabolism, cold & flu, cardiovascular & circulatory segment). The medicines in the ***Antibiotice*** portfolio are delivered to the local market and to markets in Europe, Asia, North America and Africa. The 158 products in the nomenclature reach, through distribution partners, more than 8,000 pharmacies and all hospitals in the country. 37 drugs in the company's portfolio are considered essential according to the qualification of the World Health Organization. In 2021, Antibiotice strengthened and maintained its position as the world leader in the active substance Nystatin.

c. The strategy of diversification through quality - through the existing research-development and technological potential, it tries to enter new fields of activity with products or services, oriented on quality classes or at higher quality levels compared to the competition. ***Terapia*** has managed to make an essential contribution to people's lives through the drugs it has produced and which today are known for their effectiveness for generations: from the launch of the most popular Romanian brand Faringosept® in 1963, to the appearance of the product that protected Romanians from palpitations, starting with 1987 - Aspacardin®, until the development 20 years ago of the best selling drug in Romania (in therapeutic units): Aspenter®. ***Sandoz*** invests in research and development to improve patients' lives and maximize healthcare system resources through increased access to high-quality, affordable biosimilar drugs. It is a pioneer and world leader in biosimilar medicines, with three products on the market: Binocrit®, Omnitrope® and Zarzio® / Zarxio®. Sandoz launched five major biosimilar drugs in 2020 in the fields of oncology and immunology globally. In 2016, ***Antibiotice*** obtained 7 new Marketing Authorizations in Romania for drugs of the following classes: cardiovascular (Ramipril Atb® 2.5 mg, 5 mg and 10 mg tablets, Candesartan Atb®

8 mg and 16 mg tablets), anti-infective, (Norfloxacin Atb® 400 mg film-coated tablets) and genitourinary tract, (Zifex® Ovule Complex).

d. Continuous improvement strategy - the gradual, continuous improvement of the quality of products and services, as well as of productivity and competitiveness. In 1999, ***Terapia*** marked a premiere for the local pharmaceutical industry when it became the first holder of a Certificate of Good Manufacturing Practice (GMP) issued in Romania. For the first time, in 2002, it opened the first Bioequivalence Clinical Trials Center, which had its own clinical unit with qualified staff. Terapia also stood out through the accreditations acquired over time, being the first company in Romania to obtain the certification of Good Laboratory Practice and Good Clinical Practice in 2003, from the National Medicines Agency. It has received the audit certification for the Integrated Environmental System according to ISO 14001/2004 and OHSAS 18001/2008, and the Quality Assurance System is ISO 9001: 2015 certified by SGS Romania, starting with 2015 (Adevărul, 2021).

The authors structured the research results taking into account the established objectives:

O1 - Identify the factors that influence the purchase decision.

Asked how often they buy pharmaceuticals, 44% of respondents said that they buy monthly, 17% buy only when absolutely necessary, 8% buy weekly and the remaining 5%, less than a few times a year.

When asked how people treat their health problems, 60% of respondents said they prefer the treatment recommended by the specialist, 21% of respondents choose the treatment recommended by the pharmacist while 19% prefer self-medication.

Respondents were asked to rate, on a scale of 1 to 10, the extent to which they trusted the advice of the pharmaceutical staff. The answers show that more than half of them (64%) trust the pharmaceutical staff quite a lot, giving grades from 8 to 10, while 36% of the respondents do not have much confidence, giving grades below 8: (11% gave a grade of 7, 11% a grade of 6, 9% a grade of 5, 4% a grade of 4 and only 1% a grade of 3). Similar results can be found in Kim and King (2009). The authors wanted to know if consumers of pharmaceuticals have the same confidence in Romanian medicines as in those produced in other countries. To this question, 76% of respondents answered that they have the same confidence in Romanian medicines as in those produced in other countries, while the remaining 24% have less confidence in medicines produced in our country.

O2- Determine the extent to which drug advertisements influence purchasing behavior.

Respondents were asked to what extent they are influenced by online and media advertising when buying pharmaceuticals. From the answers received, it was found that 32% of the respondents are influenced to a large and very large extent by the advertisements, 22% are neither influenced nor ignore the advertisements, and the remaining 46% are influenced to a small or very small extent by the advertisements. A similar study (Al-Haddad et all, 2014) shows that TV and Internet advertising have the greatest influence, and radio and leaflets have the least influence.

Another question related to the influence of the purchasing decision on this market was whether the reputation of the drug manufacturer (brand) influences the purchasing decision. Respondents had to rate this influence on a scale of 1 to 5, where it means 1 - to a small extent, and 5 - to a large extent. Analyzing the answers to this question, it can be seen that the reputation of the drug manufacturer is not very important for Romanian consumers (78% of respondents said that the brand of manufacturers has little influence on their decision to buy pharmaceuticals), while the remaining 22% are largely influenced by the brand of the manufacturers. Other studies (Shekhar et all, 2019) have reported the importance of factors such as trust and brand in making drug purchasing decisions.

O3 - Identify consumers' perceptions of the quality strategies used by producers in this market

Regarding the quality strategies applied on the medicine market, most of the interviewed subjects (83.55%) stated that they do not know these strategies and that they were not interested in this regard. A small part of the respondents (16.45%) claimed that they have some information on this subject and that occasionally when they choose their medicines they study and seek to find out more about the manufacturer. Asked who they buy from when they buy medicines, the answers were as follows: 59% went to the doctor, 52% to the pharmacist, 9% to relatives, friends and 9% to the internet, newspapers, journal (Närhi and Helakorpi, 2007; Kautsar et all, 2012).

By collecting data from various questions addressed to the subjects, the authors identified that for respondents the most important quality strategy that are applied by drug companies are; continuous improvement strategy and quality diversification strategy. Respondents appreciate the manufacturing

companies that offer them a diverse range, at superior levels of quality and extra security regarding the products offered. Thus, 88.55% of respondents stated that they prefer to buy medicines from manufacturers who have obtained Good Laboratory Practice and Good Clinical Practice accreditations.

Conclusions

The pharmaceutical market is constantly expanding, even though it has been hit by the pandemic crisis, but much less so than other markets. The need for healing and maintaining health is found all over the world. In this context, being a market with strong competition, bidders must adopt well-thought-out market / quality strategies, which will help them to keep their customers, but at the same time to attract new customers. For this, they need to know very well the needs of customers, the factors that influence the decision to buy a certain product or another, the trust that consumers have in different manufacturers, doctors and pharmacists. The marketing research carried out shows that most Romanian respondents trust doctors and pharmacists, are more confident in the products of Romanian bidders and are not greatly influenced by online and media advertisements.

Based on the results of the research, the authors recommend local manufacturers, but also doctors and pharmacists to improve the communication system with consumers, to increase their confidence in the quality of Romanian pharmaceuticals and to reduce the number of those treated by the advice of neighbors and friends.

The research has certain limitations, due to the fact that the sampling was non-random, so the sample could not be statistically validated and the results could not be extrapolated to the entire research population. However, the authors believe that its results could be a starting point for further research on this topic, bringing new market information to producers.

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Comparative Study on the Impact of US and China ODA on IIQ of IGAD Member States

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Abstract

The objective of this research is to investigate the impact of official development assistance (ODA) on IIQ of IGAD member states. The study employed secondary unbalanced panel data of eight countries for 20 years period of time from 2000 -2020. To analyses and compere the effect of US and Chinese ODA on IIQ (IIQ), two separate regressions are applied for both countries independently using Random effect model after conducting Housman test. The findings indicate the effect of US and China ODA are statistically significant, but the effects sizes are negligible. However, comparatively US ODA has positive and higher effect size whereas Chinese ODA has negative effect with lower effect size on IIQ in IGAD member states. This paper provides handful insight to both donors of IGAD member states on how well their ODA is contributing to reduction of IIQ. It also opens a door for farther investigation on the reason why ODA has negligible effect size. Moreover, it gives insight to IGAD to designee a common policy approach to pursue doners to support home-grown efforts on revitalizing ODA to tackle collective challenges of high-IIQ which could extend to potential security challenges in the region.

Keywords

Official Development Assistance, IIQ, Random effect, IGAD.

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Introduction

Foreign aid has been one of the most strategic foreign policy instruments in advancing and protecting national interest in international relations. In many cases, donor countries aim to ameliorate their sphere of influence in terms of political, socio-economic matters, and ideological values. The magnitude of instrumentalizing ODA to issues that are not related to poverty and inequality reduction could grow even higher when there are opposing ideological views between contending global powers such as the US and China. According to Dreher et al., (2014) Strategic and geopolitical motives of donors adversely affect the effectiveness of ODA. Thus, ODA objectives of effectively fighting causes of poverty, inequality, and related multifaceted consequences are intertwined with the fundamental construct of donors' national interest and its interplay in international relations. In part, due to different motivations of doner, researches show the effectiveness of ODA in addressing poverty and inequality is controversial.

Over the past fifty years, ODA was directed to developing countries by OECD DAC member states despite its results being contradictory (Pham 2015; Herzer and Nunnenkamp 2012; Shafiullah 2011). According to Alemu and Lee (2015) Only in Africa, 1 trillion USD was directed as development assistance over the past 50 years. A majority portion of ODA is channeled from DAC of OECD member states through bilateral forms and other multilateral organizations like the world bank and IMF which are essentially influenced by the US and its allies such as the Paris club. In 2019 alone 152.8 billion which represents 0.30% of Grosse National Income (GNI) was channeled by DAC member states (Janus, 2022).

However, this trend seems changing due to the rising interest of new donor stats that are not economically prospers like traditional donor states (DAC). Though, new donors' motivations for integrating and instrumentalizing ODA as part of foreign policy tools is not mainly due to altruistic purposes since many of them still have economic challenges internally. Thus, implicit economic and security interest could be driving factors for the growth of Aid funds. China's ODA growth trend over recent years is exemplary case. In the years between 2000 and 2014 alone Chinese foreign aid (ODA and OFF) commitments had grown from 2.6 to 37.3 billion USD whereas US aid had grown from 13.4 to 29.4 for similar periods of time (Regilme and Hodzi, 2021).

As highlighted above, foreign aid as a policy instrument can be associated with development unrelated objectives and conditionalities. In this regard, US foreign aid is mainly associated with conditionalities which are a manifestation of its political economy and ideological values such as freedom of speech, electoral democracy. Moreover, US ODA is mainly directed to human development-related areas (Regilme and Hodzi, 2021). On the other hand, China's ODA has no-interference policy on internal matters, besides its mainly directed to state-led infrastructure building programs (Mueller, 2021). Thus, due to different if not opposing national interest and values of US and China on development assistance allocation; its rational to hypothesis the possibility of resulting different type of impact on IIQ of aid recipient countries.

IGAD (Intergovernmental Authority on Development) is a regional block in East Africa that consists of eight countries: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. These countries are economically poor however they receive a significant amount of ODA from both the US and China. The region has growing strategic geopolitical relevance that attracted both US and Chania. Its manly due to growing multipolarization of power dynamics factored with counties proximity to red sea and middle east oil economies. IGAD member states cover around 6960 Km of coastline with the Indian Ocean, Gulf of Aden, (IGAD, 2020). Moreover, the Red Sea is a get way to the Swiss canal that hosts 20% of global trade volume by linking the endian ocean and the Mediterranean Sea (Chaisse and Górski, 2018).

The study aims to assess and compare the impact of US and Chains ODA on curbing IIQ. It's evident that there are preceding researches that assess the impact of ODA on growth (Shafiullah, 2011). However, researches regarding to ODA effect on IIQ are limited. Even though researches like Regilme and Hodzi, (2021) made contrast b/n US and China aid in the context of power dynamics their study doesn't focus on specific countries or regions unlike this paper does by specify IGAD as a region based on similarity of geopolitical characteristics which attracts competing powers.

1. Literature review

Foreign aid has been instrumentalized to serve altruistic motives though its historical evolution doesn't depict that. During the era where rationalism IR theory was a defining approach of relations between states, many countries used foreign aid to push their interest directly or indirectly by helping other nation-states to fight beside or on behalf of them. According to Sinha (2013) at the beginning of the 18th century, countries like Prussia subsidized their allies. Similarly, the French government had also granted aid to the American colonies to assist them in evicting the British who were enemies during the seven years of war (Markovits et al., 2019). Even during the cold war years US leveraged foreign aid to contain USSR's ideological expansion. However, In the aftermath of post-cold war where the US championed liberal unipolar world order, international relations were manlily shifted from Rationalism and bilateral approach to liberalism and multilateral international relations. As a result, foreign aid has become an instrument which serves not only explicit national economic, and political interests rather it also embraces explicit ultraistic purposes such as humanitarian and emergency aids as claimed by traditional donors.

However, as it had been seen during the cold war period, as rivalry and competitive major global powers arose to challenge encumberment global order set by hegemonic state; the purpose and distribution of foreign aid changes in a way that doesn't effectively address underdevelopment issues. Thus, when political motivation dominates aid distribution effectiveness could be at stake. According to Herzer and Nunnenkamp (2012) Doners are only self-centered, and manly politically motivated foreign aid strategic approaches could most likely compromise need-oriented and merit-based aid allocation across countries, since it allows for local political elites to utilize funds in a way that favors the wealthy interest group than the people who are in need in aid recipient countries. Thus, partly the intent of aid allocation and objectives of donor countries are reasons for having controversial research findings on the effect of ODA on economic growth and inequality.

According to Calderón and Chong (2006), the research made using dynamic panel data of 111 countries has got the result which depicts foreign aid has no significant effect curbing IIQ and poverty even taking

the presence of good institutions into account. Another research that aimed to examine the role of foreign aid inference in widening or narrowing IIQ over 27 sub-Saharan African countries for the period of 21 years shows that aid has an increasing widening effect on IIQ (Pham, 2015). On the contrary other research, finding depicts that aid has a small but reducing effect on IIQ (Shafiullah, 2011).

2. Motivations and characterization of donors in IR

One of the major presumptions of this research for comparing US and China aid is versatile and competitive motivation of donors which could result different effects on IIQ. Specifically, in the lens of competitive global power's motivations in the international system. A recent study categorizes the motivation of donors using a different electric topology that is based on power index and regime type in the context of the Realism IR approach. the result indicates countries like the US that are categorized as major powers (powerful and democratic) grant ODA globally mainly to ensure security and economic interest (Sen, 2018) On the other hand countries like China which are labeled as emerging major powers with the character of being (powerful but less democratic), initially prioritize economic interest but assumes dominance in the long run over the existing major power (Ibid). Surprisingly the research indicates middle powers categories such as swidden which are characterized as less powerful but more democratic are the one that considers recipients' need at most (Sen, 2018).

3. US and China ODA principles and conditionalities

Depending on motivations and purpose, donors adopt different aid principles and layout conditionalities to distribute aid among recipient countries. China as a leading contender of the US in global power competition (De Graaff and Van Apeldoorn, 2018), its crafted eight major principles such as respect for sovereignty of the state, non-interference on internal matters, non-conditionality, and focus on low-cost and effective development projects which promotes equality, easing burden of aid recipient countries, ensuring mutual benefit across projects and programs, reducing dependency on aid and promoting self-reliance of aid recipient countries (Regilme and Hodzi, 2021). On the contrary US ODA is mainly based on liberalist principles like electoral Democracy, better Human rights situation, and market-led economies. However, there are times where those principles have been compromised or overshadowed due to other internal political and security priorities. As an example, recently US temporarily frizzed assets and suspended humanitarian aid in Afghanistan to restrain the Taliban's operation amid the takeover of the country (Ioanes, 2022). Though the measure was short-lived it shows how US foreign aid would be instrumentalized when there is a security dilemma.

Comparing aid conditionalities, US ODA conditionalities have strong and wide scope than China. This is mainly due to conditionalities imposed are not only limited to its own bilateral aid but also its extended influence on agenda setting for other western donors and multilateral institutions such as WBG (World Bank group) and IMF (International monitory fund) (Sullivan, 1996, p.402). Thus, it's better to consider both direct bilateral and indirectly administrated aids to understand governing aid conditionality. In this lens, US conditions that influence or "re-engineer" internal political and economic policy matters of recipient counties… "through *democratic governance, market-led development and civil society empowerment* [mainly promotion of media freedom]" (Regilme and Hodzi, 2021, p.121, my italics). Similarly, on multilateral track World bank and IMF instigates conditionalities like devaluation, trade liberalization, removing subsidies for industries, reducing government expenditure, increasing tax (Hodd, 1987, pp. 333 – 335). On contrary, Chinese development assistance programs give wider freedom of choice for aid recipients to manage their internal matter since it doesn't have conditionalities aligned with the recipient nation's commitment to human rights, democracy, and political paradigm. However, there are some non-negotiable conditionalities on foreign policy issues such as conformity to One China Policy together with conditionalities on economic issues like tied aid procurement of Chinese-manufactured equipment and technical assistance on development projects (Regilme and Hodzi, 2021, p.117). The scope and intensity of these conditionalities are less impactful in redrawing internal political and economic policy matters as compared to US conditionalities.

4. Data and methodology

To analyze and compare the effect of US and China ODA on IIQ, the research employed five variables, from credible international database which are highlighted on table one. Secondary data is gathered for 20 years period of time from 2000 to 2020 except for South Sudan which covers only 9 years after the day of

independence July 9, 2011. Moreover, the data has unbalanced long panel data format that consists of eight countries of IGAD member states which are mentioned on introduction part. Missing data is handled using data imputation technique.

Outcome variable: Income inequity is a dependent variable measured by GINI coefficient. Gini is not the only indicator to measure IIQ it has been commonly used in many preceding researches. It shows the extent of income distribution among households in population deviates from the hypothetical perfect equality line. The index measures inequality within the range of 0 and 1; where 0 indicates the lowest ideal level of IIQ while 100 indicates the highest level of IIQ. The research collected IIQ data from World Inequality Database and Standardized World IIQ Database version 9.1."SWIID gathers and standardize observations from different data sources [using] Bayesian approach to…maximize the comparability of available IIQ data for the broadest possible sample of countries & years (Solt, 2016, p1)."

Predictor variable: Net ODA is a flow of financial assistance granted by official agencies including state and local governments mainly aiming promotion of economic development and welfare of developing countries. It also includes loans made on concessional terms net of principal repayment with a minimum grant element of 25 % at 10 % discount rate (OECD, 2021). However, the grant element increases as high as 45% for all LDC that includes all IGAD member states. This description of ODA exactly matches US ODA, however Chinese version of ODA doesn't have clarity on defining the term since its mixed with trade and investment (Regilme and Hodzi, 2021). To address such confusion, data is extracted only by ODA-like flow class from (Custer et al, 2021).

Control variables: government spending (% of GDP), Employment in agriculture (% of total employment), and trade openness (export and import) (% of GDP) index are taken as a control variable from WB (World Development Indicators) database. These variables are selected based on theoretical relevance, significant coefficients on preceding research together with testing correlation matrix to identify the strength of the relationship and exclude variables that induce multiclonality among independent variables.

Literatures regarding to the causal effect relations, Trade openness has contradicting effect on IIQ. Research conducted by Meschi and Vivarelli (2009) using dynamic specification to measure with in-country IIQ indicates that developing countries' trade with high-income countries deteriorate income distribution effect. However, according to Reuveny and Li, (2003) a study which covers 69 countries shows economic openness reduces IIQ in developing countries. This research also hypothesizes an inverse relationship between IIQ and Trade openness as trade openness could reduce cost of Imports of household consumption goods.

Government expenditure indicates its ability to mobilize financial resources from internal and external source such as loans or tax collection to cover state machine running costs and to finance public goods such as health, infrastructure, and education. This is expected to have an inverse relationship with IIQ since it has a redistribution effect which helps to ensure social welfare through subsidies and investment on common good. Government expenditure is represented as a percentage of GDP.

Employment in agriculture has significant conceptual relations with IIQ. This is mainly due to majority of inhabitants in developing countries make earnings from agriculture activities. Thus, an increase in employability in agricultural sector is expected to reduce IIQ for a majority of the people in developing countries which have predominantly agrarian economies.

Table no. 1. Summary of variables

Variable	Indicator	Source
IIQ	GINI coefficient	SWIID, WID
ODA	Net ODA US and China	OECD &AIDDATA
Employment in agriculture	Employment in agriculture (% of total employment)	WBG
Government expenditure	government spending (% of GDP)	WBG
Trade openness	export and import (% of GDP)	WBG

Table no. 2. Descriptive statistics

Variables	GINI	NET ODA US,000$	NET ODA China, 000$	Employ't Agri% share	Trade openness%	Gov't expenditure %
Mean	43.49773	356,000	243,000	66.5335	78.65079	13.5194
Std. Dev.	6.149688	332,000	497,000	16.0588	82.19276	8.5300
Min	26.74404	60,000	10,373	24.55	0.7846308	0.8336
Max	57.98276	1,130,000	5,070,000	83.18	443.9956	32.4837
Obs	157	157	157	157	157	157
GINI	1.0000					
NET ODA US	0.2071	1.0000				
NET ODA China	-0.1914	0.0649	1.0000			
Agri Emp/Total	-0.0012	0.3151	-0.0192	1.0000		
Trade Openness/GDP	-0.1432	-0.4074	-0.0961	-0.7609	1.0000	
Gov't expenditure/GDP	-0.3748	0.0527	0.1319	-0.4131	0.1597	1.0000

Source: own compilation

Based on table two which describes variables statistical characters and correlation index. The average Income distribution score of IGAD member states (MS) is 43.94, which can be categorized with big income disparity range of 0.4–0.5 (40-50) (Aysan et al., 2021). These numbers are closest to Eritrea's average score of 44.25 scores and specifically 43.5 scores recorded in 2007. Minimum (26.74) and maximum (57.98) GINI coefficient are recorded by Djibouti in 2020 and Kenya in 2016 respectively.

Average ODA granted is by US amounts 356 million which is higher by 31.74% as compared to Chinese average of 243 million. Comparing of U.S. 332 million and China 497 million standard deviations, US ODA variability is low. This shows US ODA is distributed in a relatively constant manner across years over countries in the region. On contrary, the Chinese ODA flow has high variability in IGAD Member states. This could be due to Chinese ODA flow includes huge concessional loans which are granted to commence massive infrastructure investment projects for some specific countries as compared to others. The minimum amount of US development assistance which amounts 60,000was granted to Eritrea in 2019 whereas Chinas minimum assistance which amounts 10,373 was granted to Sudan in 2013 for the purpose of emergency response. Maximum amount of ODA of U.S. is 1.13 billion granted to Sudan in 2009 whereas China's maximum aid which amounted 5.07 billion was delivered to Ethiopia in 2015 as a concessional loan to finance development projects in railway and telecommunication sector.

All control variables are expressed in percentage share. Average percentage of employment in agriculture sector in the region is 66.53%. Besides, it has low standard deviations which amounts 16.05%, this could be due to similar economic structure of IGAD MS that is based on primary agricultural products. Low employment share in agriculture sector is 24.55% which is recorded by Djibouti in 2019 whereas the highest 83.18% is recorded by Somalia in 2000. The average trade openness is 78.65 with a minimum percentage of 0.78 (Sudan) in 2020 and a maximum value of 443.95% of Djibouti in 2007. The percentage is very high due to low GDP is factored by low investment, government expenditure and trade deficit. Average Government expenditure as a percentage of GDP is 13.51% with a minimum value (0.83%) of South Sudan in 2016 which is caused by a civil war which erupted in Juba after independence in 2011. The maximum percentage of government expenditure is amounting 32.48% is recorded by Kenya in 2020.

The correlation matrix depicts linearity relations between variables. The lower section of Table two shows net U.S. ODA as a positive relationship whereas net China ODA has an inverse relationship with GINI coefficient. However, it doesn't imply causal effect relation of ODA and IIQ. Also, Trade openness and ODA are inversely related. Government expenditure is inversely related with IIQ however it's positively related with ODA. Finally, correlation values are less than 0.8 which indicates the absence of multicollinearity across variables.

5. Econometric analyses

The research applied two Random effect model independently on both US and Chinese ODA to analyze and compare effects of ODA on IIQ.

$$Y_{it} = \beta + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \alpha_i + u_{it} \quad (1)$$

Random effect model is chosen after conducting Hausman test which determines appropriateness of a model comparing with fixed effect model to control unobserved country / individual specific effect. In

Housman specification test (1978), a null hypothesis assumes that individual specific effects are uncorrelated with the other regressors. Falling to reject null hypothesis leads to accept Random effect model (RE) as appropriate model to analysis. Therefore, the test result shows null hypothesis is not rejected at P-value < 0.05 significant level. Thus, RE is useful method to control for unobserved heterogeneity or country specific effects. Following that Breusch-Pagan Lagrange multiplier (LM) test is conducted to choose between random effect and pool OLS. After testing the null hypothesis which assumes that variance across levels is zero or no panel effect across countries. The result shows for both countries P-value was significant at < 0.05, thus null hypothesis is rejected in favor of alternative hypotheses which assumes the presence of panel effect or variance between countries.

$$IIQ_{it} = \beta + \beta_1 Net\ US\ ODA_{,it} + \beta_2 Agri_Empl/\ Total_Emp_{,it} + \beta_2 Trade\ openes/\ GDP_{,it} + \beta_2 Gov't\ expe/\ GDP_{,it}\ \alpha_i + u_{it} \quad (2)$$

$$IIQ_{it} = \beta + \beta_1 Net\ China\ ODA_{,it} + \beta_2 Agri_Empl/\ Total_Emp_{,it} + \beta_2 Trade\ openes/\ GDP_{,it} + \beta_2 Gov't\ expe/\ GDP_{,it}\ \alpha_i + u_{it} \quad (3)$$

As indicated in general model eq 1 Random effect model assumes that unobserved heterogeneity or individual-specific effect alpha (α_i) is random and not correlated with independent variables. However, the composite error term which includes individual-specific effect and idiosyncratic error term is correlated over time within each individual. This results serial correlation by transferring part of each period error term to the other that could lead to biased estimation. It's evident that such correlation happens because individual-specific effect alpha (α_i) doesn't change or it duplicate itself overtime for every individual.

Thus, the random effect model uses a parameter to adjust time de mean values by multiplying them with parameter of weighted average values of pooled OLS and fixed effect estimator valued between 0 and 1. In other words, it partially pools idiosyncratic error variance from individual-specific effect or Fixed effect estimator. This makes random effect efficiently control unobserved heterogeneity or country-specific effect by pooling out or reducing idiosyncratic error term and allowing covariance of error terms to be managed by Feasible Generalized List Square estimator. In the presence of serial correlation OLS can't be used to generate an efficient estimate of parameters as it violates Best Linear Unbiased Estimator (BLUE) assumption.

6. Result and discussion

The aim of this research is to examine the effect of US and China ODA on Income distribution of IGAD member states. Moreover, to compare the results which is defect size and direction, - for twenty years period of time from 2000 to 2020.

Table no. 3. Summary of variables

Dependent variable: IIQ

	Random Effect: US (R1)			Random Effect: China (R2)		
Independent variables	Coefficient	Standard error	Robust Std. Err.	Coefficient	Standard error	Robust Std. Err.
ODA	4.54E-09	(0.000134) ***	(0.000969)***	-1.68E-09	(0.0000645)***	(5.06e-10)***
Agri_EmplofTempl	-0.1983	(0.055984) **	(0.1139555)*	-0.2040639	(0.0570236)***	(0.1259292)
TradeopenessasofGDP	-0.01478	(0.0071004)***	(0.008033)*	-0.0198043	(0.0073009)***	(0.0075656)***
GovexpenoneducGDP	-0.2534	(0.0490307)***	(0.0930899)**	-0.2458011	(0.049763)***	(0.0717414)***
_cons	59.55516	(4.42069)***	(8.290325)***	62.15156	(4.508876)***	(9.163196)***
Observations	157					
No. countries	8					
Adjusted R^2						
Between	0.4824			0.3954		
Within	0.2062			0.1846		
Wald chi^2 overall F-test	36.19***			41.69***		

*Notes: P-value of coefficient for corresponding standard and robust standard errors is *Significant at 10%; **Significant at 5%; ***Significant at 1%. Standard errors and errors in parentheses.*

Table three shows random effect coefficients and corresponding standard error and robust error used to estimate for two independent regressions. R1 indicates random effect regression result which includes US ODA and R2 Indicates RE regression result which includes Chinese ODA. P- values which are indicated in asterisk shows significant value of relations (coefficients) when respective Standard and robust standard errors are employed. Also, adjusted R^2 of between and within indicates how well the variance of dependent

variable is explained by independent variables within country over time and across countries. Thus, result depicts that adjusted R^2 is higher in between effect than within effects. This implies, independent variables explain 48% and 39% of variation of dependent variable in R1 and R2 between countries. So, the RE model captured the variance in IIQ better between countries than within country overtime (country specific effect).

The first random effect regression model (R1) result shows that USA ODA has direct relation and statistically significant effect on IIQ at less than 1% level of significance. This implies on average an increase of U.S. ODA by 1% across IGAD member states over time leads to an increase on IIQ by 4.54E-09. However, the coefficient (effect size) is negligible. On contrary, the second regression (R2) shows, Chinese ODA has inverse relation and statistically significant effect on IIQ. It implies Chinese ODA effect on IIQ is inversely related. Thus, an increase of Chinese ODA by 1 % across time and countries decrease IIQ by -1.68E-09 — Which is negligible effect size. Since the coefficients are very low, they converted to Standardize coefficient beta (β) to zoom in for comparison purpose. Therefore, based on standardized coefficient beta U.S. ODA has higher the effect size which is (β) 0.25 while Chines ODA has -0.14. Based on the result, it's possible to summarize that U.S. and Chinese ODA has contradictory and statistically significant effect on IIQ. However, there effect size is negligible due to having very low coefficients.

This result is similar with findings such as (Cuesta et al., 2006) who found "aids …effect [on] recipient countries' inequality [is] neither largely nor always in the same direction". This could be mainly due to doners conditionality on economic policy which could undermine recipient countries effort to reduce IIQ such as policy prescription to shrink government expenditure. Moreover, poor management of funds such as provision of high administrative costs on projects financed by ODA, together with volatility of aid flow and less predictability could be reasons that reduced effect size.

In the R1 Employment in agricultural has inverse r/n and significant effect on IIQ at 5 and 10 percent significant level for standard and robust estimation respectively. This indicates 1 % increases of employment in agricultural sector reduces IIQ on average by 19.8%. likewise, in R2 employment in agriculture has negative effect on IIQ significant at 1 percent however robust regression is not significant at any level of significance. Coefficients indicate 1 % increase of employment in agriculture sector by 1% reduces IIQ on average by 20.8%.

An increase of trade openness has negative and significant effect on IIQ at 1% and 10% significant level when standard and robust estimate are used respectively. This shows a 1 percent increase in trade openness/GDP leads to a decrease in IIQ by 1.4% in R1. Similarly, in R2 an increases of trade openness/GDP by 1 percent reduces IIQ by 1.9 %. This might be due to trade openness could reduce prices of imported goods. Moreover, export of commercial agricultural products could help majority of a people in IGAD member states to generate income from better price in international market.

The finding in R1 and R2 show that government expenditure has percentage of GDP has significant negative effect on IIQ based on estimates made using both standard and robust error. There coefficients show strong effect size, which tells an increase in 1 percent of government expenditure leads to a decrease of IIQ by 25.3% and 24.5% respectively in R1 and R2. This implies government expenditure has strong contribution in reduction of IIQ in IGAD member states. It might be due to spendings are essentially targeting poor segment of the population. The effect could be realized through increasing spends on infrastructure project which create jobs directly and indirectly by providing benefits from the projects such as education which can reduce IIQ in long run.

Conclusion

Over the years ODA has been granted aiming a betterment of societies in Lest developed countries (LDC). However different researches indicate contradictory findings of ODA effect on addressing IIQ and economic growth which are one of the manifestations of betterment of the society. This research chooses U.S. and China by takings into account growing polarization b/n opposite global powers in international system could affect the way they use ODA to project their contending national interest in aid recipient countries which could influence the effectiveness of ODA on IIQ in IGAD member states. In the research, model specification is determined after conducting Hausman test to choose between fixed and random effect models. After conducting two independent Random effect for both regressions of U.S.(R1) and Chinese (R2) ODA on unbalanced panel data of eight IGAD member states for 20 years period of time from 2000 to 2020. The results indicated that the effect of U.S. and China ODA are statistically significant but the effects sizes are negligible based on masseurs using both standard and robust estimates. However, in comparison U.S. ODA has higher effect size and increasing effect on IIQ of IGAD member states. Whereas, Chinese ODA has lower effect size but decreasing effect on IIQ of IGAD member states. This

result is consistent with other findings of prior studies such as (Cuesta et al., 2006). Other controlling variables which are Agriculture employment, trade openness, government expenditures are statistically significant in both independent random effect regressions R1 and R2. Moreover, all of them have relatively higher effect size and reducing effect on IIQ in IGAD member states.

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Value Based Classification Technique for Sustainable Business Models (SBMs)

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Abstract

Sustainable innovations, efficiency, and social responsibility for society are demanded by every long-term surviving business model. Though they are important, but insufficient in themself to perform innovation when applied individually. Any long-term innovation and sustainable business model is difficult to achieve its goal if these holistic techniques are applied individually. That is a big challenge for any sustainable technique with minimizing the risk factor associated with it. Many sustainable business models involve a triple bottom line approach and include a wide proportion of stakeholder interest along with social and environmental sustainability. They are important and work as the driving potential for growth in the long term. These sustainable innovations can be embedded into business processes and purposes and work as the key factors in a competitive global market. Many innovative techniques perform quite well when applied individually but not grouped under a single theme.

In this work wide range of literature is analyzed and various sustainable models are grouped under a common theme in terms of samples. These samples have collaborated with the various available case studies and industrial exposure. These sustainable business models are introduced by describing grouping mechanisms and their solutions that can be used as hands-on exposure to the new practitioner. The aim of this grouping is to give a common language for the acceleration of sustainability implementation in the business model.

Keywords

Business model Innovation, Industrial sustainability, Value creation, Stake Holder.

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Introduction

With the anticipation of a growing population of the world along with proportionate accelerated global expansion resulted in escalating use of resources and detrimental environmental impacts. It is obviously apparent from the current scenarios of these constraints that any conventional business setup will not sustain for long terms. The world needs more than 1.8 times the planet to provide the needs of the current planet and wastes [The world Count].

Awareness regarding these needs with the current ecological system on the earth requires new trends with sustainable business models (Constanza et al., 1997). In history and even in the current scenario, it is not common to give appropriate values to free natural resources. So, for having a sustainable future, it is required to have a universal or comprehensive approach in business models across the world. These models should include the approaches to combat detrimental effects on the environment.

Model to have a sustainable economy should have the following features (Jackson et al., 2009):

1. A Model should concern with reducing and if it is possible then imposing limits on the quota of consumption on energy, goods, and water used for processing purposes.

2. A Model should impart growth of environment and society rather than focusing only on economic growth.

3. There should be 100% closed-loop processing within the business model. i.e. there should not be any kind of wastage or discard of unused or defective material and parts. The business model should focus on recycling, repairing, and remaking.

4. A model should envisage developing expertise and functionality instead of focusing on ownership of the product.

5. A model should also focus on developing human skills and creativity.

6. Model should focus on collaboration of similar type of business rather than aggressive approaches in competition.

These types of alteration require a fundamental shift in existing or any new model for sustainability. These innovations on any business model offer revitalization of the purpose of that model and logic development that create value for that particular model. It has been found that in the case of the existing mainstreaming business model if incubation of the above-stated features is done carefully then it is quite simpler to make the existing model into a sustainable model (Stubs et al., 2017).

Innovation of the Business model results in greater environmental and social sustainability in the existing industrial lobby (Ludeke et al., 2010). However, in the current era of cutthroat competition among various companies, it is difficult to maintain that sustainability (Stubbs et al., 2017).

In this paper, an attempt has been made to review various types of business model innovations along with categorizations for imparting sustainability in the existing or new models. This categorization results in further research by proposing samples of sustainable business models. These samples can be used for imparting it on new business or existing business models. In this paper, an attempt has been made to define the categorization mechanism of the sustainable business along with their hand on the example of current industrial uses. This hand-on exposure may be used for any new or existing business models that fall under a common theme.

1. Literature review

Many research works have been done for sustainable business model development through innovation that has strived thoroughly for presenting current models. This literature review is used for framework and guideline development for sample creation which is the main work of this research article. Some critical findings during review have been discussed here in this section:

Evan et al. (2017) have proposed a work that emphasized five steps for any sustainable business model is to create value in the model the first step is to create social, economical, and environmental benefits.

Geissdoerfer et. al. (2018) has proposed work by designing the concept of 'Value Ideation', value opportunity portion, and value proposition prototyping.

Biloslavo et al. (2018) have proposed a value triangle (VT) for the economic growth of the firm. In this framework, value is co-created by the collaboration of the firm with the stakeholders. The value generated through this model is used for facilitating customer value, partner value, and public value.

Oskam et al. (2018)have introduced value shaping in sustainability-based innovation. This results in generating financial, environmental, and social values by interacting with various values generating networks. Different networks assist in designing the value. They also argue that change in the value generated by a firm is the direct result of the change in the mindset of the firm.

Joyce et.al. (2016) have proposed a novel approach for developing a sustainable business development model. That model is a triple layer to meet the social, economic, and environmental benefits. Each of these layers results in value creation and satisfy the need of business through the economic, environmental, and social benefits.

Roman et al. (2018) have proposed a three-step approach for a sustainable business development model. This model progresses toward a sustainable business model through the open database. These datasets are used for the open innovation process.

Schaltegger et al. (2016) have proposed a strategic model that works as an alternative to the sustainable business model. This model results in a competitive advantage to the industry by making a conventional business model meet the sustainable development goal. This ultimately results in increased profitability and productivity.

Apart from this literature based on value identification of business models, a business model based on the economic growth of the organization has been shown in table 1. Along with societal and environmental sustainability, every organization is required to have self-sufficiency in terms of economic growth.

Table no. 1. Application of Sustainable business model in Economic growth of organization

Author/Authors	Year of publication	Economic factor in Contribution	Data source
De bernadi et al.	2018	Process and designing	Case study
Baldassarre et al.	2017	Framework	Literature synthesis
Tolkamp et al.	2018	Process and designing	Interview
Kurecz et aal.	2017	Conceptual model	Literature synthesis
Morioka et al.	2018	Framework	Case study
Stubbs	2017	Process and designing	interview

2. Methodology

Basically business model is a conceptual tool that envisages the functionality of a particular firm. This model is used for analysis, assessment, innovation, and comparison of firms. The business model defines the competitive strategy by analyzing the design pattern, marketing trend, and pricing strategy of the services and products offered by them. It also depicts how it is differentiating itself from other firms in terms of value.

In this paper, any business model is defined by three elements. That are value proposition, value creation, and delivery, and the last one is value capture as indicated in figure 1. The value proposition is associated with products and services offered by the firm in hope of economic returns on the other hand Value creation can be assumed as the heart of any business model while for capturing value, the firm needs to be always in the hunt to find out new channels for making funds and goodwill among customers. Business models along with their innovations are keys to the success of any business within an industry.



Figure no. 1. Basic Elements of Business model
Source: The Business Model,Richardson et al. 2018

Ludeke et al.(2010) found in their work that a sustainable business model creates competitive models that create advantage not only by providing values to the customers but also by contributing to society and the environment. Eco-design and Eco-Friendly techniques are important from a sustainability point of view. It is achieved through the reduction of energy and product consumption along with the reduction of waste per unit and emission. This efficiency improvement will culminate into improved services and products by making them more accessible and affordable as defined by the “rebound effect” (Herring et al. 2009). In a similar attempt, the government of the United Kingdom has declared reduction of 80 % green house gases by 2050 relative to the year 1990. This can be only possible through long-term sustainable development. By improving efficiency, it is easier to convert efficiency into profit but it is not feasible always to convert societal and environmental policies into the profit of the firm. To tackle the unsustainable future of the organization, innovations are required at the core of the organization rather than as an add-on to counteract the negative effects of an unsustainable future. Business model innovations may not be viable at starting but may become viable after a certain time period due to environmental needs and regulations from the government. This can be assimilated through the invention of the electric car as it was not so viable in the

launch year though it was innovative and eco friendly now due to demand of cleaner environment those firm are blooming than conventional Business Model of vehicles.

In the literature review, it has been found that there are various different strategies and approaches for innovation in sustainable business development. Also, there are not exactly common sources that are available for the construction of innovation models. That makes it difficult for practitioners to make an innovation model with available data hence causing hindrance in practical experimentation. These un-connected sources also restrict the synergic implementation of different innovation approaches. This reduction or constraint on potential benefits can be overcome by systematic categorization of business models having innovative approaches. This grouping can make it easy for practitioners to perform experiments in developing business models and identification of the corresponding bottlenecks in the growth. This grouping is termed a sample in this work. These samples are found by following 3 steps. The first step is to find out the correct theme for the development of the sustainable model. In the second step, work has been done to suit the sustainable business model categorization of the sample and in the third step, an attempt has been made for analyzing business model innovations through practice or available examples. Similar is depicted in figure 3.

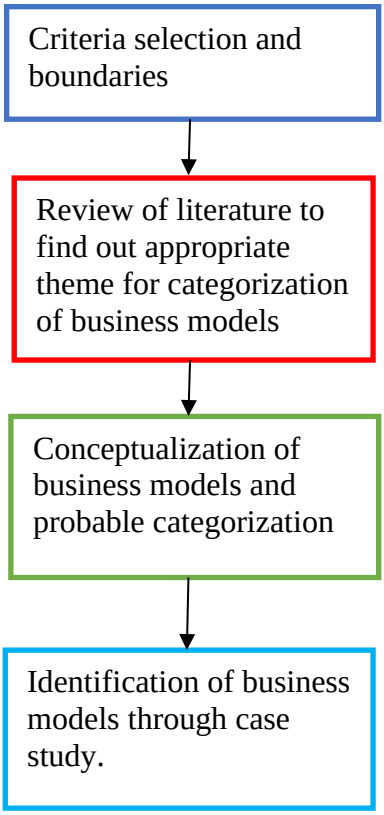


Figure no. 2. Methodology for finding out sample of Sustainable Business Model

Boundaries and criteria are defined for facilitating the steps of collection of examples for literature and experimental practice point of view. It defines the generic methodology for supporting business model developments for innovations.

The sample made through this is representative of the main feature of the transformation of business model innovations. It also should be exemplary and mutually exclusive but not should be overly susceptible.

The literature review is achieved through standard journals. This literature contains all relevant keywords. This literature envisages sustainable business models. Major script achieved from the sustainability literature focuses on contribution to the business model for sustainability.

In the literature of concerned research articles, it has been found that there is a lack of categorization of business model sampling. In some industrial case studies, it has been found that they are using techniques for sustainable business model innovations that are much ahead of existing theoretical studies. So examples from existing industries are crucial in developing categorization samples.

3. Results

In this section, samples of the various sustainable business models have been found. These samples are classified on the grouping of higher orders. Important types of innovations of business model include Technological, social, and Organizational based innovations. The technical grouping includes samples that are mainly focusing on technological development for the development of the business model. To achieve this, manufacturing and product redesigning is achieved; similarly, the social grouping includes improvements in offerings to the customers and modification of consumer behavior while in case of organizational grouping focus is made on changing the fiduciary responsibilities of the firm. They are a high level of grouping but often they are paired with other innovations.

Clustering	Technological			Social			Organizational	
Sample	Maximise material and energy efficiencies	Create valve from waste	Substitute with renewables and natural processes	Develop functionality and parent ship	Adopt a stewardship role	Promote sufficiency	Reconstructing for society and environment	Produce scaled solutions
Examples	Low carbon Manufacturing	Closed loop economy	Move from non renewable to renewable energy	Product oriented maintenance and extended warranty	Biodiversity Protection	Product longetivity	Not for profit	Collaborative approaches
	Lean Manufacturing	Cradle-to-cradle	Solar and wind based energy innovations	User oriented rental	Consumer care promotion and consumer well being	Slow fashion	Hybrid business	Incubator and entrepreneur support model
	Additive manufacturing	Industrial symbiosis	Zero emission initiatives	Result oriented pay per usePrivate finance initiative	Ethical trade	Demand Management	Alternative ownership	Open innovation
	Low Carbon Solutions	Reuse, recycle, remanufacturing	Blue economy	Design, Build, Finance and operate	Choice editing by retailer	Premium branding	Social and biodiversity regeneration initiative	Crowd sourcing
	De-Materialisation	Take back management	Biomimicary	Chemical management Services	Radical transparency about environment	Frugal business	Localisation	Licensing
	Increased functionality	Use excess capacity	The natural step		Resource Stewardship	Responsible product		
		Sharing assets	Slow manufacturing					
		Extended product responsibility	Green chemistry					

Figure no. 3. Classifications of sampling

In this section 8 types of samples have been founded out that discussed below:

1. Maximize material productivity and energy efficiency: In this type of business model sample, there are approaches to do maximum with fewer available resources. Hence results in less emission and pollution. This sample focuses on the basic manufacturing sector and industrial sustainability. This sample should propagate through the entire business structure subsequently resulting in value propositions. As resources available are going to be short in the future along with increment in energy price, this model is going to be high uses in the future. This model encompasses lean manufacturing, eco-friendly and cleaner production firm that improves resource efficiency. There are various industrial or businesses available having this type of approach. An industrial example of this model is Toyota Production System (Womack et al., 2003). They integrate lean manufacturing throughout their business.

2. Create value from waste: In this stream, waste is eliminated from business. Waste is converted into a useful product for the input of the processing unit. For any efficient seeking organization, waste removal may be a beneficial step as it affects efficiency directly. In some industries, waste removal is added up as complementary value additions as in the case of coal thermal power plants, fly waste ash can be used for

fire bricks. This approach is similar to our food supply chain where waste from species becomes food for other species (Boon et al., 2002).

This type of sampling of sustainable business models results in a reduced effect on the environment. And also the continuous demand is supplied by recycling of the resources resulting in a closed material loop.

Cradle to cradle (Mcdonough et al., 2002) incorporate the idea of a close-loop instead of the open-loop cycle in the nutrient development phase. In the latter case, they found it difficult to recapture the waste products.

3. Substitute with the natural and renewable process: It aims in reducing environmental impact and increase business resilience by incorporating the limit to a growth model in the case of non-renewable sources and the current production system. This sample includes a business model that relies on renewable energies and natural processes to create an eco-friendly industrial system. This focuses on limiting the use of available resources on the planet.

Evan et al. (2017) studied an industry where solar energy is used for lighting purposes and hybrid solar and windmill incorporated for generating electricity for manufacturing purposes.

4. Delivery functionality rather than ownership: In this approach basic idea found is to focus on product improvement as per the interest of the consumers. So, ultimate idea is to focus on improving the quality of the product rather than its quantity. This type of model solemnly shifted toward the providing greater service model. Hence provide products that have pay per service rather than selling a complete set of products with similar attributes. To achieve this product is going to be changed again and again inside the industrial system.

Manufacturers may develop products having good upgradability, reparability that results in low uses of resources, and corresponding wastes are also reduced. Example of this type of model includes car servicing firms and Xerox performing firms (Tukker et al., 2018)

5. Adopt a stewardship role: In this approach business models have been found to be in long-lasting relation with their stakeholders for the long-term good future of the firm. Stakeholders are thoroughly involved in all crucial as well as other decision-making meetings. This long-term satisfaction of stakeholders results in a positive effect on society. An example of this type of model is found in Marine stewardship council

6. Encourage sufficiency: This type of business model has an approach to reduce the demand of the product on consumer size hence limiting the production of that firm. This involves durable product design so that products have a longer life. This model tries to have the habit of consuming and wasting less on the customer side. This type of model results in a good relationship with the customer and also result in large market capture as increased reputation due to durable product development.

Energy-saving companies have adopted this model to save energy consumption by customers. Due to these savings, profit made by the company is shared with customers partially (Fora et al., 2010)

7. Repurpose for society/environment: In this type of sample, there is the business model that seeks sustainability through capturing the social and environmental benefits rather than economic profits. Close integration between society, firm, and stakeholder established. On a basic system level, this type of firm is inclined for driving globally rather than scale for the smaller regions. Example of these type of model includes microfinance and manufacturing enterprises having service area in rural cantonment (Yunus et al., 2010).

8. Develop scale-up solutions: The aim of this type of model is to mass-scale level sustainable production for maximizing benefits to the society and environment. This type of business model can be created by having proper employing channels and partners so that long-term and large-scale benefits can be combined simultaneously. Most franchise-based organizations are examples of this type of model (Dant et al., 2011).

Conclusion

The available literature for sustainable innovation is segregated in a large range. There are various novel techniques also found out that are of great for innovations for sustainability. This research work tries to group those techniques into 8 unique with common themes for each domain in terms of the sample. The main purpose of sampling is to group similar types of value generation businesses under a single umbrella. This mechanism assists in further research and innovation that can be done for sustainability. Results obtained can be used as de-risking parameters for beginners as an analysis done on various industries in

literature and case studies. The 8 business model can be viewed as an initial point for broadening research and innovation for starting or existing business model.

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Customers' Perception of the Risks Associated with the COVID-19 Pandemic in the Romanian Hospitality Industry

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Abstract

The purpose of this study is to analyse consumers' perceptions of the risks associated with the COVID-19 pandemic in the Romanian hospitality industry. To this end, a quantitative research was conducted using an online survey, based on a questionnaire with a number of 12 questions, administered to customers of units in the hospitality industry (hotels, restaurants, cafes). A total of 292 respondents (103 men and 189 women) answered all questions. Four working hypotheses were formulated. It was concluded that the extent of the safety measures taken by the units in the Romanian hospitality industry had a positive impact on customers. The perception of the measures is a positive one and the customers do not feel any fear or significant threat regarding the possibility of infection with the SARS-CoV-2 virus in these units. The risk perceived by customers, in various forms, is not an obstacle in blocking the demand and development of the hospitality industry. The study helps to broaden the understanding of the behavioural effects of clients during a pandemic and it is good to know this behaviour of customers in another unpredictable scenario of the evolution of the spread of COVID-19 disease. The study conducted in Romania can be used as a bench-mark for other countries and researchers.

Keywords

risk, COVID-19 pandemic, customer perception, hospitality industry

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Introduction

In December 2019, a pneumonia outbreak with an unknown source broke out in Wuhan city in China. The World Health Organization then classified the virus as the new coronavirus disease COVID-19 in February 2020. The pandemic spread globally as a result of international tourists returning to their home countries after visiting infected areas. Cases of COVID-19 have been increasing very rapidly globally on a daily basis. This has resulted in increasing global economic anxiety (Fetzer et al., 2021), which has had a significant impact on the hospitality industry (Faroudi et al., 2021), created uncertainty and negative perception on the hospitality industry, tourism and travel destinations due to the need for global quarantine and severe restrictions on movement.

The restaurant industry has been heavily impacted financially by the effects of the COVID-19 pandemic and the restrictions caused by it (Byrd et al., 2021). In the wake of the global health pandemic and its devastating impact on every industry, particularly in the hospitality industry, there have been calls for systematic, theoretically driven research into customers' perceived health risk so that hospitality managers can develop and implement health-related risks (Faroudi et al., 2021). The COVID-19 pandemic is widely regarded as a significant negative issue in a particularly difficult time for global tourism. However, studies are quite few on how previous and potential new customers behave when considering the use of hospitality services. Moreover, it is essential to investigate how the pandemic is reshaping the consumption landscape

and consumer desire in the long term. Understanding customer beliefs and behaviour would help hospitality managers respond more effectively to a crisis.

The purpose of this study is to analyse consumers' perceptions of the risks associated with the COVID-19 pandemic in the Romanian hospitality industry. It includes four main sections. First, the Review of the scientific literature, where the main researches related to the approached topic are reviewed. The second section, Research methodology, describes the methodology, the research hypotheses and analysis process of the empirical study. It is followed by the Results and discussion section and the paper ends with conclusions, the practical implications, and the limitations and research prospects.

1. Review of the scientific literature

Risk theory is considered a powerful theory for explaining tourism behaviour during a global pandemic (Cahyanto et al., 2016; Faroudi et al., 2021). Previous research has found that travelers' perceived risk has a direct influence on travel intention (Al-Ansi, Olya and Han, 2019; Olya and Al-Ansi, 2018). Tourists, according to risk theory, always seek to maximize their satisfaction while avoiding any negative experience. In other words, customers will reduce their purchasing habits if they perceive a high level of health risk (Lim, 2003; Faroudi et al., 2021). The future of the hospitality sector in this unprecedented period depends on consumer perceptions of disaster shock, beliefs, anticipated emotions and future desires. In terms of perceived risk theory, it has been observed that low levels of perceived health risk in hotels have been associated with low levels of expected human interaction, which is enabled by the mobile check-in system (Shin and Kang, 2020). They also found that perceived health risk was directly affected by the level of cleanliness.

Pandemic-generated anxiety has also been investigated from different angles (Cheng et al., 2021; Tavitiyaman, Ren and Fung, 2021). Wong and Yang (2020) reported on anxiety from the perspective of guests in enforced isolation. Their research indicates that a high level of service quality can contribute to relieving loneliness anxiety. Other papers address the link between consumer behaviour and forced positive or negative emotions (Radic et al., 2021; Sung, Hu and King, 2021; Rastegar, Seyfi and Rasoolimanesh, 2021). In the case of restaurants, positive emotions can influence consumers' desire to return. In contrast, negative emotions influence how risk is perceived by consumers, generating a preventive behaviour towards restaurants.

During the pandemic, the hospitality industry also made much use of the increased interest in online food delivery (Leung and Cai, 2021; Šerić et al., 2021) aiming for a certain level of performance, trust and social influence. In this case, the visual appeal, informative nature of the menu, consumer desire for food and convenience provided by online ordering indirectly influenced consumers' purchase intentions, despite their perceived risk. At the same time, the negative impact of online ordering on consumer intentions has also been highlighted. In areas heavily affected by the pandemic, higher self-efficacy of individuals was observed and in less affected regions, the negative impact was generated by risk perception. Studies, generated in the aftermath of the pandemic, indicate certain changes in consumer behaviour. In the restaurant industry, the pandemic has encouraged a preference for dining, restaurant and private rooms (Šerić et al., 2021). The pandemic has caused an increase in the amount of food ordered and a higher consumer tolerance for food waste (Šerić et al., 2021; Sharma et al., 2021). Consumers are no longer concerned about food waste resulting from increased use of food delivery apps.

Some papers have addressed technological innovations (Ene and Bojescu, 2020) in hotels (Kim and Lee, 2020; Šerić et al., 2021). The results indicate that in the wake of the pandemic, consumer preference tends towards robot-staffed service at the expense of human-staffed service. Factors such as safety concerns and social distancing strongly influence this new preference for robotically staffed hotels. Shin and Kang also associate reduced human interaction with technological innovation (e.g., mobile or kiosk check-in systems and robot cleaning systems) with increased booking intentions (Shin and Kang, 2020). At the same time, the importance of self-service technology as a factor in customers' perception of hotel safety has also been highlighted (Atadil and Lu, 2021; Šerić et al., 2021). Other factors mentioned are medical training, hygiene control and health communication.

2. Research methodology

The research was conducted in Romania in the field of hospitality industry and includes an analysis of data based on a survey.

The survey questionnaire was built using online survey tools, "typeform.com", a reliable online survey tool widely used by large corporations. The statistical community was represented by the clients of the hospitality units. A 12-question questionnaire was developed for the clients of these units (Table no.1).

Table no. 1. Questions from the customer questionnaire

Question number	Questionnaire statements
1	I am satisfied with the safety and hygiene measures implemented by the unit (hotel/restaurant).
2	I understand the role and purpose of the SARS-CoV-2 virus safety and protection measures taken by the unit (hotel/restaurant).
3	I did not feel threatened by my infection with the SARS-CoV-2 virus during my stay at the hotel/restaurant.
4	I did not feel afraid of being infected with the SARS-Cov-2 virus from the unit's customers.
5	I consider that the services provided by the hotel are in line with my expectations regarding the safety and protection against the SARS-CoV-2 virus.
6	I am satisfied with the safety and hygiene measures in my hotel room.
7	I did not feel afraid of being infected with the SARS-Cov-2 virus from the unit's employees.
8	If I had another variant of the unit, I certainly would not have chosen this restaurant/hotel.
9	I am convinced that the unit has used the most effective methods of maintaining safety and protection against and combating the SARS-CoV-2 virus.
10	I am concerned and concerned about public health issues.
11	I am worried and worried about my health and the health of my family.
12	I have taken extreme measures for my health and that of my family.

Data collection was performed by several methods. Through the face-to-face method, the authors personally visit the units in the hospitality industry (hotels, restaurants, cafes), but also through cold calls, e-mails, etc. Before starting the questionnaire, its purpose was explained and the respondents participated voluntarily. A total of 292 respondents (103 men and 189 women) answered all questions. There were also questionnaires that were not completed in full and those were omitted from the study. The complete answer rate to all questions in the questionnaire was 64.47%. The authors ensured the anonymity of the answers and the confidentiality of all data collected.

The study period overlapped with that of holidays and vacations, when the hospitality industry was much more in demand. The analysis of the primary data collected was performed quantitatively and qualitatively. The data were coded for easier econometric processing and for the development of descriptive statistics.

The evaluation was performed using the Likert scale, according to the model shown in Table no. 2. The scale is between 1 and 5, with the following meanings: total disagreement (1), disagreement (2), neither agree nor disagree (neutral) (3), agreement (4) and total agreement (5).

Table no. 2. Evaluation scale

Evaluation Criterion	Total Disagreement	Discomfort	Neutral	Agreement	Total Agreement
1. I am satisfied with the safety and hygiene measures implemented by the unit (hotel/ restaurant).	**1**	**2**	**3**	**4**	**5**

The following working hypotheses were formulated:

Hypothesis1. *There is a positive perception from customers about the safety of hospitality units.*

Hypothesis2. *Respondents do not feel fear or threat of being infected with the SARS-CoV-2 virus.*

Hypothesis3. *Respondents who do not perceive any threats during their vacation are concerned below level 4 about their own and their family's health.*

Hypothesis4. *The gender of the respondents influences their fear of being infected with the SARS-CoV-2 virus by employees.*

The calculation technique used in this study targeted the R program. With its help, the authors calculated the V Cramer correlation coefficients. In case of hypotheses, the t test was also used. Program R proved to be extremely useful for this research in data analysis (linear and nonlinear modelling, classical statistical tests, classification, grouping and so on) (Upton and Cook, 2002; Longhow, 2010). The Cramer V method

was used to test the data and determine the degree of association when a significant Chi-square was obtained (Upton and Cook, 2002; McHugh, 2013). These coefficients were used to test the hypotheses and a descriptive statistic was based on them (Schober, Boer and Schwarte, 2018).

3. Results and discussion

Based on the collected data and the methods used, the hypotheses were tested.

Hypothesis1. ***There is a positive perception from customers about the safety of hospitality units.***

The first hypothesis is validated.

A "t test" is calculated on the answers to question number 1 (Q1). In this test, the default media 3 represents a neutral perception of the safety measures implemented by the hospitality unit. The null hypothesis is obtained if the population average is equal to 3 (neutral), and the alternative hypothesis if the average is not equal to 3. The *p*-value is of 2.2×10^{-16}, therefore the null hypothesis is rejected. The authors conclude that the customers' perception of the safety measures implemented by the unit is positive, as the lower limit of the range of 4.05 is higher than 3 (the value of the neutral perception).

Based on the Chi-square test, it was tested whether there was any association between the gender of the respondents and the perception of the measures taken against the spread of the SARS-CoV-2 virus. It was found that there is no association between customer satisfaction and gender, as the p-value obtained, equal to 0.26, is well above the significance level of 0.05.

It was then tested whether there was an association between education level and customer satisfaction. The method used was the whole chi-square test, and the result obtained indicated a significant degree of association. Using the V Cramer method, a value of 0.22 was obtained, which shows a rather low association. It is still checked if there are major changes in customer satisfaction depending on the level of education (high school or university), but the differences are unnoticed.

Hypothesis2. ***Respondents do not feel fear or threat of being infected with the SARS-CoV-2 virus*****.**

The second hypothesis is validated.

The t test was performed on questions no. 3 (Q3) and Q4 of the questionnaire. The range limits for the mean value, with a 95% confidence interval, are 4.05 and 3.61. The values obtained after performing the test are above the neutral value. This indicates that clients do not feel threatened or afraid of becoming infected with the SARS-CoV-2 virus from other clients in the hospital unit.

Hypothesis 3. ***Respondents who do not perceive any threats during their vacation are concerned below level 4 about their own and their family's health*****.**

In the third hypothesis, the authors tested whether the threat of infection with the SARS-CoV-2 virus is associated with other variables. Using the Chi-square test, it was tested whether there was any relationship between customer satisfaction with the SARS-CoV-2 virus prevention measures taken by the unit and their concern for their own health and that of their family. The null hypothesis reflects that there is no association (correlation) between the two variables. The alternative hypothesis reflects an association between the two variables.

After performing the test, a p-value of 0.01 was obtained. This is below the significance level of 0.05, and thus rejects the null hypothesis. The conclusion is that there is an association between the two variables.

The authors then calculated Cramer's V to determine the degree of association between the two variables. The result indicates a coefficient of 0.21, which reflects a low association in terms of customer satisfaction with anti-COVID measures and concern for one's own health.

The method applied to questions no. 1 and no. 8 indicates that there is no relationship between the two variables, ie if customers were more satisfied, the decision to choose the restaurant / hotel would not have been affected.

Hypothesis4. ***The gender of respondents influences their fear of being infected with the SARS-CoV-2 virus by employees*****.**

The authors test whether there is any association between the gender of respondents and their fear of being infected by employees with the SARS-CoV-2 virus while consuming hotel/restaurant services. The Chi-square test indicates a p-value of 0.82, so the null hypothesis is rejected. There is no association between

the two variables. Whether or not customers have experienced a threat of SARS-CoV-2 virus during their stay, it does not depend on their gender.

Performing the Chi-square test on questions no. 10 and no.11 indicates that clients are concerned about their health and that of their family and have taken extreme steps to protect their health. The authors check the degree of association between these two variables and the level of threat and fear of infection with the SARS-CoV-2 virus in the hospital unit. The Chi-square tests between questions Q3 – Q10, Q4 – Q10, Q3 – Q11 and Q4 – Q11 indicate the following p-values: 0.08, 0.39, 0.06 and 0.29. All p-values are above the significance level of 0.05. The null hypothesis, which refutes the existence of a connection, is not rejected. Consequently, we can say that there is no obvious association between the variables mentioned above.

Conclusions

The SARS-CoV-2 virus induced fear (Magano et al., 2021) and significant uncertainty among people (Faroudi et al., 2021) and chaotic conditions in many industries. The tourism and hospitality industry is one of the worst affected by the pandemic. Although almost all global restrictions have now been lifted (March 2022), the World Health Organization is drawing attention to the growing number of cases of SARS-CoV-2 infection in many regions (WHO, 2022), including 18 European countries, such as the United Kingdom, Ireland, Cyprus, France, Italy, Germany. Under these conditions, managing the behaviour of customers in the hospitality industry poses new challenges.

Such periods of uncertainty require the maintenance of a high level of customer satisfaction and more behavioural and causal research is needed to determine the (differential) effects of these operational strategies on customer attitudes and behaviour (Gursoy and Chi, 2020).The present research has shown that the decrease in the number of tourists and customers in the hospitality industry is not primarily due to the possibility of COVID-19 infection in hospitality units, but rather to the restrictions and limitations imposed by the authorities to combat the spread of the virus. According to Hypothesis 1, which is validated, there is a positive perception from customers about the safety measures of the hospitality units. At the same time, customers do not feel fear or threat about being infected with the SARS-CoV-2 virus, according to Hypothesis 2 validated.

A particularly important conclusion of the study is that the risk perceived by customers, in various forms, is not an obstacle in blocking the demand and development of the hospitality industry. If customers are satisfied with the measures taken by the unit, they will show their appetite for consumption. Therefore, it is good to know this behaviour of customers in a further unpredictable scenario of the evolution of the spread of COVID-19 disease. This study, including conclusions on customer perceptions of the risks associated with the COVID-19 pandemic in the Romanian hospitality industry, can be used as a benchmark for other countries and researchers.

Regarding the limits of the study, we must remember that the data were collected during the pandemic (summer 2020), in a rather unclear situation on the evolution and effects of the pandemic. In the current context of lifting the need for security measures, however, we are witnessing a different behaviour of customers, many of whom are still wearing masks and having requirements to comply with measures to prevent infection / reinfection. Therefore, future studies may be conducted in a less standardized context. Future research directions can be focused on the study of tourist behaviour in the next period. They can be checked for new behaviours and patterns of consumption in the hospitality industry compared to those before the pandemic broke out.

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State of Health Emergency and Survival of the Contractual Relationship in International Contracts

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Abstract

Moroccan law seems to limit the principle of "force majeure" to the sole non-performance of damages. In all cases, the defaulting party bears the burden of proving its liability. However covid-19 has created confuesion and inconsistance on exeqution of force majeure of internatioal contracts. Thus, the objective of the stusy is describe and anlyse how Covid-19 global state of health emergency affect performance of contractual obligations of international contracts in Morocco. Morover to assess to what extent can international contract be adapted to the test of covid-19 per the provisions of Moroccan law. The research employed observation method which is an exploratory type of research approch that collect relevant information and data through observation to describe and anlyse how Covid-19 global state of health emergency affect performance of contractual obligations. The study found that Moroccan law does not have an explicit legal framework for contract negotiations, but could provide a basis for sanctioning an abusive termination of negotiations which is evedent during the covid-19 case. In addation" Dahir" (executive decree by king) which describes obligations and contracts, did not take into account the theory of hardship. Therefore, besed on the findings It is recommended to stpulate explicit legal framework for contract negotiations to integrate various impacts, particularly in terms of deadlines, in the contracts to be concluded. Moreover, inclusion of new Dahir to embrece the theory of hardship which alows revison of binding force (force majeure) of the contract during hardship time such as Covid-19. Making such changes would help for effective exicution of contractual concept of force majeure in the time of C-19 to effective decide approprate combination of suspension of performance, exemption from liability for non-performance or termination of the contract.

Keywords
COVID-19, International Business Contract, Health Emergency, Moroccan law

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Introduction

The Covid-19 outbreak currently sweeping the globe is an unprecedented event of unparalleled magnitude (Ait Mokhtar, 2022), which has directly affected international trade and economic actors due to both the spread of the disease and government restrictions, Morocco is by no means immune to this global health pandemic because many international trade relations have been terminated by contractors or the performance of contractual obligations has become very difficult, if not impossible, for many economic actors who are therefore tempted to look for ways to adapt their contract to this epidemic and restore the contractual balance within their contracts.

A party to a contract could be tempted to invoke the current crisis but above all the government measures taken in this regard as constituting a case of force majeure to request the suspension of the execution of the contract in the event of a temporary impediment or even the resolution by operation of the law of the contract in the event of permanent impediment. However, Section 268 of the D.O.C appears to limit the principle of force majeure to non-enforcement of damages only In any case, the defaulting party has the burden of demonstrating the existence of force majeure to clear itself of its liability (Zeynalova, 2013).

In general, government measures to combat the COVID-19 epidemic would rather lead to a temporary impediment that could only justify a suspension of the performance of the obligation discussed and not the termination of the contract.

However, the application of force majeure will necessarily have to be studied in concerto according to the obligation in dispute and the contractual stipulations binding the parties.

Another course of action lies in the theory of the exception of non-performance defined in article 235 of the DOC (Mazzacano, 2022). Under this Legal text, the debtor of an obligation could decide to suspend the execution of the contract if his co-contracting party does not perform its obligations, subject to compliance with the conditions of formal notice incumbent on it.

Based on the above, to what extent can the international contract be adapted to the test of covid-19 per the provisions of Moroccan law?

These theories could be invoked in the context of the performance of various obligations, which will necessarily have to be studied on a case-by-case basis and subject of course to any legislative or regulatory measures which may be taken subsequently, keeping a close eye on the solutions offered by comparative law.

1. Literature review

Applications to the pre-contractual phase and preliminary contracts.

Contract negotiations

The conclusion of a contract generally involves a preliminary phase of discussions and negotiations between the potential future contracting parties. This period of pre-contractual negotiations does not have an express legal framework in Moroccan law and in principle, the parties, who are not contractually bound to each other, are free to contract or not. However, this principle is not absolute and must be limited, following the example according to Nouali, (2019) French law which sanctions the abusive termination of talks, by obligations of good faith or even the absence of intention to harm by one of the parts. Article 94 of the D.O.C could constitute a legal basis making it possible to sanction an abusive termination of negotiations.

In any case, the breakdown of negotiations should not be considered abusive given current events. However, in the context of ongoing negotiations, the parties are informed, before the signing of the contract, of the current situation and its consequences. It will then probably be impossible to invoke the COVID-19 crisis as constituting a case of force majeure once the contract has been signed. It is therefore recommended that the parties already integrate the various impacts, particularly in terms of deadlines, in the contracts to be concluded.

The argument of force majeure is, without a doubt, a means of releasing oneself from one's contractual commitments when their execution becomes impossible. However, many players in the economy are not affected by this scenario, which implies the existence of an insurmountable ("irresistible") obstacle to the performance of an obligation. In this case, the majority of operators seem to be faced more with the occurrence of circumstances that make the performance of their obligations particularly onerous but not, strictly speaking, impossible to perform.

In some cases, the parties to a contract may have planned – upstream – adjustments and corrective mechanisms likely to be implemented in the current context:

- Indexation clauses (or sliding scale clauses) thus make it possible to calculate the price of a service or product according to the fluctuation of a reference index (the price of wheat or oil). However, this type of clause can only influence the contractual price, even though other factors are likely to cause performance difficulties (delivery times, etc.)

- Also, the renegotiation clauses at maturity require the parties, often on the anniversary date of the contract, to come together to renegotiate the conditions of their commitment. However, this renegotiation is only possible on the date set by the parties to the contract, which may prove to be too far off to deal with the urgency imposed by the context of an economic and health crisis;

- Finally, the hardship (or safeguard) clauses by which the parties undertake to renegotiate the conditions of the contract when, as a result of external circumstances, the conditions of performance of the contract become deeply unbalanced, can make it possible to adapt the contract to the consequences of a crisis such as the one we are going through.

Preliminary contracts

In the case of preliminary contracts, it will be necessary to assess the situations in which the ban on assembly and the containment measures materially prevent, at least temporarily, the reiteration of promises before a notary within the required time limits or the signing of contracts of purchase of securities of companies holding real estate, taking into account in particular, the possibility of an electronic signature for the latter.

Since 2007, electronic signature and certification have been possible for private deeds, it being specified that Barid Al-Maghrib is the only entity approved by the state to issue electronic certificates (Mejdoubi, Ghita and Kevin, 2020). Nevertheless, it seems to us that for acts whose legalization is necessary, a trip to the competent administration is always necessary.

Concerning the unfulfilled conditions precedent provided for by the terms of the promises and contracts, the automatic postponement of the deadline for fulfilling these conditions precedent does not seem to be possible at this stage. Indeed, it would be necessary to examine on a case-by-case basis depending on the nature of the condition precedent to know whether its fulfillment within the stipulated deadlines has been made impossible due to the COVID-19 crisis and the government measures taken in this regard. In general, the parties will have an interest in agreeing on an amicable extension of the deadlines for the fulfillment of the condition's precedent or the non-fulfillment of the resolutive conditions.

2. Research methodology

Observation is widely used research approach in an exploratory phase, usually in an unstructured form, to figure out what's going on in a situation as a prelude to testing the insights gained (Aynalem and Vibhute, 2022). It is also used as a supporting or supplementary way to collect data that may complement or put data obtained through other means into perspective (Ibid). In this research the first step starts by observation case and complaints at different levels of Moroccan courts. Following those repetitive cases which took place during Covid-19 were identified by looking court cases. Subsequently, case related to non-performance of contracts due to covid-19 were selected through Identify similarity of causation which are related to Indexation clauses, renegotiation clauses, hardship (or safeguard) clauses for breach of international contracts. finally, the researcher identified clauses of Moroccan legal system available in handling international contracts which could be applicable at a time of such global health emergency like Covid-19 to analyses to what extent can the international contract be adapted to the test of covid-19 per the provisions of Moroccan law and put some recommendations to address similar circumstances in the future.

3. Results and discussions

3.1. Resistance of the binding force of international contracts in the face of the Covid-19 pandemic

Force majeure clauses identify exceptional circumstances upon the occurrence of which the debtor is exonerated from liability for failure to perform. Whether an event constitutes force majeure under a contract involves a casuistry analysis of the facts. In most cases, a force majeure event must be unforeseeable; moreover, the debtor must not be able to avoid or overcome the event or its consequences.

In some contracts, events that constitute force majeure are specifically listed and these lists may include epidemics, pandemics, or other serious and widespread disease terms, which cover Covid-19. If the list is supposed to be exhaustive, the absence of an express reference deprives the injured party of the protection linked to this clause. However, several contracts contain only a general catch-all phrase referring to the force majeure requirements mentioned above (or contain a purely illustrative list), thus leaving open the question of whether the Covid-19 pandemic qualifies force majeure under this specific contract.

Even if Covid-19 falls under the contractual concept of force majeure, other conditions must be met, namely a direct causal link between the pandemic and the non-performance (which must be "due" to the pandemic) (Mundi, 2007) and the inevitability of the effects of Covid-19 (or subsequent pandemic mitigation restrictions), and the unpredictability of the epidemic must also be questioned. (ConocoPhillips Co, 2020).

If all these conditions are met and if the party affected by the impediment invokes force majeure under other contractual requirements (form, deadline), the clause then provides for a compensation regime which, in most cases, is based on the combination of suspension of performance, exemption from liability for non-performance or termination of the contract. In some of the rare comparable circumstances (i.e., when other epidemics have occurred), the courts have been extremely reluctant not to dismiss the plaintiff (Guiomard, 2020).

In particular, the party that successfully invokes force majeure may suspend performance for the duration of the impediment, provided that the other party can also react by suspending its counter-performance. However, if the suspension of performance or its extension in time deprives either party of what it was reasonably entitled to expect from the contract, either party may terminate the contract (Berger and Behn, 2020).

In any case, whatever the recourse between the suspension and the termination, the party which does not perform the contract is exonerated from any liability for damages, including lump-sum damages for delay in the execution and other contractual penalties.

In a smaller number of cases, the contractual remedy may contain alternative solutions – which are more often found in hardship clauses – aimed at preserving the contract, namely an obligation to renegotiate the terms of the transaction. (Which does not in itself imply an obligation to reach an agreement on new terms) or the endowment of a third party or a court with the power to adapt the terms of the contract to changing circumstances.

Not only do these alternative remedies imply that the force majeure clause in question also covers situations where performance is not impossible but simply more cumbersome (because renegotiation would otherwise be pointless), they also appear to be based on the assumption that the preservation of the contractual relationship is desirable, presumably based on the argument that the termination of the contract would entail the burden of new costs.

This is, however, a questionable assumption to be weighed carefully against the benefits arising from the termination of the contract, which allows the parties to return to the market in a competitive environment and to seek again, in the newly changed circumstances, the most profitable transaction, either with the old or with a new contractual counterparty. In the absence of a contractual remedy, the attention of economic actors turns to the national options offered by the restrictions for the mitigation of the pandemic.

3.2. Force majeure and the theory of unpredictability

In Morocco, unlike France, the drafters of the Dahir of obligations and contracts, did not take into account the theory of hardship, claim that this revision is detrimental to the binding force of the contract, because of the imperative nature of obligations, which must be honored in good faith, and the non-performance of which gives rise to the contractual civil liability of the defaulting debtor, giving rise to the right to compensation, also that unforeseeability only makes the performance of the obligations more onerous for one of the parties, and not impossible like force majeure.

Given the extraordinary situation and the uncertainty related to the position that the Moroccan courts will adopt once seized of these subjects, the general recommendation remains the bringing together of the parties to reach amicable solutions.

Concerning contracts in the process of being concluded, it is also recommended that the parties already integrate the various impacts of the current crisis, particularly in terms of deadlines and liability.

At the level of case law, several French judgments rendered in recent decades, "mediators of good justice and precursors of the law", have testified to a certain tremor in case law, to a certain flexibility of the law, clearly reflecting an evolution in the requirement in good faith: from an abundantly reinforced obligation of cooperation, we sometimes slip towards a parsimoniously affirmed obligation to adapt (on this evolution, among these avant-garde decisions, we will note:

The EDF v. Shell France judgment of the Paris Court of Appeal of December 28, 1976: in this case, the balance of the supply contract between EDF and Shell had been upset by the fivefold increase in oil prices. The safeguard clause having been used without success, the judges imposed, by an interlocutory judgment, a new negotiation under the supervision of an observer, reserving the right, in the event of failure, either to terminate the contract if the imposed formula had to alter the economy, or above all to impose this solution automatically in the opposite case. This initiative went far beyond the terms of the safeguard clause providing, in the event of a sudden rise or fall in prices, a rapprochement between the parties and, in the event of failure of the negotiations, an option of termination.

According to (Cabrillac, 2014) the “Huard” judgment rendered by the commercial chamber on November 3, 1992, abundantly quoted and commented upon, (Grimaldi, 1992) confirms the reinforcement of the requirement of good faith, this time in terms of distribution contracts. But here we move from a simple obligation to adapt to an obligation to renegotiate in the event of an unforeseen change in economic circumstances. This involved a distribution contract between BP and a trader bound to the latter by an exclusive

supply clause. The new circumstances, constituted by the liberalization of fuel prices, seriously exposed the distributor to competition. However, the Court of Cassation approves the Paris Court of Appeal for having considered that the requirement of good faith forced BP to negotiate a commercial cooperation agreement allowing the distributor to align itself with its competitors.

The theory of unforeseeability will know through the 2016 ordinance its legal consecration, it thus marries the European conception of unforeseeability. However, it sets the conditions and frames its processing in such a way as to avoid certain abuses. Thus, following the example of foreign models or even European academic projects, the new article 1195 of the Civil Code states in a first paragraph: "If a change in circumstances unforeseeable at the time of the conclusion of the contract makes the execution excessively party who had not agreed to assume the risk, the latter may request a renegotiation of the contract from its co-contracting party. It continues to exercise its obligations during the renegotiation". The text adds in a second paragraph:'' In the event of refusal or failure of the renegotiation, the parties may agree to the termination of the contract, on the date and under the conditions which they determine, or request by mutual agreement the judge to proceed with its adaptation. Failing agreement within a reasonable time, the judge may, at the request of a party, revise the contract or terminate it, on the date and under the conditions that he fixes''.

Conclusion

In the light of the above, it is clear that the outbreak of coronavirus "Covid-19" is not independent by a specific provision, sometimes it does not affect the contract and becomes mandatory to implement following this which has been agreed by the parties, and at other times it places the status of force majeure, which makes the contractual commitment impossible, and not only more difficult and exhausting, and sometimes makes the obligation very onerous, which requires the intervention of the judge to adopt the contract and restore the balance between the two parties, in the application of the theory of hardship.

At the end of this analysis, which is undoubtedly incomplete, and given the doctrinal differences to which the Covid-19 pandemic may have given rise, the international contract remains very sensitive to external changes that may affect its fair balance and its fair substance, its adaptation to future circumstances should be encouraged, allow prevention and securing the contractual whole. So, we should promote the implementation of the will of the parties, and if this will be not clear, the judge or the arbitrator must interpret the contract, according to the economic efficiency of the contract, to maximize the contractual balance between the contracting parties.

Such maximization will occur by limiting the cases of exemption and resolution and suspension of international contracts. However, companies affected by the consequences of the coronavirus epidemic must act in good faith in discussions with their partners (suppliers, customers, Banks, etc.), and in the implementation of the said clauses, to ensure the maintenance of the contract in the event of a change in the circumstances that led to its conclusion.

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Artificial Intelligence's Role in the Healthcare System

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Abstract

Nowadays, because of the development and the evolving technologies, artificial intelligence (AI) changed the way healthcare systems function and altered the interactions between medical practitioners and patients. In this context, AI has the potential to revolutionize the healthcare system and is an opportunity to strengthen the doctor-patient relationship by offering accurate information in a reasonable amount of time. After a brief journey of the evolution of defining artificial intelligence, the article first covers the meaning of AI in the healthcare system through a systematic literature review, classifying the essential roles of AI in this system. It continues with the explained grade of involvement of the European Union in this field and its decisions during the COVID-19 pandemic regarding the uptake and upscale of digital health solutions. Lastly, this article emphasizes the necessity of having a unitary approach across the European Union regarding the AI involvement in the healthcare system by suggesting the implementation of a single European platform for medical appointments to adapt to the digital world and facilitate medicine without borders. This article aims to provide an overview of the AI roles in the healthcare system that have been developed and implemented and are playing a much-needed role in improving healthcare services, quality of medical practice, and patient satisfaction regarding the services. The classification underlines the positive aspects of adapting the current healthcare system to the new era and embraces the challenges. Artificial intelligence's roles lead to a better approach to the patient's attitude once they know the benefits of using and accepting artificial intelligence technologies in the medical field.

Keywords

Healthcare system, artificial intelligence, medical applications, healthcare management, patients needs

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Introduction

As the World is continuously evolving and society is learning to adapt to new practices and develop new technologies that intend to improve the quality of life, artificial intelligence could be considered one of the best things ever happened to humankind. Similarly, it might be the worst thing that could bring about the end of humans if it gets under control, as Stephan Hawking stated in an interview in 2015. Following AI's purpose in our lives, UNESCO states that artificial intelligence can significantly boost the attainment of sustainable development goals. However, each technological innovation brings new inequalities that must be anticipated and limited to protect human lives and avoid dangerous situations. It's a fact that some markets, sectors, and business models are more advanced than others, while AI is still in a relatively early stage of development. It is essential to mention that artificial intelligence is not a single technology but rather a group of technologies that work together (Davenport and Kalakota, 2019).

Moreover, the enormous potential of this domain for the development and improvement of a wide variety of applications is signaled by the numerous applications currently available on the market. Being aware of this inequality, governments throughout the world have established ambitious programs to encourage the development of technologies based on AI and ensure that it works for the well-being of people. Equally important, the involvement of the European's Union in AI's ecosystem relies on social trends and technology created in non-EU states.

The last findings show that hospitals have started implementing and utilizing artificial intelligence-enabled tools to assist medical personnel in inpatient diagnostic and treatment activities for various diseases. Aside from that, artificial intelligence technologies influence the efficiency of nursing and administrative functions in hospitals (Lee and Yoon, 2021). While many research papers can demonstrate that AI can perform as well as or better than humans in critical healthcare activities, today, algorithms are already surpassing cardiologists in detecting atrial fibrillation and radiologists in terms of detecting dangerous tumors and endocrinologists in continuous glucose monitoring. These are just a few examples of how AI technology contributes to health (Davenport and Kalakota, 2019). On the other side, patients have been eagerly awaiting the introduction of augmented medicine since it would provide them with greater autonomy and a more individualized treatment; yet, physicians have been resistant to the idea because they have not been prepared for such a shift in clinical practice. Because of this occurrence, it is necessary to validate these contemporary instruments with traditional clinical trials, discuss the educational upgrading of the medical curriculum considering digital medicine, and address the ethical implications of implementing this technology (Briganti and Le Moine, 2020).

This paper aims to identify artificial intelligence's role in the healthcare system (Figure no.1), as concluded from the literature review. Overall, this paper wants to provide an overview of the AI roles in the healthcare system that have been developed and implemented and are playing a much-needed role in improving healthcare services, quality of medical practice, and patient satisfaction regarding the services. The study systematically identifies the devices and tools found in the public and the private healthcare system. Moreover, this study explains the roles of the devices and tools based on AI technology in medical practice and their benefits for medical practitioners and patients.

This article shall provide a structured overview of artificial intelligence's role in the healthcare system and its benefits over the influence of diagnosis, medical practice, treatments, and customer service. In particular, the paper will discuss an overview of different definitions given to AI and improving health and well-being, how the concept spreads to the healthcare system, and AI's role in people's opinion. The paper will continue with the case of the European Union's attitude towards the use of AI in the healthcare system. Concluding remarques will end the article.

1. Methodology

This article is based on a systematic literature review by selecting and collating findings of prior relevant studies, a method considered very useful in establishing a solid ground for a scientific argument (Tranfield, Denyer, and Smart, 2003).

The collection of scientific production from Web of Science and Scopus databases allows the identification of the variety of definitions that have been given to AI from 1955 until 2022 and select the ones that might be considered representative of the research's goal. These databases were chosen as the best options because of their quality and the vast data sources referring to artificial intelligence and healthcare. In addition, Google Scholar was another database from which the research information was collected in the terms mentioned above.

2. Artificial Intelligence: from computer science to healthcare

Artificial intelligence is a branch of Computer Science that has its origins in various disciplines that contributed ideas, points of view, and techniques and made from AI into what it represents today. The disciplines that constitute the pillar of this field are philosophy, mathematics, neuroscience, psychology, computer engineering, control theory, cybernetics, and linguistics (Russell and Norving, 2021). Sadiku, Fagbohungbe, and Musa (2020) gave one of the possible definitions. They considered that artificial intelligence is a branch of Computer Science that has its origin in various fields. We can find tools and applications dominated by AI in abundance in the present times. Marvin Minsky, the person who is considered to be one of the founding fathers of artificial intelligence, defined artificial intelligence in 1968 as "the science of making machines do things that would require intelligence if done by men." In general, AI is a sub-field of computer science that focuses on whether devices/tools/software can emulate human intelligence as defined by the European Coordination Committee of the Radiological, Electromedical, and Healthcare IT Industry. The discussion is about how it can become human-like rather than being human. Artificial intelligence originated in computer science and penetrated all the fields creating intelligent devices and particularly innovative computer programs.

Since 1956 when the Dartmouth Summer Research Project (McCarthy et al., 2006) was held to study AI, there have been many attempts to define AI. Different other definitions have been given to artificial intelligence. One of the most popular definitions of AI states that it is an artificial agent that can "achieve objectives in various situations." (Cihon, Schuett and Baum, 2021, p.3). In addition, the term AI refers to what the public considers to be AI. Because people's expectations increase through time and technology evolves, it is almost impossible to define AI. Still, we can break down the main definitions of AI, considering the point of departure for its journey, and analyze the impact on the healthcare field. Overall, improved diagnosis, new medical discoveries, better forecasting of catastrophic weather occurrences, safer driving with assistance, and ultimately self-driving technology are examples of how artificial intelligence may save lives. (Russell and Norvig, 2021).

If this paper had emphasized one universally agreed definition of AI, it would have made it easier to evaluate AI's role and legal framework across different countries. Moreover, in the 21st century, there are plenty of definitions of AI with various flavors that are willing to capture the main elements of interest and AI's capacity to assume its intelligent nature. Furthermore, AI is an algorithm-driven computing technology programmed to self-learn from data and make intelligent predictions and real-time decisions through artificial neural networks, machine learning, robotic process automation, and data mining, among other technologies (Siala and Wang, 2022).

Artificial intelligence has an impactful role in the healthcare system and is advancing quickly. The evolution can be seen through potential applications that have been launched across a wide range of medical and decision-making fields. The use of AI in the healthcare system came very quickly after individuals realized that computers could measure more than numbers. This conclusion led to thoroughly developing traditional intelligent systems that might have a different role. Medicine as an application area is one of the most challenging aspects of artificial intelligence that is hard to accomplish, deal with, or understand. As Holzinger (2014) mentioned, one of the most critical goals in the future treatment of patients is to model the complexity of individuals to personalize medical choices, health practices, and medication to the specific needs of each unique patient. The use of AI in the healthcare environment can be described as using intelligent data-driven technologies to more effectively utilize available healthcare resources and data to support and streamline healthcare decision-making and provide improved health services tailored to individual needs (Siala and Wang, 2022). Computer systems in healthcare have more than one purpose, and besides assisting with documentation and administrative tasks, they can provide efficient assistance to medical practitioners in many situations. For example, in clinical research, we can find a higher diagnostic accuracy even if only a few AI systems have been tested and received regulatory approvals to be considered medical devices. Still, those approvals are increasing day by day (Varghese, 2020).

3. Essential roles of AI in improving the healthcare system

Artificial intelligence brings many opportunities to contribute to the well-being of individuals and the advancement of the healthcare system. Nowadays, in the medical community was introduced a new term named "medical technology" which refers to a variety of tools that can help health professionals improve the quality of life of patients and society by performing accurate diagnoses, reducing complications, optimizing treatment, and providing less invasive possibilities, and shortening the length of hospitalization. Artificial intelligence has transformed medical technologies. It is usually recognized as the branch of computer science capable of dealing with complicated problems involving multiple applications in fields with a large amount of data but little theoretical understanding. Oncology, neurology, cardiology, and radiology are just a few medical sections that use AI systems. The steps that medical practitioners follow are early detection of the disease, diagnosis, therapy, outcome prediction, and prognosis assessment. Artificial intelligence helps medical practitioners go in-depth while investigating and establishing the treatment that should give successful results.

Furthermore, the primary debate about this subject regarding its implementation in the medical system is whether medical practitioners will eventually replace human physicians in the near future? For the moment, no one can come across the proper answer, but it is bound to help medical practitioners make better clinical judgments. Some specific instances can even replace human judgment (Jiang et al., 2017). Furthermore, medical robotics is represented by robots programmed to perform tasks in healthcare science. Therefore, on the market, there have been developed three categories of robots: surgery robotics, wearable, and rehabilitation robots, and robots that replicate the human body. For example, the surgical robot can execute a surgery or could help a surgeon act more precisely, improving his ability to see, create minimally invasive incisions, stitch wounds, and so forth, or an intelligent scan could picture an accurate diagnosis, or a virtual nursing assistant can monitor patients and answer their questions in real-time, or a medical diagnosis could

be pronounced since the beginning of the investigations. Those AI tools support clinicians in their daily work, and through them, we can assure that the medical act is executed professionally and without hindrance. The use of remote-controlled robotic surgeries has been demonstrated to increase procedures' safety and perform surgeries in anatomic regions that would otherwise be inaccessible to human hands (Matheny et al., 2019). As revealed by European Commission, in 2021, they were delivered to hospitals across the member states 305 disinfection robots to ease the burden of hospitals during the COVID-19 pandemic. In short, robots can be used for surgeries or early detection of disease and help alleviate the pressure of clinicians while offering patients more excellent protection against infections.

Moreover, a medical consultation could be carried out without direct interaction with a medical practitioner using just an online sickness database. The sickness databases aim to support medical practitioners in correlating the symptoms presented by the patient with the diseases that have been integrated into the system. Similarly, the virtual nurses' assistants are based on the same technological model (Yamin, 2018). Because of the new medical technology after implementing those devices/tools, we can remark an increase in the accuracy of input because the appliances in use have to be upgraded, and having a significant amount of data in the system can indicate and correct the information inserted immediately.

Additionally, AI is becoming increasingly crucial in surgeries because of its implication for decision-making. For instance, if devices are constantly upgraded and there is an increase in the input in the system, roadmaps could be provided to assist surgical teams in the operating room. The goal is to lower the associated risks and manage surgeries more safely (Matheny et al., 2019).

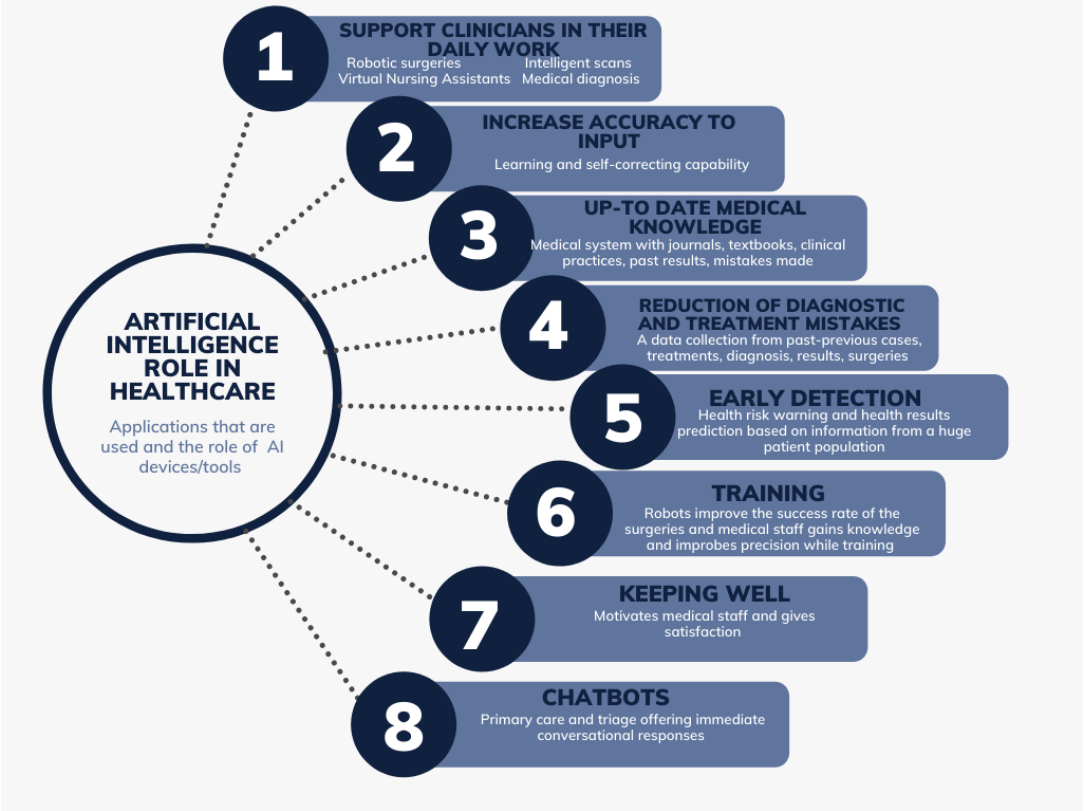


Figure no. 1. The Role of Artificial Intelligence in the healthcare system and the tools/devices that are used

Source: Author's elaboration

Another role for healthcare staff linked to this is to access a straightforward platform to gather medical journals, medical textbooks, clinical practices, and case studies and learn from others' mistakes recorded in the system. Nowadays, plenty of platforms offer this type of information, starting with small observational studies that may have minimal relevance and ending with complete clinical trials. The need for this kind of product was noticed from the need for a trustworthy and evidence-based database in a world where digitalization has taken the place of hardcover publications. On the other hand, AI also has a role in reducing diagnostic and treatment mistakes based on the database, compiled from past-previous cases/treatments/diagnosis/results/surgeries and whose primary purpose is to instruct and indicate when a mistake could be made. Diagnostic image recognition can distinguish between benign and maligned tumors. In this case,

AI's role is to serve as a helping tool by sorting and prioritizing images for an immediate review and diagnosis, highlighting essential findings that might have been missed, and classifying simple results.

In consequence, through this database, the medical practitioners can focus on more serious problems and provide quick and accurate diagnoses and treatments for cases similar to the previous ones (Matheny et al., 2019). Furthermore, collecting all the investigation results and implementing them into a database may help the medical staff determine an early detection of a high-risk disease commonly found in a vast population and whose provided results impact the future. Nowadays, early diagnosis can be achieved by improving the extraction of clinical insights and implementing them into a validated system. Moreover, this system makes it possible to realize an epidemic outbreak prediction if the parameters are partially known, and the gathered information indicates a likely outcome. In particular, medical practitioners recommend devices that can detect early-stage breast cancer- wearable vest- and devices that can improve cardiac monitoring and rhythm management for heart irregularities (Figure no.2). Although training is commonly found in each field and helps improve the quality of provided services and personal knowledge, having a device or a tool that strengthens the capabilities of a medical doctor brings an increase to the public perception about the proper execution of the medical act. Also, we can emphasize here that the success of the medical action contributes to the well-being of the medical staff, and they feel more motivated and secure doing their job. Medical practitioners appreciate each AI device/tool developed because it manages and reduces the potential of unintended consequences and focuses on the real problems. The last tool that brings a significant role to the healthcare system are chatbots for patient interaction, mental health, wellness, and telehealth.

In brief, chatbots are applications whose primary purpose is to automate chats. Suppose a patient uses an online application or calls an emergency number. In that case, the chatbot is answering, offering automated replies without human intervention in two ways: text-based conversation or voice recognition. Besides, chatbots are not entirely based on artificial intelligence, and they have pre-defined and rule-based programming to answer appropriately to patients' inquiries. Currently, chatbots are also called embodied conversational agents. Their role is to analyze symptoms, report back on outputs from health monitoring, and prescribe a course of action based on the information provided, simulating real-world conversation (Matheny et al., 2019). Even though this is not widely implemented, we can appreciate its latent qualities that may be developed and lead to future success or usefulness of the primary-care and triaging patients that are willing to arrive or have arrived at the urgent care and might be helpful for simple transactions like refilling prescriptions or scheduling appointments.

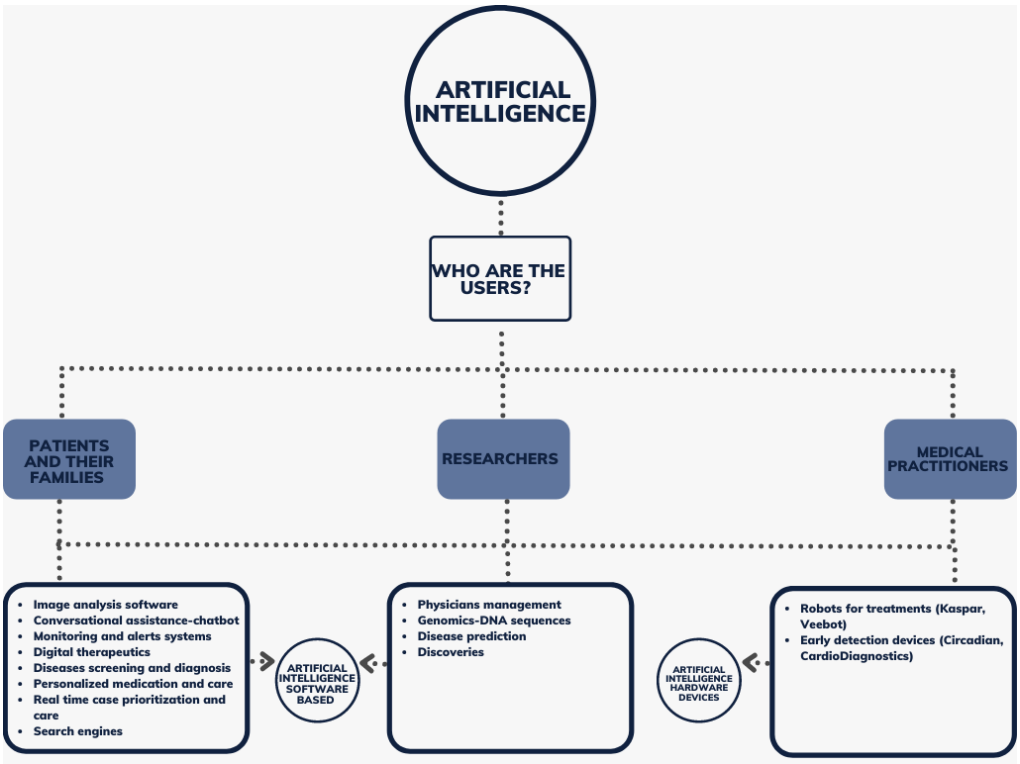


Figure no.2 What kind of AI healthcare devices are used and by who.
Source: Author's elaboration

4. How is European Union involved in supporting AI in the healthcare system?

Artificial intelligence can be considered a soft subject and a playground for political, legal, and technological issues. At the same time, the adoption of AI in Europe can be either impeded or expedited, as the Directorate-General for Internal Policies mentioned in a leadership study in 2018. The success rate of artificial intelligence will not be attained unless governments, businesses, and people adopt and integrate a wide range of AI applications in various ways (van Roy et al., 2021).

Globally, European Union is a leader in applying artificial intelligence in the healthcare field because extraordinary improvements have been made during the past years, and the results have been noticed. Commission proposed and began taking necessary measures to develop European Health Data Space (EHDS) in 2020, willing to ensure the secure free flow of health data, promote the uptake of digital health, and address issues related to governance and security, and data protection. The role of this data space will be to encourage the upscale and uptake of digital health solutions and provide concrete benefits to patients while supporting the training and testing of artificial intelligence algorithms. This legislative proposal is expected to be adopted in spring 2022.

During the COVID-19 pandemic, there was an increased demand for telemedicine and online medical appointments just a few weeks from its debut. Since the beginning, a few startups have noticed the need on the market, and they were quick to develop platforms to fulfill patients' needs. But immediately after the launch, they faced three main problems: the lack of a legal framework for medical services that can be provided through telemedicine, the lack of a legal framework for e-prescriptions, and the lack of a health records platform. Each European member state responded individually to this legislative challenge without taking a standard action at the EU level. In the near future, it is expected that the European Health Data Space and eHealth Digital Service Infrastructure will be implemented in all the member states and simplify access to medical services.

Conclusions

Artificial intelligence is one of the most exciting and rapidly expanding topics today and is already earning billions of dollars in income every year. Equally important, the applied artificial intelligence technologies may help improve population health while also providing access to diagnosis and treatment in an evolving manner. Still, we must remember that none of those devices or tools are less expensive, and as a result, society may face a significant challenge, that of accessibility.

The positive impact of artificial intelligence on the healthcare system can't be disregarded. Artificial intelligence benefits are one of the AI developer's motivations within this field. In consequence, the main perks must be mentioned: helping doctors give more accurate diagnoses and direct opinions toward more efficient treatment alternatives, increasing the productivity of medical practitioners, and reducing the healthcare spending's at a large scale after the investment. Equally important, it must be implemented at the EU level regulation for telemedicine and a platform for medical appointments to avoid exchanging emails between patients and clinics or phone calls that might seem time-consuming. This type of digital platform arises from the need to adapt to new digital trends. Because of globalization, the population is much more open to receiving treatments abroad. Notwithstanding, the people must embrace this challenge of adapting to the new medical practice, which involves artificial intelligence technology, and put their faith in those technologies that constitute the future and were developed for their well-being.

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Innovation and Competitiveness in the European Union with and without Britain

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Abstract

This paper aims to assess the correlation between economic competitiveness and innovation potential within the European Union in the context of Brexit. For the quantitative evaluation of the mentioned relationship, we use the World Economic Forum Index as a proxy variable for economic competitiveness, respectively the following five indicators for different dimensions of the innovative potential at the level of EU member states: gross expenditures on R&D, R&D personnel, innovative enterprises, patent applications, and high-tech exports. In our research, we want to find out the impact of Brexit on the correlation between innovation and competitiveness in the EU, in which sense we demonstrate the hypothesis that the UK's exit from the EU has led to a differentiated reduction in the contribution of different innovative components on competitiveness. The main objective of our analysis aims to quantify / rank the intensity of the correlation between the different indicators of innovation and competitiveness, on the whole EU-27 compared to EU-28 in 2019 (the year before Brexit). In order to determine the intensity of the correlations, we calculated the correlation coefficients and the coefficients of determination between the variables of innovation and economic competitiveness, and then, to identify management priorities, we analyzed comparatively the values for EU-28 and EU-27 for each category of indicators. Our findings show that the strongest correlations are between competitiveness and R&D expenditures, respectively high-tech exports to both the EU-28 and the EU-27, but the most visible impact of Brexit was on the R&D personnel, an indicator whose contribution to competitiveness recorded the most significant decrease post-Brexit. In this context, the original contribution and practical implications of this research are given by the identification of priorities for intervention in the field of innovation to improve competitiveness in the EU-27 post-Brexit.

Keywords

Innovation, competitiveness, correlation, impact of Brexit, European Union post-Brexit

DOI: 10.24818/BASIQ/2022/08/034

Introduction

Increasing the interest of European governments and institutions to ensure sustainable growth in the European Union (EU) under the conditions generated by Brexit, has generated a constant focus of attention of EU forums on increasing economic competitiveness based on innovative input. Assuming that competitiveness depends on the ability to innovate and modernize (Porter, 1990), European decision-makers have in recent years focused on increasing competitiveness by pursuing policies to encourage advanced research and the application of industry results (Clark and Guy, 1998). Against this background, there has been a continuous evolution of the approach to innovation versus competitiveness, in the sense of sophistication and diversification of the subjects investigated. The reflection of these trends in current economic assessments has materialized through the configuration of several lines of analysis regarding the place and role of innovative components in the chain of support for competitiveness. Starting from standard approaches that postulate the comprehensible and positive relationship between innovation and competitiveness (Huang, 2011), current analyzes focus on multiple aspects, such as normative and legislative favorability of innovation (Berkhout, 2006), the potential of regional factors generating

innovation and competitiveness (Camagni and Capello, 2013; Aarts, Van Woerkum and Vermunt, 2007; Martin, 2005), the valences of cultural factors in the innovation process (Brancu et al., 2015; Petrakis, Kostis and Valsamis, 2015), the role of intermediaries in promoting innovation (Howells, 2006), the impact of ITC technologies (Ollo-López and Aramendía-Muneta, 2012) and the multi-level integration of technology systems on innovation and competitiveness (Markard and Truffer, 2008).

Quantitative knowledge of the relationship between the various components of innovation (investments in research and development - R&D, R&D personnel, innovative enterprises, patents, high-tech exports) and economic competitiveness is relevant for prioritizing decisions to improve the European and national regulatory framework with an impact on stimulating innovation in the post-Brexit European economy. In an organization with a level of integration such as the EU, the existence of an innovative environment based on incentive regulations is essential, as a prerequisite for sustainable economic performance (Haidar, 2012).

Against the background of the changes caused by the departure of the United Kingdom (UK) from the EU, our interest is focused on the specific research issue on the impact of Brexit on the correlation between innovation and competitiveness in the EU. In investigating the relationship between these terms, we are testing the hypothesis that Britain's exit from the EU has led to a differentiated reduction, on different innovative components, of the contribution of innovation to competitiveness. In this context, the objective of our research is to quantify / rank the intensity of the correlation and explanatory contribution between the different indicators of innovation and economic competitiveness in the EU-27 compared to the EU-28 at Brexit, in order to substantiate normative intervention priorities to improve EU competitiveness post-Brexit. The epistemological framework of our research was revealed through the systematic analysis of the literature, and the relationship between innovative components and competitiveness was investigated using quantitative methods (calculation of correlation and determination coefficients) and comparative analysis.

Our study covers an unprocessed area in the literature, namely the comparative investigation of the behavior of the different components of innovation in relation to economic competitiveness in the EU with and without the United Kingdom. The paper is structured modularly, starting with an introductory section followed by a brief review of the essential elements of the literature. Next section contains the general picture of empirical research, followed by a presentation and discussion of the results of empirical modelling, and finally a presentation of research findings.

1. Review of the scientific literature

The implications of Brexit for the European economy as a whole have led to a focus of scientific analysis on ways to increase the contribution of innovation to maintaining economic competitiveness in the EU. The different perspectives of the approach have considerably extended the epistemological and conceptual area of the field. Competitiveness is a concept specific to the integrated and globalized world influenced by a multitude of determinants (Van de Ven et al., 1999) of which innovation is unanimously recognized as one of the key engines. But the way in which the innovative dimension contributes to forging a competitive environment raises many views and controversies. Referring to EU innovation policies, Clark and Guy (1998) identify in the EU a number of paradoxes in the relationship between research and productivity, due to the inability of many Member States to make the most of their existing innovation base; the two authors consider the linear models of innovation to be outdated and propose "focusing European policies on promoting the diffusion and efficient use of technologies in order to close the development gaps and solve the paradoxes of research and productivity" (Clark and Guy, 1998, p. 389). Along the same lines, Shim and Shin (2022) show that the value of R&D investment does not necessarily have an impact on the performance of R&D programs, so that in order to generate the efficient effects of innovation it is necessary to add an efficient management of the innovative process (Tidd and Bessant, 2018), to use a highly qualified human resource (Koottatep, Sukavejworakit and Virasa, 2021) and to adopt adequate marketing strategies and implementation of R&D programs (Chabowski and Mena, 2017).

The concept of national competitiveness is even persecuted by Krugman (1994, p. 28), who states that "the idea that a country's economic fortunes are largely determined by its success on world markets is a hypothesis, not a necessary truth; and as a practical, empirical matter, that hypothesis is flatly wrong". Applying the above thesis to EU states, the author argues that "in each case, the growth rate of living standards essentially equals the growth rate of domestic productivity - not productivity relative to competitors, but simply domestic productivity" (Krugman, 1994, p. 41). The relationship between innovation and competitiveness has been approached even from a philosophical-economic perspective, with reference to the ways in which economists must convince European decision-makers on the strategies they propose for building innovation policies. The approach can be a difficult one, given that, according to Davies (2011), their advice must be precise, credible and loaded with the epistemological weight of

justification, but at the same time not be too burdened by quantitative, econometric and bureaucratic formulas. Empirical studies propose three ways for the effective transfer of knowledge from the scientific niche to the decision-making niche: by emphasizing its practical utilitarian character, by emphasizing its aesthetic attractiveness, or by suggesting its supreme character of ontological knowledge (Davies, 2011).

In an increasingly competitive and interdependent world, scientists point to different solutions to maximize the effects of innovation on EU competitiveness. In order to stimulate innovation, a flexible legislative framework is essential to create favorable conditions for investment in R&D infrastructure (Cebula and Mixon, 2014), and Haidar (2012) shows that every reform of business regulations induces an average increase of 0.15% in economic growth.

In line with the principle of subsidiarity and EU multilevel governance, a number of current studies include regional competitiveness in the concept of regional development. Thus, Camagni and Capello (2013) argue, through the grid of endogenous growth theory, that the use of local territorial capital is the basic link, at the regional level, in shaping competitiveness, and Martin (2005) assesses the competitive potential of regional factors from the perspective of different theories of economic growth. Based on case studies from the Netherlands, Aarts, Van Woerkum and Vermunt (2007) demonstrates the need to include innovative regional strategies in spatial planning policies. Socio-cultural factors are another explanatory element for the characteristics of the entrepreneurial and innovative spirit generating competitiveness (Brancu et al., 2015), context in which Petrakis, Kostis and Valsamis (2015, p. 1436) argue that "a society that has or is developing a pro-innovation culture can perform better in the future, despite adverse macroconditions. In contrast, an anti-innovation culture hinders innovation and competitiveness, even if policymakers improve macroconditions".

Firms can act as redistributors of innovative goods and services as agents of innovation, a process widely practiced in the United Kingdom (Howells, 2006) and which can be successfully replicated in the EU, especially in the field of high technologies (Ollo-López and Aramendía-Muneta, 2012). IT&C technologies are responsible for most of the innovative contribution to the EU (Fagerberg, 1996), which has led to the recent emergence of the concepts of technological sustainability and sustainable technologies as complementary terms to sustainable development (Vacchi et al., 2021). Non-polluting technologies are the main elements in the category of sustainable technologies (Saunila et al., 2019), whose integration in the form of multi-level networks is the key to the spill-over of innovation and competitiveness (Markard and Truffer, 2008).

Against the background of the trends of quantification and modelling of the innovative process, the concept of responsible research and innovation (RRI) was recently launched as a model in which social and innovative actors become mutually responsible to each other in the innovative process (Stahl et al., 2017). In this regard, Owen et al. (2013) proposed the creation of a legal and ethical framework for responsible innovation.

The effects of Brexit on regional competitiveness appear to be different in the UK from the EU. According to research by Thissen et al. (2020), the greater vulnerabilities of the British regions compared to the vulnerabilities of the EU regions (due to the dependency of the UK on the EU via global value chains), will shape the rise of interregional inequalities in the UK compared to the EU situation. However, current studies do not indicate the correlations between the components of innovation and economic competitiveness in the EU in the context of Brexit, a segment that our current analysis investigates.

2. Research methodology

In investigating the relationship between competitiveness and innovation we use a series of indicators as evaluation proxy variables. To express competitiveness, we use the global competitiveness index (built by the World Economic Forum), and to express the innovative potential we use five specific indicators (provided by Eurostat): volume of R&D expenditure, R&D staff, number of innovative enterprises, number of patent applications and volume high-tech exports. At the same time, we use as analysis tools the reports of the European Commission (Annoni and Dijkstra, 2019; Martin, 2005) and of the World Economic Forum on economic competitiveness in the EU (World Economic Forum, 2019). The reference administrative-territorial units are the EU Member States, for which we use statistics at the level of the last year (2019) of the UK's presence in the EU (Table no. 1).

Table no. 1. Parameters of competitiveness and innovation in the European Union

Countries	Competitiveness Index *(points)*	R&D Expenditures *(€ billion)*	R&D Personnel *(No.)*	Innovative enterprises *(No.)*	Patent applications *(No.)*	High-tech exports *(€ billion)*
Belgium	76.4	15.109	93,524	9,835	876	33,078
Bulgaria	64.9	0.512	26,399	4,664	186	2,098
Czechia	70.9	4.348	79,245	11,358	765	37,656
Denmark	81.2	9.107	62,229	5,301	1,351	9,578
Germany	81.8	110.025	735,584	100,250	46,632	208,148
Estonia	70.9	0.453	6,394	2,801	31	1,735
Ireland	75.1	4.370	32,170	2,007	58	39,354
Greece	62.6	2.337	53,932	7,368	356	1,778
Spain	75.3	15.572	231,413	21,986	1,288	15,036
France	78.8	53.427	461,891	35,716	14,103	120,534
Croatia	61.9	0.600	14,492	3,915	195	0,952
Italy	71.5	26.259	355,854	74,856	9,229	32,548
Cyprus	66.4	0.164	2,121	1,394	4	0,093
Latvia	67.0	0.195	5,924	1,558	82	1,469
Lithuania	68.4	0.486	12,998	3,917	90	2,527
Luxembourg	77.0	0.737	5,790	982	117	0,791
Hungary	65.1	2.158	56,943	4,814	427	18,426
Malta	68.5	0.080	1,588	498	5	0,754
Netherlands	82.4	17.760	160,422	13,523	2,228	86,981
Austria	76.6	12.441	83,660	11,333	2,066	15,959
Poland	68.9	7.046	164,006	14,675	3,887	19,829
Portugal	70.4	2.991	61,455	7,843	703	3,594
Romania	64.4	1.067	31,665	4,198	881	6,994
Slovenia	70.2	0.990	16,983	2,365	255	2,333
Slovakia	66.8	0.776	21,196	2,599	206	8,048
Finland	80.2	6.715	51,494	5,399	1,321	4,563
Sweden	81.2	16.154	92,172	11,600	1,802	17,416
United Kingdom	81.2	44.364	486,088	42,515	12,061	76,894
EU-28	**72.4**	**356.243**	**3,407,632**	**409,270**	**101,205**	**769,166**
EU-27	**72.0**	**311.879**	**2,921,544**	**366,775**	**89,144**	**692,272**

Sources: World Economic Forum, Eurostat, 2019.

Against the background of the UK's exit from the EU, there is a decrease in the competitive and innovative potential of the EU-27 compared to the EU-28 for all benchmarks, a context in which we want to find out the impact of Brexit on the correlation between innovation and competitiveness in the EU. To quantify the intensity of the link between economic competitiveness and the five parameters of innovation in Brexit conditions, we used the Pearson correlation coefficient (r) as an evaluation tool. Then, we calculated the coefficient of determination (r^2) in order to quantify the extent to which the decline in innovation potential in the EU-27 explains the variation in economic competitiveness (Table no. 2).

Table no. 2. Correlations between competitiveness and innovation components in the European Union

Correlated variables and reference space		Coefficients used		
		Pearson correlation	Coefficient of determination	p-value
Competitiveness Index & R&D expenditures	EU-28	0.56	0.31	0.001818***
	EU-27	0.52	0.27	0.004535***
Competitiveness Index & R&D Personnel	EU-28	0.52	0.27	0.004473***
	EU-27	0.46	0.21	0.013709**
Competitiveness Index & Innovative enterprises	EU-28	0.40	0.16	0.033714**
	EU-27	0.36	0.13	0.063368*
Competitiveness Index & Patent applications	EU-28	0.41	0.16	0.026189**
	EU-27	0.39	0.15	0.043265**
Competitiveness Index & High-Tech exports	EU-28	0.55	0.30	0.002107***
	EU-27	0.53	0.28	0.004392***

Notes: *** Significance level of 0.01; ** Significance level of 0.05; * Significance level of 0.1

Source: Author's proceedings based on World Economic Forum and Eurostat, 2019.

We evaluate the robustness of the link between competitiveness and innovation based on the values of the Pearson coefficient (r) and, according to the interpretive grid of Hopkins (2000), we find the following:

- a high correlation (r: 0.5 - 0.7) between competitiveness and R&D expenditures, as well as between competitiveness and high-tech exports, both in the EU-28 (r = 0.56 and 0.55 respectively) and in the EU-27 (r = 0.52 and 0.53 respectively).

- a moderate correlation (r: 0.3 - 0.49) between competitiveness and innovative enterprises, as well as between competitiveness and patents, both in the EU-28 (r = 0.40 and 0.41 respectively) and in the EU-27 (r = 0.36, respectively 0.39).

- on the size of the relationship between competitiveness and the share of R&D staff, the correlation is high only in the EU-28 (r = 0.52), and after Brexit it is moderate (r = 0.46).

Then, we analyzed the impact of the decrease in innovative parameters on the level of competitiveness in the EU-27 based on the values of the coefficient of determination (r^2) and, according to the evaluation model of Cohen (1988), we found the following situations:

- the volume of R&D expenditures and high-tech exports induces a substantial effect on economic competitiveness ($r^2 > 0.26$), both in the EU-28 ($r^2 = 0.31$ and 0.30 respectively) and in the EU-27 ($r^2 = 0.27$, respectively 0.28).

- the number of innovative enterprises and patents has a moderate effect on competitiveness (r^2: 0.13 - 0.26), both in the EU-28 ($r^2 = 0.16$ both) and in the EU-27 ($r^2 = 0.13$ and 0.15 respectively).

- the share of R&D personnel generates a substantial effect ($r^2 = 0.27$) on competitiveness in the EU-28, while in the EU-27 it induces a moderate effect ($r^2 = 0.21$).

The comparative analysis of the coefficients of determination (r^2) at EU-28 and EU-27 level for each innovation indicator allowed the ranking of innovative parameters according to the size of the decrease of their competitive contribution with Brexit. In fact, the method has made it possible to identify the most vulnerable innovative indicators, the improvement of which would raise the level of competitiveness at European level in the post-Brexit era.

The evaluation of the correlations between the innovation variables and the economic competitiveness with the help of the coefficients used is valid because it is based on data on the entire community space, and the veracity of the results is ensured by the margin of significance of 0.05 for each of the correlations (except for the correlation between innovative enterprises and competitiveness, credited in the margin of significance level of 0.1).

3. Results and discussion

Our results show that within the EU-28, among the innovative parameters used, the volume of R&D expenditure was the strongest correlation with economic competitiveness, followed by high-tech exports, and the weakest correlation was for innovative companies. Without the UK, however, the strongest link between competitiveness and innovation in the EU-27 lies in high-tech exports, followed by R&D investment, and the lowest correlation also lies with innovative companies. The explanation for the phenomenon lies in the fact that many of the companies included in the category of innovative ones do not constantly operate innovative solutions, partially apply them or have abandoned some of the processed innovative schemes.

The hierarchy is also maintained in terms of effects on competitiveness. In the EU-28, the variation in competitiveness is determined in proportion of 31% by fluctuations in R&D investments and 30% by fluctuations in high-tech exports. In the EU-27, the main share belongs to high-tech exports (28%), and investments in the R&D sector occupy the second place with 27%, while the innovative enterprises register the weakest impact of only 13%.

Regarding the impact of Brexit on reducing the competitive contribution of innovation indicators, the most significant decrease is in the case of the R&D personnel category: the contribution of this indicator on economic competitiveness decreases by 6% with the transition from EU-28 to EU-27. Similarly, the correlation and deterministic effect of R&D investment on economic competitiveness is reduced by 4%. The smallest decrease in deterministic effects concerns the category of patents whose correlation with competitiveness decreases by 2%, and its effect on competitiveness is reduced by only 1%.

Therefore, the hierarchy of declines in the contribution of innovation to competitiveness, as a result of the UK's withdrawal from the EU, shapes the priorities for action by EU decision-makers to overcome the innovative deficit generated by Brexit. Thus, the priority areas of normative intervention identified are: stimulating the training of highly qualified human resources for the R&D field, encouraging investments

(public and private) in the R&D sector and stimulating high-tech exports. It should be noted that the decrease in the contribution of high-tech exports and innovative enterprises is approximately equal (2-3%) in the absence of the UK, but the situation of the contribution of high-tech exports at a much better level (28%) compared to innovative firms (13%), makes encouraging high-tech exports more important than stimulating innovative companies.

Conclusions

In the conditions of Brexit, the innovative dimension acquires new valences in the configuration of the competitive potential in the EU, materialized by the differentiated reduction, on different innovative components, of the contribution of the innovation on the competitiveness. The strongest deterministic effects of innovation on economic competitiveness are provided by the R&D investment component, followed by the volume of high-tech exports, both at EU-28 and EU-27 level, but the most visible impact of Brexit was on the component human resources R&D, an indicator whose contribution to competitiveness registered the most significant decrease with the departure of Great Britain from the union club. In this context, the original contribution of this research is the construction of a hierarchy of innovative deficits responsible for the relative decline of the EU. The practical implications of our approach are to identify the most suitable innovative segments for legislative-normative intervention in order to maximize the improvement of the competitive potential in the EU-27 post-Brexit. Stimulating the training of research staff for the R&D sector, promoting the favorable regulatory framework for R&D investments and favoring high-tech exports are the main levers for remedying the competitive deficit generated by the withdrawal of the UK. The concrete construction of the mechanisms for implementing these instruments opens the perspective of interdisciplinary extensions of research between complementary epistemic areas, such as European economics and business, European law, territorial planning, regional development, economic geography.

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A Theoretical Model of eVTOL as a Business Administration Vehicle for Efficiency

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Abstract
The current research paper is purposed to evaluate the upcoming Urban Air Mobility trend as a logistics alternative for the modern organisation design, as industrial complexes are directing resources to the development of these concepts. Our qualitative analysis relies on secondary data, due to scarce information available. Starting with a descriptive analysis of the technological evolutions, the study undertakes a thorough market evaluation based on key criteria that are meant to determine if the efforts to initiate this new entrepreneurial avenue will be met by a successful adoption into organisational design.
With technological and regulatory limitations in the vertical take-off and landing (VTOL) segment, nearing a century of helicopter operations, it is unlikely that electrical flight aircraft will take charge of the skies above crowded cities anytime soon. Human error and technological failures still present a high risk to urban operations. The electric vertical take-off and landing (eVTOL) concept has far greater potential, considering remote work and the adoption of the Work from Anywhere concept.
This research effort aims to clarify aspects regarding eVTOL, probing the potential of a market that is to rely on this solution. This pragmatic approach is meant to define transition milestones, relying on current rules and regulations, as well on technological hurdles that are still to be overcome.
By means of qualitative research and a thorough market evaluation, with a predictive analysis, this study reveals that organisations can now pivot their design to expand their workforce needs into wider regions, having the ability to fly their key employees into their offices periodically from the remote locations they opt to live in and/or work from. Including eVTOL aircraft into the employer branding strategy, business processes should be beneficial for organisations that wish to be looked at as pioneers by their workforce and targeted market.

Keywords

eVTOL, aviation, tourism, Urban Air Mobility (UAM), technological innovation, organizational design management

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Introduction

The novel coronavirus pandemic continues to influence business administration, forcing innovation in all industries, operations, and processes. New norms came into force as a response to a global health crisis, gradually leading to their permanent adoption as habits, particularly the "working from anywhere" concept.

No further proof is required to the claim of a permanent change in business dynamics than the phenomenon came to be known as "the great resignation" (Ksinan, 2022), with 47 million Americans opting for a new career in 2021 due to grave anxiety related to the promise of a return to normal working conditions, where organisations would not adapt to the changed circumstances (Berger, 2022). Fuller and Kerr (2022), argue that this is no coincidence, and even though the pandemic has fuelled a tendency of unrest in the workforce, the steady increase of people voluntarily leaving their jobs is closely related to a lack of hygienic motivators.

The scope of the research is to develop an organisation design that incorporates the Urban Air Mobility (UAM) market, emerging as a hypothetical alternative to ground transportation solutions, that have become dangerously overcrowded by MaaS and urban logistics. Ground transportation now sees a drastic rise in operations due to increased demand, transforming into a permanent market feature (Ikeuchi et al., 2019).

This study will rely on secondary data, as the UAM market is not yet mature enough for primary data collection. A qualitative analysis will be detailed henceforth, of the existing and developing solutions for an efficient market breach of electrical vertical take-off and landing aircraft that are proposed to be the vehicles for the future UAM market. The analysis develops from a descriptive approach of the current market, on the analytic infrastructure provided by Kaufman (2020) in "10 Ways to Evaluate a Market".

The research concludes that eVTOL has the potential to become a disruptive technology. If proven to be safe and reliable, the growth rates and high number of aircraft required will consecrate the Urban Air Mobility (UAM) concept as a viable transportation alternative in the metropolitan area, such as air taxis for passengers and air cargo for goods. It could thus ferry anything from people to consumer goods, flying between city destinations or warehouses and stores.

1. Review of the scientific literature

1.1 Technological assessment

For the purpose of this study, an empirical research effort of UAM operations will be detailed below, which includes both manned aircraft (with pilot on board) or unmanned aircraft (without pilot on board), in the congested areas of cities and inhabited areas. We should note that operations with eVTOL should be facilitated through a range of measures, from production to certification and personnel licensing (Liu, Cai and Zhu, 2021).

Unmanned aircraft have the advantage of decreased weight on-board and increased operational range resulting in a higher profit margin by consequence. Operations can efficiently be controlled from a remote location, with a human controller (Dursun and Çuhadar, 2018). The human factor can be completely eliminated from the operation by placing algorithms into autonomous commands. A fully autonomous fleet is proven to reduce navigation errors to zero, by successful studies from the automotive industry (Bachute and Subhedar, 2021). Still, risk continues to loom, regarding the human error factor in maintaining the aircraft airworthy, as the deterioration of the aircraft mid-flight might prove disastrous, especially in overcrowded urban areas.

The sustainability of the eVTOL business relies on travel and tourism (Atn.aero., 2022) taking the market lead until the corporate world will begin to use this solution instead of the grounded alternatives (Taxi, Mobility as a Service, public transport). However, the initial use of eVTOL aircraft will be restricted to current approved flight paths, as is the case in many experimental grounds, Dubai being one of the most advanced (Tigner, 2022).

Vertical Take-Off and Landing (VTOL) aircraft are currently undertaking extensive development. VTOL aircraft refers to the possibility of using propellers or rotors that enable the aircraft to take off or land vertically, in addition to the capacity to move in any direction and to hover. In existence since the early 1940s (Boyne, 2022), helicopters are the typical example of VTOL aircraft. While helicopters have been used extensively for the transport of passengers and to reach areas that are inaccessible or hardly accessible otherwise (Amoroso et al., 2012), there is a very high cost associated with helicopter operations. And since this is due largely to the high fixed costs of the fuel, equipment, and personnel, it puts the helicopter out of the reach of the general public with no perspective to the contrary. The final objective for all VTOL manufacturers is to propose a type of aircraft that is electrically powered and requires no pilot on board, and which can perform similarly to piloted aircraft. This concept became known as eVTOL, or electric vertical take-off and landing aircraft.

Billions of dollars were invested in several projects under design or experimental phases worldwide (McKinsey&Company, 2022). The pressure is mounting on civil aviation authorities from companies seeking the type of certification required to operate eVTOL within a demanding schedule. Certification is only of the several hurdles to the new eVTOL concept taking off. Another one is of technical nature, namely, how to generate reliable powered lift and control.

Smart cities are usually referred to when discussing the impact of technology and digital solutions on the urban environment. However, McKinsey points out that we are now facing a situation where it is no longer the city that changes with the technology, but where technology is "injected more directly into the lives of residents" (Woetzel et al., 2018). As such, smartphones become the vehicles to bring information about the city – including traffic, health, various community updates – to large numbers of people, whether living in the city or simply transiting the city. This approach puts people first, instead of technology, for an improved quality of life.

According to McKinsey, there are three characteristics of the smart city, all of them having gravitated around technology, particularly ensuring that sensing is possible through mobile communication networks. Moreover, tools and applications that derive meaningful recommendations to the public from multiple data sources are a key component and a third characteristic is the ability to inspire mass adoption of these applications. There is also a positive spin from the business perspective since it creates new ways of public-private partnerships.

Flexibility and dynamic adaptation are two key characteristics of smart cities (Ilić, Milošević and Ilić-Kosanović, 2022). When considering the impact of these cities on UAM networks, we should consider urban ground & underground mobility as key competitors. Moreover, the placement of operational terminals (helipads) must consider key activity places (industry, administration, R&T, storage and distribution, entertainment, and recreational sites) (Nanaki, 2021; Zhu, Shen and Ren, 2022). Lastly but most importantly, sustainability issues, such as environmental, security and privacy aspects must be considered (Marx and Manaugh, 2022; Nickels, 2021; Pukhova et al., 2021).

We concur with Melo et al. (2022), that the environmental footprint of eVTOL will make it a prime option for tourism from a carbon emissions perspective. The comparison is made with electric vehicles (EVs) since both eVTOL and EVs operate using batteries and electric power. What makes a big difference is the trajectory of the trip, which brings down the travel time and this saves energy and reduces emissions, as clearly illustrated in the Figure 1, below:

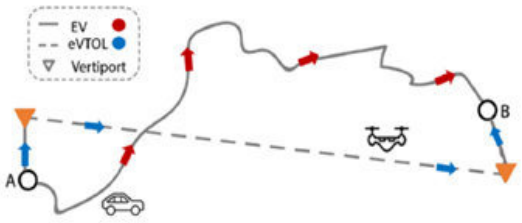


Figure no. 1. Trajectory effects on resources utilization, EVs vs eVTOL
Source: Melo et al., 2022

According to Aviation Benefits Report 2019, the aviation industry generates roughly 65.5 million jobs and 3.6% of the world GDP, having an economic impact of 2.7 trillion USD. What we found particularly noteworthy is that the tourism catalytic impact accounts for one-third of the GDP and 56% of the jobs. This corroborates with the fact that the largest growth in terms of travel and tourism are taking place in Asia-Pacific and the Indian subcontinent (World Travel & Tourism Council WTTC, 2022), where wages are significantly lower compared to Europe or North America, and despite the fact that jobs amount of 185.1 million and account for 10% of the total employment, information summarised in Figure 2, below:

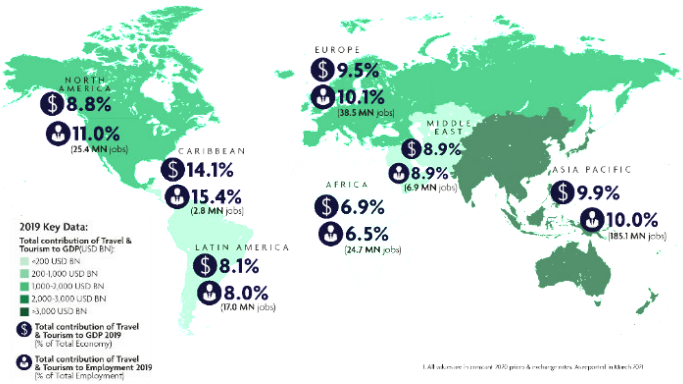


Figure no. 2. Travel to GDP correlation
Source: World Travel & Tourism Council (WTTC), 2022

Expected to be all-electric, eVTOL would contribute to sustainable urban mobility (Melo et al., 2022). Several major cities have already started to plan for eVTOL operations, with Dallas, Los Angeles and Melbourne considering introducing them as early as 2023 (Wai, Tan and Low, 2021). Though some of the main considerations for eVTOL adoption stem from adding a layer of UAM that would bypass road traffic

congestion and allow for a high degree of travel convenience, we concur with the above-mentioned authors that tourism would also benefit from this endeavour.

Questions remain about the feasibility of eVTOL operations, the externalities associated with such new means of transportation, and not least the costs involved and the final price of the ride. Most of the eVTOL research has focused on the technical characteristics of these aircraft, mainly payload and technology, and specific applications, such as aerial works, military, search and rescue, supply (Intwala and Parikh, 2015; Wilson, 2009).

1.2. Organizational Design Management

Several conclusions can be drawn from the previous section, regarding the paradigm shift in corporate logistics and the involvement of corporations in the development of this new technology. Moreover, a subdivision of logistics begins to take shape in literature, which this current research effort wishes to accentuate by means of empirical evidence, as it drastically changes organisation design, from the infrastructure corporations are relying on for their functioning, to the urban norms within the cities where organisations conduct affairs in (Ma et al., 2021; Rześny-Cieplińska, Szmelter-Jarosz and Moslem, 2021; Trecozzi, Iiritano and Petrungaro, 2022).

City/urban logistics are more constrained to complying with sustainability standards, operators functioning under social pressure to positively contribute to their environment, as per the findings of Hauge, Birkie, and Jeong (2021). Li, Rombaut and Vanhaverbeke (2021) study further technological developments in urban logistics, by means of complete autonomy in operations, that further increase the positive effects on the environment by complete process optimisation in elaborate transportation networks. Starting from the cities and expanding the systems regional-wide would translate into a bottom-up integration of innovative and sustainable logistics systems (Tan, Wang and Zhang, 2022) for organisations that would consider the transportation of goods and cargo a parallel activity to the main activity of the organization.

Having the option to reach new regions easily and sustainably, both in digital and physical realms, corporations open new avenues of business. Magazzino, Alola and Schneider (2021) accentuate trade openness as a crucial aspect for business continuity, that has gradually been facilitated by technological progress and bottom-up revolutions in logistics, from urban people and cargo dynamics to global integration.

2. Research methodology

The comprehensive literature review, spread over the two previous chapters, covering both the technological advancements in aerial logistics and the ability of organisations to assimilate them into new organisation design standards, that open new productive avenues, is enriched following the criteria developed by Kaufman (2020) in his book "10 Ways to Evaluate a Market". The *urgency* with which the market demands such services, the *market size, pricing policies, cost of converting customers, fixed and variable costs of transition to this specific solution, uniqueness of offer, speed to market, financial effort to breach, connected businesses and potential to evolve and the ability of the new business to become a necessity* will be analysed henceforth.

The analysis is developed by engaging secondary data analysis techniques. Data was collected following trustful sources, these being mainly academic literature reports, technical reports, official statistical databases, and indexed books. The credibility of secondary analysis must be carefully reviewed as the researcher has no influence, control, or involvement when data is acquired (Bryman, 2004). Sources of data were therefore cautiously chosen for the study, based on credibility, year of publication, size and consistency of sample and topic relatedness.

3. Results and discussion

The paper therefore disseminates the findings into a market evaluation based on criteria detailed by Kaufman, 2020. The ***urgency*** aspect of our analysis can be treated from various perspectives, as new methods of safe, secure, and cost-efficient transportation of people and goods are always a priority for a global economic community. However, in an increasingly digitised environment with offset production, eVTOL transportation can easily be substituted. eVTOL technologies are envisioned as a faster, and ideally more efficient, alternative to land travel for both inter-city and intra-city travel. They are not intended to replace

planes, but rather to cater to short-distance travel. Therefore, the tourism industry would consider implementing business processes that rely on this technology 'of high priority and urgency'. Moreover, electric 'flying vehicles' are expected to lower the number of automobiles on the road, ease traffic congestion and shift some of it to the skies. This would have a cascading effect, reducing vehicle noise and carbon emissions and encouraging a greener city.

We next evaluate our proposed technology by looking at its current ***market size*** and forecasts. Analysts show positive upward trends, as Marketresearchfuture.com (2022) records a steady increase of the market, reaching USD 2,000 mil. in 2020. By the end of the forecast in 2030, a more rapid increase of the market is expected. The eVTOL Aircraft Market is projected to grow at a CAGR of 30.30 %, reaching a market value of USD 4,063.3.

The major regions of Asia Pacific, North America, Europe, Latin America, and the Rest of the World are considered in the geographical analysis of the global eVTOL Aircraft Market. Because of the largest UAV fleet used in military and civil applications, North America is the world's top region in terms of market share. Due to air traffic congestion in nations such as India, China, and Japan, Asia-Pacific is expected to increase at the fastest rate over a projected period of 2021-2027 (Bizwit, 2022).

The effort to bring eVTOLs to the mainstream market is becoming visible, and the reasons mainly rely on a fair ***pricing potential*** for both the aircraft and, respectively, the unit price per utilisation on the business to client dimension. Head (2022) finds that the eVTOL is much cheaper to produce than current VTOL solutions, capable to accommodate more passengers at better operational costs, mainly due to their electric propulsion systems and eliminating crew costs. Fuel and crews are the two most important factors in the pricing policy for aviation transportation products. Al Haddad et al. (2020) argues that the eVTOL technical solution is being developed parallel to the evolution of shared mobility software, that ensures cost efficiency to customers. With intuitive software that evenly distributes the financial effort for the trip between clients matched by the system, customers are to be met by a very fair offer in the eVTOL market.

Corporations stand to benefit most, as volume traffic that fills empty seats will be highly sought after by operators. Attractive packages for corporate mobility will most likely result in customers opting to pay for mobility services through their employers. Audretsch et al. (2021) argue that labour mobility services come to consolidate the community within organisations, as a key part of the employer branding strategy, as acquiring the best performers from the workforce requires catering to their needs. 4

Moreover, the ***uniqueness of the offer*** has the potential to be disruptive, taking a long time for potential competitors to emerge on a segment with high barriers of entry, that is quickly transforming into a red ocean between few players. The ***upfront investment*** is important at this stage, as it defines the high barriers of entry. Opting to adopt such services into organisational processes, as a user, will most likely guarantee a fair cost for the service, while operators compete for business. The ***value-delivery cost*** and the technological efforts are tremendous, as new aircrafts are built to break the laws of physics in cost-effective conditions. However, the eVTOLs are built for specific business processes, with ROI calculations already, with more than a century of engineering behind successive technological evolutions (Zhou, Zhao and Liu, 2020).

Speed to market is intrinsically tied to global aviation safety standards and aircraft type certification regulations. The industry is far beyond the proof-of-concept stages, being now in the latter stages of certification for several models that come into production. Aviation safety and security standards are some of the most rigorous ones that can encounter in any industry, similar to those applicable to nuclear applications. Such standards apply to eVTOL operations, as Rice et al. (2022) reveal. Shared mobility services by means of eVTOL solutions will be available in locations where the infrastructure allows it, such as the airport infrastructure with a very dense airport presence in key areas of access to important cities. Similarly, building heliports become an important component of the eVTOL deployment. The availability of such specially designated/built places where eVTOL could land or where it could take off from will make the difference when discussing how fast eVTOL can be put into service, how large of a range they could cover, and how many clients they could reach.

A diverse collateral market is foreseeably emerging, on a conceptual level, from business cases drawn up around the eVTOL solutions. The tourism sector stands to gain most from the ***up-sale potential*** of sustainable aerial vehicles carrying clients to remote destinations for short experiences. Moreover, delivery services stand to benefit as well, with a much wider area of operations insured by this technology.

The eVTOL solution is not a concept anymore. It is close to causing significant business disruption in the mobility industry. Yet, several aspects must be adjusted before eVTOL aircraft can breach the city airscape, however new markets emerge with eVTOL availability, such as regional connectivity on helicopter

flight paths. The innovative aircraft studied in this article is to expand the urban concept by connecting cities with each other, rather than pollute unique cities' skylines.

The tourism industry stands to gain the most, and fastest, from the emergence of businesses that use this technological conception. With rapid integration of these services into the organisational design, starting from employer branding tactics of companies that wish to employ the best that the regional workforce has to offer, corporations are to finance the eVTOL transportation industry. Having to find solutions to cope with the 'great resignation', a phenomenon that promises to continue disrupting the labour market, corporations are to concede to the workforce's demand for a flexible, yet socially rich labour experience, by letting employees chose their most productive work environment and flying them in when necessary. This is a viable secondary market, foreseeable a new organisation design.

The analysis developed under this section reveals very lucrative industry segments emerging together with eVTOL as new technology that promises to disrupt the transportation market. Operators, direct clients, and the corporate environment all stand to benefit from new financial influxes that accommodate this solution. As revealed by the analysis, eVTOLs take shape as a solution to environmental issues, to social discomfort in the workforce, to a pivoting opportunity in the tourism industry that demands an alternative to the declining aviation sector.

Conclusions

More research needs to be conducted regarding the infrastructure required to accommodate eVTOLs into the mobility industry, starting from dedicated airports or the modernisation of unused regional airports and connecting this transportation service into regional and continental intelligent transportation. An analysis of eVTOLs as key components into intelligent transportation systems will clarify the aspects regarding the required infrastructure and door-to-door services that would benefit both direct clients and the corporate environment.

As the current research succeeds to find new business processes and models new organisation designs that function based on eVTOL availability, a new design has to be drawn for organisations that operate this aircraft, solving business operations issues and regulatory problems as well.

The paper identifies several impediments regarding product-to-market in the eVTOL developing industry. At the same time, it finds a range of benefits in the potential market and hypothetical user base. New research will stand to resolve the pending issues recognised in this paper and enable the successful deployment of an instrumental product to a welcoming market.

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Approaches to Tackling Illegal Tobacco Trade in EU Countries

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Abstract

The objective of this paper is to demonstrate that an effective strategy to combat illicit trade in tobacco products (ITTP) in EU countries is one targeted on groups of countries, based on international and intersectoral cooperation, involving actors from government, education, civil society and the media. A basic statistical analysis was performed and regression models for panel data were used to identify the effects of changes in price and non-price factors in ITTP along with other control variables. In general, improving regulatory quality and education all over the EU will decrease the level of ITTP. However, the observation that the relationship between the proportion of people at risk of poverty and social exclusion and counterfeit and contraband consumption varies according to the existence of a border with a non-EU country, emphasizes the need for a tailored approach to combating ITTP. The first important result of this study is that improvements in quality of regulations, in education for all EU countries and reducing the poverty and social exclusion in New EU countries lead to decreases in illicit tobacco consumption. The second one is that increasing prices of tobacco products leads to increases in consumption of illicit tobacco products when the maximum gap between prices in EU countries and neighboring countries remains constant. We didn't find in our estimated models, significant negative dependency between WAP and illicit trade, meaning that the other factors are more important for decreasing the consumption of illicit tobacco products. Another important result is that decreasing the differences in prices of tobacco products in EU countries compared to neighboring countries lead to decreases in illicit tobacco consumption only in association with the reduction of poverty and social exclusion. The study also emphasizes the positive consequences of a holistic approach of all tobacco control measures.

Keywords

illicit tobacco trade; European Union countries; regression analysis; governance indicators.

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Introduction

The European Union (EU)-funded project: Illicit Tobacco Trade in the European Union 2017–2019 – Raising awareness and enhancing understanding of illicit tobacco trade among academic researchers in the European Union, offered a broad overview of the various approaches that countries have adopted to tackling illicit trade in tobacco products (ITTP). In EU Member States, there are few efficient punishments for those involved in ITTP. Very few people involved in illicit tobacco trade receive substantial sentences and the prosecution processes incur long delays. However, the exchange of information between neighboring countries plays an important role in detecting illicit tobacco flows. In this regard, the cooperation between EU countries is significant. Nevertheless, the current exchange of information with source countries can be improved.

The main objective of this paper is to prove that an effective strategy to combat ITTP in EU countries is the international cooperation and intersectoral cooperation, involving actors from ministries (finance, trade, foreign affairs, justice, internal affairs), customs administration, education and health sectors, civil society

and mass media by two hypotheses. The first one is: *"Improvements in education, in material and social conditions of living and in quality of regulations lead to decreases in illicit tobacco consumption*" and the second one is: *"Increasing the differences in prices of tobacco products in EU countries compared to neighboring countries lead to increases in illicit tobacco consumption".*

In a previous study Boboc and Ciobanu (2021) proved that countries sharing a common pattern of modus operandi in ITTP also share common strengths and weaknesses in their governance status. Reinforcing governance with common instruments and common goals in countries sharing a common ITTP modus operandi, could improve the control of illicit trade in these products. At national level, Ciobanu & al. (2018), even if there is an inevitable lag time between tobacco control interventions and their impact on smoking prevalence and related diseases in the population, there is an association that supports the tobacco taxation despite the perceived risk of increases in illicit trade and supports strengthening tobacco control laws in Romania.

The major contribution of this paper to the field of illicit trade with tobacco products is the comparison of various panel data regression models, based on various economic, educational, social and governmental indicators such that to define the best ways to follow in order to decrease the illicit tobacco consumption.

1. Literature review

There are many reasons to reduce illicit trade in tobacco products (ITTP). The question is how. The first study to demonstrate the scale of ITTP looks to be the estimation made by Merriman, Chaloupka and Yurekli, (2000): between 6% and 8.5% of global cigarette consumption. Since then, many other studies have been made to demonstrate the scale of ITTP, its measurement and the impact of taxation policies on ITTP. But fewer studies focus on new and innovative approaches to reducing the extent of ITTP.

The technical report of the World Bank Group (2019), Global Tobacco Control Program: Confronting illicit tobacco trade: A global review of country experiences, identifies some key strategic directions that have characterized national advances in the control of ITTP. The authors highlight action points those policy-makers and implementers can prioritize to sustain progress in confronting.

Cigarettes are highly taxed in Europe to discourage tobacco use and to fund public health measures to mitigate the harms from tobacco consumption. But at higher levels of taxation, price differences between the legal and illegal tobacco markets largely determine consumers' inclination to use illicit cigarettes. This issue is hotly debated in the literature. One of the most vigorous claims that prices only minimally affect illicit retail trade in cigarettes (IRTC) and what other factors are more important, was made by Joosens and Raw (2008): "Higher income countries, where cigarettes are more expensive, have lower levels of cigarette smuggling than lower income countries. The role of prices in stimulating IRTC is far more empirically important than that of corruption in European countries, both examining illicit market shares or illicit volumes". Later, Schwartz and Zhang (2016) argue also the assumption that the increase in taxes charged on tobacco products always leads to the increasing use of illegal tobacco is misleading. In their view, lowering taxes on tobacco would not solve the problems with contraband tobacco.

In 2018, in their paper, Schafferer, et al., demonstrated that higher taxation would reduce total tobacco use and increase tax revenues but also increase contraband trade. Prieger and Kulick (2018) in their study on ITTP in Europe, found that while the overall correlation between licit cigarette prices and illicit market share is negative, raising prices in any one country would lead, other factors being equal, to substantial increases in the expected illicit market share and volume.

Tobacco price heterogeneity among European states has been identified as the main incentive of illicit trade (Agaku, et al., 2016; Johnston, Kegö and Wenngren, 2016). Specifically, tobacco products are considerably lower priced in South-eastern Europe than in other European countries, proliferating illicit trade and subsequently altering consumption within the European Union.

As seen in previous scientific papers, the factors contributing to ITTP are extremely complex. Taxes and prices have only a limited impact on the illicit cigarette market share at the country level. Evidence indicates that the illicit cigarette market is relatively larger in countries with low taxes and prices and smaller in countries with higher cigarette taxes and prices (Joossens and Raw, 2008). Non-price factors – such as governance status, weak regulatory framework, social acceptance of illicit trade and the availability of informal distribution networks – appear to be far more important determinants of the size of the illicit tobacco market (Daudelin, Soiffer and Willows, 2013).

A high level of education plays an essential role in society, by fostering innovation, increasing economic development and growth and improving the well-being of citizens more generally. Although the

relationship between educational attainment and cigarette consumption has been studied by many authors (Helmert, Borgers and Bammann, 2001; Jefferis, et al., 2003; Barbeau, Krieger and Soobader, 2004; Galea, et. al., 2007), the relationship between illicit cigarettes consumption and educational level has not been extensively studied by so many authors. Authors like Cantrell, et al. (2008) and Coady, et al. (2013) revealed correlations between illicit cigarettes consumption and some specific racial and ethnic minorities (for which included references to the educational level). On EU populations, Joossens, et al (2014) found a correlation between the educational level (low, medium, high) and illicit cigarettes and hand-rolled tobacco. Even if the evidences of a relationship between education and illicit tobacco trade among EU countries are incipient, a possible relationship could prove significant in longitudinal analysis.

2. Data and variable description

According to the WHO-FCTC definition, illicit tobacco trade refers to any practice related to distributing, selling or buying of tobacco products that is prohibited by law, including tax evasion (sale of tobacco products without payment of applicable taxes), counterfeiting, disguising the origin of products, and smuggling. 'Contraband' refers to tobacco products produced legally and illegally diverted into another market after manufacture. 'Counterfeit' refers to tobacco products that are illegally produced and bear false manufacturing labels, unauthorized trademarks or trade names. 'Illicit whites' (or 'cheap whites') refers to cigarettes produced in one country for the sole purpose of being exported and illegally sold into another country without payment of any tax (FCTC-WHO, 2013). Traditionally the illicit tobacco trade has been dominated by counterfeiting and contraband, but illicit whites are an emerging trend (Aziani and Dugato, 2019).

In 2017, counterfeit and contraband (CAC) cigarette consumption in the EU was estimated at 8.7% of total consumption, accounting for 44.7 billion cigarettes. Despite a recent decline in CAC volumes (i.e. 7.4% decrease in 2017 compared to 2016) – which is more pronounced than the decline in legal domestic cigarette consumption of only 2.5% in the same period – CAC cigarette consumption grew in countries with the largest price differences with source countries, such as in the Netherlands and the United Kingdom.

Table no. 1. Variable description

Variable	Definition	Unit of measurement	Source
CAC consumption	The Counterfeit and Contraband, including Illicit Whites cigarette consumption in total cigarette consumption	%	*KPMG, SUN project*
Regulatory Quality (RQ)	Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	Units	*The World Bank Database (Worldwide governance indicators)*
Tertiary Education (TE)	The percentage of population with tertiary education (aged 15-64)	%	*Eurostat*
People at risk of poverty or social exclusion (PRPSE)	The proportion of persons who are: at risk of poverty or severely materially deprived or living in households with very low work intensity in total population. Persons are only counted once even if they are present in several sub-indicators.	%	*Eurostat*
WAP *MAX_GAP_WAP*	The weighted average price for cigarettes calculated by reference to the total value of all cigarettes released for consumption, based on the retail selling price including all taxes, divided by the total quantity of cigarettes released for consumption. The maximum difference in weighted average price for cigarettes between destination country and neighboring countries	Euro	*KPMG, SUN project* *&* *Tables of excise duties on tobacco published by European Commission*

Therefore, even though many studies have suggested that tax policy is considered the most effective strategy to reduce tobacco consumption and prevalence, we argue in the present paper that a multidimensional approach is potentially much more efficient in addressing ITTP. The socioeconomic, educational or governance factors are considered to be important in determining the size of illicit tobacco trade, along with other dummy variables such as 'old' EU countries (i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK) versus 'new' EU countries (i.e. Bulgaria, Croatia, Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania,

Malta, Poland, Romania, Slovakia, Slovenia) or proximity to non-EU countries (i.e. such as in Bulgaria, Croatia, Czech Republic, Estonia, Finland, Greece, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Slovak Republic, Slovenia) or the weighted price level of cigarettes, or largest differences in prices between destination countries and neighboring countries.

Positive changes in socioeconomic factors in EU countries might imply consumers switch to purchasing cigarettes through the legal market and decreasing tolerance of smuggling. In order to study the relationship between the illegal tobacco market and socioeconomic factors, we have used the variables presented in Table no. 1, chosen according to the main results from the literature. The data set presents a panel structure, containing information about the 29 EU Member States, Norway and Switzerland, observed over 5 years, from 2013 to 2017.

In 2017, 112.8 million people in the EU lived in households at risk of poverty or social exclusion, equivalent to 22.4 % of the population. Compared to 2016, the proportion of population at risk of poverty and social exclusion in 2017 declined sharply in Bulgaria, Croatia, Cyprus, Poland, Portugal, Romania and the Slovakia.

In contrast, the proportion at risk of poverty or social exclusion increased in highly developed countries such as: Denmark, Luxembourg, Norway and Switzerland. We observe that in countries forming the eastern Border of EU (e.g. Bulgaria, Latvia, Lithuania and Romania) the percentage of people at risk of poverty and social exclusion is very high and the CAC consumption is among the highest in Europe. For these people living close to the EU eastern borders, cigarette smuggling is a way of life, and shifting a pack a few miles over the border can quadruple its value. As long as these people remain in high proportion, demand for smuggled cigarettes will always be high.

A high level of education plays an essential role in society, by fostering innovation, increasing economic development and growth, and improving the well-being of citizens more generally. Therefore, in this study we have used the percentage of people with tertiary education, aged 15-64 (i.e. provided by universities and other higher education institutions) to describe the growth potential of a country. Low levels of tertiary education produce reduced opportunities in the labour market and lower participation in political, social and cultural activities. In 2017, at least 35% of the total population (aged 15-64) had completed tertiary education in the UK (38.8%), Cyprus (38.1%), Switzerland (36.8%), Norway (36.8%), Finland (36.4%), Sweden (36.0%) and Belgium (35.6%). At the opposite end of the scale, the lowest proportions (less than 20% of total population aged 15-64) were observed in Romania (15.3 %) and Italy (16.5%).

Law enforcement activities and improved legislative frameworks might also lead to reduced flows of illegal tobacco products from non-EU countries. Therefore, in this study we have used a 'regulatory quality estimate' (RQE) to measure the ability of governments to formulate and implement sound policies and regulations. The countries with the lowest levels of regulatory quality estimate are Greece, Croatia, Romania, Slovenia, Bulgaria and Hungary.

Predictably, this group of EU countries are also important actors in illicit tobacco markets. Weak regulatory quality enables the transit of illicit cigarettes and the active engagement of such countries in developing governance strategies against ITTP is essential.

With higher price differences between legal and illegal cigarettes, consumers tend more towards purchase and use of illicit products. Consequently, our analysis includes a 'weighted average price' of cigarettes (WAP) to measure the impact of price on ITTP, as recommended by the EU Tobacco Tax Directive for calculation of excise levels (Council of the European Union, 2011).

Moreover, we have computed the maximum difference in WAP between destination country and neighbouring countries (MAX_GAP_WAP) as high price differences between neighbouring countries may lead smugglers to divert products to higher priced neighbouring countries where the ITTP remains a low-risk, high-reward activity. The data used for WAP drew from the SUN Project database for the period 2013–2017 (KPMG, 2017) and tables of excise duties on tobacco published by European Commission (European Commission, 2019). The highest cigarette WAPs were registered in Norway (€ 12.12 per pack of 20 cigarettes), UK (€ 8.86 per pack) and Switzerland (€ 7.27 per pack). Even if increased legal prices augment consumers' incentives to buy illicit cigarettes, these countries are not among those with the highest levels of CAC consumption as a percentage of total consumption. This reiterates the observation that smokers with limited incomes and low levels of education are more likely to turn to illicit consumption as the price of legal cigarettes rises (Aziani and Dugato, 2019).

3. Research methods

We used a panel data approach to capture the impact of price and non-price factors described previously as influencing ITTP.

A two-way panel data model assumes the presence of individual effects αi, i = 1, …, N for each cross section and the presence of individual effects γt, t = 1, …, T for each time section:

$$yit = \beta 0 + X'it\,\beta + \alpha i + \gamma t + \varepsilon it, \quad (1)$$

$$uit = \alpha i + \gamma t + \varepsilon it, \qquad i=1,...,N;\ t=1,...,T \quad (2)$$

The linear models for panel data analysis can be conducted using fixed-effects or with random-effects (RE) models. In the fixed-effects model the αi (γt) are permitted to be correlated with the regressors xit, while continuing to assume that xit is uncorrelated with the error εit. In the random-effects model, it is assumed that αi (γt) is purely random, which is a stronger assumption implying that αi (γt) is uncorrelated with the regressors. The empirical study aims to capture the impact of price and non-price factors described previously as influencing ITTP in the 29 European Countries included in the analysis by comparing the econometric results obtained from the application of certain panel regression models. In order to determine the panel regression model that best explains the impact of the factors on illicit tobacco trade, five models have been tested: the simple regression model (OLS), the one-way fixed effects model, the two-way fixed effects model, the one-way random effects model and the two-way random effects model. Based on F-test for fixed effects, the Hausman test, the significance of the model parameters, the R2 coefficient of determination and the distribution of residuals, it has been revealed that the one-way fixed effects regression provided the best results in models that do not have as predictors dummy variables for New or Old EU countries and the one-way random effects models provided the best results in the last two cases. The results for one-way panel data models are presented in Table no. 2. For the current analysis, we used SAS Software to estimate parameters. The procedure PROC PANEL in SAS estimated panel data models and supported model specification. We have used also the option of Newey-West standard error correction for heteroscedasticity and autocorrelation. The formula for the Newey-West covariance matrix estimator can be found in Greene (2003).

4. Results and discussions

In order to capture the impact of price and non-price factors described previously as influencing ITTP, we estimated several linear models with CAC consumption (%) as a dependent variable and the variables described in Table 1 as regressors, for panel data with five periods of time (yearly data from 2013–2017) and 29 cross sections (EU countries, Norway and Switzerland included). Since the variables WAP and MAX_GAP_WAP are correlated and both are price factors, they were not introduced simultaneously in the regression equations. In all models, the estimators of WAP were not significant. Therefore, we have kept in our models only the variable MAX_GAP_WAP. According to Hausman test, to F-test for fixed effects and also to the distribution of residuals, the fixed-effects model is more appropriate to describe the relationship between variables in all cases. The estimated results are presented in Table no. 2.

Table no. 2. Regression analysis results – one-way panel data models with fixed effects

Dep. variable: CAC consumption	Model 1	Model 2	Model 3	Model 4
Intercept	0.57***	0.28 ***	0.54***	0.54***
RQ	-0.05***	-0.04*	-0.05**	-0.05**
TE	-0.39***	-0.25 **	-0.33***	-0.33***
PRPSE	-0.75***	0.14 NS	-0.79**	-0.03NS
MAX_GAP_WAP	-0.01*	-0.01 NS	-0.00NS	-0.03***
PRPSE x non_EU_neighbours	0.91***	-	-	-
PRPSE x MAX_GAP_WAP	-	-0.16 NS	-	-
PRPSE x New EU	-	-	0.76*	-
New EU x MAX_GAP_WAP	-	-	-0.03**	-
PRPSE x Old EU	-	-	-	-0.75**
Old EU x MAX_GAP_WAP	-	-	-	0.03**
R-squared	0.90	0.90	0.90	0.90
Hausman test	10.13*	6.78NS	12.28 **	12.28 **
F-test for no fixed effects	18.77***	18.43***	18.96***	18.96***
Breuch Pagan Test for random effects	142.93***	121.52***	134.78***	134.78***

Notes: *: significance at 10%; **: significance at 5%; ***: significance at 1%; NS: non-significance at 10%

The current analysis presents a strong argument for supporting the high impact of various socioeconomic factors (alone or in association) on illicit trade with tobacco products.

Improving the general regulatory framework in a country in order to promote and implement the principles of the 'state of law' is clearly correlated with a decrease in CAC consumption, and in a relatively short time period (i.e. five years). This effect exists in all EU countries, independent of their old/new status.

The results demonstrate that increasing the percentage of people with tertiary education is a factor for driving down the CAC consumption. One explanation could be the inverse relationship between the level of education and smoking prevalence, for which there are strong evidences (mainly for developed countries), including in relation to the use of legal cigarettes.

Existing studies demonstrate that CAC consumption is more common in deprived areas. As the countries having a border with non-EU countries tend to have more deprived areas than other EU countries, the direct relationship between the proportion of people at risk of poverty and social exclusion and CAC consumption in these countries was anticipated and our model prove their significance. But, when calculated for all EU countries, the correlation between the two variables is not significant. For old EU countries we have a positive significant relationship between these variables. Apart from the fact that in old EU countries there are not many people at risk of poverty and social exclusion, the result could signal the possible existence of factors that have not been taken into account in the current analysis, which might influence CAC consumption. Another possible explanation could be the methodology used to define CAC consumption, as long as some components of it could be biased by many unpredictable factors (Helmert, Borgers and Bammann, 2001; Zhang, et al., 2006; Prieger and Kulick, 2018).

The negative correlation the current study identified between the maximum gap in WAP between reference country and neighbours and CAC consumption in new EU Member States could be the result of the persistent poor governance. Increasing the price of tobacco products in a country is a measure of political will and support for tobacco control measures. Thus, other policies reflecting good governance are expected to be simultaneously introduced in a country with high cigarette prices, policies that could lead to better enforcement of legislation against money laundering, illicit traffic, better customs procedures etc. Taken together, these policies are characteristic of a general state of law, leading to reduced ITTP, including reduced availability of CAC products. In order to decrease CAC consumption in a given country, increases in the prices of cigarettes could be an efficient measure only in old EU Member States, when measures to ensure enforcement of legislation against money laundering, illicit traffic, better customs procedures, etc. have already been taken.

This study also demonstrates the existence of associations between the evolution of socioeconomic factors and CAC consumption, which are not explained in many independent studies and are somewhat counter-intuitive. For example, the negative relation between simultaneous action on reducing the persons at risk of poverty and social exclusion and in decreasing the maximum gap between prices in tobacco products between neighbouring countries and CAC consumption. By decreasing the percentage of people at risk of poverty (as a result of good governance) and simultaneously decreasing WAP differences between neighbouring countries (as a result of cooperation and global good governance), the CAC consumption would decrease. One explanation might be that the maximum WAP decreases because of the increasing prices of cigarettes in less developed countries. The decreasing percentage of people at risk of poverty means that the people have more possibilities and they are less attracted to smuggled goods even if they have more opportunities to buy illicit tobacco products.

Conclusions

This paper provides evidence to support the beneficial role of improving the socioeconomic environment on CAC consumption in a relatively short time period (five years). Improving the general regulatory framework in a country is an achievable goal in five years and is effective in diminishing the CAC consumption component of ITTP.

By demonstrating that increasing the percentage of people with tertiary education is a factor for decreasing CAC consumption, the paper brings a new argument for governments to support tertiary education of young people. By implementing supportive educational policies, impacts on ITTP could be seen in the first five years after ending tertiary studies.

The observation that the relationship between the percentage of people at risk of poverty and social exclusion and CAC consumption varies according to the existence of a border with a non-EU country, emphasizes the need for a tailored approach to combating ITTP. There are some generalized recommendations

but must be adapted according to specific national circumstances – such as the proximity of countries with different regulatory frameworks (i.e. non-EU countries). In support of this approach, the study offers a further argument: each 1% decrease in the proportion of people at risk of poverty or social exclusion in EU countries with a non-EU border, all other factors remaining equal, is expected to decrease the CAC consumption by 0.15%.

Increasing prices of tobacco products leads to increases in consumption of illicit tobacco products when the maximum gap between prices in EU countries and neighbouring countries remains constant. We didn't find in our estimated models, significant negative dependency between WAP and CAC magnitude, meaning that the other factors are more important for decreasing the consumption of illicit tobacco products. Another important result is that decreasing the differences in prices of tobacco products in EU countries compared to neighbouring countries lead to decreases in illicit tobacco consumption only in association with the reduction of poverty and social exclusion, or for old EU countries (characterised by high levels of standards of living).

The study emphasizes the importance of a holistic approach to all tobacco control measures. Increasing the price of tobacco products in a country is a measure of good governance, which also includes interest for a better education of citizens and for reducing the risk of poverty. Adopting measures to improve all these indicators could lead to a more substantial decrease in CAC consumption than when only single measures are implemented.

The use of data from reports/databases produced by companies with direct or indirect ties with the tobacco industry, as well as the use of data potentially influenced by the industry, is the most significant limitation of the current study.

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Telework - Its Implications and Effects During the Pandemic on the Accounting Profession

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Abstract

The digital transformation is facing a significant paradigm shift in our society, it has already profoundly changed our world of work and will continue to do so in the future. The COVID-19 pandemic has greatly facilitated this increase in digitization in recent months. Many companies have had to move from office to home office to protect the health of their employees and ensure their livelihood. As it is not possible to access local files in one's home office, many companies have been increasingly digitizing their data and documents in recent months, securely storing them in digital media and using innovative business content so that the employees should be able to access and edit management solutions anytime, anywhere. In this sense we released a questionnaire to evaluate the perceptions of the accountants about the teleworking during the COVID. Given the problems of professional reasoning and the new technology they faced with the pandemic. The novelty of the article concerns the analysis of the situation in Romania, for which no specific research was carried out on the fields of activity, especially in the field of accounting. The results show that accountants were forced to adapt to telecommuting and learned a lot from this period. Like any research, it has several limitations and leaves room for future research. In the future, the increased focus on multi-cloud or digital media should support companies in achieving their goals and contribute to the maximum added value.

Keywords

digitalization; COVID-19; telework, teleworking

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Introduction

The crisis caused by the COVID-19 pandemic is a real test for digitization. In a very short period of time, ways and means had to be found to maintain the various types of administrative services, while protecting employees and the population. In many cases, home office work (teleworking, also known as remote work) has been relied upon to protect employees and to protect their overall health (Baicu, et al., 2020).

With the onset of the pandemic in March 2020, project management was able to rely on established project structures. This included detailed project planning in a partially agile process model, transparent project organization, regular meeting and communication structures, established risk management, good technical equipment and, above all, a motivated and highly qualified project team. The cornerstones for the transition to reliable and structured distance work have been the already established project structures and standards. A clear project plan, the division of the project into independent subprojects, effective coordination committees and clearly defined project working days provided the framework for cooperation in a situation where the daily work routine for all project employees changed dramatically in just one week.

After half a year of remote work on the project, several factors emerged that, in reflection with the project staff and other project actors, are considered essential for the success of teleworking. In addition to the acquisition of new additional technologies and the adaptation of control and communication structures, both the familiar work formats and the planned events had to be rethought and adapted to the modified technical requirements and conditions.

To continue the successful operation of the project in the form of telework, it was opportune to stick to the planning of the project, especially in exchange with the departments. Important elements in the project procedure, such as the implementation of the target image workshops and the organizational launch in the departments, as well as specialized and integration tests, were therefore carried out within the planned time frame, but in different formats. A lot of design and coordination effort have been invested in adapting formats and developing new methods. As a result, project stages could be maintained, and all essential work packages could be processed (Beauregard et.al,2019).

The human factor is at the heart of the changes that have resulted from the pandemic. Physical change in the workplace and work environment, lack of direct contact with colleagues, and often sudden changes in family and work compatibility requirements have led to additional challenges that need to be addressed. Since regular shift in the lobby, in the kitchen for coffee or from office to office was no longer necessary, this was offset by phone calls, which often interrupted their own work pace (Mann and Holdsworth, 2003)

It has been helpful for many employees to block fixed calendar times to work on their own topics, as well as fixed break times, including a long enough lunch break. The use of conference calls and web conferencing has increased significantly. In order to facilitate cooperation in such conferences, a remote discipline with rules of the game was introduced from the beginning, the most important point being to deactivate yourself when you are not speaking (Figure no. 1.).

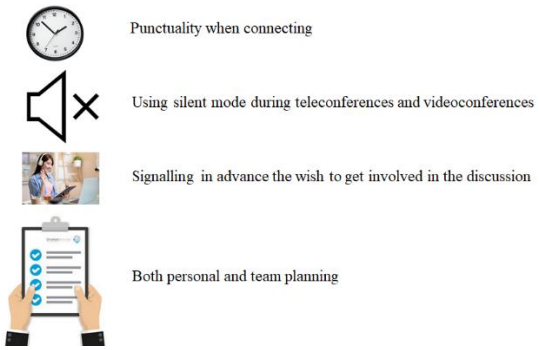


Figure no. 1. Rules for cooperation in a conferences

From one day to the next, remote work has completely changed the workplace for many employees. When it became clear that the distance phase would take longer, a large number of employees bought more comfortable headphones. In addition, the work area itself has often been equipped with a suitable desk and an office chair to prevent back pain. After the teleworking phase began, it quickly became clear that social interaction at work had decreased because people could not see each other. At the same time, personal exchange is inherently important for successful cooperation. For this reason, the project has become active in many places.

1. Literature review

Telework has been widely promoted as a future model, but the moderate spread and rapid growth of telework during the crisis raises the issue of the costs and benefits of telework for companies and the economy. The effect on productivity, which has already been investigated in several studies, is particularly relevant for an economic assessment.

In the spring of 2020, there have been decisive changes in teleworking. Thanks to measures to reduce the COVID-19 pandemic and to promote "social distance" worldwide, teleworking has suddenly gained importance. In this context, the question arises as to the extent to which telework will remain so important even after the pandemic. The crisis caused by the pandemic has further increased the importance of digitalization. Instead of physical meetings, employees are now given tools to enable virtual conferencing and work from home (Borgmann 2020). Bitkom President Achim Berg considers the breakdown of existing structures an urgent need: "The COVID-19 pandemic and the drastic damage to public life require a radical rethinking of the culture of many companies. Public employers, for whom the home office is often a foreign word, are even more challenged. Digital technologies are the key to ensuring the functionality of businesses

and public institutions, such as offices and schools, even in this time of extraordinary crisis" (Bitkom, 2020). The paradigm shift described by Berg becomes particularly clear when we look at how often we use cloud services / digital media. According to a representative survey conducted by Bitkom Research industry association on behalf of KPMG AG, 76% of companies surveyed used cloud computing power / digital media in the last year. In 2018 it was 73% and in 2017 only 66%. A steady increase in cloud solutions is clearly visible (Pols and Heidkamp, 2020). If we look at the current literature on "digitization" and its likely effects on the world of work tomorrow, a surprising number of studies refer to layoffs and downsizing due to the growing influence of digitization (Frey and Osborne, 2013; Silva, 2021).

Arntz, Gregory and Zierahn (2016) consider individual activities instead of individual professions or occupational groups and reach a significantly lower probability of 12% compared to the total number of jobs in Germany. According to the authors, a possible explanation for the large discrepancy between forecasts is that employees often perform a large number of interactive, non-routine activities that cannot be automated or can only be automated with great difficulty. Given the person who works, such studies may explain the fears of losing a job. In addition, a transformation of (remaining) activities during digitization is to be expected (Arntz, Gregory and Zierahn, 2016; Montealegre and Cascio, 2017). Giovanis (2019) examines employee loyalty based on the 2004 and 2011 Labor Relations Survey (WERS) survey, which includes all UK companies with at least five employees and includes surveys of both employees and employers. Answers to questions, measured on a Likert scale from one to five, are used to measure employee satisfaction and loyalty. There is a positive correlation between teleworking and satisfaction and loyalty. This is justified by the elimination of unfavorable, stressful conditions on the way to and from work. It is also emphasized that teleworking promotes autonomy and flexibility of working time. In turn, this allows employees to organize their free time, tailored to individual needs, which can sometimes lead to additional stress, as shown in Kazekami (2020). However, this means that telecom companies are more attractive than other companies and can therefore attract more productive workers, which ultimately increases their productivity. In terms of productivity, Bloom et al. (2015) further with their work on CTrip employees that telecommuting can lead to an increase in performance of up to 13%. On the one hand, people worked nine percent more at home, and on the other hand, four percent more calls per minute were made. Both points require closer examination. In the case of the former, it should be noted that the extra work was done voluntarily, but in the long run, it can also lead to increased stress and / or a balance between work and private life, which is consistent with Kazekami results (2020). To increase the number of calls per minute, employees said that changing jobs has led to a quieter environment, which has made it easier for customers to understand the phone and reduce questions. However, working in a call center offers extremely specific conditions, which make it much easier to work remotely. Kazekami (2020) also uses the above data to investigate the effects on the productivity of Japanese companies and employees. The results of the research show that teleworking an adequate number of hours per week can increase labor productivity. According to the results, teleworking around 20 hours a week maximizes the effect on productivity. An extension beyond this number limits productivity gains through telework. This decrease in marginal productivity can be explained by the increase in loneliness, which in turn can have a negative effect on life satisfaction. In addition, the results of the study suggest that teleworking leads to higher productivity increases for employees who travel an hour or more each day. According to the authors, this is due to the additional stress experienced by congested public transport workers in Japan. This can reduce productivity and can be avoided by teleworking. These results largely coincide with those of Giovanis (2019) and thus the negative influence of long commuting times.

Based on the regular ZEW ICT survey conducted by German companies, Viete and Erdsiek (2020) examine more than 1,000 German service companies to what extent the so-called "trust-based working time arrangements", ie flexible agreements where and when the work is carried out, they also include home offices, which affect labor productivity. They show that labor productivity increases as the proportion of these agreements increases. Associated with this are, of course, mobile technology solutions that have a complementary effect and also reinforce this effect. Focused on the prevailing crisis and takes into account the period between February and May 2020 in the United States. Specifically, the authors examine changes in unemployment rates. It can be seen that the federal states that have a higher share of employment in the areas of "information activity, including management, professional and related occupations" 3 have fewer redundancies and leave. This is due to the fact that jobs in these sectors tend to work more in telework than others (Brynjolfsson, et al., 2020). Schymik and Fadinger (2020) also find that teleworking has a strong negative correlation with COVID-19 virus infection rates. NUTS-2 regions in Germany, with a smaller proportion of employees who can work from home because of their jobs, have higher infection rates than other federal states. Subsequently, the authors point out that the economic costs of a blockage are significantly higher in regions with a lower proportion of jobs that can be done from home. Telework also

contributes to a significant part of the resilience of an economy in times of global crisis, such as the COVID-19 pandemic.

2. Methodology

The research was conducted using a questioner based on a descriptive and exploratory methods. The questionnaire, which was addressed to accountants, outlined several aspects regarding the teleworking in during the health crisis. The analyzed sample consisted of 125 validated responses, and the date obtained where validated by using SPSS.

3. Covid's implications on work in Romania

The COVID-19 pandemic has considerably changed the labor situation and work pressures of several individuals, who get began working at home, in telecommuting. In adding to homeworking, several families have confronted the position of assisting their children, who, staying similarly limited at home, have started to take space education classes. According to Thulin, Vilhelmson and Johansson (2019), there are just a small number of empirical research on how employees manage their everyday employment. In telecommuting, the worker is available everywhere and every time, and this need meets the pressure of the company (Baruch, 2000). When teleworking, space is ignored, and the employee's technical sketch and self-control are important in the worker's profile so that he can utilize job professionally and successfully (Gálvez, Tirado and Martínez, 2020). This system of work does rigorous use of computer-generated interaction to provide communication among work groups and to concentrate on great managing of individuals and projects (Mann and Holdsworth, 2003; Murphy and Reeves, 2019).

The conceptual model we analyzed was resulting since the crisis-induced telework adjustment structure. The theoretical foundations of the present research lie in the telework analyzed by Dawis and Lofquist (1984) and the interactional model of personal adjustment analyzed by Nelson (1990). The variables that are incorporated in the research are particular for the crisis, i.e. the context of the crisis "generates" them or otherwise changes the relationship with the adjustment of telework. We have considered the following factors (Figure no.2.):

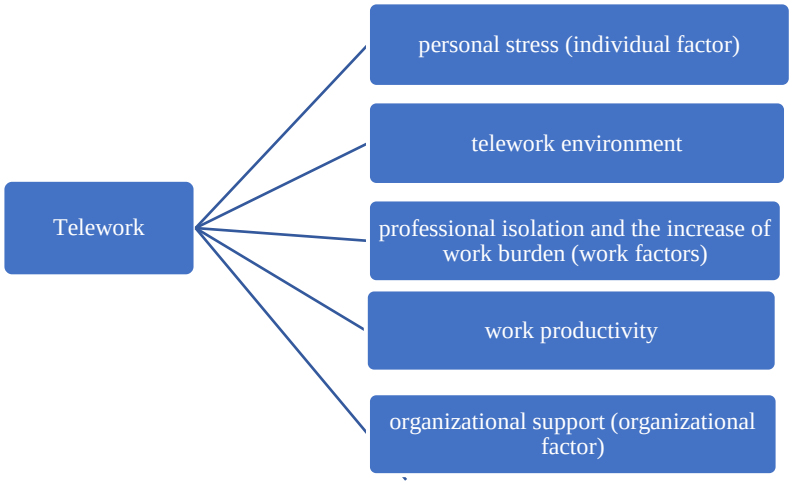


Figure no. 2. Proposed model

We also added as control variables the age, gender, educational level, experience in the field, experience in telework and team size (Table no.1.).

Following the establishment of the basic factors of the specialized literature, we resorted to the formulation of hypotheses that were subsequently tested to confirm or refute them.

The level to which an worker realizes his/her life unpredictable, overworked, even unmanageable as it became with the onset of the pandemic contributes significantly to the individual stressor (Cohen, Kamarck and Mermelstein, 1983). As several researchers in the literature have pointed out, the stress factor can have a negative influence on various labor results (DeTienne, et al., 2012; Yoruk and Acikgoz, 2022).

Table no. 1. Demographical information

Dimension	Subgroup	Distribution
Gender	Female	87
	Male	38
Age	18-25	0
	26-35	18
	36-45	86
	46-55	14
	Peste 55	7
Education	Undergraduate	15
	BA	66
	MA	44
Experience in the field	Less than 1 year	0
	1-5 years	9
	5-10 years	13
	More than 10 years	103
Experience in telework	Less than 1 hour	5
	1-2 hours	12
	2-3 hours	15
	3-4 hours	17
	More than 4 hours	76
Dimension of the team	0-10 employees	49
	10-50 employees	51
	50-100 employees	19
	100-300 employees	5
	More than 300 employees	1

Based on these statements found in the literature, we formulated our first hypothesis:

H1: Stress has a negative impact on the various outcomes of work.

Newman (1977) was concerned with the issue of the work environment, so the degree to which an worker has favorable circumstances for teleworking at at home can influence his performance and performance. Thus, the researchers in the field analyzed the employees' perception regarding their work environment. A good physical work atmosphere can positively influence worker performing (Kacmar, et al., 2009). Disruptions, noise, and interruptions are likely to affect performance as well as inadequate physical condition (Gist and Mitchell, 1992; Staples, Hulland and Higgins, 1999).

H2: Employees' perceptions of their work environment positively influence their performance.

In a situation free of pandemic crisis, it has been demonstrated that the more than a person understands that he is significant, obvious and concerned in the organizational society (organizational connection), the more than this person adapts to telework (Raghuram, et al., 2001). Thus, it is necessary to analyze the influence of isolation on telework.

H3: Isolation has a negative influence on teleworking.

With the restrictions brought by the pandemic, the perception of the change of work effort was significantly influenced (Cording, et al., 2014). Workload or efficiency has been recognized as one of the reasons for telework, expected to the anticipation of disruptions and / or the reduction of traveling period. Reasons for efficiency include the need for telework to improve work productivity and performing (Allen, Golden and Shockley, 2015) and thus promote to a good quality variation of work.

H4: Labor productivity is positively influenced by telework.

An important role in this period of crisis is also represented by the facilities offered by the organization. Thus, organizational assistance has remained as one of the achievement aspects in the implementation of telework for workers to adapt good to this way (Allen, Golden and Shockley, 2015; Beauregard, Basile and Canonico, 2019).

H5: Organizational support negatively influences telework.

Table 2 shows that the load values of the related question factors are greater than 0.40. In addition, the results of the T test in each factor load variable are significant and accurate to less than 0.01. Moreover, based on Cronbach (1955), the acceptable alpha value for model reliability is 0.70, while in the current study the alpha value for each variable is greater than 0.70. Consequently, the composite reliability (CR)

values for the variables are obtained as a value greater than 0.70 for each variable. The average values of variance extracted (AVE) describe that the convergent validity of the variables is convenient (Table no.2.).

Table no. 2. Statistical results

	Sample Mean	Standard Deviation	Cronbach's Alpha	C.R. Value	AVE Value	R Square
H1	2.53	1.1	0.84	0.91	0.77	0.71
H2	3.11	0.96	0.83	0.9	0.76	0.67
H3	3.31	0.98	0.74	0.86	0.69	0.68
H4	2.24	1.14	0.85	0.91	0.78	0.66
H5	3.51	1.18	0.89	0.92	0.79	0.6

Thus, following the results obtained, the hypotheses formulated by us are confirmed (Table no. 3.):

Table no. 3. Hypothesis confirmation

Factor	Hypothesis relation	Confirm/Reject
Stress	H1 (-)	confirmed
Work environment	H2 (+)	confirmed
Isolation	H3 (-)	confirmed
Work productivity	H4 (+)	confirmed
Organizational support	H5 (-)	confirmed

Absence of contact and confidential interactions with teammates, as good as opinion from the administrator and the organization in general, is one of the most important difficulties facing telework as described in the literature (Feldman and Gainey, 1997; Golden, Veiga and Dino, 2008.). This phenomenon is also underlined by the respondents of the questionnaire who emphasize that they lack face-to-face contact with colleagues, so we emphasize that our research is in line with existing literature, as a robust and substantial negative influence was found on employees in their adaptation. teleworking due to their isolation. The need for adequate teleworking restrictions so that workers can actually work from home has proven to be the second extremely crucial factor affecting employees to adapt to working conditions in the teleworking variant. Here the adaptation was an even bigger challenge among the respondents due to the fact that with the pandemic not only they as employees remained at home but also the rest of the family members, thus or faced with the issue of space and time management. This result is also in line with the literature (Staples, Hulland and Higgins, 1999; Beauregard, Basile and Canonico, 2019; Yoruk and Acikgoz, 2022), not surprisingly because the swift and compulsory environment of the blockage has frequently left workers who were possibly unfamiliar with teleworking before, ill-equipped while their individual and work arenas clashed. Therefore, it is exceptionally hard to resolve the limitations of our expert life with those of our family members. All this has the impact of considerably improving our emotional load, pushing us to assume that we cannot remain engaged on a project or an meeting due to disruptions all around us. Anxiety was discovered to be one of the extremely important crisis-specific factors, with a solid negative effect on change. Occupational wellbeing and ambiguity in the perspective of the epidemic crisis is believed to have remained a key cause of individual stress, as well as the crash of individual and professional life. Thus, it highlights the crucial importance of detecting, controlling and managing employee anxiety when applying new methods of working (Mann and Holdsworth, 2003) and particularly in periods of crisis.

Unusually, our findings also showed that the perception of an increase in capacity take the lead to superior job fulfilment, efficiency and excellence. The fact that the intensification in labor productivity is linked to a improved change might appear amazing at primary look, however, it is in line with one of the initial meanings of applying telework in organizations, namely to provide more flexibility and decrease period and the pressure of moving from home to work and back.

Surprisingly, despite the fact that the literature states that organizational support counterbalances the feeling of professional isolation (Mann and Holdsworth, 2003), our results are contradictory, which can be also explained in terms of the target group where most work in accounting firms and thus have real support from the employer due to the fact that they are both employers and employees within the entity. Moreover, the support that employers can offer is aimed at the software part and not at the work environment where we think especially about space, noise and work-family conflict which was probably the biggest challenge with the assessment of the pandemic.

Conclusions

Most studies show that teleworking can have a positive impact on productivity. However, studies also show that this depends on the context. A positive correlation is found primarily in people who have a great influence on their work and in employees who carry out creative activities. The number of hours per week that are worked through telework is also important for productivity. As explained above, Kazekami (2020) makes it clear that if telework is high, marginal productivity may decline. Moreover, the positive effects of telework on employee satisfaction and loyalty could be identified, but only to a certain extent. Isolation will probably play a very important role here. Many health issues are also negatively related to teleworking. However, they are increasingly concerned with the long-term consequences and are therefore initially dealt with against the background of the current COVID-19 pandemic and the associated economic and health consequences.

Thus the processes had to be changed quickly and rethought. The restructuring and digitization of a company and its workflows, which otherwise lasted months, had to be implemented in a few weeks. People had to overcome their existential fears and be compelled to act. Government measures have required the search for appropriate tools to enable mobile and flexible operation to further contain the spread of the virus. According to a Bitkom survey, at the beginning of the COVID-19 pandemic crisis in mid-March, every second person remained completely or at least partially in the telework variant (Bitkom, 2020). The long-term effects of these experiences cannot yet be conclusively evaluated. However, it has already been shown that there is a possibility for remote collaboration with appropriate technical and organizational adjustments.

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The Sustainability of E-learning of the University Education System Generated by the COVID-19 Epidemic

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Abstract

The health crisis caused by Covid-19 has affected the whole world, even the university environment. With the advent of this virus, universities were closed as a measure to prevent and combat these health epidemics, so these measures had a significant impact on the teaching / learning environment in the university environment. Thus, this paper analysed how teachers adapt to the e-learning system before and during the pandemic. The authors start from the description of the importance of sustainability for universities in general and in particular in such a period of health crisis and, moreover, the importance and role of e-learning during the period of health crisis. The authors provide a description of teachers' perceptions of e-learning based on descriptive statistics and will conduct an empirical study in future research to develop these results. The results show that the e-learning system was indispensable during the pandemic, although the classroom teacher cannot be replaced by such a system. The novelty brought by the article is the analysis of the perception of teachers from Romanian university's regarding the acceptance of technology. This research also faces a few theoretical, practical and managerial limitations on the number of respondents, the synthetic way of analysis, and the evolution over time of the results, and the perception of the usefulness and acceptance of the e-learning system.

Keywords

Sustainability; e-learning; Covid-19; technology; usefulness.

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Introduction

As institutions of education, research, and services, universities are key players in the sustainable development of society and the economy. This requires an analysis of the institutional anchoring of sustainable development and how universities meet these expectations, i.e., in what aspects relevant to sustainability a university acts in a future-oriented manner and where optimization is needed. At sustainability same time, the analysis allows universities to position their sustainability efforts in comparison with other players in the university field. Based on the analysis of university sustainability, an exchange between universities and shared learning is allowed. Higher education has undergone radical changes in many nations since the 1990s, when reforms inspired by the new public administration required the development of university management techniques.

The European Commission has expressed its desire to modernize universities since 2006, at the same time the European Commission has established that modernization is considered - if universities want to contribute to the EU's goal of becoming a global, knowledge-based economic area - to be of importance. fundamental. European universities have enormous potential, which unfortunately remains largely untapped due to rigid structures and various disabilities. Unleashing the vast pool of knowledge, talent, and

energy requires immediate, profound, and coordinated changes: from the way systems are governed and managed to the way universities are run (European Commission, 2006). University sustainability must be the active participation of all higher education institutions in the development of environmental protection policies. The sustainable university is the one that, in addition to the governmental involvement, contributes to the protection of the environment by adapting the curriculum to the ecological needs and by the progress of the scientific knowledge, as a result of the didactic and research activities (Ng,2020). A university that wants to be sustainable must have the capacity to make its programs more flexible according to the evolution of the labour market, especially by adapting to the economic activities that take place in the main recruitment pool, by giving increased interest to the specialized practice, respectively, the consistency of the implementation of these programs (Schunk et al, 2014). The competencies of the teachers, respectively, their level of training, the active presence in the specialized fields at national and international level, the development of an external collaboration network of the educational institution, as well as the organization of highly prestigious academic events, are an important indicator of sustainable development for higher education institutions.

1. Literature review

Today's students are tomorrow's decision makers. To succeed in social transformation in terms of sustainability, students need to be trained in sustainability and sustainable management, because they, as multipliers, are implementing sustainability in practice now and later. Pure knowledge transfer is just one aspect. Through a close link between theory and practice, students should develop their own skills that can be applied in later activities in business or science practice (Förster, Zimmermann and Mader, 2019). E-learning and blended learning are important elements of contemporary university teaching. The study models offered are as diverse as the students. With the help of innovative teaching concepts, students' individual learning styles can be approached, and on the other hand we can discuss the different learning materials. Universities around the world are supporting students and faculty in creating and using digital courses, especially during this pandemic. For example, the MOODLE learning platform allows working in virtual learning environments and the use of a wide range of activities and work materials (Zhang, et al., 2020; Ng, 2020). The end of e-learning development has not yet been reached, not only for organizational and motivational reasons, but also because technical developments and policies set new goals, namely the comprehensive digitization of studies and teaching. Such far-reaching requirements are not only problematic for data security reasons, but also in terms of good teaching, many questions remain unanswered. The aim should be to use digital elements in teaching in a meaningful, integrated, and measured way and to ensure that participants have control over their data. Other objectives appear in terms of the use of e-learning, as can be seen from the various initiatives, especially of the states and, to a lesser extent, of the government. In addition, the level of development in universities, in universities and in the comparison of subjects is very different. If everyone involved is interested and financial resources are available, there are attractive and extensive e-learning elements that are used in teaching; otherwise, they are missing. The spread of MOOCs has also given a new impetus to online learning (López Meneses, Vázquez Cano and Mac Fadden, 2020).

2. Research methodology

For the quantitative study, we developed a questionnaire based on the literature and then sent it to teachers to obtain an x-ray of the status and challenges they face in the full adoption of e-learning in higher education. Specifically, the questions are about perceived usefulness and perceived ease of use. The first section deals with the personal information of faculty members that reflects their field and experience. The second section focuses on the level of use of e-learning. Data were collected using a survey, which was conducted using the computer-assisted web interview technique CAWI (Vehovar and Manfreda, 2008; Sowa, et al., 2015; Taniguchi et al., 2019; Ejdys, 2021). A link to the electronic questionnaires was distributed to the individual teachers of the Romanian universities through the university's e-mail system. These were distributed between January and February 2022. In total, 267 completed questionnaires were received, of which 24 that were incomplete were removed, so we analysed 243 questionnaires.

3. Research framework and results

The term e-learning has its origins in the 1980s, following the introduction of the first computer-assisted jobs, which led to the replacement of handheld computers and typewriters with computers, so to speak. Employees have been trained in new software applications (e.g., operating system, text program, and databases) through traditional employee training courses and, and this was new - through small learning

programs that have been installed on workstation computers. Work by program providers. These tools were originally simple didactic texts, which were processed in the following years using graphics and animations.

The characteristics of the sample are presented in Table 1, which shows that 13.9% of those sampled were in the category of assistants, 41.15% Readers, 30.86% Lecturers and 13.99% teachers, which indicates a distribution between the four categories. We also note that over 66% of respondents have over 15 years of experience in teaching. All 243 respondents are in a public or private university.

Table no. 1. Sample characteristics

		No. Answer	Percentage
Category of teachers			
	Assistant	34	13.99%
	Lecturer	100	41.15%
	Assistant Professor	75	30.86%
	Professor	34	13.99%
Total		243	100%
Age group			
	21-30 years	25	10.29%
	31-40 years	48	19.75%
	41-50 years	85	34.98%
	51-60 years	66	27.16%
	Over 60 years	19	7.82%
Total		243	100%
Work years			
	1-5 years	36	14.81%
	5-10 years	17	7.00%
	10-15 years	28	11.52%
	15-25 years	88	36.21%
	over 25 years	74	30.45%
Total		243	100%
University type			
	Public	224	92.18%
	Private	19	7.82%
Total		243	100%

Below we present the results obtained on the 12 elements and the 36 related items in order to have an x-ray on the perception of teachers regarding the acceptance and use of the e-learning system.

Ability to use

The use of skills and abilities acquired by individual teachers specifically at the university is an important process when we discuss the ability to teach and learn in an online e-learning environment (Chien, 2012; Schunk, Meece and Pintrich, 2014). In addition to the ability to successfully implement professional knowledge, personal mastery also includes coping. The conditions of departure of the teachers were and are heterogeneous. Acquiring technical and teaching skills at the same time has been a challenge for many teachers, but it is necessary due to the complexity and multifaceted nature of e-learning. In addition, technical difficulties and malfunctions are to be expected at any time with e-learning sequences, which abruptly disrupt the coherent process and consume valuable learning time. We notice from our results an increasing trend regarding the agreement expressed by the teachers regarding the technical resources, the digital skills held, and the easy access to the e-learning system (Figure no. 1.).

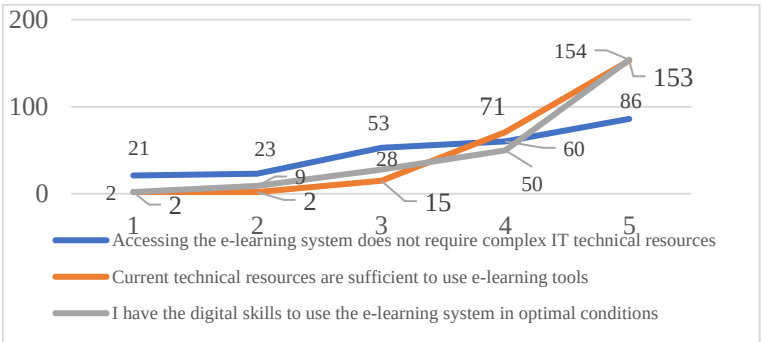


Figure no. 1. Ability to use e-learning platforms

However, in terms of general teaching and methodological skills, the teachers themselves could not see any increase. The knowledge gained in the e-learning approach has been changed and deepened, especially between specialist colleagues and teachers. The transfer of knowledge also led to a coordination of the content of teaching between colleagues.

Course content and design

During the preparation of courses and seminars, on the one hand, it is analysed which forms of learning are suitable for transmitting and consolidating the content of teaching and ensuring the learning outcome and, on the other hand, which e-technology is suitable for each teacher (Junus, et al., 2015).We note the rather divided opinions of teachers regarding the acquisition of practical skills based on the use of the e-learning system; a number of 63 teachers expressed their total agreement, 54 are neutral, and 30 express a total disagreement. Also, regarding the objective evaluation of the students, the opinions are divided between neutral, partial agreement, and total agreement, at the same time a percentage of 25% does not agree or only to a small extent with these aspects. On the contrary, we note that the majority of teachers, almost 97%, consider that the courses supported through the e-learning system are clearly designed and structured. As we have already mentioned, the presentation of the content is gaining more and more space and importance. This form of learning also seems to have an impact on comprehension, as students are required to work on the content themselves. The use of e-learning opens up new opportunities for motivation, especially for students who find it difficult to access learning content through conventional instruction.

Instructor contribution

On the one hand, it is about trying innovative forms of teaching and learning. In this sense, the use of new technologies contributes to the professionalization of teaching, so we consider it an enrichment for teaching in terms of method and teaching (Harandi, 2015). The importance of e-learning in universities is great, but attention is paid to the fact that the focus on technology should not overshadow other areas of university interest. The computer should be perceived as a tool and not as an object of focus, which is why e-learning is considered an additional component in the design of courses and seminars. The learning platform as a communication medium is able to contribute to the formation of networks and facilitate teamwork through effective communication. It becomes clear that the self-taught lecturer is the most important factor in learning success. If, in addition, the material is presented in a lively and fun way and is discussed in class, which the reader should encourage, then two other important factors for productive learning are met. We note that the teachers consider that they are ready for the e-learning system; respectively, the organization they belong to provides them with the necessary resources to access the e-learning system.

Previous experience in e-learning

Teachers who have little previous experience with new electronic technologies have reported more often that they have had initial difficulties, that they are overwhelmed and stressed, and that they are particularly reluctant to engage in new media (Lee and Lehto, 2013; Hrtoňova, et al.2015). The results show that only half of the teaching cards used the e-learning system before the pandemic, but many more used online communications software (Table no. 2.).

Table no. 2. Distribution of previous experience in E-learning

	1	2	3	4	5
I have used e-learning platforms in the past	57	39	41	45	61
Accessibility to technical resources needed for the e-learning process was also used before the COVID pandemic 19	34	39	66	41	63
I have had experience using online communication software even before the COVID 19 pandemic.	28	28	40	46	101

Notes: *1 Total disagreement; 2 partial disagreements; 3 neutral opinion; 4 partial agreement; 5 total agreement

The quality of the e-learning system

The competence of fashionable word media, which has only become the subject of educational policy debates with the new media, marks the new quality of information processing and knowledge production (Fathema, Shannon and Ross, 2015). Teachers and students alike face the challenge of rethinking these processes and critically evaluating their practical implementation. We note that most teaching cards over 123 consider that the use of e-learning systems is accessible and ensures data security, but expects a prompt and daily update from universities, i.e., a more proactive involvement from the university.

Quality also means creating the opportunity to improve and the desire to develop. The quality of the e-learning system in universities is also reflected to some extent in the desire and ability to learn. The use of multimedia elements in university teaching is not intended to replace face-to-face teaching, but rather to enrich it and improve the quality of long-term teaching.

Perceived utility

When a person decides whether the newly introduced information system is useful (perceived usefulness), the quality of the results plays a crucial role (Scherer, Siddiq and Tondeur, 2019). The perceived usefulness of the information system also depends on the results produced by the information system, whether they reflect the user's expectations. The introduction of digitized teaching is greatly facilitated by students who are themselves convinced of the benefits. Previous studies show that perceived benefits and perceived ease of use have a significant impact on the acceptance of e-learning. Thus, our results confirm this primarily through the flexibility offered by the e-learning system with a total of 98 responses. However, a large part of the teachers consider that the use of e-learning tools does not ensure an improvement of the results, respectively, the teaching / academic performance cannot be increased.

Perceived ease of use

Ease of use also plays an important role in accepting the e-learning offer (Binyamin, Rutter and Smith, 2019). Specifically, it must include the following aspects: the highest quality, attractive design, well-thought-out user guide, methodology and teaching, consideration of different media skills and personalities, adapted usage habits, and how to provide the learning offer (Figure no.2.).

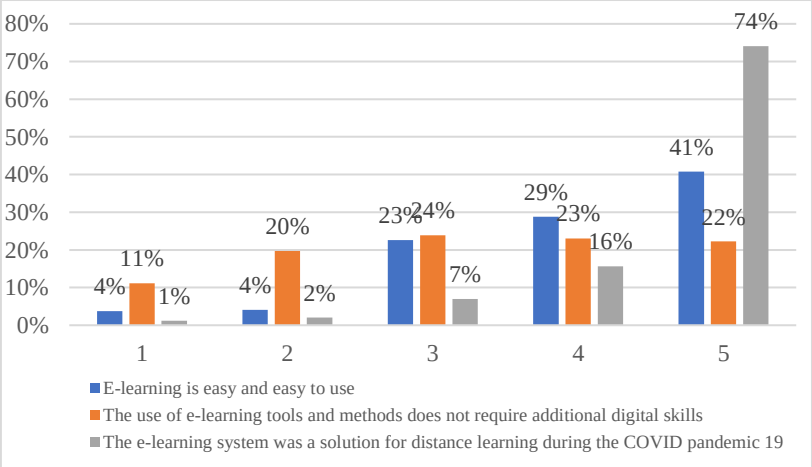


Figure no. 2. The ease of use of E-learning platforms

Attitude towards use

It becomes clear that competencies can only be specifically defined if there is a university-specific target framework that names the scenarios that are intended to be implemented (Hussein, 2017). How can these skills be developed within the university? More and more forms of on-the-job or integrated learning are being proposed, as well as learning based on informal communication and exchanges on social networks, while ensuring that they go beyond simple on-the-job learning. Universities should apply measures to develop skills on a broad basis and not focus on training courses that do not achieve sufficient sustainability and effectiveness on a broad basis. At the same time, measures need to be incorporated into explicitly developed ideas about what teaching guidelines a university (or faculty) would like to base its courses on and what role media use should play here. More than 60% of teachers consider that e-learning was a good alternative during the pandemic and was a good idea to continue the teaching / learning activity, but only 33% consider it is an attractive form of teaching.

Satisfaction and personal development

The specific benefits of using e-learning could not always be implemented to the full satisfaction of teachers (Weng and Tsai, 2015). It is often pointed out that the purpose of using the platform has not always been seen as appropriate and in some cases has been rejected (Table no.3.).

Table no. 3. Personal developments and satisfaction with the use of e-learning

	1	2	3	4	5
I prefer to use the e-learning system more than the traditional education system	23%	16%	26%	14%	22%
E-learning tools give me the opportunity to be more creative	7%	13%	20%	28%	32%
E-learning gives me the opportunity to have a flexible schedule	10%	13%	17%	22%	38%

Notes: *1 Total disagreement; 2 partial disagreements; 3 neutral opinion; 4 partial agreement; 5 total agreement

Behavioral intent to use

In principle, e-learning is appropriate if well-founded theoretical knowledge is to be transmitted, with a large proportion of text, video content, or sound sequences (Chow, et al., 2012). This requires a longer duration of attention. Mobile learning, on the other hand, is particularly suitable for consolidating what has been learned using small bits of learning. The use of e-learning in the classroom is closely related to the issue of added value. Depending on the technical possibilities, this can be seen in what the new media can do more. A total of 226 teachers stated that they use e-learning platforms in all activities and that they use them every day, but only 160 of the teachers used this system before the pandemic.

Actual use

The use of e-learning in the classroom is closely linked to the issue of added value (Almaiah, Al-Khasawneh and Althunibat, 2020). Depending on the technical possibilities, this can be seen in what the new media can do more (Figure no.3.)

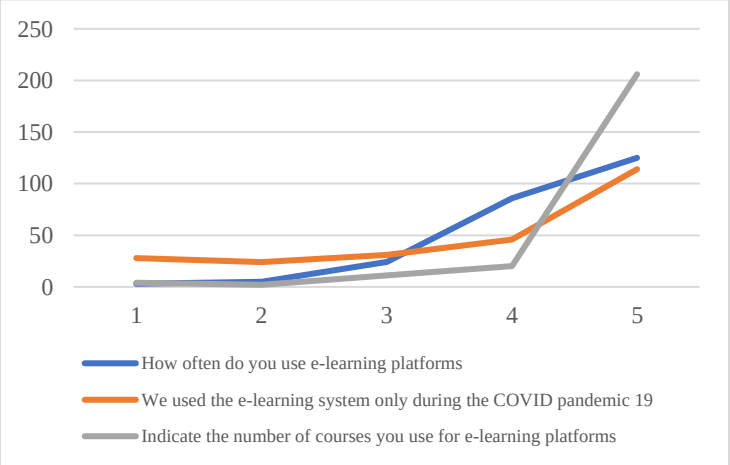


Figure no. 3. Actual use of e-learning platforms

Academic performance

In the discussion of higher education, e-learning is regularly seen as an engine of change in higher education. The chances of e-learning are aimed at "better" teaching: teaching that relies more on student activities - rather than teaching - that encourages self-directed and cooperative learning, focusing on case studies, materials, complex issues, or work. on projects and promotes interuniversity cooperation in teaching - and internationally (Al-Maroof and Al-Emran, 2018). Teachers are a key factor when we think about university performance and sustainability; they can be seen as promoters, depending on whether e-learning is used successfully in a long-term university: teachers, their competence, and motivation play a role. key role in promoting e-learning and establishing an innovative teaching and learning culture. Skills development is increasingly recognized as an essential condition for the sustainable anchoring of new forms of learning and media in the university. It initially refers to teachers' knowledge, skills, and attitudes towards the development, introduction, and use of innovative forms of e-learning in teaching. In addition, skills development also includes an institutional level; it also affects the ability of an organization to provide certain quality services. For this reason, increased efforts can be seen in many universities to motivate teachers to innovate in e-learning and to reorganize or set up processes and structures of support facilities to build this competence at the individual and organizational level. Computer skills are only a small part of "e-learning skills" (Table no.4.).

Table no. 4. Influence factors on academic performance

	1	2	3	4	5
E-learning systems effectively enable teacher-student interaction	19	25	55	63	81
The e-learning system has contributed to the significant increase in assessment grades	20	18	75	67	63
The e-learning system contributes to the development of ICT skills among both teachers and students	6	7	31	80	119

Notes: *1 Total disagreement; 2 partial disagreements; 3 neutral opinion; 4 partial agreement; 5 total agreement

Conclusions

In short, sustainable development at universities and technical colleges is becoming increasingly important. However, in peer review, it has become clear that the implementation of sustainable measures and concepts is only in its infancy in many institutions, with the exception of pioneer universities. The detailed analysis of your company, stakeholders, and comparison group is an important first step in formulating goals for your university and towards the goal of a comprehensive sustainability strategy.

E-learning as a new learning concept seems very tempting at first glance: it opens up the possibility of learning and continuing education according to individual needs when and where we want. The computer and the Internet connected to it are now an indispensable part of our lives, which is why a combination of learning and electronic media is a good idea.

As technology advances at a rapid pace, further progress will be made in the field of e-learning, but it is important to remember that e-learning also has limitations. On the one hand, an e-learning environment according to its didactic concept and certainly not only according to its technical feasibility, which depends on the creators of the respective programs. In addition, the learner is still usually the same person as in classical learning methods. Where there is a lack of motivation, interest, or desire to make an effort, e-learning will not be able to work wonders. In addition, the constant flexibility and availability of learning programs tempt people to put in additional learning effort and possibly overwhelm them. In short, e-learning cannot replace teachers. In particular, the concepts of blended learning seem to make more sense than pure e-learning. Social contact between learners is important, and it should take place primarily interpersonal in direct interaction and only additionally through forums, etc. E-learning offers many possibilities, but the use and success of learning depend primarily on the respective teachers and learners, while a learning program can only have a sustaining effect.

What implications can be derived from this research for future research? First of all, this paper represents a first careful examination of the subject of accepting e-learning in Romanian universities. Therefore, the article should be understood as a starting point for future research. The acceptance investigation of e-learning must also be studied from an empirical perspective with respect to the acceptance of new technologies. This analysis is future research that we want to do based on the information collected and why no study can be extended to the student's perspective on the e-learning system. As a result, the purpose of further investigations is to perform a more detailed analysis of the different types of e-learning used.

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The Financial Implications of Non-Compliance in the Transportation Business

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Abstract

The research interest in this study stems from the idea that "good business practices" in road transportation, concerned with increased care for staff safety, as well as regulatory compliance, may have profound social and economic implications. The institutional and political actors involved in transport have developed a common policy for rail, road, inland waterway, sea and air transportation, focusing in particular on: the development of common rules for transport within the European Union; the establishment and development of trans-European infrastructure networks; the provision of transport services and relations with countries outside the European Union; transport safety; relations with international bodies and organizations. This paper contributes to an empirical analysis in the field of transport, by conducting a quantitative analysis of the nonconformities found in the transport activity in the Romanian coastal area, complemented by an analysis of the interdependencies between these nonconformities and the profitability of transport companies. The analysis of nonconformities consisted in the investigation of noncompliance or deviations from the transport regulations in force in the coastal area of Romania during the years 2016-2020. The study investigated the structure and volume of the contraventions found and of the sanctions applied by the authorities to the entities operating in the field of transport in Constanta County. Our research continues to explore the social inflections of transportation nonconformities and economic incidents. The research used the Principal Component Analysis (PCA) method, which helped to analyze the relationships and the associations between the numerical variables introduced in the study.

Keywords

financial implications of non-compliance; transportation business; transportation sanctions; transportation non-compliance.

DOI: 10.24818/BASIQ/2022/08/039

Introduction

According to the latest statistics, transport industry currently accounts for over 6% of the European Union's (EU) gross domestic product (GDP), over 6% of the labor force, 40% of Member States' investments and 30% of EU's energy consumption. This sector has grown steadily over the last two decades, with 2.3% per year for goods transport and 3.1% for passenger transport. At the same time, the pressure exerted by the transport sector on the environment and society has increased. The correlation between the increase in road traffic and in health risks is not impossible to change. However, the issue cannot be solved by a single measure or policy, an integrated approach being needed in order to reduce the negative effects of both emissions and noise (IER, 2005). The municipalities can adopt transport management strategies that promote alternatives to car use. Reducing the number of cars in traffic, respectively using public transport modes, cycling or walking, can dramatically reduce the levels of pollution and noise (Stan, 2022). Based on the "polluter pays" principle, all transport users (transport companies, drivers, passengers) must be financially responsible for travel costs, including for the damage resulted from their actions to their natural and built environment, to the society and economy (IER, 2005). Taxation for infrastructure use, environmental or traffic congestion taxes would reduce traffic, respectively the impact of transport on health and the environment; this would also ensure that investment funds for this purpose are available.

Studies show that transport policies that start from the premise of having as little impact on the environment as possible will not only improve the quality of life and the state of health of the population, but they will also lead to a higher employment rate (Filip, Stan and Vintilă, 2016). Simple strategies can help reduce the damage caused by transportation to human health: even the strict implementation of speed limits and parking regulations can lead in many cities to the limitation of emissions, an increase in safety and in public transportation use. The institutional and political actors involved in this activity, in their concerns related to the development of a common policy for rail, road, inland waterway, sea and air transport have focused in particular on: drafting common rules applicable to transportation within the European Union; establishing and developing trans-European networks in the field of transport infrastructure; providing transport services and relations with countries outside the European Union; transport safety; relations with international bodies and organizations in the field of transport (IER, 2005).

The research interest in this study is derived from the idea that a good conduct of road transportation businesses, manifested in the care for the safety of the transport operator job, as well as in the observance of the rules specific to this activity, can have profound social and economic implications. This paper contributes to the increase of empirical studies in the field of transport, by conducting a quantitative analysis of the nonconformities found in the transport activity in the Romanian coastal area, supplemented by an analysis of the interdependencies between these nonconformities and the profitability of transport companies.

1. Review of the scientific literature

The human component involved in the actual coordination or implementation of transport has key specificities in the field of transport, ensuring the mobility of people and goods in a way that promotes the social and economic development of present and future generations and limits the negative impact on the environment (UN, 2016). Transport can help the economic and social environment as a whole face modern challenges, provided it receives support from all the entities involved in transforming and reducing its negative externalities, which include traffic accidents affecting human life and health, air and noise pollution, the time wasted in the vehicle and greenhouse gases, emissions which contribute to climate change (UN, 2015). The beneficial effects of the mobility of goods and people must be in line with the efforts generated by the social, environmental and economic costs. Undoubtedly, in a social context, transport offers access to jobs and a whole range of social opportunities. In addition to this, efficient transport helps minimize the loss of time, ensure the safety of all people, improve the state of health of the society and, finally, raise the quality of life. Sustainable social development is not directly guaranteed by economic growth. Other authors, concerned with capturing social sustainability (Sueyoshi and Yuan, 2017; Zhang, Li and Gao, 2018) or social efficiency (Fukuyama, Yoshida and Managi, 2011; Ha, Yoshida and Zhang, 2011; Oum, Pathomsiri and Yoshida, 2013), defined it mainly as an economic growth conditioned by environmental protection, using as indicators: the GDP, the number of transported passengers and the indicators for CO2 emissions.

Recognizing the importance of the social dimension in the sustainability of regional transport, Stefaniec et al. (2021), using Shannon-DEA techniques (Soleimani-Damaneh and Zarepisheh, 2009) determined the social sustainability performance of road transport in EU Member States in a multi-output scenario, incorporating both the desirable and the undesirable results. This study seems to have been a first attempt to assess the regional social sustainability of transport, which explicitly used multi-results performance measurement. Although the indicators proposed by all these studies are adequate measures of mobility, access and safety, they do not cover all the social issues of transport's complexity. The impact of transport on society is wider and it extends to social factors derived from economic and environmental conditions. Even if it involves an overlap with other dimensions of sustainability, an extended definition is preferred so as to avoid ignoring the factors which could be of a social nature (Geurs, Boon and van Wee, 2009).

The inclusion of human health issues can be useful in explaining the impact of the environment on the human habitat, which has been observed by various researchers. The sociocultural sustainability component, presented in the study of Jeon, Amekudzi and Guensler (2013), in addition to taking into consideration accessibility and safety-security, also covers equity and public health. While public health was measured by the exposure to emissions and noise, equity referred to the changes in wellbeing and to the population exposed to the emissions and noise. In the studies of Miller et al. (2016) and Smith, Axon and Darton (2013), the impact of transport on human health was marked by the burden of the disease related to transport pollutants or noise levels. Similarly, Reisi et al. (2014) added mortality due to air pollution as one of the social indicators. Zheng et al. (2013) simply represented the aspect of human health through air quality and, in addition to this, through the modal share of walking and cycling.

Investigating the issues related to compliance with or non-compliance of the conduct of transporters with the specific legislation or the impact of the deviations from regulations on the economic aspects of transportation businesses are not yet sufficiently developed.

2. Research methodology

Our research continues by exploring the social inflections of nonconformities in the field of transport and by exploring some economic incidents. The statistical method of analysis chosen was PCA. The Principal Component Analysis is a descriptive method of multidimensional analysis of the data, with the help of which the relationships, the associations between the numerical variables are analyzed, which, in view of conducting the analysis, are standardized (centered and reduced). Starting from a large-scale table, the method highlights a system of factorial axes that concentrates the information contained in the original table for a better visualization. The factorial axes, also called principal components, represent a linear combination of those variables which are correlated with each other. In PCA, each factorial axis is associated with some of the information contained in the original data table. This part is called inertia or explained variance. Each of these axes (F_i) can also be interpreted in terms of correlation with the initial variables, and are ranked in descending order, depending on their discriminatory power.

The objectives pursued in applying ACP are the following:

- highlighting the statistical relationships between the considered variables
- highlighting the similarities / differences between the statistical units analyzed according to all the registered variables.

The investigation pursued the existence of relationships or interdependencies both between the values of the penalties imposed and between the values of the penalties and the financial result indicators of the companies operating in the transport sector in the Romanian coastal area. Our study has shown the increased relevance of the analyzed variables, as can be seen in the correlation matrix in Table no. 1 and it has also allowed "anchoring" in a quantitative analysis of phenomena specific to the goods and passenger transport sector. Of interest to our research was the investigation of the scope of deviation from the regulations in force found among the transporters operating in the Romanian coastal area throughout the 2016-2020 period. Thus, an analysis was carried out of the structure and volume of the contraventions found and of the penalties imposed by the control bodies on the entities operating in the field of transport in Constanța County.

Seen from a structural point of view, the contraventions were related to the provisions of 3 significant regulations:

1. Government Decision/HG no. 69/2012 on the establishment of infringements of a contraventional nature of the provisions of Regulation (EC) no. 1071 / 2009 establishing common rules on the conditions to be met to pursue the occupation of road transport operator (Marked as HG 69);

2. Government Ordinance no. 37/2007 on establishing the framework for the application of the rules on driving periods, breaks and rest periods for drivers and the use of their activity recording equipment (Marked as OG no. 37);

3. Government Ordinance no. 43 of August 28, 1997 regarding the regime of roads, exceeding the maximum masses and / or dimensions allowed by the legislation gradually classifies contraventions, depending on the gravity of the contravention, into minor, serious and very serious contraventions (Marked as OG. 43).

Each of these 3 regulations establishes criteria for classifying non-conformities into 3 areas of seriousness of the contraventions, respectively very serious, serious or minor contraventions. Stating each deviation from the legal norms, undertaken by the economic operators carrying out road transport or related activities is made by structures of the public authority with control responsibilities, such as the State Inspectorate for Control of Road Transport, by the personnel with control responsibilities within the Labor Inspectorate, the National Sanitary Veterinary and Food Safety Authority, the traffic police or the staff of the Romanian Company of Motorway and National Roads, the National Environmental Protection Agency, at the state border crossing points.

We are presenting below, as an example, the way of classifying according to the three categories of severity of the contraventions under examination, according to each regulation analyzed:

1. HG. 69 determines the classification of the contraventions according to the following scale of severity:

1.1. Very serious/VS: carrying out road transport or road transport-related activities without a transport license or the mandatory documents required by law, carrying out other transport services than those listed in the working timetable, using drivers without valid legal documents, exceeding substantially the maximum total authorized mass for vehicles, etc. (Marked as HG.69.VS)

1.2. Serious/S: carrying out road transport on the basis of documents reported lost, non-compliance with the regulations on completing the roadmap, non-compliance related to carrying out international road transport, non-possession at the headquarters/premises mentioned in the road transport certificate of the documents listed in the regulations, errors in reporting to state's authorities, etc. (Marked as HG.69.S)

1.3. Minor/M: Failure of the driver to present the documents necessary for traffic control, road transport of goods with a minor exceeding the maximum total authorized mass for vehicles, non-compliance with deadlines for reporting road transport, etc. (Marked as HG.69.M)

2. OG.37 provides the following classification of the severity of the deviations from the norms:

2.1. Very serious: exceeding by long periods (for example more than 2 hours a day) of the driving time, reducing the compulsory rest period laid down in the driving schedule by long periods, imposing remuneration criteria that could jeopardize driving safety (such as the speed of delivery, the quantity transported or the distance traveled), non-preparation or poor preparation of tachograph charts, refusal to allow the verification of the driving period records, use of uninspected tachographs, etc. (Marked as OG.37.VS)

2.2. Serious: exceeding driving time by an average period (e.g., between 1 hour and 2 hours a day), reducing, by an average period, the mandatory rest period laid down in the driving schedule, not having a sufficient number of tachograph charts on board the vehicle or the use of unapproved tachograph charts, non-conformities in the organization of the activity or in the training of the drivers, etc. (Marked as OG.37.S)

2.3. Minor: Exceeding driving time by a minor period (for example, less than one hour per day), reducing, by a minor period, the mandatory rest period laid down in the driving schedule, not having on board the vehicle enough paper to print reports with the help of the equipment for recording errors in completing the tachograph diagram, etc. (Marked as OG.37.M)

3. OG. 43 classifies the irregularities gradually, according to the severity of the contravention, into minor (OG.43.M), serious (OG.43.S) and very serious (OG.43.VS) contraventions regarding exceeding the maximum masses and / or dimensions allowed by the transport legislation.

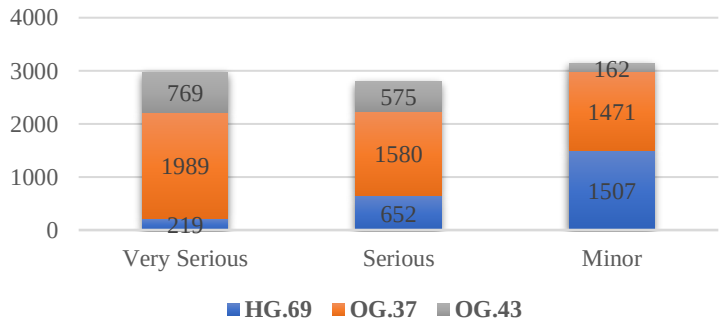


Figure no. 1. Number of penalties applied in the 2016-2020 period by the public authorities to the companies operating in the field of transport in Constanța County

Figure 1 presents the numerical situation of the penalties applied by the Romanian public authorities to the companies operating in the field of transport in Constanta, during the years 2016-2020, with a representation of both the classification of the penalties according to the severity of the deed and the classification according to the three analyzed regulations. According to the graph, there is a comparable number of penalties applied according to the 3 classes of severity, with significantly more minor penalties being found than very serious and serious violations. Regarding the classification of the deeds according to the 3 regulations, one can see from Figure 1 that the highest number of penalties was applied in the analyzed period with reference to OG.37, most of which were established as being very serious. The situation shows

a significant level of non-compliance, in particular with regard to non-compliance with drivers' driving times, breaks and rest periods, as well as deficiencies in the use of recording equipment for their activities. The implications of such a finding suggest significant social implications for the activity of transporting goods or persons, as drivers' rest and safety have a direct impact on the quality of their work, i.e., delivery times, increased or slowed goods supply flows, or road safety.

3. Findings

The correlation matrix, presented in Table no. 1, indicates significant statistical relationships between the analyzed indicators, marked in black in the table above. A strong statistical relationship can be observed between HG.69.VS and the variables OG.37.VS (0.869), respectively OG.37.M (0.840). This suggests that punishing very serious deviation from the compliance with the legislation specific to the occupation of road transport operator or non-compliance with the legal functioning formalities is very likely to lead to the finding of very serious contraventions related to the fulfillment of drivers' safety and rest conditions. The legal norms in the field of transport establish clear and rigorous obligations for the authorization and operation of land transport operators, and deviations from these rules have an effect not only on the non-fulfillment of bureaucratic obligations, but also on the safety of transport and the safety of the human factors involved. Strict adherence to the driving times, breaks and rest periods of the drivers, as well as the use of approved and efficient equipment for monitoring working hours are key prerequisites for supporting occupational safety and security in the transport sector.

Table no. 1. The Correlation matrix

	HG.69.VS	HG.69.S	HG.69.M	OG.37.VS	OG.37.S	OG.37.M	OG.43.VS	OG.43.S	OG.43.M	CA	PR
HG.69.VS	1.00	0.60	0.32	0.86	0.43	0.84	0.40	0.06	0.67	0.48	0.46
HG.69.S	-	1.00	-0.25	0.57	0.52	0.17	0.87	0.47	0.32	0.52	0.84
HG.69.M	-	-	1.00	0.01	-0.53	0.56	-0.28	0.32	0.71	-0.34	-0.64
OG.37.VS	-	-	-	1.00	0.80	0.81	0.56	-0.12	0.23	0.83	0.53
OG.37.S	-	-	-	-	1.00	0.35	0.64	-0.27	-0.35	0.96	0.68
OG.37.M	-	-	-	-	-	1.00	0.16	-0.08	0.50	0.48	-0.00
OG.43.VS	-	-	-	-	-	-	1.00	0.54	0.01	0.72	0.65
OG.43.S	-	-	-	-	-	-	-	1.00	0.41	-0.10	-0.01
OG.43.M	-	-	-	-	-	-	-	-	1.00	-0.27	0.00
CA	-	-	-	-	-	-	-	-	-	1.00	0.54
PR	-	-	-	-	-	-	-	-	-	-	1.00

At the same time, strong statistical relationships can be observed between the specific indicators HG.69 and OG.43.VS (0.874) and OG.43.M (0.719). These probably indicate a directly proportional increase trend in the penalized deviations regarding the exercise of the occupation of road transport operator, at the same time with an increase in the deviations consisting in exceeding the maximum masses and/or dimensions allowed by the legislation. Failure to comply with the formalities for the authorization of the activity of transport operators is often complementary to attempts to fraudulently accelerate the quantities or volumes of the delivered goods, as well as the delivery of other goods than those stated in the transport documents.

The next stage of the analysis focused on the existing relationships between the value of the penalties applied by the authorities with control responsibilities based on the three analyzed normative documents and the financial indicators of the companies operating on the territory of the same area, respectively the Romanian coastal area. Following repeated attempts, we have chosen as significant the relationship with the financial indicators: turnover (CA) and gross profit (PR) declared by the transport companies in the 2016-2020 period.

Our study shows that there is a significant statistical relationship between the turnover reported by the analyzed companies (CA) and the value of the penalties applied against very serious OG.37.VS (0.839) and serious (OG.37.M) deviations. The situation can be explained by the fact that many deviations regarding the non-observance of the driving schedule, of the rest periods by the drivers or the precarious use of the monitoring equipment of the driving hours are found in the companies with an extended economic activity.

Increasing deviations that can affect the safety and security of drivers' work is a significant indicator for the improvement of managerial control systems at the level of the transport entities with an intense economic

activity, as well as the improvement of activity verification procedures. Allocating increased resources for monitoring and improving the quality of drivers' work can generate long-term economic and social benefits.

The conclusions are also supported by the significant relationship between CA and OG.43.VS (0.725), suggesting a strong relationship between reporting a large turnover in the field of transport and the predilection for violating the regulations on maximum masses allowed by law in order to illegally increase the quantities of transported goods and speed up delivery times.

In terms of profitability (PR), the strongest statistical relationship is recorded in relation to HG.69.S (0.842), which indicates an increased probability of serious deviations among the companies with an increased profitability in the field of transport. Such deviations are: carrying out road transport activities based on documents reported lost, non-compliance with regulations on completing the roadmap, non-compliance in carrying out international road transport activities, non-possession at the headquarters/premises mentioned in the road transport certificate of the documents listed in the regulations, errors in reporting to state's authorities, etc. The analysis indicates increases in value of the deviations in terms of working conditions as the economic performance of companies increases, as shown by the relationship between PR and OG.37.S (0.684) and between PR and OG.43.VS (0.650). An interesting relationship exists between PR and HG.69.M (-0.641), as this suggests that as the profitability of a transport company increases, its risk of committing minor deviations from regulations decreases, such as the driver's failure to present the documents necessary for traffic control, carrying out road transport of goods with minor exceeding of the maximum total authorized mass for vehicles, non-compliance with deadlines for reporting road transport.

Table no. 2. Communalities - Extraction Method: Principal Component Analysis

	Initial	Extraction
HG.69.VS	1.000	.923
HG.69.S	1.000	.680
HG.69.M	1.000	.942
OG.37.VS	1.000	.887
OG.37.S	1.000	.904
OG.37.M	1.000	.731
OG.43.VS	1.000	.674
OG.43.S	1.000	.136
OG.43.M	1.000	.833
CA	1.000	.824
PR	1.000	.723

The Communalities matrix presented in Table no. 2 supports the existence of significant statistical relationships between the analyzed indicators, the smallest contribution being made by the violation of the provisions of OG.43.S regarding exceeding the maximum masses and / or dimensions allowed by transport legislation.

The eigenvalues of the Correlation matrix and the variance explained by each factorial axis are presented in Table no. 3. One can observe that the most important differences between the types of nonconformities are highlighted by the first two factorial axes: the first factorial axis explains 47.692% of the total variance and the second axis factorial explains 27.376%.

Table no. 3. Total Variance Explained - Extraction Method: Principal Component Analysis

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.246	47.692	47.692	5.246	47.692	47.692
2	3.011	27.376	75.068	3.011	27.376	75.068
….	….	….				

The graphical representation of the position of the variables on the first two factorial axes is presented in a suggestive manner in Figure 2. The interpretation of the position of the variables on these factorial axes shows that the first factorial axis highlights a significant difference between HG 692014M on the one hand and financial indicators (turnover and gross profit) on the other hand. The second factorial axis highlights a significant difference between OG431999M on the one hand and the financial indicators on the other hand.

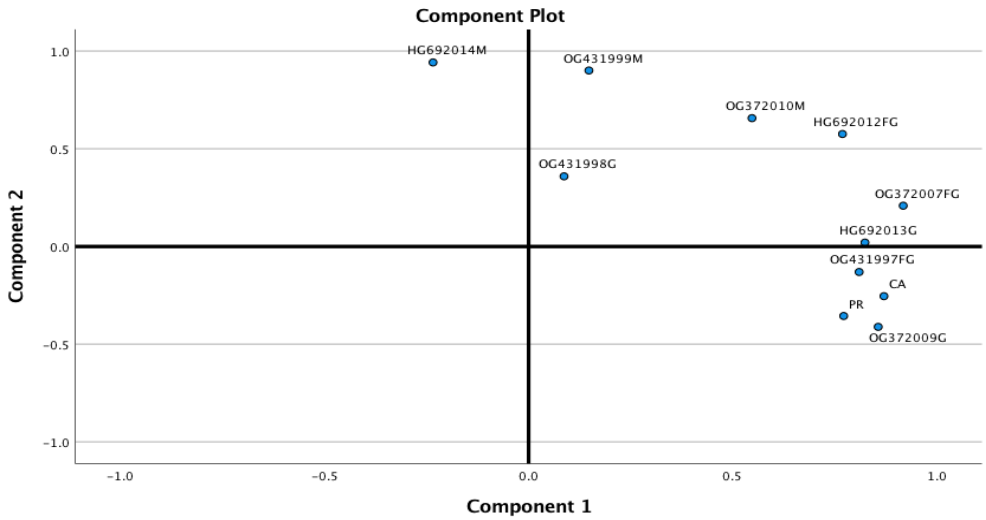


Figure no. 2. Representation of variables in the system of the first two factorial axes

Conclusions

The general objective of the European transport policy is to strike a balance between economic development on the one hand, and the quality and safety requirements of society, on the other hand, in order to develop a modern and sustainable transport system. The European Commission has proposed a large number of regulatory measures to develop a transport system capable of changing the share of transport modes, revitalizing rail transport, promoting maritime and river transport and controlling the growth of air transport. The objective of the EU's freight and passenger policy is to create the optimal conditions for the efficient provision of transport services; promoting an efficient common road transport system; contributing to the harmonization of competition between transport operators; encouraging compliance with the rules on working conditions in this sector. In order to achieve the established objectives, at the level of the EU member states regulations have been implemented in order to ensure the observance of the conditions for optimization, safety and efficiency of transport. The analysis of the incidence of deviations from these regulations brings new data to the sphere of research in the field of transport. At the same time, our study analyzes the interdependencies between the deviations from the specific transport regulations and the profitability and the growth prospects of the businesses operating in this field. The obtained results are interesting and suggest a significant relationship between the predilection for deviation from human safety norms in the field of transport with the analyzed financial indicators. The current transport system of the European Union is not sustainable and, in many respects, it is moving further away from sustainability. Frequent requests for action address the issue of the transport volume. These requests came from expert groups, but also from high political levels in the EU. According to the implemented integration strategy, the Transport Council states: "*It is necessary to ensure continuous economic growth without necessarily implying an increase in traffic and, respectively, its negative effects*". In this context, it is important to note that certain aspects of transport policy need to be further developed, such as: common rules for market and profession access; fair competition conditions; social aspects (working hours, working and rest periods, tachograph policies); road transport taxation (taxes and fees); constraints and penalties; promoting international agreements (Interbus, transit agreements); traffic restrictions.

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How to Build Innovative Competency-Based Education in Adolescents' Communities? A Case Study of Montessori Cluj

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Abstract

Innovative competency-based education in adolescents' communities is one of the most challenging thins of the new millennium. Researchers from all over the world are trying to find models of competency-based education for the young and adolescent students. In this paper, starting with the last available data of the OECD Program for International Student Assessment (PISA), the authors are analyzing the results using a linear regression modeling. Their findings reveal that there is an inverse relationship between the science performance and the total study time in after school hours. One solution that the authors give is the alternative education in general and boarding school within the alternative Montessori educational system. The novelty of the paper is the econometric analysis of the data obtained by students in PISA tests and the use of these results to achieve an innovative education based on skills in adolescent communities. The results of this work could be used both by parents to choose a suitable school for their children and for the governors, to create a national educational ecosystem based on the development of adolescents' skills.

Keywords

alternative education; innovation; competence; Montessori; Erdkinder; adolescence; boarding school; campus.

DOI: 10.24818/BASIQ/2022/08/040

Introduction

On the path of fulfilling its mission, Montessori sets out to cultivate respect, compassion, and gratitude for mankind, strong power of adaptation to unknown, like the capability to innovate including in the field of digitalization, artificial intelligence, and automatization. It focuses on independence, responsibility for self and others, awareness of caring for the environment and a deep sense of love for work.

There are several aspects in setting up the environment for the adolescents like the ownership which belongs to the adolescents and the professors which will be involved as experts, generalists, co-workers in all community work tasks. The primary task of the student is not academic success; it is self-construction and adaptation to the current technological trends. The major focus is driven by the work of building the environment on the developmental task and the psychological needs of the adolescents while the challenge is to find, involve, train adults with the right competence profile - from generalists to specialists who create the right open program, with long periods of uninterrupted work time, no broken-up schedule, large periods of open and chosen work, while students have the time to engage in deep, meaningful work.

To support the achievement of social and economic independence of the adolescents we need to provide the framework for work for everybody, prepare the framework for finding "projects", setting goals, and work independently to achieve them - students and adults involved. The feeling of valorization is needed for everybody in the community - students as well as adults. They need to experience the value of their work. Living in community, they all will have the chance to give valorization as well as to receive it. The more diverse the opportunities are for contributions to the community, the more opportunities there are for valorization.

"Work makes study better". The challenge and responsibility are to provide the right work for everybody in the community. The developmental tasks arise from the characteristics of adolescents which depend on gender and individual maturity level.

The developmental task of the adolescent in the view of Maria Montessori is also related to the economic and social independence.

"*The essential reform is this: to put the adolescent on the road to achieving economic independence". The emphasis ultimately seems to fall on valorization through work that is meaningful: "For [economic independence] would result in a 'valorization' of his personality, in making him feel himself capable of succeeding in life by his own efforts, and on his own merits, and at the same time it would put him in direct contact with the supreme reality of social life"* (Montessori, 1996, p.64).

Students should be involved in a real cycle of production and exchange, and they should receive some sort of tangible benefit from the work. Montessori links this process to economic independence and the need for "experience in the elements of social life". The environment that Montessori described as best suited for this the developmental task is an operating farm where students live, work, and study in a microcosm of society, while engaging in the farm community's related production and exchange activities.

The farm as environment provides a multi-faceted experience of meeting fundamental human needs in very concrete ways: providing one's food, maintaining the buildings where one lives and works, participating in economic endeavors, interacting with the natural world, adapting to, and building upon the natural world in supra-nature. The Farm should be complemented with the IT and AI Innovation Lab.

Adolescents gain experience in selling things and commerce, express themselves, get involved in production, selling and exchange. The guesthouse - which includes the opportunity to organize meals, think about healthy nutrition and plan accordingly, social life with unknown people, controlling and finance, maintenance, decorating, organizing for comfort and order etc. The work on land - the adolescent is learning and understanding the methods of doing automatized agriculture as part of his understanding of nature and supra nature. In Figure 1 below we could see the degree of work independence and adult dependence depending on the maturity level of the adolescent.

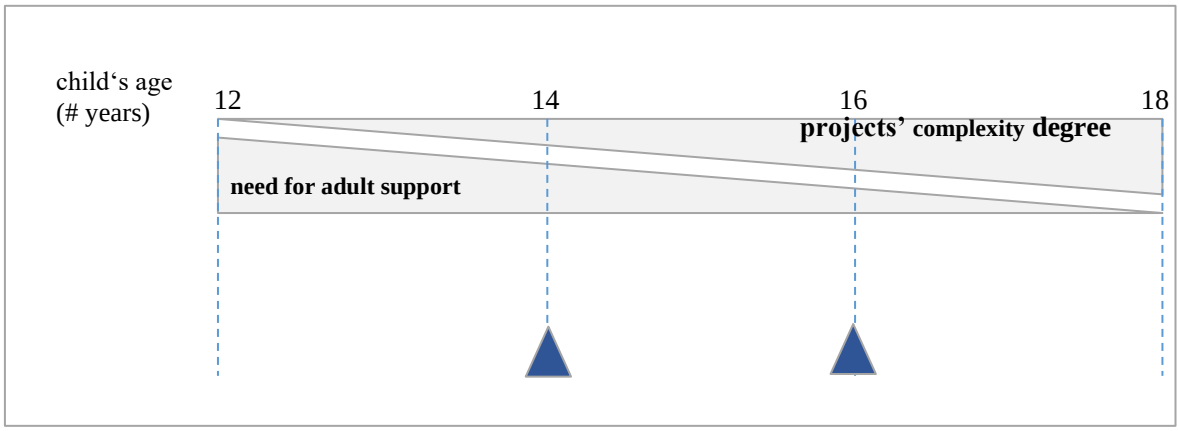


Figure no. 1. Degree of work independence and adult dependence depending on the maturity level of the adolescent

Source: own analysis

1. Review of scientific literature

Adolescents' community has been analyzed by many researchers. In his paper, Kahn (2001) analyzed the behavior of adolescent students at The Hershey Montessori Farm School. When compared with students from other traditional schools, it resulted that the students from Hershey Farm School have higher quality of experience while doing academic activities. Their results suggest that the students from Montessori have perceived their classmates as friends, have a better understanding of the environment and spent more time on doing collaborative projects rather than being passive in the class while listening to the lecturers given by their teachers.

Ayer and Stone (2006) are analyzing the boarding experience (separation from families) of the Montessori adolescents. They describe the boarding environment as an opportunity for the young children to take initiative and assume responsibility, even if that could lead to a failure. The authors conclude that the

boarding students are less fashionable than the day students. They are also engaged, bright-eyed and independent.

The social evolution of the Montessori community was described by Kahn (2006). After ten years of intensive research, the author concludes that the Montessori environment is following the expectations of Montessori theory and practice. Moreover, he argues that the teachers, adolescents, and their parents together make a "little community" which is a base for learning and future adaptation of the society's demands.

Castiglione (2016) made a presentation of the Near North Montessori School of Chicago and its approach to technology. Her research starts from the adolescent needs for social acceptance, independence, and social justice. She creates a template with seven characteristics of the adolescents' behavior: social, independent, adaptability, real, safety, order, beauty, structure, and the role of the guide. The author concludes that, to help the adolescents to grow, the teachers have to know, challenge, create space for them to invent, and understand the new technology.

In a study focused on the seventh-grade students of the Montessori program, Casquejo Johnston (2016) analyzed the self-determination feelings of the students throughout the academic year to capture the change in self-determination. The research was designed to give voice to students, provide a perspective of the students and add a disclosure on middle-school reform. The study provides ways in which, the Montessori adolescent program could help its students and suggests ways for other secondary schools to provide support to their students.

McNamara (2016) is making a description on how the Montessori upper elementary adolescent students integrates science, technology, mathematics, and the environment. Starting with what he had learned from his professors, the author shares the lessons to his own students. Languages, history science and math are so integrated in the curriculum that the students did not even think that they were doing math or science.

Casquejo Johnston (2019) considers that, while most Montessori students are three-to six-years old children, many researchers do not know that Montessori wrote and spoke about middle level education before 1952. In her paper, the author describes the learning environment for students between 12 and 16 years old. This learning environment includes the four essential attributes as well as a few innovations related to them. According to the Montessori's writings, personalized learning creates a learning environment where the students are encouraged to innovate.

Ewert-Krocker (2013) argues that, until a child is twelve years old, nature ought to constitute his primary interest. After he reaches twelve, the feeling of society must be developed in each child, with the goal to contribute to a better understanding of the people and then, as a result, to more love.

In another research, Hoffman (2009) discusses the major issues faced by Montessori schools and teachers and the resources needed to transform them, such as translating adolescent and child development literature into a friendly user format for delivery links and courses to the accreditation process. The author highlights theories and principles derived from investigations and ongoing research presented to the roundtable meetings.

Thakur and Patnaik (2017) realized a study to analyze the effect of adolescent education on their reproductive health. The analysis was based on two groups, one treatment and the other one control group, each group consisted of 102 students. There was a pre-test followed by a post-test administrated to both groups and mean, standard deviation and t-test were calculated. It came out that the difference between the two groups was statistically significant.

Colby (2019) conducted an analysis based on a sample of 1380 students from secondary schools in EU countries in terms of competence-based education. The results of the study show that there are still significant differences in the results of high school students between developed and developing countries. Similar results were obtained by other researchers (Lurrie and Garett, 2017; Gruppen at el., 2016).

2. Case study Montessori Cluj

Montessori Cluj Campus is a state-of-the-art research and development center aimed at driving global transformation in the field of scientific education for 12- to 18-year-olds through bridging Montessori established methods with technology. In Figure 2 is described the state-of-the-art technology.

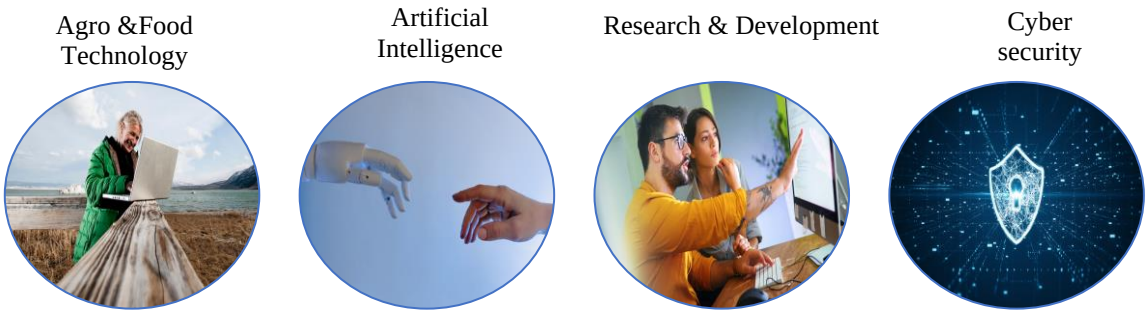


Figure no. 2. State of the Art Technology
Source: own analysis

We believe that human life will be improved by grate minds that will be able to design, create and master systems of extraordinary complexity. We aim to channel cutting edge technology in all aspects of the operations and by bridging nature, nurture, and state of the art technology together, to have truly a valuable impact into education, globally. The concept concentrates technology on 4 major pillars.

Key concept of our work is to harness all the power of the data and to use it in terms of reimagining the most valuable experiences we can offer to youth all over the world. Unlimited customizable learning ecosystem providing deep learning and modelling is based on Montessori Scientific observation and Artificial Intelligence.

The Montessori Campus is a smart campus equipped with the latest technology and facilities all in green buildings, especially featuring latest food technology and safety, bio sciences & bio engineering lab, a museum of machines and a robotics and artificial intelligence lab. It is designed to offer a prepared environment for the 12 to 18 adolescents so that they can grow into their natural duty: to become the best version of adults they can be.

3. Research methodology

In order to check the efficiency of the traditional learning system, we alalyzed an ordinal least square (OLS) simple linear regression model with one dependent variable and one indepedent variable.

$$y = \beta_0 + \beta_1 x + \varepsilon \quad (1)$$

where,

y = dependent variable
x = independent variable
β_0, β_1 = parameter coefficients.
ε = residual coefficient

The regression equation is statistically significant if the p_value is below the 0.05 threshold. Moreover, the model does not have autocorrelation errors oif the variance inflation factor is between 1 and 5, while the Durbin-Watson test is close to 2. We have also calculated the coefficient of determination (R^2), which shows us what percentage of variation of the dependent variable is explained by the variation of the independent variable.

$$R^2 = 1 - \frac{SSres}{SStot} \quad (2)$$

SStot is the total sum of squares and SSres is the total sum of the residuals. They are calculated using the formulas:

$$SStot = \sum_{i=1}^{n} (yi - \varepsilon i)^2 \quad (3)$$
$$SSres = \sum_{i=1}^{n} (yi - \bar{y})^2 \quad (4)$$

where,

yi = predicted values
$\bar{y}$ = mean of the predicted values
εi = residuals

For the above regression model, we will test Durbin-Watson statistic to test the presence of autocorrelation of the errors. The statistic is:

$$d = \frac{\sum_{i=2}^{I}(ei - ei-1)^2}{\sum_{i=1}^{I} ei^2} \quad (5)$$

Moreover, we will test the multicollnearity with the variance inflation factor (VIF). The value of the VIF statistic could be calculated by the formula:

$$VIF = 1 - \frac{1}{1-R^2} \quad (6)$$

4. Results and discussion

The first step in our analysis was to plot the science Pisa score versus total time of study in the selected countries. The results could be seen in Figure 3.

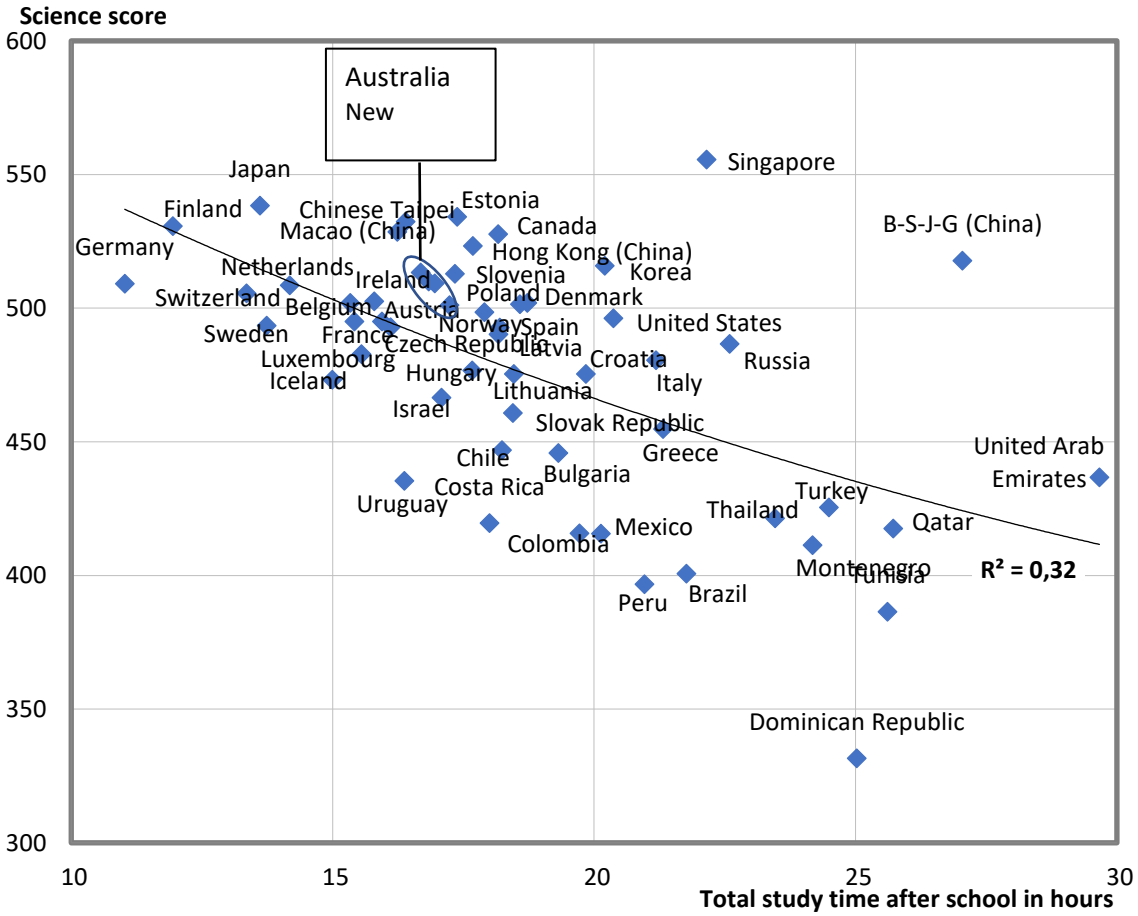


Figure no. 3. Science score vs total time after school in hours

Source: PISA 2018 score results

From the graph above, we could see that there is an inverse correlation between the total study time in after school hours and the science score in the selected countries. In other words, the average science score is lower in countries and economies where students spend more time learning after school.

We could also see that the countries with the best ratio of science score to total time after shool hours are Japan, Estonia, Canada and Hong Kong, while the countries with the lowest ratio of science score to total after school hours are Dominican Republic, Tunisia, Montenegro, Peru and Brasil.

We have also perfeormed a quantitative analysis, where have used the OLS methodology to obtain a simple linear regression equation with the dependent variable the science score and the independent variable the total study time in after school hours. The results could be seen in the tables 1-3.

Table no. 1. ANOVA table

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36752.849	1	36752.849	24.775	.000[b]
	Residual	80108.133	54	1483.484		
	Total	116860.982	55			

Nots: a. Dependent Variable: Mean_score_science; b. Predictors: (Constant). Total_study_time

Table no. 2. Model summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.561[a]	.315	.302	38.516	2.140

Notes: a. Predictors: (Constant). Total_study_time; b. Dependent Variable: Mean_score_science

Table no. 3. Model coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	604.438	26.119		23.142	.000		
	Total_study_time	-6.812	1.369	-.561	-4.977	.000	1.000	1.000

Note: a. Dependent Variable: Mean_score_science

From Table 1 we could conclude that the model is statistically significant as the p_value (Sig. = 0.000) is below the 0.05 threshold. From the second table we could see that the correlation coefficient is 0.561. That means the mean score results and total study time or moderately correlated. Moreover, the Durbin-Watson statistic (DW=2.14) is close to 2, which means that the residuals are not autocorrelated. Also, VIF is greater than 1, which makes us conclude that there are not multicollinearity issues for the model.

From the values of the coefficients from Table 3, results the linear regression model.

$$Mean\ score\ in\ science = 604.44 - 6.81(Total\ study\ time) + \varepsilon \quad (6)$$

From this regression equation we could conclude that for each additional study time hour, the mean score in science would decrease by 6.81 on average.

Conclusions

The regression analysis revealed that there is an inverse relationship between mean score in science and total study time in after school hours in the selected countries. In other words, the more time the students spend in after school, the less grade they get. This is an argument for Montessori boarding program, which integrates the study time in all their activities.

The quantitative model was well defined and statistically significant. The linear model assumptions were tested and validated by the regression model. The results of the econometric analysis are in line with other recent studies on innovative competency-based education in adolescents' communities (Sullivan and Downey, 2015; Gruppen, et al., 2016; Levine and Patrick, 2019).

The profound psychic development emerging from the body-mind-hand connection is lived within a community context at the Farm School combined with the IT and AI innovation Lab. The community life

is about all the things that the adolescents and the adults that live there do together. Also, it should lead to a complete economic independence and interdependence.

A limitation of the study is related to the data availability. Future research should focus on recent data add more variables to the model. This study could be useful for government, public and private education institutions as well as for the local and central communities.

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The Role of Digitalization as a Support of the Local Communities from the Rural Environment in Romania

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Abstract

The relationship between human, health and nutrition is one of the main concerns of our society. Food is the source of energy for the body, and science reveals nutritional principles maintaining the health of society using high-nutrition agro-food products and preparation methods that preserve these qualities of food. By giving the necessary importance to digital solutions in agricultural activities, it will be possible to feel their impact on the transformation of smallholder agriculture. Thus, through the Information Platform CPAC (Catalog of Certified Food Products) developed by AFIR (Agency for Financing Rural Investments) in partnership with the Ministry of Agriculture and Rural Development promotes and supports the consumption of products approved at national level (traditional, mountain products, with a well-established recipe) and at European level (products with a protected designation of origin - PDO or a protected geographical indication - PGI). The CPAC is an application that facilitates access to information centralized by the Ministry of Agriculture and Rural Development (MADR) on agri-food products registered on national and European quality schemes. CPAC created the direct link between the authentic producers of Romanian products and the public. Using an GPS map with a marked route, the manufacturer can be called directly from the web page and the feedback of other consumer can be displayed as a help for choosing something new. Also in this way, the manufacturers can promote their certified products and the local market can be developed in a better way.

Keywords

digitalization, local communities, rural environment, CPAC application, agro-tourism.

DOI: 10.24818/BASIQ/2022/08/041

Introduction

Studying consumer behavior, Euromonitor in the „Voice of the Consumer: Health and Nutrition 2021 survey„ states that 64% of consumers think that the priority of general health is well-being. Studying this report, it can be concluded that the emotional and the mental have a great contribution to the purchase decision and to the return to tradition. The Covid-19 pandemic has influenced both our economic model and our way of life. Both consumers and producers have redefined their consumption and sale concepts so that consumer goods are still easily accessible. Social media platforms have demonstrated their potential by bringing to the public offerings of goods and services focused on consumers, need to eat healthy foods with higher nutritional quality, but also to protect themselves while ensuring their primary needs with minimal social exposure. The unique application CPAC in Romania paves the way for better consumer information, improves the decisions of buying good food and offers a wide rage of products of certified quality.

In Romania, supporting local communities is still far from reaching its full potential. The concept of "from farm to fork", "from farm to consumer" or "from farm to table", already popular in Western countries, penetrates timidly entering our country as well.

Providing sustainable food sources with high quality and nutritional levels has become a priority for consumers, and some niche producers have understood and implemented the need. In order to see the impact of digitalization on certified food products on quality schemes, we can mention that the time of launching the CPAC application (July 2018) it included 230 producers with 753 listed products. Currently, 957 producers are registered in CPAC with 2883 products.

Given that the health of the population is part of the concerns of researchers in all fields, public and political debates, Romanian institutions have aligned their legislative framework to implement quality schemes and labeling of products of controlled origin. The demand for transparency regarding the origin of products, technology, e-commerce, and transportation offerings have created a series of opportunities for food tracking from producer to final consumer.

The tendency to consume local products is very important both from the desire to support small entrepreneurs, local farmers and thus to encourage the development of agriculture, but also to have as many products as possible "controlled origin" with nutritional quality to promote the great value of Romanian lands and farmers.

1. Literature review

The alternative supply of agro-food products gives consumers access to relevant information about small agricultural producers, practices and techniques used in obtaining production. The main information refers to: the place of origin of the agri-food product, the methods used in production (handmade, traditional or manufacturing type), the name of the farmer, the certifications obtained based on the recipe used attesting their quality (organic, DOC, PGI, TSG etc.) and last but not least, product traceability.

According to the communication of European Commission from Brussels to the European Parliament in 20.05.2020 - A "Farm to Consumer" strategy for a fair, healthy and environmentally friendly *food and the retail sector should illustrate the way forward by increasing the availability and accessibility of healthy and sustainable food options to reduce the overall ecological footprint of the food system. To promote this, the Commission will develop an EU Code of Conduct for Responsible Business and Marketing Practices, which will be accompanied by a monitoring framework. The code will be developed together with all relevant stakeholders.* "

Also, *"all farmers and all rural areas need to be connected to a fast and reliable internet. It is a key driver for job creation, for and for investment in rural areas, as well as for improving the quality of life in areas such as health care, entertainment, and e-government. High-speed broadband internet access will also allow for the widespread use of precision farming and artificial intelligence. This will enable the EU to fully leverage its global leadership position in the field of satellite technology. This will ultimately lead to reduced costs for farmers, improved soil management and water quality, reduced use of fertilizers, pesticides and greenhouse gas emissions, improved biodiversity and a healthier environment for farmers and citizens. The Commission aims to accelerate the deployment of high-speed broadband internet in rural areas in order to the 100% access target by 2025"*

The "From farm to fork" strategy, as well as other components of the European Green Deal, must be looked at with concern and impact assessments. A very complex regulation will increase the administrative burden on farmers and hinder the application of the basic principles of sustainable agriculture.

The five dimensions that characterize the efficiency and impact of digital public services in society as they are included in the research DESI - Digital Economy and Society Index of 2020 (European Commission, The Digital Economy and Society Index, 2020), are digital public services, capital human resources and connectivity, as well as the use of the global Internet and digital media and not in the last degree of their integration. As mentioned by the authors (48) / 2021, pp. 83 Alexandru Roja and Mihaela Boc in the paper „Digital public administration - proposal for a digital transformation model of Public Institutions„ Transylvanian Journal of Administration Sciences 1 –105: „ all five dimensions specific to the DESI study have a major impact on the digitalization process and are convergent in terms of increasing digitalization capacity. As can be seen in the Composite Index of the DESI study published in 2020, Romania is behind the European average in all five dimensions, being in line with the ranking in terms of digitalization of public services".

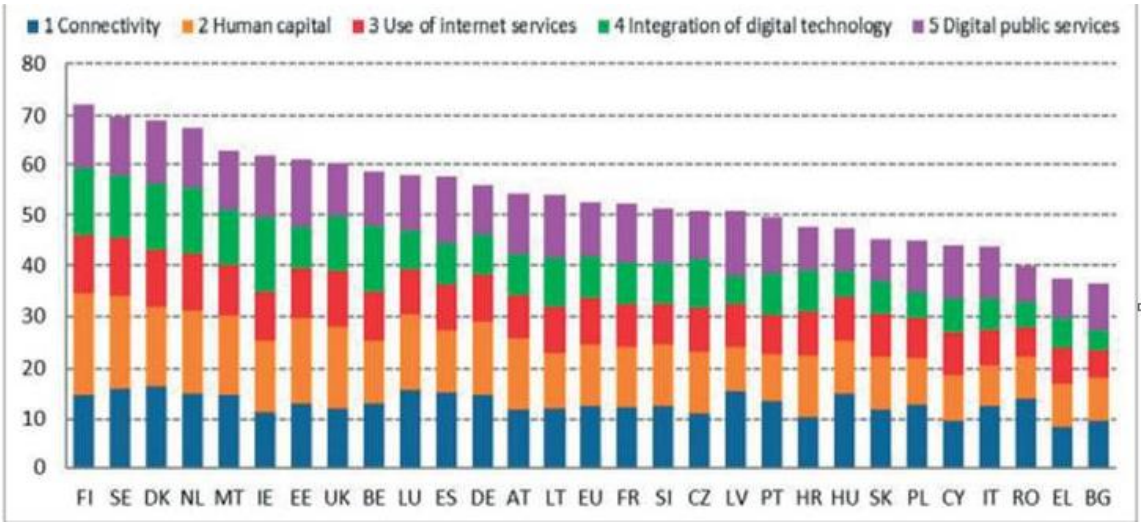


Figure no. 1. Composite index DESI
Source: European Union, Eurostat

Those who master the data master the future (Yuval Harari in the book: "21 lessons for the 21st century,, Polirom 2018 publishing house, in chapter 4, pg. 83) and the race to obtain them has already begun. Even if you do not know how to take advantage of the data today, it is worth having, because it could be the key to controlling and shaping life in the future,, says the same author on pg. 88.

On the other hand, it is well documented in the literature that the use of digital technologies can influence other measures of social welfare, such as gender equality and women empowerment (Martin Hilbert, 2011) but can also involve challenges, limitations, and risks in particular. for small farmers and for women.

Globalization has certainly brought benefits to some important parts of humanity, but there are signs of growing inequality both between society and within them (Yuval Harari, pg.84, 21 lessons for the 21st century Polirom 2018 publishing house)

Several studies highlight the fact that in the event of a health crisis, the proper functioning of agri-food supply chains influences food and nutrition security (FAO 2011, FEWS NET 2010).

2. Methodological framework

The aim of this study was to briefly review the impact of the digital solution on the transformation of small farmers' agriculture, as well as the challenges that influence the digitalization of agriculture in Romania. We used a comprehensive approach that includes original research articles, work papers, peer-reviewed articles, conference papers, databases, book chapters, guides, and indicators from other European countries such as Austria or the UK.

Our conclusion shows that when the digital solution is used properly, consumers benefit from real-time access to information about authentic manufacturers in Romania is improved. At the same time, it is also known that for small producers, the valorization of production can constitute an obstacle due to the distances to the points of sale or the costs of transportation, marketing, etc.

It is essential to invest in digital technologies that are adaptable to the target population and in providing digital skills training to farmers by segregating them by gender, age, and education in order to make full use of the opportunities of digitalization in agriculture. It is known that for small producers, the valorization of production can be an obstacle in terms of distribution costs, marketing, access to various markets, although their products are qualitatively superior to other agro-food products.

3. Results and discussions

Outside Romania, there are many hotels, boarding houses and agro-pensions that have made their own vegetable gardens or small farms, to ensure that their guests consume local products, verified and of the highest quality. For some this concept has become a and at EU level more and more importance is given to this initiative, the idea being included in the European Green Pact through the Farm2Fork Strategy developed by the European Commission.

According to Euromonitor report published in 2021, Romania ranks 28th in the world in terms of sustainability in the field of tourism, the analysis being performed for several 99 countries in terms of ecological, social and economic sustainability, country risk, as well as the current demand for sustainable tourism, transport and accommodation services. Thus, Romania ranked in front of countries with weight, such as Australia, Greece, Italy, Japan or even Great Britain or the USA, a country that gave birth to the "Farm-to-Table" concept, Ziarul Financiar claims, citing a published Euromonitor report in 2021.

From EU decision-makers, farmers should be guaranteed that when environmental standards for food in Europe are raised to comply with the European Pact, imports of agri-food products also meet these standards. In this way, the products of small farmers will not be replaced by cheap food from other countries, where environmental standards may not be as high as in the EU.

The presence of fraudulent food on the market generates a degree of distrust on the part of consumers according to the Romanian Employers' Federation of the Food Industry - Romalimeta.

Food authenticity is represented by a certain origin and in accordance with the standards and norms in force. The criteria that define the authenticity vary from one product to another, the most notable being: geographical origin, animal, or botanical origin (raw material), type of raw category (conventional, organic, ecological, genetically modified agriculture), processing and conservation technology, year of production (especially in the case of wines).

In Romania, there have been cases of food fraud. and employers claim that 25% of black bread in the market is counterfeit. Similar situations have been identified over time on the Romanian milk market and the Council of the European Union has acknowledged that the process of illegal trade in counterfeit food is a global problem, which requires action in cooperation with non-EU bodies. MADR considers this situation to be severe and goes further, estimating that the greatest vulnerability goes to meat, milk and dairy products, certain varieties of bread, honey, wine and alcoholic beverages and olive oil. Consumers must have products that have intrinsic nutritional value and do not endanger the human body (safety).

Certain aspects of household behavior, quality of family life in rural areas, spiritual habits and practices, demographic structure, external migration, education, infrastructure, access to digitalization, high speed internet access, are aspects that must be considered in the analysis. on the success of the implementation and implementation of the catalog of traditional products that could benefit both small farmers and the consumer willing to consume traditional products, certified and quality in terms of nutrition for the body.

The age structure of the resident population in Romania is very important in the realization and implementation and functioning of the digital solution considering the level of knowledge of smart technology.

According to the INSSE, on July 1, 2019, the resident population in rural areas was 8,917,774 people, of which young people up to 14 years old were 1,439,537 people, adults between 15 and 65 years old were 5,651,042 people and elderly people aged 65 and over were 1,827,195 people. According to the data mentioned above, the share of young people in rural areas was 16.14%, the share of adults was 63.36% and that of the elderly was 20.48%. Even if these data would show, according to studies (Rotariu Traian, 2009, Iftimoaei Ciprian 2018) that the Romanian rural population has an aging population, and that respecting the proportionality when the share of the population aged 65 and over is 7 % of the total population, the demographic aging begins, the adult population of 57% expressed as a percentage, can be considered the target population that can fully capitalize on the opportunities of digitalization in agriculture.

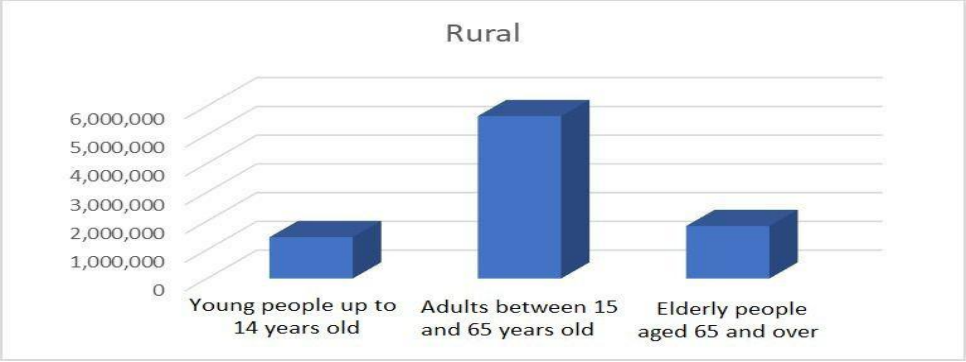


Figure no. 2. resident population in rural areas
Source: Author self-conclusion according to INSSE

Developing and implementing a concept for a pilot application used on mobile devices with android and IOS operating system can help promote traditional Romanian products certified on Romanian and European quality schemes, while ensuring their traceability.

The application currently provides the following feature: Functionality to accurately identify and locate Romanian products, which have already been approved at national level (traditional products, mountain, with established recipe) and at European level (products with protected designation of origin - PDO or protected geographical indication - PGI).

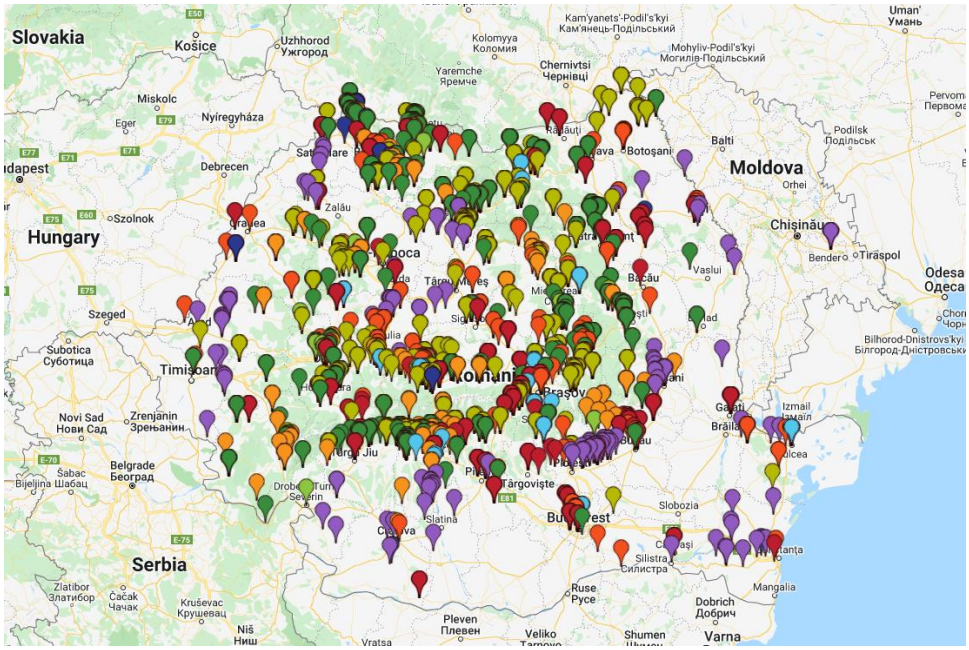


Figure no. 3. Representation on the map of the producers
Source: Application GPS prototype

A web portal through which the producers to authorize / certify new products, without having to go to the headquarters of the County Agricultural Directorates to submit their files to certify the products.

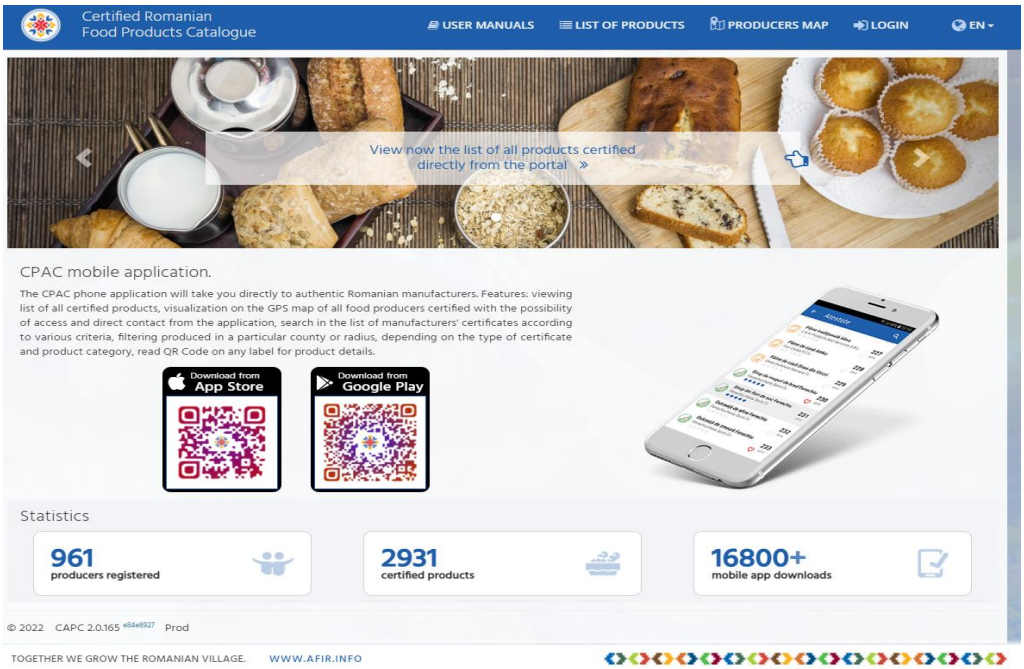


Figure no. 4. The main page of the web application
Source: Application prototype

The application allows in fairs, markets, stores, through the function of scanning the QR codes on the product label, to verify the authenticity of the products, thus ensuring that what you consume is an authentic product and not a counterfeit one.

In the future, an application-level functionality that presents the quantity made for each food product, as well as the certification that that product has in the recipe exclusively the main ingredients of local origin, would be useful for the consumer and would bring more security to him. respectively, the fact that what you consume is in accordance with the information on the product label.

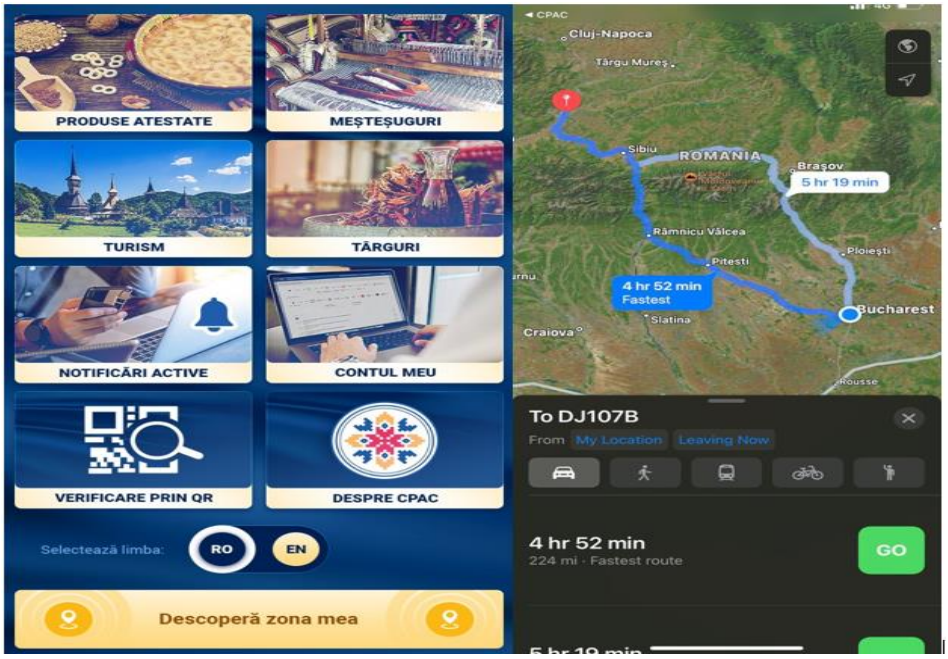


Figure no. 5. Mobile application pages
Source: Application prototype

Considering that the application must be easy to use by consumers who do not have special digital skills, it also has other functions such as:

- Search for products and manufacturers by name and certificate number.
- Map display of manufacturers with the ability to navigate through maps (e.g., Google maps, Waze, etc.) to a manufacturer,
- Filtering products and producers according to the type of certificate (Traditional Product, Consecrated Recipe, PDO, PGI, Mountain Product), product category, manufacturer's county.
- Visualization of the distance to the place of sale of the product (it is necessary to activate the location system of the device);
- The ability to evaluate a product - functionality that on the one hand helps consumers to identify products appreciated by others but can on the other hand motivate the manufacturer to make high quality products throughout the year.
- Access to pensions, agro-pensions, information centers and existing tourist recreation centers in rural areas.

Conclusions

In conclusion, to increase the degree of access to public services offered to citizens, in the present case of certified food producers, the creation of a portal to facilitate the modification of products directly by the producer and to offer the possibility to submit online authorization documentation is of real use, including in the context of the Romanian Government's strategy related to digitization. Given that the application can help define a country brand, it can also be downloaded by tourists, foreigners visiting the country, it allows viewing information both in Romanian and in English.

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Comparative Bibliometric Analysis of Social Responsibility Related Literature in Romania and Hungary

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Abstract

This paper investigates the trends in the publications on social responsibility in a comparative manner, the papers published on this topic in Romania and Hungary. Given the geographical proximity of these countries, and the cross-border collaboration supported though different European funded projects, we expected to find both cooperation and common approaches in the study of CSR in the two countries. To test these hypotheses, we conducted a bibliometric study on the papers published in scientific journals indexed in Clarivate – World-of-Science on the key words "corporate responsibility" and, respectively "Romania" and "Hungary". We found a great variability both in terms of approaches, the number of published papers (221 in Romania and 64 in Hungary), the journals in which these papers are published. More, we can refute our hypothesis, as the collaboration in this area is rather limited. More, the approaches of these papers, analyzed using the WoS Viewer software, coming from Romania compared to the Hungarian context is very different. Given the increasing interest for the topic of social responsibility, we expect increasing collaboration in this area between the two countries.

Keywords

Social responsibility, CSR, Romania, Hungary, bibliometric analysis.

DOI: 10.24818/BASIQ/2022/08/042

Introduction

The research on social responsibility (SR) gained increasing attention from both academics and practitioners all over the world, with a high degree of variability. These differences are attributed to the variability of the legal framework (Saveanu, Badulescu and Badulescu, 2021a) as well as the cultural values and norms that shape the socially responsible behaviors (Matten and Moon, 2008; Aguilera et al., 2007). Even if these differences are well acknowledged in the studies on CSR practices - no systematic comparative study was conducted to analyze the different approaches in this field from an academic point of view. We intend to fill this gap with an analysis on the literature on social responsibility in Romania and Hungary.

As in both neighboring countries SR is primarily emphasized by practitioners, we expected to find some common studies, and/or similar approaches. However, our bibliometric analysis revealed large differences regarding the academic focus on SR. In our first section we introduce the general topic and then focus on information on SR in the two countries. After the second methodological part, we present, in the third section, our bibliometric study. The final concluding section summarize the findings and highlight prospects.

1. Literature overview

The first use of the term "social responsibility" is attributed to Howard Bowen. In this publication of "Social Responsibilities of the Businessman" in 1953, Bowen argued for the importance that firms should pay attention to the impact they have on the society (Carrol, 1999). Given their power and the influence they have a large number of people, companies must promote social good. In this own word: business people "have the obligation to promote those policies, to make those decisions and to follow those directions of action that are desirable in terms of the objectives and values of society" (Bowen, 1953, p 6, apud Carroll, 1999 pp. 270). Starting with this first use of the concept we notice the normative dimension: CSR is not much about what companies do, but about what these should do. The problems of the power of companies in society, power that for some multinational companies might exceed that of governments, is emphasized in recent studies in this field (Matten and Moon 2005).

The main limitation of this initial approach stems from its normativity, which remained rather constant in many studies. Even now, this approach can be found in many practitioners' definitions. Studies that focused on why firms should act upon these responsibilities revealed: gaining competitive advantage, gaining visibility and prestige, counteracting negative image in particular communities, gaining support from different groups, but also improving the financial performance. These are the main benefits studied for the socially responsible firms. Other benefits include those at the level of communities, through social and environmental actions and investments. One may consider the contribution of companies to the achievement of the Sustainable Development Goals.

Subsequent evolutions of the concept brought the necessary clarifications and delimitations for a better operationalization (Carroll, 1999), especially towards the end of the 1970s. The construction of theories of social responsibility also appeared during this period. As we can see from Carroll (1999), the most numerous studies in this field were published in the 1970s and 1980s. However, theories often conflicted with each other, contradicted, or emphasized other dimensions, thus hindering theoretical evolution. The main problem of CSR definition, as concluded by Dahlsrud (2008) in his analysis of the 38 most frequent definitions of social responsibility, remains the normativity of the concept. More, it is not yet a consensus regarding an optimal social performance of firms. From a paradigmatic point of view, two main traditions are identified in the discussion on SR of organizations: business ethics and stakeholder management. These are supplemented by sustainable development insights that shaped the practitioners' approaches towards CSR (Saveanu et al., 2021b).

It is also important to note that different theorists have proposed other concepts than the general one of corporate social responsibility: social performance, corporate citizenship, and sustainable development, each developed from different theoretical traditions. In order to comprise as many approaches as possible we search for the broadest concept, that of social responsibility.

1.1. CSR in Romania

Concerns regarding social involvement of organizations became more visible both for practitioners and for academicians in Romania in the past 10 years. It is mostly the effect of implementation of social responsibility policies by multinational companies (Ilies, 2011). Practitioners' interests can be considered the engine of these type of actions in Romania. The academic community also focused on this topic with an increased interest and attention. Theoretical summaries highlight either the competitive advantages resulting from investments in CSR, as well as a systematization of CSR forms (Cizmaş and Stan, 2010); how to manage the relations with the stakeholders (Miron, Petcu and Sobolevschi, 2011) or its contribution to sustainable development (Gănescu, 2012). A meta-analysis based on 186 scientific papers published on the topic of CSR in Romania in 2011-2015, especially from the field of accounting, has revealed that the most frequently researched topics are those related to CSR actions followed by CSR theoretical works (Lungu et. al. 2016). Most empirical studies argue for advancement, interest and dedication towards social responsibility by Romanian firms (Obrad et al., 2011; Echevarria-Cruz et al. 2015; Hategan et al., 2018). Nevertheless, there are studies that attest the discrepancy between statements and actions when it comes to social responsibility (Ciuperca, 2011) and sometimes even between different statements (Baleanu, Chelcea and Stancu, 2011). There are several factors that explain this discrepancy: the mimetics that characterizes this field of activity (Baleanu, Chelcea and Stancu, 2011, Ilies, 2011), the communist legacy (Ciuperca 2011); lack of information and knowledge. A specific factor influencing the Romanian context is derived by the post-communist context, as in the previous period actions that now fall under CSR and are voluntary by nature were mandatory under the previous regime (Ciuperca 2011; Hatos and Stefanescu, 2017).

Fewer studies focus on barriers and facilitators of CSR implementation in CSR. An exception is a study proposed by Costache, Dumitrascu and Maniu (2021) based on 71 responses from managers of SMEs. The data revealed that the most prominent hinders are related to lack of financial and human resources, while such an investment is promoted by the personal values and beliefs of employees and also by the need to promote a positive image in the community. Other studies on Romanian context reveal the effect of age (Badulescu et al., 2018), size (Badulescu et al., 2016) and the managerial value orientation (Saveanu et al, 2021b).

1.2. CSR in Hungary

CSR programs in Hungary are usually implemented as a result of shareholder initiative (whether foreign or domestic), even though in foreign-owned companies in Hungary the employee initiative is the second engine of CSR actions (Dőry, Harsányi and Porubcsánszki, 2019). Similar to those found in Romania, foreign-owned corporations are better organized and more innovative in their CSR programs, and the traditional forms of CSR (sponsorship, volunteering) although they remain the most popular, we find an opening towards new forms of CSR, such as skills-based volunteering in projects, long-term partnerships with non-profit organizations.

According to Győri et al. (2021) the current state of CSR policies in Hungary has been strongly influenced by Hungary's accession to the EU and subsequently by the adoption of the Hungarian National Action Plan on CSR. A peculiarity of these guidelines, also noted in the literature on this topic, is that responsible employment is the main vertical priority of the Action Plan, and, respectively, a secondary position of issues related to economic development and environmental protection.

The forms and holistic approach to CSR, the emergence and implementation of the UN Sustainable Development Goals (SDGs) and the issue of sustainability are themes that have emerged in the literature and practice of the last decade. The authors also note that, in Hungary, the pressure from stakeholders is weak, and they expect an increased state-level intervention and control over CSR issues. In addition, the motivational aspects of companies are not clear, and the transition from explicit to implicit CSR is only partially visible (Győri et al., 2021).

In this paper we investigate the more recent papers published on this topic in a concrete geographical area: Romania and Hungary, two neighboring countries in Eastern Europe. Given the similarities, (H1) we expect to find common research on the topic of social responsibilities published jointly by authors in the two countries, and also (H2) we expect similar themes approached in the two countries as highlighted in the clusters generated by WoS Viewer software.

2. Methodology

In order to select the information, we searched for papers published in academic journals indexed in Clarivate World-of-Science data base. The key words were “social responsibility” – in abstract and Romania/Hungary in all fields. We selected only article type of paper, and filtered only the economic and environmentally related journals, looking also for the fields with a high number of articles. Consequently the final selected Web of Science categories were: Business, Management, Economics, Environmental Sciences, Environmental Studies, Green Sustainable Science Technology, Metallurgical engineering, Religion, Social Sciences Interdisciplinary, Ethics, Public Environmental Occupational Health, Education Research, Business Finance, Mathematics Interdisciplinary Applications, Communication, Engineering Environmental, Geography, Law, Materials Sciences Textiles, Public Administration, Engineering Chemical and Political Science. Though some of the categories seem less relevant for such a study, as religion, after looking at the abstracts of the papers we concluded that these are relevant for our endeavor and consequently kept.

The search on the Romanian papers in relevant journals extracted 221 papers, while the same search on Hungary resulted in only 64 papers. This rather large difference may be explained both by the different sized between countries, the different relevance of Clarivate indexed papers for academia in the two countries, along with the different opportunities in the two countries (national Clarivate indexed journals).

The data obtained was analyzed using WoS Viewer software which, depending on the criteria introduced, identifies common key words and based on the interrelatedness (co-occurrence) between these creates clusters of approaches or papers using correlated words. The clusters are grouped on different colors in the graphical result of this analysis. The strength of the correlation between two words is highlighted by the distance of the line between two words. The size of an item/label indicates its prominence in the cluster.

3. Analysis

3.1. Trends in social responsibility publications in the two countries

The 221 papers published on Romanian SR, were published in a total of 55 Journals indexed in Clarivate WoS. However, more than half (132 papers) were published in 5 Journals. We list below, table no. 1, the first 10 journals in which papers on social responsibility in Romania were published. We can consider that these journals, and their editorial and review policies, greatly shape this field of study in Romania.

Regarding the years of publication, we can notice a general increase in number of papers: as in 2008 (the first year of publication of a paper non the search criteria) there were 6 papers published and in 2021 there were 21.

Table no. 1. List of Top 10 Journals publishing papers on social responsibility in Romania

	Name of the Journal	No. of papers
1	AMFITEATRU ECONOMIC	52
2	SUSTAINABILITY	45
3	METALURGIA INTERNATIONAL	16
4	TRANSFORMATIONS IN BUSINESS & ECONOMICS	10
5	QUALITY-ACCESS TO SUCCESS	9
6	ENVIRONMENTAL ENGINEERING AND MANAGEMENT JOURNAL	6
7	CURRENT ISSUES IN CORPORATE SOCIAL RESPONSIBILITY: AN INTER-NATIONAL CONSIDERATION	5
8	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUB-LIC HEALTH	4
9	CORPORATE SOCIAL RESPONSIBILITY IN THE DIGITAL AGE	3
10	ECONOMIC COMPUTATION AND ECONOMIC CYBERNETICS STUDIES AND RESEARCH	3

Source: authors own analysis on data from WoS database

The maximum number of published papers was in 2020, when, out of the 30 papers, 16 were published in Sustainability Journal. The detailed presentation of this evolution is presented in the figure no. 1 below.

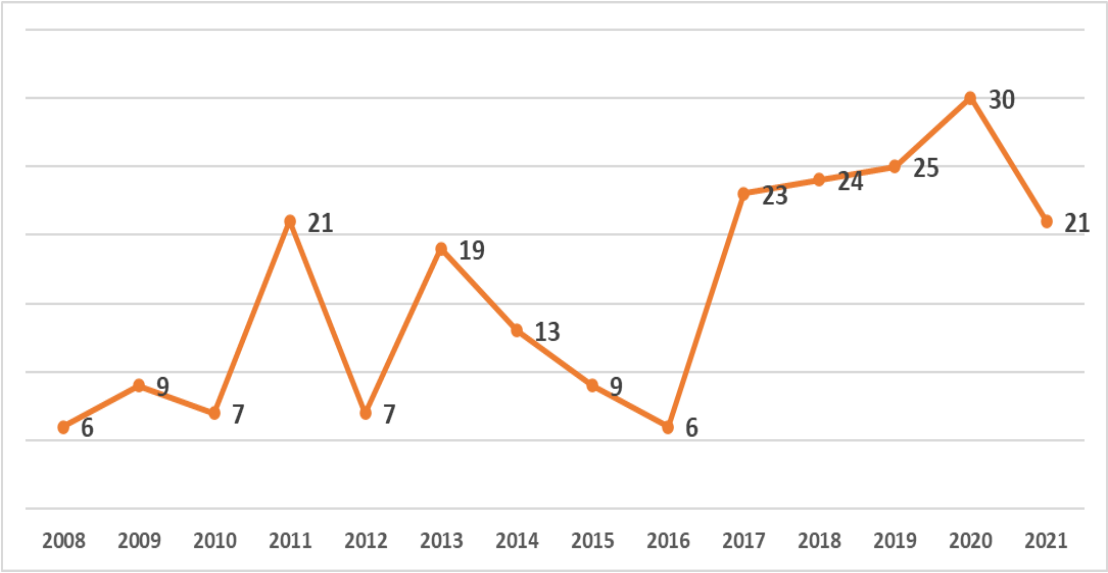


Figure no. 1. Number of papers per year of publication on SR and Romania

Source: authors own analysis on data from WoS database

Most papers are authored by Romanians, with a rather small openness towards collaboration. Foreign athors looking at the Romanian social responsibility context is also rather small. The structure of authorship is the following: 178 papers are authored by Romanians, 33 have mixed authorship added 3 papers authored by Romanian and Hungarian authors. Only 7 papers on SR and Romania were authored by foreign authors.

As we can see, the collaboration between Romanian and Hungarian authors on the topic of social responsibility is still at an early stage. Most of the papers are authored by Romanian academics (over 70%), and a small part as collaborations.

The 64 papers on CSR in Hungary are published in a total of 41 scientific journal indexed in Clarivate WoS. 33 of these journals published a single article. The top ten journals in order of number of articles published is listed below in table no. 2. While the concentration of papers is not similarly concentrated as in the case of Romania, this analysis still reveals the strong impact of Sustainability journal has in this field of study.

Table no. 2. List of Top 10 Journals publishing papers on social responsibility in Hungary

No.	Name of the Journal	No. of papers
1	SUSTAINABILITY	9
2	CIVIL SZEMLE	4
3	MARKETING AND MANAGEMENT OF INNOVATIONS	4
4	INTERNATIONAL J. OF ENVIRONMENTAL RESEARCH & PUBLIC HEALTH	3
5	JOURNAL OF EAST EUROPEAN MANAGEMENT STUDIES	3
6	POLISH JOURNAL OF MANAGEMENT STUDIES	3
7	PUBLIC FINANCE QUARTERLY-HUNGARY	2
8	REVUE D ETUDES COMPARATIVES EST-OUEST	2
9	ACTA POLYTECHNICA HUNGARICA	1
10	CARPATHIAN JOURNAL OF EARTH AND ENVIRONMENTAL SCIENCES	1

Source: authors own analysis on data from WoS database

The time frame in which these papers were published is longer then in the results for Romania. The first paper meeting our search criteria was published in 1998. Also, it may be noticed from the Figure no. 2, a steadier increase in number of papers published, with a peak in the last year of 18 papers.

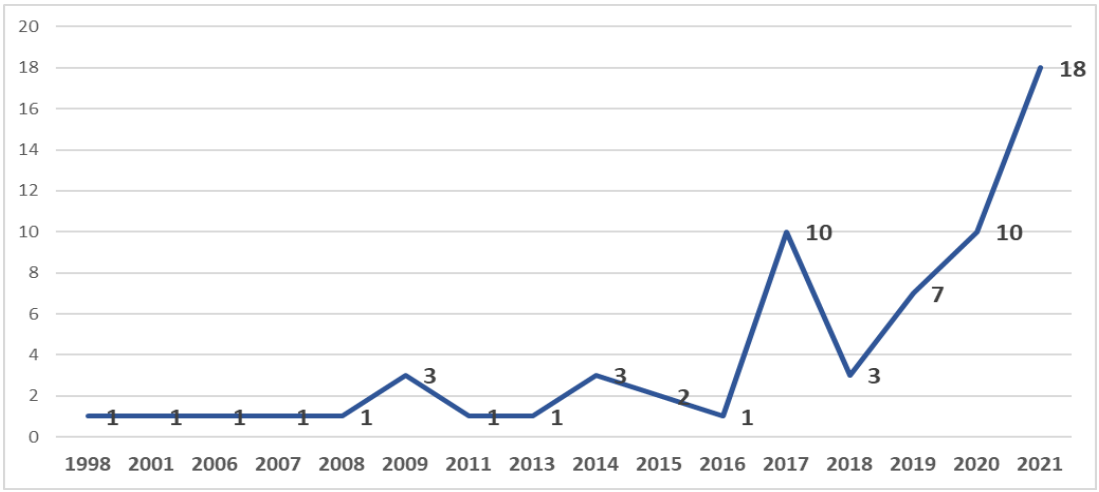


Figure no. 2. Number of papers per year of publication on SR and Hungary

Source: authors own analysis on data from WoS database

Regarding authorship, we can notice that the contribution of foreign authorship, along with papers authored by international collaboration between Hungarian academics along with academics from other countries (mostly Eastern-European) is much stronger compared with author affiliations in the case of papers published on social responsibility and Romania. In details we can say that 31 of the published papers are authored by Hungarians, 17 have mixed authorship adding 3 authored by both Hungarian and Romanian authors, 11 are authored by foreigners adding 1 authored by Romanian authors.

While the publication of papers on SR and Romania by Romanian authors was of 80.54%, the publication of papers on SR and Hungary by Hungarian authors is of 49.21%, as presented in Table no. 3.

The one paper written by Romanian authors on a comparison between Romania and Hungary (Hatos and Stefanescu, 2017), was developed partly as a consequence of a cross border cooperation project – the data presented in the article were extracted from a joint database. However, though numerous similar projects

were developed, this was the only paper highlighted as such. This situation is presented in Table no. 3, as Romanian authors writing on SR and Hungary with a percentage of 1.59%.

Table no. 3. Comparative analysis of authorship between the two countries on (SR)

	SR & Hu	SR & Ro
Romanian	1.59%	80.54%
mixed (including Ro and Hu)	4.76%	1.36%
foreign	17.46%	3.17%
mixed	26.98%	14.93%
Hungarian	49.21%	0%

Source: authors own analysis on data from WoS database

3.2. Bibliometric analysis of the Romanian literature on CSR

The bibliometric data was analyzed using WoS viewer software which identified common topics analyzing both titles and abstract of all 221 papers. The minimum occurrence of a term was 10, yet from the 140 terms selected, the authors manually deselected some with general meaning (such as author, size, article etc.). The results are presented in Figure no. 3 below.

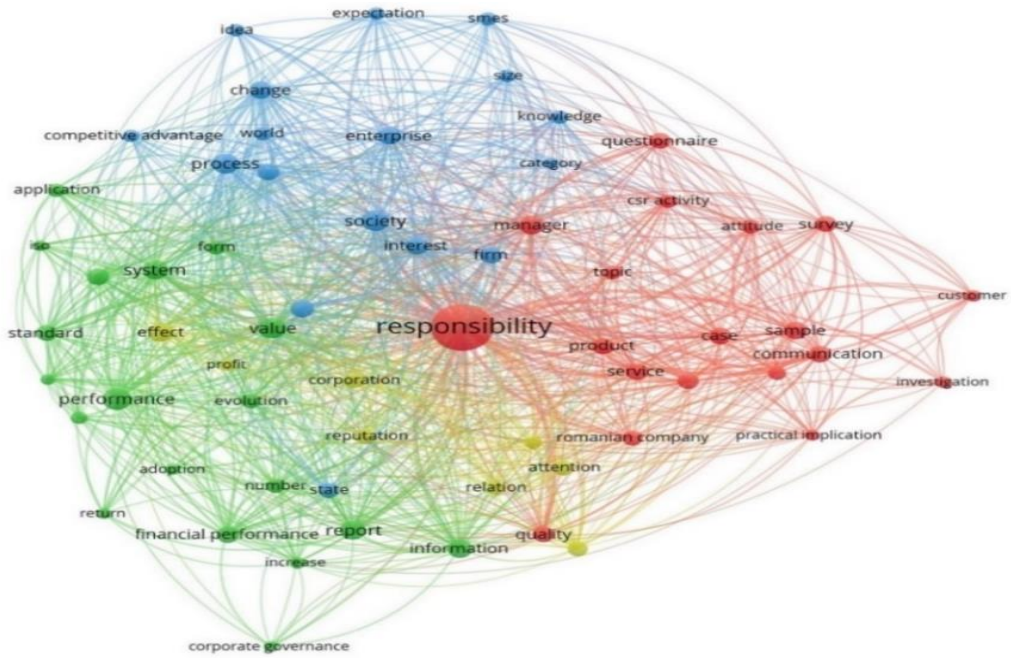


Figure no. 3. Cluster analysis of titles and abstracts of WoS papers on SR and Romania

Items: Cluster 1 - red (19 items): attitude, case, communication, consumer, CSR activity, difference, investigation, manager, practical implication, product, quality, questionnaire, **responsibility**, Romanian company, sample, service, survey, topic; Cluster 2 – green (19 items): adoption, application, consideration, corporate governance, evolution, financial **performance**, form, increase, indicator, information, iso, number, performance, report, return, risk, standard, system, value; Cluster 3 - blue (17 items): category, change, competitive advantage, enterprise, expectation, firm, idea, interest, knowledge, need, principle, **process**, size, SMEs, **society**, state, world; Cluster 4 – yellow (8 items): attention, corporation, **effect**, ethic, example, profit, relation, reputation.

The key words, or prominent item in each cluster, along with the other items indicate a structure of approaches used in the published papers. Consequently, we can say that the first category of studies is related to qualitative studies of responsibility of firms, the second approach focuses on the impact of SR on firm performance, the third approach reflects SR processes at the level of firms of different sizes and their impact on society, while the last category of studies is grouped around the ethical dimension and the effects of SR.

3.3. Bibliometric analysis of Hungarian literature on CSR

The bibliometric study was conducted in the same manner as in the Romanian literature, however the analysis on titles and abstracts, identifies 45 words that occurred at the minim threshold of 5. The results are presented in the figure no. 4.

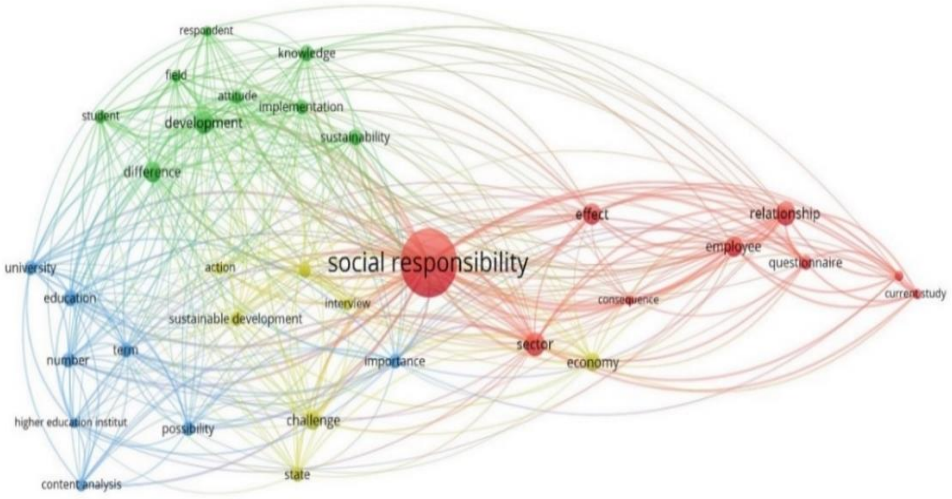


Figure no. 4. Cluster analysis of titles and abstracts of WoS papers on SR and Hungary

Source: authors own analysis on data from WoS database

Items: Cluster 1- red (9 items): consequence, current study, effect, employee, questionnaire, relationship, sector, **social responsibility**, structural equation model; Cluster 2 - green (9 items): attitude, **development**, difference, field, implementation, knowledge, respondent, student, sustainability; Cluster 3 - blue (8 items): content analysis**, education**, higher education institution, importance, number, possibility, term, university; Cluster 4 - yellow (7 items): action, **challenge**, economy, interview, opportunity, state, sustainability sustainable development.

The Hungarian studies are also grouped in four clusters. The first is somewhat similar to the first Romanian cluster as it comprises of empirical quantitative studies on SR. The second approach focus on sustainability and development, the third on education and SR of higher education, and the last on qualitative approaches of the challenges of sustainable development.

Conclusions

In this study we aimed at identifying common research and common approaches regarding SR in Romania and Hungary. However, as reveled by the data presented, the collaboration between authors in the two countries on the topic of SR measured as co-authorship of papers indexed in WoS Clarivate database is limited. More, the cluster analysis of topics (titles and abstracts) also highlighted great diversity. In both countries we can find on cluster of papers focusing on quantitative studies on SR, yet in the case of Hungarian studies we could notice a stronger orientation towards sustainability and a focus on educational institutions, while in the Romanian we can find studies on the effect of SR on firm performance and the social and economic impacts of SR.

In order to create a more detailed picture of the collaboration and the similarities and differences between approaches on this topic, future studies should include papers indexed in different scientific databases. In Hungary there is a stronger relevance of Scopus database. Also, to highlight the realities of SR in the two countries a more in-depth study of the joint papers is recommended.

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Aspects Relating the Influence of Spirituality on CSR in Online Organizations

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Abstract
In the last years, the emphasis on the concept of "Corporate Social Responsibility", abbreviated as (CSR) is increasing due to the influence of the digital era and competition. The access to information is instantaneously, thus, it is difficult for companies to maintain a positive identity without involving themselves in social causes.
Spirituality could lead to a level of awareness that could direct towards more social responsibility and strong relationships. Spiritual individuals are responsible human beings, who take into consideration their actions in general. Therefore, it could be a powerful correlation between CSR and spirituality.
This article analyzes the influence of spirituality on CSR in organizations that operate also online. The scope of this research is to see whether there are interdependencies between CSR and spiritual responsible behaviour. Does spiritual awareness or spirituality could change the approach regarding corporate social responsibility, and respectively be included in CSR norms.
To verify these aspects, two questionnaires have been applied to a sample of 217 people who are employees and entrepreneurs. All have responded from proper initiative. The number of questions was 9 in each questionnaire. As well, the same questions were asked, but adapted to each category.
The questionnaires have been used to establish several indicators related to the social corporate responsibility. This research is useful to all parties involved in CSR.

Keywords

social media; e-Commerce; spirituality; responsibility.

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Introduction

Nowadays, the society is increasingly focusing on responsibility and transparency. The interest with regards to the impact of corporations on communities and the environment has widen the number of researches related to "Corporate Social Responsibility" (CSR). Due to the fact that more and more companies started to be more transparent towards their employees and the communities around them (Nijhof and Jeurissen, 2010), they are still involving in programs related to online social responsibility in order to use this as an indicator for growth. Being more responsible towards others and the environment means that companies have to be more responsible with themselves and employees.

Technology and the internet are not enough to help communities grow and evolve, for they are just a facet of the whole. The other facet is the human being (Owusu et al, 2021). By unifying these two facets, responsibility could record a drastically increase in general. Responsible individuals act in a conscious manner with regards to the outer and inner worlds. Therefore, they have a higher degree of empathy. The physical world is just a reflection of the spiritual realm. At the time, individuals will not have any more the desire of possession for the self-alone, the opportunity to share and evolve as a community will increase (Adhia, 2010).

In the present when our smartphones have introduced a culture of disconnection and isolation, this same innovative technology is glimmering with sparks of promise due to the capacity to bring the masses closer than before toward the collective good of the users. Through sharing and connection with each other on a level deeper than screens and emoticons (Boyd and Ellison 2007), it can increase the peer-to-peer connection and create a more valuable and dynamic world for everybody.

This study analyzes the influence of spirituality on CSR in organizations that operate online. Does spirituality or spiritual awareness could change the approach regarding CSR, and respectively be introduced in CSR norms. The structure of the paper is as follows: revisiting the literature review concerning concepts like CSR, spirituality, social media and online enterprises; and analyzing data from a questionnaire with the scope to check whether there are interdependencies between CSR and spiritual responsible behavior. The last part of the paper concludes with evidence that employees and entrepreneurs believe there is a strong connection between spirituality in correlation with success and self-development.

1. The relationship between CSR, spirituality, leadership, and online enterprises

Very few publications and studies have acknowledged the relationship between the mentioned variables. Even though the link between spirituality, CSR and leadership in online organizations is not so clear at first, it may be surprisingly deeper and strong. At their roots, spirituality and CSR tend to be slightly different. While spirituality is more an inner process that involves the self-enquiry, where one strives for a better good, humanity, God or nature, the CSR is more about the interest of the stakeholder's organization (Bubna-Litic, 2009). CSR is outward looking due to its organizational vision on long term, whereas spirituality is inward looking. Still, the link between the indicators is very strong and the study will demonstrate the linkage towards them. Another well-known research study on the spiritual CSR is based on Fry's three level model. Firstly, a leader creates a view "that gives organizational members a sense of meaning and purpose." Moreover, a person with the characteristics of a leader aims for the development of the specific environment and organizational culture "based on the value of altruistic love whereby leaders care for others and endeavor to create a sense of community where individuals feel understood and appreciated." A leader's actions in relation with his vision, encourages faith and hope among the employees. In Figure no 1, according to Fry's spiritual leadership intrinsic motivating causal model, an organization receives love in an altruistic manner to erase negative emotions such as worries, anger, feelings of failure, and developing a culture with a sense of mutual membership.

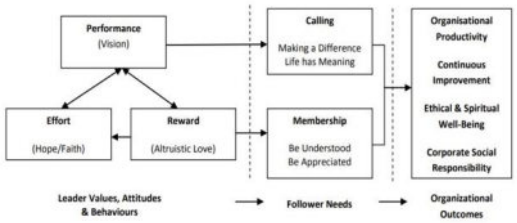


Figure no. 1. Fry's Causal Model of Spiritual Leadership
Source: Adapted from Fry's Causal Model of Spiritual Leadership, 2003, 2005

1.1. Corporate Social Responsibility

The society and the business surroundings are interdependent. Businesses could not exist in isolation. In our progress as a society, the social responsibility encourages the enterprises to become responsible, conscious citizens in a dynamic changing world (Eckhaus, 2021). Recently, the notion of social responsibility in organizations became an important factor of the corporate environment (Uka and Prendi, 2021) and is an integral part of the business. In today's literature, there is a vast variety of connotations and definitions, from the corporate philanthropic activities to strategic repositioning of enterprises in society. This concept is used to sketch out how organizations implement the social responsibility going beyond economic criteria. The Commission Green Paper stands for the fact that corporations must voluntarily integrate environmental and social issues into their business operations and interactions with stakeholders, knowing that this behavior will contribute to the development of their businesses on long term. Moreover, it is a premise for businesses to invest more in human capital, stakeholder relationships, and environment.

1.2. Spirituality in leadership

Many researchers associate spirituality with seeking for a purpose, for a greater meaning and towards a source beyond everything visible (Ashar and Lane-Maher, 2004). Delbecq (1999) made reference to this energy at the moment he was defining spirituality as one's "life experience of the transcendent", "whether that would be God, Buddha, Tao or the Force" (Leigh-Taylor, 2000). In addition, other experts (McCormick, 1994) talked about the "beyond," and (Conger, 1994) remarked that spirituality "lifts us beyond ourselves and our petty self-interests... it is the most humanistic of energies," tied to spirituality's transcendental component. It allows us to perceive our deeper ties to one another and to the world around us." According to Pandey and Gupta (2008), academics have never been wholly blind to the spiritual viewpoint on labor. Nicholls (1994) emphasized the subject by highlighting the importance of spirituality in business as a reward soul seeking in the workplace rather than simply hushing it up or avoiding it. In the opinion of Pandey and Gupta (2008) a brief spiritual literature review could influence employees, behaviours as incentive, commitment, learning organizational performance like financial, quality orientation results. In terms of employee behavior and performance, the impact of spirituality on corporate organizations has been investigated. The perception on the conceptual extension of the notion of spirituality at work and its relation to leadership is still in its early stages (Dent, Higgins and Wharff, 2005). According to some study, firms with notable levels of spiritual behavior outshine those without them that in term on progress have remarkable financial indicators. Being spiritual does not require that you believe in a deity. It is possible to exhibit spirituality via labor when work is done with a feeling of significance that transcends the job's instrumentalities. "Spirituality in the workplace" is defined by Neal (1997) as "people perceiving their employment as a spiritual journey, as a chance to grow individually and make a meaningful contribution to society." It's about becoming more compassionate and empathic toward coworkers, bosses, subordinates, and customers. It's all about being honest, staying true to oneself, and telling the truth to others. Spirituality in the workplace can refer to a variety of things like a person's efforts to live out his or her principles more completely at work. It can also relate to the methods in which businesses organize themselves to promote their workers' spiritual development."

Many challenges of the business world, bring extended work hours and overload to employees. This conducts to job burnout and mental stress amidst managers. Conceivably this is derogatory to perfect the triple bottom line (organizational performance, employee wellbeing, and main environmental stakeholders). Ashar and Lane-Maher (2004) stated that an increasing number of discontent employees complained about feeling deprived of purpose at their jobs. The employment practices of corporations are based on charisma and intellectual skills, and their advancement criteria on clever corporate politics and short-term incomes. Ethical decision-making and emotional intelligence are visionary concepts for individuals who are both interested in accountable and comprehensive progress. Likewise, business schools rarely encourage universities to center on spirituality topics. The revealing business scams and crises have unfolded the leadership critical point in organizations. The present leadership practice is incapable to solve the important issues confronting businesses. Moreover, this has brought to the forefront the important roles of spirituality, as well moral and ethical values regarding all facets of the society, especially business. There is an increasing interest among educators, practitioners, and researchers on the wide issue regarding spirituality and its part in business.

1.3. Social media

Social media became an important lead for spreading and acquiring information in different fields, such as business, entertainment, politics, science and crisis management. Social media is so popular due to the opportunity to create, receive and share public messages at free or low costs at any time (Stieglitz et al. 2018).

Social media is a tool that allows people to share various sorts of information and publish it in various formats; as a result, it may be used for marketing purposes that require continual updating. It is an instrument to be utilized for gaining the most limited resource or attention from the users which is a point for achieving the business end-goals. There are some challenges with regards to technology linked to the new trends of utilization of social media. The shift in the economic media is obvious when groups of users are addressed in an individualized way. There is a continuous change with regards to the technological basis and content, which creates a challenge for organizations to continuously check for trends in the content use. Through social media, companies get the chance to collect information, and monitor different opinion of users, imply the targeted audience in a discussion about the services, products, or other related topics. The COVID 19 had a huge influence on all aspect of life, inclusively on CSR and online businesses. Due to the corona virus, many online businesses emerged, and the existing ones had to adapt themselves to the online

environment quickly. In terms of CSR, the fact that most employees have started working remotely or hybrid, has helped corporations reduce overall consumption and be more sustainable. As well, employees showed more efficiency and performance.

Individuals may establish a semi-public or public profile on the platform, create and follow a list of other people with whom they want to be connected, and also navigate or browse their list of friends to check those added by others (Grizanea and Jurgelane, 2016). This is the primary actor of globalization with its hyper textual, convergent, complex, digital and interactive nature. After the COVID-19 pandemic, the number of online outcomes increased dramatically. This leads to a higher level of interconnectedness and complexity in human interactions and society (Chen and Zhang, 2010). The growing usage of social media in the past years is based on features in technology advancement, autonomy, privacy, social presence, playfulness and personalization (Goncalves, Kostakos and Venkatanathan, 2013). Still, like every other adoption of technology, it has also negative aspects. The easy and quickly communication tool, social media, caused privacy issues, false information, offensive contents and mind distraction (Siddiqui and Singh, 2016). On the other side, this instrument has the potential to radically alter an individual's interpersonal structure and create a new sort of spiritual connection.

1.4. Online enterprises

Access to knowledge, as well as the ability to share, it has never been easier thanks to modern technology, and in theory is endless in today's dynamic world. Attracting potential clients over the internet is entirely dependent on the speed with which service providers react and respond (Onete, Pleșea and Budz, 2018). These days, companies unavoidably face huge challenges in their businesses, such as high competition, the unpredictable changes in trends with regards to consumption and more refined customer demands. Unquestionably, the capability of firms to generate and support customer satisfaction is the key element which can firmly determine the success of the business. In order to create and maintain competitiveness to perform better rivalry, it is needed for the companies to struggle to deliver higher quality services to clients, in order to improve customer satisfaction. To achieve this task effectively, it is crucial for the businesses to precisely find out and understand the desires and needs of the customers and be competent to tailor the products or services to meet or exceed customers' expectations and perceptions (Charoensukmongkol and Sasatanun, 2017).

Electronic commerce, online trading or shortly, e-commerce, means buying and selling via the Internet (or other forms of remote data transmission). The electronic mall was the early manifestations of e-commerce founded in the online portals of the 1980s. E-commerce enables consumers to electronically exchange goods and services without time or space barriers. In the previous 10 years, electronic commerce has grown at a remarkable pace, which is anticipated to continue or perhaps accelerate. The distinction between "electronic" and "traditional" commerce will become increasingly blurred as more enterprises relocate in the near future elements of their operations to the Internet. E-commerce is usefully defined as the implementation of trade in goods and services using telecommunications and technological tools.

Nowadays a variety of online shops exist, such as Electronic Money Transfer (EFT), Electronic Data Interchange (EDI), Internet Marketing, Supply Chain Management, Online Transaction Processing or Merchandise Management Systems. The two main forms of e-commerce are “business-to-business” (B2B) and “business-to-consumer” (B2C). The “e-commerce” between two or more entities on the Internet, rather than between a company and its clients, is known as “business-to-business”. B2B enterprises frequently interact with hundreds, if not thousands, of other businesses as clients or suppliers. In comparison to traditional techniques, computerized processing of these transactions offers considerable competitive benefits. E-commerce, when properly executed, is frequently faster, cheaper, and more appropriate than traditional means of transferring products and services. Electronic data exchange (EDI) has been used in electronic transactions for a long time (from now on, EDI). EDI necessitates the creation of a dedicated data connection between each supplier and customer, and electronic commerce is a cost-effective way for businesses to construct several ad-hoc linkages. Electronic commerce has also led to the development of electronic marketplaces, where all parties implied naming clients, suppliers, and new customers are brought together to conduct mutually beneficial business.

B2C e-commerce is the exchange of services or goods over the Internet between shops that operate online and individual customers. User preference for the handiness of online shopping - coupled with the simple with which an online store can be opened - has made e-commerce one of the fastest growing industries. Consumer-to-consumer e-commerce is a consumer who sells goods or services online to another consumer. This sale is frequently eased by a website which is a third-party that assists to take care of the details regarding the transaction. The aim of “consumer-to-consumer” electronic transactions is to allow

consumers to sell straightly towards other consumers without turning to an intermediary. This allows the seller to retain more of his profit and the buyer may be able to buy the goods at a better price.

2. Data models

Spirituality has a great impact on all life, especially where one focuses the most energy. The majority of people spend most of their time at work. The models below show the trajectory and influence of spirituality with regards to work and CSR.

2.1. Impact of spirituality on CSR

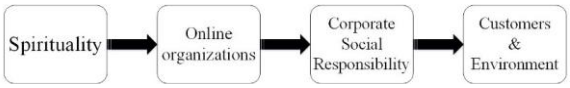
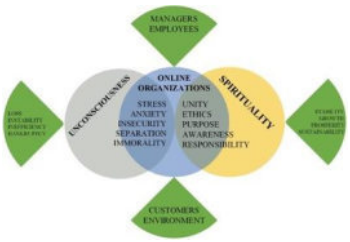


Figure no. 1. Trajectory of Spirituality with Regards to Organizations Model

Once implemented in organizations, spirituality could spread naturally in all domains, with the help of CSR, turning the society, in general, into a more sustainable one. The result could be more awareness towards the customers and environment, as well sustainable growth and prosperity.



Fgure no. 2. Impact of Spiritual Behaviour on Organizations Model

The model above shows the interconnectedness between all elements that form the organizational chain. The impact of spiritual and unspiritual behaviors on managers and employees affects the organizations, which are influencing the customers and environment in a positive or negative way. It must be taken into consideration the benefits of spirituality in all fields.

3. Questionnaire analysis

This article analyzes the influence of spirituality on CSR in organizations that operate online. The purpose of this research is to verify whether there are interrelations between spiritual responsible behaviors and the implementation of CSR. This paper answers the question if spirituality or spiritual awareness could change the tackle regarding CSR, and respectively be implemented in CSR norms. To verify the aspects mentioned above in this research, two questionnaires have been created separately and sent to a sample of 217 individuals who are entrepreneurs and employees. All the respondents answered from proper initiative. The number of questions was 9 for each sample. The questions were the same for both categories, but adapted to each one.

3.1. Description of the used data

The number of respondents was similar in both categories, 98 entrepreneurs and 119 employees. The following table includes general information of the questionnaire's respondents. In this case, entrepreneurs, their backgrounds and the business they are involved in.

Table no. 1. General information about the respondents – Entrepreneurs

Gender		Number of employees		Average profit - €		Average age	
Female	36%	< 50	81%	< 1500	0%	< 25	20%
Male	64%	51-150	15%	1501-3000	11%	26-35	56%
Unknown	0%	> 151	4%	> 3000	89%	> 36	24%

The following table contains general information of the employees about their backgrounds and the firms they work in.

Table no. 2. General information about the respondents – Employees

Gender		Number of colleagues		Average income - €		Average age	
Female	57%	< 50	15%	< 1500	76%	< 25	40%
Male	43%	51-150	38%	1501-3000	22%	26-35	45%
Unknown	0%	> 151	47%	> 3000	2%	> 36	15%

We can see that there is no significant difference regarding the number of the respondents of each questionnaire.

3.2. Questionnaire answers

In the charts below, we can find information with regards to the respondents' answers divided in the two categories.

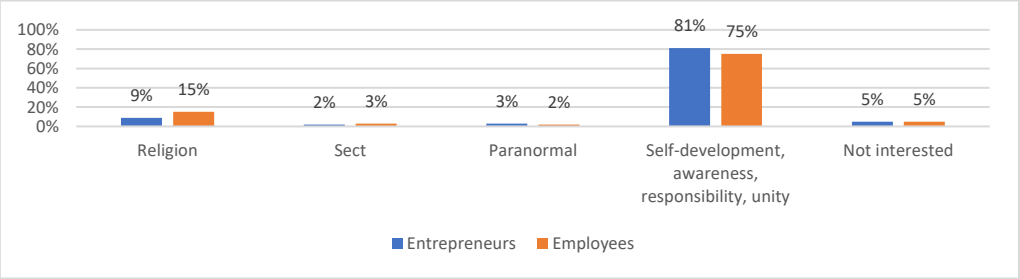


Figure no. 2. Meaning of spirituality from each's sample's point of view

As we can see, most of the entrepreneurs think that spirituality brings self-development and strengthens relationships by being more conscious as a person. They became more aware that spirituality is compulsory for a beneficial change in business. The chart above shows that employees as well see spirituality as an important factor nowadays. They are seeking ways to improve their lifestyles and mindset. By adopting a mindful, present approach, employees know that this is a great way to increase their productivity and creativity. Spirituality can help people see more clearly their common purposes with regards to work.

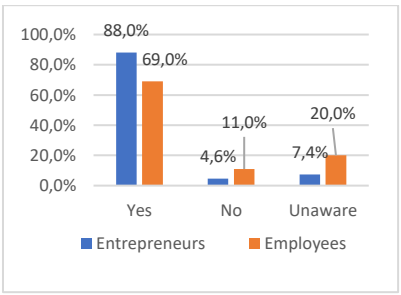


Figure no. 2. Beliefs about the contribution of spirituality in companies linked to CSR

Entrepreneurs believe that spirituality might have a big contribution towards the business approach regarding CSR. Including spirituality in CSR would correct tremendously the problems and inequalities that organizations have. The employees pay a huge part as well. From the employees' perception, spirituality might actually change the business environment dramatically in a better way for all parties involved. When having a positive approach in general, and empathizing with other beings, there are no losing parties.

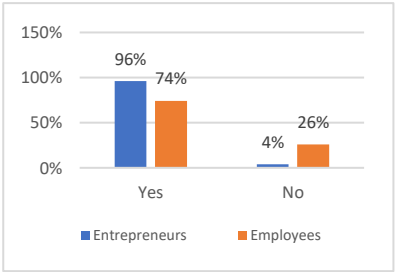


Figure no. 3. Do corporations imply in online social responsibility programs to utilize this as a growth indicator?

Entrepreneurs' perception about this is that the main reason corporations and other businesses involve in social responsibility programs is to utilize this as an indicator for growth. Being more exposed and interested to this kind of information, entrepreneurs are aware that it is an important instrument for manipulation and advertising. The most part of employees are conscious that the adoption of "corporate social responsibility" planning by major companies and corporations are far from transparent. No visible results were in the local communities regarding the improvement of the quality of life and the environmental protection most of the times.

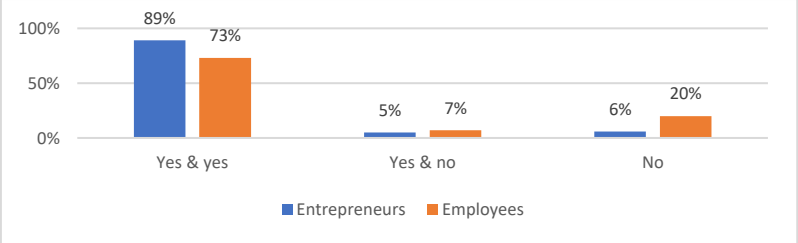


Figure no. 4. Do respondents apply spirituality in their daily personal and work life? And if yes, does it have positive results?

Most entrepreneurs apply spirituality in their daily personal and work life. The majority of them are making positive affirmations and visualization meditations in the first minutes after they wake up. This helps them have better perspectives and face the daily challenges more easily. Spirituality is getting more popular at workplaces. Employees are starting more and more to implement positive affirmations, and thinking in order to cope with stress and workload. They mentioned that they personalize their offices with positive affirmations and photos that elevate their mood, and try to be mindful when dealing with several work problems.

Conclusions

Results of the present study show that employees and entrepreneurs believe there is a strong connection between spirituality in correlation with success, self-development, awareness and unity. Both parts think that spirituality could have an important contribution if implemented in businesses with regards to Corporate Social Responsibility. The majority of them, especially entrepreneurs think that corporations get involved in social responsibility programs to utilize this as an indicator for their businesses to grow. Entrepreneurs and employees apply spirituality in their professional and personal life on a daily basis, and mentioned that it has positive effects. The percentage is bigger for entrepreneurs than employees due to their schedule, having the possibility to organize their time as they wish, not being so conditioned when wanting to invest in their personal and spiritual development. As well, they have the possibility to spend more time searching for spiritual information and techniques.

Personal development contributes to self-evolution and awareness and influences the exterior environment as well. Entrepreneurs are independent individuals, motivated by personal development, and could have a great impact on employees' way of thinking regarding spirituality and CSR. The profession and motivation influence the implication in social responsibility programs. The spiritual way of thinking shifts mind patterns and leads towards more responsibility and empathy. It is difficult to accept that there is no perfect model to apply spiritual CSR in companies or to endorse authentic spirituality at work. By exposing good practices and through an excellent leadership role model, replicating spirituality techniques is possible. They can also be promoted through good will. However, there are no exact ingredients to achieve spirituality at work for sure. In order to adopt a spiritual and holistic viewpoint, people must celebrate their individualities and not embrace a "one-size fit all" attitude. The consciousness of our own nature is very important for personal achievement, to cope properly with others and to be respectfully acknowledged.

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Designing a General Framework of Sustainable Diet Guideline for Romanian Population Based on Young Consumers' Insights. A Qualitative Study

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Abstract

Even though the high progress has been made in agriculture and food industry lately, it has become obvious that most of the contemporary diets are unsustainable. Intensive production of agri-food raw materials and their industrial processing, together with the exponential growth of world population and its increased urbanization rate have led to an alarming level of environmental pollution, dramatically limiting the possibility of preserving natural resources, with negative consequences on the "legacy" passed on to future generations. This paper aims to identify some of the key-elements that should be used in designing a general framework for a new model of sustainable diet for Romanian population. Given the willingness of young consumers to embrace the principles of sustainable diet, the framework we put forward was conceived by incorporating their views, fact that support the originality of our study. The research undertaken is based on qualitative data collected from a sample of 26 Romanian students, through the method of narrative inquiry based on participant produced narratives. Data analysis highlighted respondents' standpoints regarding the key-messages that should be included in a sustainable diet guideline for Romanian population, showing a clear focus on flexitarianism, locally grown and less processed foods and healthy and environmentally friendly food habits. Based on respondents' insights, we build the framework for a new model of sustainable diet for Romanian population around the core ideas on traditionality, sustainability and health, organizing its key-messages on the following three pillars: tips targeting foods and cooking methods; directions for reinforcing the traditionality; guiding principles addressing health and sustainability.

Keywords

Sustainable diet, health, environment, food consumption behaviour, traditionality, consumer education, qualitative research

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Introduction

There is clear evidence in the previous literature that the current food consumption behaviour of most consumers poses great negative impacts for their own health and the environment. Research has shown that the "Western/North American diet", which, generally based on both energy-dense and nutrient-poor processed foods, determined the "double burden of malnutrition" (Popkin, Corvalan and Grummer-Strawn, 2020), fueling the most common NCDRDs (non-communicable diet-related diseases) (Maillot et al., 2007; Alleyne et al., 2013; Pieniak et al., 2016; WHO-UN, 2018). The big issue of this diet lies in the overconsumption of meat and processed meat, especially the red one, which is considered the most harmful form of food consumption of all foods of animal origin, both from environment and consumers' health (Hallström, Carlsson-Kanyama and Börjesson, 2015; Dettling et al., 2016; Ranganathan et al., 2016). Thus, considering the general framework of contemporary food, the transition towards a sustainable diet has become a priority all over the world lately. Obviously, this goal requested strategies and programs for consumer education. The starting point was to provide the public with a consistent vision about what should be understood through sustainable diet. After many attempts to find the most comprehensive definition, in 2010, FAO

came up with a consensus definition, according to which ”sustainable diets are those diets with low environmental impacts that contribute to food and nutrition security and to healthy lives for present and future generations; sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable, are nutritionally adequate, safe, and healthy, and optimize natural and human resources” (FAO UN, 2010). Then, the emphasis was on understanding consumers' perception on sustainable diet and their willingness to change their behavior to align with sustainable diet principles. The rise of consumer’s interest for this topic has emerged as a common finding for many recent pieces of research (Werle, Trendel and Ardito, 2013; Johnston, Fanzo and Cogill, 2014; Aktas et al., 2018; Austgulen et al., 2018; Rejman et al., 2019; Żakowska-Biemans et al., 2019). In Romania as well, previous research has highlighted the consumers’ desire, especially those of the younger generation, to make the shift to a more healthy and sustainable diet (Voinea et al., 2019; Bumbac et al., 2020).

A step forward in the demarche of consumer education could be considered the attempts to incorporate sustainability into dietary guidelines, to provide consumers with the conceptual framework needed to make the switch to a sustainable diet. The first countries that explicitly introduced sustainability in their national eating patterns, launching sustainable diet guidelines were Germany (2014), Brazil (2014), Sweden (2015), Qatar (2015), Norway (2015), Canada (2019). As for Romania, even though the dietary guidelines in force, developed in 2006 by The Ministry of Health in collaboration with some universities and nutrition institutes, have different impacts on health and environment through some of its key messages (such as eat plenty of cereals, fruits and vegetables, choose foods that contain small amounts of fat, eat highly processed foods rich in sugar sparingly) (Graur, 2006), however they do not have a direct focus on sustainability. To fill this gap, *the main purpose of the undertaken study is to put forward a general framework for a further development of a new model of sustainable diet for Romanian population*.

Taking as a starting point the fact that the traditional elements of food preferences are still important for Romanian people (Purcărea et al., 2013; Voinea et al., 2020) and that sustainable diet should be not only healthy and environmentally friendly, but folded on the cultural pattern of food consumption as well (Johnston, Fanzo and Cogill, 2014), the framework for a sustainable diet guidelines was designed to have a clear focus on the relationship between traditionality, sustainability and health. Because previous research has shown young consumers’ willingness to embrace the principles of sustainable diet, the proposed framework was conceived by incorporating their views, fact that support the originality of present study.

To do this, the following research question was addressed: *What are the key-elements that should be included in a sustainable diet guidelines for Romanian population, from young consumers’ standpoint?*

In order to provide a comprehensive answer to this question, a qualitative research was carried out on a sample of Romanian students, using the method of narrative inquiry, to elicit research participants' standpoints regarding the key-messages that should be included in a sustainable diet guideline for Romanian population. To reach its aim, the study, divided into several sections, starts with an introduction which underlies consumers’ responsibility for the sustainability of food system. Next sections present the methodology of the research carried out and the discussion of its results. The paper ends with a section comprising authors’ recommendations and another one dedicated to conclusions.

2. Research methodology

The present qualitative study, aiming at designing a general framework for a new model of sustainable diet for Romanian population, used narrative data collected from a sample of students from The Bucharest University of Economic Studies. Taking into account the main aim of our research, we considered the narrative inquiry based on participant produced narratives the most suitable methodological approach, because it allows to emphasize the naturally emerged points of views and interpretations of research participants and further develop theoretical explanations (Coffey and Atkinson, 1996; McAdams, 2012; Saunders, Lewis and Thornhill, 2019). For the purpose of our study, we collected narratives from our informants, which include their points of view on the defining aspects of a sustainable diet for Romanian population.

Research questions

Having as a starting point the young generation willingness to make the switch to a sustainable diet, our study addresses the following question: *What are the key-elements that should be included in a sustainable diet guideline for Romanian population, from young consumers’ standpoint?*

Research participants' profile

The research was carried out between October-December 2021 and data were collected from a sample of 26 respondents (10 men and 16 women), grouped in 13 teams of two members. Respondents were aged from 19 to 24 years and all of them were undergraduates at The Bucharest University of Economic Studies,

Faculty of Business and Tourism. The respondents' teams were alphanumeric encoded, from T1 to T13, and for students' names an alphabetic code was used, representing the initials of their first and last name (s), as follows: T1 (PAL, PLA), T2 (BRG, BE), T3 (NIA, HT), T4 (IA, CIR), T5 (VV, TI), T6 (MIM, TG), T7 (BIA, GAA), T8 (II, DI), T9 (IAJ, CB), T10 (BB, APC), T11 (IT, MA), T12 (SRM, HE), T13 (PI, SM).

Data collection and analysis

To elicit research participants' standpoint regarding the elements that define a sustainable diet for Romanian population, they were asked to provide a short narrative in which to highlight the following aspects: the food groups that should be included in a sustainable diet and their frequency in consumption, the types of foods that should be avoided, behavioral guiding principles for consumers concerning health and environmental sustainability. Given the aim of our study, to the corpus of narratives provided by participants we applied the narrative analysis approach, described by Saunders et al. (2019). In this process, we worked across all the narratives at the same time, providing codes (with the support of Microsoft Word and Excel), building-up categories and developing themes (Drisko, 2013). Further, we relied on sustainable diet theoretical framework as it reflected in the previous scientific literature (Johnston, Fanzo and Cogill, 2014; Fischer and Garnett, 2016), to interpret the data collected from informants and thus to contribute to the building of a general framework for a new model of sustainable diet adapted to Romanian population.

3. Results and discussion

Data analysis was organized by the following three themes which were established and interpreted by taking into account the categories identified in the whole corpus of data.

3.1. Flexitarianism comes to the fore: plenty of plant-based foods and handful of animal-based foods

In line with Grunert (2011) and Austgulen et al. (2018), data show that young consumers are taking the responsibility for food sustainability as they expressed the support for flexitarian eating style, pleading for the transition towards a plant-based and low-meat diet. Respondents' key messages regarding the basic food groups (Table no. 1) primarily recommend a predominant plant-based food consumption concomitant with a low-meat consumption. Although nowadays vegetarian or raw-vegan diets tends to become a fashion (Cohen, Leroy and Karpagam, 2019), Romanian young consumers do not advocate for the definitive elimination of meat, but only for the significant reduction of its consumption, which denotes an understanding of the fact that flexitarian eating style could be the right choice for both individual and environmental health, as it was pointed out by Morrison (2019). This finding comes to reinforce the claim of de Boer and Aiking (2017), according to which meat can be part of a sustainable diet if eaten in moderation and produced sustainably. As research subjects' narratives show, key-messages related to dairy products and fish are built around the concept of moderation (Fischer and Garnett, 2016) revealing their deep understanding not only of the nutritional advantages, but also of the disadvantages of these food groups. The key-messages related to fat and oil are developed on saturated-unsaturated antagonism, favoring the consumption of vegetable oils to the detriment of animal fat. Overall, key-messages proposed by respondents reveal young generation awareness of both the main health benefits and potential risks of the basic food groups.

Table no. 1. Respondents' key-messages related to plant and animal-based foods

Food groups	Respondents' quotes
Fruits, vegetables and cereals	*"Each meal should contain fruits or vegetables or cereals." (T3)* *"Half of your plate should be fruits and vegetables. Whole grains are better than powders." (T10)* *"Fruits and vegetables are a great source of vitamins and minerals, lots of fibers they are low calorie and low fat. Cereal and cereal products are an important source of energy." (T13)*
Meat	*"Consume meat occasionally; balance the meat consumption with plant-based alternatives." (T2)* *"Choose lean meat, preferably not imported. Have meat free meals a couple of times per week." (T7)*
Dairy	*"Consume moderately and try to focus on lower fat versions." (T4)* *"Dairy products are vital for our daily meal plan, providing with the necessary intake of calcium and many other good elements, but we should choose low-fat products." (T6)* *"Reduce the amount of cheese consumed." (T10)*
Fish	*"Fish and seafood are important sources of iron and should be consumed twice a week." (T6)* *"Eat small quantities of fish and aquatic products sourced from certified fisheries." (T8)* *"Try to eat fish twice a week and vary the type of fish you consume." (T11)* *"Some sort of seafood like shellfish can be an environmentally responsible choice." (T13)*
Fat and oils	*"Choose healthy vegetable oils and avoid saturated fats." (T3)* *"Go for healthy fats and oils: avocado, coconut, grapeseed, walnuts." (T7)* *"Try to avoid the products full of fat and use healthy oils like coconut or olive." (T10)*

3.2. Focus on locally grown and less processed foods

Data show Romanian young people are characterized by the same proactive attitude towards eating habits to which Rützler and Reiter (2018) refer in their study, as they are interested in checking different aspects of food quality more rigorously.

One aspect concerns the nutritional quality, as a multitude of key- messages proposed by respondents urges consumers to avoid overprocessed foods, because the high content of added sugars, saturated fats, sodium or food additives that they might contain (Table no. 2). Similar findings related to consumers' awareness about side-effects of processed food can be found in the studies of Heerman et al. (2017) and Bobe, Procopie and Bucur (2019).

Another issue is related to the origin of foods. The key-messages meant to draw consumers' attention to locally sourced foods (Table no. 2) prove respondents' deep understanding of the fact that healthy eating is an issue of ethics too and strengthen the findings of previous research related to consumers' increased interest for local producers and short food supply chains, perceived as opposed to mass production and also as necessary conditions for providing high food quality and economic sustainable growth (Butu et al., 2019; Brumă et al., 2021).

Table no. 2. Respondents' key-messages related to processed foods and locally grown foods

Consumers' attitude	Respondents' quotes
Limit the processed food intake	*"Avoid frequent consumption of processed foods rich in added sugars, saturated fats and sodium." (T2)* *"Processed foods are not healthy and should be avoided as much as possible." (T6)* *"Avoid processed foods full of additives." (T10)*
Support for locally grown foods	*"Eat fish caught locally." (T1)* *"Look into buying fruits and vegetables from trustworthy sources and farms. Preferably choose meat from local farms rather than mass production ones." (T4)* *"The dairy products must be from locals, in order to be natural." (T5)* *"Encourage local productions and small local entrepreneurs through buying from them before considering any other source." (T6)*

3.3. Embracing healthy and environmentally friendly food-related habits

A deep awareness that what is good for human health is good for the planet too (Morrison, 2019), and that consumers' food choices and food-related habits can have an impact on environmental sustainability and our food supply emerged from the data. The analysis of the whole corpus of data revealed respondents' awareness of the central role played by consumers in the transition to a sustainable diet and the multitude of behavioral changes needed in all phases of the food consumption cycle (Table no. 3). This resonates with the findings of prior research of Johnston, Fanzo and Cogill (2014), Röös et al. (2020) and Bajželj, Laguzzi and Röös (2021). Based on the key-messages provided by respondents, we outlined the following three directions for changing consumers' food-related habits: adopting healthy cooking methods, preventing food waste and loss and reducing the environmental impact.

Table no. 3. Respondents' key-messages related to sustainable food habits

Food-related habits	Respondents' quotes
Healthy cooking methods	*"Avoid frying, use baking, streaming and boiling." (T1)* *"Remove excess fat from meat products." (T7)* *"Prepare food at the right temperature needed for every product." (T11)*
Prevention of food waste and loss	*"Buy just what you need, use the leftovers that are still edible." (T1)* *"Buy and cook rational quantities of food to avoid food waste and loss." (T2)* *"When you go shopping do a list, prepack your food for a whole week." (T9)*
Reduction of the environmental impact	*"All our actions should be more nature friendly." (T3)* *"Eat less meat, use less plastic, collect food waste separately." (T8)* *"Avoid food waste, try to find products that are environmentally friendly and fair trade." (T13)*

4. Recommendation

The research team's initiative to design a framework for the further development of a sustainable diet guidelines for Romanian population aligns to the conclusions of the report of The World Resources Institute (WRI) (Ranganathan et al., 2016) which warned that "it becomes very urgent to profoundly change our food strategy and to promote fair, culturally-appropriated, biodiversity-based, sustainable diets".

Based on the emerged themes in the process of data analysis and interpretation of results, research team drew up the sustainable diet general framework as a set of key-messages with a more direct target on the relationship between traditionality, sustainability and health. In this regard, there were considered the key-components of sustainable diet proposed by Lairon (2012): well-being and health; equity and fair trade; cultural heritage and skills; food and nutrient needs; food security and accessibility; biodiversity, environment, climate; eco-friendly, local, seasonal foods.

The set of key-messages put forward by the research team to underpin the further development of a sustainable diet guidelines for Romanian population is organized on the following three pillars: tips targeting foods and cooking methods; directions for reinforcing the traditionality; guiding principles addressing health and sustainability.

I. Tips targeting foods and cooking methods

Focus to:

- Eat plenty of seasonal and locally grown fruits and vegetables (5 servings daily)
- Eat at least half of cereals and derived products (bread, pasta etc.) whole
- Eat local nuts and seeds (sunflower, pumpkin, flax, nuts, hazelnuts) as snacks
- Eat eggs from hens ecologically raised
- Eat lean proteins sources (poultry, turkey, fish, pulses)
- Eat low-fat dairy products
- Use cold pressed vegetable oils from local sources (sunflowers, colza)
- Use local aromatic herbs for seasoning the dishes

Try to avoid:

- Saturated fats and trans forms
- Sugar and sweets
- Strong alcoholic beverages
- Sweetened dairy products

Cooking methods:

- Prefers boiling, baking, steaming instead of frying
- Remove the skin and the visible fat from meat before cooking
- Use small amounts of vegetable oil instead of animal fat when cooking
- Prepare food without additional high-fat sauces

II. Directions for reinforcing the traditionality

Make eating important in your life:

- enjoy meals with family and friends
- eat regularly and respect the time-table for the main meals of the day
- share cooking skills

Consider seasonal and locally grown food

- focus on seasonal and locally grown foods
- eat canned local vegetables and fruits in the off-season
- eat light meals during the warm season
- eat pork and charcuterie moderately during the cold season

III. Guiding principles addressing health and sustainability

- Be active, do more exercise
- Constantly check your weight
- Stay hydrated, drink at least 2 litters of water daily
- Drink alcohol in moderation (for women no more than 14 alcohol units a week and for men no more than 21 alcohol units, where 1 unit is equivalent to 10 ml of 100% pure alcohol)
- Eat small servings
- Limit the consumption of processed foods and avoid ultra-processed foods
- Reduce at least 1/3 of added sugar from pastry recipes
- Be flexitarian:
  - eat mainly foods of vegetal origin
  - eat less red and processed meat
  - replace at least 1/3 of meat from recipes with plant origin food (cereals, pulses or root vegetables)
  - have at least 3 meat-free days weekly
- When go shopping, get used to making a shopping list and buy just as much as you need
- Check food label and pay attention to:
  - nutritional information (choose processed foods with no more 15 g/sugars, 20 g of fat, 5 g of saturated fat, 1.5 g of salt or 350 kcal in 100 g)
  - ingredients list (try to avoid high-processed foods with high fructose syrup, hydrogenated fats and many food additives)
  - sustainability-related packaging symbols (look for "eco", "fresh", "natural",

"clean", "STG", "DOP", "IGP", "recycled", "biodegradable")
- Try to reduce your household's food waste and loss:
  - use fresh ingredients whenever possible to reduce packaging waste
  - freeze food leftovers
  - donate food leftovers if they are suitable for consumption
  - smell or taste food before throwing it out and consider that some of them are often good after the expiry date
- Use environmentally friendly cleaning products (bags, gloves, dishwashing etc.)
- Collect (food) waste separately

If Romanian consumers would embrace a new eating behavior model based on a flexitarian food style with emphasis on seasonal and locally sourced vegetables and fruits, low meat consumption, and sustainable methods of food processing, it may result in increasing consumers' health protection and environment preservation.

Conclusions

Recent research (Pieniak et al., 2016; WHO-UN, 2018; Popkin, Corvalan and Grummer-Strawn, 2020) demonstrates that the diet adopted predominantly by Western/North American consumers is based on excessive consumption of highly processed, energy-dense products that are poor in essential nutrients. The obvious consequences of such a dietary style, in which processed meat and especially the red one predominate, are linked to the so-called "double burden of malnutrition", which translates into major health risks for consumers and a strong negative impact on the environment. As consequence, apart from recycling, reducing food waste and supporting the consumption of local products, there is an urgent need to move towards sustainable diets (Voinea et al., 2019), based mainly on plant origin food products, which should be supported by both food producers and consumers.

Take into account the willingness of young generation to gradually adopt the principles of sustainable diet, the objective of our study was to offer insights on Romanian young consumers' view on sustainable diet, in order to propose a general framework of recommendations for the further development of a new dietary model for Romanian population, based on the relationship between sustainability, traditionality and health.

The methodology used in our qualitative research was based on narrative inquiry, through which we collected narratives from a sample of 26 undergraduates, grouped in 13 teams, from The Bucharest University of Economic Studies.

As a result of data analysis process, three main themes emerged, reflecting young people's stance toward the principles of sustainable diet: the willingness to adopt a flexitarian dietary style, based on preponderant plant origin food consumption and a low meat consumption, the concern for supporting local, traditional products while reducing the consumption of highly industrially processed foods, and the call for adopting healthy and environmentally friendly food-related habits. These themes were used by the research team as a basis for designing a general framework that can support the further development of a sustainable diet guideline for Romanian consumers, in the form of a set of key-messages organized under the following three pillars: recommendations targeting food and cooking methods, directions for strengthening tradition and guiding principles approaching sustainability and health.

Considering dominant characteristics of contemporary food, the transition to sustainable diets has become a priority worldwide lately. We believe that the achievement of this goal requires a synergic action by academia, research institutes and both governmental and non-governmental organizations.

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Software as a Service's Role in Sustainable Business

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Abstract

Environmental legislation places ever greater and occasionally forceful pressure on companies to comply with norms that can be disruptive to business and profitability. Digitalization is a first step towards more agile operations and more environmentally friendly practices, supply chains, and decisions. The data-driven company can more easily comply with new environmental requirements, however, digitalization can itself be a burden on a company's finances, particularly if it is in its early stages, and, just as critically, IT infrastructure can represent a significant portion of a company's footprint. Datacenter power consumption has been extensively analyzed by legislative bodies and private companies and has been determined to be a significant element of total worldwide power consumption and operating a datacenter can be detrimental to a company's carbon footprint goals. Datacenter location, proximity to renewable power sources, and infrastructure optimum utilization cannot be controlled in an independent establishment operated by a company who operates is a totally different business than IT. The article explores studies, reports, and material and addresses how Software as a Service helps mitigate environmental concerns around digitalization, by allowing companies to consume IT resources (infrastructure, software, human capital) in the most scalable and sustainable manner possible. The paper concludes that digitalization is a key step towards sustainability, that data driven organizations will gain a competitive advantage, and that Software as a Service is the most appropriate path to sustainable digitalization.

Keywords

Sustainability, datacenter, Software as a Service, carbon footprint, efficiency

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Introduction

Sustainable development represents a mix of environmental goals but also values, as described by Pătărlăgeanu et al. (2020) who also delve into the fact that scientific literature and the focus on sustainability were very extremely rare in the 1960s and 1970s, with all of that changing beginning with the 1980s. However, as pointed out by Dinu et al. (2020), companies and individuals have focused on "Green Procurement" in order to align with environmental and sustainability goals, a commendable effort, one which, however, one that addresses punctual issues for the most part rather than systemic ones.

Jora et al. (2022) elaborates on the increased legislative pressure applied in recent years, particularly by European legislative bodies, for companies and governments to embrace sustainability objectives. As these are more and more optimistic, they can impede companies' ability to compete effectively. Furthermore, companies face the challenges of operating in a modern, digital world, while at the same time doing so within the strict boundaries of legislation. While companies view digitalization to achieve sustainability objectives, they approach the process gradually due to limiting factors in their budgets or expertise.

This paper explores the competitive edge, the agility, and the adaptability a data-driven company will display and how these characteristics are interlinked with sustainability goals. It goes on to describe the nature of the challenges digitalization can present and how digitalization efforts can, depending on the

approach, be detrimental to sustainability targets such as carbon footprint. Additionally, the aim is to underline how delayed digitalization can itself represent a major issue, as it requires a full IT overhaul of a company. Further details are offered about the challenges that operating a complex IT environment can present and the impact, both financial and environmental, that datacenters can represent.

The purpose of the paper is to describe a solution for companies that seek accelerated digitalization and who are faced with the legislative constraints of meeting environmental goals or seek to do so as part of their core values. This is in the form of Software as a Service, a more modern means of 'consuming' IT resources in the 21st century, taking advantage of the proximity of the data center to renewable power sources, the efficiencies brought about by standardization between multiple customers, data security, and economies of scale. The paper describes how Software as a Service addresses numerous issues, particularly in sustainability, in a manner that allows economic operators to focus on their core business while simultaneously reducing their carbon footprint.

1. Sustainability driven by legislation and enabled by digitalization

In the context of the European Green Deal (EU Commission, 2019), we observe a tendency to accelerate, even force, a change in the structural components of economic sectors aimed at achieving a more “green” and “sustainable” economy before a deadline.

Jora et al. (2020) reflect on the relationship between law and legislation and the sometimes difficult to achieve balance between the two. When existing norms and legislation either force digitalization or transition towards a green economy, the authors conclude that unforeseen consequences can affect participants in an economy. A legislative framework that is both restrictive and overly optimistic will inevitably limit the potential turnover and will result in exposure to problems generated by segments of the economy that have been artificially inflated and prioritized (for example, electronic 'waste', obsolete batteries for electric vehicles, unexpected energy expenditures, supply chains that are inadequate for increased volumes).

Sustainability, viewed as the efficient and economic use of resources, is based on decisional factors in any economic activity. Appropriate allocation of resources, anticipating the use of those resources and their consumption, and efficient cost structures are just examples of constant challenges facing management teams across all industries today. Competition has traditionally been the main catalyst towards an increased focus on these factors. An economic operator who has been able to reduce cost, who could increase productivity, and ultimately obtain a superior profit margin, can implicitly face an overcome his competitors in the market. The fight over market share has often occurred in the field of efficiency and agility in business (Marshall et al., 2019).

In the context of the green economy, legislation can deviate from traditional views on efficiency, and ambitious goals our society strives for can occasionally go against the current structure of our industry and economy. An example cited by Jora et al. (2020) is that of electric vehicles. These comply with existing legislation and “green” objectives; however, their very feasibility as a replacement for internal combustion-based vehicles remains exclusively a result of government intervention (incentives for purchase by the population, tax deductions and credits for manufacturers, government investment in charging infrastructure and not private investment).

Agility and supply chain adaptability to the most recent norms becomes critical, the decisions that form the basis of any change process will be the most appropriate ones only when they are based on accurate and abundant data. Immediate availability of data is a practical consequence of digitalization. It concludes that companies are increasingly viewing digitalization as a means to achieve sustainability objectives and that management teams view digitalization as a critical milestone. However, the approach to digitalization is gradual, limited by the in-house expertise within companies, the need to invest in additional skills, and the prohibitive nature of a full IT overhaul. Reflecting on the unforeseen consequences of sustainability efforts, the cost of digitalization and ultimately operating in a modern digital manner can exclude a large component of local economies from keeping up with competition.

Turkeș, Stăncioiu and Băltescu (2021) conclude that, for enterprises, digitalization represents a complex process that ultimately allows the implementation of the necessary means to generate a profound and sustainable change at the level of the entire business model and work activity itself. Digitalization will be a determining factor in companies' ability to generate increased cash flow, therefore equipping them financially to adapt to newer, more strict environmental legislation and adapt their supply chains in an agile fashion.

Data-driven organizations can take proactive steps to influence their reputation positively, actually leveraging environmental goals to their advantage. They can and will factor in reputation risk in their decision-making process, aggregating multifaceted data available to identify the fine balance between sustainable development, positive marketing, and margin objectives. Ultimately, they will enjoy wider support from their customers, legislative bodies and the market, therefore gaining a competitive advantage as concluded by Tăchiciu et al. (2020) when reviewing reputational risk, particularly in the financial industry in Romania.

These early pioneers are companies that have the mechanisms, often digital, necessary to transfer the added cost of sustainable business to their customers. This is often achieved through marketing campaigns fueled by sentiment data, rapid analysis, and subtle trends in the market, which they are able to anticipate and adapt to.

I shall offer a solution to a challenge that many currently non-digital operators are facing today in order for them to be able to walk the fine line between achieving digital objectives in order to remain competitive and remaining compliant with existing sustainability-focused legislation. This challenge is the massive allocation of capital required to address the delayed digitalization of a company while at the same time balancing digitalization with sustainability and environmental goals.

2. Impact of the datacenter on the carbon footprint, colocation, and Software as a Service

Paradoxically, digitalization of a company, while increasing agility and responsiveness to business conditions and environmental legislation, will likely increase its carbon footprint through the need to operate IT infrastructure and build a datacenter of its own. Datacenters are capital-intensive, energy-intensive establishment, which place a massive human resource burden on companies undertaking their journey to the digital world.

Building a datacenter and operating the hardware and software infrastructure required to digitalize the company's operations will require capital investment at a scale that most medium-sized operators will not be able to sustain. Furthermore, the operation of the data center and the maintenance of daily operations can, depending on the primary activity of the company, represent the most negative impacts on its carbon footprint in its day-to-day operations.

Bouley (2020) concludes that datacenters can be up to 40 times more energy intensive than an office building and are designed around different parameters than buildings meant to house workers. As the main consideration for a datacenter room would be ensuring integrity of the systems it houses, a company is less likely to be able to use existing space due to humidity, ventilation, cooling, and energy requirements. Failover considerations must also be taken into account, which usually leads to increased investments in locations and infrastructure to ensure business continuity.

The proximity to sustainable power sources is also difficult, if not impossible, for individual companies to ensure. Their business, offices, and personnel locations will be dependent on their primary activity. Easy access to sustainable power sources or more appropriate climate conditions is very rarely an option for individual operators; therefore, power consumption can increase to compensate for weather that is less ideal, regardless of the type of power sources used.

In recent years, companies have resorted to taking advantage of the real estate of datacenter operators to house their infrastructure. The model is known as colocation and provides access, for a fee of course, to more appropriate locations. Furthermore, colocation datacenters can achieve proximity to sustainable power sources such as hydroelectric power plants or wind farms and climate-controlled rooms. Those facilities average lower per-unit costs of operation due to economies of scale. However, the model retains numerous limitations, listed below:

- Maintenance and replacement of obsolete equipment remain the responsibility of the tenant.
- Software maintenance activities require system administrators, developers and consume human capital resources in quantities that differ little from hosting the equipment in-house
- Geographic considerations remain a factor due to the inherent nature of maintenance activities, and companies are still required to have resources available for on-site activities.
- Several restrictions are applied by the datacenter operator to the equipment housed in their facilities, such as standardized rack sizes, renting rack space in increments that sometimes do not reflect the owner's requirements, leading to unused space that is still paid for.

- Equipment depreciation, maintaining infrastructure modern, and ensuring security remain the responsibility of the tenant

The model only answers part of the problem for organizations looking to transform into digital, environmentally friendly, and sustainable companies. In the Datacenters and Decarbonization Report (Bloomberg NEF, 2021) published in October 2021 jointly by Bloomberg NEF, Statkraft and Eaton Corporation, it is concluded that large data centers in the UK, Germany, Ireland, Norway and the Netherlands are projected to draw 5.4GW (gigawatts) in 'live IT power' demand in 2030, up from 3GW at present. This is exacerbated by inefficiencies in most of the client's operating independent segregated IT infrastructure within major datacenters, adding to the already inefficient operation of 'on location' datacenters and datacenter rooms that are still widely present at the European level.

Economic operators will find it increasingly difficult to meet optimistic environmental and carbon footprint goals set out by legislative bodies, ensure rapid and sustained digitalization meant to obtain or retain a competitive advantage, and hire the right resources to operate in a digital-first environment. The paper aims to analyze an increasingly popular alternative approach that brings benefits in all areas of concern addressed so far, namely Software as a Service. In essence, this represents consuming the entirety of an IT infrastructure as a service, compared to developing in-house IT infrastructure from the ground up by each individual company, as well as maintaining that newly developed infrastructure current.

This approach answers several challenges that both legislative constraints may pose as well as financial one related to the initial capital investment that modernizing and maintaining an independently operated IT infrastructure can bring.

- Significant capital expense related to hardware and software licenses or software development (Rodrigues, Ruivo and Oliveira, 2021)

- Significant recurring expenses related to human resources, among the most expensive in the market and presenting one of the highest turnover rates (Williams Towers Watson, 2021).

- A significant increase in the energy consumption footprint of the individual company only partially offset by colocation models (Gholamhosseinian and Khalifeh, 2012).

- Elasticity and flexibility within the IT infrastructure space are limited to whatever investment and 'room to maneuver' has been built into the initial project.

- Operating a frequently non-homogenous IT environment, often a patchwork of independently developed applications which gather and process data depending on limitations of a single IT team. (Gholamhosseinian and Khalifeh, 2012)

- Innovation and market data are limited to the company’s own investment capabilities and research, essentially driven solely by the company’s available budget.

Software as a Service can address these factors, increasing competitive advantages for economic operators while at the same time ensuring sustainable operations, thus contributing positively to the company’s carbon footprint. (IDC Corp., 2021). To begin with, SaaS requires comparatively very little in terms of capital expenses; it is for the most part an operational expense incurred on a consumption basis. The SaaS ecosystem will allow for IT consumption without the need to operate a datacenter and ensure appropriate conditions, purchase expensive equipment which depreciates rapidly in value, or perform hardware maintenance. The SaaS vendor is in charge of maintaining the hardware and the software, part of the connectivity, hosting the data, and addressing ever-evolving security requirements (Gholamhosseinian and Khalifeh, 2012).

Energy expenditure is also minimized, mainly due to the SaaS vendor’s ability to take advantage of the same factors that colocation providers are able to leverage. Proximity to renewable power sources is possible for large-scale operations, as investments in those areas can make sense when the core business is operating IT infrastructure and datacenters (Anderson et al., 2021).

One of the largest Software as a Service vendors in the world (Oracle Corp., 2021), offering a portfolio that spans the entirety of Enterprise Applications, the company clearly outlines how this model of consuming IT can leverage all the benefits listed above in their 2025 Sustainability objective:

- 100% renewable energy for Oracle Cloud

- 100% renewable energy use for Oracle Real Estate and Facilities

- 25% reduction in air travel emissions for employees

A study conducted by Accenture for Microsoft referenced in Data Center Efficiency, Renewable Energy and Carbon Offset Investment Best Practices (Costello et al., 2021), compared the environmental impacts of providing three of Microsoft's business applications, Exchange, SharePoint and Dynamic CRM, through customer data centers and Microsoft cloud data centers. The study found that Microsoft cloud-based operations reduced carbon emissions by an average of:

- 90% or more for small operations (per ~100 users)
- 60% to 90% for medium-sized operations (per ~1,000 users)
- 30% to 60% for large operations (per ~10,000 users)

Accenture Corp. (2020) presents in the graph below, the incremental levels of carbon reduction that can be achieved with the greatest savings shown by moving workloads to the Public Cloud, such as is the case with Software as a Service.

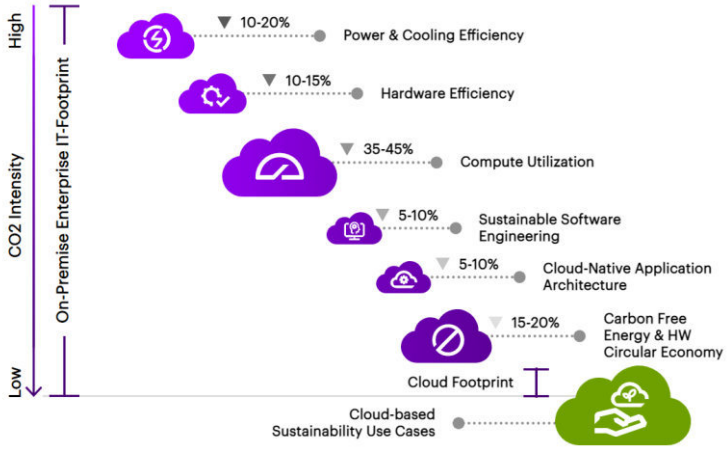


Figure no. 1. Carbon reduction savings by category of actions implemented
Source Accenture, 2020

Power consumption can be further reduced by large-scale upgrades and process adjustments that have a direct and measurable impact on the vendor's bottom line if successful. Economies of scale play a role and are a determining factor, and measurable improvements in the carbon footprint can be achieved by performing upgrades that leverage increased negotiation power with a SaaS vendor's own suppliers (Gholamhosseinian and Khalifeh, 2012).

Elasticity of a company's own product demand can influence IT resource consumption; however, in a capex model there is very little elasticity possible. Less revenue and margin can mean operating a static environment, which can represent an ever-larger percentage of the cost of a company. SaaS environments are inherently elastic and can scale up or down rapidly, there is no previously incurred cost of infrastructure that is no longer user at capacity due to a temporary decrease in sales, decrease in usage, and compute requirements. Servers in idle mode consume between 70 and 80 percent of the power consumed when fully operational (Costello et al., 2012) and in a company's datacenter, servers cannot be easily repurposed because there is no constant incoming workload, so it is worth noting the impact of carbon footprint of underutilized equipment, something SAAS vendors manage quite effectively due to a large and ever-expanding customer base.

Additionally, features developed for the software being sold as a service are driven by industry trends, and vendors are able to assess those trends and react accordingly. Therefore, their clients can benefit from features being introduced that would otherwise have required extensive and expensive in-house development efforts. Companies can remain 'leading edge' from a software perspective with minimal or no additional investment as a result (Rodrigues, Ruivo and Oliveira, 2021).

Data itself is inherently owned by the client in a SaaS model. However, data models and industry trends are used to further develop the technology, thus benefiting all. In a sense, SaaS can be a great equalizer in an environment that has generally benefitted companies with sufficient capital to invest in digitalization efforts and that has excluded companies that have historically found this level of innovation cost prohibitive. The vendor will build and develop their technology based on an aggregate of industry requirements, and nimble, if not large, organizations can suddenly obtain an edge that would otherwise not have been available to them.

Software as a Service (SaaS) presents numerous advantages to economic operators struggling to meet the requirements being set forth by both the market, consumer preferences, and, very importantly, the legislative framework within which they need to operate. This model of consuming technology is the most recent leverage companies have to ensure sustainable business practices of their own that comply with the evolving global environment.

Conclusions

The sustainability of a business and an industry has become a critical factor in conducting operations in recent years. Ideally, there would have been a natural evolution of business and business practices towards sustainability, driven by natural undercurrents in the market.

However, sustainability, the 'green economy' and environmental protection can be seen as having displayed fluctuations in the level of focus they have received in recent decades. Consequently, despite the ideals of capitalism and an open and free market, sustainability has begun to be brought into the forefront of conducting business through government involvement. As a result, economic operators will need to continue their activity at the intersection between the sovereignty of the individual (law) and the sovereignty of the legislative bodies (legislation). Legislation in particular is evolving to incorporate sustainability guidelines and practices enthusiastically, potentially disrupting natural innovation in certain areas, and artificially shifting the direction of the market and the consumer.

Further exacerbating the effects on independent operators and the economy, governments are driving the direction of business and, in some instances, generating unforeseen consequences. In order to prepare for these unforeseen consequences as well as conduct efficient and profitable business in a newly, more regulated environment, business have to become more flexible, more agile, able to react to elasticity of demand, and able to respond efficiently to changes in the marketplace, regardless of the changes being induces by legislation or shifting market dynamics or consumer preferences.

In order for businesses to achieve this, they need to become digital, and data driven, a status historically reserved for the largest companies, most willing and able to invest in costly and complex IT infrastructure that has provided an edge in the past. These same companies are the most equipped to respond to new legislative requirements aimed at increasing sustainability, furthering the advantage they have on industries and companies that have delayed digitalization.

An IT overhaul in today's market will represent a massive project and a massive capital investment for companies just beginning this journey due to initial costs, IT staff requirements, and more recently the increased carbon footprint of modern datacenter. Of the available options, the most appropriate solution for companies that have embarked on their digital journey is the Software as a Service model. This allows an economic operator to benefit from the most recent technology, in a scalable and elastic fashion, while minimizing the financial impact and environmental impact of them going digital.

Software as a Service provides an edge to companies looking to modernize, comply with the latest requirements in terms of sustainability, and remain relevant in today's business environment. It by no means reduces the need to diversify supply chains and develop sustainable business operations, however, it allows for environmentally responsible digitalization and leveraging economies of scale in IT.

Software as a service will continue to take advantage of sustainability advantages, such as the proximity of data centers to renewable energy sources. It will also allow for large scale overhauls of IT infrastructure that leverage the most recent, most sustainability-oriented technology with the smallest per/user financial impact to their customers and to consumers, therefore centralizing the complex activities required to maintain an IT ecosystem. Ultimately, Software as a Service will continue to allow companies to focus on their core activity, streamlining costs, and directing resources to achieving further goals individual to themselves, in a legislative environment that will continue to place an increasing emphasis on eco-friendly sustainable practices.

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Revisiting the Master Plan for Tourism Development in Romania. Content Analysis

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Abstract

The tourism industry has gained importance as a trigger of sustainable economic growth and regional development after the regime change in 1990. This paper investigates the Master Plan for Tourism Development issued in 2006 as the main strategic policy document to guide the next two-decade long evolution. The gaps between the goals set by the master plan and the persistent low performance of the Romanian tourism call for more systematic research of policy guidelines and outputs. Responding to this need, the study employs the content analysis based on computer-aided techniques (VOSviewer) aiming to get insights into the main themes approached by the master plan. Based on the semantic clustering and relatedness of the key terms, our findings point to a fairly good match of pre-defined categories of the master plan and the core associations of terms identified in the analysis. We also highlight the conceptual shortages and themes overlooked that hamper the coherence and structuring of the master plan. The analysis provides policy relevant information for government, entrepreneurs and local communities engaged with tourism development. We argue that this analysis is timely in the anticipation of future tourism reassessments and recovery strategies in post-COVID-19 era prompted by the reorganization of stakeholders and their actions to meet the changing perceptions and behavior of tourists. Further directions of research are outlined.

Keywords:

Tourism; master plan; content analysis; VOSviewer; Romania.

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Introduction

Since the regime change in 1990, Romania has embarked in a transformation process of economy and society. Tourism came to the forefront as an economic sector with a great potential for development grounded on the diversity and richness of the natural and cultural resources. During the 1990s the challenges encountered by the tourism industry were, among others, the slow privatization of formerly state-owned infrastructure, political and economic instability, difficult institutional capacity building. These reflected in declining international arrivals, derelict infrastructure, low performance and competitiveness. However, the availability of EU funds (LEADER, SAPARD) helped the emergence of new tourism investments and businesses. In particular, rural tourism was empowered as a strategy of economic diversification through the generation of jobs and incomes. Driven by the compliance with *acquis communautaire* along the accession process to EU, a master plan for tourism development was issued in 2006. Structured in two main parts, this strategic policy document was aiming at developing Romania as a 'quality tourism destination' matching the EU standards of product and service delivery (Ministry of Economy, Energy and the Business Environment, 2007). Covering a two decade-long period (2007-2026), the master plan set specific targets to be accomplished: 6.9% tourism contribution to GDP, international arrivals and nights spent to grow by 4.8% and 6.8%, respectively. Taking as a reference timeline the year 2019 - before the onset of the pandemic crisis, the policy outputs fall short of the master plan goals, especially in regard to international arrivals (2.68 million), employment in hotels and restaurants (3.62% of total employment) and contribution to GDP creation (2.7% in 2019). According to Eurostat tourism statistics in 2019, Romania ranked low in tourism attractiveness (nights spent) and intensity (nights spent by tourists at accommodation

establishments per inhabitant), average stay, share of population participating in tourism, and travel receipts and expenditure.

Although the planning period is not over yet, the mismatch between the master plan targets and actual developments drove us to search for explanatory factors that prevented the progress of tourism industry. To this aim, we use the content analysis as a tool of qualitative research to scrutinize the second part of the master plan devoted to vision, goals and targets, and strategic initiatives to assess the coherence and structuring of the policy designed by the master plan. The novelty and originality of the paper relies on the research method that has not been used so far to assess tourism policy documents. We argue that this analysis is timely and relevant in the anticipation of future tourism reassessments and recovery strategies in post-COVID-19 era.

1. Review of the scientific literature

There is a wide recognition of tourism as a path to development. Its role to support development is conditioned by proper planning and management based on policy frameworks (Harilal, Tichaawa and Saarinen, 2019). Tourism planning is defined as "anticipating and regulating change in a system to promote orderly development so as to increase social, economic and environmental benefits of the development process" (Murphy, 2013, p. 156). Hence, the tourism industry requires holistic and future-oriented planning to downsize the negative externalities and further guide the development (Saarinen, Rogerson and Hall, 2017). The economic models that influence the design of tourism policies rely on the multiplier effects and backward linkages of tourism that positively impact the local and regional economies (Yang and Fik, 2014; Bohlin, Brandt and Elbe, 2020). Empirical studies focused on the correlation between economic and tourism growth at sub-national levels point to strong interaction and dependence of tourism growth on the overall economic development. Hence, the conclusion is that tourism follows rather than leads the economic development (Bohlin, Brandt and Elbe, 2020). This finding highlights the role of local and regional policies to capitalize on the complementarities and synergies between tourism and other economic sectors. Besides the economic models related to tourism, the contextual and historical dimensions of tourism influence its evolution (Saarinen, Rogerson and Hall, 2017) and should be considered in policy design and conceptualization. This view enables the understanding of tourism as pursuing a path-dependent evolution or following a breaking-through trajectory of development.

Planning and management of the tourism industry entails comprehensive and dynamic input data of both supply (accommodation infrastructure) and demand (tourist flows). Several arguments support the need of an integrative approach of tourism: first, the tourism space cannot be regarded as a fixed entity (Miller 2017), but has a strong spatiotemporal dimension as it is constantly produced and consumed; second, both supply and demand are strongly localized and concentrated (Yang and Wong, 2013; Majewska, 2017); third, both the supply and demand are related to territorial attributes unequally distributed within and between territories (Batista e Silva, et al., 2018). In-depth assessment of tourism variables and their spatial patterns is paramount to the correct management of tourism (Rodríguez Rangel, Sánchez Rivero and Ramajo Hernández, 2020). Supply of accommodation holds a direct influence on the overall development of tourism destinations and should be regarded as a central tenet of the planning process (Sharpley, 2000) since the diversity and density of accommodation supply are attractions on their own (Majewska, 2017). Dinamic analysis of tourist flows across space and over time adds policy-relevant information on various models of destination development, local and regional competitiveness, and competition-cooperation frameworks (Yang and Fik, 2014; Bohlin, Brandt and Elbe, 2020; Rodríguez Rangel, Sánchez Rivero and Ramajo Hernández, 2020). Spillovers stemming from tourism dynamics flow within and between destinations and regions bearing a strong impact on knowledge, productivity, and role in regional economies. Therefore, the tourism policy should consider both positive and negative externalities by incentivizing collaborative marketing efforts and joint strategic actions (Yang and Fik, 2014; Romão, Guerreiro and Rodrigues, 2017). Tourism is regarded as a vehicle in regional development and in reducing spatial disparities (Bohlin, Brandt and Elbe, 2020). However, it should be supported to contribute to the balanced regional development (Goh, Li and Li, 2014) given that tourism is more sensitive to centripetal rather than centrifugal forces of the economy (Bohlin, Brandt and Elbe, 2020). It means that urban centers are more attractive for tourism location due to diversified infrastructures, amenities, accessibility, assets, and experiences. Against this prevailing concentration pattern of tourism in urban areas, there is a widely acknowledged view of tourism as an engine for growth in peripheral regions. The positive outcomes of tourism development in the peripheries are many: diversification of local economy, additional source of income, enforced resilience to external shocks. Nevertheless, peripheral regions share structural weaknesses that are difficult to overcome without public investments and targeted regional planning and policy interventions. Placed at the intersection of endogenous growth theory and stakeholders theory, the literature on tourism advocates the

role of local communities to generate development through investments in human capital and innovations (Romão, Guerreiro and Rodrigues, 2017; Bohlin, Brandt and Elbe, 2020). In addition, Sanabria-Díaz, Aguiar-Quintana and Araujo-Cabrera (2021) point to the power and involvement of the public authorities in implementing development policies and influencing specific target groups or stakeholders (tourists, the tourism and hospitality companies and tourism destinations).

The pandemic significantly challenged the tourism industry worldwide. A central question arises related to the impact of the pandemic on tourism industry: which factors trigger the bounce back of tourism in post-crisis setting (Haywood, 2020; Higgins-Desbiolles, 2020; Ioannides and Gyimothy, 2020). In such a context, the renewal of tourism in the post-pandemic era entails tourism policies able to respond in a systematic and comprehensive way to changing patterns concerning climate change mitigation, sustainable tourism promotion, local communities engaging and societal welfare (Sharma, Thomas and Paul, 2021). In the particular context of the EU where a solidarity fund has been enacted to cope with the pandemic effects, planning interventions should match the supranational and national levels of decision-making including stakeholders (enterprises, tourists and destinations) through institutional coordination, resource management, political responsibility and education programs (Sanabria-Díaz, Aguiar-Quintana and Araujo-Cabrera, 2021).

2. Research methodology

Content analysis (quantitative relational analysis) helps categorizing textual units based on frequency counts and similarity scores to cluster and visualize the networks of related items (Kirilenko and Stepchenkova, 2018). Applied to bibliometric mapping (van Eck and Waltman, 2010; Bazm, et al., 2016; Merigo, et al., 2018; Rialp, et al., 2019), the content analysis based on VOSviewer (a java-based program freely accessible) has been extended to a wide range of research fields: political discourses (Albaugh, et al., 2013), policy documents (Derrick, Meijer and van Wijk, 2014), corporate website disclosure of environmental policy (Popescu, 2017). Similarly, tourism studies employ content analysis to identify the main areas of research, topics, authorship, and geographical coverage of high ranked scientific journals (Martorell Cunill, et al.. 2019). This research method has been recently used to identify the themes central to resilience-based strategies aiming at reviving tourism industry in post-COVID19 era (Sharma, Thomas and Paul, 2021).

A growing body of literature uses VOSviewer for investigating the content of policy documents which employs a linguistic filter to select the most relevant noun phrases helping the identification of thematic clusters. The analysis of various corpora of texts identify clusters of words based on their occurrence and relatedness (co-occurrence), which may be hierarchically associated and visualized as maps or graphical charts based on the spatial proximity. Steps taken before running the software include: collection of the text document, convertion into a text corpus for analysis, similarity checks of structure and style, removal of stop words irrelevant to identifying the themes; co-occurrence matrix creation of words with a minimum ten occurences retained in the analysis; topics extraction; interpretation of word clusters and networks based on their proximity and relatedness.

This paper uses the VOSviewer software for an in-depth hierarchical cluster analysis of the content of the Master Plan for National Tourism Development 2007-2026. Our focus is on its second part dedicated to Vision, Goals, Targets and Strategic Initiatives containing 125 pages and 59,584 words. The section is organized along multiple headings including: tourism policy, organization and legislation; human resource development and training; planning and development proposals; information services; investment policy; marketing and product-market matching; and environment.

3. Results and discussions

By the means of VOSviewer software a semantic cluster map resulted displaying five main clusters with different degrees of importance (Figure no. 1). The minimum number of occurrences of a term was set at 10; from the total of 6,942 terms, 211 met the pre-defined threshold. For each term retained in the analysis, a relevance score was calculated and the default choice was to select 60% most relevant terms. Finally, the selected terms number 127 grouped in five clusters with 1,399 links. One of the most extended and coherent cluster is built around the term ‘plan’ and secondly comes the term ‘ministry’. This association of terms shows the emphasis given to the management-related activities as the core functions of the governmental body. ‘Policy’ comes next to ‘function’, ‘guideline’, ‘legislation’ and ‘responsibility’ showing the main role of the national tourism organisation (NTO). This goes in line with the aim of the master plan to restructure the NTO as an efficient and effective organization in charge with marketing, information provision

and support to all sectors of the tourism industry. The term 'role' is matched with 'advice', 'recommendation' and 'support' which embody the need of strong and efficient relations with the industry stakeholders. In fact 'local administration' and 'county' represent the main stakeholders for territorial planning and policy implementation and so complete the geographical scales to be approached in the process of tourism development. There is a strong association of the terms 'implementation', 'action', 'process', 'target' and 'funding' which denotes the process by which policy is translated into action. Likewise, the terms 'tourism destination', 'promotion', 'tourism information centres' and 'regional development' are closely linked.

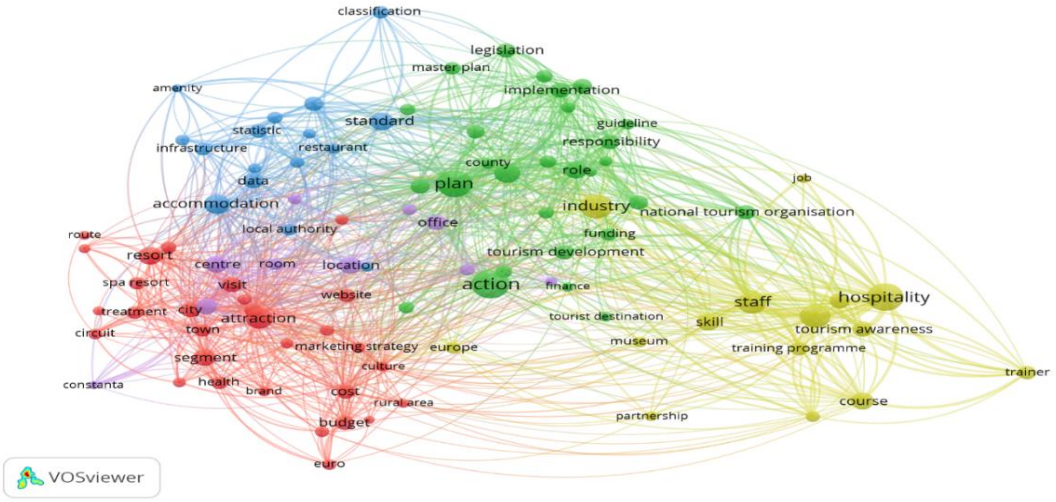


Figure no. 1. Semantic cluster mapping – networks of terms

Another strongly connected cluster has two key terms: 'industry' and 'hospitality' closely related to 'staff' that pinpoint one of the main shortcomings of the Romanian tourism: the quality of the employment. This is suggested by the next layer of terms as importance in this cluster including the words 'job' and 'skill' which are further associated to terms such as 'training program', 'trainer' or 'course'. The term 'visitor satisfaction' is interestingly added as a variable, showing the connection between service quality, highly influenced by the employment quality and training, and visitor satisfaction, which eventually determines the destination revisiting rate. According to the cluster mapped relations it could be read the fact that 'development' and 'visitor satisfaction' can be reached through 'training programs' and 'partnership' as the terms 'staff', 'skill' and 'job' are semantically close to 'trainer' and 'course'.

Beside these two clusters revolving around the key words associations of 'plan – ministry' and 'industry – hospitality', other three important semantic groups outstand from the analysis, namely one around the term 'attraction', close to the one around the term 'accommodation' to which a third one referring generally to tourism role is added.

The significant cluster centered on the term 'attraction' contains networked terms, such as: 'tourism destination', 'tourism product', 'resort', 'visit' and 'stay'. Close relatedness is found between associations of 'circuit' and 'route'; 'spa', 'health' and 'treatment'; 'city' and 'culture' showing on the one hand the dominant forms of tourism products (spa tourism, cultural tourism) and the increasing role of new destinations and products within overall tourism offer. Another form of tourism is 'ecotourism' that appears strongly related to 'environment' and 'rural area'. The target region is Transylvania, and the cities of 'Constanta' and 'Bucharest' seem mostly appealing for both domestic and international tourists. Two more terms are included in this cluster, namely: "awareness" of the stakeholders of the attractiveness of the tourism destinations on one side, and "website" as the main channel of communication and information and also of promotion for many of the local and regional tourism attractions and their amenities on the other side. Closely connected is the succession of terms, such as 'market demand', marketing strategy' and 'brand' that altogether represent the core of the strategic design.

Less developed is the cluster built around the term 'accommodation', although the cluster composition suggests a significant semantic coherence. It is closely connected with 'standard', 'classification' and 'rate' as the occupancy rate and the high seasonality of tourism demand remain important problems for the accommodation units in many tourism destinations of Romania. The term "restaurant" adds to the mapping of this cluster, showing the importance of catering units for the industry in general and of their contribution to the overall turnover of the sector, even in out of season periods due to events meant for both business tourism and local residents. A strong association is found between the terms: 'infrastructure', 'transport',

'road' and 'improvement' stressing the relation between the attractiveness of tourist destinations and the overall quality of activities, mobility and accessibility. The term 'local authority' is added to point to the main stakeholder involved in local development policy whereby road infrastructure modernization is key to support the performance and competitiveness of tourism destinations.

The last cluster stands apart by its more difficult semantic correlations to be deciphered. The cluster is made up of terms, such as 'centre' associated with 'office', 'conference', 'meeting', 'representative' and 'member'. Supposedly, it may refer to Romania as an appealing destination for business tourism, although the term is not explicitly mentioned. Or it may emphasize the structural and institutional complexity of the tourism industry and the role of cooperation and joint involvement into decision making.

The density of connections between terms summarizes the emphasis of the master plan on specific issues related to tourism development (Figure no. 2). The relatedness of the key terms indicates a well-framed structure of the master plan underpinned by some persistent themes within the dimensions of tourism development. The highest density reflects the level of semantic relatedness between industry, plan and action. The strong co-occurrences of these terms embody the main aim of the master plan to providing the legal, institutional and policy framework for the long-term development of the tourism industry. The second semantic core relates to the importance of human resources development to trigger tourism specialization and economic growth. Finally, tourism attractions are central to the identification of the main forms of tourism and targeted regions for development.

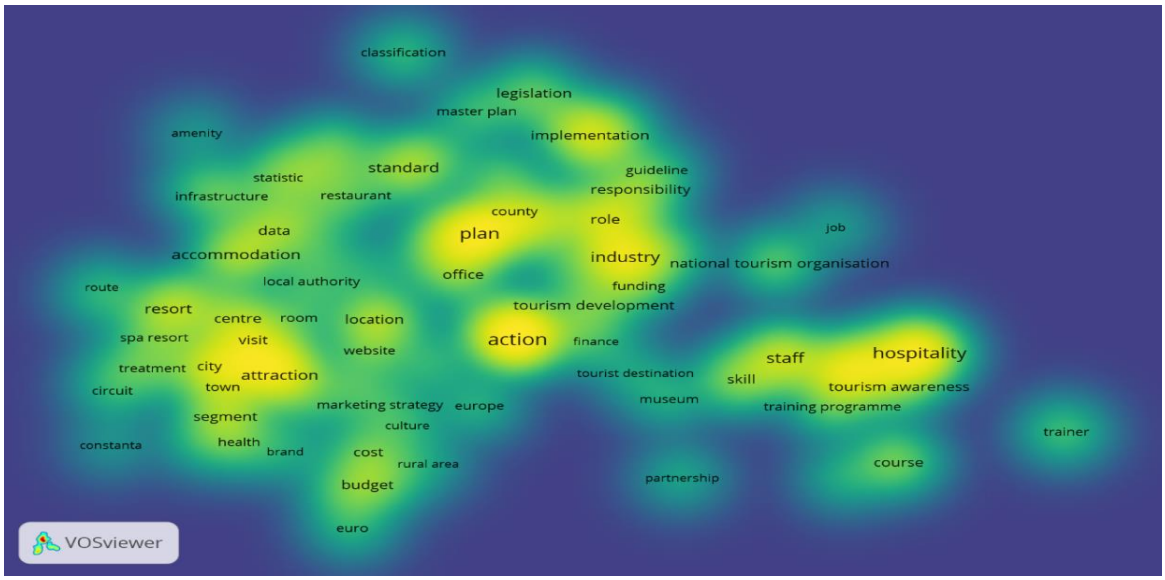


Figure no. 2. Semantic cluster mapping – relatedness of the key terms

Overall, the semantic cluster mapping on the tourism master plan shows that there was a multidirectional approach targeting different areas of action among which the most important seems to be the staff training, the attractions development and promotion, the improvement of transport access, the modernization and the higher occupancy rate of accommodation infrastructure. The master plan promotes specific types of tourism – nature-based, spa and wellness, rural and cultural tourism. It also envisages measures to address critical issues for the tourism development: the low level of management activities and implementation of projects; the lack of focus on monitoring and assessing the progress towards the enhancement of tourism development; the marginal role of promotion and advertising for tourism destinations; poor relations with stakeholders and little interest to respond to their needs and requirements. Acknowledging the lack of strategic direction, the master plan intended to provide key inputs for the formulation of future tourism development and marketing policies (Jaliu, 2012). Recent tourism studies discuss the institutional instability, poor administrative capacity and financial shortages as the main determinants hampering the implementation of the master plan (Burja and Burja, 2014; Postelnicu and Dabija 2016; Pop, Coros and Balint, 2017).

Conclusions

In sum, there is a good match of pre-defined categories of the master plan and the semantic clusters identified in the analysis. The approach integrates economic, sociocultural and environmental values in tourism planning and development. It also includes public management by distinguishing the main stakeholders involved into the process of tourism growth. The master plan relies on the understanding of

the tourism industry as a link between different levels of decision-making and interconnected areas of action.

The directions and measures promoted by the master plan gained more consistency through the follow-up strategic documents and programs released after 2006 demonstrating the conceptual and practical underpinnings of the tourism policy. Two of them are worth mentioning, albeit with mixed results. First, it is related to the marketing and promotion strategy enacted in 2010. As a result of a EUR900 thousand project, Romania was branded under the logo 'Romania: explore the Carpathian Garden'. Contested in content and criticized in form, the brand was unable to raise the international visibility of Romania as an appealing tourism destination. In contrast, more benefits are expected from the series of documentaries ('Wild Romania', 'Flavors of Romania', and 'Wild Danube') streamed by the British Broadcasting Company espousing the untouched nature, traditions and lifestyles on one side and the challenges for a sustainable tourism development on the other side. Second, it is the recently launched program 'Attractive Romania', EUR100 million budget within the National Plan for Recovery and Resilience. It extends the priority given to cultural tourism in the master plan by identifying 12 cultural routes with positive impact on reaching international markets.

Conversely, our analysis points to some important conceptual shortcomings and confusing wording that should be addressed by the forthcoming revisions of the tourism policy. The utmost limitation is the neglect of the term 'space' as a central dimension of any economic policy. The lack of associated terms, such as 'balanced territorial development' or antonyms (inequalities, disparities) gives credit to the findings of the existing studies arguing that tourism is a factor of widening rather than reducing spatial gaps (mainly inter and intra-regional) (Constantin and Reveiu, 2018; Cehan, et al., 2019). There is also an incomplete approach of some basic themes. For instance, the term 'sustainability' is missing either when referring to environment protection or/and destinations development. Cultural tourism is supported as a mainstream form of tourism; however, the term 'heritage' does not receive a proper consideration. Likewise, promotion, marketing and branding are discussed without reference to 'international visibility' although the goal of attracting increasing international arrivals was clearly set up in the policy document. The identification of the stakeholders is limited to local authority, regional development agency and county; 'communities', 'entrepreneurs', and 'tourists' do not appear as key terms of the identified clusters and networks. Overlooking these stakeholders means to under-estimate the interactional and relational effects entailed by inclusion, participation and coordination and their meaning for planning and development. Alternatively, we noticed a relative semantic disconnection of the relevant terms. Analyzing the relatedness and co-occurrences of the key terms, it appeared that some are placed in wrong language contexts. For example, market research and marketing strategy although semantically close, are grouped in different clusters. Similarly, the term museum is related to hospitality and training, instead of city and culture. Finally, the fifth cluster identified in our analysis while connecting terms with similar meaning, it is difficult to interpret and place within the overall design of the policy document.

Tourism industry is an outcome of its policy formulation and implementation. As shown by our study, the formulation of the master plan is well-grounded on tourism specificities and the directions of development are rightfully meant to capitalize on natural and cultural resources. It follows that the implementation failed to close the gap between plan and action. This assumption echoes the conclusions of the recently released strategy for tourism development (The World Bank, 2019) pointing to the deficitary implementation, low involvement and financing, and institutional changes as the main determinants that hampered the positive effects of the master plan. In terms of liabilities of tourism development, this new document reiterates some emphasized by the master plan (low accessibility of tourism attractions, low quality services of destinations) and adds some new (limited opportunities for consumption, low institutional capacity, inadequate segmentation of the market, poor international visibility). However, many of the shortages exceed the tourism policy framework and relate to the wider context of economic develpment. We argue that a valuable extension of the present research could be the comparative semantic analysis of the two policy documents to follow the dynamics and adjustements revealing the change of focus, the temporal variations in frequencies of term clusters, reasons and contents of change.

The systematic and comprehensive research investigation of policy documents may be useful in the post-pandemic context when planning and management play a vital role in designing actions for tourism recovery. As advocated by the international literature, tourism policies should propose efficient ways to manage stakeholders through coordinated involvement of insitutions, efficient management of resources, educational programs and enhanced political responsibility (Sanabria-Díaz, Aguiar-Quintana and Araujo-Cabrera, 2021; Sharma, Thomas and Paul, 2021). Aligned to these worldwide efforts of reconstruction and renewal, the policy response based on scientific knowledge and taking advantage of the European Solidarity Fund, may help Romania becoming a successful tourism destination.

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Overcoming the Negative Consequences of Coronavirus Pandemic on Tourism: The European Union Experience

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Abstract

This article aims at analyzing the impact of the COVID-19 pandemic on the tourism activity of the European Union (EU) countries, as well as the link between the synthetic index of tourism competitiveness and the possibility of supporting tourism in times of crisis. In order to demonstrate this connection, but also the other correlations that present the overall situation of tourism from 2019 to 2022, the specialized literature that dealt with this common issue worldwide, and especially at the EU level, was reviewed; similarly, specialized statistical sources, as well as qualitative and quantitative research methods were also synthetized. From the analysis of the four hypotheses (of which only three were validated) the authors conclude that: the connection between GDP and the number of tourists is a direct one and of medium intensity, the developed countries managing to support their tourist activity even in less favorable conditions; the association between the index of competitiveness in tourism and the arrivals of tourists is a direct one, of medium intensity, which demonstrates that the index of competitiveness in tourism influences the flows of tourists, especially towards the developed countries; the third hypothesis correlates GDP per capita with the number of tourists, but the results did not highlight the existence of a link between these two variables, which led to the rejection of this hypothesis; the last researched and confirmed aspect is the degree of influence for the vaccination rate in the receiving countries and the number of international tourist arrivals, thus, the large number of vaccinated residents encouraging tourist arrivals.

Keywords

COVID-19 pandemic; European Union countries; GDP; domestic tourism; international tourism.

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Introduction

Tourism is an important sector of the global economy. In the pre-pandemic period (2019), tourism exports accounted for 6.8% of the total exports (USD 1.7 trillion) and 27.4% of the global services' exports (UNWTO, 2022a). The number of international tourists was almost 1.5 billion, and the total revenue from tourism was USD 9.2 trillion (10.4%). The coronavirus pandemic (COVID-19) was primarily a humanitarian crisis that has affected people's lives and triggered a global economic crisis. This has a major impact on the tourism sector, which is essential for many people (OECD, 2020), by generating countless jobs – 334 million in 2019, due to the dynamics of this sector (Panasiuk and Wszendybył-Skulska, 2021), especially at the beginning of the 21st Century (WTTC, 2021). The pandemic has hit very hard this sector, highly sensitive to such shocks, in which the losses are huge, as reflected in the dramatic decrease in its contribution to global GDP, by almost half, in 2020 falling to 5.5% (USD 4.7 trillion) and a reduction in jobs to 272 million. Europe's contribution to global GDP was substantial in 2019, at USD 2,191 billion. The COVID-19 pandemic has also led to a decrease in the contribution of European tourism to global GDP by almost half in 2020, i.e. USD 1,065 billion (WTTC, 2021).

The authors have chosen to approach the countries of the European Union (EU), because the contribution of these countries' tourism to the global GDP is particularly important, here are the countries that receive

the largest numbers of visitors in the world, but also from the EU, France, Spain, Italy, Germany (WTTC, 2020), the tourist offer, represented by both the tourist resources and the tourist infrastructure is very generous, and, last but not least, the first cases of COVID-19 in Europe were registered here, namely in Italy (Dorrucci, et al., 2021; Găitan, 2020) and Austria (Kreidl, et al., 2020). The COVID-19 pandemic has hit these countries hard (Moshammer, et al., 2020; Nadeau, Wardley and Rajabi, 2022), with an impact felt especially in countries, cities, and regions where tourism is an important part of the economy, and restrictive measures have led throughout different periods of time to the isolation of countries and to the development of much smaller tourist activity. A factor meant to support the recovery of the tourism sector, at the EU level, is the high vaccination rate registered among the EU member-states, which allowed the re-opening of borders in 2021 and tourist circulation, especially within the EU.

The paper addresses some of the strengths of tourism in the EU countries, especially targeting their ability to cope with large shocks, such as the COVID-19 pandemic, which has hit destinations worldwide in an unpredictable way. The ability of the EU member states to meet this challenge lies primarily in their economic strength and in their diversified activities that make up their GDP. Among the EU countries, the most affected were those in which the contribution of the Travel & Tourism (T&T) sector to the GDP is high, over 10%, and which are small states, with a less diversified economy, from the category of island states in particular, as is the case of Malta, Ireland, and Cyprus, or even Greece, which has many islands famous for tourist activity. Another important factor is generated by the extremely rich tourist resources that these countries have, whether natural or cultural, and the multitude of sights that belong to the UNESCO World Heritage Sites, which continue to be an attraction for visitors. The tourism resources of each EU member state, along with other important factors for tourism, are presented in The Travel & Tourism Competitiveness Index (TTCI) (WEF, 2019), which will be analyzed in more detail in relation to the number of tourists arriving in the EU countries.

Another important factor is the fact that we refer to an economic group (EU) that has a set of common rules and regulations, which facilitate the freedom of movement, a very important aspect for tourism. Even though initially there was no set of common measures at the EU level and some countries applied preventive measures on their own, later attempts were made to harmonize these measures so that the pandemic could be controlled and stopped. The measures taken right from the beginning of the pandemic have led to the isolation of countries and the reduction of tourism activity in almost the entire EU. The strictness of the isolation measures, the contribution of tourism to GDP in each EU country, and the quality of governance are key factors in explaining the differences in economic losses in different EU countries (Sapir, 2020), the months of March and April 2020 being the most affected from this point of view. After the cease of the state of emergency, the relaxation and opening of the borders gradually began, the tourism taking place in conditions of maximum sanitary care.

An important factor in the recovery of the tourism sector, after the opening of the borders, is the acceptance of the vaccine and the vaccination rate. Thus, the long-awaited solution for the end of the pandemic - the vaccine -, which was produced towards the end of 2020, appeared. The beginning of 2021 came with the hope that tourism will resume as a result of the possibility of free vaccination in all EU countries, with vaccinated people being able to travel without too many constraints. Vaccinated people with the full scheme in the EU countries later received a kind of vaccination passport in order to facilitate travel within the EU and beyond (ECA, 2021). EU countries have high vaccination rates, and this can be correlated with the number of tourists arriving in EU countries, due to the openness it offers for travel to another country and at the same time due to the health security of the host country to the arriving tourists. With the increase in the share of the vaccinated population, tourist activity resumed, and the signs of tourism recovery became more and more encouraging. The beginning of 2022 came with a relaxation of sanitary measures due to the fact that the Omicron version of the virus proved to be less aggressive. The fact that these relaxation measures were taken before the end of the pandemic was felt in a short time when the number of new cases began to increase and some countries, such as Austria (Negreanu, 2022), returned to more severe measures.

This paper addresses a topical, unique, and with a major economic and social impact subject. In the introduction, the general framework of the approached subject is presented. Then follows a review of the literature that has become increasingly rich in works addressing the pandemic from many points of view, including medical, economic, social, and political perspectives. The research and methodological parts involve the formulation of four hypotheses further analyzed from the perspective of their validity, using the Statistical Program for the Social Sciences (SPSS). Last but not least, the paper presents its conclusions.

1. Review of the scientific literature

The COVID-19 pandemic has been the subject of numerous papers. Thus, Farzanegan et al. (2021) addresses the relationship between tourist flows and COVID-19 outbreak. The analysis shows a positive and significant correlation between international tourism and the number of cases and deaths caused by COVID-19. It is interesting to see to what extent the coronavirus can affect the image of a destination (Zenker and Kock, 2020), as in the case of the EU countries, which are important tourist destinations. In countries such as Austria, Italy, and Spain, which have suffered greatly during the pandemic due to the high rates of infection, the tourist image could be affected. These countries could be associated with doubts and mistrust regarding certain tourist activities.

One of the most frequently used macroeconomic variables to highlight economic growth is the GDP growth rate. National GDP analysis, GDP structure but also GDP per capita are frequently used in various analyses. Bădulescu, Bădulescu, and Simuț (2018) analyze how economic growth affects tourism in the economies of Central and Eastern Europe. In this sense, three hypotheses are formulated that are used in the analysis of the GDP per capita in relation to international tourism demand. The relationship between tourism and economic growth within the EU-28 is also analyzed by Haller et al. (2021). The authors argue the existence of a positive and direct relationship between tourism and economic growth, i.e. economic growth can lead to an increase in tourism activity. In developed or developing countries, tourism activity can be identified as an important source of income. EU economies have a strong tourism industry, but there are differences in growth rates between regions, and these have increasingly become visible as the EU expands (Simionescu, 2021). In the context of the COVID-19 pandemic, it is found that emerging or developing countries have had the largest decreases in tourist arrivals (Aronica, Pizzuto and Sciortino, 2022). Sapir (2020) presents three factors that may explain the differences in the magnitude of the shock felt in declining GDP by EU countries, namely: the strictness of isolation measures, the structure of the economy (especially the contribution of tourism to GDP), and the quality of governance in each EU member state. The particularly important role that the tourism industry has is also recognized by the Lisbon Treaty (Art.195), which refers to the need for the competitiveness of the tourism sector within each member country (European Commission, 2009).

Analyzing the Central and Eastern European countries, Dugulan et al. (2010) present the association between international tourist arrivals and cultural resources in the Travel & Tourism Competitiveness Report and the very strong relationship resulting between the two pillars. Competitiveness in tourism also makes the tourism sector stronger and has the capacity to attract tourist flows and to generate wealth; furthermore, the key to restoring the tourism industry is the degree of competitiveness that each country has (Salinas Fernández, Guaita Martínez and Martín Martín, 2022). In the context of the pandemic crisis, the authors analyze the recovery of the tourism industry after the pandemic, using in the analysis the contribution of tourism to the country's economy, the impact of COVID-19 in the country and the degree of competitiveness of the tourism industry. The authors want to present which are the most vulnerable countries in the context of the crisis in the tourism industry and the expected recovery. According to Abreu Novais, Ruhanen and Arcodia (2018), the analysis of tourism competitiveness should consider the following dimensions: attractiveness and satisfaction with the destination, economic dimensions, dimensions associated with the well-being of the local population, and sustainability. An important study presents the design of a synthetic index for 80 countries (Salinas Fernández, et al., 2020) that attract tourists by their level of tourism competitiveness. Research shows that Western Europe is the most competitive region and includes countries in the EU, such as Germany, Austria, France, and the Netherlands, distinguished by both attractiveness and very similar values. Northern Europe is the third most competitive area in the world, with EU countries such as Finland, Sweden, and Denmark. However, although Northern Europe has high values in the synthetic index of tourism competitiveness, it does not attract such a large number of tourists. Southern Europe is in fourth place, with Spain and Portugal in leading positions. This study focuses on identifying the most influential dimensions of tourism competitiveness so that it can improve a country's tourism competitiveness by finding the most effective and important policies. The top positions are occupied by Germany, Spain, Austria, Finland, France, followed by Sweden, Netherlands, Portugal, Denmark, Ireland, Estonia, Belgium, Malta, Greece, Czech Republic, Slovenia, Italy, Croatia, Lithuania, Latvia, Poland, Hungary, Cyprus, Slovakia, Bulgaria, and Romania.

2. Research methodology

In order to conduct this research, both quantitative and qualitative methods were used. Quantitative methods used statistical information from UNWTO (2022b), WTTC (2020 and 2021), WEF (2019), Country Economy (2021), and from other sources. These statistics were used to demonstrate the hypotheses

formulated in the research using the Statistical Program for the Social Sciences (SPSS). The qualitative method was used to analyze the documents issued by various authorities regarding the measures taken during the COVID-19 pandemic in the EU.

In order to highlight some factors that had a particularly important role in supporting the tourist activity during the pandemic, under completely exceptional conditions, four hypotheses were formulated:

- Hypothesis 1 (H1): In case of a crisis (in this case the pandemic crisis), developed countries have the capacity to continue to carry out their tourist activity, even if this may be diminished.
- Hypothesis 2 (H2): The number of international tourists is directly influenced by the tourist potential of a country.
- Hypothesis 3 (H3): A high standard of living, with a high GDP per capita, positively influences the arrivals of international tourists and the tourist activity in general.
- Hypothesis 4 (H4): A high vaccination rate favors the arrivals of international tourists.

In order to validate or invalidate these hypotheses, several simulations were performed, the results of which will be presented in the next section, of results and discussions.

3. Results and discussions

Among the European countries which are the world's largest contributors to global GDP in terms of Travel & Tourism (T&T) are precisely the largest EU economies. Thus, the largest contributor in 2019 was Germany, with USD 394 billion, then Italy with USD 269.8 billion, France with USD 240.5 billion, and Spain with USD 202.1 billion (WTTC, 2021). In 2020, the contribution of the T&T sector to the GDP fell by almost half: Germany with USD 208.8 billion, Italy with USD 132.2 billion, France with USD 123.2 billion, and Spain with USD 75.4 billion. For these values, a major contribution had the activities associated with domestic tourism but also those associated with international tourism (international arrivals) (Figure no. 1).

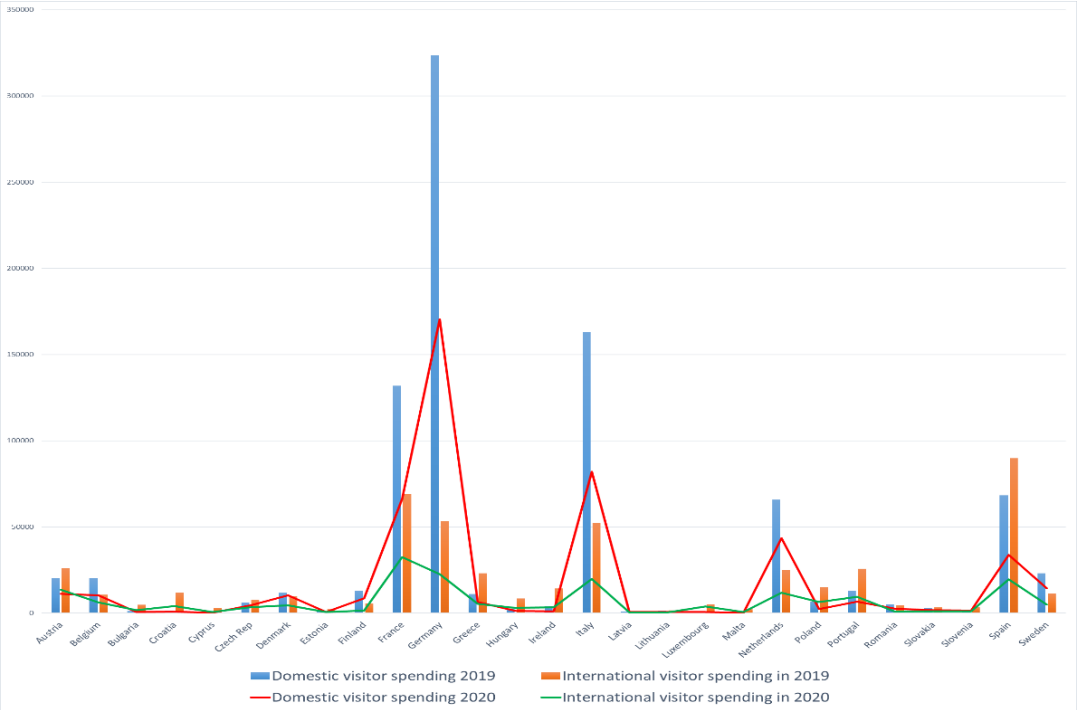


Figure no. 1. Domestic and international tourism contribution to economy (comparison between 2019 and 2020)

Source: Made by authors based on data provided by WTTC, 2021

Germany was a leader in terms of revenues from domestic tourism both for the period before COVID-19 and towards the end of the pandemic, with over USD 323 billion, followed by Italy and France. Regarding the revenues from international tourism, the authors found that Spain (USD 89.8 billion) holds the leading

position for 2019, followed by France (USD 68 billion) and Germany (USD 53.4 billion). Instead, with the advent of the virus, France becomes the leader (USD 32.5 billion), followed by Germany (USD 22.5 billion) and Italy (USD 19.8 billion) (WTTC, 2021).

The proportion of domestic and foreign visitors varies between EU member states. In countries like Sweden, Romania, Poland, and Germany, over 75% of arrivals are domestic visitors. In countries with a smaller population and area, especially island countries, such as Cyprus or Malta, foreign tourists are the majority (over 90%). A high proportion of foreign tourists are also found in Croatia, Cyprus, Luxembourg, or Ireland. Among the big tourist receiving countries, Italy and Spain, the distribution is more even.

EU countries traditionally considered to be tourist destinations, which are heavily dependent on international arrivals, such as Croatia, Cyprus, Greece, Malta, and Spain or Ireland, have suffered the largest declines (over 60%) in terms of international tourist arrivals (ECA, 2021). Less affected were the countries where domestic tourism is an important component of tourism. Thus, a decrease of between 20 and 50% was registered in France, Belgium, Germany, the Netherlands, Austria, Denmark, and Finland (WTTC, 2021).

The countries of the EU are among the most visited destinations worldwide. Most international tourists coming to Europe go to these EU countries, some of which are by definition considered tourist countries, due to the importance of tourism recognized as having a significant total T&T contribution to national GDP (the cases of Croatia 24.3%, Greece 20.3%, Portugal 17.1%, Malta 15.9%, Spain 14.1%, Cyprus 13.4%, Italy 13.1%, and of other countries with values over 10%, such as Estonia, Austria, the Netherlands, Bulgaria, and Slovenia). In the other EU countries, tourism also made significant contributions to the GDP in 2019. The health crisis has substantially reduced this contribution, in most cases by half, a situation similar to that of the EU region (WTTC, 2021). For some countries, the contribution to GDP in 2020 has dropped dramatically, by more than half, about two-thirds, as in the cases of Greece (8.7%), Malta (5.4%), and Cyprus (3.7%) (Figure no. 2).

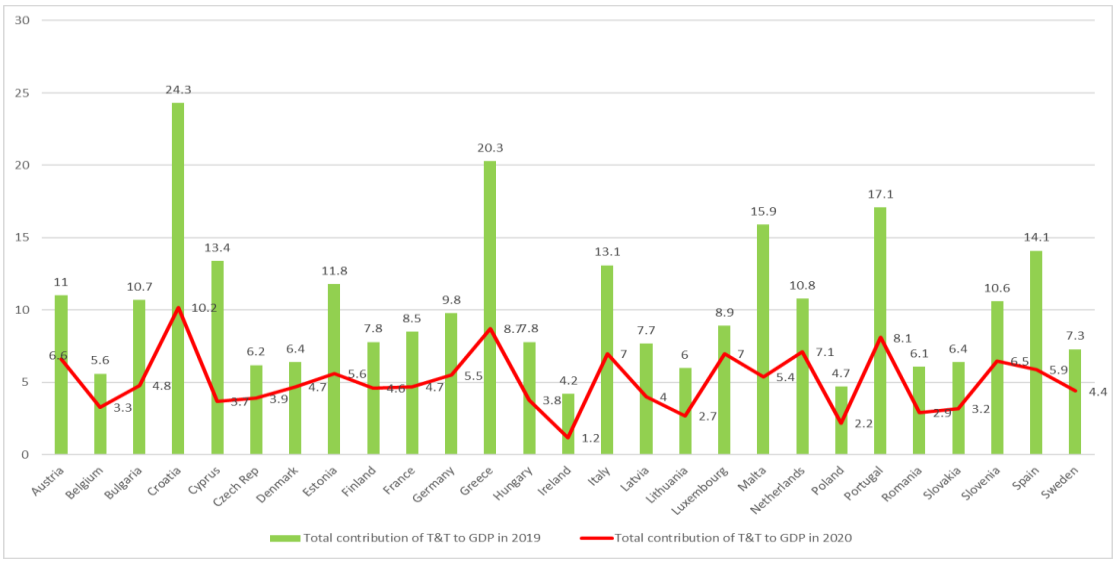


Figure no. 2. T&T contribution to GDP, a 2019 to 2020 comparison

Source: Made by authors based on data provided by WTTC, 2021

Based on these observations, the aim of the quantitative research was to test the influence of variables such as GDP, tourism potential, GDP per capita, and the degree of vaccination on tourist arrivals in EU member states. The influence was verified by performing correlation tests between the above-mentioned variables. Also, most studies point out the influence of tourism on GDP growth, while fewer studies address the opposite situation.

Table no. 1. Correlation between variables of interest (H1)

	Tourists Incomings 2021	GDP 2021
Tourists Incomings 2021	.	
GDP 2021	.621**	.

Note. ** Correlation is significant at the 0.001 level (two-tailed)

To validate H1, a first test was performed aiming at the association between GDP and tourist arrivals (Table no. 1). The results show the existence of a correlation, direct by nature and with moderate intensity between the analyzed variables. The results highlight the fact that the economically strong countries were able to continue to attract tourists, even if the medical conditions were not always optimal, thus H1 is confirmed.

In order to validate H2, another test was performed aiming at the association between the score of the TTCI (2019) and the international arrivals (Table no. 2). Thus, the results highlight the existence of a correlation, moderate by the intensity and having a positive meaning, between these two elements. In other words, the competitiveness index influences the flow of tourists, especially in developed countries. The results lead to the validation of the 2nd hypothesis (H2).

Table no. 2. Correlation between variables of interest (H2)

	Competitiveness index score 2019	**Tourists Incomings 2021**
Competitiveness index score 2019	.	
Tourists Incomings 2021	.566**	.

Note. ** Correlation is significant at the 0.002 level (two-tailed)

In order to validate the 2nd hypothesis, data provided by the WEF (2019), TTCI, were used. Europe and Eurasia remain the most competitive regions in T&T. The key element is the abundance of cultural resources, which are mainly concentrated in Southern and Western Europe. The high degree of market integration, regulations, and travel policies centered on the EU and the Schengen areas support intra-regional travel, which represents the vast majority of its international arrivals.

Of interest for the present research was also H3, thus the ratio between GDP per capita and international tourist arrivals was tested (Table no. 3). The results did not highlight the existence of a link between the researched variables, so it can be stated that GDP per capita does not influence the arrivals of tourists/tourist activity.

Table no. 3. Correlation between variables of interest (H3)

	Tourists Incomings 2021	**GDP/CAP 2021**
Tourists Incomings 2021	.	
GDP/CAP 2021	-.064*	.

Note. * Correlation is not significant at the 0.75 level (two-tailed)

Therefore, it is found that H3 is not validated, which means that a high GDP per capita in the host country does not influence the arrival of a large number of tourists. In contrast, a high GDP per capita in the issuing country may influence the increased flow of tourists to the host countries (Bobi and Cimpoeru, 2021). An econometric model is used in this regard by Dritsakis and Athanasiadis (2000). The importance of the economic determinants of international demand for tourist services is analyzed by Garin-Munoz and Amaral (2000) in Spain, and Martins, Gan and Ferreira-Lopes (2017) show that GDP per capita is relevant to explaining tourism arrivals. The last hypothesis investigated, H4, focused on the degree of influence of the vaccination rate in the countries receiving tourists and the arrivals of international tourists (Table no. 4).

Table no. 4. Correlation between variables of interest (H4)

	Tourists Incomings 2021	**COVID -19 vaccine doses administered**
Tourists Incomings 2021	.	
COVID -19 vaccine doses administered	.712**	.

Note. ** Correlation is significant at the 0.000 level (two-tailed)

The results highlight the existence of a very high-intensity correlation between the researched variables, of a positive sense, an aspect that validates the 4th hypothesis. The existence of this correlation suggests that a large number of vaccinated inhabitants encourages the arrivals of international tourists.

Conclusions

The effects of the COVID 19 pandemic are multiple and complex. Among the economic sectors, one of the most impacted was tourism, both international and domestic, as evidenced by our research. The authors have clearly determined a direct link between GDP, vaccines, and competitiveness, in international tourism.

The results showed that countries with strong economies in the pre-pandemic period maintained their economic strength during the crisis generated by the COVID-19 pandemic. The already existing important and varied tourism resources as well as the massive investments in creating the appropriate infrastructure prior to the pandemic were instrumental for this outcome. In addition to this, numerous European and national programs were channeled towards keeping the tourism industry on the survival line and on supporting the economy contributing to the economic strength of the EU countries. The research has also found that as vaccination has intensified, with EU member-states having one of the highest vaccination rates in the world, international tourist arrivals in EU member states have also intensified. All these circumstances have led to attracting an increased number of tourists, who came both from EU and non-EU countries. The research findings suggest as well that a common and coherent EU public health policy could contribute to overcoming in a relatively short time many of the negative aspects brought to the tourism industry by the COVID-19 pandemic.

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The Priorities of Transport Activities from the Perspective of the Spatial Approach of the Land-Sea Interactions in the Romanian Coastal Area

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Abstract

Maritime spatial planning can play a very useful role in determining the guidelines for the sustainable and integrated management of human activities at sea, the conservation of the living environment, the fragility of coastal ecosystems, the erosion and social and economic factors, when considering land-sea interactions. The analysis and organization of human activities in marine areas are aimed at achieving ecological, economic and social objectives, as well as promoting cooperation between the Member States. This study is part of the MARSPLAN BS II project, in which the authors took part, and it seeks to examine the perception of MSP-interested stakeholders on the most important land-sea and sea-land interactions for river, road, rail and maritime transport activities in the Romanian coastal area, from the point of view of economic, social and ecological priorities. In order to achieve the objectives of the study, a questionnaire was developed that includes the key operational elements in approaching the LSI concept from a two-way perspective: (1) the assessment from land to sea, namely how terrestrial developments influence and support marine developments and the way in which they have an impact on the environment; (2) the assessment from sea to land, i.e., how the sea supports or influences land-based activities, in particular so as to ensure the well-being of coastal communities. The questionnaire designed within the project was administered to the MSP-interested stakeholders, the data collected being aggregated according to the scale on which the activity of the participating organizations (international, local and national) is carried out. The results of the performed analysis are beneficial to the subsequent decisions in MSP regarding the interactions between land and sea for the transport activities in the Romanian coastal area of the Black Sea.

Keywords

Land–Sea Interaction (LSI); transport domains; stakeholders; Maritime Spatial Planning (MSP); Romanian coastal area.

DOI: 10.24818/BASIQ/2022/08/049

Introduction

Maritime Spatial Planning (MSP) is the process by which the authorities combine the analysis and organization of human activities in marine areas in order to achieve ecological, economic and social objectives, a process which must take into account land-sea interactions and promote cooperation between the member states (Directive 2014/89/UE).

The coastal area is a space where the interests of land and sea activities merge (O'Hagan, Paterson and Le Tissier, 2020), where the land and the sea interact, being the place where many developments are amalgamated (Schlüter et al., 2020). Therefore, the subject of maritime spatial planning efforts is a key challenge for the spatial management approaches that need to identify where land use affects the sea and how much sea use affects the land (Ehler, Zaucha and Gee, 2019).

Promoting cooperation between the Member States, the European Commission funded in the 2019-2021 period the MARSPLAN BS II project, carried out by Bulgaria in partnership with Romania, a project which

aimed to develop MSP plans at national and regional / cross-border level for the Black Sea area. A part of this project was to conduct a study on land-sea interactions (LSI) by consulting the stakeholders in order to prepare the maritime spatial plans, thus complying with the requirement of the MSP Directive (2014/89/UE).

This study examines the perception of MSP-interested stakeholders regarding the most important land-sea and sea-land interactions for river, road, rail and sea transport activities in the Romanian coastal area, in terms of economic, social and ecological priorities.

1. Review of the scientific literature

The coastal area is the geographical space situated where the sea comes into contact with the land, where there is a high concentration of human activities, having a potential for economic growth and job creation due to maritime and coastal activities which are often closely linked (Directive 2014/89/UE).

The Malta "Maritime Spatial Planning Conference: Addressing Land-Sea Interactions" report (DG MARE, 2017) reiterates the MSP Directive (2014/89/UE), stating that maritime spatial planning can play a very useful role in determining the guidelines for the sustainable and integrated management of human activities at sea, the conservation of the living environment, the fragility of coastal ecosystems, the erosion and social and economic factors, when considering land-sea interactions. Thus, in the context of maritime spatial planning (MSP), the LSI analysis seeks to provide the information needed for a coherent terrestrial-marine planning along the coastal interface (SUPREME, 2018), so as to promote the sustainable use of maritime space.

Maritime Spatial Planning (MSP) is an effective tool for reconciling human activities and environmental values (Tolvanen, Erkkilä-Välimäki and Nylén, 2019), and the analysis of land-sea interactions (LSI) must be taken into account in the planning process for the identification of the key elements linking the terrestrial and marine components of the coast.

Within the European Union, transport is a strategic sector of the economy, and there is a desire to create a "blue zone" in order to speed up the transition from road transport to maritime transport, the development of maritime space being a necessary measure for managing the growing number of maritime and coastal activities, as well as for the protection of the marine environment.

The transport sector is one of the important economic sectors, but also a major source of pressure on the environment. Recent research reveals the importance of maritime transport both from a socio-economic and from an environmental perspective (Niavis et al., 2017), this sector being an essential component of the economic system that plays a key role in the import and export of resources, as well as in providing employment opportunities (Yan et al., 2021). Moreover, the river and rail modes of transport, along with road transport are an integral part of economic activity and are, therefore, essential for its development (Alonso de Armiño et al., 2022).

The transport sector is a key economic activity in the coastal zone, with relevant social and environmental implications. In their research paper Lee, Noh and Khim (2020) examine the challenges and opportunities of the Blue economy, pointing out that it has two competing modes: growth and development opportunities and threatened and vulnerable areas in need of protection. Therein lies the importance of studying coastal areas, which is justified by their resources, the ecosystem services and the key role played in socio-economic development (Petrişor, et al., 2020).

On the other hand, the MSP Directive (2014/89/UE) states that it is essential for the stakeholders, authorities and public to be consulted in order to promote sustainable development effectively. Moreover, expert consultation can also be integrated as a part of the stakeholders' involvement process, helping create knowledge and information based on scientific foundations and reasoning (Calado et al., 2021), while the exchange of information plays an important role in the development of beneficial relationships in the process of maritime spatial planning (Stan et al., 2021a).

Recent studies on maritime spatial planning (MSP) reveal that, although it remains a complex and challenging process, despite the experience gained over the last decade (Ansong, Calado and Gilliland, 2021), still it has become the preferred planning process for determining what, where and when human activities should take place in the marine areas (Ehler, 2021), thus contributing to the efficient management of maritime activities and the sustainable use of marine and coastal resources. Unfortunately, the permanent legislative changes, as well as the indecision of the Romanian political factors (Stan and Vancea, 2014; Vancea, Aivaz and Duhnea, 2017) have led to a completely inefficient policy in this area. We can add the lack of vision in terms of the allocation of government funds, the structuring of projects that would lead to

the implementation of the obtained results from the consistent research carried out in recent years in support of the implementation of an appropriate legislation (Vancea and Duhnea, 2013).

From this point of view, both Romania and Bulgaria must be interested in structuring a set of public policies that address all the categories of resources and ensure adequate funding, taking into account certain economic indicators and their impact on savings. In this context, i.e., of the concerns regarding financial resources, specialized literature has paid interest to the examination of some macroeconomic indicators (Aivaz and Condrea, 2012), a particularly important aspect in the context of the concerns about a long-term sustainable development.

However, maritime spatial planning remains one of the key tools for achieving a sustainable blue growth and facing its challenges (EASME, 2018), leading to the gradual imposition of a coherent, transparent, sustainable, evidence-based framework for decision-making.

2. Research methodology

The aim of this paper is to carry out an assessment of stakeholders' perceptions of land-sea interactions for transport activities in the Romanian coastal area of the Black Sea, in order to identify the significant aspects of promoting an integrated approach of maritime spatial planning.

Within the MARSPLAN BS II project, for the implementation of Activity 2.3 "Integration of Land-Sea Interactions (LSI) in MSP for the cross-border region" a questionnaire was designed by the representatives of the National Institute for Marine Research and Development "Grigore Antipa". The partners involved in the project administered to the interested parties the online questionnaire, which was then interpreted by the authors from "Ovidius" University in Constanța involved in the MARSPLAN BS II.

The need to develop a broad understanding of LSI issues among both terrestrial and maritime stakeholders and the need to promote land and sea planning and management integrated approaches must be taken into account when tackling LSI (DG MARE, 2017). Thus, the Land and Sea Interaction (LSI) analysis methodology is the result of experiences and tools of some pilot projects carried out in Europe and it consists of a process with various stages and levels, namely: an initial and more general inventory phase, followed by an in-depth analysis of the most relevant interactions and a final phase aimed at informing the planning process about the key results of the LSI analysis (SUPREME, 2018).

Thus, in order to achieve the objectives of the research, we have used a questionnaire necessary for the field of maritime spatial planning, by taking into account the interactions and the reciprocal land - sea impact. The key operational elements in tackling the concept of LSI included a bidirectional perspective: (1) the assessment *from land to sea*, namely how terrestrial developments influence and sustain marine developments and how they affect the environment; (2) the assessment *from sea to land*, i.e., how the sea supports or influences land-based activities, especially so as to ensure the well-being of coastal communities. The processing of the questionnaire prepared so as to clarify these issues was achieved by grouping the variables-questions according to the scale at which the activity of the participating organizations (inter-national, local and national) unfolds, these being MSP-interested stakeholders. From a methodological point of view, this assessment has been performed for each identified activity, by establishing the ecological, economic and social value, using a numerical set from 3 to 0. For each type of answer, the assessment of *ecological priority*, *economic priority* and *social priority* is defined by the score value, as follows: High (score 3), Medium (score 2), Low (score 1) and Not Known (score 0). The data processing, the systematization of the results, as well as obtaining the indicators used for the statistical analysis were achieved using the Statistical Program for the Social Sciences (SPSS).

3. Results and discussions

The transport infrastructure in the Romanian coastal area comprises the transport networks consisting of roads, railways, air transport, river transport on the Danube River and the Danube-Black Sea Canal and the maritime transport on the Black Sea.

Within MARSPLAN-BS II, a project aimed at developing a common MSP strategy that should lead to the drafting of MSP plans, the analysis of land-sea interactions (LSI) explores the possibilities of identifying and practicing on important aspects of LSI in the cross-border region of Bulgaria and Romania (Stancheva and Stanchev, 2021).

For the analysis carried out in this article, from the complex questionnaire applied to the stakeholders, which targeted the most relevant activities taking place in the Romanian coastal area, the questions on river,

road, rail and maritime transport activities were selected. The stakeholders identified and surveyed were entities from sectors of activity relevant to the use of marine space (public authorities, economic agents, non-governmental organizations, research institutes and universities, public companies, etc.) whose activity is carried out at different levels - international / national / local.

Thus, the evaluation of the way in which terrestrial developments influence and support marine developments and the way in which they have an impact on the environment in terms of *river, road and rail transport activities* were scored by the interested parties (Figure no.1) according to their specialized knowledge and interests that are influenced by maritime spatial planning.

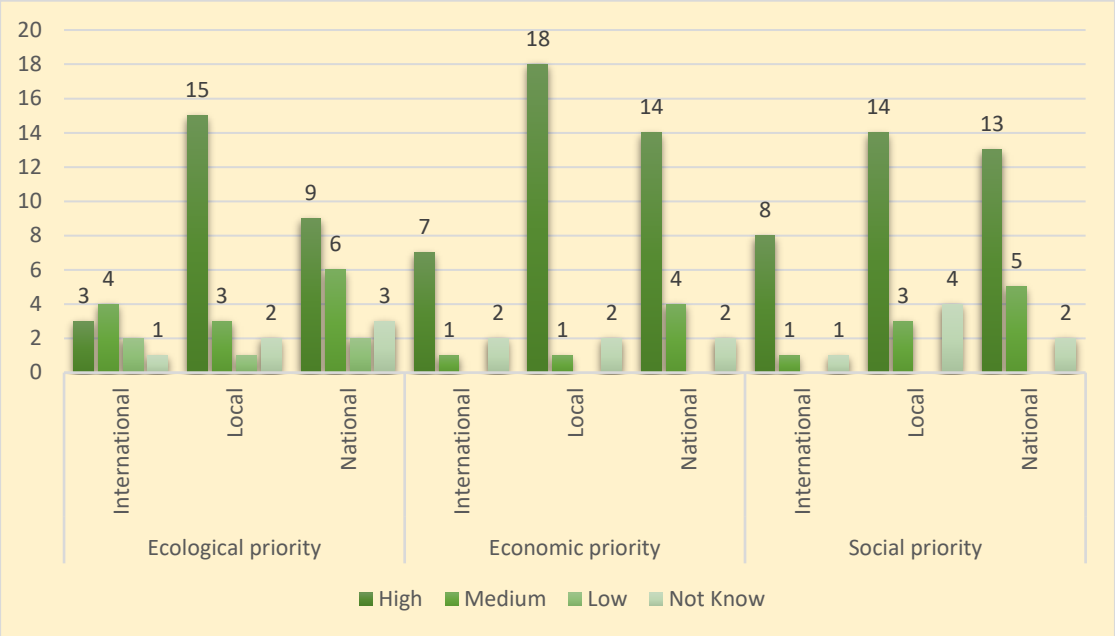


Figure no. 1. River, road, rail transport
Source: Authors' own research

According to the data analysis, regardless of the scale at which the activity of the responding organization is carried out (international, local, national), the river, road, rail transport activities are considered an *ecological priority*, obtaining the following scores: 52.90% - High, 25.50% - Medium, 9.80 % - Low and 11.80% - Not Known. It is well known that, at European Union level, transport is a source of pollution, therefore the recommendations are to redirect long distance road transport to other environmentally friendly modes of transport, such as rail or river or sea transport. However, local entities consider these activities to be an ecological priority in a proportion of 71.40%, which shows the concern of the local community about improving the behaviour of transport in relation to its environment in terms of climate change and environmental quality.

Regarding the extent to which the surveyed organizations consider the river, road and rail transport activities as an *economic priority*, the following scores resulted: 76.40% - High, 11.80% - Medium, and 11.80% - Not Known. The Romanian coastal area, through the Constanța and Tulcea Counties, has a good connectivity due to the diversified transport infrastructure (port, airport, railway, highway, roads with access to the TEN-T infrastructure), which also supports the development of other economic sectors. Thus, the 64 km long Danube-Black Sea Canal, which shortens the navigation to the port of Constanța by 300 km and the infrastructure of the Pan-European Corridor IV (road, rail) and Corridor VII (Rhine-Main-Danube) are important assets for economic, social and entrepreneurial environment development. The opinion expressed by the stakeholders confirms the fact that the sustainable economic development of these activities can generate new opportunities for job creation, which could generate added value from an economic perspective in the Romanian coastal area (Mirea and Aivaz, 2016; Munteanu Florea and Aivaz, 2017).

The organizations surveyed regarding the *social priority* of the river, road and rail transport activities gave the scores according to the following structure: 68.60% - High, 17.60% - Medium and 13.80% - Not Known. It can be noticed that the international level entities gave a high score to this criterion, of 80.00%, which indicates their concern about a balanced development of the transport services market under competitive conditions, while respecting the rules on working conditions in this section. Although the transport sector accounts for a significant share of the workforce, recent studies (Lincaru, Grigorescu and

Pîrciog, 2021) indicate that, post-Covid, this sector is expected to shrink, productivity growth and innovation adoption being reduced, and the quality of jobs lowered.

The way in which river, road and rail transport activities can influence and sustain marine developments and have a positive impact on the environment is to make public and private investment in sustainable transport, in order to help their economies find new sources of growth and bring benefits in the region.

The assessment of how the sea supports or influences land-based activities, especially in order to ensure the well-being of coastal communities in terms of *maritime transport activities*, was scored by the stakeholders (Figure no. 2) according to their expertise, information and interests which are affected by maritime spatial planning.

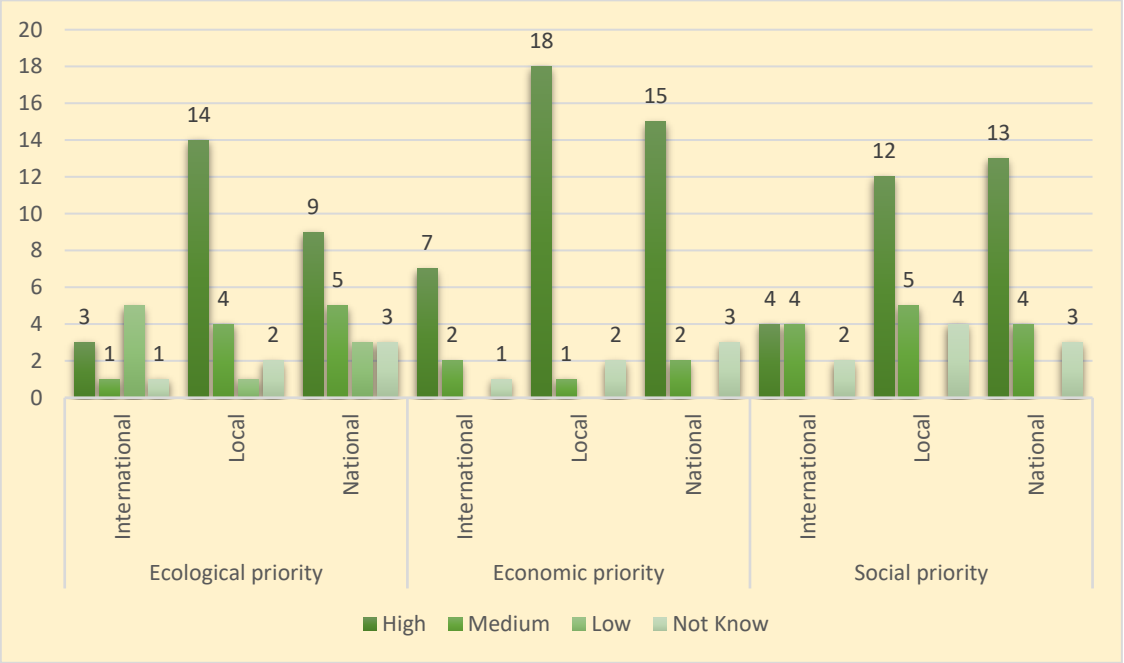


Figure no. 2. Maritime transport
Source: Authors' own research

According to the analysis carried out based on the questionnaire, regardless of the scale at which the activity of the responding organization (international, local, national) unfolds, maritime transport activities are considered an *ecological priority*, the distribution of the scores being as follows: 51.00% - High, 19.60% - Medium, 17.60% - Low and 11.80% - Not Known. Maritime transport has a strong impact at the boundary between land and sea, a major impact on the environment being represented by the potential accidents and oil spills of the ships (Stancheva and Stanchev, 2021), interactions due to human activities and uses. This assessment of the stakeholders regarding the environmental issues emphasized by the maritime transport activity shows that ecosystem services need to be integrated into planning decisions, which can make a significant contribution to achieving a good ecological status in the Black Sea (Stan et al., 2021b), thus removing the problems caused by the harmful effects of the polluted environment on human health for the communities in the Romanian coastal area.

The port activity is marked in the Romanian coastal area by the existence of the seaports of Constanța, Mangalia, Midia (in Constanța county) and Sulina (in Tulcea county). The port of Constanța is both a seaport and a river port and it benefits from an advantageous geographical position, being located on the pan-European Rhine-Danube transport corridor. The port of Constanța provides good connections with all the modes of transport: rail, road, river, air and pipelines.

Regarding the assessment of the *economic priority* of the maritime transport activity, the surveyed entities made the following assessments: 78.40% - High, 9.80% - Medium and 11.80% - Not Known. As can be seen, the perception of the stakeholders is relevant because, at present, maritime transport covers about 90% of the world trade. At the level of the Romanian coastal area, the marine waters' transport activity has a high economic priority due to its contribution to the socioeconomic development of Constanța County by supporting other economic sectors and generating jobs, the Port of Constanța being one of the main distribution centres serving the Central and Eastern Europe region. Niavis et al. (2017) argue that the activities carried out in marine and coastal areas shape a type of economic sector – the maritime transport,

which could be considered Europe's "Blue Economy". Furthermore, the entities at the local level give a high score to this criterion, in a percentage of 85.70% considering it a high priority. In this sense, in order to capitalize on the existing potential and the sustainable development of the coastal area, it is necessary to modernize transport infrastructure, the public investments needing to be much more energetic (Filip, Stan and Vintilă, 2016) and to serve mainly local economic development.

Regarding the extent to which maritime transport activities are a *social priority*, the distribution of the stakeholders' results regarding the perception of this priority are: 56.90% - High, 25.50% - Medium and 17.60% - Not Known. This view expressed by MSP-interested stakeholders can be explained by the fact that urban and rural coastal communities pose different social problems: tangible disparity between the standard of living of the different segments of the population associated with poverty, unemployment and increasing numbers of socially vulnerable people. Thus, if at the level of the urban center of Constanța the economic development due to the maritime transport activity is easily observed, at the opposite spectrum is the community of the town of Sulina where the local economic life is almost non-existent outside the port and tourist activities.

Therefore, the way in which the maritime transport activities influence land activities, especially in order to ensure the well-being of the coastal communities is perceived differently at the level of the Romanian coastal area, due on the one hand to the heterogeneous local interest groups who have different concerns and knowledge and, on the other hand, to the local government decisions on key political, administrative and legislative issues.

Following the SUPREME approach (2018), adapted for the prioritization of LSI at the level of the Romanian coastal area, from the analysis of the scores of land-sea interactions for river, road, rail and maritime transport activities it can be seen that the problems due to pressures and environmental impact, as well as the economic and social effects of these activities are comparable with those of the Bulgarian partners (Stancheva and Stanchev, 2021).

As a result, in order to achieve an efficient management of maritime activities and the sustainable use of marine and coastal resources, the information, knowledge and experiences of the stakeholders must be integrated into the elaboration of the MSP plan. Thus, given the potential and emerging issues given by the specific development of the Romanian coastal area, it is absolutely necessary to involve the stakeholders in maritime spatial planning because they sometimes provide information, data, solutions, opinions and complex recommendations that can be incorporated into the scientific research of the domain.

Conclusions

Therefore, the trimodal proposal in the field of transport (road and rail transport, and water transport - river and maritime transport) in the Romanian coastal area contributes to the development based on the three traditional pillars (economic, social and environmental) in the Black Sea cross-border region (Filip, Stan and Vintilă, 2016), offering new opportunities to this region. Consequently, in the context of the sustainable development of activities in the marine and coastal space of the Black Sea, it is necessary to know the priorities of transport activities from the perspective of the spatial approach of land-sea interactions (LSI).

Even though ambiguity can also be seen as to what MSP can or should tackle (Mayer et al., 2013), in the last two decades, marine spatial planning has matured from a concept to a practical approach of the transition to sustainable sea development and a 'blue economy' (Ehler, 2021).

Given that decisions in the MSP can change the opportunities of marine, as well as terrestrial sectors, just as much as structural changes in other economic sectors can change the context and needs for MSP decisions (Weig and Schultz-Zehden, 2019), future research in the field must also identify the needs of other sectors, as they may be important both for the planning process itself and for mobilizing these stakeholders.

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A Snapshot of the Barriers Related to Tourism-Underwater Cultural Heritage-Environmental Protection in MSP. A Stakeholders' Perspective

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Abstract

In the context of maritime spatial planning (MSP), in order to achieve the sustainable development goals, an approach to the concept of multiple use (MU) is needed as a tool for the efficient management of the multiple activities which take place in the maritime space. The concept of multiple use (MU) is the intentional common approach / analysis of certain maritime activities and marine resources which are in close geographic proximity. In this context, the combination of maritime activities or uses, through joint operations or approaches, helps reduce spatial pressures on the sea and may create new opportunities for socio-economic development and for the protection of the marine environment. The aim of this paper is to analyze the perception of the stakeholders on identifying legislative and administrative barriers which adversely affect the implementation of the combination Tourism-Underwater Cultural Heritage-Environmental Protection in the Romanian coastal area, the Constanța-2 Mai sector, in the context of maritime spatial planning. The empirical analysis in this paper took into consideration the statistical description of the factors in the DABI catalogue (Drivers-Added values-Barriers-Impacts), selecting the Barriers category of factors and is based on data collected from stakeholders interested in maritime spatial planning, grouped into two categories: "local public entities" and "educational and research entities". As a result of the performed analysis, several recommendations were made in order to overcome the legislative and administrative barriers identified by the stakeholders. The obstacles identified by the local public entities and the educational and research entities in the Black Sea area may hinder the sustainable development of the area and need to be brought to the attention of the authorities and decision makers. The knowledge of these barriers for the optimal combination of various marine activities must be incorporated into the spatial decision support tools used in MSP.

Keywords

legislative and administrative barriers; tourism-underwater cultural heritage-environment combination; stakeholders; Maritime Spatial Planning (MSP); Romanian coastal area.

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Introduction

In the context of maritime spatial planning, in order to achieve the sustainable development goals, an approach to the concept of multiple use (MU) is needed as a tool for the efficient management of the multiple activities which take place in the maritime space (Directive 2014/89/EU), given that its real potential and current state of implementation in various sea basins are largely unexplored (Depellegrin et al., 2019).

In line with the relevant legislation and national policies of the Member States of the European Union, they must ensure a comprehensive planning process that identifies the different uses of the maritime space (Directive 2014/89/EU), by involving authorities, economic operators and other stakeholders at different levels (Văidianu and Ristea, 2018; Aivaz et al., 2021; Zaucha and Kreiner, 2021), the MSP stakeholders

being individuals or groups of people who have an interest in or are affected by the MSP' results (Luhtala et al., 2021).

In this context, Romania in partnership with Bulgaria carried out the MARSPLAN BS II (2019-2021) project, a project expected to lead to the drawing up of MSP plans for both countries, the authors being involved in the project implementation team. One of the activities of the project was to identify the use of maritime space for different maritime uses, namely the combination Tourism-Underwater Cultural Heritage-Environmental Protection, with the aim of collecting the most up-to-date information and data from the stakeholders.

In this paper, *the legislative and administrative barriers* that adversely affect the implementation of the combination Tourism-Underwater Cultural Heritage (UCH)-Environmental Protection, identified in the Romanian coastal area, are described and analyzed, using the DABI spatial analysis methodology (Drivers - Added values - Barriers - Impacts), in order to manage space uses and conflicts in the Romanian marine area.

1. Scientific literature review

Maritime spatial planning aims to integrate the maritime dimension of certain coastal uses or activities and their impact so as to develop an integrated and strategic vision (Directive 2014/89/EU) materialized in MSP plans. The growing demand for marine resources is putting increasing pressure on the use of maritime space and the potential for multi-use conflicts (such as offshore wind energy/power, fishing and aquaculture, dredging, mineral extraction, maritime transport), which has led to an increased interest in maritime spatial planning (Douvere and Ehler, 2009).

With regard to reason 14 of the MSP Directive, maritime spatial planning should use an ecosystem-based approach to promote the sustainable growth of maritime economies, the sustainable development of maritime areas and the sustainable use of marine resources. A whole series of specialized studies have treated the concept of multiple use as the intentional joint approach / analysis of maritime activities and marine resources that are in close geographic proximity (Zaucha et al., 2016), Kyvelou and Ierapetritis (2019) suggesting a broad definition of the multiple use (MU) concept in order to be more easily integrated into MSP, given that it is a developing concept meant to overcome spatial claims and to support Blue Growth (Depellegrin et al., 2019).

Even though the relationship between MSP and Blue Growth is multifaceted and not yet fully explored (EASME, 2018), at EU level in recent years several projects have been funded in order to promote sustainable development and to provide various models for combining economic activities.

For the Romania-Bulgaria cross-border area, within the MARSPLAN-BS II project, the combination Tourism-Underwater Cultural Heritage-Environmental Protection (Marine Protected Areas), defined as the combination of tourist and recreational activities with the protection of underwater archeological sites and adjacent marine ecosystems, was examined. By carrying out desk research in consultation with the stakeholders, the project implementation team identified several factors which promote or hinder the implementation of this combination of multiple uses of the maritime space. The factors were grouped, by taking into account the key aspects of setting up of the maritime space, into four themes (drivers, barriers, added value, impacts), these themes being grouped into categories (Zaucha et al., 2016).

In the Romanian coastal area, the main economic activity is tourism, which has a major role in the socio-economic development. In order to ensure the necessary framework for a sustainable development of the Romanian coastal area, a balance must be ensured between the economic development, the protection and conservation of the natural, socio-cultural environment and meeting the needs of the local communities, given that the concept of sustainability covers virtually all the areas and sectors in which a development process takes place (Petrişor, 2017). Therefore, coastal, and maritime tourism must bring benefits to the local communities, being well known that tourism activity implies a complex of services engaged in a local economy, and their unsustainable development can put great pressure on the environment (Gogonea et al., 2021). Several studies in the specialized literature have identified, using exploratory methods, the similarities and differences between economic activities, so that in terms of different economic and financial indicators, they can be taken as benchmarks in business design at the level of the local economy (Mirea and Aivaz, 2016; Munteanu Florea and Aivaz, 2017).

Thus, for the identification of the main promoters and barriers regarding the implementation of MU in the "soft" combination of tourism, UCH and environmental protection (Stancheva and Stanchev, 2020) the

active involvement of stakeholders from the beginning and throughout the process was used as an essential element of any successful participatory activity (Văidianu and Ristea, 2018).

Therefore, in order to promote the sustainable development of the coastal and maritime area, it is essential for the stakeholders, relevant authorities and the public to be consulted in order to capitalize on experiences, knowledge, data and information, as both the public and the private sector contribution is fundamental to medium and long-term sustainable development.

2. Research methodology

The aim of this article is to analyze the perception of the stakeholders, namely of educational and research entities and local public entities, on the identification of legislative and administrative barriers that adversely affect the implementation of the combination Tourism-Underwater Cultural Heritage-Environmental Protection in the Romanian coastal area, Constanța-2 Mai sector, in the context of maritime spatial planning.

In order to achieve the objectives of the research we have used a questionnaire drawn up by all the partners involved in the MARSPLAN BS II (2019-2021) project under the coordination of the National Institute for Research and Development on Marine Geology and Geoecology - GeoEcoMar. The online questionnaire applied to the stakeholders in the process of developing and implementing the MSP plan was prepared within Activity 2.4 "Addressing the Multi-Use (MU) concept with MSP in the cross-border region" for collecting the most up-to-date information and documented data.

According to Zaucha et al. (2016), for the DABI spatial analysis method (Drivers - Added values - Barriers - Impacts) the information came from desk research and led to the identification of certain factors which promote or hinder the implementation of the combination Tourism-Underwater Cultural Heritage-Environment, as well as factors which determine the positive or negative effects resulting from the implementation of the analyzed combination. The factors for the four templates were further grouped into sub-categories, using different criteria that took into account key aspects of maritime spatial planning: policies, administrative / legal issues, environmental and socio-economic constraints, technical capabilities and knowledge gaps. The stakeholders were asked to score the importance associated with a DABI factor, as being a support for or an obstruction of an MU (Onyango et al., 2020); when scoring the factors, a semi-quantitative scoring system with 4 levels is applied: high priority (3); medium priority (2); low priority (1); irrelevant or absent factor - N/A (0), in relation to their positive or negative influence on MU.

The empirical analysis in this paper took into account the statistical description of the factors in the DABI catalogue, selecting the *Barriers* factor category and is based on data collected from the maritime spatial planning stakeholders, grouped into two categories: "local public entities" and "educational and research entities". The data processing, the systematization of the results, as well as obtaining the indicators used for the statistical analysis were achieved with the help of the *Statistical Program for the Social Sciences* (SPSS).

3. Results and discussion

The MARSPLAN-BS II project, which aims to develop a common MSP strategy meant to lead to the drawing up of MSP plans for Romania and Bulgaria, is the first project to include a pilot case study specific to MU and will most likely be useful in terms of stimulating the analysis and harnessing MU potentials in the national MSP plans (Stancheva and Stanchev, 2020).

Following the marking of the DABI factors through the involvement of the participating stakeholders, the perceived obstacles are the result of these parties' own way of relating to the process itself, to the situations and risks, as well as to the existing documents in the context of maritime spatial planning.

Regarding the score given by the two types of entities surveyed regarding the factors which make up ***legislative obstacles*** (Table no. 1), 71.00% of them assign high priority to the *lack of a unitary legislation for the regulation of recreational diving activities*, 21.10% - average priority and only 7.90% consider it an irrelevant factor. In 2021, the Methodology on the regulation of diving activities in Romania was adopted, recreational diving being regulated in a chapter of the normative act. However, professional associations in the field are dissatisfied with the over-regulation and over-taxation of the recreational diving activity.

In the Constanța-2 Mai area of study, through the national legislation regarding the designation of special avifaunal protection areas, the Natura 2000 ROSPA0076 Black Sea site was declared an integral part of the European ecological network Natura 2000 in Romania. Natura 2000 is complemented by marine protected

areas which were designated in accordance with national legislation, the network of marine protected areas comprising 9 sites of EU interest.

The assessment of the local public entities and of the educational and research entities regarding the *conflicts between the regulations / measures for the conservation and protection of the environment* (*Marine Protected Areas, Natura 2000) and those in the field of fishing* is high priority for 73.70%, for 15.80% - medium priority, for 2.60% - low priority and only for 7.90% an irrelevant factor. The stakeholders' evaluation is supported by the fact that, on the one hand, the protected natural areas and nature conservation bring benefits to the economic and social development of the area, and on the other hand, the coastal communities depend on the fishing activity and put pressure on the fishery resource. The countless changes in legislation, including the one related to environmental and water resources management, an issue noticed in the specialized literature (Stan and Vancea, 2014), adversely influences the fishing and aquaculture activity in the Romanian coastal area. Thus, in order to reduce this obstacle, the measures taken by the decision-makers must take into account the promotion of environmentally sustainable fishing and improvement of its resource use efficiency.

The factor *conflicts between the regulations / measures for the conservation and protection of the environment (Marine Protected Areas) and the shipping lines* is scored by the two categories of stakeholders as being high priority - 63.20%, 26.30% - average priority, 2.60 % - low priority and only for 7.90% it is an irrelevant factor. It is well known that protected natural areas and nature conservation have local economic and social value and, at the same time, maritime transport is a major source of environmental pressure, although it is one of the links in the transport chain with an important contribution to the local and national economic development. Thus, information on the types of shipped goods, the chosen routes and the type of ship used allows MSP practitioners to estimate which sectors are affected by the possible changes in the shipping lines (Weig and Schultz-Zehden, 2019).

Table no. 1. Legislative barriers

Factor	Scale	Local public entities	Educational and research entities	Total
1.1. Lack of a unitary legislation for the regulation of recreational diving activities.	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	7 25.00%	1 10.00%	8 21.10%
	High priority	18 64.30%	9 90.00%	27 71.00%
	Low priority	0 0.00%	0 0.00%	0 0.00%
1.2. Conflicts between the regulations / measures for the conservation and protection of the environment (Marine Protected Areas, Natura 2000) and those in the field of fishing.	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	3 10.70%	3 30.00%	6 15.80%
	High priority	21 75.00%	7 70.00%	28 73.70%
	Low priority	1 3.60%	0 0.00%	1 2.60%
1.3. Conflicts between the regulations / measures for the conservation and protection of the environment (Marine Protected Areas) and the shipping lines.	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	6 21.40%	4 40.00%	10 26.30%
	High priority	19 67.90%	5 50.00%	24 63.20%
	Low priority	0 0.00%	1 10.00%	1 2.60%

Source: Authors' own research.

As a recommendation for overcoming the legislative barriers identified by the stakeholders for the combination Tourism-Underwater Cultural Heritage-Environmental Protection, the revision of national legislation and practices and the correlation of the MSP legislative normative framework with that of MSP-relevant activity sectors, taking into account the potential for multiple use at the local level are proposed.

In their paper Stancheva et al. (2022) state that in the Black Sea region, the Underwater Cultural Heritage (UCH) plays an important role; there are activities which combine marine tourism with the conservation

and capitalization of UCH sites, MSP being a unique opportunity for a better protection and wiser management of UCH (Papageorgiou, 2018).

The assessment of the two categories of entities surveyed regarding the factors which make up ***administrative obstacles*** (Table no. 2) for the development of the combination of MU studied is the following:

(i) *Lack of communication / coordination between the relevant authorities in the fields of underwater cultural heritage, tourism and environmental protection (Marine Protected Areas)* is considered by 71.10% as high priority, 18.40% - medium priority, 2.60% - low priority, and for 7.90% it is an irrelevant factor. The idea of reducing the communication, leadership and coordination availability of the relevant authorities leads mainly to a lack of mutual trust and to a weakening and underdevelopment of the field. A recommendation for the removal of this hurdle are formal and informal communication solutions, through the creation of databases, web platforms, clusters and common stakeholder structures that can be crucial to expose, mediate and promote mutual knowledge of the areas of underwater cultural heritage, tourism and environmental protection and to initiate collaborations and relationships between them.

(ii) *Insufficient knowledge of the national legislation and of the UNESCO Convention on Underwater Cultural Heritage* is high priority for 65.80%, medium priority for 21.10%, low priority for 5.3% and an irrelevant factor for 7.90%. The perception of the interested parties is the focus on promoting this type of activities in order to know the normative framework which regulates the field of underwater cultural heritage.

(iii) *Illegal underwater construction (without special permits issued by the relevant authorities)* is seen by 65.80% of the responding entities as high priority, 26.30% - medium priority, and for 7.90% it is an irrelevant factor. Although underwater construction works indirectly generate major benefits for the Romanian Black Sea coast (Stan, Vintilă and Ţenea, 2014; Filip, Stan and Vintilă, 2016), they must comply with the legislation on their authorization, which is why it is imperative to raise awareness and to penalize the economic operators who do not comply with the procedures and the legislation in force.

(iv) *Insufficient updating of Marine Protected Areas management plans* is perceived by 21.30% as high priority, by 21.30% as medium priority, by 52.10% as low priority and by 5.30% as an irrelevant factor. The management plan sets out the framework for conserving the biological diversity and in particular the habitats and species of plants and animals for which protected areas have been declared, and its updating is necessary for the development of methods to improve decision-making at the level of central and local public authorities with responsibilities in terms of environmental protection.

(v) *Lack of strategies for the protection and capitalization of underwater cultural heritage sites* is seen by 71.00% of the entities as high priority, 23.70% - medium priority and only 5.30% consider it an irrelevant factor. It is well known that underwater cultural heritage and tourism are mutually beneficial because, on the one hand, underwater cultural heritage can generate substantial income for the tourism industry, while on the other hand, tourism can serve underwater culture heritage sites by promoting and capitalizing on it. The absence of strategies can lead to a lack of vision and foundation of the objectives regarding the capitalization of the potential of underwater cultural heritage and tourism, without sufficiently seizing the opportunities.

The obtained results show that the two categories of entities surveyed consider, to a large extent, that administrative barriers can adversely affect multiple use in the maritime space. As a recommendation to remove this obstacle we propose the need to tackle the administrative issues of maritime spatial planning in an integrated coastal area management.

Therefore, with the help of the MU assessment methodology (DABI catalogue) for the combination Tourism-Underwater Cultural Heritage-Environmental Protection studied in the Romanian coastal area, the Constanța-2 Mai sector, the stakeholders assessed the categories of factors that hinder MU according to their informational and expertise level. Thus, the respondents, "local public entities" and "educational and research entities", considered, in a significant percentage (63% -73%), that the lack of legislation for undertaking MU is a high priority. Moreover, specific administrative obstacles in allowing MU are perceived as high priority in a suggestive percentage (65% -71%) by the two categories of entities.

Table no. 2. Administrative barriers

Factor	Scale	Local public entities	Educational and research entities	Total
2.1. Lack of communication / coordination between the relevant authorities in the fields of underwater cultural heritage, tourism and environmental protection (Marine Protected Areas).	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	4 14.30%	3 30.00%	7 18.40%
	High priority	20 71.40%	7 70.00%	27 71.10%
	Low priority	1 3.60%	0 0.00%	1 2.60%
2.2. Insufficient knowledge of the national legislation and of the UNESCO Convention on Underwater Cultural Heritage.	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	7 25.00%	1 10.00%	8 21.10%
	High priority	16 57.10%	9 90.00%	25 65.80%
	Low priority	2 7.10%	0 0.00%	2 5.30%
2.3. Illegal underwater construction (without special permits issued by the relevant authorities).	N/A	3 10.70%	0 0.00%	3 7.90%
	Medium priority	8 28.60%	2 20.00%	10 26.30%
	High priority	17 60.70%	8 80.00%	25 65.80%
	Low priority	0 0.00%	0 0.00%	0 0.00%
2.4. Insufficient updating of Marine Protected Areas management plans.	N/A	2 7.10%	0 0.00%	2 5.30%
	Medium priority	8 28.60%	2 20.00%	10 21.30%
	High priority	8 28.60%	2 20.00%	10 21.30%
	Low priority	10 35.70%	6 60.00%	16 52.10%
2.5. Lack of strategies for the protection and capitalization of underwater cultural heritage sites.	N/A	2 7.10%	0 0.00%	2 5.30%
	Medium priority	8 28.60%	1 10.00%	9 23.70%
	High priority	18 64.30%	9 90.00%	27 71.00%
	Low priority	0 0.00%	0 0.00%	0 0.00%

Source: Authors' own research.

Thus, in order to improve the potential for multiple use (MU) in the studied area, interventions on the barriers (legislative regulations, public policies, administrative decisions) by the relevant authorities are needed. These obstacles identified in the Black Sea area can hinder sustainable development and need to be brought to the attention of the authorities and decision makers. The knowledge of these barriers, in order to optimally combine different marine activities, must be incorporated into the spatial decision support tools used in the MSP.

Conclusions

Although at present the two countries, Romania and Bulgaria, have not yet developed their MSPs, the findings obtained from the studies conducted within the project aim to inform the MSP process, in particular by offering recommendations on how MSPs can promote diversity and eliminate barriers that greatly hinder the development of MU (Stancheva et al., 2022).

The Black Sea coastal area has huge resources for sustainable development, ensuring both conservation and well-being, which is why it is necessary to also identify the needs of other sectors, which are important both for the planning process itself and for mobilizing these stakeholders. However, the need to mobilize

financial resources in the area of identified priorities should not be neglected (Vancea and Duhnea, 2013). From this point of view, both Romania and Bulgaria have to be concerned with structuring a set of public policies that address all the categories of resources and ensure adequate funding, taking into account certain indicators and their impact on the economies (Aivaz and Condrea, 2012; Vancea, Aivaz and Duhnea, 2017).

MSP can be used to open up new economic potential by stimulating the synergies between different uses (EASME, 2018), while for the adaptation of spatial maritime planning to the specifics of the area, a transdisciplinary collaboration between the stakeholders is needed (Stan et al., 2021).

Thus, it is necessary to continue conducting new studies given the complexity and heterogeneity of the issues raised by MSP planning, as well as the identification of various factors which have a direct, indirect and induced influence on MSP planning. Possible further research of the different uses of maritime space can be performed also through comparative dynamics analyses (between different sectors of activity, between different categories of entities, between different countries).

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Are Technical Skills, Digitalization, and Cultural Intelligence Competitive Advantages for Modern Organizations?

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Abstract

Over the last few years, skills-based education and their use in business have played an important role in increasing organizational performance. Skills acquired by employees in the education system and further developed on the job are divided into hard and soft skills. Hard skills refer to technical and technological skills as well as problem solving, while soft skills refer to interpersonal skills that are largely acquired throughout the professional life. Thus, the purpose of this study is to identify whether these skills are essential for an employee in the modern organization. Though a considerable amount of research has been dedicated to each of these skills leading, individually, to a competitive advantage, through this descriptive analysis, the research contributes to the existing academic literature as well as to business practice by emphasizing the necessity for modern employees to have both hard and soft skills to help their organization gain a competitive advantage on the market. This study is a starting point for future research and would help education institutions to train their students for the challenges of the labor market, and also contribute to a better use of these benefits by the business environment.

Keywords

competitive advantage; cultural intelligence; digitalization; technical skills.

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Introduction

In the modern business environment, characterized by globalization, diversity, complexities, fast changing economic conditions, and technological advancements, combined with intense international competition (Van Dyne and Ang, 2005), organizations must find innovative ways to create a sustainable competitive advantage. Competitive advantage, "the invisible component of the strategy" (p. 60), is the reason why any organization is in business. It is obtained when a firm succeeds in creating more economic value than their adversaries (Popa, et al., 2011). Michael Porter (1985) classifies competitive advantage into two types: cost leadership and differentiation which, depending on the scope of activities the firm undertakes to gain, will result in 3 generic strategies that organizations can implement for obtaining above average performance: cost leadership, differentiation, and focus. The focus strategy can, in turn, be divided into cost focus and differentiation focus. According to Popa, et al., (2011), there are three main sources of competitive advantage:

- superior financial, physical, and human resources;
- superior technical, economic, organizational, and managerial skills;
- superior position on the market.

Day and Wensley (1988) define skills as "distinctive capabilities" of an organization's employees, which differentiates them from those of the competitors', and resources as "more tangible requirements for advantage which enable a firm to exercise its capabilities" (p. 3).

According to the Resource-Based Theory, an organization's resources, which include "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc." (Barney, 1991, p.101), can become sources of competitive advantage as long as they are valuable, rare, imperfectly imitable, and if they don't have strategically equivalent substitutes. This requires leaders to precisely identify the skills and resources which possess the greatest edge on position and performance and make strategic choices to blend them together to obtain a competitive advantage (Day and Wensley, 1988).

Considering all of the above, this paper aims to analyze the profile of an employee within the modern organization in the era of digitalization while analyzing the technical but also the intercultural skills, which could allow an organization to become competitive on the market. Therefore, in this paper we will discuss whether technical skills in the light of business digitalization as well as the intercultural skills of the employees may foster competitive advantages within an organization.

1. Research Methodology

In this paper the researchers have synthesized the relevant state of the art pertaining to an organization's capabilities leading to new competitive advantages. The method used is a preliminary descriptive analysis of the literature on the role of organizational capabilities which could drive competitive advantages. The carried research encompasses on-line and published sources, such as Web of Science, Science Direct, Elsevier, eBooks, Emerald Management, EJournals, Scopus, J-Stor, and others, these research platforms offering quick access to qualitative research data.

The research focused on comparing such capabilities in terms of the way they could contribute to an organization's competitive edge. As a result of the analysis, we identified two main directions, namely digitalization, technical and technological skills of graduates and future employees on the one hand, and interpersonal skills of existing employees in an organization, more specifically, cultural intelligence, on the other hand. The discoveries led to highlighting the importance of digitalization, technical and technological skills combined with cultural intelligence as essential organizational capabilities leading to competitive advantages.

2. Literature review

2.1. Technical skills and digitalization as competitive advantages

In the context of the knowledge-based economy, the level of education of employees requires continuous improvement through the development of essential skills in today's business environment. Challenges such as globalization, the accelerated pace of change in the labor market, and the growth of technologies require human resources with key skills such as the ability to constantly acquire knowledge, the ability to put knowledge into practice by finding ways to solve problems (Makasheva et al., 2016).

Thus, skill development becomes a strategic management tool (Sousa and Wilks, 2018) as well as a research issue in educational institutions, which is an important goal for stakeholders in the education system. A recent study (Rodrigues et al., 2021) shows that a central issue in a country's education and social policies is the development of technological skills. During their school career, students have the opportunity to develop various skills that will become useful for both academic and professional life. The same authors (Rodrigues et al., 2021) identify the main skills of the 21st century as problem solving, transforming information into knowledge, critical thinking, technological skills and communication. All this is essential for the future satisfaction of the people.

In this sense, technological ability is considered an organizational technique, and distinctive technological skills refer to the organization's ability to use technical knowledge to improve the processes and underlying the development of the organization's products (Roustapisheh and Yazdizadeh, 2019).

Given the technological dynamics, employment opportunities are based on various professional skills mentioning eight directions of key competencies in the workplace: global skills, communication skills, personality skills, information use, information research, complex thinking, creativity. To increase the chances of employment, it is important to have a practical training course to educate students to familiarize them with the responsibilities and tasks of the job. In this sense, Marinaș et. al. (2021) identifies two categories of skills that contribute to increasing employability: technical skills (hard) specific to each job and business and managerial skills (soft). Thus, it is considered necessary to pay more attention to the technical knowledge and skills that can be developed through partnerships between educational institutions and economic agents, these being specific to the job for which the student is preparing since school.

However, to help increase organizational efficiency, future candidates should also have soft skills, such as employment skills, that allow them to develop their careers in the context of technological change. The literature specifies that employment skills involve the acquisition of entrepreneurial skills by students, such as problem solving, teamwork, empathy, innovative thinking, and the ability to relate. In this case, the labor market offers them the opportunity to work on practical projects to be able to lay the foundations of a professional experience (Pardo-Garcia and Barac, 2020). The same authors identified directions to be followed by educational institutions to increase employability:

- diversification of the curriculum by inviting employers to courses, greater use of foreign languages, and ICT;
- teaching business protocols that involve training students in decision making and problem solving, improving communication and teamwork skills, creating business plans;
- job matching through internships, accessing job search forums;
- learning from the experience of graduates by organizing visits to companies where graduates work and other activities.

In this context, organizations focus on hiring people with key competencies to create new benefits that lead to increased customer satisfaction and a stronger position in the face of competition. Popa et al. (2011), are of the opinion that a company that creates an economic value higher than the competition has a competitive advantage. Therefore, the first step in gaining a competitive advantage is to create value for your employees. Thus, employees with professional, technical and entrepreneurial skills contribute to increasing productivity and organizational performance, being willing to make an extra effort to accomplish the tasks that lead to meeting organizational goals. Furthermore, Sousa and Wilks (2018) believe that organizations need to invest in the development of their employees so that they are motivated to stay in the company and contribute to gaining competitive advantage. They identify the following benefits that skilled workers can bring to the companies in which they work:

- reduction of labor costs (fewer and more qualified employees, reduction of training expenses);
- reducing the delivery time of products on the market;
- increase productivity;
- increasing the quality of products;
- diversification of production (automation of manual labor);
- creating new products and services;
- analysis of a larger volume of data;
- changes in the organizational structure.

It is not enough just to gain the competitive advantage, but it must be maintained in the long run because in today's environment there is a need for sustainable development in all areas. First, sustainability has its starting point in education, which is a tool for change. A recent study (Pouratashi, 2021) showed that skills such as empathy, systemic thinking, participatory skills, anticipatory thinking, and creative thinking have a key role to play in increasing the sustainability and efficiency of future employees. However, Vehmaa, Karvinen and Keskinen (2018) consider that the inclusion of sustainability in the education system is not enough, and the skills and knowledge gained through education must be transferred to the practices of professional life. The same authors state that there is not enough knowledge on how graduates can integrate sustainability skills into job-specific tasks.

Therefore, the organization must harness the many benefits that come from developing employee skills to ensure its long-term sustainability. Rapid changes that occur in the labor market require constant updating of skills and their matching with job requirements so that organizations can cope with technological problems (Popescu, et al., 2020). In order to improve the skills and increase the professional potential of the employees, it is recommended to use a system of incentives regarding salaries and other economic benefits, job satisfaction. All this will contribute to corporate sustainability and the establishment of strategies to increase performance and competitiveness.

The benefits of digital transformation are obvious and can apply to all sorts of organizations including educational institutions. The process of digitalization usually aims at implementing digital technologies, but a broader perspective can include change and transformation at multiple organizational levels (Pettersson, 2020). According to Pettersson (2020) these changes can refer to new knowledge, pedagogical skills, communication or even the process of organizational skills at institutional level.

Rensfeldt and Player-Koro (2020) who have analyzed the major Swedish school digitalization reforms over the past 50 years and its results in a future imaginary society, highlight the importance of the digital competencies for an employee in the modern organization who should constantly acquire new knowledge

and competencies in order to improve results. These digital skills means being able to successfully use a wide range of digital devices such as computers and smart pads but also programs and digital resources for further study in the field of education and business. They also state that digital technology is a key factor in the future emerging society and this process has been taking place since the end of the IInd World War when the world made its transition to a „digitally-based economy" (Rensfeldt and Player-Koro, 2020, p.13.). This is why the education system in Sweden was subject to many reforms like those from the 1960, 1990s and 2010s with an enormous impact on school curricula and technology use. Rensfeldt and Player-Koro (2020) conclude that digitalization is a powerful instrument for improving different aspects of schooling which will become more efficient and streamlined.

On the other hand, concerning the benefits of digitalization for companies, Ferreira, Fernandes and Ferreira (2019) developed a study that analyzed the factors which influenced companies to adopt new digital processes and their impact on innovation or performance. Their study included 983 companies in Portugal in which was applied a questionnaire concerning companies market share, the access to new markets or the service quality or the range of products. The final results of the study demonstrated that the digital transformation can significantly contribute to a company differentiation in terms of competitive advantages. However, the same studies also explain that the impact of ICT technologies may vary from one industry to another depending on the business profile for instance an agricultural firm might differ from a manufacturing or service company which led to the conclusion that the impact of digitalization is "homogenous amongst firms".

The main findings of the study support the idea that the more innovative a company is the more competitive it becomes on the market. More than this, the study also suggests that "to be digital would be a question of surviving and an entrepreneurial opportunity to increase the company's innovation and performance" (Ferreira, Fernandes and Ferreira, 2019, p.589). They also mention the importance of university-company collaboration because companies need to distinguish themselves from the competition and this is the reason why they have to seek out sources of knowledge and innovation, namely, centers of learning.

In addition to this, Gray and Rumpe (2015) differentiate between various models of digitalization ranging from the business domain where digitalization mostly informs on variables like buying and selling rates or the relationship with customers as compared to other domains like production, water and energy supply or transportation, where digitalization would mean designing products, information on the status, physical distribution or sustainability. They also underline the importance of model personalization which would mean creating meta models for different domains using digital tools so as to integrate technology into all aspects of daily life (smart homes, e-healthcare, security, social media relationships or even services in e-government.

Knudsen et al., (2021) argue that digitalization has benefits that are unprecedented and mainly consists of the symbiosis between Big Data and the use of network effects. They continue to say that the competitive advantage is directly proportional with the complementarity between Big Data and network effects and vice versa. However, other voices have previously claimed that digitalization comes with some risks and disadvantages.

For instance, Shah (2022) claimed that on the one hand organizations that are highly digitalized have functions that are very explicit and also available to every individual of the organization through libraries, databases and other practices. On the other hand, the intellectual capital becomes quite vulnerable through codification because of an increased risk of information leaks. Still, considering the paper based records from the past, which could be only managed and checked through a laborious process or audits, the codified knowledge offered a competitive advantage due to the process efficiency. He continues to emphasize the importance of digitalization because the use of computers favored automatization which could guarantee easy access of information, quick transactions and decision making which were also a competitive advantage that allowed some companies to stay ahead of their competitors.

Shah (2022) gives the example of Amazon which used Big data analytics (BDA) in order to collect real time information about its customers and suppliers, to create algorithms, personalize product recommendations and even predict future behavior. The same author identifies the following elements that ensure the competitive advantage in the business world:

- Data Authenticity- the use of reliable information acquired via a very solid input of information;
- Real-time access; instant access to available data at any moment;
- Versatility of applicability- BDA can be applied across sectors ranging from text or web analytics to sales and marketing, Risk Management, Customer Service and even Workforce Planning.

In addition to making information available to anyone at any time, it is also important to use digital tools and processes to promote innovation and performance.

Fernández-Portillo et al. (2022) state that the internet has allowed all sorts of companies to access more easily markets, information on competition and the business environment. Still the competitive advantage offered by digitalization is not equally spread among all firms. This was the reason why Fernández-Portillo et al. (2022) carried out research in order to understand why "the improvement in performance doesn't take place in all companies?" especially because companies usually make important investments to achieve their digitalization. Their initial presumption was that digitalization doesn't ensure a business performance alone, but it should be aligned with an innovation strategy in order to attain economic and financial performance. In the conclusions of their study, following their Multivariate Analysis and survey carried out in 805,588 mercantile companies in Spain in 2016 they confirmed that innovation has a high influence on the relationship between digitalization and business performance. In addition to this, Fernández-Portillo et al. (2022) they point out the importance of the human resources who must be trained and gain experience in using new digital resources.

2.2. Cultural intelligence as competitive advantage

With globalization becoming an integral part of all aspects of the society (Ang, Rockstuhl and Tan, 2015), the necessity for an employee in the modern organization to become culturally adept, ready to face the challenges brought about by the increasingly diverse composition of communities, has become more and more obvious (Azevedo and Shane, 2019).

According to Earley and Ang (2003), Cultural Intelligence (CQ) is an individual's ability to work and interact effectively in a culturally diverse environment. The same authors (2003) developed the CQ framework, aiming to define the capabilities necessary for an effective interaction in a multicultural environment. This conceptual framework, expanded by Ang and Van Dyne in 2008, consists of four dimensions: Metacognitive CQ, Cognitive CQ, Motivational CQ and Behavioral CQ. Van Dyne et al., (2012) have identified eleven sub-dimensions for the four main dimensions, which can become important capabilities the modern employee in an organization will need in order to work effectively with colleagues and business partners from multicultural backgrounds.

CQ Drive is the degree to which individuals feel motivated and determined to persevere in tackling situations involving cultural diversity (Livermore, 2011). The same author defines CQ Knowledge as the degree to which an individual is able to understand the implications culture has on the way people think and act, as well as the differences among cultures. In the same book, Livermore (2011) defines CQ strategy the degree to which an individual is aware of the events occurring in multicultural contexts and their ability to use this awareness to their advantage in solving problems effectively. The fourth element of the CQ framework, CQ Action, has been defined by Livermore (2011) as the appropriateness with which an individual can handle a situation in a multicultural context, their flexibility using verbal and non-verbal behavior, and the extent to which they can adapt to various norms of culture. Although each of these four capabilities can be seen as independent from one another, together, they are essential to building successful relationships at every level in an organization. While a valuable resource for the organization and an important source of competitive advantage, for it to lead to a sustainable competitive advantage, CQ capability needs to be discovered in job candidates and trained in existing employees.

Currently, Cultural intelligence (CQ) is not part of the academic curriculum at undergraduate levels. However, the necessity for an increase in teacher CQ has surfaced, especially in geographies with high student diversity. Two competitive advantages schools could gain from integrating CQ in their curriculum, would be a reduction in the number of students wrongly placed in special needs schools for lack of teacher intercultural training (Gay, 2002), as well as an increase in the number of interculturally educated and globally engaged future citizens, equipped with the necessary skills to study in international environments during study exchange programs even at high-school levels (Gog, 2012).

The most prevalent cases of Cultural Intelligence (CQ) training occur within the organizations. Faced with the challenges of the fast-changing global society, organizations have realized that interculturally-effective leaders are a valuable, rare, and inimitable resource which can lead to competitive advantage (Barney, 1991), and therefore are making constant efforts to implement CQ in their business strategy. They then intervene in enhancing global leadership effectiveness through in-house cross-cultural training programs provided by consulting firms. Through these programs employees gain specific intercultural skills and abilities like cross-cultural difference awareness, knowledge of appropriate behavior when working in diverse teams, or international business and management knowledge. Another way organizations equip

their employees with the necessary CQ capabilities is through a more holistic exposure to a foreign environment – the opportunity to live and work abroad (Ng, Van Dyne and Ang, 2009).

According to Livermore (2016), high CQ organizations could gain a competitive advantage in the following areas:

- *access to diverse markets* (through their employees' ability to adapt the local delivery of products and services to the specific needs of those markets);
- *provision of high-quality service to culturally diverse clients* (through their employees' deep understanding of different cultures they can anticipate various needs of culturally diverse clients as well as handle miscommunication appropriately);
- *speed and efficiency* (their employees' ability to act effectively in diverse situations will lead to effective and efficient deal closing);
- *productivity in global assignments* (their employees high CQ will lead to successful and sustainable worldwide assignments;
- *becoming an employer of choice* (global talent will be easily attracted to corporations where cultural intelligence is appreciated and used as a model across the organization;
- *profitability and cost saving* (in a global environment, high CQ employees make a great contribution to high quality results and bottom-line performance);
- *multicultural team effectiveness* (effective communication of high CQ employees in diverse teams leads to high performance).

In conclusion, while CQ is not a competitive advantage per se, we believe that it should become an indispensable part of any organization's business strategy, and that by making constant efforts to discover, acquire, develop, and retain high CQ talent, organizations will be able to gain a sustainable competitive advantage.

3. Results and discussions

As a result of the analysis, the authors showed that both hard and soft skills, namely digitalization, technical and technological skills together with interpersonal skills and cultural intelligence contribute to gaining competitive advantage on the market. This approach allowed the authors to provide a holistic understanding of the skills required in a modern organization which can always adapt and reinvent itself in order to outperform its competitors. The employees and their skills are the main source of competitive advantage, enabling modern companies to evolve and thrive on a market subject to sudden changes, and under constant development.

In the context of the growing role of competency-based education in business, we have identified that in order to increase the performance of modern organizations; it is necessary for human resources to have varied and essential skills to adapt to rapidly changing business environments. Thus, we took into account those skills which are formed within the education system, being later adapted and developed in organizations, also called hard skills, such as technical and technological skills, problem solving, information use, digitization knowledge, etc. In addition, we considered it appropriate to research the skills that are being developed within organizations, also called soft skills, which include interpersonal skills and focus, in particular, on the cultural intelligence of employees.

Conclusions

After researching the literature, we found that new digital technologies contribute to adding value to the companies and help promote innovation and performance. Those employees who have acquired technical skills in school add a lot of value to the organization in which they work because they contribute to the process of digitalization which will entail lots of benefits like an increased qualitative productivity, easy access of information, quick transactions, diversification of production (automation of manual labor), improved data management, etc. The new digital skills will therefore become a competitive advantage that allows some companies to stay ahead of their competitors. At the same time, the literature has shown that the most important skill developed within the organization is cultural intelligence, through which employees acquire specific intercultural skills and abilities, such as awareness of intercultural differences, knowledge of appropriate behavior when working in diverse teams, or international knowledge. business

and management. This leads to competitive advantages such as access to diverse markets, provision of high-quality service to culturally diverse clients, speed and efficiency, productivity in global assignments, profitability and cost saving, as well as multicultural team effectiveness.

In conclusion, employees in the modern organization can contribute to enhancing the competitive advantage of an organization if he possesses technical and digital skills on the one hand and if he is interculturally-effective on the other hand. Organizations must harness the variety of benefits which arise from developing the skills presented to increase their performance, maintain competitiveness, and ensure long-term sustainability.

Given the results of the research, several implications can be determined both in the academic environment and in the business environment. For the academic environment, this study is relevant because it presents elements that need to be deepened to train successful graduates on the labor market, such as curriculum diversification, teaching business protocols, internships in companies, and integrating the study of cultural intelligence into the curriculum. Furthermore, in the context where digital transformation can significantly contribute to a company differentiation in terms of competitive advantages, it is essential for organizations to adapt their recruitment process and seek the employment of people able to use digital tools in order to optimize the results of the company. Besides innovation and digital performance, companies can become competitive by employing culturally intelligent students, capable of handling work in culturally diverse environments, especially in a fast-changing global society which makes interculturally-effective leaders a valuable, rare, and inimitable resource on the market.

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The Relationship Between Economic Development and the Health of the Financial System in Emerging Economies: The Case of Lebanon

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Abstract

After several decades of continuous geopolitical and financial instabilities, the Lebanese financial system and mainly its banking sector was one of few financial systems that could withstand many local, regional, and international crises. On the other hand, the incremental cost of borrowing led to over burden the capital structure of the Lebanese Republic that designated the indirect beneficiary of the liquidity supplied by highly concentrated stakes in the banking system in form of various types of deposits that were allocated by different Lebanese governments for financing the development and construction processes of the country after decades of continuous war massive destruction. Consequently, the adoption of modern strategies for reducing cost of fund and for reinventing the whole Lebanese financial system including its various economic sectors became a must while considering the education the Lebanese investors to assume new investment approaches that could be of their pretentious benefits.

The main objective of this research is to emphasize the necessity of leading the Lebanese economy with all its industries and sectors towards adopting a scientific and well-structured reform and towards interpreting new sources for financing the economic development and industrial activities rather than depending on the banking sector solely for this purpose. Despite the lack of references and disclosed studies about the Lebanese Financial System, the methodology of research and investigation in this study evolves from analyzing the core economic indices and figures of the Lebanese economy. The analysis shall involve the impact on the performance of the financial system and the banking sector by reviewing and analyzing the official reports disclosed by the correspondent entities. Furthermore, it will assume analyzing the approaches and financial models adopted by a selected sample of the highly ranked/alpha banks operating in Lebanon during the period of political, security and economic stability between the year 2011 and 2015.

The demonstration through this research will emphasize the essential role of the banks in supporting and developing emerging and developing economies, namely in the case of Lebanon. The findings are to demonstrate through theoretical and descriptive argumentations and technical simulations the necessities emerged to innovate, structure, and introduce new investments alternatives by activating the domestic capital and money markets. The results show that the banks in Lebanon are in front a surging need to start thinking of recrafting new business models by inventing modern financial investment strategies that suits their clientele and the industry simultaneously.

Keywords

Lebanon; economy; banks; finance; market.

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Introduction

This research paper was prepared to cover fundamental and technical areas of research study and to interpret the relation between the healthiness of financial system in emerging economies in relation to economic development. The paper aims at covering the study of micro and macro aspects of the economy of Lebanon and its financial system. The problematic in this research study evolves from the need of linking the correlation of benchmarks of economic key performance indicators (KPIs) in a certain emerging economy

to the steadiness, stability and healthiness of the correspondent financial environment and its related monetary and fiscal policies as well as the adopted practices of micro and macro investment across all the domestic economic sectors.

The study will refer to all the key players being the legal bodies, regulatory parties, investment industry stakeholders, economic sectors, investment, commercial and retail banks as well as investors. The major analytical correspondences will investigate the necessity of launching and accommodating for the reform and for the transitional phases that are recommended for adoption by all the key players by targeting the findings and recommendations of this research paper.

The core problematic of this paper evolves from several fundamental facts that are adding heavy burdens and barriers against the development of the Lebanese financial and economic sectors (Kankeu et al., 2013; Sumpf, Isaila & Najjar, 2016). The controversy and the dilemma subject of this research study were initially identified by the key facts derived from the highly corrupted and deteriorating economy (Dibeh, Fakih & Marrouch, 2018), the suffering economic sectors in spite of the growth of banking sector that embeds high concentration customers' deposits in the banking sector in which it involves many direct and indirect types of exposures of different risks (Awdeh & Hamadi, 2018).

The concentration of funds has been bearing an advantage for the Lebanese commercial banks designated in collecting easy profits generated from the reinvestment opportunities in the Lebanese public debt. However, the private sector industries remained suffering from the lack of resources and offerings for raising funds. Consequently, they were directed to depend on the shelters of indebtedness secured by the banks for financing their expansion and operational duties at premium to those risk-free rates that the government had been servicing its debt at.

The study then will aim to illustrate the national, regional, and global financial challenges and opportunities especially those related to the investment behaviors and the allocation of capitals along with the economic incentives granted by governments in the form of interest rate that are currently ticking at negative yields in well-developed and leading economies. The latter economies maintain universally recognized legal frameworks and controls that organize the essential roles of stock exchanges, banks, and other financial institutions.

Having this vast of legal organization and economic development, the developed countries facilitate and encourage their economic sectors to get publicly listed for trading on the exchanges so that to encourage raising funds, boost liquidity, decrease cost of borrowing and creating investments opportunities. The arguments for these actions are connected to stimulating investments (Dima, 2021), facilitating new business development (Trifu et al., 2014) that stimulates local industry to become more competitive (Dima, 2018). In this context, while the development reached the majority of the world economies and financial industries, the Lebanese financial investment industry remained closed with very shy public listings where the whole public and private sectors were left to their destiny to depend on the banking sector for financing their investment, debt, and commercial activities.

This study aims to cover through several fundamental and technical approaches the necessity of opening the Lebanese financial investment markets and to encourage the Lebanese corporations to get publicly listed and to start issuing their own financial papers for financing their commercial activities. Moreover, the study will investigate the advantages and the incentives that the Lebanese banks would remain enjoying even if the capitals were routed towards financing the other public and private economic sectors. Nonetheless, the research will also aim at demonstrating the advantages that would be announced for boosting the whole national economy by enhancing employment rates, balance of payments, increasing GDP, decreasing public debt, attracting foreign investments and capitals, increasing the reserve in foreign currency, lowering cost of debt service, and borrowing, decreasing the level of associated risks whilst complying with the international benchmarks, best practices, recommendations and

The paper will review, investigate, and refer to publicly disclosed and referenced sources from Lebanese local, regional, and international sources so that to illustrate and demonstrate the findings and the recommendations.

1. The Lebanese economic standing and debt breakdown

After the civil war, Lebanon was left alone with many dramatic challenges on all levels especially those related to its economy and finances (Vrontis et al., 2019). Lebanon major concern was to raise the needed funds and capitals for financing the process of the reconstruction and to secure the ways of sustaining and stabilizing the economic and financial factors associated with the local currency fluctuation by

reestablishing the value of the Lebanese currency. Consequently, Lebanon found itself forced to depend on local and Eurobond issuances in the domestic and the European markets throughout issuing treasury bills that caused the rise in the level of both foreign and domestic indebtedness. The process of raising the needed funds and capitals was mainly managed by the central bank beside the contributions that were channeled from the Arab and the international communities through the local banks after adopting the pegging policy of the local currency against the U.S. Dollar at an average rate of 1$/1,507LBP.

The Lebanese local banks, that are family established, founded, and owned, enjoyed advantageous opportunities of adding their secure profitable premiums on all the attracted funds for investment in the Lebanese economy by managing the process of facilitating the process of subscription to the Lebanese public debt. In fact, the Lebanese banks contributed by attracting the local, regional, and international institutional, and retail high, medium and small size placements by structuring relative banking investment schemes and products for investment purposes that were all sponsored by the high returns secured by the country's courteous debt service levels. The attracted capitals were invested in form of deposits with the banks that were later reinvested in the Lebanese Republic public debt.

On the other hand, the casual instability at the levels of security, politics and economy has left the Lebanese industries suffering from allocating the needed sources of funds for recovery after decades of war and regional destruction. Beside a deteriorating legal framework and because of the highly corrupted political regime, the financial sector, that cannot function without abiding by the international financial standards and best practices of compliance, transparency, and disclosure, found itself paralyzed in front of securing the required funds, attracting new investments, and maintaining a trustful environment for the existing businesses to sustain.

The key basic services that Lebanon lags behind are electricity, safe water, sanitation, telecommunication, and transportation. These services are not only essential for the growth in productivity and income, but also for ensuring a basic level of living standard for the citizens. When the latter services effectively provided along with a stable environment, they can be reflecting a positive impact on income fairness by allowing low-income groups to have the access to better and courteous opportunities.

Moreover, the degraded bad level of basic services led to regressive consequences on the social, moral, educational, and legal for all the economic classes. It also led to deteriorate the social bonds between the citizens and to increase the level of legal corruption that be reflected on the increase in the levels of crimes and fairness. Also, it would lead to widening the gap between the social classes with the effect of diminishing the middle class to the favor of the lower classes in which corresponds to higher poverty, exhaustion, and suffering.

Referring to the report issued by the Lebanese Ministry of Finance, Debt and Debt Markets, Issue No. 51, Q4, 2015, the following figures can be concluded about the performance of the regulating bodies, the government, and the economic status of the Lebanese nation. For instance, between the years 2007 and 2015:

- The overall debt grew from LBP 63,364 billion (USD 42.3Bn) to reach LBP 105,994 billion (USD (70.66). Representing about 167% as a growth rate in debt. Out of which:

- The public debt denominated in local currency grew from LBP 31,373 billion (USD 20.92 Bn) to reach LBP 65,195 billion (USD 43.46). Representing about 208% as a growth rate in local debt in Local currency;

- More than 90% of the public debt denominated in local currency is held by the local commercial banks and the central bank combined. 63% of the public debt is held by the local commercial banks and 37% of the public debt is held by the Central Bank;

- The public debt denominated in foreign currency (EURO-Debt) grew from LBP 30,991 billion (USD 21.32) to reach LBP 40,799 (USD 27.20) Billion. Representing 128% as a growth rate in local debt in foreign currency. 92% of local debt denominated in foreign currency is in the form of Eurobond.

"Moody's considered that reliance on domestic debt to finance budget deficit is expensive and it can adversely affect the balance of payment flows and foreign currency reserves. As fiscal deficit remains high, public debt is increasing at an annual average between $4 billion and $5 billion if the increase in spending is continuous. The burden of higher debt is felt through the debt service and the situation may worsen with any hike in global interest rates. In the recent past, high growth and low global interest rates have helped to lower the country's debt burden according to the IMF's report, 'Concluding Statement of the 2015 Article IV Mission'. But the same report warned that global and domestic conditions will be less favorable in the foreseeable future and without adjustment, public debt will continue to increase. The report said that interest

rates will inevitable rise along with global rates. Citi research forecasted that public debt would be 149 percent of the GDP, equivalent to its 2015, but much more that in 2014 (143 percent) or four years ago (133 percent)" (Lebanon Opportunities, 2016).

"High indebtedness has been plaguing the Lebanese economy over the past two decades or so, as the government has been caught in a vicious cycle of a hefty public debt burden and recurrent budget deficits. This has thwarted the economic growth, escalated the debt crisis, and positioned Lebanon among nations with the highest debt to GDP ratios in the world." (Credit Libanais Bank, 2016).

"External Debt in Lebanon increased to 29877.90 USD Million in April from 29873.30 USD Million in March of 2017. External Debt in Lebanon averaged 15116.05 USD Million from 1993 until 2017, reaching an all-time high of 29877.90 USD Million in April of 2017 and a record low of 315 USD Million in July of 1994. External Debt in Lebanon is reported by the Ministry of Finance, Republic of Lebanon." (Ministry of Finance, Republic of Lebanon, 2016).

On the other hand, the interest rates disclosed by the FED to be in the United States are showing some optimistic exertion with bullish projection and expectations towards an attained increase that reached 2.50% currently. Consequently, it is worth taking into consideration that about 93% of the Lebanese debt in foreign currencies is denominated in the US Dollars (Ministry of Finance, 2016). Accordingly, this factor would necessitate an upward driven impact on the interest rates in Lebanon so that to reach another all-time high over a decade.

The deposit dollarization ratio registered a slight increase, reaching 65.8% while the loan dollarization ratio continued its downward trend to reach 72% at end-2016, its lowest recorded so far (Central Bank of Lebanon, 2016). Accordingly, deposits in USD are about reaching the edge of USD 90 Billion to constitute about 190% of Lebanon GDP that reached by the end of 2016 USD 47.6 Billions. All the precedent indicators lead to demonstrate the depth, the strength, the level of dependence and the direct correlation in the relationship between the Lebanese pound and the Dollar base currency. Accordingly, this indicator also implicates the level of correlation between the interest return on the deposits denominated in USD versus those in LBP.

"The dollar tends to depress the values of emerging market currencies at a time when many EM economies are already weakening and their currencies have already slumped against the greenback. However, many analysts and fund managers expect the greenback to continue to climb higher in the coming years, as the Fed raises interest rates further …An upward move in short-term interest rates will be positive for savers who have been missing out on interest on their deposits" (Financial Times, 2016).

All the precedent demonstrated facts constitute major reasons for causing the incremental trends in increasing the interest burdens on the local public debt. More, the depositors with their placements with the banks in Lebanon transformed the banks into being the main suppliers of the public debt have been granted courteous and arbitrageurs' opportunities to invest in higher yields.

The role of banks turned them into "Premium-Makers" by discounting their premiums from the return that should have been granted to the investors themselves if they had the chance to directly invest their capitals in the government debt. The active engine of the banks was the easily generated profits beside the fact that contributed in abusing the advantage of the possibility of converting the generated profits generated in the local currency to USD as a pegged foreign currency. Thus, the ultimate fact would be the incremental level of the money supply in the Lebanese deteriorated economy that have already exceeded its domestic public and private debt and more than five time of its GDP.

2. Lebanese banks' income breakdown

Reviewing the annual reports of the banks that have been operating in Lebanon during the past three decades, precisely the part of the breakdown of liabilities, would lead to remark the elevated level of a continuously growing concentration in customer deposits as a main constituent of liabilities on the balance sheets of these banks. In fact, this indicator would advocate the investment anatomy of the Lebanese investors' perception. This fact illustrates the endeavors towards maintaining investments in the form of saving accounts with the bank that reimburse optimally the safest and highest yields on invested capital.

More relatively, the direct investment behavioral approach in the Lebanese financial market through the Lebanese local banks and financial institutions has been discouraged and yet it was alternated by encouraging the indirect investment approach in form of time deposit schemes. The deposits with the banks were

rechanneled by the local banks for nurturing the domestic sovereign public debt. The latter process ultimately served the interests and objectives of the investors in the local banking sector regardless of the parties that were sponsoring the ultimate processes.

On the other hand, after reviewing the consolidated balance sheet of the same banks for the same financial periods, the attention will be all drawn towards the left side that has been floated with different financial papers invested in the Lebanese public debt that have already crossed the borders of eighty USD billions after 2017. In fact, the Lebanese public debt was designating the main gear of a well-structured engine that courteously generated the risk free and safe income for most of the banks operating in Lebanon for over than three decades.

The fundamental illustration in the form of technical presentation in the following reported figures and diagrams are extracted from the annual reports and disclosed financial statements of the top leading Alpha Banks (Top Lebanese Banks with more than $2B in deposits) operating in Lebanon for more than 10 years. The following illustration will highlight the level of concentration in liabilities of the banks chosen as the samples for undergoing various analyses in this paper.

Referring to the report issued by the Lebanese Ministry of Finance, Debt and Debt Markets, Issue No. 40, Q1, 2017, the actual allocation of the government debt liabilities as assets for other institutions being the holders of the debt in subject. The debt is presented as being held by 3 main holders being:

- The local banks with 65.90%
- The local public institutions with 21.50%
- Banque Du Liban (BDL) with 11.20%

The represented fact reflects that:

- The Local banks (Banks and Central Bank "BDL") are the main lenders for the Lebanese Government with an overall aggregate amount of 77.10%.
- Less than 22% of the Lebanese debt is held by local public institutions.
- by the banking industry with a high concentration that exceed three quarters of the debt value.
- The banking industry alone is highly exposed to the Lebanese Sovereign debt
- Other sectors and private institutional investors aren't holding or represented in holding the Lebanese sovereign debt.
- The sovereign debt is attractive and accessible and favorable to the Lebanese local banks.

"Shleifer claims that psychological evidence shows that people deviate from rationality mostly in the same direction. "This problem becomes more severe when the noise traders behave socially and follow each other's mistakes by listening to rumors or imitating their neighbors" (Shleifer, 2000, p.12). This behavior affects not only 'common people', but also to professional investors, traders and dealers, pension, and mutual fund managers, etc. Furthermore, not only professional managers are subject to the same behavioral biases as individual investors, but since they manage other people's money, their decisions could be severely affected by herd instinct. In capital markets and the asset management industry it is a frequent behavior to choose portfolios that resemble the benchmark the manager is evaluated against, or to make recommendations on stocks according to what other analysts or market consensus believe, to avoid a bad relative performance" (Peón and Calvo, 2012).

Consequently, the study flow will investigate the breakdown analysis of the Lebanese Local banks source of funds. The funds in the custody of the Lebanese banks are registered as assets after being invested in different nominal asset classes for generating income for the banks. However, once the funds are attracted to the banks, they are registered as liabilities on the balance sheets of the banks leading them to bear all the relative Cost of funds and the associated Risks of reinvestment, Liquidity, Market, and Credit.

There are 62 banks operating in Lebanon with an aggregate total deposit outstanding of USD 172 Bn. "Customer deposits have increased by around 8% to reach a new high of USD 172 billion at end-2016, with additional funds of around USD 10 billion entering the banking sector. Lending activity recorded a 5.4% growth during 2016, with total credit to the private sector exceeding USD 58 billion in December 2016" (Banque Du Liban, 2017).

The study will adopt a sample of 4 banks belonging to the Alpha group of banks operating in Lebanon being the highly ranked with more than $2B of customers' deposits. As it will be illustrated in the corresponding analysis that follows, the referenced sampled population dominating aggregate deposits, under the externally audited records of liabilities extracted from the relative officially disclosed annual financial statements, of USD 88Bn designating more than 51% of the total deposits of the whole industry that regulates 62 banks.

Table no. 1. Banks Customers' Deposits to Total Liabilities

Bank	Indicator	2014	2015	Average
Bank Audi	Customers' Deposits (Million)	USD 35,821	USD 35,609	USD 35,715
	Deposits to Total Liabilities	85%	84%	84.5%
Blom Bank	Customers' Deposits (Million)	USD 24,006	USD 25,091	USD 24,549
	Deposits to Total Liabilities	86.1%	85.8%	86.95%
Byblos Bank	Customers' Deposits (Million)	USD 15,715	USD 16,637	USD 16,176
	Deposits to Total Liabilities	82.6%	83.7%	83.15%
Bankmed	Customers' Deposits (Million)	USD 11,443	USD 11,656	USD 11,550
	Deposits to Total Liabilities	84.2%	86.1%	85.15%

Sources: Bank Audi Annual Report and 2015, BLOM Bank Annual Report 2015, Byblos Bank Annual Report 2015, Bankmed Annual Report 2015

Table no. 2. Weighted Average Customers' Deposits to Weighted Average Total Liabilities of the Sample

Bank	Yearly Average	Weight/Total	Yearly Average Dep./Lia.	Weighted Average
Bank Audi	$ 35,715	41%	84.50%	34%
Blom Bank	$ 24,549	28%	86.95%	24%
Byblos Bank	$ 16,176	18%	83.15%	15%
Bankmed	$ 11,550	13%	85.15%	11%
Total	$ 87,990	100%		85.02%

Sources: Bank Audi Annual Report and 2015, BLOM Bank Annual Report 2015, Byblos Bank Annual Report 2015, Bankmed Annual Report 2015

- ***Bank Audi:***

Referring Bank Audi Annual Report of 2015, the concluded figures indicate a high concentration of deposits in the nature of the bearing liabilities. For instance, Audi Bank liabilities breakdown reflects that:

- Total liabilities in the form of deposits: 89%.
  - 84% customer's deposits
  - 5% bank's deposits (Local Institutional Placements)

- ***Blom Bank:***

Referring Blom Bank Annual Report of 2015, the concluded figures indicate a high concentration of deposits in the nature of the bearing liabilities. For instance, Blom Bank liabilities breakdown reflects that:

- Total liabilities in the form of deposits: 88.2%.
  - 85.8% customer's deposits
  - 2.4% bank's deposits (Local Institutional Placements)

- ***Byblos Bank:***

Referring Byblos Bank Annual Report of 2015, the concluded figures indicate a high concentration of deposits in the nature of the bearing liabilities. For instance, Byblos Bank liabilities breakdown reflects that:

- Total liabilities in the form of deposits: 86.6%.
  - 83.7% customer's deposits

– 2.9% bank's deposits (Local institutional placement)

- ***BankMed:***

Referring BankMed Annual Report of 2015, the concluded figures indicate a high concentration of deposits in the nature of the bearing liabilities. For instance, BankMed liabilities breakdown reflects that:

- Total liabilities in the form of deposits: 89%.

– 86.1% customer's deposits

– 2.9% bank's deposits (Local institutional placement)

As shown in the above referenced figures, the investments in the top Lebanese banks are highly exposed to a concentration in customers' deposits constituting the dominant source of funding as Liabilities.

Conclusions

Looking over the public debt figures, that exceeded USD 77 Billions, will also lead to conclude the level of contribution of the banks in supplying the correspondent funding of the public debt, exceeds 77%. In fact, this circle can simplify and demonstrate the role of the Lebanese banks as intermediaries between the government and the end investors for creating investments in the form of a spiral loop targeting the employment of the money supply within the local market.

The investors in the Lebanese banking sector enjoy courteous investment opportunities leveraging the burden of the Lebanese Public debt that is increasing with every sunrise to reach historical records against GDP. In fact, the local debt to income will involve increasing the interest rates that designate the premiums of debt growth that would be reflected by exposing the country to excessive levels of risks and costs burdens.

As a result, the banks in Lebanon are in front a surging need to start thinking of recrafting new business models by inventing modern financial investment strategies that suits their clientele and the industry simultaneously. However, the banks cannot be managing the whole process without having the support of the Lebanese legislative and regulatory bodies since many of the prevailing laws and regulations do not authorize many of the operations that corresponds to digital transactions and contracts.

The fact would lead the government, policymakers, regulator, economic sectors and banks to assume new financial models associated with the nature and with the roles of investment banks that would engage the processes of taking various business entities to the capital markets to raise their needed financing objectives. Furthermore, the latter process would lead to acquire new investment opportunities through the domestic capital and debt markets. Consequently, the banks shall be able to assume new Initial Public Offerings, innovative well-crafted financial products and services on their shelves so that to introduced to the major stakeholders in the Lebanese financial industry.

Finally, the adoption of the referenced recommended approach in developing the Lebanese financial industry by renovating the role of Beirut Stock Exchange in supporting all the economic sectors in raising their finances and by deliberating the structure of revolutionary domestic capital markets and debt markets would be incentivizing, rebating and reimbursing all the performance of the whole Lebanese economy with direct and indirect renders.

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Towards Sustainable Web Platforms: Post-pandemic Reflections on E-government in Romania

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Abstract

The Covid-19 pandemic has spurred the acceleration of the digital transition by bringing digital ethics to the forefront to extend cybersecurity to the privacy of consumers' personal information and to provide truthfulness to digital content. At the same time, when properly used, the Internet has a positive effect on consumers, improving their quality of life. New consumers are more receptive, selective, and interested in new technologies. They are quickly informed about the offer of products / services on the Internet, and organizations provide them with a suitable process, simplified by diversity and accessibility. The aim of this paper is to explore whether the Covid-19 pandemic has accelerated or not the transformation towards electronic government (e-government) in Romania. Thus, based on a descriptive desk research, the paper briefly puts forward the general landscape of e-government in Romania between the period 2020-2022, focusing on particular features and strategies. This study might be useful to all parties involved in the e-government process.

Keywords

Covid-19 pandemic; e-government; digital citizen behavior; sustainable web platforms.

DOI: 10.24818/BASIQ/2022/08/053

Introduction

The proliferation of the information systems linked to the data administration and delivering services for more effective activities has led to a technical breakthrough in the last decades. Interconnections and interactions between individuals and other social, economic, or administrative entities, have evolved as a result of this technical breakthrough.

While the private sector has progressed more quickly, the public sector has been slower, but has made some notable achievements. In such a context, electronic government (e-government) can be viewed as a reform of a state's complete administrative structure, which entails upgrading operations using contemporary modern technologies. The need for such a change is prompted by the need to streamline some bureaucratic processes while eliminating others completely. As a result, e-government encompasses all operations carried out by the government using electronic systems, such as the storage of citizens' information, tax and fee payments, public announcements and public procurement (Stoica and Ghilic-Micu, 2020).

The Covid-19 disruption demonstrates that strategy, in general, and behavioral action plans, in particular, come with a lack of solid frameworks for coping with uncertainty that go beyond typical patterns of risky decision making in a variety of ways (Foss, 2020). E-government should make information available online and enable interactive access for citizens with digital abilities when conducting transactions with public authorities (Urs, 2017).

The purpose of this article is to present, from a descriptive perspective how e-government has evolved in Romania during the Covid-19 pandemic. Romania is strongly acknowledged for its high bureaucratic character this being one important reason in many Romanians' decisions to migrate to more developed Western countries (Petrescu, Bâc and Zgură, 2011; Grosu and Constantin, 2013; Grosu and Dinu, 2016). The difficulty of building e-government in the Romanian public sector comprises several agreements that necessitate a coordinated approach. The elements that determine the development of e-government in

Romania are related to the institutions that make available the transformation to digital public services. The main purpose of this article is to illustrate the current economic realities and how various governments have interpreted the use of technology during the pandemic. In such a context, the present paper is structured into three main parts, besides the introduction and the conclusions sections. The next section focuses on conceptual boundaries in the area of 'e-government', while the second one briefly outlines the research methodology. The third section of the paper presents the main results of the carried-out research.

1. Research background on e-government

Caves (2004) states that e-government is the delivery of services to residents and other members of the public in a country or region via technological communications equipment such as computers and the Internet. E-government creates new opportunities for citizens to interact with government in a more direct and convenient manner, as well as for government to give services directly to citizens. In the same line, according to the World Bank Group (2018), e-government refers to government agencies that use information technology to transform relationships with organizations, citizens and other government agencies. These technologies may be utilized to expand citizen access to government services, facilitate interactions with the business environment, enable citizens through access to information, or develop government administration. Moreover, from an integrative approach, figure no. 1 outlines a model of the focal dimensions of e-government on three digital levels:

- improving government processes with e-administration;
- connecting individuals with e-citizens and e-services
- building external interactions with e-society.

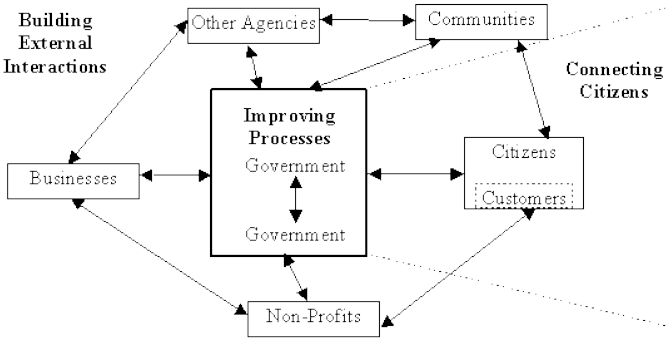


Figure no. 1. Holistic model for e-government initiative

Source: Institute for Development Policy and Management, 2008

The phrase 'e-government' has a wide range of meanings and interpretations since 2000 when the digital era became the pillar of shaping and modernizing the new society. The Organization of American States (OAS) interprets e-government as the digitalization of public procedures and processes to ensure greater credibility, capabilities and interaction between the government and the citizens. According to the United Nations (UN), e-government defines the use of technology instruments by entities such as governments to provide digital content and services to individuals. On the other hand, the European Union (EU) correlates it with the integration of technology in public administration to reform public services, democratic processes, and policy support.

Furthermore, in OECD's vision, the function of public sector and its interface with the people are projected to improve as a result of e-government. The term 'e-government' refers to how public authorities benefit from the use of technology to perform a wide range of functions. The Internet's and associated technologies' networking capabilities, in particular, have the potential to revolutionize government structures and operations. The positive aspect is that automatization of public services provides several advantages to help e-government achieve its goals. The focus on e-government has been too often on information and communications technology (ICT) solutions rather than on user demand. Although this has been helpful for putting services online, it has resulted in a profusion of incompatible, confusing, and overlapping websites, portals, and electronic services related to the interaction with digital citizens.

2. Research methodology

The present paper is based on desk research, mainly consisting of a bibliographic study, focusing on secondary data analysis on e-government. The research implied the development of a descriptive analysis centered on the inter-connections between e-government and digital citizen behavior in the context of the Covid-19 pandemic in Romania using the concept of 'sustainable web platforms' as a reference. The bibliographic study, mainly developed with a particular focus on secondary data analysis, was performed by consulting national and international reports developed by prestigious, trustworthy institutions. The main results of the analysis are presented in the following section.

3. Analysis of e-government in Romania in relation to the digital citizen behavior during the Covid-19 pandemic – main results

The 'National Strategy on the Digital Agenda for Romania' is focused on the ICT sector and aims to contribute to Romania's economic growth and competitiveness through direct action for digitalization, as well as indirect actions such as increasing efficiency and reducing public sector costs, improving private sector productivity by lowering administrative barriers to the state, and accelerating the competitiveness of Romania's ICT. The Strategy was created using the 'Digital Agenda for Europe' as a point of reference for defining an overview of how to strengthen the digital economy from 2014 to 2020.

The most notable e-government initiative in Romania includes two web platforms as part of digitalizing the fiscal dimension: *ghiseul.ro* and *anaf.ro*. These solutions incorporate all areas of the public fiscal system in relation to individuals and businesses. *Ghiseul.ro* is devoted to physical persons (covering registered sole traders) and accepts online payment of fees and taxes, towards both local and national authorities and fiscal administration.

An analysis of the elements of the digital consumer behavior in Romania from 2016 revealed that the habit of paying cash is striking in Romania, because the value of withdrawals from ATMs is growing (Onete, Teodorescu and Vasile, 2016). The major change occurred exactly after 2016 in regard to online payments for taxes and public services, when the number of individuals using the online tax payment platform *ghiseul.ro* had an accelerated growth. As outlined in Figure no. 2, this platform has been the start of the Romanian e-government initiative towards sustainable web platforms, as in the period 2011-2020 there has been a significant increase in new members, reaching 165,882 new users in 2020 (pandemic year).

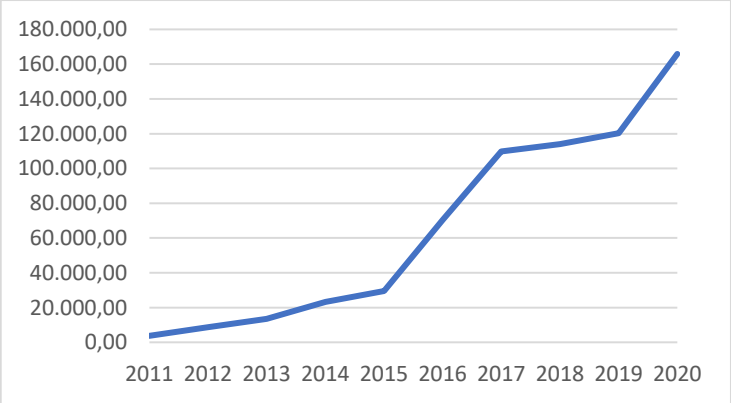


Figure no. 2. The number of new users of the *ghiseul.ro* platform, in the period 2011-2020

Source: General Secretariat of the Government - Policy and Priorities Coordination Directorate, 2020

Although there has been a great improvement in Romanian e-government by implementing new tools related to web platforms, concerning communication and interaction between citizens and public authorities using the Internet, there is still a lot of work to do as the next indicator reflects poor values, especially when compared to the EU average. Figure no. 3 reflects that, in correlation with the EU average, the percentage of people, by gender, using the Internet to interact with public authorities in Romania is reduced. Starting with 2020 (the outbreak of the Covid-19 pandemic), due to several restrictions and measures imposed by the government to limit the spread of the virus, the Internet became the principal instrument to carry out activities in all domains, leading to important changes in both businesses and consumer behavior (Stanciu and Rîndașu, 2021). However, in the context of digital interaction with public authorities in Romania, neither women nor men show a significant percentage increase in comparison with the EU mean.

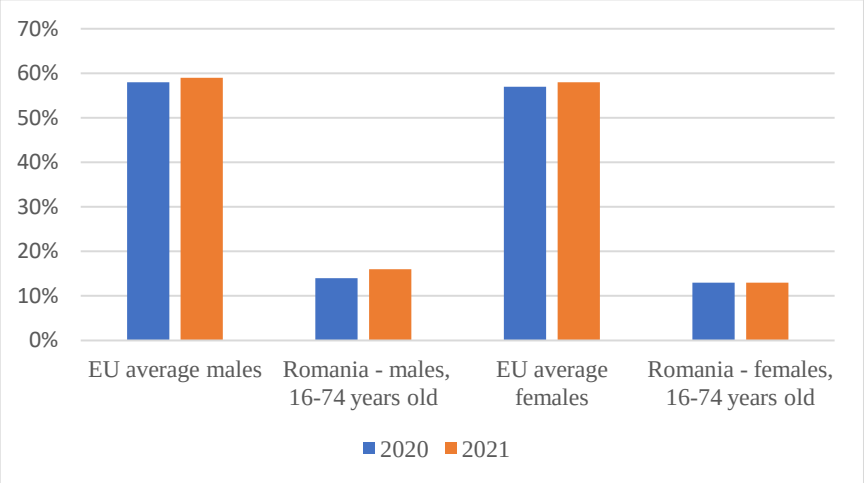


Figure no. 3. Percentage of individuals, by gender, using the Internet for interacting with public authorities in Romania

Source: Eurostat, 2021

Due to the length and severity of the Covid-19 pandemic, public health authorities, states, and even international organizations were forced to change their operating procedures. Romania was only vaguely aware of the threat associated to Covid-19 in the first two months of 2020. In February, various procedures were implemented to monitor newcomers from places already experiencing a health crisis, as reported in the external news section. The outbreak of the pandemic in March prompted a lockdown, and the topic of the pandemic dominated all forms of communication (Cernicova-Buca and Palea, 2021). In a study conducted in 2020, around half of respondents (52%) were not satisfied with the measures or actions taken; specifically, 38% were not very satisfied and 14% were not at all satisfied (European Parliament, 2020).

The most important indicator when evaluating the progress of e-government implementation is the public trust. OECD defines this as the legitimacy of public institutions and a functioning democratic system. Political participation and social cohesion are both components of the public trust. Trust in public institutions has been critical for governments' capacity to respond quickly and win citizen support throughout the Covid-19 pandemic. Studies have shown that in Romania public trust was severely destroyed during the pandemic and Romania approached its fourth wave without limits; a population that was barely vaccinated and a society that was profoundly divided (Dascalu et al., 2021). With reference to public trust, during the Covid-19 pandemic in Romania, results in Figure no. 4 show that the most credible public authority in Romania during the pandemic was the Army. In contrast, key public authorities like government or parliament suggest the most insignificant percentages in the hierarchy, conferring to citizens the impression of insecure and doubtful authorities.

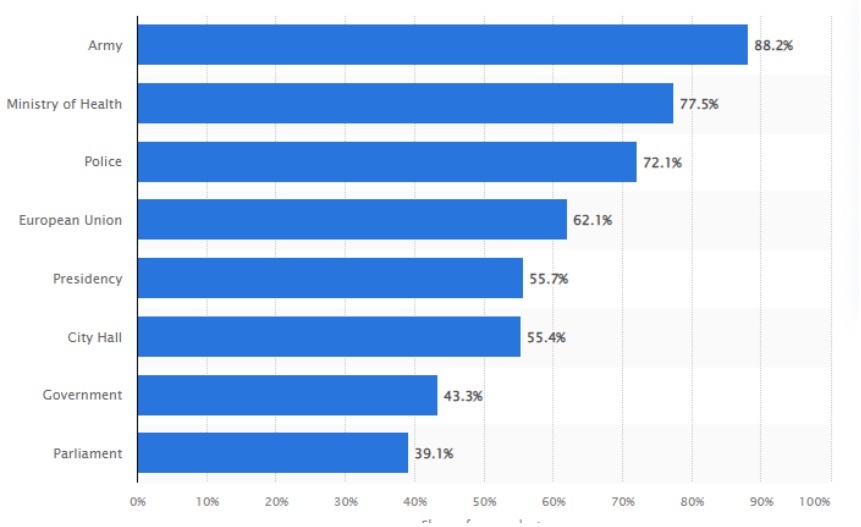


Figure no. 4. Level of trust in the institutions since the outbreak of Covid-19 in Romania

Source: Statista, 2022

Statistics show that Romania ranks as the last position of the 27 EU member states in the 2021 edition of the 'Digital Economy and Society Index' (DESI), an indicator that highlights the digital development of a nation in terms of broadband connectivity, human capital, the incorporation of digital technologies by businesses, and digital public services. Furthermore, Romania ranks also on last places for indicators defining e-government concept: pre-filled forms, e-government users, open data and digital public services for citizens and businesses (Figure no. 5). With the inconsistency regarding artificial intelligence, Romanian businesses do not fully cultivate digital technology (social media, electronic information sharing, big data and cloud). Romania ranks worst with regard to the key indicators like digital public services for individuals and enterprises, e-government users, and prefilled forms when it comes to digital public services. Projects aimed at meeting various digital priorities are included in the 'Romanian Government's National Investment and Economic Recovery Plan', which was presented in July 2020 and includes a financial allocation of EUR 100 million from EU and national funding for the years 2021-2030 (European Commission, 2021).

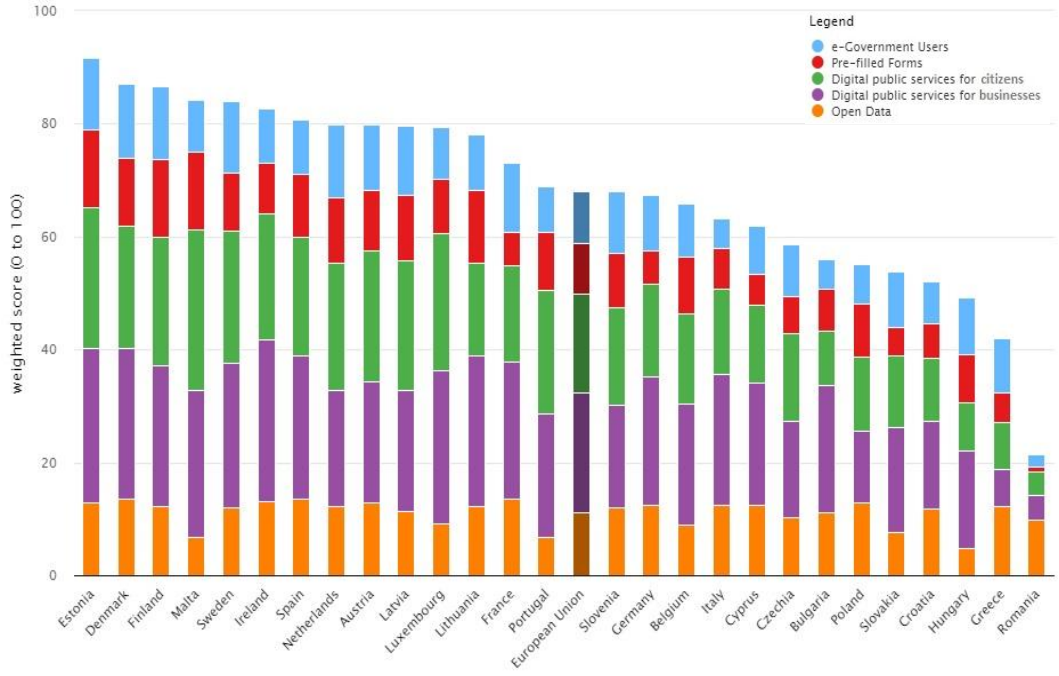


Figure no. 5. Indicators of e-government in the European Union countries

Source: European Commission, 2021

Conclusions

After analyzing the series of aspects covering e-government in Romania, it can be concluded that, to better digitalize the public sector, the e-government in Romania must be more centered on citizens rather than on developing tools. The issue with public institutions regarding e-government is not about implementing technology into their daily operations, but rather about convincing the public that this is the proper path to follow. In addition to this, the level of trust in the Romanian government during the Covid-19 pandemic was the biggest concern of citizens. Even if the digital infrastructure exists and Romania benefited from the European funds and directives by creating web platforms to reduce bureaucracy, the key element remains the digital interaction with citizens. People are typically reluctant to embrace change and accept it. It is also likely that some citizens are unaware of how to use digital tools. As a result, there is a need for proper civil training on digital public platforms. The digital interaction between public authorities and the citizens and the education about the use of public digital services constitute in a personal view the main factors towards sustainable web platforms for e-government. The decrease in bureaucracy in Romania was a great improvement by developing the *ghiseul.ro* platform in the public financial sector. A sustainable website is not only about creating energy-efficient platforms with improved site navigation to make it easy to find information or choosing a green web host, but to reach out to the public in a sustainable manner to enhance digital interaction.

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Tapping into Romania's Competitive Advantage to Attract Digital Nomads

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Abstract

In the Covid pandemic context, attracting digital nomads became a fearful competition between states. We believe that Romania has an untapped potential to become one of the top receiving countries in the EU for digital nomads. Therefore, this paper is the first to analyze how Romania can become an important European attraction for digital nomads. More specifically, we try to respond to three questions: (i) what Romania's potential is to attract digital nomads compared to other EU 27 member states; (ii) what regions in Romania have the highest potential to attract digital nomads; and (iii) what cities have untapped potential to accommodate significant numbers of digital nomads.

To perform the analysis, we use available data from Eurostat and Numbeo regarding the cost of living and rent, internet and broadband access, restaurant and groceries price index, and crime and safety index. Then, we rank Romania against other EU 27 Member States based on those indicators. We also perform cluster analysis of Romanian regions considering available data at regional data on internet and broadband access. Further on, we select the cities with the lowest cost of living and rent from those regions.

The analysis confirmed that Romania has an unexploited potential to attract digital nomads, considering the main criteria they are using to select their country of destination: internet access, cost of living, and safety. Romania has one of the highest Internet speed and broadband coverage in the EU27 and the lowest cost of living and rent. The Bucharest-Ilfov, West, North-West, and Center regions have the best internet and broadband access. Inside these regions, Arad, Oradea, Sibiu, and Timisoara cities showcase the lowest cost of living and rent.

In conclusion, we recommend that the Romanian Government should improve its information and communication channels with potential digital nomads and cut red tape.

Keywords

digital nomads, migration, remote work, telecommuting, labour market.

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Introduction

The development of information technology and the widespread use of the internet have driven a flexible work style that offers the possibility of working remotely, ensuring a balance between professional performance and personal satisfaction, blurring the boundaries between work and leisure, between work and personal space (Dery, Kolb and MacCormick, 2014). The concept of flexible working has been conceptualized in different ways as flexible or non-standard work arrangements (Wood and de Menezes, 2007), schedule flexibility (Dumas and Perry-Smith, 2018), remote working (Martínez Sánchez, et al., 2007), compressed working time (Facer and Wadsworth, 2008) or reduced hours (Kossek and Lee, 2008).

Our paper focuses on the digital nomads' perspective of working from home as professionals who migrate to work remotely. Although Makimoto and Manners (1997) initially promoted the term digital nomad in "Digital Nomad" 25 years ago, there is still no clear definition of the term digital nomad in the scientific literature. However, the general acceptance is that it refers to young individuals, such as millennials or

Generation Z. They usually have more flexibility due to a certain period of life and combine virtual work with travel (Reichenberger, 2018; Wiranatha et al., 2020).

Romania recently adopted a visa for digital nomads. Romanian Law number 22/2022 defines digital nomads. Therefore, a digital nomad is a foreigner who has an employment contract signed with a company outside Romania and provides services using ICT. Or he can be a foreigner who owns a company in another country, to which he provides services using ICT.

The decision of the digital nomads to choose a destination country is influenced by several important factors such as the cost of living and accommodation, the availability of adequate facilities such as internet access, transport, digital banking, entertainment, visa restrictions, security, and business communities (Wang, et al., 2019).

Digital nomads work in various fields, including information technology, education training, consulting, coaching and research, sales, marketing, PR, and creative services (Wang, et al., 2019). These professions can be conducted remotely using digital tools and the internet.

According to nomadlist.com, one of the world's most prominent digital nomads' communities and reference websites for digital nomads worldwide, Romanian cities appear to be not so attractive. As of March 2022, Bucharest was situated in 37th place, Timisoara in the 38th, Cluj in the 51st, and Brasov in the 55th, behind cities in Portugal (Lisbon in the first place and Porto in the third place), and Warsaw (19th place). However, according to the Digital Nomad Index (Circleloop, 2021), Romania ranked third place in the world, after Canada (first place) and the United Kingdom (second place).

Romania has adopted a welcoming attitude towards digital nomads and facilitates the conditions for remote workers. Recently, the Parliament adopted the legislation regarding the visa granted to "digital nomads," so Romania joins the countries that offer visas to foreigners who want to work remotely. The main advantage of the digital nomad visa is the period that the holder can spend in a country - 12 months, compared to most visas that are valid for only three months. According to the substantiation note accompanying the law proposal on digital nomad's visa, by introducing the digital nomad visa, Romania is expected to attract at least 2000 digital nomads, that are likely to spend around 2000 Euros per month, which could bring around 50 million Euros to the Romanian economic sector.

Therefore, this research aims to analyze how Romania can become an important European attraction for digital nomads. Romania was chosen for the analysis for two reasons. Firstly, the Romanian Parliament showed interest in putting Romania higher on the digital nomads' list by adopting the digital nomads' visa. Furthermore, Romania has a high potential to attract nomads because it has one of the best increases in the internet infrastructures globally, a reduced cost of living, and its cities are secure. Moreover, last but not least, digital nomads that decide to stay and work in Romania can reverse the effects of brain drain in the long term.

For the scope of this analysis, we considered factors of attraction for digital nomads when choosing future destinations: the cost of living (Thompson, 2019), internet connectivity (Richards, 2015; Green, 2020; McElroy, 2020), socioeconomic conditions (Wang, et al., 2019).

1. Review of the scientific literature

It is generally acknowledged that the presence of digital nomads positively affects local economies through (i) consumption by paying for services and facilities in the country where they live and not in the country of their employer (Richards, 2015), (ii) advertising for tourism (Wiranatha et al. 2020), (iii) innovative ideas and the transfer of knowledge and know-how to local actors (Gast, Werner and Kraus, 2017), (iv) jobs created (), and (v) the networks they develop and coworking spaces (Richards, 2015; Wang et al. 2019).

Digital nomads are limited in choosing the place of business to the areas where their technologies can function correctly. Internet access, whether in broadband or mobile data, is important to digital nomads at the highest possible speeds. Tools such as strong Wi-Fi connections are a filter in the choice of spaces.

Although digital nomads move on their own, one of the attraction factors is the existence of nomadic communities. The coworking and co-living spaces provide digital nomads with the tools they need and provide the necessary infrastructure (Wang, et al., 2019). These coworking spaces serve as a place where freelance creative workers are often "fashionable." Nomadic workers tend to look for places that provide the necessary resources, such as workspaces that allow them to feel like members of a community or coworking offices with security and maintenance included (Spreitzer, Cameron and Garrett, 2017). At the

same time, coworking spaces respond to the need for socialization of "collaboration, openness, community, accessibility, and sustainability" (Capdevila, 2015).

Nonetheless, the choice of destination is directly influenced by the living environment (lack of crime, social peace) and the availability and efficiency of the medical system to ensure that, if needed, they can find the care they need (Wiranatha et al., 2020).

2. Research methodology

Digital nomads tend to move from one place with a higher cost of living to another with a lower cost of living. Therefore, the cost of living (Thompson, 2019) correlated with the alternatives of living are among the most important criteria in choosing the destination. In addition, the need for socializing and networking makes the existence of a community also an important factor (Bloom, 2018).

To analyze the possibility of Romania becoming an attractive destination for digital nomads, we started our work with a comparative analysis of the EU countries regarding access to the internet, cost of living, and safety index. The primary purpose of this step was to compare Romania with the other EU countries and the average of EU countries using the main characteristics that help digital nomads choose the country to live in for a short period. Next, we shifted the focus to the macro-regions and cities from Romania. The focus of this analysis was to highlight the best regions/ cities that digital nomads can choose. We used the same data and approach described in the previous step for the second part of our analysis. The only difference is that the comparison has been made between regions/ cities.

We have used hierarchical cluster analysis for the region classification based on internet and broadband access. The primary purpose of this approach was to identify the regions which form the cluster with the highest internet access. This way, we can further focus on the cities inside these regions to identify the most appealing ones for digital nomads. The main output of the hierarchical cluster analysis is the dendrogram. This represents a tree diagram frequently used to illustrate the arrangement of clusters produced by the hierarchical grouping.

- Data from this study were obtained from Eurostat and Numbeo. From Eurostat, we used the variables related to internet access, while Numbeo was used for the data regarding the cost of living and safety indexes. Numbeo is a free database where users can easily compare the cost of living worldwide. To collect data, Numbeo relies on user inputs and manually collected data from authoritative sources (websites of supermarkets, taxi company websites, governmental institutions, newspaper articles, other surveys, etc.). These indices are established in relation to New York City (NYC). This means that for New York City, each index should be 100 (%). If for instance, a European city has a rent index of 120, this translates into rents 20% more expensive in that city than in NYC. On the other hand, if a European city has a rent index of 70, it means that in that city rents are 30% lower than in NYC. The baseline values are for 2022. The missing data for Cyprus have been replaced with the average of the EU not to influence the results of the comparative analysis. The indicators with missing data are the cost of living and the other indexes from the Numbeo database.

The main variables included in the analysis are:

- level of internet access, as a percentage of households with internet access;
- access to the internet at home, as a percentage of households with internet access at home;
- the cost of living is a relative indicator regarding the prices of consumer goods, such as groceries, transportation, restaurants, and utilities. The cost of living index does not comprise accommodation expenses (like mortgage or rent).
- rent index that is an estimation of prices of renting apartments in the city compared to New York City;
- cost of living plus rent index that is an estimation of consumer goods prices including rent compared to New York City;
- groceries index that is an estimation of grocery prices in the city compared to New York City;
- restaurant price index that is a comparison of prices of meals and drinks in restaurants and bars compared to NYC;
- local purchasing power index captures the relative purchasing power regarding buying goods and services, in a specific city, related to the average net salary that is in that city;

• the crime index captures the total crime level in a specific country or city. We apply the following scale of crime levels: lower than 20 is considered very low, between 20 and 40 is considered low, between 40 and 60 is considered moderate, between 60 and 80 is considered high, and crime levels that are higher than 80 are considered as very high;

• safety index is an indicator that is measured as opposed to the crime index. A city with a high safety index, is found as very safe.

3. Results and discussion

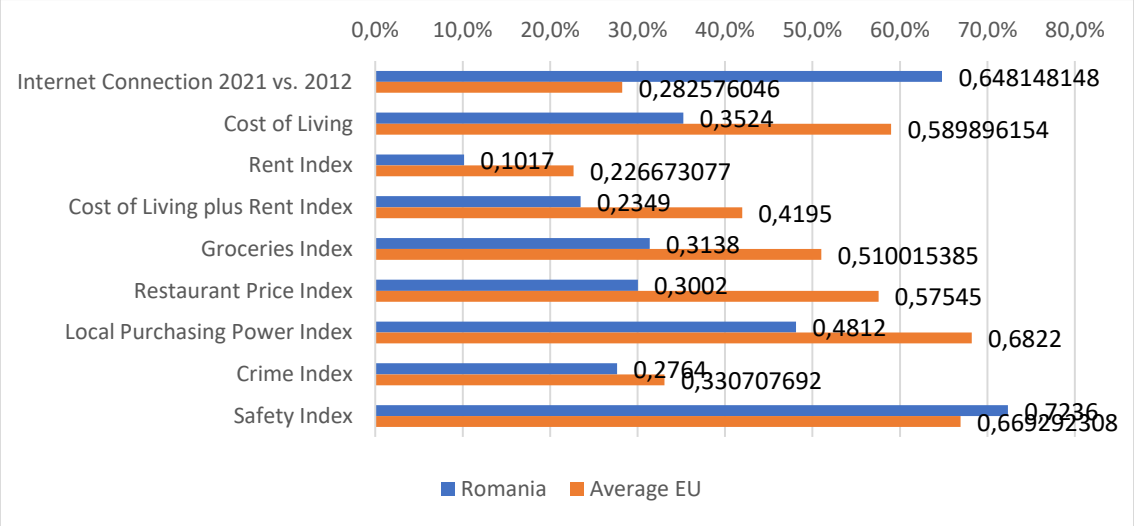
3.1. The untapped potential of digital nomads

Romania has a vast potential to become the European Union's highest attraction for digital nomads worldwide. Romania offers more easily accessible coworking spaces that inspire digital nomads to work. The internet connection is good, cheap, and reliable, mainly because the Internet infrastructure was built on optic fiber upfront. In addition, Romania offers a lower-cost one-person lifestyle (Graph no. 1) that is probably not so well known by potential digital nomads worldwide. In The Digital Nomad Index 2021 (Circleloop, 2021), Romania ranked third, after Canada and the United Kingdom, on top of the work attractiveness from home mainly due to the increased speed of the internet connection and cheap cost, with an average broadband internet speed of 188 Mb / s, an internet cost of 7.5 euros and a rent of approximately 323 euros for a studio.

3.2. Findings of the analysis

Romania has one of the highest potentials in EU 27 to attract digital nomads. Our comparative analysis between Romania and the average EU 27 countries showcases a clear competitive advantage for Romania regarding the cost of living and rent, internet connection, restaurant and groceries price index, and other indicators and indexes presented in section 2. Research Methodology and showcased in Graph 1 below. Anne 1 includes a more detailed table with the findings for all the countries included in the analysis.

Romania has the higher growth rate regarding access to the internet, with approximately a 65% increase in 2021 compared to 2012. Therefore, the internet connection in 2021 compared with the 2012 indicator is calculated as a report between the number of households with internet connection in 2021 and the number of households with internet connection in 2012.



Graph no. 1. Comparison between Romania and EU27 average regarding the indicators reflecting digital nomads 'interests

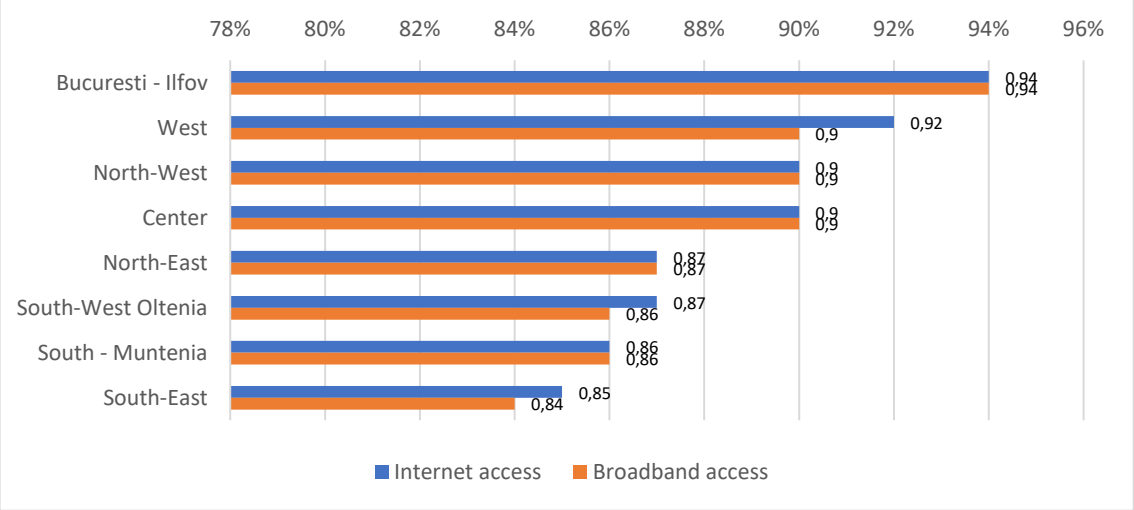
Source of data: Authors' analysis based on Eurostat and Numbeo database

When analyzing the cost-of-living indexes, we observe that Romania ranks 1st if we consider the cost of living plus rent index (23,5%) in EU 27, followed closely by Bulgaria. However, the results are significantly lower than the average of the EU (42%) and far away from countries such as Luxembourg, Ireland, and Denmark, with the cost of living higher than 60%.

Romania also showcases the lowest indexes in terms of groceries and restaurant prices, other indicators that digital nomads usually look at when choosing their destination country. Finally, regarding the local purchasing power index, Romania is the fifth country in EU 27, after Greece, Malta, Bulgaria, Portugal, and Croatia, and statistically significantly lower than average of the EU (68,2%).

Another important characteristic that influences the digital nomads' decision to favor a destination country is the safety of the respective place. Our analysis captures two indexes related to security: crime and safety index. As shown in Graph 1 above, Romania is in the top 10 safest countries in EU27, with better values than the EU average (crime index is 27,6% compared with 33,1% of EU27 average, and safety index is 72,4% compared with 66,9%).

Narrowing down our analysis, we shift the focus to the regional level inside Romania. The scope of the second step of our research is to identify the regions of the country that have the potential to attract more digital nomads. This will help determine the cities with the best internet connection and lowest living costs in Romania.



Graph no. 2. Ranking of Romanian regions based on Internet and Broadband connection

Source of data: Author's analysis based on Eurostat data

Considering the internet and broadband access data available at the regional level, the Romanian regions have been grouped into three clusters: 1) Bucharest-Ilfov region, around Bucharest capital, 2) West, North-West, and Center cluster, and 3) the remaining four regions of the country: North-East, South-West Oltenia, South-Muntenia and South-East, as the last cluster. Based on the hierarchical clustering analysis, the first two clusters with Bucuresti-Ilfov, West, Nort-West, and Center regions appear to have the potential to attract more digital nomads, as they have the best internet and broadband connection.

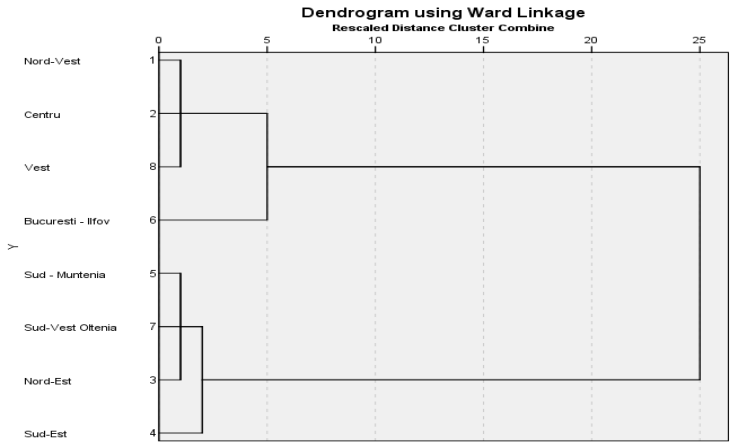
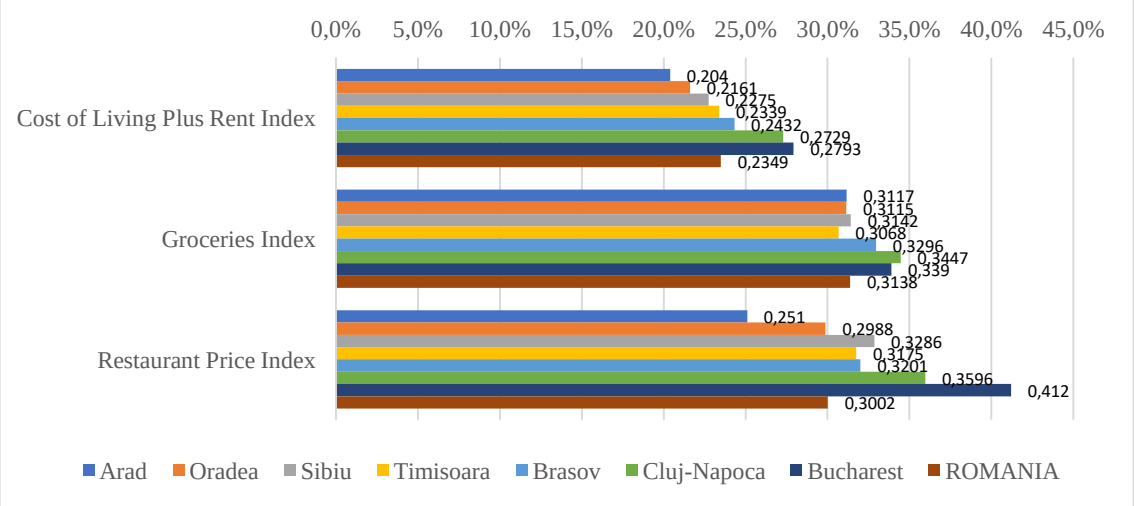


Figure no. 1. Region classification based on internet and broadband access

Source of data: Eurostat, 2021

To select the most attractive Romanian cities for digital nomads, we ranked the tenth most important cities (where data was available). The four regions presented above are Arad, Oradea, Sibiu, Timisoara Brasov, Cluj-Napoca, Bucharest. The indicators used to rank the most attractive cities are the indicators where Romanian ranked first place in EU 27: the cost of living and rent index, the groceries index, and the restaurant index.

Based on the cost of living and rent index, the Romanian cities with the highest potential to attract digital nomads are Arad, Oradea, Sibiu & Timisoara. In these four cities, the cost of living is below the national average. The results are also similar if we look at the groceries index. Regarding the restaurant price, Arad and Oradea are below the national average, while Sibiu, Timisoara, and Brasov have slightly higher prices than the national average in Romania. Nomadlist.com ranks Timisoara in 39th place, closed to Romania's Bucharest capital (38th place). The city has an excellent total score, being marked overall as good by all nomadlist.com members that checked in. According to the website, you need 1403 dollars per month to live in the city, while based on the Numbeo database the required amount per month is 848 dollars. Brasov city is also ranked 53rd place on nomadlist.com with 1489 dollars per month to live in, compared with 876 dollars estimated on Numbeo. Arad, Oradea, and Sibiu are not promoted on nomadlist.com, but these cities have close estimated monthly costs (including rent) on Numbeo: 642, 729 respectively 771 dollars.



Graph no. 3. Comparison between Romanian cities with the highest potential to attract digital nomads

Source of data: Authors' calculation based on Numbeo data

Conclusions

The analysis finds out that Romania has an untapped potential to attract digital nomads. Compared with EU 27 member states, Romania has one of the best internet and broadband access, with the lowest cost of living and the lowest prices for rent, groceries, and restaurants. Safety is also high compared with other EU27 countries. Four regions have the best internet and broadband access: Bucharest-Ilfov, West, North-West, and Center. Of these regions, four cities are the best to work in because of the reduced cost of living: Arad, Oradea, Sibiu & Timisoara.

Nevertheless, the analysis above is an excellent opportunity to put forward some suggestions on how to improve the attractiveness of Romania for the digital nomads around the world.

Our analysis shows asymmetry of information regarding the aspects where Romania has a proven competitive advantage to attract digital nomads, such as excellent Internet and Broadband access, the lowest cost of living, and very good safety. Romania needs to develop a centralized information center with a corresponding website to overcome this problem, mimicking the nomadlist.com website. Interested digital nomads could find general information about Romania's cities and regions and specific information about living and working conditions.

Last but not least, with a recently adopted legislation on digital nomad visas, Romania needs to develop a comprehensive system of cutting red tape that can become a barrier for digital nomads that want to work from Romania.

Acknowledgment

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Annex: 1

Table no. 1. Detailed results of the analysis of each EU 27 country regarding the main indicators

	Internet Connection 2021 compared with 2012		Cost of Living		Rent Index		Cost of Living plus Rent Index		Groceries Index		Restaurant Price Index		Local Purchasing Power Index		Crime Index		Safety Index	
	%	Ranking	%	Ranking	%	Ranking	%	Ranking	%	Ranking	%	Ranking	%	Ranking	%	Ranking	%	Ranking
Austria	20,3%	16	71,0%	19	27,1%	21	50,5%	20	65,9%	24	66,0%	17	77,3%	18	23,7%	4	76,3%	4
Belgium	17,9%	20	72,6%	21	25,8%	18	50,7%	21	63,3%	20	78,6%	24	79,7%	19	44,0%	23	56,0%	23
Bulgaria	64,7%	2	38,4%	2	9,8%	1	24,6%	2	34,0%	3	32,4%	2	46,0%	3	38,5%	20	61,5%	20
Croatia	30,3%	12	48,9%	10	13,4%	6	32,3%	8	42,0%	9	41,3%	8	47,6%	5	24,7%	5	75,3%	5
Cyprus	50,0%	4	59,0%	15	22,7%	16	42,0%	15	51,0%	15	57,5%	15	68,2%	16	33,1%	15	66,9%	15
Czech Rep.	21,9%	15	48,2%	8	18,4%	12	34,3%	9	42,8%	11	36,7%	6	66,5%	15	25,5%	7	74,5%	7
Denmark	4,3%	26	84,1%	27	33,2%	24	60,3%	26	68,6%	25	98,8%	27	99,5%	26	25,1%	6	74,9%	6
Estonia	24,3%	14	53,7%	11	16,4%	10	36,2%	12	42,3%	10	56,4%	14	63,5%	14	23,1%	2	76,9%	2
Finland	11,5%	22	73,2%	22	26,0%	20	51,1%	22	65,2%	21	77,7%	23	91,0%	23	23,3%	3	76,7%	3
France	16,3%	21	74,1%	23	25,3%	17	51,3%	23	73,6%	26	71,8%	19	85,4%	21	46,8%	26	53,2%	26
Germany	8,2%	23	65,6%	16	27,6%	22	47,8%	17	52,3%	16	60,9%	16	103,1%	27	34,8%	17	65,2%	17
Greece	57,4%	3	56,2%	14	12,7%	5	35,8%	11	44,7%	12	52,2%	12	39,7%	1	40,3%	22	59,7%	22
Hungary	35,8%	9	40,7%	4	11,9%	4	27,2%	3	35,2%	4	32,8%	3	52,0%	8	35,1%	18	64,9%	18
Ireland	19,8%	18	76,1%	25	42,1%	26	60,1%	25	62,1%	19	80,4%	25	82,3%	20	45,4%	25	54,6%	25
Italy	44,4%	6	66,5%	17	20,6%	13	45,0%	16	58,0%	17	70,6%	18	61,7%	13	44,3%	24	55,7%	24
Latvia	31,9%	10	48,5%	9	11,8%	3	31,3%	5	38,4%	6	42,1%	9	51,7%	7	37,0%	19	63,1%	19
Lithuania	45,0%	5	45,7%	6	15,0%	8	31,3%	6	36,2%	5	46,6%	10	58,7%	10	33,1%	14	66,9%	14
Luxembourg	6,5%	24	80,5%	26	60,1%	27	70,9%	27	74,8%	27	88,8%	26	98,8%	25	33,4%	16	66,6%	16
Malta	18,2%	19	67,8%	18	29,7%	23	50,0%	18	59,6%	18	72,4%	20	44,2%	2	39,0%	21	61,0%	21
Netherlands	5,3%	25	75,7%	24	36,1%	25	57,1%	24	65,5%	22	76,4%	22	88,0%	22	27,6%	8	72,4%	8
Poland	31,4%	11	39,0%	3	14,5%	7	27,5%	4	32,4%	2	33,5%	4	60,0%	12	28,5%	10	71,5%	10
Portugal	42,6%	8	47,9%	7	20,7%	14	35,2%	10	39,0%	7	40,3%	7	46,8%	4	29,6%	12	70,4%	12
Romania	**64,8%**	**1**	**35,2%**	**1**	**10,2%**	**2**	**23,5%**	**1**	**31,4%**	**1**	**30,0%**	**1**	**48,1%**	**6**	**27,6%**	**9**	**72,4%**	**9**
Slovakia	20,0%	17	44,7%	5	16,1%	9	31,3%	7	39,7%	8	36,1%	5	54,7%	9	29,2%	11	70,8%	11
Slovenia	25,7%	13	53,9%	13	17,9%	11	37,0%	13	47,7%	14	46,7%	11	59,5%	11	21,1%	1	78,9%	1
Spain	43,3%	7	53,9%	12	21,3%	15	38,6%	14	45,7%	13	54,0%	13	70,0%	17	32,0%	13	68,0%	13
Sweden	1,1%	27	71,7%	20	25,9%	19	50,2%	19	65,8%	23	72,6%	21	98,1%	24	47,1%	27	52,9%	27
Average EU	**28,3%**		**59,0%**		**22,7%**		**42,0%**		**51,0%**		**57,5%**		**68,2%**		**33,1%**		**66,9%**	

Source: Author's analysis based on Eurostat & Numbeo database

The Role of the Foreign Direct Investments for the Carbon Emissions Reduction Targets

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DOI: 10.24818/BASIQ/2022/08/055

Abstract

For the European Union economy and, especially, for the manufacturing industries, achieving the climate agenda goals requires a fundamental reconfiguration of the entire value chain, from production to transportation and to distribution, based on the reduction of the CO_2 emissions and a strict carbon management.
While energy proved to be a main driver for sector localization through specialization (Branger, Quirion and Chevallier, 2017), energy intensive sectors resorted to relocate key energy intensive value chains in regions with low-cost energy resources (Naegele and Zaklan, 2019). However, in the energy transition, laggard economies that will make slow steps towards decarbonization might see their competitiveness to be affected (Eicke and Goldthau, 2021).
Therefore, authors of this paper aimed to highlight the most relevant correlations and causal relationships between foreign direct investment flows (FDIs), the flows of exported goods and carbon emissions (CO_2) in an economic landscape with a challenging pillar of environmental resilience, positive corelated to the new competitiveness.
To meet the objectives of the research, we used empirical quantitative and qualitative methods. To identify the decarbonization agendas of the top 10 listed companies in Germany, France, Italy, the Netherlands, and Austria, 27 documents and 18 web sources were processed, and we used open coding in Atlas.ti for a content analysis. We also developed two gravity models based on time series data published by Eurostat, the Central Bank of Romania, and the Romanian National Institute of Statistics. The reason was to point out, using the EViews software, the causal relationships between FDI's and CO_2 emissions. The method chosen was panel least squares and we sought to identify cross section random effects by applying the Haussman test.
It can be said that the results of the two econometric models may indicate a possible carbon leakage effect in the EU, resulting from FDI's. However, companies of Romania's main partner countries have set clear targets to achieve on Scope 3. This will automatically influence the production chain to decarbonize at all levels. Failure to follow this paradigm could have negative effects on the competitiveness of Romanian exports.

Keywords

Foreign direct investments; trade; CO_2 emissions; exports.

DOI: 10.24818/BASIQ/2022/08/055

Introduction

Profoundly technological paradigm shifts, advancing trade liberalization process and the increased mobility of technology, human resources financial capital and flows of ideas have strengthened economic and commercial interdependencies and diversified business models and types of economic flows.

An advanced internationalization process and the development of new industrial clusters have increased the complexity of flows in goods and services, by intensifying outsourcing, vertical disintegration of production processes and their expansion into networks.

More and more economic actors, public or private, confronted with these new challenges, were determined to ask for revised public policies and regulations, and perform new business means to capture new

opportunities linked to a different regional and global trade landscape. At the European Union level, it increased the necessity to implement new pillars of a post-pandemic sustainable development agenda, with environmental and digital resilience requirements. Having in mind the Green Deal strategic package of objectives and activities, in special the goal to obtain an environmental neutrality, the decarbonization efforts undertaken by companies will be the most relevant indicators for their successful participation in the intra-EU good deliveries and, ultimately, in the global trade. In this context, foreign direct investment can play a multi-facet positive role in the flow of the intra-Community goods, in order to create and strengthen low or zero carbon value chains.

Therefore, authors of this paper aimed to highlight the most relevant correlations and causal relationships between foreign direct investment flows (FDIs), the flows of exported goods and carbon emissions (CO2) in an economic landscape with a challenging pillar of environmental resilience, positive corelated to the new competitiveness. In this regard, the authors used quantitative and qualitative research methods and used panel data and tested several gravity models to identify the interdependencies between all these indicators.

1. Review of the scientific literature

In a new globalization stage, specific for a new millennium, with an increased level of the world economic integration, the most visible results were seen in the increasing demand for differentiated manufactured goods and services, which spurred trade flows and the intra-industrial specialization. While energy proved to be a main driver for sector localization through specialization (Branger, Quirion and Chevallier, 2017), energy intensive sectors resorted to relocate key energy intensive value chains in regions with low-cost energy resources. Before issuing the Green Deal, this was one of the main recipes that have been applied to maintain the competitiveness of the production costs (Gerlagh, Mathys and Michielsen, 2015).

The energy transition, placed by the European Union in the middle of a complex regulatory and institutional package, is a very specific component of a process to stimulate the post-pandemic economic recovery, in order to rewrite the principles of cheap fossil fuel-based offshoring. The most powerful tools used by the European Commission are the ETS system and the future carbon border adjustment mechanism. At the same time, companies must respond to the EU's growing focus towards sustainability, which means that the production, the supply and the consumption of goods must be based on a low or net zero carbon content. This shift is drawn both by policymakers and by the increasingly prominent role of the ESG investors, who begun to redirect their capital flows from economic activities with high carbon footprints towards the sustainable ones.

Ecke and Goldthau (2021) draws attention to the asymmetric distribution of the energy transition and opens the discussion about the laggard economies exposed to the risk of making slow steps towards decarbonization. In this respect, the authors stressed that energy transition will increase the consumption of products that contribute to decarbonization. Thus, companies will be determined to find the appropriate answer to accommodate the demand through the restructuring of the value chains, while considering and measuring the carbon footprint of their suppliers. This phenomenon, in the view of the authors, will tend to hurt industries or even the entire economic landscape especially in economies that still want to have a high dependency on fossil fuels (Eicke and Goldthau, 2021).

Another author (Rokhmawati, 2021) underlined that emission reduction measures depend on expensive investments and companies will end up in generating less cashflow, which will have spillover effects at the competitiveness level. This analytical perspective was mentioned earlier by Porter and van der Lide (1985), who noted that the dynamism that characterizes the competitive environment determines companies to constantly identify innovative solutions to meet the market and regulatory challenges, including environmental ones.

To tackle the regulatory risk, the quickest option was to relocate energy intensive value chains in certain regions where the CO2 policies were friendlier, generating this way a carbon leakage effect (Banque du France, 2020). According to a definition, carbon leakage occurs between „a domestic region featuring an emissions policy and a foreign region with no policy or a less stringent policy" (Naegele and Zaklan, 2019).

However, one of the strategic goals of the European Union is to reset the basis of the multi-lateral trade by building a green economy. Therefore, the sustainable option is to produce less or zero carbon intensive products, using renewables as feedstock or as an energy carrier in the primary and in the power mix (Epurescu, 2021). To meet the scientific requirements for reducing the CO2 emissions, companies must implement a series of specific measures.

The GHG Protocol (2020) made a classification of these emissions, segmenting them according to the type of production process and economic activity:

- Scope 1: direct emissions from the production process
- Scope 2: indirect emissions resulted from the heat, power and type of fuel used during the economic activity
- Scope 3: indirect emissions which are not included in Scope 2 and which occur in the entire value chain of the company concerned and which may be generated by directing investments towards unsustainable activities, franchise activities, leased assets, use products manufactured by the company, the transportation and distribution of products, the purchase of goods and services, capital goods, waste, or even for business travel or employee transportation.

By far, the most complex CO2 taxation regime has been implemented in the European Union. This is the ETS, a cap-and-trade system, which charges power producers and energy-intensive industries for the CO2 emissions resulting from the production and for the power used during the industrial processes. Many industries, such as refining, steel or metallurgy, currently receive free allocations for the full volume of CO2 emissions from Scope 1, while they need to purchase ETS certificates for at least 25% of the emissions resulted from the power that is used.

Once the border carbon adjustment mechanism will be implemented in 2023, free ETS allocations for Scope 1 emissions will start to decline, leading companies to implement more measures to limit their carbon footprint. Given that a significant number of companies have started to announce net zero emissions targets, the biggest challenge will be to reduce emissions in Scope 3, ie those in the value chain and those resulting from the use of the final product. At the same time, behind this effort lie the biggest opportunities. While so far, companies were focused on reducing emissions from Scope 1 and especially Scope 2, emissions from Scope 3 are estimated to be 5.5 times higher than those from Scope 1 and Scope 2 combined. Reducing emissions in Scope 3 is key: if additional measures will be taken, this will ensure that emissions are not pushed to other areas of the value chain and that companies will be encouraged to be part of a sustainable value chain (Stanford, 2021).

Given that value chains are scattered in many cases across borders, in this case, a substantial role is played by the foreign direct investments (FDI). It is well known that, in many cases, FDIs had a positive impact on stimulating economic growth, by creating new jobs, stimulating competition, increasing the wages, or diversifying the production and the trade.

As some authors point out, there have been numerous attempts to demonstrate a direct relationship between FDIs and the CO2 emissions either at the industrial or macroeconomic level, to support the thesis of the carbon leakage phenomenon. The results are not conclusive.

For example, in a study about Latin America and FDIs, one highlighted the fact that FDIs inflows in energy-intensive industries could be connected with a steady rise in CO2 emissions during 1980-2007 (Blanco, Gonzales and Ruiz, 2013). On the other hand, other studies have shown that the presence of FDIs stimulated technological innovations which contributed to reducing the carbon emissions (Lin, et al., 2022). The lack of consensus in the literature regarding how FDIs might influence the evolution of the carbon emissions at macro, mezzo and micro level highlights the need for a greater clarity on behalf of the companies' reporting on emission sources.

2. Research methodology

The research started from the hypothesis that there is an interdependent relationship between foreign direct investment and the reduction of carbon emissions. Therefore, we aimed to demonstrate that the foreign direct investments allocated from Germany, France, Italy, the Netherlands, and Austria in various economic sectors in Romania have a positive effect in reducing their carbon emissions at the national level. At the same time, we tried to highlight what the rationale and motivation for such a strategy might be and why decarbonization is important for multinational companies located in these countries.

The selection of the five countries was based on the following criteria:

- The companies registered in Germany, France, Italy, the Netherlands, and Austria contribute to Romania with substantial foreign direct investments, according to Romania's National Statistics Institute

- These countries are among Romania's main trading partners, according to the Central Bank of Romania – 63% of the value of Romania's intra-EU deliveries were in Germany, France, Italy, Austria and the Netherlands

- Germany, France, Italy, and the Netherlands had, in 2019, one of the highest annual GDP levels among EU countries, while Austria had one of the highest GDP in the Eastern European region, according to Eurostat

- At the same time, the top four countries have the highest annual CO2 emissions in the EU, according to Eurostat, while Austria set itself to be carbon neutral in 2040 at the national level.

2.1. Quantitative method

We used this method to analyze the decarbonization targets and the roadmaps of the top 10 listed companies in Germany, France, Italy, the Netherlands, and Austria. To identify these companies, we used the database of the value.today website and the selection criterion was the market capitalization of these companies.

To identify the decarbonization agendas of these companies and their net zero pledges, 27 documents and 18 web sources were processed, and we used open coding in Atlas.ti for a content analysis.

The content analysis had 3 stages:

- For Stage 1, we used the keywords „Scope 1", „Scope 2" and „Scope 3" to identify the decarbonization targets.

- In Stage 2, we wanted to identify the decarbonization roadmaps. Therefore, we used the above keywords to make three groups of codes called Scope 1, Scope 2, Scope 3 which contained the following keywords: „own operations", „carbon capture", „carbon storage", „carbon offset", „energy efficiency ", „building retrofitting", „coal phase out", „renewable energy", „power grid", „hydrogen", „biomethane", „LNG", „natural gas" , „supply chain", „EV" and „battery cell production"

- In Stage 3, we used the keywords „net zero" and „carbon neutral" to search for the net zero pledges and timelines.

2.2. Qualitative method

We developed two gravity models based on time series data from Eurostat and the Romanian National Institute of Statistics to point out, using the EViews software, the causal relationships between foreign direct investment and carbon emissions.

The analyzed period was 2010-2019 and we used as a reference the FDIs from this period carried out by Germany, France, Italy, the Netherlands, and Austria in Romania.

Cross section random effects were tested and the Haussman test was used. The method chosen was panel least squares.

We used logarithmic data of the following indicators:

- LNFDI – Foreign Direct Investments made during 2010-2019 by Germany, France, Italy, the Netherlands and Austria

- LNROCO2EXP – CO2 emissions embodied in Romania's exports

- LNCO2FCPC – CO2 emissions generated by fuel combustion in partner country

- LNGDPPC – GDP evolution in partner country

- LNCO2FCPCEI – CO2 emissions generated by the energy industry in the partner country

- LNCO2FCRO - carbon dioxide emissions resulting from the burning of fossil fuels in the primary energy mix in Romania.

3. Results and discussions

After performing the quantitative analysis, we identified the following results:

- Out of 50 leading EU companies that were analysed, 13 companies have net zero commitments backed up with clear roadmaps and targets for all the type of emissions, 25 companies have just net zero pledges and different Scope targets but not a certain roadmap, while 12 companies haven't committed yet to any net zero targets (commitments or pledges)

- Daimler, Schneider Electric, ENI, ASML, Shell, OMV and Unilever are the leading EU companies with clear roadmaps for emission reductions and net zero targets

- All the 38 companies with at least net zero pledges are either present through subsidiaries in other European Union countries or have integrated EU companies into their value chain strengthening, in this way, the intra-EU deliveries, both with raw materials and intra-industrial products

- Most of the banks, investment funds and insurance companies that were under this analysis have joined multilateral initiatives, such as the Alliance of Net-Zero Asset Owners Alliance, pledging to gradually reduce their investment in fossil fuels until they are removed completely from their portfolio

- In the manufacturing, service and retail production sectors, the measures have a threefold purpose: reducing carbon emissions from own operations, increasing the share of renewables in energy consumption, and reconfiguring the relationship with suppliers in order to obtain green value-added chains.

Analyzing the targets and the roadmaps assumed by these companies, it can be stated that their main objective is to substantially reduce emissions from Scope 1 and 2, following that in a secondary stage to implement measures aimed at reducing emissions from Scope 3. This could mean that foreign direct investment could focus also on outsourcing production capacities to other countries to reduce especially the Scope 1 emissions locally.

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- In the manufacturing, service and retail production sectors, the measures have a threefold purpose: reducing carbon emissions from own operations, increasing the share of renewables in energy consumption, and reconfiguring the relationship with suppliers in order to obtain green value-added chains.

First gravity model

Using the EViews econometric software, the authors used a random cross-section of the data and correlated the random effects using the Haussman test. The R-squared result was 0.910811.

Table no. 1. Results from EViews of the Hausman Test – First gravity model

Variable	Coefficient	Std. Error	t-Statistic	Prob
LNROCO2EXP	-0.305421	0.124088	-2.461323	0.0169
LNCO2FCPC	-3.073710	0.7911297	-3.884392	0.0003
LNGDPPC	1.178802	0.392087	3.006479	0.0040
LNCO2FCPCEI	1.374190	0.452275	3.038397	0.0036

Regarding the gravitational model, it can be summarized by the formula below:

LNFDI = 0.3 LNROCO2EXP - 3.07LNCO2FCPC + 1.17LNGDPPC + 1.37LNCOFCPCEI

Following the obtained results, the authors can indicate the following: if FDIs increase in Romania with 1%, Romania's CO2 embodied emissions in exported goods will decrease by 0.3% and CO2 emissions generated in the partner country due to fuel combustion will decrease by 3.07%. On the other hand, CO2 emissions in the energy industry will increase by 1.17%. Overall, FDIs will also have a contribution in a GDP growth of the partner country by 1.37%.

Second gravity model

In the second gravity model, the authors replaced LNROCO2EXP indicator with the LNCO2FCRO one, indicator that expresses the carbon dioxide emissions resulting from the burning of fossil fuels in the primary energy mix in Romania.

Using the EViews econometric software, the authors used a random cross-section of the data and correlated the random effects using the Haussman test. The R-squared result was 0.901237.

Table no. 2. Results from EViews of the Hausman Test – Second gravity model

Variable	Coefficient	Std. Error	t-Statistic	Prob
LNCO2FCPC	-3.132012	0.864576	-3.622597	0.0006
LNGDPPC	1.646184	0.372583	4.418296	0.0000
LNCO2FCPCEI	1.375371	0.476230	2.888037	0.0055
LNCO2FCPRO	-0.077602	0.378697	-0.204919	0.8384

Regarding the gravitational model, it can be summarized by the formula below:

LNFDI = -0.31 LNCO2FCPC + 1.64LNGDPPC + 1.37LNCOFCPCEI

What might be observed from the results of the Haussman test in this gravity model is that FDI has no effect in reducing the CO2 emissions resulting in Romania from the use of fossil fuels in the primary energy mix. At the same time, the coefficients and probability parameters of the other three indicators remain almost unchanged.

Conclusions

At first glance, it can be said that the results of the two econometric models may indicate a possible carbon leakage effect resulting from FDIs, although they are limited in scope as the authors used a small number of countries and indicators.

This hypothesis is supported by several researchers that studied the problem of carbon leakage. For example, in a study focusing on foreign direct investment in Asia (Sarkodie and Strezov, 2019), it was shown by using the Kuznets curve that foreign direct investment increased the level of CO2 emissions in China and Indonesia. Another study (Lee, 2013) found that foreign direct investment has led to an increase in energy consumption in the G20 member states; however, it has not demonstrated a direct and possible increase in CO2 emissions. On the other hand, the IMF (Borga, 2021) has conducted research to analyse the impact of the FDIs on increasing CO2 emissions in the host economy. The IMF looked at carbon emissions in supply to FDI's Gross Fixed Capital Formation and those embodied in Multinational Enterprises Output / Exports. The IMF's conclusion was that FIDs can have a direct impact on increasing carbon emissions.

Regarding the result of the present research, the fact that the CO2 emissions from the primary energy mix are declining in the partner countries of the FDIs in Romania may suggest that some of the production that generates emissions has been redirected from these countries in Romania.

Goods exported from Romania, however, contribute to the increase in carbon emissions in the origin countries as a result of the energy use. Although an overall reduction in emissions in the partner country is achieved, the increase in CO2 emissions as a result of energy use might have in this scenario two causes. The first cause is that Romania exports goods with a high content of CO2 emissions. In support of this statement, it must be said that the first 20 exporting Romanian companies have an average of 25% share in total exports and represents sectors such as the production of automobiles and car subassemblies, the electronics industry, technology, the production of hydrocarbons and refining and the production of rubber tires. All these industries are energy-intensive and in 2019, for example, according to the Romanian Institute of Statistics, they generated 72.6% of the total carbon emissions of the country, namely over 45 million tons of CO2, out of approximately 62 million tons of CO2. The second reason is that the energy transition is just at the beginning, and that the share of the renewable energy is still not enough to determine a substantial reduction in emissions.

Under these conditions, although FDI has shown that it can successfully contribute to economic development, it can also contribute to reducing carbon emissions. Companies in partner countries that have set clear targets to achieve on Scope 3 will automatically influence the production chain to decarbonize at all levels.

Unfortunately, monitoring emissions from Scope 3 is an extremely difficult task, due to a lack of transparency in the reporting process.

Therefore, many companies focus on Scope 1 and Scope 2 and many net-zero pledges are closely linked to these emissions because they are related to the profile of the economic operations or industrial processes. On the other hand, Scope 3 emissions often form the basis of the iceberg. Although reportedly in larger quantities than Scope 1 and 2, they are lost in the value chain and a company may claim to be green due to its own operations, but in reality, is working with fossil fuel dependent suppliers. And this dependency is either due to the factor endowments or due to their low costs.

In the medium and long term, the champions of the value chain will be the ones who will know how to adapt faster to the climate agenda goals and will have an essential role in reducing emissions on Scope 3. This will require a sense of anticipation that the energy transition will gain traction and will be incorporated not only into climate strategies but also into security of supply national strategies.

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Sustainable Practices in Small Accommodation Units

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Abstract

Sustainable practices are becoming a necessity in a world that is depleting natural resources at an accelerated level. In tourism, the accommodation service is essential and can be a starting point for the implementation of these practices. The article aims to investigate the interest of managers/owners of boarding houses and agrotourism boarding houses in Romania for certain aspects related to sustainability: use of organic products, energy savings, selective collection, employee training, and marketing campaigns. The results reveal a high level of selective waste collection and a reduction in the use of toxic products, while the certification of sustainable practices is lower. However, based on the values obtained, we appreciate that managers' interest in sustainability is high, especially since we are talking about small organizations. The originality of the approach comes from the fact that no national coverage research has been carried out on these forms of accommodation on the topic of practices related to sustainability. The results can help managers to relate to the market average and decide what actions they need to take regarding sustainability practices. It also helps other stakeholders, such as customers or authorities, to see the level of implementation and interest in providing environmentally friendly services.

Keywords

Romania, sustainable practices, rural areas, agro-touristic boarding houses, tourism.

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Introduction

Sustainability, now a widespread concept, a reality of society (Diaconescu and Stănciulescu, 2015) has emerged as a result of human awareness of issues, such as: depletion of resources (Jhariya, Banerjee and Meena, 2022), deterioration of nature (Xie, Fan and Zhou, 2021), the danger of having nothing to leave for future generations (Shue, 2014).

The concerns for sustainable development are becoming consistent with The United Nations Conference on the Human Environment held in Stockholm, 1972. Subsequently, the World Commission on Environment and Development (WCED) wrote up the report, which has become famous as Brundtland. In this report, sustainable development was defined as "aims to meet the needs and aspirations of the present without compromise the ability to meet that of the future" (WCED, 1987). But the world needed another 20 years to sign the first serious sustainability statement. It happened in 1992 in Rio de Janeiro on the occasion of the Earth Summit, when it was concluded that sustainable development represents "an achievable goal for all peoples of the world" (United Nations, 2020).

A major current step towards sustainable development was taken in 2015 with the development of the 17 Sustainable Development Goals (SDGs), agreed by most countries around the world (193). The document named *The 2030 Agenda* is extremely ambitious and considered universal, transformative and civilized (Economic Commission for Latin America, 2022).

The 2030 Agenda is an expression in all economic areas. Tourism is no exception. Seen as a form of recreation, of restoring intellectual, moral, or physical capacities, or as a way of doing business, tourism must also become a cleaner and fairer market for all stakeholders, and, in fact, sustainable. The SDGs in which tourism plays an important role are assessed as follows. SDG 12 - responsible consumption and

production, SDG 8 - decent work and economic growth, and SDG 14 - life below water (Boluk and Rasoolimanesh, 2022).

The interest in sustainability is much more practical as there are now clear directions (through SGDs) and business is about to take these into current and future activities. This is why the authors considered it significant to investigate the interest in sustainability of managers/owners in Romanian tourism. The present analysis investigates Romanian touristic and agro-touristic boarding houses, facilities that own approximately 57% of the total number of approved accommodation spaces, followed by hotels with only 17% (Institutul Național de Statistică, 2022).

The paper provides a brief review of the literature on sustainability and sustainable tourism practices, a presentation of the methodology and results of the research related to sustainable practices in Romanian touristic and agro-touristic boarding houses In the end, there is a short section of conclusions.

1. A short literature review

The strengthening of the concept of sustainable development at the World Summit of Rio de Janeiro in 1992 has led to increased interest and the development of an institutional framework for sustainable tourism (Torres-Delgado and López Palomeque, 2012). In 2012, the United Nations stated that well-designed and managed tourism can make a significant contribution to sustainable development (United Nations, 2012). Sustainable tourism is seen as a way to have products, services or business models that will attract eco-focused tourists (Paiano, Crovella and Lagioia, 2020), which are, obvious, more concerned about environment.

Tourism takes a variety of forms according to various criteria (Minciu, 2004). A common classification is that based on the administrative territory. Thus, we have rural tourism and urban tourism, two forms that complement each other and in which the elements of sustainability vary. Compared to urban areas, rural areas are closer to nature, cleaner and less modified. Therefore, it is even more important for this space to retain these characteristics as much as possible and to offer tourists experiences that meet their wishes related to the search for beautiful landscaping, the search for quiet, low noise and environmental pollution, the desire to learn more about nature (Streimikiene and Bilan, 2015).

An analysis of interest for the sustainability of tourism in rural areas was carried out by An and Alarcón (2020). They identified 76 articles written between 2009-2019. The main topics addressed are grouped into the following categories: holistic, environmental, social, economic, and customer. The article stated that many studies on sustainable rural tourism were written from a holistic sustainability perspective. They concluded by suggesting that researchers should pay attention to interactions in all aspects of the environment, economy, and society, and to analyse them overall.

Sustainable tourism practices often require a major change in existing practices (La Lopa and Day, 2011). The implementation of sustainable business practices depended on the philosophy of business managers. The reasons are mainly, the possibility of saving costs (Hitchcock and Willard, 2009; Landrum and Edwardsm 2009), the improvement of public relations or higher employee commitment and satisfaction (Baum, 2006; Hitchcock and Willard, 2009).

In the urban area, tourism produces more negative impact compared to the rural area. Lerario and Di Turi (2018) stated that tourist flows in these areas can avoid limiting if sustainable managerial practices are adopted together with changing consumer behaviour.

A study conducted by Essex and Hobson in 2001 having as respondents accommodation managers in a major British city revealed that implementing sustainability practices is often blocked by elements such as time, cost, and expertise. But compared to other industries, a more recent study developed in Australia reveals higher levels of performance for tourism businesses in terms of adopting environmental values (Moyle, et al., 2018).

Although it is extremely important for companies to be concerned about implementing sustainable practices (Annunziata, et al., 2018), there is scarce evidence that tourism practices contribute to sustainability (Agyeiwaah, 2019; Sørensen and Bærenholdt, 2020). This reality could lead managers to postpone the decision to change the mode of operation until more evidence is provided. However, other authors have shown that there is a link between sustainable business practices of tour operators and the results, suggesting the implementation of these approaches in tourism business in Malaysia (Hamid, Isa and Kiumarsi, 2020).

Among the components of the tourism industry, accommodation is more flexible and, consequently, more suitable for the adoption of practices such as the adaptation of energy systems, buying less polluting

products, reduction of energy consumption, water, and food losses (Popescu, et al., 2021). These are ecological practices, which occur most frequently (Çelik and Çevirgen, 2021). Other practices refer to economic and social dimensions (Raderbauer, 2011; Legrand, Sloan and Chen, 2016). Some examples are: educating tourists through marketing campaigns, training employees in environmental issues, or choosing methods of protection that are not profitable in the short term.

In general, studies are conducted on large organizations, where methods and practices are easier to identify, compare, and analyse. This is also the case for accommodation units (Radwan, Jones and Minoli, 2010; Memili, et al., 2018). For example, a practice called The Resource Hunt implemented in northern European countries at Scandic Hotels revealed a 20% reduction in energy and water consumption and a 30% reduction in the volume of unsorted waste over three years (Goodman, 2000). Another study shows that in Ghana the three top eco-friendly practices include the use of energy efficient light bulbs, the reuse of linen and towels by guests, and also the training of staff to be eco-friendly (Mensah, 2006; Tomaszewska, et al., 2021). Researchers like Font (2002), Han, Hsu and Lee (2009) or Han, Hsu and Sheu (2010) studied sustainability certification and green labelling among large accommodation enterprises. According to Iorgulescu (2020), officially certified green hotels represent less than 10% of the existing accommodation units worldwide.

In the case of Romania, a research conducted by Brătucu, et al. (2017) in accommodation units located in the Carpathian Mountains concluded that managers know little about voluntary sustainable development tools (EMAS, ISO 14001, or ETIS). On the other hand, they recognize the necessity of practices with respect to sustainability, although they apply only occasionally sustainable development measures. Sustainability is not a pregnant element in the management process. Regarding small accommodation units, Midgett, et al. (2019) stated that they had low levels of understanding of sustainable practices. These organisations must realize the relevance of sustainability and their role towards global sustainability. They must commit to these actions continuously in order to see the results and measure them.

In Romania, boarding houses or agro-touristic boarding houses are important forms of accommodation. Boarding houses have a maximum 15 rooms capacity, while agro-touristic boarding houses are smaller, with a maximum 8 rooms capacity (Ministerul Economiei, 2013). Regarding sustainable practices, Ispas, Untaru and Candrea (2019) found that owners/managers are aware of their importance. However, many barriers stand in the way of implementing them: insufficient money, time, or organizational resources.

2. Methodology and main findings

Our main focus was to investigate the interest of managers/owners of boarding houses and agrotourism boarding houses in Romania for certain aspects related to sustainability. We designed a structured questionnaire containing closed-ended questions and only one open question (for leisure facilities), which was self-applied in the fall of 2021 due to territorial distribution of accommodation units, distance and large number of units, costs, time, and scope of our research. We decided to use an Exponential Non-Discriminative Snowball Sampling method. The questionnaire was applied through an online survey. Recruitment was generated by posting the URL for the survey on the authors' social media network pages. Additionally, an email was sent to the ANTREC members. After two weeks, the authors re-posted the link and the emails were resent.

Of 9,146 accommodation units, 5205 are touristic boarding houses or agrotouristic boarding houses. Except for the ANTREC data base, no other national data base with rural accommodation units was available. Furthermore, of the 5205 units, some were probably closed due to a low number of tourists and restrictions in place at that time. The large number of units, geographical distribution and available contact information made almost impossible the task to reach every unit even by email.

In a comparative analysis, Shih and Fan (2009) found that for business-to-business surveys the response rates are lower than for other collectivities. It is known that mail surveys are half as effective as telephone surveys or personal interviews (Cycyota and Harrison, 2002). In addition, online questionnaires are replacing paper due to time and cost savings. But response rates continue to fall (Sjetne, et al., 2019). For the industry-wide survey, response rates of 1.52% were obtained (Upland, 2022).

In total, we obtained 102 valid responses. If we compared it with the number of registered units we obtained a 1,96% response rate. To analyse the collected data, we used univariate analysis to determine the frequencies, mean, median, skewness, and kurtosis. The design of the questionnaire included 2 main parts: (1) information about the company, (2) sustainable aspects of the business - ten items.

In terms of the geographical distribution of the respondents, we obtained one similar to the national distribution (see Figure 1). On the first part we obtained the following results:

- 79.4% of the boarding houses have less than 5 employees, 14.7% have between 5 and 10 employees, and 5.9% between 11 and 25 employees;
- 70.6% of the businesses were started more than 5 years ago and 29.4% were started less than 5 years ago;
- In terms of number of rooms, 23.5% have less than 5 rooms, 52.9% between 5 and 10 rooms, 11.8% between 11 and 15 rooms, 5.9% between 16 and 20 rooms and 5.9% more than 20 rooms;
- The owner provided the responses in 88.2% of the cases and the employee in 11.8%;
- 14.6% of the units do not provide any Food&Beverage (F&B) services; 33.3% offer tourists the opportunity to prepare their own food; 22.9% offer only breakfast and 27.1% offer complete F&B services; This was a multiple-choice question;
- For another multiple-choice question, activities that better describe the businesses of the respondents were: nature-based activities (72 responses), tour of touristic sites (33 responses), ecotourism (30 responses), rural patrimony (27 responses), culture and traditional way of life (24 responses), agriculture (18 responses);
- Only 21 of the respondents are members of alliances or associations - 19 ANTREC members and 2 in other associations: Pro-Straja and Bran-Moeciu-Fundata Association;
- Only 4 of 102 boarding houses have an independent certification for environment or quality like Rocert, Ecoinspect, ISO.

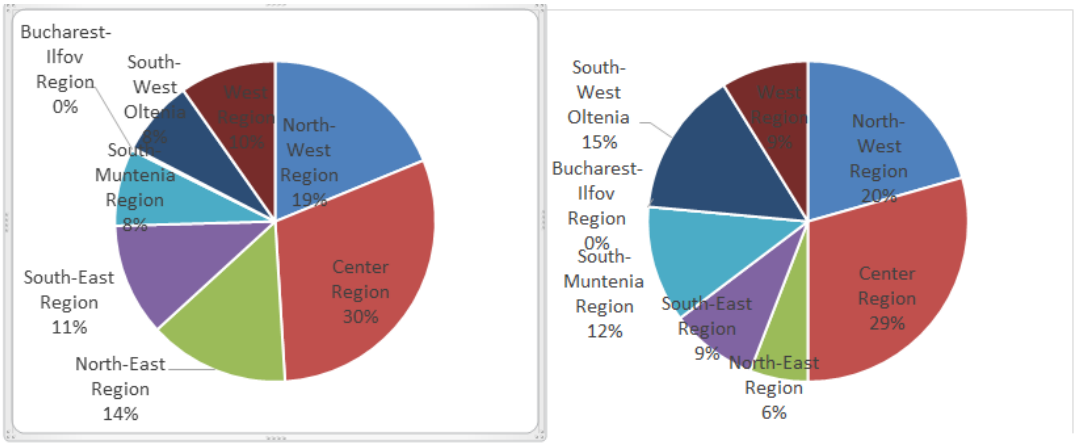


Figure no. 1. National territorial distribution of guest houses compared to territorial distribution of respondents

Source: made by the authors on the basis of NIS and their own data.

In terms of classification, due to national regulations, touristic boarding houses are classified on stars (from 1 to 5) and agroturistic boarding houses on flowers (1 to 5). Considering that we considered both types of units, we will present the data with star classification. A comparative image between the national distribution of tourist and agroturistic boarding houses can be seen in Table 1.

Table no. 1. Comparative analysis between the national and respondent distribution by comfort category

	Nation-wide distribution	Respondents distribution
5 stars	1.3%	5.9%
4 stars	11.8%	8.8%
3 stars	60.1%	67.6%
2 stars	24.9%	11.8%
1 star	1.9%	5.9%

Source: made by the authors on the basis of NIS and their own data.

For sustainable business we considered a number of 10 items ranging from knowing best practices in the field of sustainable accommodation or tourism, activities undertaken and using ecological aspects in current marketing activities. For the 10 items on sustainability, we have used a 7-point Likert scale where 1 – strongly agree and 7 – strongly disagree. The main results are shown in Table 2.

Table no. 2. Main centralized results for sustainability items

Item on Sustainability	Mean	Median	Standard deviation
It is useful to know the sustainability projects as a reference.	5.365	6.00	1.15
We reflect our commitment to sustainability through certifications.	5.06	5.50	1.65
The employees are trained in environmental issues.	5.47	6.00	1.54
With priority, we buy ecological products (biodegradable, recyclable, with recycled materials, without dangerous substances)	5.41	5.50	1.54
Ecological aspects are used in our marketing campaigns	5.50	6.00	1.579
We support the collaboration of customers in the field of environmental protection (voluntary change of towels and sheets, individual climate control)	5.88	6.00	1.12
We try to reduce the use of toxic and dangerous products	6.00	6.00	1.15
We apply energy saving measures such as: use of energy-efficient equipment and facilities, control of lighting and air conditioning.	5.82	6.00	1.678
We selectively collect waste: plastic, paper, glass, oils, batteries	6.00	7.00	1.688
We apply some environmental protection measures even if they are not economically profitable in the short term.	5.82	6.00	1.359

Source: Own elaboration based on the results

From the results obtained using SPSS software we can conclude that there is a commitment to sustainable business. There are differences in the implementation of actions to sustainable operations management. The highest median value (7) can be found for selective waste collection and the lowest value (5.5) for eco-certifications and buying ecological products.

Considered that selective waste collection became part of our daily life and is implemented in urban and rural areas in different modes, it is clear why this item scored the highest median value. More and more villages and rural areas started to collect waste in a selective way. On the contrary, eco-certifications and ecological products require time and money. In the last two years, tourism faced many restrictions and limitations due to the COVID-19 pandemic. Small business-like boarding houses were equally affected by the decrease in tourist arrivals and overnights. In general, boarding houses saw a reduction in income and profit.

By mean value, the selective collection of waste and the actions undertaken by the boarding house to reduce the use of toxic and dangerous products score the highest (6). The lowest value (5.06) can be found again at ecocertifications. Other items that scored a higher value are: encouraging customers in the field of environmental protection, energy saving measures and other environmental protection measures.

From these results, we can conclude that agro/touristic boarding houses implement only the easiest measures. The ones that require time, money, and many actions to comply with the requirements of an ecocertification program are difficult to find in Romanian rural tourism. From previous results, only 4 businesses (of 102 respondents) have an eco-certification.

It is encouraging that rural businesses are addressing sustainability even if they implement only the easiest actions. In the light of these findings, we should underlie the importance of the other topics addressed in our research that score lower and could have a great importance in future business development: using ecological aspects in marketing campaigns and training employees in environmental issues.

The commitment to sustainability and ecology can be a differentiating element that can be transformed into a unique selling proposition. Furthermore, ecotourists are willing to pay more (Hultman, Kazeminia and Ghasemi, 2015; Kazeminia, Hultman and Mostaghel, 2016; Duong, et. al., 2021) for an eco-touristic product. This product should include all aspects of business sustainability that include ecocertification. The newest technical solutions that can save energy and water even if they have a higher investment cost will save money in the end. And these solutions can be implemented by any boarding house on a different scale to reduce operational costs and improve profitability.

Conclusions

The results are in line with previous studies (Mensah, 2006; Brătucu, et al., 2017; Tomaszewska, et al., 2021; Popescu, et al., 2021; Çelik and Çevirgen, 2021) showing that sustainable practices are often summarized in the easiest actions. Ecocerification is still a niche market due to the information required, the time and money, and the interest of the owners. A better understanding of eco-certification schemes and the advantages brought could lead to and extension of these types of accommodation. Our paper showed that the attitude of managers toward ecocertification had not changed over the years, although several studies (UNWTO, 2022; WTTC, 2021) shown that there is an increasing demand for sustainable tourism activities. A wide array of stakeholders (accommodation managers, destination managers, employees, consultancy companies) can benefit from the implementation of sustainable activities in a destination. In-depth qualitative research can offer a clear picture of the drawbacks of not implementing ecocertification.

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Digitalization in Romania Measured with DESI

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Abstract

The current paper examines the current state of the digitalization in Romania and the European Union (EU), considering also the first year of pandemic. The purpose is to identify those zones with a significant performance gap between Romania and EU regarding digitalization and to highlight barriers that prevent digitalization. At EU level, one of the evaluation tools regarding the success of the digitalization strategies is the Digital Economy and Society Index (DESI). We have used this tool in this article. Our research revealed a number of relevant indicators pertaining to digital economy where Romania ranks above the EU average however, most of them have values below EU average.

Based on a comparative and a factorial analysis, we have assessed a set of elements that may influence the digitalization. We have created a statistical model that uses historical data and linear regression in order to estimate how the digitalization dimensions look like without the influence of pandemic and we have compared this estimation with the actual data from the first year of pandemic.

The originality of the article consists of the comparative analysis between the actual evolution of the digitalization during pandemic and the estimated trend of this evolution should the pandemic did not occur. For this, we have used the most recent formula for DESI, which is the 2021 edition.

As the new data from DESI 2022 becomes available, the new researches might be able to evaluate more accurately the impact that pandemic had on the digitalization of Romanian society and economy.

Keywords

Digitalization, DESI, Digital Economy and Society Index, Romania, pandemic.

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Introduction

The pandemic, in these two years of manifestation, has proven to public and private organizations that they cannot do business without immediate links. A significant part of the business could have been performed online or remotely if the companies had been implemented programs and electronic platforms that allow them to perform this work. The society, at large, is more and more interested in adopting the digital transformation of activities (Lichtenthaler, 2021). The digitalization reshapes the strategies and the working procedures in most industries (Bánhidi, Dobos and Nemeslaki, 2020). In the same time, the acceleration of this transformation process is imposed by the need to achieve the sustainable development objectives of the 2030 Agenda, sustainability and digitalization being two major trends that will influence the businesses (Aksin-Sivrikaya and Bhattacharya, 2017). In order to achieve the sustainable development objectives, the politics of the Green Pact indicates that the European Union (EU) to stimulate via investments the digital transformation (European Commission, 2019). The investments consider all type of entities either public or private, regardless of their dimension (Hossnofsky and Junge, 2019; Lichtenthaler, 2021).

With Digital Agenda Scoreboard, the European Commission (EC, 2015) has designated as a digital performance monitoring tool at EU level, the composite index - Digital Economy and Society Index (DESI).

In the current paper, the authors propose an analysis of the evolution of the digitalization process in Romania using the most recent version of DESI (the 2021 edition) with the presentation of two scenarios:

the first scenario looks at the digital changes under pandemic period and the second scenario considers an estimation of digitalization process should the pandemic wouldn't occur. The novelty of the paper is the utilization of the DESI 2021 edition for Romania and EU, in these two scenarios. The topicality of the paper resides in the purpose of this research namely, to get an overview of the existing digitalization capabilities at country level, to get insights on the underlying indicators to be improved in order for Romania to catch up the performance gaps to the EU member states.

1. Review of the scientific literature

DESI represents a tool that allows comparative analyses regarding the digitalization and it can be applied to rank the EU countries with an aim to monitor the evolution of the digital competitiveness both at country and at European Union level. This tool has been used for the first time in 2014 (EC, 2014). From 2015, DESI have five components (EC, 2015) that could be measured individually or aggregated as an overall index (EC, 2018). The tool has been mentioned in multiple researches. DESI has been used to compare the digital development trends, for example Latvia with EU (Vidruska, 2016). Most of researches have revealed significant digital differences that prevent the creation of a common digital market. The concept of DESI has been officially launched in 2016 in the documents released by European Commission as a comparative tool at international scale (EC, 2018).

The trend toward digitalization is closely related to functioning and developing of society and with the commitment to investments in equipment and innovative technologies. All of these will lead to an increase of general wellbeing and the creation of the necessary conditions for sustainable economic growth (Borowiecki et al., 2021).

From existing researches, it can be understood that the value of the overall index is directly associated with the digitalization trends recorded in the previous years for the analyzed countries. Also, the index growth rate is slow. To the same degree, the fundamental pillars that support the development of its specific components are defined by the following: the capability of the citizens to use the information technology and the capability of the education sector to deliver specialists in this field (Stavytskyy, Kharlamova and Stoica, 2019). The digitalization will improve because the accessibility to the hardware and software investments will be extended and because the internet connectivity will be large, in keeping with the general economic development (Bánhidi, Dobos and Nemeslaki, 2020).

2. Research methodology

In our work, we have examined the effects of pandemic on the digitalization process for public institutions and private companies in Romania. Staring from DESI, we have used the comparative method in order to assess the progress in this domain. In the same time, it has been applied the factorial analysis in order to compare the value of this index for Romania with the average of EU and we have examined the main factors that have had an influence on the overall result. The statistical analysis has been applied in order to create a linear model to simulate the trends of the index dimensions and we have compared them with the actual values from the dataset DESI.csv (EC, nd- available at https://digital-agenda-data.eu/datasets/desi). We have used classical statistics tools (Țițan, 2003; Voineag, et al., 2007).

In this analysis, it has been applied, as a benchmark, the DESI index which is published yearly by European Commission. The index provides an indication on the progress toward digitalization for each of the European Union countries. Its three levels structure includes dimensions, sub-dimensions and indicators. Starting with 2021, the European Commission has adjusted this index to be in line with the major European initiatives related to digital transformation: the Digital Decade Compass and the Recovery and Resilience Facility (RRF). The index includes now only four dimensions instead of five. Furthermore, each dimension is now equally weighted in contrast with the previous years. A comparison of the index dimensions for 2021 versus 2020 and earlier has been illustrated below (Table no. 1).

Table no. 1. A comparison of the DESI Dimensions and their weights 2020 versus 2021 and earlier

DESI 2020 Dimensions	Weight%	DESI 2021 Dimensions	Weight%
Human Capital (HC)	25%	Human Capital (HC)	25%
Connectivity (Conn)	25%	Connectivity (Conn)	25%
Integration of Digital Technology (IDT)	20%	Integration of Digital Technology (IDT)	25%
Digital Public Services (DPS)	15%	Digital Public Services (DPS)	25%
Use of Internet Services (UIS)	15%	-	-

Source: Adapted from European Commission, 2021

These four dimensions include the following sub-dimensions with its weights:

- Human Capital includes the following two sub-dimensions, equally weighted: Internet user skills (50%) and Advanced skills and development (50%);
- Connectivity includes the following four sub-dimensions: Fixed broadband take-up (25%), Fixed broadband coverage (25%), Mobile broadband (40%), Broadband prices (10%);
- Integration of digital technology includes the following three sub-dimensions: Digital intensity (15%), Digital technologies for businesses (70%) and e-Commerce (15%);
- Digital public services dimension includes one sub-dimension: e-Government (100%).

Each sub-dimension includes a number of indicators that are calculated for each of EU Member States.

The same formula applies for any EU country to calculate the overall index. The index is calculated based on Eurostat data and specialized surveys and it represents a powerful tool that can be used for comparative analysis or general performance assessment of digitalization in EU.

In the current paper, we have compared the values of the DESI indicators, sub-dimensions and dimensions that compose the overall index from Romania with the EU average. We have focused mainly on the indicators that measure the targets stated for 2030 Digital Compass. Typically, these indicators have double weights within their sub-dimensions and they are more important from an index calculation perspective (EC, 2021a):

- Human Capital (25%)**:** (i) At least basic digital skills, (ii) Information communications technology (ICT) specialists, (iii) Female ICT specialists;
- Connectivity (25%): (i) Gigabit for everyone, (ii) 5G coverage;
- Integration of digital technology (25%): (i) Small and Medium Enterprises **(**SMEs) with a basic level of digital intensity, (ii) Artificial Intelligence (AI), (iii) Cloud, (iv) Big data;
- Digital public services (25%): (i) Digital public services for citizens, (ii) Digital public services for businesses.

3. Results and discussion

The digitalization in EU has progressed with different speeds subject to the analyzed countries. From an overall DESI perspective, Denmark, Netherlands, Finland, Sweden and Ireland are the front-runners on the digitalization. By contrast, Romania had a slow progress regarding digitalization comparing with the EU countries, as shown in the graph below (Figure no.1). In the same category of laggards, there is Bulgaria, Hungary and Greece.

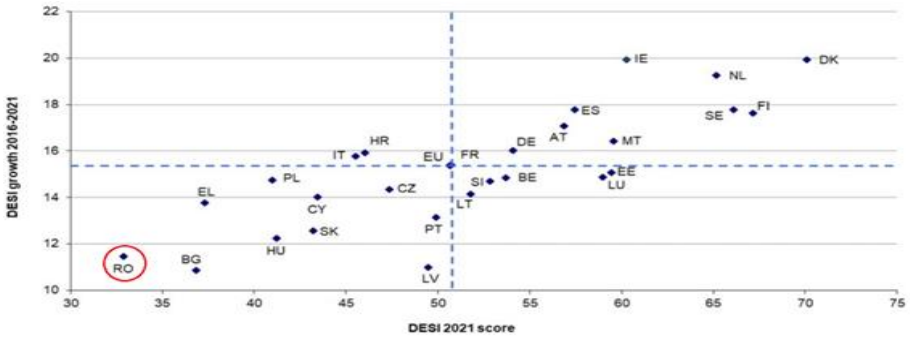


Figure no. 1. Digital Economy and Society Index – Member States' progress, between 2016-2021

Source: DESI 2021, European Commission

In the 2021 edition of the Digital Economy and Society Index (EC, 2021b), Romania ranks last among EU states with a DESI overall index of 32.9 compared with the EU average of 50.7. If we examine each dimension, Romania ranks 26th in EU for Human Capital, 10th for Connectivity, 25th for Integration of Digital Technology and 27th for Digital Public Services out of 27 EU Countries (Figure no. 2).

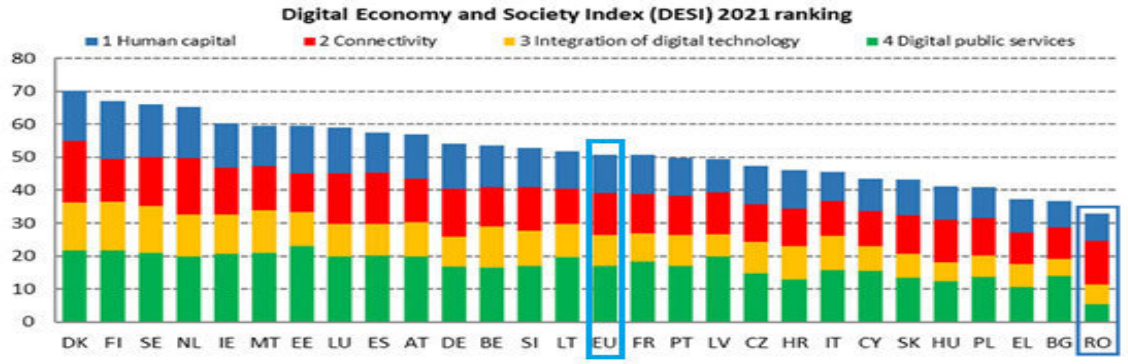


Figure no. 2. Overall DESI 2021 EU Member States rankings, including EU average

Source: European Commission, 2021b

Romania performs above of the EU average on the following indicators that are composing DESI 2021: Female ICT Specialists, ICT graduates, At least 100 Mbps fixed broadband take-up, the fixed very high capacity network (VHCN) coverage, Broadband prices index when analyzing all product baskets (fixed, mobile, converged), Artificial Intelligence, ICT for environmental sustainability. The remaining indicators rank equal to or below the EU average. Furthermore, with one exception (Female ICT Specialists), the indicators with a double weight have their values below the EU average.

The fourth dimension of the index – Digital Public Services- is ranked last among EU member states. The biggest influence in ranking low on overall DESI for Romania is explained by Digital Public Services dimension. In order to improve the overall DESI score, Romania has to make a substantial progress with improving the score on Digital Public Services dimension.

The low score for Digital Public Services has two explanations: one is the slow progress in this domain comparing with the rest of EU countries and second, the adjustment of the index structure and the change in the way the composing indicators are calculated. For example, in 2019 and 2020, the indicator related to "e-Government users" within the Digital Public Services dimension took into consideration all the users who have to submit online forms to the public authorities in Romania regardless of the year when this submission has occurred.

Starting with 2021 edition of DESI, this indicator considers only the percentage of users who have used the internet in the last year in their interaction with public authorities. This change in the way the "e-Government users" is calculated has determined a significant drop (from 82% to 16%) of the values assigned to this indicator in 2021 comparing with the previous editions. If in DESI 2019 or 2020 editions the value of this "e-Government users" indicator for Romania were above EU average, in 2021 the newly calculated value is way below this average.

Table no. 2. The indicators from Digital Public Services, comparison Romania versus EU

Dimension	Sub-dimension	DESI 2021 Indicators	Romania%	EU Average%
Digital Public Services	e-Government	4a1 e-Government users	16%	64%
		4a2 Pre-filled forms	6%	63%
		4a3 Digital public services for citizens	44%	75%
		4a4 Digital public services for businesses	49%	84%
		4a5 Open data	69%	78%

Source: adapted by authors based on European Commission, DESI 2021

4. Statistical Analysis – DESI 2021

Our research presents a comparison between the DESI progress for Romania and the EU. The data used for the following figures come from the dataset DESI.csv and they are aggregated data. We have used linear regression in order to model the non-pandemic situation, and put under each graph the regression equation. The model fits very well the situation, as shown by coefficient of determination and the level of significance F. The equations represent the respective DESI indicators function of time (t).

The research team has also illustrated the difference between the two scenarios considered – pandemic scenario vs basic scenario, for 2021, shown as Delta under each graph, where applicable. In the figure no. 3, we compare the DESI components for Romania with those at EU level and we notice that they look

different (we have studied also other countries, from the upper echelon, and the graphs look similar with those of EU).

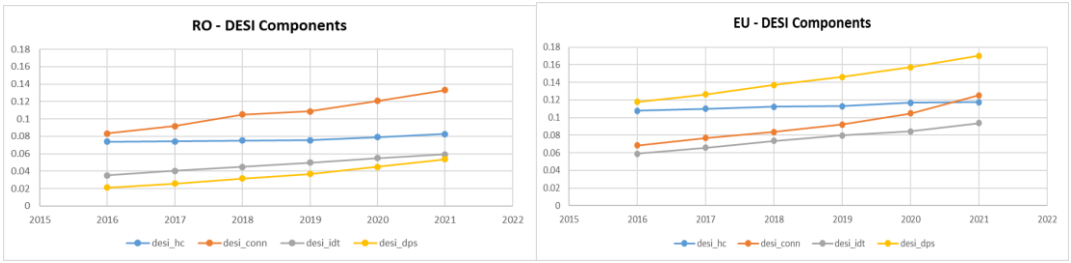


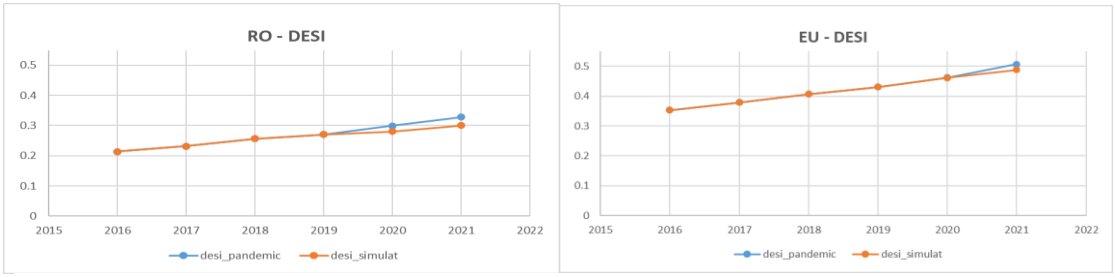
Figure no. 3. The evolution of index four dimensions for Romania and EU

Source: Dataset DESI.csv (EC,nd)

Analyzing these two charts, we can state the following:

- desi_dpt (Digital Public Services) - the least developed in Romania (vs. EU);
- desi_hc (Human Capital) - quasi-constant for Romania (vs. EU). This item to be the most important correlated with at least other 2 out of the total of 3 remaining (IDT and DPS).

Moving forward, in the figure no. 4 we can see a stronger increase for the Romanian DESI (more than double as for the EU) as compared to the simulation of the non-Pandemic case. The pandemic has accelerated the enhancement of the DESI index for Romania; however, there still are a lot to improve in order to have the values over the EU average.

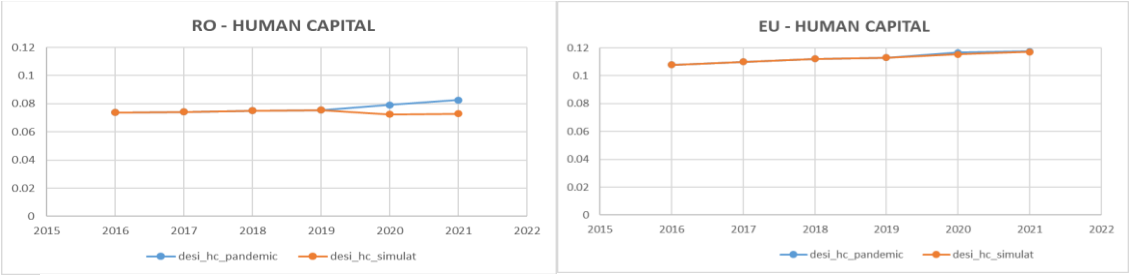


Delta: +9.51% (pandemic vs non-pandemic)
Coefficient of determination: 98.98%
Regression: f(t) = 10^(-3)*19.53*t - 39.17
Significance F: 0.005099

Delta: +3.94% (pandemic vs non-pandemic)
Coefficient of determination: 99.95%
Regression: f(t) = 10^(-3)*26.09*t - 52.24
Significance F: 0.000245

Figure no. 4. The evolution of DESI (simulated versus real, considering the first pandemic year)

Source: Dataset DESI.csv (EC,nd)



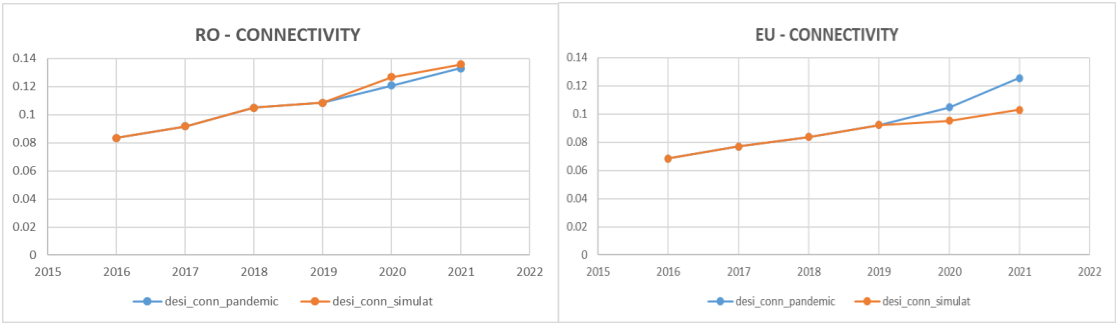
Delta: +13.16% (pandemic vs non-pandemic)
Coefficient of determination: 98.11%
Significance F: 0.009499
Regression: f(t) = 10^(-3)*0.62*t - 1.18

Delta: +0.41% (pandemic vs non-pandemic)
Coefficient of determination: 99.95%
Significance F: 0.019769
Regression: f(t) = 10^(-3)*1.77*t - 3.46

Figure no. 5. Comparison Romania versus EU average on Human Capital dimension

Source: Dataset DESI.csv (EC, nd)

Human Capital dimension of DESI (figure no. 5) for the non-pandemic scenario is quasi-constant; as it results from the figures and as illustrated in above graph, the pandemic has accelerated the development of this dimension for Romania. There are three factors determining this acceleration: (1) need generated by the pandemic; (2) additional time at hand for people and the work from home option, generating opportunities for online education and (3) the general EU trend.



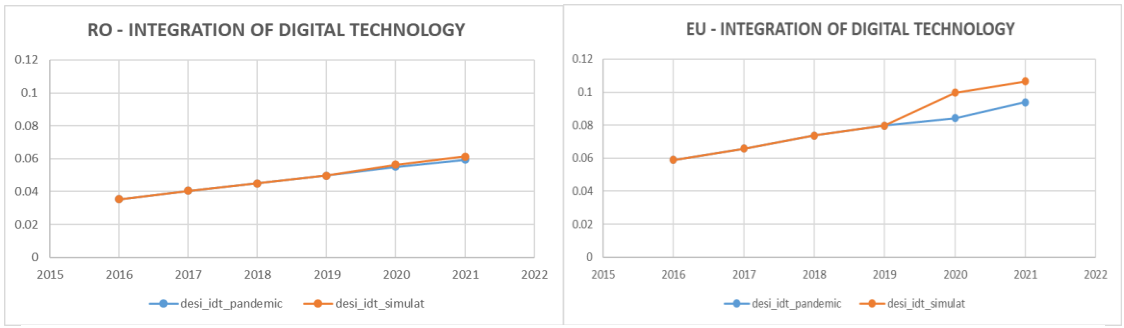
Delta: -2.00% (pandemic vs non-pandemic)
Coefficient of determination: 96.05%
Significance F: 0.019974
Regression: f(t) = 10^(-3)*8.84*t - 17.73

Delta: +21.80% (pandemic vs non-pandemic)
Coefficient of determination: 99.83%
Significance F: 0.000863
Regression: f(t) = 10^(-3)*7.76 *t - 15.58

Figure no. 6. Comparison Romania versus EU average on Connectivity dimension

Source: Dataset DESI.csv (EC, nd)

Connectivity dimension for Romania is the only dimension higher than the EU (figure no. 6). As the Romanian trend is very little influenced by the pandemic, the EU trend shows acceleration.



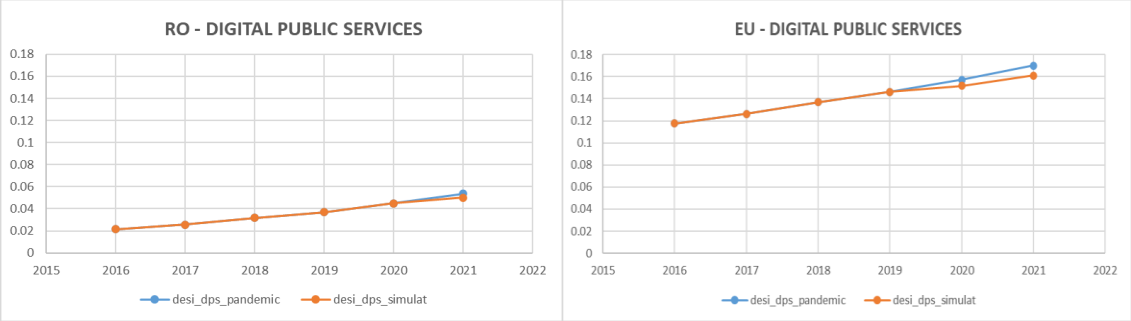
Delta: -2.98% (pandemic vs non-pandemic)
Coefficient of determination: 96.05%
Significance F: 0.000325
Regression: f(t) = 10^(-3)*4.82*t - 9.68

Delta: -11.88% (pandemic vs non-pandemic)
Coefficient of determination: 99.73%
Significance F: 0.001353
Regression: f(t) = 10^(-3)*6.98*t - 14

Figure no. 7. Comparison Romania vs. EU average on Integration of digital technology dimension

Source: Dataset DESI.csv (EC, nd)

Analyzing the above figure and according to our model, we have noticed that the pandemic did not influence the progress for this dimension, for Romania (figure no. 7). At EU level this dimension has decelerated with ~12%, due to saturation.



Delta: +6.91% (pandemic vs non-pandemic)
Coefficient of determination: 99.62%
Significance F: 0.001893
Regression: f(x) = 10^(-3)*5.25*t - 10.56

Delta: +5.55% (pandemic vs non-pandemic)
Coefficient of determination: 99.83%
Significance F: 0.000838
Regression: f(x) = 10^(-3)*9.58*t - 19.2

Figure no. 8. Comparison Romania versus EU average on Digital Public Services dimension

Source: Dataset DESI.csv (EC, nd)

Digital Public Services is slowly increasing for Romania, showing very little acceleration due to pandemic, as compared to EU for which this index increases with 5.5% as compared to the base scenario of no pandemic (figure no. 8). An explanation could be the fact that in Romania there already are plans for which the implementation is in progress, so the pandemic was not able to influence visibly this dimension.

5. Barriers in pursuing the path to digital for Romania

From those presented previously, it can be noticed that Romania is facing a number of difficulties in the process of digitalization. Although a number of steps have been made toward digitalization of public services such as "Virtual Private Space" (www.anaf.ro), launching and developing of ghiseul.ro platform (for tax payments), the public procurement system - e-licitatie.ro, The National Office Trade Register, it appears that these may not be sufficient.

Empowering the Authority for the Digitalization of Romania (ADR), the allocation of an important number of financial resources through NPRR on digital transformation component, adopting the European strategy "Digital Decade Compass" represents positive influence factors that may contribute to the progress of the digitalization in Romania.

In a study released in April 2021, ADR identified barriers on the path to digital for the public sector: lack of effective and efficient IT infrastructure for the management of electronic public services, lack of information systems for operationalizing the electronic public services, insufficient number of specialists in e-Government and human resources in the IT departments of public institutions, insufficient competencies required for the development and the maintenance of electronic public services, lack of a unified legal and procedural framework for supporting electronic public services.

The same study (ADR, 2021) has highlighted a number of factors that have impacted the private companies:

- human capital (low digital skills, digital skills specific to SME management is under represented and to a lesser extent the number of IT specialists working on SMEs);
- lack of financing for adopting the advanced digital technologies along with the support for expertise and consulting;
- lack of clarity and a coherent evolution of e-government tools.

Conclusions

At EU level, the pandemic has accelerated the digitalization process. The DESI index (2021 edition) has shown that Romania, despite ranking higher than EU average on the connectivity dimension, has recorded an overall slow progress on digitalization comparing with the other European countries. The existence of certain barriers toward digitalization, especially in public sector, such as the lack of ICT specialists or the lack of an appropriate IT infrastructure, makes the improvement of DESI ranking for Romania a lengthy process. In order to catch up with the digitalization gaps, the decision makers from both public and private

sectors should focus more on initiating and implementing projects in this domain. The results from the current paper highlight, via DESI analysis the weaknesses of the country (insufficient human resources, low integration of digital technology, public services not digitalized) and the barriers in the process of digitalization. This paper may serve as a starting point for next studies regarding the digitalization process, the access to online services or regarding the impact of public policies on the digital transformation strategies for Romania.

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Sustainability in Global Food System and the Pursuit of Human Life on Earth

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DOI: 10.24818/BASIQ/2022/08/058

Abstract

The global food system represents the set of the most important activities aimed at both the continuation of human life on Earth and the safeguard of natural resources. There is no doubt, in fact, that human beings cannot live without food and, at the same time, for their food supply they are dependent on global food system.
In addition, agricultural activities involve 37% of all the emerged land and they require the use of natural resources (soil, water) and living organisms (cultivated plants and raised animals) to be done.
It follows that, for the sustainability, no human activity is more relevant than those aimed at food production.
At present, all the agro-industrial activities covered by the food global system, are experiencing serious efficiency problems, which effects are evident in environmental, social and economic criticalities, whose costs tend to be higher than the total value of the production. The future of mankind appears to be more and more tied not so much to a further increase in the agricultural productivity, but rather to the possibility to redirect the agro-industrial activities towards a more efficient behaviour able to achieve the best possible compromise between the different human needs and the necessity to preserve natural resources useful for their development.
The purpose of this paper is to analyse if the current productive systems are able to achieve their economic objective while taking into account the human needs and the characteristics of the nature, that is if their development can be achieved through a cost benefit ratio acceptable as regards the objective of sustainability. To do this, a comparative analysis of studies about the sustainability of global food system was conducted. The analysis highlighted the unsustainability of the current global food system and the need to re-orientate in a more efficient way agro-industrial business so that the top quality of product and process sustainability and efficiency can be ensured. This study might serve as a starting point for further research on the subject.

Keywords

Global Food System; Sustainability; Food Security; Agriculture.

DOI: 10.24818/BASIQ/2022/08/058

Introduction

For years, sustainability has been the main reference for carrying out of every human activity. That said, you should not underestimate that, for the purpose of human existence, agriculture, including all activities aimed at ensuring food supply is the most relevant activity to boost sustainability

In fact, every human activity can continue to be practice, to evolve and to differ only if humanity will continue to exist. For existing, all human beings ought to be able to take food; without any exceptions. Regardless any differentiating features, all human beings have in common the need to eat. This means that every day, even if we don't think so or we don't realize, we need of agriculture. Beyond the above considerations, there are a lot of aspects which highlights the absolute importance of agriculture for sustainability. First of all, agriculture is the most widely practiced human activity on Earth. Farming activities occupy 37% of emerged lands (FAO, 2021); no other business can compare unto it in this respect. In addition, there are no other business that use natural resources and living organisms in order to get their

products and that, to be carried out, need to artificialize nature. It follows that, as it happens for the humankind, also for most of natural resources and living organisms the relationship with agriculture is obliged every day.

Since the beginnings, the human beings through their activity interact with the environment: natural resources, animals, plants, their fellows and the same results of these interactions. People have always been the author of a continuous process of transformation which is continuing to going on through following settling in addition to the previous. This compounding process that has been -and that still is -the basis of social and economic development of all human communities creates a permanent unbalanced situation, with unclear effects on sustainability.

In this framework, it is necessary to develop the awareness that the continuous impact linked to the increasingly diverse sequence of human activities must be consistently aligned with the research of balance each time representing the best possible compromise between the needs of men and the necessity to maintain resources in order to meet those needs. While this consideration may be addressed to all activities, this is particularly true for agricultural activities. There is, in fact, no doubt that agriculture is no more sustainable when it is not able to balance the economic goals, the needs of men and the characteristics of nature. When that happens, the resulting costs are passed on all mankind and nature.

For these reasons, it is of fundamental importance to try to figure out if the current productive systems are able to realize the mentioned compromise, namely if they result in a cost-benefit ratio considered acceptable for the purpose of sustainability. This paper aims to deal with this issue.

First of all, the issue of the sustainability of agri-food system is analysed through a literary review in order to highlight the main economic, social and environmental criticalities.

Secondly, the critical points, identified during the literary review have been discussed taking into consideration the three pillars of sustainability (environment, ethic and economy). Then, the authors have chosen to use two different estimates: World Bank (WB, 2019) and Food and Land Use Coalition (FOLU, 2019) in order to highlight the cost-benefit ratio. Finally, some conclusions have been drawn.

1. Review of the scientific literature

The issue of sustainability of agricultural and food production systems is very difficult to deal with, as many economic, social and environmental variables are, at the same time, a driver and an outcome of the agri-food system, given that they affect it but they also receive strong impacts from it (Fanzo, et al., 2021).

Also for these reasons, lately, the issue of the sustainability of agro-industrial system has been the theme of several studies aimed at investigating both specific aspects and their overall impact.

According to the findings of current studies, it seems now clear that the global food system should be considered the main responsible of the most important environmental and socio-economic issues that, at present, riddle our world (Rockström, et al., 2020).

With regard to environmental criticalities, we refer, in particular, to: the greenhouse gas emissions (Crippa, Solazzo and Guizzardi, 2021); the loss of biodiversity (Sukhdev, May and Müller, 2016); the destruction of eco-systems (Bongaarts, 2019); the land use change (Vieri, 2012; Ramankutty, et al., 2018) and the soil degradation (Shukla, et al., 2019); the depletion of commercial fish stocks (Troell, et al., 2014; Loring, 2021); the consumption of water (Islam, et al., 2021); the different forms of environmental pollution (FAO, 2017; Chaudhary, Gustafson and Mathys, 2018) and the related effect on human and animal health ranging from the nitrogen leaching (Lassaletta, et al., 2016), the presence of chemical residues in soil (FAO-UNEP, 2021) and food (FAO, 2021a) up to the contamination of animal products due to the phenomena of antimicrobial resistance (Naghavi, 2022; EMA, 2020).

As regards social and economic aspects, the most relevant critical issues are malnutrition, in its three burden: denutrition, overweight and obesity; and micronutrient deficiencies.

It is important to note that issues affecting malnutrition are the most critical risk factor for human life, so much so that it was estimated that, only in 2017, 11 million people died prematurely and about 255 million years of life have been lost for these reasons (Afshin, et al., 2019).

We must also consider that, in addition to the above-mentioned costs in terms of human life, also direct costs (health expenditures) and indirect costs (loss of income and working capacity), both considered effects of malnutrition, should be added: (Freijer, et al., 2013; Webb, et al., 2021).

According to FAO (FAO, 2021b), 2,37 billion of people, in the world, are in condition of food insecurity, 928 million of which live in conditions of severely food insecurity.

These issues are expected to worsen as a result of both pandemic covid-19 (FAO, 2021a; Manning, 2021) and the war in Ukraine. According to World Health Organization (WHO, 2022) there are about 1,9 billion of overweight people, one third of whom are obese; the number of people suffering from micronutrient deficiencies is estimated to be about two billion.

The existence of relationship between malnutrition and sustainability of agro-food systems, in the last years, has been the focus of growing attention and it has been highlighted both in general (Lindgren, et al., 2018; Steiner, et al., 2019; Willet, et al., 2019), and with reference to the single burden (Ul-Allah, 2018; FAO, 2021b; Fanzo, et. al., 2022).

Another important issue is the problem of food loss and food waste (FAO, 2011) that, in addition to being a direct expression of the inefficiency of the current production and consumption system (Alexander, et al., 2017), it has also important implications in terms of food security and environmental impacts. Food losses not only involve a reduction in food availability (Santeramo and Lamonaca, 2021), but also a useless waste of natural resources and productive factors, with all that is in terms of environmental impacts on water, soil and emissions (Hodges, Buzby and Bennet, 2011).

It is to be also noted that the above mentioned issues don't just determine negative impacts on single aspects but, especially in Developing Countries, combine to slow down rural development processes, going to drastically increase rural poverty and inequalities (De Schutter, Jacobs and Clément, 2020) and, more generally, to further compromise the already compromised chances of achievement of the Agenda 2030 Sustainable Development Goals (Herrero, et al., 2021; United Nations, 2021).

By this such complex framework, results some elements of certainty, first of all the knowledge that, in order to overcome the aforementioned issues, a complete rethinking of the current development models is necessary, rather than acting on single variables (Calabrò and Vieri, 2014; Springmann, et al., 2018; Rockström, et al., 2020). For example, it appears evident that, the current results given, it is just not an option to rely only on increasing agricultural productivity in order to ensure food security worldwide (Benton and Bailey, 2019).

Moreover, there are no particular doubts about the fact that the efficiency of agricultural production processes must be increased, by reducing, for example, food losses and wastes (El Bilali, et al., 2019) and improving the level of food consumer education in order to gear their choices towards products with a lower environmental and health impact (Springmann, et al., 2018). In particular, the consumption of products of animal origin (Alsaffar, 2016; Ranganathan, et al., 2016; Clark, et al., 2020) should be reduced in order to relieve ecological footprint of global food system, especially in terms of land use, greenhouse gas emissions and water use.

2. Research Methodology

With the purpose to better highlight the relation between costs and -benefits of the performance of agro-industrial activities, reference has been made to the 2019 estimates of both the World Bank and Food and Land Use Coalition (FOLU), a community of Organizations that supports science-based solutions in delivering on the Sustainable Development Goals of Agenda 2030 and the Paris agreement on climate. In both cases, both costs items of the main environmental, economic, and social issues and the value of production attributable to the global food system have been estimated.

These data have been subdivided by impact categories (environmental, social and economic), in order to better represent the costs arising from the different issues with regards to the three dimensions of sustainability.

3. Results and discussion

By the analysis of considered data, two different non overlapping and non-integrable situations emerge, because the methodology used by the different sources for the calculation do not coincide, as shown by table 1, where the different estimated values per similar items on both cost items and production are reported.

Table no. 1. Hidden costs of global food system 8 (billion US$)

		World Bank (2019)	FOLU (2019)
A	**Costs for health care (social dimension)**	**4,050**	**6,600**
a.1	Denutrition	2,430	1,800
a.2	Overwieght and obesity	1,620	2,700
a.3	Pollution and antimicrobial resistances	not estimated	2,100
B	**Environmental costs (environmental dimension)**	**470**	**3,200**
b.1	Soil degradation due to poor agricultural practices	200	not estimate
b.2	Greenhouse gas emissions	270	1,500
b.3	Natural capital loss	not estimated	1,700
C	**Economic costs (economic dimension)**	**1,510**	**2,100**
c.1	Financial losses for land use and land chance	330	Not estimate
c.2	Economic losses from food insecurity	110	not estimate
c.3	Food loss and waste	1,070	1,300
c.4	Costs for rural welfare	not estimated	800
D	**Full costing estimates (A+B+C)**	**6,030**	**11,900**
E	**Market value of agro-industrial production**	**8,000**	**10,000**
F	**Total budget (E-F)**	**1,970**	**-1,900**

Source: our processing of World Bank (2019) e FOLU (2019) data.

In this regard, for example, it is considered that the value of the losses and wastes is estimated to be 1,070 billion dollars by the World Bank and to 1,300 billion dollars by the FOLU and the production value is estimated to be respectively 8,000 and 10,000 billion dollars.

This does not mean that the comparative analysis of the two studies brings out elements which allow important indication to be drawn regarding the current level of sustainability of global food system.

First of all, the substantial difference that seems to be between the cost-benefit balances resulting by the two studies (in positive of about 2,000 billion dollars for World Bank, in negative of 1,900 billion dollars for FOLU) is, actually, less marked than may seem.

A large part of the difference through the two balances (3,900 billion dollars) is, in fact, attributable to the following values: pollution and antimicrobial resistances costs (2,100 billion dollars) and natural capital loss (1,700 billion dollars) estimated by FOLU but not considered by World Bank; the different value of estimates of the greenhouse gases emission costs (1,500 billion dollars FOLU, 270 World Bank).

If we consider that, the description of the calculation methodology in the World Bank study expressly states that the costs are underestimated, because pollution and antimicrobial resistances costs could not be calculated but the global food system is, however, considered primarily responsible of greenhouse gas emissions, there are reasons to believe that the two studies have reached results much closer than it may seem from the observation of values attributable to single items.

Another important consideration is that according to both studies the most critical issue refers to malnutrition as major cost item and, therefore, the impact of this issue over mankind which, as should recalled, for about 40% (more than three billion people) is affected by this problem.

This is an extremely important aspect that, more than any other, denotes the level of unsustainability of the current global food system, as it highlights the failure respect to what should be its most important aim: ensuring food security to all the world population.

Similar considerations can be referred to the environmental issues that are the expression of the substantial inability of the current agri-food systems to operate efficiently to ensure the right compromise between economic needs and the necessity for natural resources conservation.

In recent decades, we had been able to benefit from an unprecedented availability of food and this is strongly reflected in the world population that from 1950 to today increased from 2,5 billion people to 7,8 billion people.

However, it cannot be ignored that this result has been achieved through an unprecedent exploitation of resources. It is legit to have doubt that the opulence of the last decades can constitute the condition for future growing difficulties. Indeed, there are worrying signs in this respect; first among all, the unbalanced cost-benefit ratio that, as mentioned, characterizes the present global food system.

With regards to the above, it is clear that the above-mentioned issues, are mainly due to efficiency problems closely related to the current structure of the agro-industrial sectors. We are referring, in particular, to the

fact that, in these sectors, the different upstream and downstream segments are dominated by players operating under an oligopoly. This is particularly marked in the production factors sector , especially in the field in which operates the three so-called multinational biotech, that control almost the entire of the seed and pesticide market in the world. These firms, more than others, have the power to guide and affect the activities of the whole system (Pavitt, 2001), given the close link between agri-food production and seed (Deconinck, 2019).

It is clear that in a system like the one just described, where production is guided by three multinational that control the market of the main production factor (seed) and where the other main sectors (raw material, distribution and trade) are conducted by just a handful of firms, only inefficient behaviours can occur. These behaviours are also caused by the lack of competition due to the presence of entities operating in oligopoly.

Given that such a structure would lead effectively to distortion, it is inevitable that, inefficiencies will come out from this, as well as costs that will pass on the most vulnerable member of society.

This mechanism is one of the plagues affecting humanity and, for what concerns agro-industrial systems, takes the place of costs which we have already said.

Conclusions

Given the importance for the continuation of human life and the relationship with natural resources and living organisms, the global food system has to work in a sustainable manner.

The unsustainability of this system so important for the existence of humankind happens when it is not possible to realize the right compromise among the economic objectives, human needs and characteristics of nature. And when this happens, mankind and nature pay the consequences for the imbalance of the system.

That is what is happening in global food system where costs attributable to the main critical issues of the system- such as malnutrition, food loss and waste, greenhouse gas emissions and its economic, environmental and social consequences- exceeded the production value.

The cause of such issues lies mainly in the structure of the current agro-industrial productive systems, that being controlled by few firms operating under oligopoly, in itself distorting competition, tends to generate inefficiencies whose costs are inevitably relieved on the most vulnerable member of the society. The possibility that, in the future, the global food system will continue to ensure food supply to humanity is not therefore linked to increase agricultural productivity but is tied rather to the ability to re-orientate in a more efficient way agro-industrial business in order to create the best possible compromise between the different human needs and the necessity to preserve natural resources without which it will no longer be possible to carry out development.

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ERP Systems – Technological and Social Innovation for Sustainable Business

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Abstract
The growing interest of managers in ensuring the sustainability of business has led to an increase in research on ERP systems that have quickly entered the market, mainly targeting the field of sustainability. This was determined by the massive increase in the current of digitalization of the activity carried out by organizations in order to reduce the waste of resources (electricity, paper, etc.), but also to cope with the changes in the sector in which these organizations operate.
The aim of the paper is to observe what is the possibility of an organization to become a sustainable business by implementing ERP systems. An analysis was performed based on the exhaustive research of the papers dealing with the topic of the article, gathering relevant information from selected articles in specialized journals. The work adds value to the literature, combining novelty concepts with concepts found in the works of other authors.
Following the research, the author concluded that ERP systems can ensure the sustainability of a business, due to the many advantages that these systems offer, especially from the point of view of digitalizing the activity. However, the role of this article is to provide an overview of how ERP systems work, mainly used in various fields, focusing in general on the main advantages and disadvantages of using them.

Keywords

ERP systems, innovation, sustainability, business, implementation

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Introduction

Information technologies are constantly evolving, they have a major impact on the development of industry and professions, by automating the main activities carried out bringing added value to organizations. Thus, the concept of digitalization was seen as an opportunity to support the professional and technological progress of organizations, which became able to reduce the inefficient consumption of resources and became sustainable business in a relatively short time.

In order to materialize the concept of digitization, there has been a significant increase in the number of organizations implementing ERP systems, because these systems can be adapted to the needs of an organization depending on the specifics of its activity, allowing management of all components of a business in the only database. Fotache et al. (2013) says that integrated ERP systems can ensure "connectivity and communication between the flows of economic functional processes". The purpose of this system is to eliminate as much as possible the manual management of information flows, allowing the storage and provision of data from a single database. Given that all information is stored in a single database and can be generated directly from the ERP system, this reduces the consumption of paper used to print and transfer information from one department to another.

Almost all organizations in the European Union have the obligation to develop their business sustainably in order to obtain the necessary funding to carry out certain categories of activities (Dona, 2020).

According to Bradford (2014, p.2), ERP systems are process-centered systems, providing a "clear, real, logical and complex view" of the organization's business processes.

This article has the following structure: a section on literature review presenting the most important concepts of the paper, presenting how to collect the information needed to "build" this article and concluding with a brief presentation of the results identified in the selected articles and conclusions.

1. Review of the scientific literature

The process of developing ERP systems began with the need to automate the main activities of data processing and input (Rîndașu, 2018), but also to develop sustainably in a short time. According to Srivardhana and Pawlowski (2007), the implementation of ERP systems "provides new opportunities by developing different common cognitive structures for employees in different functional areas", giving the organization the opportunity to develop efficient innovative processes. Chofreh et al. (2020) considers that ERP systems contain essential components that help the sustainable development of a business.

However, to understand this, sustainability is defined in the literature as a concept and process "of enforcing environmental, economic and social transformation towards a better quality of life" (Scheidel et al, 2018).

As a result of this growing trend towards the concept of sustainability, many organizations have begun to incorporate the concept into internal policies and operations, strategy, business relationships with business partners and other business areas (Chofreh, Goni and Klemes, 2016).

However, the process of sustainable development is quite difficult because the requirements are very high. The main goal of sustainability is to create new opportunities using innovation. Thus, organizations that develop sustainable businesses can benefit from various advantages (reduction of costs for the acquisition of new programs). A sustainable business model can be developed when organizations recognize the importance of moral and ethical values and integrate corporate social responsibility aspects into the business model (Fiorentino et al., 2020).

Evans, Rana and Short (2014) observed that the sustainable development of the business environment can be characterized by 5 components:

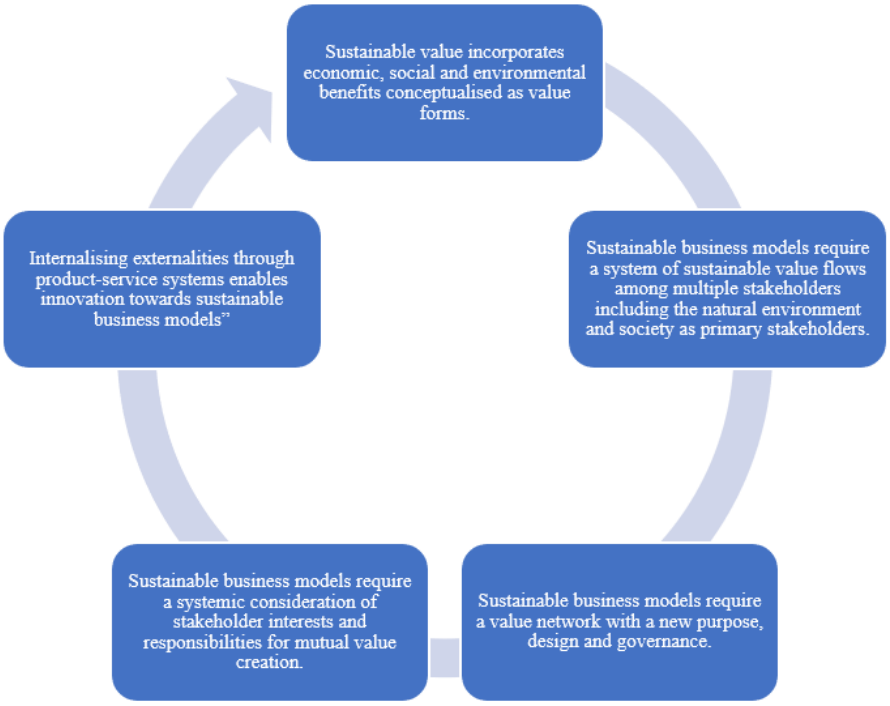


Figure no. 1. Sustainable development of the business environmental
Source: Adaptation after Evans, Rana and Short, 2014

Other reasons to become a sustainable business, identified by the authors Geissdoerfer, Vladimirova and Evans (2018) and Evans, Rana and Short (2014) were:

- increase productivity
- reducing inefficient resource consumption

- more prompt decisions due to the use of ERP systems
- much more organized activities, due to the modules contained in ERP systems
- reducing the working time on a certain activity
- numerous financial benefits

In the next section, the author presents the research methodology based on the review of the articles dealing with this topic.

2. Research methodology

The paper was based on exhaustive research of the papers dealing with the topic of the article, gathering relevant information from selected articles in specialized journals. Articles were selected from Web of Science, Google Scholar, Elsevier, and other databases, based on keywords such as: "ERP systems", "innovation", "sustainability", "business process" and "sustainable business".

In order to structure the results obtained from the selected articles, the author structured some research questions:

Q_1: Which is the role of ERP systems in adopting a sustainable business process?

Q_2: Which are the technological and social innovations to develop a sustainable business?

Q_3: Which are the advantages of developing a sustainable business using ERP systems?

Q_4: Which is the importance of business sustainability?

3. Results and discussion

In this section, the author structured the main information found in the selected articles from the databases. At the first question, *"Which is the role of ERP systems in adopting a sustainable business process?"*, the author found that ERP systems contain a series of modules that are essential in the activity of an organization. Implementing an ERP system "takes a lot of time and money" (Chofreh et al., 2020), but also a fairly rigorous planning of activities to avoid failure.

The role of ERP systems is to help employees and managers to manage and monitor the organization's resources, integrating all internal and external information. Many ERP systems (such as Microsoft Dynamics AX, Sustainability Performance Management 4.0 from SAP), contain an environmental sustainability dashboard that provides the organization with monitoring, evaluation and reporting of sustainable performance ensuring a sustainable business process, considerably reducing the harmful / negative effects of the business on the environment (Chofreh et al., 2020).

At the second question, *"Which are the technological and social innovations to develop a sustainable business?",* the author identified the definition of business process innovation as a "performing work activities in a radically new way to attain visible and dramatic results to meet the business objectives" (Davenport, 1993).

According to Anand et al. (2013), an organization can survive in the market only if it uses innovative technologies in order to reduce the side effects of the activity, but also to increase the performance of the organization. Using innovative technologies, organizations expect to increase performance, reduce costs in the shortest possible time, reduce costs and time on activities and have better control over the business. Thus, the process of innovating the business so that it becomes sustainable can be presented as the alignment of IT resources to the strategic objectives of the organization. IT resources must have components that consume as few resources as possible (electricity, paper) and that allow the organization to carry out its activities with maximum efficiency.

A sustainable business involves the application of innovative solutions that create immunity relative to the risks of the industry in which it operates, or of the business environment as a whole.

At the third question, *"Which are the advantages of developing a sustainable business using ERP systems?"*, Microsoft (2018) said there are 5 benefits to ERP systems for an organization to become a sustainable business and this are presented at figure no. 2:

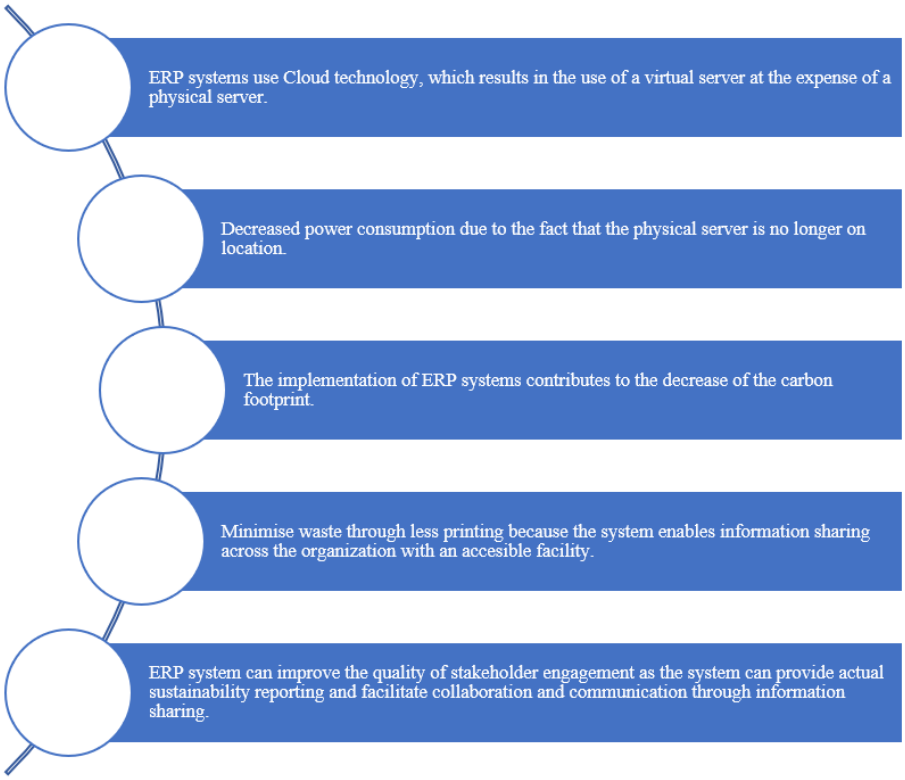


Figure no. 2. Five benefits to ERP systems for an organization to become a sustainable business
Source: Microsoft, 2018

At the fourth questions, *"Which is the importance of business sustainability?"*, the author found that integrating sustainability into business processes can be a challenge for many organizations because it has an effect on decision-making at all levels of management (see figure no 3).



Figure no. 3. Decisional paradigm
Source: Chofreh, Goni and Klemes, 2018

The decision-making process has an important effect in achieving the sustainability objectives, because the problems that the activities carried out on the environment could cause must be identified as correctly as possible.

According to Chladek (2019), the concept of sustainable business development presupposes that the business has a positive impact on one or more areas, mainly contributing to building a beneficial effect on the environment.

The main benefits of business sustainability are:

- Brand protection - organizations that invest money in high-performance equipment that reduce harmful effects on the environment have a better reputation.
- Competitive advantages - a sustainable organization more easily attracts new talent, new customers, new investors, because their activities have a positive effect on society.
- Market growth by producing sustainable products / services
- Reduce costs - the implementation of innovative systems that optimize an organization's business leads to lower costs (Tiuttu, 2021)
- Transparency improves sustainability practices

Geissdoerfer, Vladimirova and Evans (2018), define sustainable business model "as business models that incorporate pro-active multi-stakeholder modifications have accounted for the multi-stakeholder nature of sustainable business model in two of the elements the focus on customer and monetary value of the value capture element endured ".

An organization should have a sustainable vision, so that resources are used as efficiently as possible by implementing the best possible IT solutions (e.g. ERP systems) in order to incorporate the entire activity with the help of these systems. The role of this sustainable vision is to minimize the effects of your organization's impact on the community or the environment.

According to Austral.ro (2021), 62% of managers consider that a sustainability strategy is necessary to differentiate from the competition. Concern for the environment and society will add value to the marketing strategies of organizations that are sustainable business.

According to EcoSynergy.ro (2021), the sustainability of a business can be represented by the economic sustainability (it can be represented by projects and plans without endangering the resources it has) and the financial sustainability (attracting funds by using innovative collection methods of waste).

At the level of an organization, the strategic objectives should take into account 3 major areas presented in figure no. 4:

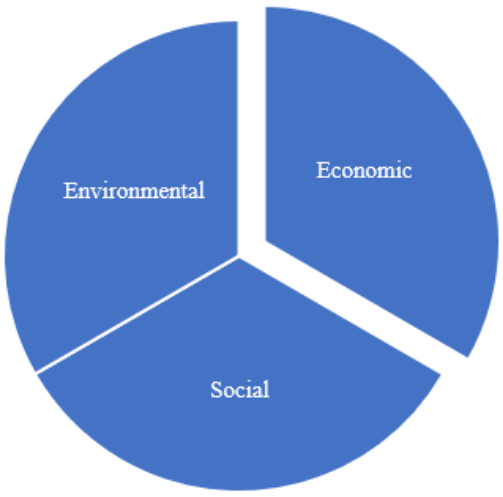


Figure no. 4. Areas of interest
Source: Author's creation

The economic component considers the impact of the organization on the economic well-being of stakeholders and on the local, national and global system.

The environmental component considers the impact of the organization's activity on the natural systems (water, air, land).

The social component reflects the organization's attitude towards its employees, suppliers, contractors and customers.

Conclusions

The paper aimed to review the literature in order to highlight how ERP systems can provide the organization the opportunity to develop sustainably. Following the analysis, the integration of ERP systems aims to increase efficiency and flexibility, contributing in particular to increasing the performance of the organization. Business process innovation has a fairly high impact on the decision-making process, but also on business continuity.

The correct use of ERP systems will ensure maximum efficiency in the activity carried out by the organization.

However, the organization must take care of environmental economic changes and social performance when they want to become a sustainable business.

For an organization to be successful in implementing its activities, the sustainability strategy must be analyzed in the business strategy and everything should be carried out according to the established plan before starting the process of implementing ERP systems. This will reduce the possibility of failure to implement the ERP system (Chofreh et al., 2020).

It can be said that ERP systems help the organization to share activities and processes between departments and to effectively improve the production process and sustainability.

Thus, ERP systems can provide support in the process of evaluating sustainability performance, reducing inefficient resource consumption, increasing efficiency and reducing carbon emissions by 40% (Tsai, 2019).

Analyzing the selected articles, the author concluded that the implementation and use of ERP systems has a positive impact on the development of a sustainable business, as they significantly reduce the overuse of the organization's resources (reduce electricity consumption due to the fact that the server is no longer in location of the organization).

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The Role of the Dobrogea Local Action Group in Increasing the Quality of Tourist Services in the Region

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Abstract

This article highlights the contribution of Local Action Groups in supporting the economic and tourism development of a locality or region, with reference to the possibilities through which tourism, as an economic activity, can revitalize a local community or a region, providing solutions to stakeholders. increasing the quality of life.
The aim of this paper is to present the natural and anthropic tourism potential of Dobrogea, but also to find solutions for the development, protection, protection and sustainable use of Dobrogea through the Local Action Group, starting from tourist resources and ending with tourism as a branch. of the national economy. The fundamental arguments of this approach are provided by the large number of existing protected areas in the Dobrogea area, where the maintenance of cultural traditions offers the possibility of a better use of local resources. It is considered that the implications of tourism highlight its economic importance by the fact that it is a means of diversifying economic structures, capitalizing on resources, creating new jobs, and last but not least stimulating investment.

Keywords

Local Action Group, tourism, Dobrogea, sustainable capitalization

DOI: 10.24818/BASIQ/2022/08/060

Introduction

The paper has three main objectives which are set out below:

- identification, centralization and description of tourist resources in Dobrogea;
- appreciating the degree of conservation of the tourist potential and identifying the main problems related to anthropogenic aggression;
- finding solutions for the sustainable capitalization of the tourist potential of Dobrogea, at the level of Dobrogea Center, through the Local Action Groups, which are set up in order to access European funds for the development of rural tourism in the region.

At the level of the Dobrogea region, the main forms of tourism are: coastal tourism - a form of tourism already established for which there is an appreciable tourist potential, recreational and leisure tourism - a form of tourism that has a direct link with coastal tourism in terms of relaxation and work capacity restoration, cultural tourism - historical, based on the multitude of resources and sports tourism - a form of tourism suitable and practicable (Hu and Shen, 2021).

Coastal tourism has seen a continuous increase in all states that have such a tourist potential. In the contemporary period, coastal tourism is a very strong attraction. Regarding the infrastructure, until 1930 there were only certain constructions with temporary function which will then constitute the nucleus of some tourist complexes and further of some famous coastal tourist resorts.

1. Review of the scientific literature

At the territorial level, several actors can play an important and decisive role at regional or local level (professional actors, institutions, tourists and the population of the receiving area), if they look together at the effectiveness of a productive tourism system.

The productive system of tourism works by involving different actors. The analysis of the functioning and relationships, the mobilization and communication of these actors within this system seems interesting and relevant for our study territory, indeed we are led to question the identity of each actor and then the identity of the space. Since each actor is tempted to define the place according to different objectives (image and promotion of the territory, mobilization, etc.), it will be interesting to analyze the skills of each actor.

However, empirical research on this topic in developing countries such as Romania is exceptional. More relevant studies, focusing on the actor system, appear in the scientific literature of developed countries (Koba, 2020). Other researchers have studied the key role of actors, especially in countries where tourism is strengthened.

In the actors' system, within the Doborgea Center LAG, the geographical proximity has a well-established interest: each actor pursues his own interest depending on his strategic skills, their relationship with the territory.

We can ask ourselves about the organization and structuring of this productive tourism system, but then the problem of collaboration between actors becomes essential. The system of stakeholders greatly influences the success of tourism development. This system is dominated by public and private actors: the system of institutional actors is organized within the state and other public administrations. These are distributed at different levels such as: national level, departmental level, local level and municipal level, and the private sphere includes mainly companies involved in the production of a large part of the services in the tourism economy. In addition, an important actor is the tourist himself who has the power to create the tourist space.

In the territory, intermediation is carried out by incoming agencies, but public and semi-public bodies responsible for tourism and consular chambers have a role to play. It should be noted that the intermediation is also carried out by the inhabitants, who interact with the tourists, inform them, welcome them, etc. The involvement of actors in the local development process must also mobilize appropriate means by opting for the principles of good governance (participation, cooperation, evaluation, transparency, accountability). Among the radical elements of this governance, actors must be responsible for the exercise of their functions related to knowledge, action or recognition. We believe that it seems necessary to move forward in the tools and methods of decision-making or strategy. This chapter is dedicated to presenting the theory of our study.

2. Research methodology

The work is a combination of geography, history, tourism, marketing. In writing this paper we have used several working methods that we will briefly present in this introduction. Observation - was used to perceive the most valuable natural and anthropic aspects, but also to study the bibliographic materials, maps and images that were useful in our work. Working with the map - was one of the indispensable methods extremely useful in working on this topic. Numerous maps of the study area were analyzed. Some of these maps will be included, in the form of images and in the text of the paper. Problematization - involves raising the issues that have arisen during the research, identifying their causes and discovering ways to solve these slippages. It's a research method. Problematization involves several sequences: the perception of the difficulty, its detection and definition, the suggestion of possible solutions, the drawing of conclusions from the probable solution, the performance of observations and experiments that verify the probable solution. Synthesizing information - is a very important method, given that there are many sources of information (selective bibliography, specialized maps, internet, images) is very useful and necessary in equal measure. Comparison - will be used to analyze elements from several bibliographic sources. It is used to discover certain inaccuracies, but also to find out more opinions about a certain phenomenon, about the history of a tourist attraction or about certain historical events.

3. Results and discussion

In 2021, a questionnaire was implemented that targeted a number of 1,500 tourists, which showed that more than half of the tourists visiting Dobrogea are under 34, most of the tourists come from urban areas. One of the main objectives is to establish a strategy to attract as diverse categories of tourists as possible (Ielenicz and Sandulache, 2018).

Among the directions of action and development of tourism in Dobrogea by the local action group are also targeted as vectors of the strategy: tourist equipment, urban experiences, marketing, cultural events. The following forms of tourism are proposed for development: seaside, spa, business, cultural events, city break, culinary.

3.1. Tourism demand analysis

The analysis of the tourist demand will analyze elements related to indicators such as the capacity of tourist accommodation in operation, the number of tourist arrivals including by types of tourists (Romanians, foreigners-by state), the number of tourist arrivals by types of accommodation units, the number of tourist overnight stays and the evolution of the index of net capacity utilization in operation, including by types of accommodation units. The analysis will be performed for the time interval between 2015-2021, and the data were taken with the help of the National Institute of Statistics. Table no. 1. and figure no. 1 insert data on the number of tourist arrivals.

Table no. 1. Number of tourist arrivals, Dobrogea, 2015-2021

The year	Number of tourist arrivals
2015	844 802
2016	953 008
2017	859 634
2018	883 947
2019	1,021,475
2020	1 162 958
2021	1 235 542

Source: tempo-online, INSSE

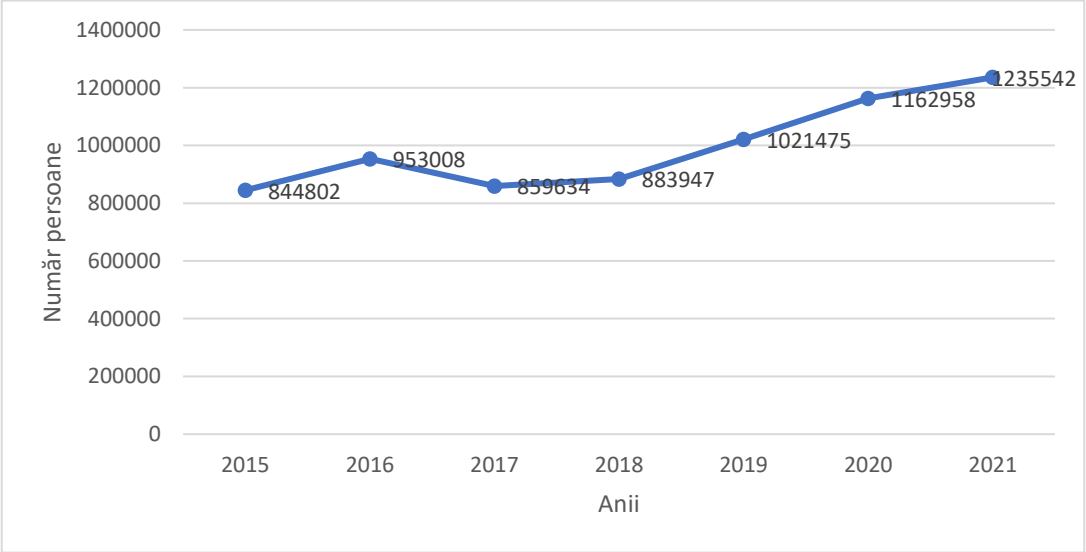


Figure no. 1. Number of tourist arrivals, Dobrogea, 2015-2021

Source: tempo-online, INSSE

The analysis of the data on the number of tourist arrivals in Dobrogea, 2015-2021 shows a general evolution of growth, even if initially the evolution was oscillating mainly due to the consequences of the economic crisis, with the year 2017, when a number of approximately 860,000 people, the evolution has been constantly increasing, reaching to accelerate from approximately 884,000 tourist arrivals to approximately 1,163,000 arrivals (year 2020), and the growth will continue in 2021, exceeding 1,235,000 tourist arrivals. This was possible due to the adoption of a strategy to attract tourists to the Romanian coast, a strategy that had a partial positive effect.

Among the reasons why Romanian tourists have gradually started to choose the Romanian coast are: security issues in other states recognized as countries for coastal tourism (the problem of terrorism in countries like France or Spain or North Africa) or conflicts armies near the borders of some states, such as Turkey or Israel, which is why a certain share of Romanian tourists began to prefer the Romanian coast.

3.2. Strategies for the development of tourism products sold in Dobrogea

Dobrogea, from a tourist point of view, has many tourist motivations, of which we mention: rest, sports leisure, complex spa treatment. Dobrogea's tourist vocation is equally conferred by its geographical location and the cultural-historical profile of the region (Pike, 2005).

Another important feature is the combination of old and new, between tradition and modernity. This complementarity gives the city an extra charm and creates the opportunity for tourists to know and understand the history and tradition of the places they visit.

Actions that contribute to the development of accommodation units in rural areas, in order to promote rural tourism, as a result of the implementation of projects on European funds of the Local Action Groups in Dobrogea Center:

- construction, renovation and aestheticization of the facades of all tourist units in rural areas, for sustainable tourism;
- installation of new road signs and tourist signs; In order to facilitate the access of tourists to the accommodation in rural areas, signposts have been placed next to the hotels in the resort; the panels are made in identical graphic dimensions and conditions;
- arranging 8 playgrounds for children, located between hotels;
- the realization of a modern and efficient irrigation system with the help of which the green spaces of the resort and the lawn surfaces around the hotels were invigorated; the irrigation system consists of 3 parallel networks: 2 spread on the Promenade and one on the shore of Lake Mamaia. The total length of the main pipe is 19,000 ml, the irrigation being done with the help of 311 sprinklers;
- increasing the accommodation capacity where this is required and diversifying the tourist services specific to rural tourism;
- modernization of accommodation units under 3 stars as a comfort category;
- hiring and training staff in the field of tourism;
- equip the hotels with modern swimming pools and restaurants serving a wide range of cuisine.

All these public investments in the area were both the hypothesis and the necessary support for private investments. Thus, in the last four years, in Dobrogea Centru, a whole series of private investments have been completed, having as a benchmark either the modernization of the accommodation capacity and the improvement of the related range of services, or the increase of the perimeter attractiveness by establishing new tourist interest objectives. . Thus, from private sources, three new 5-star hotels were built, and other hotel units significantly improved both the tourist classification and the quality of services offered to tourists (Hyde, 2008).

The governance of local tourism through LAGs in the Dobrogea region refers to actors, their relationships, structures and coordination processes. Several coordination and collaboration issues are particularly central to this governance: between public and private actors, professional or institutional.

The concept of "stakeholder" was integrated into the English-language scientific world by Freeman in 1984 through "Actor Theory", which states that "any group or individual that may affect or may be affected by the achievement of the organisation's objectives". "should be considered an actor.

This theory was originally developed for use in business management. Therefore, the actors were identified by belonging to a group or organization, such as employees, traders, competitors and shareholders. However, Sautter, Leisen (1999) contributed to the translation of its use in the field of tourism. The concept of actor is increasingly considered in the social sciences, especially in geography, as it is increasingly considered a "major object" of territorial construction.

Within the Central Dobrogea LAG, the actors carry out individual actions in which they interact with other actors, but also collective actions with actors within a group (semi-organized or organized) with which they share common characteristics. Actors are all definable and distinguished entities that participate in the

dynamics and organization of a collective and / or individual action, which is active in a social process, which performs acts.

The actors are those who, through their involvement and action, contribute to the development of a certain sector, at the level of the Dobrogea region. These actors within the physical or legal LAGs can be public (state, local authorities, joint unions), private (consumers, producers, residents) or mixed. The main actors of the geographical space are: the individual, the group, the company, the local community and the state.

The concept of actor allows him to understand the qualities and abilities of a human being as he develops his intentions, strategies and discourses with a direction on these actions. The authors distinguish from the point of view of tourist objectives three types of actors:

- "Local actors", actors who develop a strategy without questioning where they are;
- “Local actors”, actors who use the character of a place to create their outward-looking strategy;
- "Actors-place", whose strategy is created and organized internally related to the place.

At the level of the Dobrogea Centru region, the collaboration of stakeholders is a widely accepted approach to solving problems related to lack of understanding. And the sharing of common goals between these many stakeholders operating in different territories.

In this region, private actors (hosts) have their own strategy of attracting tourists to their homes, while some professional actors are already destined to attract them there. They do not collaborate, caught in this competition of the tourist market. Tourists travel for various reasons, more or less influenced by actors (Santos et al., 2022).

In the scientific literature there are studies to identify the actors, their strategies, their management plan and the constraints of collaboration for the development of the tourist destination (Mandić et al., 2020). Thanks to European funds, at the level of the Dobrogea Center region, more public, private entities, NGOs and individuals are collaborating to develop the area from a tourist, economic and social point of view.

The effort of these entities contributes to strategies on three levels: attraction, integration and management, in terms of developing the tourism potential. The aim of this study is to contribute to the knowledge base for understanding how stakeholders can be more involved in achieving sustainable tourism.

Some of the common features of community tourism destinations suggest that collaboration, as a dynamic, process-oriented strategy, may be appropriate for the management of local development areas. In addition to facilitating public-private interactions, collaboration can provide an effective mechanism for community participation in tourism planning by selecting key stakeholders to represent diverse public interests.

The communication sets out a set of messages issued by government institutions at various levels, especially those of cities, to be staged, to give a favorable image to the outside world. The competitive promotion of the site in question is a reason for this communication. Territorial communication through the LAG is achieved through the advertising image of places, promotional materials, events, in a competitive approach to the place where the territory is at the center of this marketing (Farmaki and Pappas, 2021).

It is also a set of messages issued by government institutions, public actors: town halls, regional and general councils, and its formatting is done by communication professionals to give the image of a territory. In this type of communication, local public actors engage with private actors to adopt a management logic to manage the territory.

Tourism is a system of actors, practices and places, whose purpose is to allow individuals to travel for recreation outside their usual places of life, to go and live temporarily in other places. Tourism involves three combined systems, a system of spaces, a system of actors and a system of images.

Development is perceived as a relationship of interaction between local or often regional institutional policies and entrepreneurs taking initiatives in the social and local fabric. Behind this development, we see a "tourism productive system", which works differently depending on the territory. This development is seen as an approach to local development due to the action of determined actors who will "invent" or "reinvent" a place in their territory.

All actors participate in this local development, whether they are political actors or local actors who are committed to implementing a strategy in this direction. In this context, the local term covers, from a social point of view, endogenous actors and “transition actors” (Soteriades, 2012).

The local development at the level of Dobrogea Centru, considers the policies aimed at reducing the role of the state, the relocation of decisions, giving more importance to the initiatives of local actors, resources

and values of the territory. Local development must be taken into account for the future of a territory, in order to make it evolve.

3.3. Proposals for the development and diversification of the tourist offer

Due to the special importance of tourism promotion, it must be done very carefully and especially, there must be a well-developed strategy. It should be borne in mind that before starting a tourism promotion campaign, it is necessary that the tourist resources be protected and arranged for visiting, the access roads to the resorts of Venus, Neptune and Olympus should be modernized as well as those to the main tourist attractions. of the locality (Minciu, 2019).

For all these resorts, the tourist image created both in the country and abroad is very important. From this point of view, making a logo can be the first step. The participation of the representatives of the resort in the domestic tourism fairs is more than a necessity, it is a condition for creating a favorable image but also for attracting a larger number of tourists.

The promotional activities in tourism, as in all economic activities, have as main purpose, attracting new customers as well as retaining existing ones, their loyalty. As such, it addresses the general public, potential customers but also specific targets. In other words, the activity of promoting the tourist product is a specific form of communication, it considers the transmission of messages through different communication channels, information through which tourism operators and potential tourists are informed about the characteristics of the tourist product and its components. (Seakhoa-King, Augustyn, and Mason, 2020).

Very importantly, tourism promotion has the following objectives in mind: customer loyalty, attracting customers to other tourist areas, transforming non-consumers of tourism services into potential and then actual consumers, awareness of the service-tourism product. informing about special services offered to the consumer, creating and improving the image of the tourist destination, advertising for special offers, expanding distribution channels, removing an aggressive attitude and forming a favorable image about a tourist destination, attracting new market segments.

Also, it is possible to create tourist programs for domestic tourism, which will capitalize on lesser known tourist objectives, and through this their value will gradually increase but also tourist programs for international tourism to highlight the strengths of the resorts. Neptune and Olympus, I mean water sports, practically everything that means tourist leisure, including motorized rides that will enhance the tourist trails in the Comorova Forest or along the coast, certain endurance trails and special landscapes.

In addition to the realization of such tourist programs that highlight the tourist objectives of the locality, other requirements are added for a proper capitalization of the tourist potential:

- *modernization of general and tourist infrastructure:*as the main lever in facilitating access to the main points of tourist interest; it is necessary to modernize the transports and the technical-municipal endowments;

- *expanding the range of tourist offers*in order to reduce the tourist seasonality, this can be achieved by developing complementary tourist services;

- *the practice of differential tariffs*at the beginning and end of the tourist season;

- *developing the strategy of multiple attraction for other types of tourism*, apart from the one for coastal tourism, already consecrated in Neptune-Olympus, it is about business tourism, meeting tourism, periodic or occasional festivals, events specific to the seasons or some historical events; this will lead in time to the diversification of tourist activities;

- *creation of animation centers*organized by professionals in the field;

- *launching in international tourism, for coastal tourism*through an efficient external promotion of the resort of the tourist potential in this respect.

If until now, the diversification, development and modernization of the tourist offer and services within a locality with tourist potential was achieved by highlighting products unique or of great tourist value, gradually move to capitalizing on tourism and highlighting the latent tourism potential and practicing some types and forms of relief.

The development and modernization of the tourist offer are related and depend both on the international effort, on the need to adapt to the current requirements in domestic and international tourism, with an increase in demand for superior quality services, but also on the structure and quality of the existing base.

On the basis of current tourism, efficient tourism can be developed only if it is adapted to the current requirements of international tourism (Fayos-Solà and Alvarez, 2014).

The resorts can be developed from a tourist point of view by implementing local programs or by interconnecting the resort within domestic and international tourist circuits. Equally, the emphasis can be on the development of specific coastal tourism, the modernization of the infrastructure specific to this type of tourism, the corresponding tourist promotion. However, it is a mistake for Neptune and Olympus to focus only on summer tourism and the resort's tourist offer needs to be diversified so as to include other types and forms of tourism (business tourism, meeting tourism). It is necessary to diversify the accommodation base. For a resort of this type, the existence of a few accommodation units in accordance with international tourist standards for coastal tourism is an inappropriate fact.

The enhancement of the tourist objectives must be done in parallel with a good organization of the tourist activity that involves better services, modernization roads, sources of information about certain tourist resources with information that can be interesting, general so that it becomes interesting for tourists. The tourist development also implies an economic development of the locality, so that the increase of the living standard becomes palpable. Resource protection, sustainable development of the resort is a necessity for local development (Lewis and Jönsson, 2016).

Conclusions

Regarding Dobrogea, the priority issue is to solve all the infrastructure problems in road and rail transport in order to increase the traffic safety of tourists and easier access to the coast (stopping all repairs and maintenance during the summer season, the introduction of speed trains, car transport from CFR Constanţa Railway Station to the south of the coast to be done through resorts, etc.).

It is absolutely necessary for the southern coast to have access to European funds for the construction of attractions, sports facilities, sporting events, for the rehabilitation of historical monuments and the organization of domestic and international competitions, increasing the number of events, shows every weekend.

The main objectives for the development of the region can be mentioned:

- the Dobrogea region will become the most important tourist landmark in the region by consolidating its leading position in the summer tourism segment, but also by developing business, cruise and itinerary tourism;
- developing a cultural and regional identity;
- ensuring favorable conditions for private initiatives that aim, directly or indirectly, at capitalizing on the cultural and historical heritage of the area, especially in the field of tourism;
- every effort will be made to place the Constanta Metropolitan Area on the transit route of oil and other natural resources from the Sea and the Caucasus;
- this area, which is extremely interesting in terms of its natural resources, will be extremely exploited in the near future, which will require the determination of a route for the transfer of resources to Central and Western Europe;
- the inclusion of Constanţa on this route will facilitate the development of the port economy and will increase the strategic importance of our city and the metropolitan area on the map of the extended region, with beneficial effects both in terms of long-term investments.medium and long, as well as in terms of ensuring high security and stability in this area;
- creating the premises for increasing the attractiveness of the area for foreign investors;
- in the short and medium term, by virtue of a real financial and administrative decentralization and in accordance with the recommendations and directives of the European Union in this field, all necessary steps will be taken to transfer to the local public authorities the Commercial Port of Constanta and coastal beaches.

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ESG – A New Global Trend. Examples for Austria, Poland, and Romania

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Abstract
Purpose/objectives: Corporate social responsibility (CSR) concept gained importance on the business market some years ago. Nevertheless, years later, this proved to be of insufficient value, thus its replacement by the broader concept called ESG (i.e. environmental, social and corporate governance) is currently observed. Non-financial reporting is considered fundamental for managing the transition to a sustainable global economy by combining long-term profitability with environmental protection and social justice. The aim of the article is to present the state of implementation of the ESG strategy in selected EU countries: Austria, Poland, and Romania.
Design/methodology: The material was prepared on the basis of a critical review of the available literature sources.
Findings: Austria is a leader in ESG performance. Polish Listed Companies made progress. Romanian companies have made great progress in ESG performance.
Originality/value: ESG is now an important factor considered when making business decisions in growing number of companies around the world. Investors prefer choosing companies that incorporate in their activity the ESG related values. Both public and private investments should be stimulated with the overarching goals of ESG to enable the EU transition to a climate-neutral, green, competitive, and inclusive economy.
Possible practical implications: The EU taxonomy established the ESG classification system, a list of environmentally sustainable economic activities, which should help companies, investors, and policymakers in making informed decisions regarding which economic activities to invest in.

Keywords

ESG strategy, results of ESG Austria, results of ESG Poland, results of ESG Romania

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Introduction

Corporate social responsibility (CSR) is a concept that was gaining importance among many companies some years ago (Lin-Hi and Blumberg, 2018). It promotes the principles of sustainable development in the business environment. Nevertheless, due to growing environmental challenges, like for instance the climate crisis, CSR proved not to be effective enough (Landi et al., 2022). It was also observed that some enterprises, instead of making real use of its potential to stimulate a transition towards a more sustainable business, used CSR as a pure strategy to improve the company's image among their clients and potential investors (PwC, 2021). To this end, not only stand-alone positions were created in companies, but also entire CSR departments were set up to work in this direction. An ISO standard, ISO 26000:2010 Guidance on social responsibility, was even developed and reviewed in 2021.

Years later, this development proved to be insufficient, so nowadays a broader term called ESG is gaining importance (Landi et al., 2022). Environmental, social and corporate governance are the new criteria, which stand for a range of aspects that modern businesses should pay attention to. This development is vital not only from the point of view of customers, who put more and more attention to sustainable choices in their

purchase decisions, but also about investors for whom the values of sustainable development play an increasingly important role. ESG is currently considered an important factor taken into account when making business decisions in many companies around the world and helps investors choosing companies and undertakings that reflect their value system in business activities (Yu and Luu, 2021; Zumente and Lace, 2021; PwC, 2021).

The aim of the article is to present the state of implementation of the ESG strategy in selected EU countries: Austria, Poland and Romania.

1. ESG - Environmental, social and corporate governance

Responsible investing, which involves integrating environmental, social and corporate governance factors into investment policies and business decisions, is one of the prevailing trends in the current financial world (Zumente and Lace, 2021). Investors in different parts of the world seek to integrate ESG into traditional financial analyses recognizing that this approach enables better business results (Przychodzen et al., 2016). In order to gain more transparency regarding social and environmental performance of large entities, accounting rules needed to be changed.

In September 2014 the EU adopted the European Commission's (EC) Directive on the disclosure of non-financial and diversity information by certain large companies and groups, the so-called NFID – Non-Financial Information Directive (European Parliament, 2014). The Directive sets the requirement of disclosing information on the way certain large enterprises operate and manage social and environmental challenges. In this way investors, consumers, policy makers and other relevant parties can be informed on the non-financial performance of large companies. The overall objective is to foster businesses transition towards more responsible management models.

The incorporation of the ESG into the functioning of businesses fits well with the general recent developments in the EU. The European green deal (2019), presented by the EC in December 2019 together with the EU's international commitments regarding the climate and other sustainability objectives (like for instance the UN Sustainable Development goals) raised attention to sustainable finance and the role it can play in delivering the related policy targets (EC, 2022). As a consequence, in January 2020, the "European green deal investment plan" in the volume of one trillion Euro was presented, with the aim to promote and support an increase in sustainable investments in the EU in the coming years. Both public and private investments should be stimulated with the overarching goal to enable the EU transition to a climate-neutral, green, competitive and inclusive economy (EC, 2020a). In July 2021, in order to support this transition, the Commission adopted the "Strategy for financing the transition to a sustainable economy", which contains a comprehensive set of measures aimed at directing the flow of financial resources towards financing the necessary actions and investments (EC, 2021). Last but not least, the EU taxonomy established a classification system listing environmentally sustainable economic activities, which should inform companies, investors and policymakers' decisions regarding economic activities worth investing in (Taxonomy Regulation, 2020).

2. Non-Financial Information Directive, ESG and their impact on enterprises

The NFID Directive (European Parliament, 2014) requests from the large public-interest entities (i.e. employing more than 500 employees) a description of the policies implemented by them to accomplish the environmental, social, employee and corporate goals. The results achieved as well as the associated risks should be explained, together with contingency measures taken. The issues covered encompass e.g. the obligation to report or disclose non-financial data relating to CSR and the diversity policy, e.g. the composition of boards. In this way an organization documents its respective strategy, management practices, achieved performance, as well as outlook into future plans, and how all these contribute to value creation in the short, medium and long term.

The non-financial reporting covers detailed information on the current and expected impacts of the entity's activities on the environment, health and safety. It encompasses further aspects such as the use of renewable or non-renewable energy sources, greenhouse gas emissions, consumption of water or air pollution. In the sphere of social and labour affairs, activities are undertaken to ensure for instance gender equality, working conditions, or the basic workers' rights. The NFID Directive defines the required „reporting elements".

The EU regulation on sustainability-related disclosures in the financial services sector (SFDR Regulation, 2019), which entered into force on January 1, 2022, obliges the financial institutions to report the

composition of their portfolios against the ESG indicators. It requires reporting of twice as many indicators: 64 instead of the existing 32, as it was requested by the NFID directive. The EU guideline includes 18 mandatory indicators and 46 additional indicators.

When reporting, companies decide between a national, a European or an international reporting framework. Currently the most popular non-financial reporting guidelines are the so-called GRI (Global Reporting Initiative). Other guidelines of relevance are for instance the UN Global Compact, the ISO 26000 Standard. Sroka (2014) provides a comparison of specific elements of these three guidelines.

Non-financial reporting and ESG are considered fundamental to foster the transition to a sustainable global economy as they combine long-term profitability with environmental protection and social justice (Landi et al., 2022). Whether or not companies decide to incorporate it into their business model may influence, i.e. increase or decrease their chances on the investment' market. On the other hand, management strategies neglecting the ESG may decrease confidence in the enterprise for the environmentally and socially conscious customers and shareholders. It can also decrease trust in the company among its employees.

Issues like discrimination in the workplace, policy of not withstanding from use of hazardous substances in production processes or causing harmful emissions to the environment are just few examples of practices that can damage reputation of a company. The positive effects expected include cost savings via product innovations, increased employee productivity, and more attractive positioning in the capital market, to mention only a few (Lin-Hi and Blumberg, 2020).

3. Examples of implementing ESG in selected EU countries

Austria

A study by Rogl et al. (2020) analyzed the trends in sustainability reporting among big Austrian companies. They noticed a constant increase in the share of companies publishing their sustainability reports since the year 2018, i.e. since the implementation of the NFID Directive through the Austrian NaDiVeG legal act. In 2019, the share of companies with a sustainability report increased from 35 to 42%, particularly among the top companies. The share of companies in the prime market remained at a high level, namely 95% of companies have produced a sustainability report. An increase was evident also among public companies - a change from 33 to 38% between 2018 and 2019.

It is worth mentioning that not only the companies obliged by the law disclose publicly information on their ESG activities. A growing number of companies which do not have such obligations also do so demonstrating their commitment to ESG and their long-term vision on their business strategies (Wared, Kusznier and Schneider, 2021).

In addition, Krueger et al. (2021) analysed ESG reporting in 29 countries, noticing that Austria was among the three countries where increase of ESG disclosure in the recent years was the highest. They noticed also a large increase in the quality of ESG reporting in Austria.

Though, a study of the Austrian National Bank, Bernhard and Riedlberger (2022) looked closer at the reports of 30 Austrian companies and noticed that information reported varies a lot among the different analysed subjects. With regards to the environmental aspects, detailed information on emissions is most frequently disclosed in the non-financial reports, e.g. the descriptions and calculations of greenhouse gas emissions emitted by the company itself or indirect greenhouse gasses from purchased electricity or purchased energy. Energy consumption within the company and internal water consumption are also frequently reported. Significantly less frequently reported are the indicators that are difficult to measure, such as animal species on the World Conservation Organization's Red List whose habitats are affected by business activities, emissions of ozone-depleting substances, or water bodies affected by wastewater discharge. Thus, although significant improvement in the area of sustainability reporting among Austrian companies can be observed, work on improvement in the coverage of all ESG aspects should continue in the future.

Poland

The survey performed under the project "ESG Analysis of companies in Poland" showed that a relatively small number of companies operating in Poland disclose data on their social and environmental performance (Sroka, 2017). An analysis conducted by the Reporting Standards Foundation and SEG, among 151 Polish companies that reported non-financial data for 2019, also showed that 56% did not report information in accordance with recognized reporting standards (BGK, 2020).

An educational project was initiated by the GES Agency in 2012 in cooperation with the Polish Association of Listed Companies, i.e. the companies that are present at the Warsaw Stock Exchange. Its main objective has been to increase the disclosure and transparency of reporting on non-financial indicators in Poland (Czerwińska and Kaźmierkiewicz, 2015). The enterprises undergo an evaluation with use of the GES Risk Rating methodology. The ESG aspects of the companies are evaluated based on the Principles for Responsible Investment (PRI) and international norms related to sustainable development. The outcomes are shown and discussed during annual conferences and published in annual reports. Recommendations for enterprises and investors on better disclosure of ESG indicators is also provided in this frame.

Despite the recognition that implementations of the ESG affects the valuation of companies on the Polish market, approximately 50% of investors perceives the ESG, but does not consider it to be of critical importance. It is, though, interesting to notice that every third of the surveyed investors is willing to lower their valuation or withdraw from investments if ESG risks are considered too high (PwC, 2021). Brokerage firms' analysts do not include ESG issues in their analytical recommendations. 18% focus on corporate governance issues in their approach to ESG. Meanwhile, only 43% of listed companies have an integrated business and sustainability strategy, and over one third has no non-financial strategy at all. More than 60% of investors believe that Polish companies are not ready to provide the required ESG information (BGK, 2020, PwC, 2021).

One of the biggest challenges for Polish companies noticed is reporting on the climate issues. Most companies listed on the Warsaw Stock Exchange still present a low level of awareness of the climate change problem. Out of 151 companies, only six scored more than 70% of the possible points. There has been some a slight improvement, as compared with the previous year, but still it amounted only 1.87 points out of a possible 10 (Sustainalytics, 2021).

Institutional bank clients in Poland, however, already notice that qualitative factors are gaining importance when it comes to discussing costs and availability of financing. The banking sector indirectly already includes ESG aspects in its lending policy, even though there are no hard-regulatory limits yet. Some of them are voluntarily introducing restrictions on financing certain sectors of the economy in support of ecological transformation (Komarnicka and Komarnicki, 2022, PwC, 2021), which is expected to further strengthen the trend toward more ESG in Polish businesses.

Romania

The ESG strategy for Romania is described in several interesting publications. Achim and Borlea (2015) evaluate non-financial performances of 65 companies listed on the Bucharest Stock Exchange (BSE), which report a “Comply and Explain Statement". In 2012 73% of these companies adopted the principles of best practices in corporate governance. Regarding the social and environmental performance, 97 % of the analysed companies report that they undertake such activities.

Recently, an analysis of the non-financial information reported by listed companies, for the period 2017–2019, and the measure of the average disclosure degree on environmental, social, economic, and governance (ESG) indicators were published by Beleneși, Bogdan and Popa (2021). The results showed a slight increase in the ESG disclosure index at the level of the sampled companies, from 47 units in 2017 to 52 units in 2019.

Marinescu (2020) provided analysis of the compliance of sustainability reports of Romanian companies with GRI Conceptual Framework. She noticed consistent increase of the level of adoption of the reporting practices according to the GRI conceptual framework in Romania and well as increase in the transparency of the reporting. Results of her work show that Romania is undergoing a continuous development with increasing number of companies publishing non-financial information to improve the ESG implementation.

Nițescu and Cristea (2020) presented a very interesting ESG report for the banking sector in Romania. The results of their empirical study show that a gradual approach to the ESG strategy may create opportunities for the Romanian banking system by adopting good practices in the field of sustainable development and by raising awareness of the risk factors and identifying solutions to minimize their potential impact. However, the implementation of an ESG strategy can pose challenges for the banking system, considering a variety of factors related to the environment (carbon dioxide emissions, electronic waste, green construction), social environment (health risk, access to communications, health and safety) and management (business ethics), instability of the financial system) that may affect the activities of banks.

Conclusions

The paper shows the level of implementation of the ESG concept in three chosen EU countries in the recent years. Austria is a leader in ESG performance. Polish Listed Companies made Progress. Romanian companies have made great progress in obtaining a high level of ESG performances. The obtained results corresponds well to the outcomes of the national CSRHub's Consensus ESG Ratings, where industry average for the companies in National Government Industry for Romania ESG reporting amounted to 58% (CSRHub, 2022a); in Poland to 87% (CSRHub, 2022b) and in Austria to 100% (CSRHub, 2022c). Observing the developments at the EU and also international arena regarding the transition to more sustainable economy it is expected that the trends of improvements among the companies in the area of their non-financial reporting will continue and that it will gain even more relevance for the future investment market.

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The Entrepreneurial Leader: A Feminine Perspective Case Study

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Abstract

While in the last decades, society has switched its focus, gathered up courage and engaged more in entrepreneurship, it has been observed that the number of females in entrepreneurship has not increased. The purpose of the current study is to identify the frame of the characteristics and general choices and to propose a model that showcases the aspects that increase the chance of females to become entrepreneurial leaders. In order to do so, an analytical review has been performed on 17 articles that treat the subject. After, a case study was presented in order to provide a clear and comprehensive view of a female lead start-up. Thirdly, an interview with the female entrepreneur, CEO of the start-up was performed in order to confirm/infirm the analytical review study and propose the above-mentioned model. The findings of the current study has showcased that although women entrepreneurs bear similar characteristics to general leaders, they should also see themselves as possessing those characteristics and have a specific background in terms of studies and work experience. The present study has practical implications for the business environment in Romania that is still male dominated and unable to offer gender congruence, especially in the entrepreneurial field. By creating a model, future female leaders can relate to tangible objectives able to help them succeed.

Keywords
leadership, entrepreneurship, female, feminine, COVID-19, pandemic

DOI: 10.24818/BASIQ/2022/08/062

Introduction

While the society has switched its focus, gathered up courage and engaged more in entrepreneurship, it has been observed that the number of females in entrepreneurship has not increased (Kimbu et al., 2021). The entrepreneurial leader stereotype refers to beliefs and expectations of how typical entrepreneurial leader behaves and looks like (Rudiac, Hubner and Baum, 2021). Correlated to the Big Five Personality traits described by Goldberg (1990 quoted by Chan et al., 2015, p.162) both entrepreneurs and leaders have been correlated to: extraversion, openness, emotional stability, conscientiousness, and low risk aversion. Although minor differences exist as conscientiousness was consistently correlated with leadership but not entrepreneurs, there are major similarities in their characteristics and decision-making process, that intertwine the two groups in the existing research.

The entrepreneurial leader has been most often than not integrated to the broader leadership context., and as in that field also the females are outnumbered, lack of feminine entrepreneurial leaders is a general unsurprising direction. Weather due to the historical status quo of the working field, or of a lack of prioritization in front of the family concerns, the subject has been mostly considered as a normal situation. However, the current study strives to analyze if the reason could be the difference between the self-image and the actual ideal image that women have regarding leaders, and in this specific case, entrepreneurial leaders.

The purpose of the current study is to perform a literature review in order to create the frame of the characteristics and general choices of female entrepreneurial leaders and to propose a model based on a specific case study and interview of a female CEO of a successful Romanian start-up.

1. Review of the scientific literature

1.1. The motivation to lead of entrepreneurial females

According to the definition given by Lord and Maher, leadership defines the process of being recognized as a leader by others. Leadership doesn't exist when there are no followers to look upon them, this implying a causality relation leader-follower that connects any characteristic of the leader to the perception of the follower. In this context, the Implicit Leadership Theory (Offermann, Kennedy and Wirtz, 1994) notes the existence of cognitive structures or trait schemes of the attributes that the followers expect from their leaders. In other words, the followers form their opinions firstly not due to the leader's characteristics, but because of their own expectations and how these characteristics answer to them.

In 1994 Offermann, Kennedy and Wirtz have identified a list of 8 factors (ILTs), including both positive and negative characteristics that the employees expect from their leaders. In 2004 Epitropaki and Martin have reconsidered this list, taking it down to 6 factors, but in 2018 Offermann et al. have reconfirmed his initial list, adding a 9th factor, as showed in the bellow schema. It has been by this way proven that the ILTs are time stable and that while they depend of external factors as culture and type of organization, the psychological expectations are hard to be modified. The initial list comprised: sensibility, dedication, tyranny, charisma, attractivity, masculinity, intelligence, and power. The study performed by Epitropaki and Marin has reduced the list to 6 factors, considering the "attractivity" factor unjustified and merging "charisma" and "power" into "dynamism". However, the second study performed by Offermann and Coats (2018) have re-confirmed the initial 8 factors that he has proposed, transforming "attractivity" into "well-grooming" and introducing a 9th factor: "creativity". It should be noted that in all these studies the factor" masculinity" remains stable in time, even while the gender equality ideas are well promoted in the las decades. This proves that the employees continue to expect their leaders (at least top management) to be men, or to prove characteristics showed generally by men,

Further proving the incorporation of the entrepreneurial leader to the broader leader concept, women and entrepreneurship have often been depicted as conflicting (Kalabadase et al., 2018 quoted by Kimbu et al., 2021, p.2). Women entrepreneurial leaders come to be viewed as subordinate and positioned as lacking when compared to omniscient male exemplars. Such an assumption stems from the consistent masculine norms within entrepreneurship studies and reinforces the implicit assumption that there is a singular (masculine) model of success performance (Dean and Ford, 2017 quoted by Kimbu et al., 2021, p.1).

A study performed by Schyns, Kiefer and Foti, 2020 analyses the fact that people see themselves more willing to take the lead and set direction, when they see themselves as similar to their own image, they have about how an efficient leader is. As showed above, masculinity is a criterion expected by the majority of followers, both females and males, therefore the hypothesis that women don't take leader positions (here included also the sense of entrepreneurial leader) as they don't see themselves capable to lead, giving up before even trying.



Figure no. 1. The connection between the Implicit Leadership Theory (ILT), Implicit Self Theories (IST) and the motivation to lead
Source: Schyns, Kiefer and Foti, 2020, p.3

As showed through the Social Learning Theory by Bandura (1977, quoted by Ilyas et al., 2020 p.197) individuals are capable in interpreting the contextual cues and are impacted by leaders, therefore influencing their capacity to act in a certain way. According to Schyns, Kiefer and Foti (2020) in order to want to lead, a person should consider herself capable to do so, women being less inclined to do so due to the historical perception, their priority that shifts towards family as well as due to the negative reactions that they continue to cause.

1.2. Females in leadership and entrepreneurial leadership: obstacles and successes

Even if the educational system has much advanced in the last years, the education being equally granted in the biggest part of the world, the gender difference continues to be an obstacle against females taking the lead, advancing to top management positions, or pursuing entrepreneurial activities. More than this, their difficulties do not end once the role was obtained, being showed that they are less liked than men (Heilman

and Okimoto, 2007, quoted by Vial, Napier and Brescoll, 2016, p.400). Penal and social fees are more often applied to women in authority positions (Rudman, 1998, quoted by Vial, Napier and Brescoll, 2016, p.400), and they are generally less accepted or wished as leaders.

The well-known syntagm "think leader, think male" was countless times proven by the research performed. In 1973 Schein, quoted by Kark, Waismel-Manor and Schamir, 2012, p.621 noted that the ideal leader possesses qualities considered as masculine, as self-trust, independency, assertiveness, dominance, and rationality. The characteristics considered to be feminine were named irrelevant, and even antithetical to leadership or managerial success. In equal manner, the entrepreneurial leader is described by Rudic, Hubner and Baum (2021, p.5) as being "young, tough, extroverted and confident risktakers, focused on entrepreneurial success, to have good communication skills and to be able to persuade others to follow their ideas and vision". The description implies a masculine beholder of these characteristics.

Other studies consider that the resistance towards females in leadership positions is due to gender stereotypes, as women are not viewed as powerful as men, nor as competent. The difference could be explained by the penalizing reaction that people have towards any discordances regarding the traditional rules and expectations (Moss-Racusin, Phelam and Rudman, 2010). As Vial, Napier and Brescoll (2016) have showed, due to female lack of legitimacy, a series of consequences could appear increased negative behavior toward the leader, a reduced cooperation, decreased psychological wellbeing of the leader as a rection to the environment factors, aggressive leader behavior or tentative leader behavior (that gives authority to those around).The below model presents the auto-consolidated cycle of illegitimacy of the feminine leader developed by Vial, Napier and Brescoll in 2016.

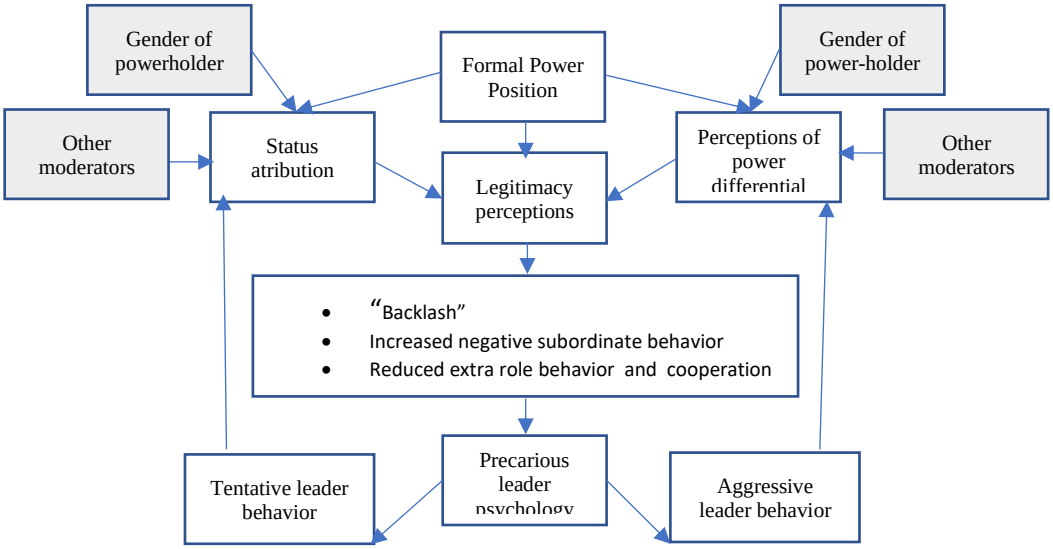


Figure no. 2. The auto-consolidated cycle of illegitimacy of the feminine leader
Source: Vial, Napier and Brescoll, 2016, p.401

The above model places the negative reaction against feminine leaders as a result of the legitimacy perception. As the entrepreneurial female leader is considered similar to the business leader both in characteristics, expectations and visibility, the model applies through a similar model to the entrepreneurial females. Kark et al, 2012 have mentioned that recent studies have become more opened to feminine attributes, and that feminine characteristics have started to be associated to the business success. Therefore, in order to be successful in a highly changing environment, les hierarchical and more flexible, leaders should know to collaborate, to show openness, interpersonal sensibility and empathy and to invest time and effort in employee development, attributes that can and will coexist successfully with those considered more masculine based on power and success oriented. However, women come with their own specific tangible benefits in any business they lead. As showed by Gangadharan et al., 2019, they have a different decisional process than men, they tend to prioritize expenses for social welfare and public services, they take long term decisions, are less prone to corruption and they react more often in case of injustice of unethical behavior. Brescoll (2016) has suggested that women in authority positions can be penalized even for minor moments that show emotion, especially when showing dominating emotions as anger and fury, but in the same manner those women that strive to show no emotion are equally penalized being perceived as uncapable of warmth and empathy. More than this, the attention given to the rules of showing emotions directly impacts the efficiency of the female leaders, decreasing their chances to succeed.

The answers of those around in front of women in authority positions, including employees, clients and other stakeholders are important, as in front of negative reactions women tend to become less motivated and less courageous, therefore directly influencing their chances to succeed. According to the study of Gangadharan et al. (2016) men contribute less to the wellbeing of the group when they are led by a woman. The reason is not connected to the capabilities of females to lead, but to the social stereotypes that make men to feel obliged to cooperate more with other men than with women. More than this, women that dear to take the lead are directly under the scrutiny of those around, that think that these positions are identified with masculinity and ready to penalize them for much less than in case of a male leader.

According to a study based on interviews with female CEOs and businesses owners published in Fortune 500 magazine, that tried to identify those characteristics that lead to success, included: having families that accentuated education, respect of women and hard work, having studies in sciences mathematics or engineering, having an evolution based on independence and challenges, having their own idea of what a leader means as well as a set of common characteristics, such as courage, assuming risks, resilience and the capacity to face ambiguity (Spencer, Blazek and Orr, 2019). Another thing that resulted from the study was the need to overmount the idea that women have to renounce having a family in order to obtain success.

According to Bagheri (2017), in case of entrepreneurial leaders' personal competencies are those that enable them to envision success and develop an innovative vision, while their functional competencies are those that inspire performance and convince those around to extend their support. Therefore, in case of female leaders, while personal competencies differences do exist although more in a positive manner than negative, as described above, regarding the professional differences there is no differentiation in most of the countries that grant gender equality in education. The statistics show that women obtain more diplomas of all study stages than men, with the exception of MBAs and they have adequate experience needed in entrepreneurship as they occupy 50% of middle management position in organizations (Spencer, Blazek and Orr, 2019).

To conclude, individuals are more likely to emerge and succeed as leaders if they demonstrate characteristics consistent with the expectations of those around them (Ute and Saurav, 2016), namely in entrepreneurship, the image female leaders hold in front of investors, customers, suppliers and their acceptance of them, directly impacts their chances to even try to succeed while the characteristics of successful female leaders are similar to those needed to strive in entrepreneurship.

2. Research methodology

To demonstrate the findings from the literature, we have chosen a successful Romanian start-up, called Bankata, founded and led by a female entrepreneur, Diana Seredenciuc. In the first part, it is presented the start-up as a case study in order to provide a clear and comprehensive view of a female lead start-up.

Then, in the second part, we will discuss the results of the semi-structured interview held with the founder. Through the phenomenological study method, the authors have drawn on observations from the lived and perceived experience of the interviewed person. The information was used in order to perform an analysis in order to understand if the particular female leader possesses qualities or views similar to those of the female leader identified through the literature review performed above.

3. Results and discussion

3.1. Case Study: Bankata – a successful Romanian start-up founded and led by a female entrepreneur

Bankata is a digital financial comparison platform. As a well-known analogy, like the booking.com for banks. The start-up tries to analyze and compare as many financial products as possible, and the main goal is to help Romanians find the products best suited for their needs.

When looking for a financial solution, price might not always be the main factor consumers look at. Therefore, Bankata analyses the entire offer on the market and find all the benefits but the also the shortcomings, thus helping consumers to make the best decision. Customers compares easy and free of charge all the products on Bankata and applies for the one they like most. Bankata sends the lead to the bank and in exchange the bank pays back a fee. Therefore, we can say that it's a win-win situation for everyone involved. Consumers find the best product easy, online and free of charge; banks receive qualified hot leads with a performance-based payout.

Table no. 1. Problem/Solution matrix for Bankata

Category	Problem	Solution
Consumers	There is no one-stop solution on or offline for all financial products, making finding the right product at the right price both difficult and time consuming There is no independent platform for financial advice Lack of information means customers often choose the wrong product for their needs	By using the comparison tables, consumers save time and money in finding the best products for their needs Consumers receive independent advice from a trusted source Conveniently access a wide variety of financial and mobile/broadband products in one place
Financial institutions	Current incentive structures of providers, result in poor-quality customers, often taking out unsuitable products Acquiring new customers is an expensive process, but value is limited given impulse driven market Competitive market means ever increasing customer acquisition costs, but with decreasing value from those customers	Providers lower their acquisition cost Increase their conversion rate Improve customer quality and retention Reach massive numbers of new consumers Gain valuable market insights Grow sales at unprecedented rates Success-based reward structure

At a global level, comparison sites are proven to be one of the most influential factors when choosing financial products. A survey done by Google reveals that consumers put almost the same level of trust into comparison sites, as for family and friends.

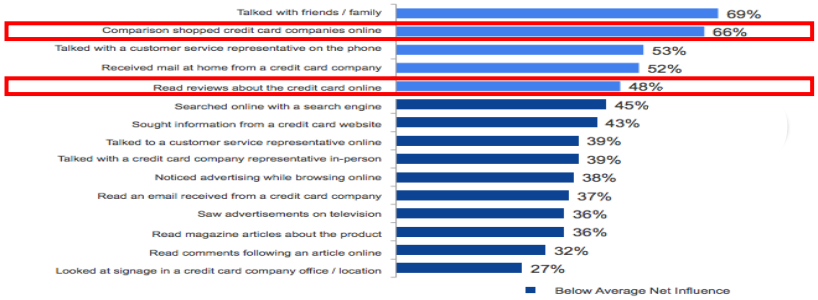


Figure no. 3. Survey on most influential sources for credit card shoppers

Source: Google survey

At the Romanian level, there is currently a very good opportunity to launch such a comparison site. First of all, the financial education is at very low levels. Apart from few specialists, most of the Romanians are not aware of basic financial products, like credit cards, not to speak about more sophisticated ones, like investments. The good news is that financial education has been gaining popularity and a lot of people are now being concerned about their finances in a more professional way and eager to learn more about diversifying their portfolios. The business model of Bankata is presented in Figure no. 4.

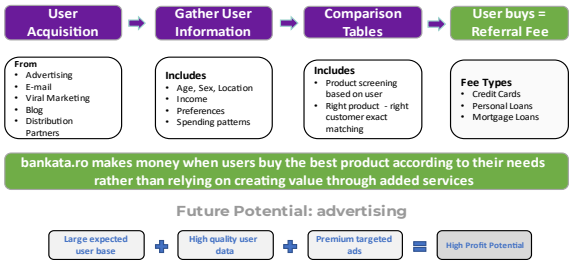


Figure no. 4. Bankata Business Model

Source: Company data

4.2. Interview with Bankata Co-founder and Chief Executive Officer (CEO)

Bankata was founded by two ambitious entrepreneurs, Diana Seredenciuc and Andrei Perianu. Diana serves as CEO, while Andrei is dedicated to business development and both have significant financial experience, gained in Romania and abroad. Since the subject of the article is female entrepreneurship, we will focus our research on Diana. To this end, we have interviewed her to get more personal details, but also insights about leadership style and what motivates her as an entrepreneur.

The interview consists of ten open questions, without any pre-determined answers. Table 2 presents the questions, as well as Diana answers in her own words.

Table no. 2. Interview with Diana Seredenciuc - CEO of Bankata

Question	Answer
What studies have you followed?	I have graduated from Bucharest University of Economic Studies – Environmental Economy
Are you married? Do you have children?	I am not married and do not have children
What experience do you have before entrepreneurship?	I have been active in the financial industry since 2007. I have been in stock brokerage, private banking, treasury and also part of the founding team members of a similar startup as Bankata in Singapore.
How did the idea of becoming an entrepreneur come about?	After moving back from Singapore in 2018, I have realized that the financial products in Romania have become more and more complex with banks launching various lending products, different current accounts and having more competitive offers while at the same time the retail consumers being deeply underserviced in branches. I decided to bring the private banking advisory services to the average consumer through a digital approach.
What qualities do you think a leader should have?	A leader should be trustworthy and able to inspire people. He/ she should also have clear messages and make complex ideas easy to understand for everyone.
What qualities do you think an entrepreneur should have?	The more I think about it, the more I realize I want to say the same qualities as for the leader. An entrepreneur should be a strategic thinker, with great risk management skills and constant forward planning. He/she should be open to feedback and have great communication skills.
What qualities do you think you have?	My investment background has shaped me into an analytical person. I know how to manage risk while evaluating possible returns. I believe growth and improvement comes from teamwork, constant feedback and being open to new ideas. The key to success in everything you do is learn, learn, learn :).
Do you consider that the woman in the position of superiority has different characteristics from the men in the position of superiority?	I don't believe we make decisions based on our gender, but more based on our personality, past experience and the mentors we have chosen throughout our career or life.
Do you have any other women on the team?	We currently are a team of 7, 3 women and 4 men.
What do you think of women leaders?	I love the fact that the number of female founders has grown incrementally in the past couple of years, especially in the Eastern Europe landscape. We should not be evaluated based on gender but based on our performance. Globally, we see many examples of women CEOs in largely male dominated industries that thrive and deliver great results such as General Motors, Oracle, Citigroup, AMD, Occidental Petroleum and the list can go on.

Conclusions

Through the analyses of the case study and answers to the interview, in comparison with the information of the analytical review, the current study shows that the female entrepreneurial leader interviewed shares similarities with the findings within the international literature review of female leaders in entrepreneurship or business environment. The background in economics is confirmed as a field of study able to create future businesswomen, the previous experience in the field of activity of the start-up, could also be underlined as a success element. Moreover, Diana Seredenciuc has gathered inter-cultural experience, by working in an environment developed and different that the Romanian one, where she could be exposed to new products and ideas, being able to further develop her way of thinking as well as her resilience.

Through the analysis of the answers, it can be concluded that the CEO considers of upmost importance the background that she was able to form in the last 15 years. The fact that she maintained the same field of activity – financial- (stock brokerage, private banking, treasury) was able to create the expertise and experience needed in order to come up with new ideas and to have the courage to act upon them. Also being previously part of a team that has founded the same type of Start-up, has increased the exposure to the entrepreneurial field, and created a precedent that was more easily replicated as exposure to similar experience and reactions existed.

As an entrepreneurial leader, Diana Seredenciuc considers that what differentiates her are her analytical thinking and her capacity to face risk and evaluate possible returns. These two characteristics comply with that of the leader and entrepreneur described by Goldberg (1990 quoted by Chan, 2015, pp 162): consciousness and low aversity to risk. Also mentioning always being willing to learn and being opened to sharing ideas and appreciating teamwork, can be addressed as related to the Goldberg characteristics of openness and extraversion. Although from the answers no information could be drawn regarding the emotional stability, by analyzing her inter-cultural working experience, as well as the current field of work that is considered to be more of a "a men world" can be concluded that she has proven the resilience, and therefore emotional stability needed in order to success as both entrepreneur and leader.

Regarding her view of the ideal leader and entrepreneur characteristics, the CEO underlines the fact that she considers them as the same, going from strategic thinker, with great risk management skills and constant forward planning. He/ She should be trustworthy, with great communicational skills and able to inspire others. As described above she used similar characteristics to describe herself, therefore confirming Schyns, Kiefer and Foti, 2020 theory of congruence between the Implicit Leadership Theory (ILT), Implicit Self Theories (IST) and the motivation to lead. In conclusion, a woman should see herself as having similar characteristics to the ideal leader that she envisions in order to be willing to step in the leadership arena.

Through the answers, it can also be concluded that in order to be willing to step as a female leader, women should believe in gender equality and the capacity of women to step in male dominated roles. As noted by the CEO, women make decisions based on personality, previous experience and contact to mentors, and not due to gender related aspects. Also, in the team that she formed it can be observed that gender congruence is of upmost importance (3:4 female/male ratio).

Therefore, taking into account the above-mentioned conclusions as well as the literature review findings, the current study proposes the bellow model, that describes the characteristics that increase the chance of female to become entrepreneurial leaders:

1. Should have personal traits in congruence with those of leaders, such as: low risk adversity, strategic thinking, openness and emotional stability.
2. Superior studies in economic field are helping.
3. Previous experience in the same field as the entrepreneurial venture on extended periods in order to gather needed expertise and to build confidence.
4. Personal characteristics identification to those of the perceived ideal leader.
5. Having gender equality concept.

The present study has practical implications for the business environment in Romania that is still male dominated and unable to offer gender congruence, especially in the entrepreneurial field. By creating a model, future female leaders can relate to tangible objectives able to help them succeed.

The study has the following limitation (a) limited generalization as it is limited to a case study and in-depth interview that is unable to represent the sum of all female entrepreneurs' opinions, but a particular success model, (b) limited access to female leaders as through entrepreneurs associations the number of females entrepreneurs in comparison to male entrepreneurs was almost non-existent and (c) the possibility that the author's own opinions influence the results interpretation.

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Take it Slow Project: Apulia B&B Environmental Awareness

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Abstract

The present explorative research, through a questionnaire, investigates the B&B operators' awareness to environmental preservation focusing on tools and actions performed. The final aim is improving knowledge related to the opportunity of implementing the right environmental certification to support the development of a specific area into Apulia region. Results achieved, indicate that Carbon footprint seems to be the suitable certification for the analyzed reality. The research question is in line with SDGs (Sustainable Development Goals) in particular 11 and 12 SDGs. The present exploratory research was carried out in the field of hospitality through a questionnaire among managers belonging to six B&B participating into LCP. The B&B observed shows a good level of awareness to the environmental preservation, but they are not able alone to support the certification weight in terms of innovation, managerial re-organization, and investments. Originality and value of present paper is linked to the specific field investigated. A lot of works is related to hospitality industry few to the B&B operators. Possible practical implications are related to the role of network. Its role is twofold: firstly, overcome the weakness of single operator and secondly improving operators' environmental performance imply to increase the attractiveness of micro destination in Apulian region.

Keywords

B&B, sustainable tourism, eco-certification, Take it slow project, Carbon Footprint

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Introduction

Tourism is considered an industry difficult to regulate through uniform quality criteria or methods. To pass through compliance assessment for environmental certification and to become green, it is necessary that hotels, B&B, etc. adopt certain environmental standards from independent verifying body which recognizes the continuous implementation and improvement of high ecological quality (Font, 2002). More than 20 years ago have already existed over 100 eco-labels for tourism, hospitality, and eco-tourism, but they overlapped in meaning how to communicate green messages to tourists. Progress in assessing the role and importance of environmental certification in tourism sector came with the deeper study and more frequent application of ISO and EMAS standards (the latter mainly in Europe), with the wider expansion of the activity of the largest educational foundation for sustainable education in the field of tourism in Europe, Foundation for Environmental Education through their programs Green Key and Blue Flag. The topic of sustainability became central for tourism research and today requires adequate policies for its green development. Sustainable tourism is considered an element of wider sustainable development (Nguyen et al., 2019; Sharpley, 2000) and over the years, the scope of theoretical research has significantly increased with an emphasis also on territorial attractiveness or the performance of local communities etc. To achieve a sustainable tourism, it is important to develop transversal network embedding different SMEs belonging to a different economic sector in the area (such as culture, craft, agro-food, other touristic services) to differentiate services decoupling the economic growth from environmental pollution. For this reason, it is important to find solution able to measure and quantify the environmental pressure on the touristic activities.

In the last years, a body of literature has focused on the evaluation of the tourism carbon footprint (CF) as a tool to account for the environmental externality of tourism growth (Lee and Hsieh, 2016; Asmelash et al., 2019). The CF is a measure that expresses in CO2 equivalent the total greenhouse gas emissions associated directly or indirectly with a product, an organization, or a service, useful for modelling environmental approach (Pertsova, 2007). The CF measurement is embedded in the ISO 14064-1 standard, and outlines the principles and requirements, at the organization level, for quantifying and reporting greenhouse gas (GHG) emissions and their removal. It includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory. In literature the research studies focused on analyze the sustainability of the hospitality through the analysis of the CF. Lenzen et al., (2018) highlight that between 2009 and 2013, tourism's global carbon footprint has increased from 3.9 to 4.5 Gt CO2e, four times more than previously estimated. Sun (2014) analyzes the carbon emissions for domestic tourism industries with the aim to evidence the economic benefits and environmental costs of further tourism development and the importance of taking into account "the energy use of national carriers for international transportation and the energy use embedded with imports with respect to tourism development". In this way it is possible to safeguard protected areas" by "minimizing the impact" over the environment (as ecotourism) and pursues ethical objectives by promoting the education and respect of the traveler. Furthermore, the measurement of environmental emission as CF, can provide important indications on future strategies by encouraging networked cooperation structures among local communities as B&B, hotels, traditional local craft and tourists, to develop environmental-friendly or low-carbon tourism (Rao and Saksena, 2021, Nguyen, Johnson and Young, 2022). The sustainability issues are also the basis of a specific type of tourism such as slow tourism. The theoretical understandings of slow tourism derived from sustainability at a territorial level as well as from tourist experience as individual well-being (Calzati and de Salvo, 2017). Also, the slow tourism can be considered a sub-part of sustainable tourism, since creates a new form involving experience with tourist structures (mainly B&Bs) and the tourists (mainly fans on pilgrimage routes) and thus emphasizes, responsibility and eco-friendliness" of all the stakeholders involved. The assessment of the quality of slow tourism is often associated with aspects such as slow food, local lifestyle, level of environmental protection of the location, level of costs.

This study represents an introductory part for the implementation of a specific outcome included in a European project Interreg named Take it slowly. The present explorative research, in line with other explorative research in the field of hospitality (Amicarelli et al., 2021; Eskerod et al., 2019) through a questionnaire, investigates the B&B operators' awareness to environmental preservation focusing on tools and actions performed. The final aim is improving knowledge related to the opportunity of implementing the carbon footprint environmental certification to support the development of a specific area into Apulia region. The research question is in line with SDGs (sustainable development goals) in particular, 11 and 12 SDGs.

The rest of the text is structured as follows. First section provides a general outlook of the project Take it Slow and its interrelation with the topic of slow tourism. Second section is consistently dedicated to the methodology of research. The third part includes discussion of main results of research. The last section summarizes the main findings and conclusions.

1. General framework of Take it slow project

Take it Slow "Smart and slow tourism supporting Adriatic heritage for tomorrow" is a project under Interreg-V-A Italy-Croatia programme. The project involves six Italian regions (Veneto, Molise, Emilia-Romagna, Abruzzo, Marche and Puglia) and three Croatian regions – Dalmatia region (with Dubrovnik, Split and Šibenik-Knin county), Ravni Kotari region (with Zadar county) and Istria region. Participants in the project from Apulia region are Public Apulian Theatre Consortium (Teatro Pubblico Pugliese, TPP) and Department of tourism, economics of culture and territorial development.

The general aim of the project is to develop the Adriatic region as a place of travel experience, enhancing sustainable tourism, slow tourism, innovation, and creativity through the identification of joint actions that would be highly beneficial for the protection of the environment in all participating regions and surrounding area. In Apulia region, the project activities are focused on the micro-destination named via Francigena located between Monopoli-Torre Canne and Selva di Fasano area, which is a part of the historical via Traiana route of the Council of Europe. Via Francigena routes covers over three thousand km starting from Canterbury to Santa Maria di Leuca (Lecce), which unites different peoples and cultures, touching 5 states, 16 regions and more than 600 municipalities.

The selected route has all the main characteristics for a successful tourism experience including food and lifestyle as well as green rural or maritime locations. The activities planned in the project have the goal to

enhance the area as green destination visitable all year through innovative eco oriented activities. To perform eco-oriented activities have been selected 37 participants (till March 2022) which signed a protocol for adhesion to a Local Community of Practice (LCP) with the purpose to create a network of enterprises for sharing best practices in tourism activities. In the LCP participate SMEs in the field of tourism activities, B&Bs operators, handcraft, enogastronomic operators, regional agencies, NGOs, and the University of Bari Aldo Moro. The role of the LCP is to develop a partnership platform able both to develop new ideas for innovating tourism products and services offered by tourist destinations and to apply various best practices for making natural and cultural heritage a leverage for sustainable and more balanced territorial development. The paper should be the result of a research in the area, corresponding to the specific topic of the conference.

2. Research methodology and B&B description

The present exploratory research was carried out in the field of hospitality through a questionnaire among managers belonging to six B&B participating into LCP. The questionnaire was sent via e-mail in October 2021 with reference to year 2020-2021 with a deadline of 20 days for the answers. Questionnaire sending has been accompanied by a short interview with each operator. These personal communications are very useful to understand same crucial implications. All the respondents have asked to remain anonymous. The questionnaire is composed by 14 questions plus a brief description of the main activity's characterising the single B&B. The questionnaire is split into four different environmental thematic areas: (a) energy; (b) waste; (c) water and (d) other, to better understand where the main improvements are implemented. In the category "other" the authors have been included all the other environmental practices observed. The B&B included in the present research are in the touristic area between Monopoli-Torre Canne and Selva di Fasano, 50 km-60 km respectively, far from Bari town. Their main features are recorded in table no. 1 and detailed below. B&B 1 is in the downtown of Fasano and has three rooms, parking and has some amenities as a course for cooking typical Apulian cuisine; B&B 2 is a vacation house in Selva di Fasano; B&B 3 has three rooms, and it is a Masseria in the Countryside of Fasano with a swimming pool; B&B 4 has nine rooms in the downtown of Torre Canne with a restaurant; B&B 5 is in Fasano town near to the selva of Fasano, has three rooms and a swimming pool; B&B 6 is between Fasano and Torre Canne, it has five rooms, bike rentals and plan and organize different excursions on the territory.

Table no. 1. Main features of B&B operators

	B&B 1	**B&B 2**	**B&B 3**	**B&B 4**	**B&B 5**	**B&B 6**
Location	Downtown of Fasano	Selva of Fasano	Countryside of Fasano	Downtown of Torre Canne	In Fasano town near to the Selva of Fasano	Between Fasano and Torre Canne
Number of rooms	3	9	3	9	3	5
Parking area	X	X		X	X	
Swimming pool			X		X	
Restaurant				X		
Car rental				X	X	
Bike rental	X		X			X
Leasure activities[§]	X		X			X
Electric car charging column			X	X		

Note: [§]) Including: nature excursions, regional tours and cook class

Source: personal elaboration of the authors.

3. Data analysis and discussion

Table no. 2 summarized main results achieved by the questionnaire useful for providing information on tools and actions performed by B&B operators.

Table no. 2. Tools and actions performed by B&B operators

Questions	B&B 1	B&B 2	B&B 3	B&B 4	B&B 5	B&B 6	Percentage results with YES
Energy							
Use of LED bulb	Yes	Yes	Yes	Yes	Yes	Yes	100%
Autonomous room temperature regulator	Yes	No	Yes	No	Yes	Yes	75%
Thermal break windows or PVC windows with at least double glazing	Yes	Yes	Yes	Yes	Yes	Yes	100%
Use of class A fridge and re-frigerator	Yes	Yes	Yes	Yes	Yes	Yes	100%
Presence of renewable sources (photovoltaic panel or solar thermal panel)	No	No	Yes	No	No	Yes	30%
Waste							
Separate collection of waste	Yes	Yes	Yes	Yes	Yes	Yes	100%
Water							
Presence of water jet breaker in the bathrooms	Yes	Yes	Yes	Yes	Yes	Yes	100%
Toilet with double button flush system	Yes	Yes	Yes	Yes	Yes	Yes	100%
Other							
Environmental certification	No	No	No	Yes	Yes	Yes	15%
Use of products with environmental certification	Yes	No	Yes	Yes	No	Yes	75%
Car-pooling service for employees	No	No	No	No	No	Yes	15%
Presence of a park or flowered balconies	Yes	Yes	Yes	Yes	Yes	Yes	100%

Source: personal elaboration of the authors

A first and general result shows that there is a high level of environmental awareness among B&Bs operators. As above stated, the questionnaire has been supported by a brief interview to improve its effectiveness and to collected as much useful experiences possible.

Analyzing the first environmental thematic areas proposed, *energy*, the B&Bs operators have done important economic investment to save energy. The 100% of the B&Bs have replaced the light bulbs with led bulbs, the windows with thermal break windows and the all the fridge and refrigerator in A class. Differently only the 75% have installed the autonomous room temperature regulator whereas only the 30% have the presence of renewable sources. According to the interview, has emerged that the owners of B&Bs are aware that this operation mode not only is helpful in reducing operating costs but can improve profits because can attract guest interested on green practices through the formation of positive image. The owners identify both guests' willingness to select eco B&Bs and/or hotels and their interest into green practices and the willing to accept the reduction of unnecessary hotel services (e.g., daily towel change, central laundry service) in favor of environmentally responsible business.

These results are also in line with the relevant literature. Han et al. (2019) highlights the "*pro-environmental intentions of practicing environmentally responsible actions during their hotel stay*" evidencing the sustainable behaviors practice when travelling. Furthermore, there is high interest in investing in renewable sources- mainly- photovoltaic panel, to become carbon neutral. The biggest obstacle to the implementation of renewable energies is due to the high cost and red tape. For these reasons, it is recognized the importance of creating a network to support major investments in the renewable energy, by creating a community for intercepting public or private funding.

The categories *water* and *waste* are considered very strategic not only for preserving the environment but also for costs saving. All the B&Bs have introduced water jet breaker and toilet with double button flush system. From the interview it emerges the need to adopt effective business practice to reduce water wastage or increasing recycling water system. This is due to the need to reduce the risk of water scarcity, or low water quality that can negatively affect the B&Bs management.

The same indication is for the waste category. In the opinion of the owners, a recovery system for waste should be adopted. All the B&Bs have a separate waste collection and do not use single plastic use in the

room or during the breakfast and refillable dispensers for soaps or shampoos and do not weight the amount of waste. All the owners agree with the idea to create a consortium for collecting waste sharing an adequate waste management system with other B&Bs and/or hotels and other industrial or trade activities in the area, recognizing profitability from recyclable and compostable waste (Pirani and Arafat, 2014). In literature are reported different successful examples of cooperation strategies in waste management. This is very important considering that the seasonality of tourism increases the issues of waste management. Bohdanowicz (2006) highlights the experience carried out in Sweden in which hotels shared an active waste sorting and recycling program included donation of hotel furniture and equipment.

The category *other* includes questions related to environmental certification, biodiversity safeguard and environmental practices in general. The car-pooling is adopted only by one B&B, whereas a flowered balcony and a park is present in the 100% of the structures. Carpooling has been identified as a possible alternative to own private car considering the reduced costs, as the fuel costs, are split among several individuals. In the opinions of employees, a minibus should be purchased from the owner of B&B to be shared among all employees, but the unsuccessful adoption of car-pooling is attributable to high costs of the minibus.

The 75% of the B&Bs use products with eco certification while only 1 B&B has adopted an environmental certification.

All the owner agreed that the environmental certification has a positive effect on hotels market value and in the last years has become an important asset for developing green marketing strategy. There is, however, an awareness of the significant costs to implement the eco-certification and the necessity to select the appropriate certification so as not to confuse the guests. This aspect is controversial and in literature is reported the confusion in the marketplace related to green certificate, with customers unable to distinguish among the different environmental claims (Bernard and Nicolau, 2022).

Conclusion

This explorative research shows that there is a high level of awareness related to the environmental by the side of B&B operators. All the participants to this study have started modifying their own energy, water, and waste management with the final aims to protect the environment, to save money (reducing energy and water bills), to increase turnover, and especially to be attractive for green tourists.

In this field, the possibility to perform environmental certifications as the carbon footprint could represent one of the best solutions. By all operators interviewed, the environmental certification, as carbon footprint, is recognized as an important lever of local development that can help both to attract customers, increasingly interested in green issues, and to preserve the natural beauty of the community The main problem is represented by the costs to be incurred for eco-certification and the bureaucratic aspects related to it. For this reason, the creation of a local community can represent a competitive advantage as it can support a new model of governance integrated with other stakeholders in the area. In addition, the creation of a network can create a critical mass that can bring forward the requests to be submitted to the public sector which can better make economic investment by addressing them to areas of common interest for the community. For example, LCP could propose and support an “area eco-certification” rather than a single structure one. In this way it will be possible to by-pass the weakness recorded in the present study, expanding all the touristic local potentialities (e. g., B&Bs and enogastronomic operators; handcraft; regional tourism agencies). Even though the small numbers of players, these results are significant intending that the LCP (Local Community of Practice), signed among the over mentioned Apulian operators, could play a key role in the direction of environmental certification and to push by local authorities’ eco-engagement. Moreover, it is possible to create the basis to converge towards innovative and low environmental impact projects.

In conclusion the main limits are the weakness of single B&B structure, the cost of adopting this kind of tools and red tape afflicting Italian systems. Lastly, this explorative research has increased eco-knowledge in Apulian region micro destination. Based on these results, future study has to be addressed to LCP Carbon Footprint eco-certification representing one of the best suitable options towards sustainable tourism offer.

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The Impact of Online Education on the Romanian Higher Education System During the COVID-19 Pandemic. Case Study: Bucharest University of Economic Studies

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Abstract
The outbreak of the Covid-19 pandemic forced all the countries either to suspend the teaching and learning activities or to convert them into an online system. In March 2020, most educational institutions around the world eliminated face-to-face schooling and switched it to distance learning in order to reduce the spread of Covid-19. In some countries, parts of the formal education system (or the entire system) did not reopen in that academic year, while in others, the formal education system had been gradually reopened untill the present time. The aim of this research is to analyze the impact of the online schooling in the higher education system, and its objective is to identify if the online education is as effective as the offline one.
The paper analyzes and synthesizes the main bibliographic sources in the field of education during pandemic times, the research being quantitative, from primary sources - analysis of statistical data provided by the questionaire that was administrated to the Bucharest University of Economic Studies students'.

Keywords

Covid-19 pandemic, online education system, students' motivation, digital competences.

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Introduction

Education is an effort aimed at enabling individuals to become whole human beings so that they can better realize, understand, and support themselves (Nurrohim, 2020). Providing quality education is an attempt to fulfill the national ideals in terms of forming the life of the nation. Therefore, education is the spearhead of efforts to improve the quality of a nation. The more qualified human resources one has, the more the quality of the country will be recognized in the eyes of the world. Achieving quality education will not be possible if the education process is not supported by students, teachers, professors and infrastructure conducive to learning. The educational issues that are currently shifting to students require a fundamental overhaul of the learning system and classroom learning patterns.

The Coronavirus pandemic accelerated the shift to distant learning to the point that it became the only existimg way of education and communication (Viktoria and Aida, 2020). Due to the advancements in digital technology, teachers and professors have been obliged to use E-learning platforms (Benadla and Hadji, 2021). The pandemic forced schools, faculties, universities and institutions throughout the world to close their doors so that students might practice social isolation (Toquero, 2020). The sudden transition from face-to-face education to online learning that has been taking place since early 2020 has left various parties, both professors and students, unprepared. As a result, online learning, which was supposed to bring benefits by providing virtual classrooms, confused those involved in learning. Reducing the intensity of interaction between professors and students can promote the emergence of learning loss. Therefore, online learning delivery cannot be sustained for long. Originally, online learning was a necessity for students to

be more independent as learning subjects, but in the current situation, it promotes a decline in interest and motivation to learn. Thus, it is clear that the introduction of online learning still needs to be combined with face-to-face learning to avoid learning loss.

This paper is structured as follows: chapter 1 includes a presentation and an analysis of the results stemming from the main specialty studies related to adapting and rendering the education process more flexible in the context of the COVID-19 pandemic; section 2 presents the objectives and methodology of this research; section 3 presents the main results of the analysis performed, subordinate to each present objective; section 4 synthesizes the main conclusions of the research and underlines the importance of the obtained results in formulating policies aimed at supporting the modernization of the education process, making it more effective and flexible in order for it to meet new challenges.

1. Review of the scientific literature

In the existing literature on online teaching and learning, there are a variety of concepts. These terms have different meanings, but are sometimes used interchangeably (*distance learning*, *online teaching*, *emergency online teaching*, *distance learning*). For example, Bozkurt and Sharma (2020) refer to distance education as a process characterized by "*temporal and/or spatial distance*" and distance education as a context of "*spatial distance*.". The definition of distance education cannot be limited only by being far away from the teaching environment such as school, because most distance education students are close to their schools and have access to educational materials through electronic media. Uşun (2006) defined distance education as a planned and systematic application of educational technology. Moore and Kearsley (2011) used the term "*distance education*" instead of "*distance learning and teaching*" because education is a broader term that encompasses both learning and teaching, as opposed to only learning or teaching, as an individual term. According to Moore and Kearsley (2011), distance education means both a teaching and a learning process, that occurs in spatial and temporal separation and requires elements of interaction through the use of technology. Distance education can also be defined as the electronic transmission of information to a remote location via satellite, video, sound, computer, multimedia technology, and similar tools, or as an educational system in which the teacher and the student are in different locations (Tuncer and Tanaş, 2011). From all these definitions, the concept of distance education is a learning and teaching model that is independent of time and space and provides educational opportunities through technologies.

The Covid-19 pandemic affected education and, in particular, prefessor education in several ways. As a result of the closure of universities and schools, teachers and students have had to quickly adjust to teaching from a distance. Teacher education is no exception. The need to create learning environments for student teachers preparing to become teachers required choices, decisions, and adaptations to meet not only student expectations, but also the demands of teacher education and the conditions under which both universities and schools had to operate (Assunção Flores and Gago 2020). The fast, unexpected, and forced transition from face-to-face to distance education has presented a number of challenges and constraints, as well as opportunities, that need to be explored. Existing literature points to a *„distress of distance education*" (Bozkurt and Sharma 2020) or *„distress of eLearning"* (Murphy, 2020) and difficulties related to poor infrastructure for online teaching, inexperience of faculty, information gap (limited information and resources for all students), and complex home environment (Zhang et al. 2020). In addition, lack of supervision and support (Judd et al. 2020) and issues related to faculty competencies in using digital instructional formats (Huber and Helm 2020) were identified. Higher education institutions constantly face challenges of diversity management (Săseanu et al. 2020). Regarding teacher education, there are several ways that described the way in which institutions and actors have adapted to the new scenario created by the Covid-19 pandemic (Bao 2020), and reported on training strategies and experiences with innovation (Ferdig et al. 2020).

1.1. Online education during Covid-19 pandemic

The Covid-19 pandemic had significant repercussions not only in terms of health and the economy, but also in social terms, especially educational ones. This means that a double crisis appeared: *an educational crisis related to the closure of schools and universities* and *a general economic crisis* that also affects the education sector. In particular, the closure of educational institutions in connection with the pandemic leads to the suspension or slowdown of educational processes and to an increase in inequality in this area.

The pandemic and the closure of schools around the world have had a negative impact on the national education systems institutions in most of the countries, the situation required special measures that had to be taken immidiately and a list of rules that had to be obeyed. According to experts, the Coronavirus

pandemic has exacerbated pre-existing problems in international education. World Bank experts have determined that the Covid-19 pandemic threatens educational progress around the world by two main factors: first, *the almost complete closure of schools at all levels*, and second, *the economic crisis caused by pandemic measures*: "It simply came to our notice then profound impact on education, closing schools almost everywhere on the planet - the biggest shock for all the education systems in our lives. The damage will become even more severe as the urgency of health will escalate into a deep global recession."

Because of the Covid health pandemic, professors and students were left with their feelings of uncertainty, and online courses were introduced on short notice as a result. In such a time of unpredictability surrounding online instruction, many questions naturally arise about its effectiveness and impact on teachers and students. Universities' closures and the introduction of distance education negatively impacted student learning through four main channels: *less time to learn, the onset of stress symptome, the change in which students interact with each other*, and *a lack of motivation to learn*. Nevertheless, distance education is essential to ensure continuity of learning in situations where face-to-face instruction is suspended.

a. Less time to learn - Most of student's formal learning takes place in universities, meaning that by closing them and transferring the learning process into a remote environment can result in students spending less time learning. According to the School Barometer survey, which took place from 25th March to 5th April, 2020 and which targeted Austrian, Swiss, and German students between the ages of 10 and 19, had shown the fact that students' weekly learning time was between 4 to 8 hours shorter during the closure of Covid -19 than the period when schools were open (Huber et al. 2020). In addition, one in five students reported learning less than 9 hours per week;

b. The onset of stress symptome - Students who were stuck at home with their parents due to Covid-19 pandemic tended to feel more anxious and stressed. Sprang and Silman (2013) shown that the students who have been isolated or quarantined during a pandemic were more likely to suffer from acute stress disorder, grief and adjustment disorder. Theese negative psychological factors can, in turn, adversely affect the learning process (Kuban and Steele 2011);

c. The change in which students interact with each other - It is well known that the school environment affects performance through peer influence. Being in a classroom and having the opportunity to interact with classmates can have important positive externalities. Peer effects can operate through many different channels: students can teach each other and improve together, high performance by classmates can motivate the student (through competition or social influence) to try harder. The student may also develop an interest in reading or mathematics thanks to classmates (Sacerdote 2011);

d. A lack of motivation to learn - The learning motivation can be measured in several aspects, namely curiosity, efficacy, attitude, need, competence, and external motivators. The concept of online learning is good enough to meet the needs of the 21st century and also to deal with and prevent pandemics. However, almost more than a year of online learning has not completely increased the learning activity of students. According to Setyorini (2020), online learning brings problems for students, teachers, professors and parents because the mastery of technology is still low, additional tasks for parents in guiding learning, additional educational costs for quotas, low intensity of communication between professors and students, irregular working hours and coordination between both of them. The combination of face-to-face (offline) and online learning is necessary to mitigate the effects of learning loss. Quality learning outcomes are also determined by the effectiveness of learning time, an aspect that is a major challenge in implementing online learning. Students usually have difficulty determining effective learning time at home because the family environment does not support students' focus on learning. The better the coordination, the more comfortable the students feel, so an increase in the dropout rate can also be prevented.

3. Research methodology

The main purpose of the research has been to determine the perception of the Bucharest University of Economic Studies (ASE) community of students on the quality of the online teaching process, after almost two years of pandemic. The data required to reach this purpose has been obtained through selective research (survey) on the ASE students, from all faculties (11 faculties), cycles of education (bachelor's degree, master's degree) and years of study (five years of study). The research took place during the September-October 2021 period when the survey questionnaire was distributed and filled out online by a sample of 1952 respondents.

The detailed objectives of the research were the following:

- Obtaining feedback on the quality and efficiency of online education;

- Identifying the need for digital training for students as well as for teachers;
- Identifying administrative problems encountered throughout the entire period of online teaching activities.

Taking into account these objectives, the survey questionnaire was comprised of a set of 19 questions and was structured into three parts, as follows:

- a six questions section dedicated to the general assessment of the digital education process and to the students' degree of accessibility to the digital education activities (electronic devices, Internet connection, etc.);
- a six questions section aimed at assessing the digital skills of the participants to the online teaching process and the need for additional training in this field;
- a seven questions section regarding the quality of electronic platforms placed at the disposal of actors involved in the online teaching process by the university, as well as identifying the setbacks encountered in accessing and using these electronic resources, or in communicating with the teachers and administrative structures within the university/faculties.

Furthermore, with respect to the identification variables, the respondents were asked to specify the faculty they attend, the education cycle and the year of study. Regarding the processing of responses, this study has applied a varied system of scaling methods, after which descriptive statistical methods specific to univariate data were applied.

4. Results and discussions

4.1. Sample structure according to segmentation variables

From the total number of respondents in the sample, the majority - almost 400 - were students of the Faculty of Accounting and Management Information Systems (representing approximately one fifth), then students of the Faculty of Economic Cybernetics, Statistics and Informatics (CSIE) (289 responses, respectively 14.8%) and students of the Faculty of International Business and Economics (REI) (264 responses, representing 13.5%) - Figure 1. Students attending university programmes within the bachelor's degree cycle participated in the survey to a greater extent (86.4%) than masters' degree students (13.6%), which is over 6 times more. Within each education cycle, the response frequency was higher in the case of students from beginning years of study, outlining a decreasing trend of these frequencies as the students were closer to terminal years (Figure 2).

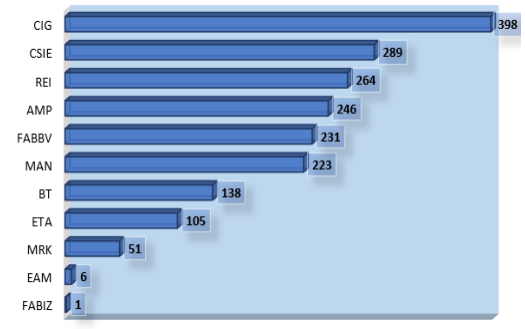


Figure no. 1. Response frequency by faculty (number)

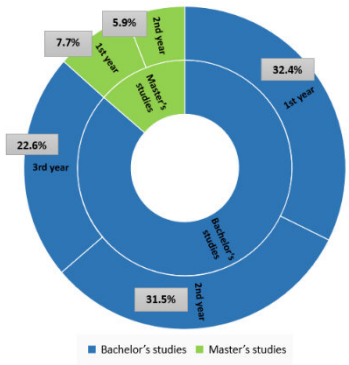


Figure no. 2. Sample structure by education cycle and year of study (%)

4.2. Characterisation of the online teaching process accessibility and quality

Approximately 70% of respondents in the sample appreciated the educational activity performed online within ASE Bucharest as "Good" or "Very good" (40% - Good, 30% - Very good). Only 7.7% of the students included in the sample had an unfavourable opinion of this activity. In any case, it is evident that the distribution of respondents by their feedback regarding the quality of the digital education process during the COVID-19 pandemic presents negative skewness, with a significant predominance of positive opinions related to this process. (Table 1, Figures 3 and 4).

Table no. 1. Overall opinion on online teaching activity

Overall opinion	Frequency	Valid Percent	Cumulative Percent	Descriptive Statistics	
Not good at all	150	7.7	7.7	Median	4
Less good	283	14.5	22.2	Mode	4
Indifferent	155	7.9	30.1	Percentiles	
Good	780	40	70.1	25	3
Very good	584	29.9	100	50	4
Total	1952	100		75	5

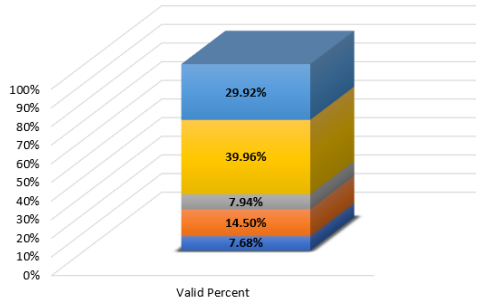


Figure no. 3. Distribution of respondents according to the general opinion on the online teaching activity

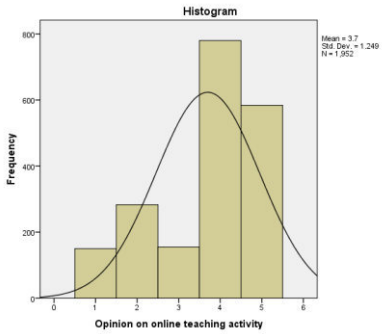


Figure no. 4. Sample structure according to the general opinion on the online teaching activity (%)

Regarding the availability of technical means for students to access online education, the results show that there were no major impediments in this regard. Thus, 87.8% of the students participating in the research state that they have access to a device for participating in online teaching activities, while less than 2% of them say they don't have one, or that they have to share it with someone else. Most respondent students use their laptop to participate in online teaching Activities (81.4%), only 9.5% use a mobile phone for this activity. 88.2% of students have adequate internet access, 10.8% have limited internet access, while only 1.1% of them have no internet access at all.

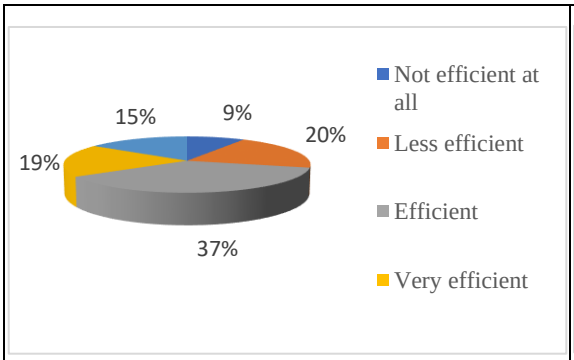


Figure no. 5. Distribution of respondents according to the opinion on the online teaching activity effectiveness

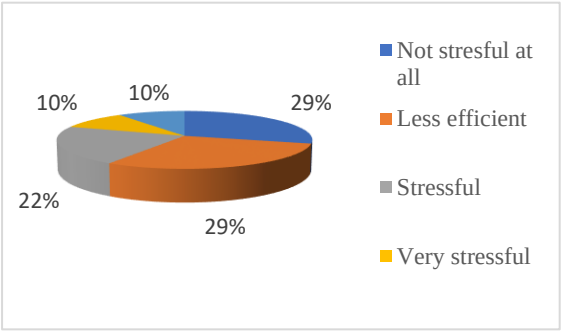


Figure no. 6. Distribution of respondents according to the opinion on the stress generated by the online teaching activity

The assessment of the online education effectiveness indicates that most students consider that from their perspective this process has proven to be effective (724 responses, which is over 37% of the total number of responses), for 395 students online education was less effective (20.2%) and for 366 - very effective (18.8%). In other words, there is an approximately symmetrical distribution of respondents according to this variable (Figure 5). From the perspective of stress, the online teaching process does not generate a particular degree of stress for respondent students, almost 60% of them declaring that online education is "less stressful" or "not stressful at all". 21.6% have found this process "stressful" and the rest - "extremely stressful "or "very stressful" (Figure 6).

4.3. Characterising the digital skills of the participants to the online teaching activity

The purpose of the questions in this section of the questionnaire is for the students to assess the level of their digital skills, which are necessary for the participation in the online education process in good conditions and with good results. As a result, slightly over 71% of respondents completely agree with the statement "I possess the digital skills required to participate in the online teaching activity", while 17.6% agree with this statement. Only 2% of the surveyed students disagree or completely disagree with the aforementioned statement, which shows that most students fully trust their digital know-how.

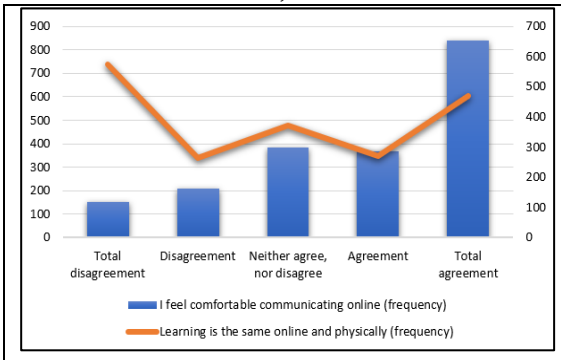


Figure no. 7. Respondent distribution according to the agreement/disagreement with the following statements: "*I felt comfortable communicating online*" **and** "*Learning is the same online and physically*" (number)

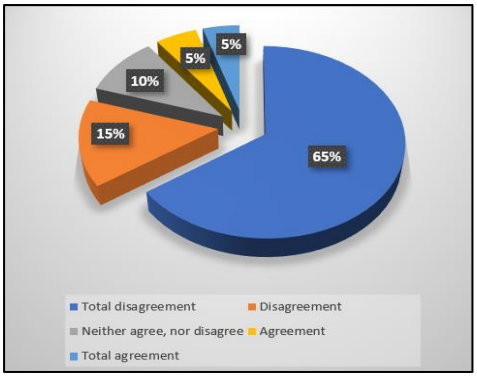


Figure no. 8. Sample structure according to the agreement/disagreement with the following statement "*I need training for digital skills***" (%)**

Almost three quarters of students who participated in the survey feel comfortable communicating online (Total agreement), just 7.8% of them having encountered difficulties in this regard (total disagreement). Comparing the online education process with the classical one (face-to-face learning), opinions are approximately symmetrically distributed: between 24 - 30% of respondents either totally agree, or totally disagree with the fact that there is a similarity between the two types of learning, and approximately 13% either agree or disagree with this fact (Figure 7). Additionally, over half the respondents consider they have absolutely no need of training to enhance their know-how in the digital field (65%), while only 5% of the students totally agree with this fact (Figure 8).

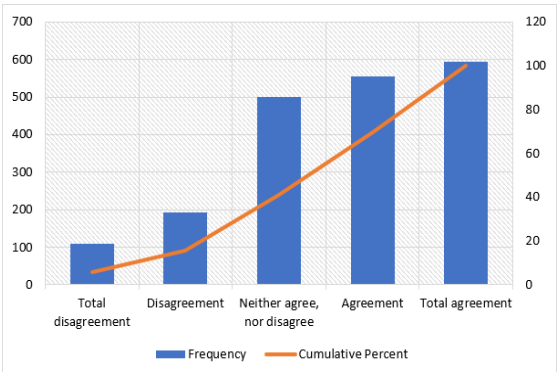


Figure no. 9. Distribution of respondents according to the agreement/disagreement with the following statement: "*Teachers have the necessary training for online Activities*" (number)

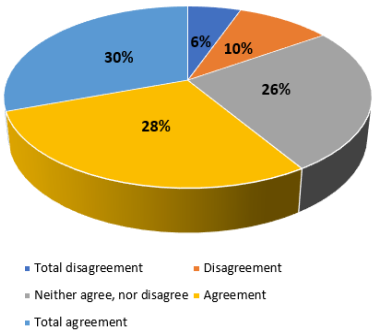


Figure no. 10. Sample structure according to the agreement/disagreement with the following statement: "*Teachers have the necessary training for online activities*" (number)

When it comes to the other participants in the online education process - teachers, the opinions of respondent students regarding the necessity to optimise the professors' digital skills through training are more evenly distributed. As a result, over half the students included in the survey consider that the teachers' digital skills do not require improvement through further training (30% - Total agreement, 28% - Agreement), other 20% neither agree, nor disagree with this statement. Only 15.5% of students consider that the teachers' level of digital know-how is insufficient, therefore requiring improvement (Figures 9 and 10).

4.4. Identification of difficulties in accessing and using the electronic platforms used in the online education activities

Performing online education activities is not a process devoid of difficulties. In the opinion of the students who participated in the survey, the difficulties in accessing the digital platforms placed by ASE at the disposal of students and teachers were encountered with relatively reduced frequency. 73% of respondents encountered no such difficulties in accessing the www.webstudent.ase.ro platform, while almost a quarter of them sometimes encountered such difficulties. The percentage of students who encountered no impediments in accessing the www.online.ase.ro platform was slightly inferior (62.4%) compared to the first platform, however reaching a high level; almost one third sometimes encountered difficulties in accessing it (Table 2).

Opinion		Difficulties in accessing	
		the webstudent platform (%)	the online.ase platform (%)
Valid	Yes	2.8	4.6
	Sometimes	24.2	32.9
	No	73	62.4
	Total	100	100

Table no. 2. Difficulties in accessing digital ASE platforms (%)

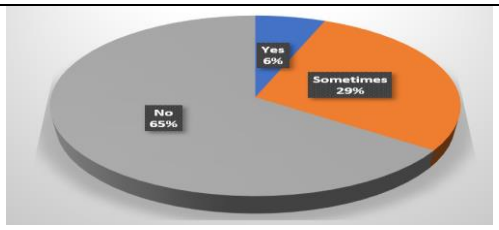


Figure no. 11. Communication problems with teachers (%)

65% of the respondent students had no difficulties in communicating online with the teachers, while 29% of respondents sometimes encountered such problems (figure 11). Students did not highlight any special problems in communicating with the administrative structures within the university/faculty in the period of online teaching activities, most of them admitting to having had no difficulties in this respect.

Conclusions

To sum up, based on the existing literature review and the most recent available data sets, four main conclusions emerge about the potential impact of Covid -19 on education. Firstly, student learning is expected to rebound on average. Despite the widespread shift to online instruction, student progress will not simply be the same as if schools were open for the past years. Secondly, the effect of Covid -19 on student achievement is likely to vary by socioeconomic status: students from less advantaged backgrounds are likely to experience a greater decline in learning than their better-off peers. Thirdly, during this time of need, inequality in socioemotional skills may also increase. Students from lower socioeconomic status were more likely to be exposed to stressful home environments than their peers from higher socioeconomic status. In addition, parents from more affluent backgrounds may have been better equipped in terms of socioemotional skills to deal with problems. Last but not least, the widening social gap in cognitive and socio-emotional skills created by Covid-19 may not only have short-term effects, but also long-term effects. This increased inequality may persist or even increase over time, affecting subsequent educational outcomes and future labor market performance. The field of education was one of the sorely tried fields in the context of the COVID-19 pandemic, which has had to reinvent itself to a certain extent, to adapt in order to ensure the continuity of the activity. The entire process of shifting the teaching activity online has, certainly encountered a series of difficulties, among which the need to stimulate the students' motivation, issues related to the infrastructure, necessary digital skills, limiting interpersonal interaction, ensuring the quality of the education process, and the Romanian university education was not fully prepared for this transition (Gutte, 2021; Coman et al. 2020). Following the survey of the students enrolled in the Bucharest University of Economic Studies, they had a high level of satisfaction related to the online teaching activity, with almost 70% of students surveyed having a good and very good opinion regarding this activity. Students feel comfortable with the activities performed online, the majority having the technical means as well as the digital skills required, and over 50% of them consider that the teachers have the necessary level of digital skills required to perform the teaching activities online. Concerning the comparison between the two education systems (physical presence and online), the respondents' opinions are split, the percentage of those who agree that the two processes are similar being approximately equal to the percentage of those who consider that the two systems are significantly different. However, the universities have strived to keep up with the challenges of online education, creating new electronic resources or perfecting the existing ones, in order to support and facilitate the learning process. As a result, less than 5% of the ASE students surveyed declared that they had difficulties repeatedly or continuously in accessing the digital platforms placed at their disposal by the university. The results obtained by this research have led to a series of proposals for the successful adjustment of the classical education to a hybrid model.

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The Risk of Automation of Occupations at European Level

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Abstract

The research paper aims to estimate the risk of automation of occupations defined by the ISCO-08 standard, at European level. The idea came from the work of the pioneers of this subject, Carl Benedikt Frey and Michael A. Osborne. Basically, we will highlight the importance of skills and knowledge in determining the risk of job automation at European level. For this we used logistic regression, which helped us to classify occupations according to the risk of automation. The results indicate that occupations that require knowledge in the fields of agriculture, forestry, fisheries, veterinary, natural sciences, mathematics, statistics, social sciences, journalism and information, but also those that require skills such as communication, collaboration, creativity and management skills, have a lower risk of automation. The risk of automation is increased instead for occupations that require skills in the categories of information skills and handling and moving skills. More specifically, occupations that involve a monotonous, repetitive activity and that require mediocre skills and knowledge, will be replaced by technology. The solutions offered by technology will be much more efficient than a human resource. Obviously, this automation will not happen for all countries at the same time and will not have the same consequences.

Keywords

automation risk; skills; labor market, digitization, logistic regression.

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Introduction

Industrialization 4.0 has a variety of consequences, more or less positive for the workforce. The nature of the consequences is debatable and can be viewed from several perspectives. However, this industrial revolution, like the others so far, has pursued socio-human progress. The economy tends to streamline activities and work faster. Basically, this industrial revolution proposes new ways of doing things, innovative ways of testing the adaptive spirit of the workforce in the economy.

Automation seems to affect the workforce differently, in the sense that professionals benefit from improved work, while for blue-collar employees it is a threat (De Witte and Steijn, 2000). Also, due to the cheapening of technology, it is more cost-effective for companies to replace the repetitive human labor force (Sebastian, 2018). Technology is an opportunity for the employee to facilitate his work, becoming a consultant in the activity he carried out, and artificial intelligence would perform the activities (Bissessur, Arabikhan and Bednar, 2019).

Thus, we considered it appropriate to identify areas in the labor market with a high risk of automation and what knowledge, skills and abilities they require. Automation is not a negative element for the economy, but it can be a risk for that segment of the workforce that cannot adapt to the new market conditions. The study started from the work of pioneers Frey and Osborne (2017), who proposed a certain classification of occupations according to the attributes of each occupation. The plus with which we come to complete their reasoning is that we will translate the algorithm on the European labor market and try to extend the forecast to the entire catalog of occupations described in ISCO-08. We intend to do this by using the supervised learning algorithm. This estimate will help us to identify the main risk areas of the labor market, but also what makes some occupations so risky. Today's society is no longer based on how much information we

have, but on what we do with this information and how it will help us survive the new economic current determined by digitalization. Human resources can develop their attractiveness on the labor market only by cultivating new skills needed in a digital economy, but also by developing its affinities.

1. Literature review

The labor market is a complex adaptive system, because the complex elements within it, which interact, have the ability to adapt. Some researchers who have studied complex systems have concluded that social systems can adapt, as opposed to physical ones (Miller and Page, 2007). In fact, the workforce needs to build a lifelong learning routine that trains them with intellectual flexibility and professional adaptability (World Economic Forum, 2018).

The uncertainty of predicting the future of the labor market, caused by the unprecedented evolution of technology, is another characteristic principle of the complex adaptive system (Horváth et al., 2019). We can say that the fear generated by the risk of job automation can be rational and justified by the pace of technology evolution (Kozak, et al., 2020). Over time, this research topic has been discussed by several authors. The extent to which new technologies can replace human activity in certain occupations, industries and which states have a greater predisposition to digitalization, but also which jobs will suffer notable structural changes (Arntz, Gregory and Zierahn, 2016; Frey and Osborne, 2017; Nedelkoska and Quintini, 2018; Pouliakas, 2018). It has also been shown that highly productive states have a high employment rate in sectors with a low risk of automation (Foster-McGregor, Nomaler and Verspa, 2021). However, it has been observed that people with a higher level of education have jobs that have a lower risk of automation and will also cause a wage imbalance in the labor market (Gardberg et al., 2019). The effects of technology on the labor market are not 100% certain, in the sense that we cannot say with certainty that human resources will be complementary to technology and that technology will act for the well-being of workers (Nazareno and Schiff, 2021). The transition to the green economy is a factor that determines the adaptation of skills on the labor market, creating both opportunities and risks for employees (Pașnicu and Ciucă, 2020). Regarding the situation at European average, around 33% (EUROSTAT, 2021) of the workforce is at risk of losing their jobs due to the automation of their employment.

2. Materials and methods

To develop an application based on which to predict the risk of automation of occupations we used the entire portfolio of occupations defined by Eurostat on the ESCO platform (European Skills, Competences, Qualifications and Occupations). The databases on this platform contain 2,942 occupations, 13,485 general skills, but also 500 transversal skills (European Comission, ESCO, 2021). In addition, we needed a risk indicator similar to that calculated by Frey and Osborne. Thus, we identified a site (https://willrobotstakemyjob.com/) that is updated and calculates in real time the risk of automation of occupations according to the model of the two authors mentioned above. As the probability of automation is calculated at the level of the United States, an adjustment of this probability was needed using a European digitization index calculated starting from the Digital competitivness ranking (IMD World Competitiveness Center, 2020).

The top analyzed contained 63 states, of which 31 are from Europe. The United States ranked first in digitization in 2020. To obtain an index describing digitization in Europe, we calculated the weighted arithmetic mean of the scores of each state included in the ranking. We considered that each state has a specific weight in the calculation of the index, which is why we chose this weight to be inverse rank. Thus, we established that the digitization index of Europe is 78.81, compared to the USA which has a score of 100. Next we used the difference between the United States and Europe, from the perspective of digitization, to adjust the risk of automation of occupations. The reasoning started from the idea that automation does not happen uniformly worldwide, but according to the possibilities related to infrastructure and knowledge in the direction of digitization.

$$Digitalisation\ Index_{EU} = 100 - \frac{\sum_{i=1}^{n=31}(Digital\ competitiveness\ ranking_i * Inverse\ rank_i)}{\sum_{i=1}^{n=31} Inverse\ rank_i} \quad (1)$$

After adjusting the risk of automation for each of the 707 occupations analyzed, it was necessary to map them according to the International Standard Classification of Occupations valid in Europe. Some of the occupations defined in the Standard Occupational Classification System, the United States standard, find an exact correspondent in ISCO-08. For some of the occupations the mapping was done approximately, based on the description that each of them has.

$$Adjusted\ automation\ risk_j = Automation\ risk_{USA,j} * (1 - \frac{Digitalisation\ Index_{EU}}{100}),\ \text{where j- jobs} \quad (2)$$

In order to estimate the risk of automation we used a supervised data learning algorithm, logistic regression. The specified algorithm is useful because some of the occupations have been labeled as automable or not, and we will use this information and the specifics of each occupation to find out the risk of automating occupations that have similar specifications. Estimated regression model:

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta_i x_i\ , \qquad i = \overline{1,7} \quad (3)$$

where:

ODD ratio = $\frac{p}{1-p}$

$\beta_i x_i\ ,\ i = \overline{1,7}$, are the coefficients of the explanatory variables in the model

$p = \frac{e^{\alpha+\beta_i x_i}}{e^{\alpha+\beta_i x_{i+1}}} = \frac{1}{1+e^{-(b^{\alpha+\beta_i x_i})}}$, , $i = \overline{1,7}$, is the probability of occurrence of an event

3. Results

We selected a sample of the 707 occupations, which should respect approximately the general structure of the population. For this step we used a training base of 230 observations and a test base of 94 observations. The dependent variable used is precisely the risk of automation of the occupation, and as explanatory variables we used the categories of skills necessary to perform the activities within an occupation, presented in Tab. A1. Although the risk of automation has values between 0 and 1, we decided that occupations with values below 0.5 should be classified as without risk of automation, and those with values above 0.5 should be considered with a high risk of automation. This adjustment is justified, if we consider, for example, the possibility of whether or not that job still exists. In principle, if an occupation has a high risk of automation (over 0.5), it will certainly disappear, but it is possible to find another occupation somewhat similar, but we are already talking about another occupation / job.

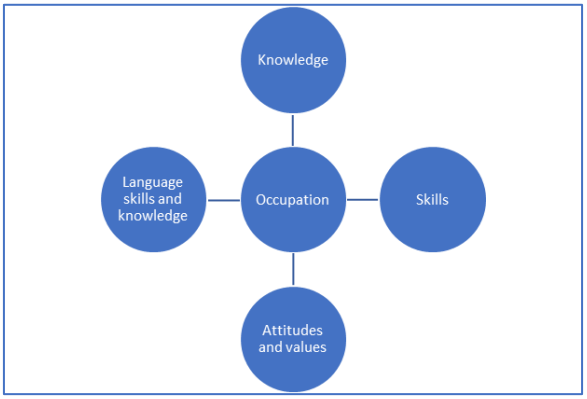


Figure no. 1. Occupation structure

ESCO presents the skills pillar in the form of a hierarchy of concepts containing four categories: knowledge (K); skills (S); attitudes and values (A); language skills and knowledge (L). The explanatory variables used in the application card indicate the number of skills or competences in the specified category, required in each type of occupation. Each occupation may require either all the categories described in the skill hierarchy or different combinations of them. In turn, these categories can be segmented to a very particular level. The working hypothesis according to which the automation risk can be calculated as a result of segmenting an occupation according to its basic activities and correlating them with the skills and knowledge necessary to perform them.

The concept of knowledge mainly refers to the qualifications acquired in one of the fields of activity defined in the Statistical Classification of Economic Activities in the European Community. Thus, starting from the 21 categories of economic activities (EUROSTAT, RAMON) ESCO groups the knowledge into 12 main categories, covering the entire universe of occupations. The first category of knowledge is the category of knowledge in the field of agriculture, forestry, fish farming and animal husbandry. The second category of knowledge includes the humanities and the arts. The third category of knowledge consists of the notions of business, administration and law. The necessary knowledge in the field of education forms an independent

category. The 5th category is represented by technical knowledge in the field of engineering, manufacturing and construction. Another very important category of knowledge is in the field of health and social welfare. The following category indicates internet communication and technology knowledge. Category number 8 includes knowledge in the field of natural sciences, mathematics and statistics. The field of services also requires specific knowledge classified separately. We can also identify a category of knowledge in the field of social sciences, journalism and information. A separate category has been created for programs and general qualifications that a person can obtain. A previously unclassified group of knowledge has also been built.

Skills are capable of being developed that an individual must have in order to learn more easily (O*Net OnLine, 2021) or to be more efficient in the workplace in the performance of their duties (Gouvernment of Canada, 2021). According to ESCO, the skills were divided into 8 categories. The first category consists of 3 of the 4Cs that define the basic skills of the 21st century: communication, collaboration and creativity (Stauffer, 2020). The second category brings together the informational skills of manipulating data and information, which are essential for autonomous learning (Pinto, Doucet and Fernandez-Ramos, 2010). A very important category of skills are those of assistance and care. This category of skills is a little different from the others, because they are also an emotional component (Pietrykowski, 2017), which is why it is a little harder to imitate by Artificial Intelligence, but not impossible. Robots can develop care and health care skills by learning (Möller et al., 2021). Managerial skills are an important category needed in the labor market and encourage the creation of an organizational culture (Shamsi, 2017). Computer skills category is the most important skill group in the digital economy (Falck, Heimisch-Roecker and Wiederhold, 2021). A distinct skill category consists of skills in handling tools and equipment. The field of construction involves a series of skills that have defined a different group. The last category of skills refers to the use of specialized machines, machinery and equipment.

Basic concepts that describe skills are also attitudes and values. Attitudes are ways in which an employee can react in a given situation at work. Values are concepts and perspectives that an employee must have depending on the activity they carry out. Jobs sometimes explicitly require attitudes and values that employees have. Last but not least, language skills are quite important in the workplace. Linguistic knowledge is divided into two categories: knowledge of foreign languages and knowledge of classical languages.

Given the skills classifications presented above, we counted how many skills in each category are required for each job analyzed. Thus, the explanatory variables in the job classification model according to the risk of automation are represented by the number of skills in each category, necessary for carrying out the activity. Initially, we introduced in the model all the variables from Appendix 1, but due to the lack of representativeness for some of them, we kept only those with explanatory power (Table no. 1).

Table no. 1. Logistic regression coefficients

	B	**S.E.**	**Wald**	**Sig.**	**Exp(B)**
K1	-0,37568	0,164451	5,218671	0,022346	0,686823
K8	-0,38634	0,127628	9,163217	0,002469	0,67954
K10	-0,734	0,41038	3,19904	0,073682	0,479985
S1	-0,14592	0,043941	11,02856	0,000897	0,864223
S2	0,138425	0,041447	11,15445	0,000838	1,148464
S4	-0,11327	0,057563	3,872325	0,049088	0,892906
S6	0,144192	0,054145	7,09185	0,007744	1,155106
Constant	0,062878	0,416581	0,022782	0,880025	1,064897

Source: own processing in IBM SPSS Statistics

According to the result of the logistic regression model, the risk of automation of occupations is positively influenced by information skills, but also handling and moving skills. The risk of automation is negatively influenced by three categories of knowledge, but also by an ability that is not related to theoretical knowledge. Estimated regression model:

$$\widehat{risk} = -0.3757 * K1 - 0.3863 * K8 - 0.7340 * K10 - 0.1459 * S1 + 0.1384 * S2 - \\ -0.1133 * S4 + 0.1442 * S6 \quad (4)$$

Thus, we note that the risk of automation is reduced by 31% in occupations that require as much knowledge as possible in the field of agriculture, forestry, fisheries and veterinary. Occupations that require as much knowledge as possible in the field of natural sciences, mathematics and statistics have a 32% lower risk of automation, and occupations that require knowledge in the area of social sciences, journalism and information have a 52% lower risk of automation. There are also skills that reduce the risk of automating

an occupation. These skills we are talking about are those in the category of communication, collaboration and creativity (reduces the risk of automation of occupations by 14%) and in the category of management skills (reduces the risk of automation by 11%). We also identified two groups of significant skills that increase the risk of automation of the analyzed occupations. These skill groups are information skills and handling and moving skills. If an occupation requires more skills in the information skills category, it has a 15% higher risk of automation, and if an occupation requires more skills in the handling and moving skills category, it has a 16% higher risk of automation.

Table no. 2. Confusion matrix for training sample

MODEL			
	PREDICTED		
OBSERVED	0	1	TOTAL
0	143	15	158
1	35	37	72
TOTAL	178	52	230
MODEL			
Accuracy	78%		
Sensitivity	51%		
Specificity	91%		

Table no. 3. Confusion matrix for test sample

TEST			
	PREDICTION		
OBSERVED	0	1	TOTAL
0	48	7	55
1	21	18	39
TOTAL	69	25	94
TEST			
Accuracy	70%		
Sensitivity	46%		
Specificity	87%		

Source: own processing in Microsoft Office Excel

The estimated logistic regression model has an accuracy of 78% (Table no. 2), and on the test sample we obtained an accuracy of 70% (Table no. 3). The difference in accuracy between the estimation on training and the test is reasonable to avoid overfitting estimation. Because in reality the "positive" event is a negative one, when the false positive rate is higher it is not necessarily a deficiency, but if the false negative rate has an impact that is not beneficial. Sensitivity has a percentage of 52%, which means that approximately 52% of the analyzed occupations that risk automation were correctly predicted through the model. In terms of specificity, we have a percentage of 91%, so that the model correctly predicts in this proportion the occupations that do not risk being replaced by automatic technologies. Taking into account the results obtained based on the estimated regression model, we will further calculate the share of jobs that risk automation, depending on the category of occupations to which the job belongs (Table no. 4).

Table no 4. International Standard Classification of Occupations 2008 groups (ISCO-08)

ISCO-08 code	ISCO-08 name	Percentage of jobs with automation risk
0	Armed Forces Occupations	10%
1	Managers	10%
2	Professionals	7%
3	Technicians and Associate Professionals	21%
4	Clerical Support Workers	17%
5	Services and Sales Workers	12%
6	Skilled Agricultural, Forestry and Fishery Workers	34%
7	Craft and Related Trades Workers	81%
8	Plant and Machine Operators and Assemblers	84%
9	Elementary Occupations	84%

Source: own processing in Microsoft Office Excel

Thus, we notice that jobs in the category of elementary occupations, plant and machine operators, but also in the category of skilled workers have a very high risk of automation. Approximately 84% of the jobs in the first two categories of occupations indicated above are at risk of automation. Approximately 81% of jobs in the category of occupations Skilled and assimilated workers are at risk of automation. Of the jobs analyzed in the category of skilled workers in agriculture, forestry and fisheries, 34% risk automation. Also with an average share of automation are jobs with the code ISCO-08 3,4 and 5. Only 10% of jobs in the category of managers and armed forces laugh to automate. Occupations in the specialist category do not have a risk of automation in Europe, noting that only 7% of the jobs analyzed have a risk of automation.

Conclusions

The automation risk was estimated as a European average. At the level of each state the situation can be slightly different. For example, Denmark has a very high degree of digitization, very similar to that of the United States. This thing may indicate that the risk of automation for some occupations may be higher. At the opposite pole is Ukraine, which would have a lower digitization rate than the European average.

Basically, this risk of automation indicates that currently the solutions offered by technology can perform certain tasks that make up the normal activity of an occupation. Every occupation requires certain skills and knowledge that may or may not be replicated by technology. Of course, these technology solutions can have high costs, costs that investors or the state cannot afford every time.

The main purpose of the research was to exploit the specifics of each occupation and how much it correlates with the risk of automation. In principle, all skills are important, but some are more abundant than others, and some better describe the risk of being taken over by robots. The results showed that occupations that are mostly operational, manual or information storage can be easily replaced by technology. It is much more efficient to use a solution offered by technology, which has an unlimited capacity to store information and knowledge, but also which can have an exponentially higher production capacity than a human.

Thus, we noticed that jobs that require a greater number of skills in the category of information skills and handling and moving skills have a higher risk of automation, while jobs that require more managerial skills, but also skills of communication, collaboration and creativity do not risk being automated. In fact, we noticed that certain groups of knowledge reduce the risk of automation, namely: knowledge in the field of agriculture, forestry and fish farming; knowledge in the field of natural sciences, mathematics and statistics; knowledge of social sciences, journalism and information.

It is not the jobs that are automated, but the tasks that make up a particular job. The more skills a job requires that can be automated (repetitive, simple), the more likely it is to be automated in the future. The solution to reducing technological unemployment, which is a direct result of task automation, could be to redefine jobs so that the employee can better exploit their skills that can be successful in the digital age and that can add value.

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Appendix A

Abbreviations used

A1	Number of attitudes	K11	Number of generic programmes and qualifications knowledge
A2	Number of values	K12	Number of field unknown knowledge
K1	Number of agriculture, forestry, fisheries and veterinary knowledge	L1	Number of languages
K2	Number of arts and humanities knowledge	L2	Number of classical languages
K3	Number of business, administration and law knowledge	S1	Number of communication, collaboration and creativity skills
K4	Number of education knowledge	S2	Number of information skills
K5	Number of engineering, manufacturing and construction knowledge	S3	Number of assisting and caring skills
K6	Number of health and welfare knowledge	S4	Number of management skills
K7	Number of information and communication technologies (icts) knowledge	S5	Number of working with computers skills
K8	Number of natural sciences, mathematics and statistics knowledge	S6	Number of handling and moving skills
K9	Number of services knowledge	S7	Number of constructing skills
K10	Number of social sciences, journalism and information knowledge	S8	Number of working with machinery and specialised equipment skills

Source: own production based on ESCO Platform (https://ec.europa.eu/esco/portal/skill)

The Vaccine Chessboard: China's International Interactions in Times of Pandemic, from Inter-Actor Agreements to Foreign Policy Approaches

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Abstract
COVID-19's pandemic outbreak, and its modulations, swiftly reshaped systemic interaction patterns across the international arena. Thus, vaccines became essential goods, transforming health, from a peripheral field, into a vital tool, whose instrumentalization led to a suite of agreements and foreign policy approaches to emerge.
This paper aims to analyse, through qualitative techniques, how PRC's external behaviours, in times of pandemic, have overlapped with medical normative frameworks and vaccine-driven trade arrangements, as a form of smart-power dissipation. In this sense, we conducted a comparative analysis of China's diplomatic and trade relations' evolution, in the global range, sectioned into major continental boundaries (Africa, Latin America, Asia, Western), due to the communality of challenges between actors, within the pandemic's timespan, aspects that were not present, in this manner, within the body of specialty literature. Through the study of secondary data, together with an in-depth observation of specificities, underlined when juxtaposing the normative, paradigmatic and operational realms of PRC's cross-border actions, we were able to interpret and present an encapsulated (each section having its own methodology-results cycle applied) overview of vaccine diplomacy's omnidirectional deployment. Our research revealed that PRC, through distribution networks and branding of medical elements as IPGs, initially focused its efforts in former strategic areas and power voids, as means to establish new bridges, pivotal points or amplify its presence. A strategy which, albeit initially fruitful results, regarding political power poles or economic centrifugal forces' creation, brought mixed end-results, especially when it was later met by other actors' pushes. With this our research paves the way for prospective explorations, especially more concentrated ones, enabling a better apprehension on how smart power usage can be employed by statal and non-statal actors, as a mean to promote their own foreign agendas, in various non-traditional and connex fields such as the case of vaccines.

Keywords

Vaccine diplomacy; People's Republic of China; Foreign policy; multilateral agreements; soft power; trade arrangements.

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Introduction

From the moment the Covid-19 pandemic became a global phenomenon it transformed health from a conceptualization, rather peripheral or adjacent to inter-actor arrangements, especially commercial agreements, into an element that took primacy in numerous agendas (Shatz, 2021). Furthermore, there is a variety of works which showcased how no singular actor possessed neither the capacities and capabilities to produce or procure the entirety of necessary goods, needed to counter such a widespread medical crisis, in parallel with its ripple disruptions, in an autarchic manner (OECD, 2020; Shatz, 2021). As both aspects merged, paving the way towards the globe's newest negotiation table, based on increased interdependent

dynamics needed to tackle such non-human formations, vaccines and other medical advancements became universalized bargaining chips.

Albeit the emergence of vaccine-spearheaded systemic influence projections, the need to regulate network flows of medical goods or services was hampered by new agreements negotiation's cumbersome procedures, aspects which would have fostered the establishment of coherent pandemic policies across the international spectrum. On the other hand, such gaps in present-day policies' effectiveness favoured People's Republic of China's deployment of vaccine trade, in complementarity to a suite of other medical elements, as an instrumentalization of alternative diplomatic and foreign policy approaches, especially vis-à-vis of soft and normative power pivots' dissipation, within its own decade-long foreign policy lines (Ding and Panda, 2021).

Thereafter, in the pandemic's incipient stages, crisis management measures were marked by an exponential increase in vaccine nationalism tendencies, especially across the *demos*, all while actor's behavioural patterns followed suite. In this regard, governmental and legislative agencies, already under tremendous internal and external pressures, were forced to securely forestall the doses' supply chains, as a way of leveraging enhanced crowd immunisation, which led to Advance Purchase Agreements' (APAs) usage by countries with higher GDP rates. This went up to a point where ¼ of the globe's population had pre-ordered billions of doses (some of which later donated or destroyed due to expiry dates), with some states having secured, in a matter of months from the virus' discovery, more than 60% of their national need, as part of broader vaccine-nationalist trends, which later spiralled into a true tragedy of the commons, in part due to the commonality of challenges faced and individualistic behaviours exerted (Sharun and Dhama, 2021). It can be observed that, through these agreements, higher-income countries prioritised, or even monopolised, their access to vast amounts of vaccine doses and other medical goods, sometimes at the expense of lower-income countries (McAdams et al., 2020). In addition, with every new international agreement that was signed, PRC's image as vaccine and medical developer, manufacturer and supplier increased, as it became the largest producer of four primary vaccines and numerous secondary ones, reaching by March 2021 33% of global doses with an export rate of 62%.

So far, trade-driven omni-directional interaction assemblages in this sector are divided between two major pivotal areas, with the European Union and United States of America being at the centre-stage of normative-based distribution, especially leaning towards high-income buyers (as larger quantities are preferred), while the Republic of India spearheads shorter-term focused deliveries into emerging markets, with lesser legal prerequisites. As far as the PRC is concerned, a much broader orientation towards the whole spectrum of foreign medical collaboration networks and cooperation frameworks can be noted, alongside an exponential spike and overall repositioning underlined, when compared to mainly domestic-driven pre-pandemic markets or regional formats (Guetta-Jeanreanud, Poitiers and Veugelers, 2021). Furthermore, amid global economic slowdown and sectorial shutdown, entrenched into individualistic separation or autarchic statal behaviours, Chinese firms pledged to send abroad over 400 million new vaccine doses, although at that time it managed to immunise mostly essential personnel, high-risk persons, and diplomatic staff (Segev, and Lavi, 2021).

If we were to juxtapose these elements, with other connex elements found in the broader literature, as part of a qualitative analysis, we could observe the ways in which PRC's international approaches have shifted during the pandemic crisis, especially in terms of trade-driven inter-actor formats of collaboration and foreign policy projections, all of which form the basis for the paper's main research question. Thus, certain variations can be noted, through an in-depth analysis of secondary data, based on the selection, extrapolation and interpretation of specialised literature and documents, at the present juncture, in terms of systemic medical distribution patterns, compared to pre-pandemic periods. Elements and specificities that are particularly underlined when overlapping both the legal ramifications, within the internal community, and the foreign policy tendencies or avenues that were instrumentalized by the People's Republic of China through, with and within the medical sector, in times when it engulfed almost all the Globe's agendas, as a paradigmatic interpretation. All of the analysed juxtaposed aspects, temporarily structured within the pandemic timeframe, apart of when comparisons with the general status quo, Beijing's external alignment or pre-existing normative frameworks are needed, are spatially coagulated into a continental logic, due to the commonality of particularities found between those actors, structure which delineates the analytic spheres within the bulk of the work into smaller-sized capsules. Each of them possesses its own modular and self-oriented literature, results and discussion, while the methodology applied remains unitary, sole exemption being the introduction and conclusion which switch from the bottom-up approach towards a singularized and uniformized bird-view scanning of the subject at hand. This is due to the fact that it enables and easier reading, simplifies the writing and maintains the structural cohesion of the works' body, all while allowing for easier extrapolations and comparisons to be made between the continental spheres.

1. Vaccines – a global juxtaposition of commercial interests and diplomatic strategies

Africa – feeling and filling soft power's voids

The modern times African continent is nothing like it was decades ago, yet, albeit a plenitude of forward leaps, the fact that it is sometimes overlooked or even shadowed by bigger actors' interactions remains a constant, one which often forestalls its ascendency on the international stage. Such aspects generate both voids and surges in power dissipation, across a palette of pivotal strategic interests' areas, the latter transcending its focalized or intrinsic modulations, through continental ripple-effects or spill overs, primarily in times of crisis, into a grand opportunity to project, regardless of the level, soft and hard power manoeuvrings from abroad, chances whose instrumentalization was gradually perfected by the PRC (Itugbu, 2021; LSE Ideas, 2021).

Thus, to achieve and secure its long-term strategic aims, Chinese entities, agencies, or representatives sought to strengthen diplomatic ties with their counterparts within the African continent. As way of example, the summer of 2020 was marked by President Xi Jinping's assurance of HM King Mohammed VI of Morocco, during a bilateral conversation, that Chinese vaccine's goal is to become a „global public good" and that its distribution is part of Beijing's vision of a „shared future for the people of the world to work as one", like positions taken during World Health Assembly meetings (MFAPRC, 2020). Concomitantly, Wang Yi, PRC's foreign minister, embarked on a continental tour, as to attract and offer investment guarantees to both favourable partners and those that weren't quite aligned, in addition to promote vaccines as IPGs (international public goods that are nonexcludable, non-rivalrous, and globally available) or as Global Commons, its meetings being held in DRC, Botswana, Tanzania, or Seychelles, by way of example to illustrate Beijing's orientations in terms of early-stage medical cooperation against the pandemic (Zhao, 2017; Barabanov et al., 2020).

Despite PRC's efforts to cosmeticize its image at a continental level, there were still some states which did not hesitate to show their animosity or even confront the *dragon*, believing that every dose was dripping its influence. Nigeria for instance was a strong opposant of Beijing's actions, with even medical personnel being met by equally forceful responses from the national authorities, especially as its leaders tried to showcase how PRC's infection rates were higher than the Global South's and that Nigeria already possessed well-trained medical corps able to act across the borders (Staden and Wu, 2021). Thereafter, some of PRC's diplomatic endeavours and foreign policy approaches, in juncture with its pandemic efforts, where forestalled by the nationalistic, populistic, or extremist tendencies of some of the actors, the latter determined to play either a self-reliance card or a trans-regional grandiose positioning. Aspects that can be explained as countermeasures to what Nye (2008) described as „power of co-optation" to „obtain desired outcomes through attraction", especially since the current systemic foreign policy endeavours had unprecedented individualistic and competitive behaviours across the spectrum, aspects never foresighted, even in the most extreme, pre-Covid-19, conceptualizations of global health interactions and vaccine diplomacy (Katz et al., 2011; Kelman, 2019).

Even across the MENA regions such endeavours fluctuated, yet during a visit to Iran, Saudi Arabia, UAE, Turkey, Oman and Bahrain, Wang Yi promoted, alongside medical solutions' distribution and donation, a multilateral vaccine production facility, similar to Africa's CDC, as a part of broader plans to „deepen vaccine cooperation in the light of the needs of regional countries, an idea often employed across Beijing' strategic documents and regional prospective pathways (Woertz and Yellinek, 2021).

Latin America – vaccine-fuelled modern-day space race, on earth.

For the Latin American continent, PRC's relations are defined by clustered patterns of coagulated interactions, which commonly takes the form of in bloc exchanges with the Community of Latin America and Caribbean States (CELAC). This continental umbrella, originally created during the Latin American and Caribbean Unity Summit on Integration and Development (CALC) in 2010, formalised its unitary functions with Caracas Declaration' signage in 2011, which in turn laid off its main core: the establishment of a shared common cross-border political, economic, social, and cultural space, and the alignment of prospective developmental avenues in these strategic sectors (Soria and Herrera-Vinelli, 2020; CELAC, no date; MFAPRC, 2021).

The idea of vaccine diplomacy looked like a race against the clock, especially in the Latin Americas, in which statal authorities, private entities, civil societies and even entire international communities or organisms sought to reach the finish line first and pioneer entire support schemes overseas. From this perspectives, western countries had a relatively moderate progressive slope, with the United States, for instance, sending out the first doses of vaccine by June 2021, while their eastern counterparts have already

begun shipments as early as March. Furthermore, Brazil served as a continental springboard, with July 2020' Sinovac trials that were the first tests conducted abroad and a mark of credibility, alongside steppingstone for more in-depth collaboration assemblages, which were only rejected by Suriname and French Guyana in the end (Locke, Iancu and Kappos, 2021).

Apart of having 21 partners, which received 10 mil. doses in donations, some even under the auspices of South-South Cooperation and Belt and Road Initiative frameworks, alongside 396 mil. more in sales, out of which 230 represent Sinovac's ¼ of global transactions, as of 2022, there are some countries that embarked on a FP rollercoaster (BRIDGE, 2022). An example would be Paraguay, one of the few to recognize the Taiwan area as independent, which received 20.000 doses through Chile and almost passed a bill to open relation channels with Beijing, of course in exchange for a more favourable approach to the Two China's Issue, with Nicaragua being one of the players who chose the latter course of action (Karásková and Blablová 2021; Voss, Zhou and Shuldiner, 2021).

Asia – a silent dragon and a responsible power

PRC, alongside almost all its public, private or governmental entities, has taken numerous initiatives in regional multilateralism over the years, particularly in Asia, with a strong emphasis on the applanation of security dilemmas and dismissal of China's Threat Theory, especially as the latest Lowy Institute's Asia Power Index (2021) show a loss of comprehensive power across regional actors, with a tendency to asymmetrical power balancing acts, when compared to pre-pandemic levels. As to achieve this target, in conjunction with other strategic goals or generalised ambitions, of gaining primacy as a regional player and trans-continental actor, we can observe a wide array of soft power projection's usage patterns within Asian countries, more so than outside the latter's boundaries, with clear orientation towards the creation of a statal image as a „responsible great power" (Liao, 2012). Therefore, COVID-19 pandemic' systemic reverberations and modulations represented an opportunity to consolidate influence in Southeast Asia and capitalise on emergent political rearrangements within the ASEAN Regional Forum, amongst some of the first steps.

In respect to the crisis' management, actual support actions were doubled, by what seems to be a *praxis* in Beijing's vaccine distribution policy, or even a *modus operandi* for high-uncertainty times, namely a suite of diplomatic or official's visits to soon-to-be partner countries, overlapped with normative and declarative assurances from high-ranking representatives. A perfect example of wielding tight-knitted multi-actor collaboration networks would be China's build-up of interactions with ASEAN members, from early 2020's Vientiane (Laos) meeting, aimed at the promotion of pandemic cooperation, all the way to 2021's grand ceremonies held in Chongqing, which celebrated the 30th anniversary of bilateral relations. to promote pandemic cooperation all the way to 2021's grand ceremonies held in Chongqing (ASEAN, 2021). In this context, Wang Yi intensified his visits to ASEAN countries' frequency and hosted numerous encounters with his counterparts in the mainland, both acts seen as an indicator of regional close ties' importance for the state agencies, and as part of global health diplomacy intersection with trade (Chattu, Pooransingh and Allahverdipour, 2021).

In terms of normative and quantitative vaccine-driven connections, a simple look at the numbers showcases how, just within early pandemic Southeast Asia, more than 25.6% of China's international medical commitments, or over 203 million doses alone, were allocated to the area, with main buyers in the likes of Indonesia, Philippines and Thailand. Even in terms of donations and direct support offered, in the same timeframe, the region received 7.3 million (roughly 29%) out of the 25 million doses which Beijing globally distributed free of charge, a number closely followed by Africa (Khairulanwar, 2021). In this head-start game, even by December 2020, Indonesia already received its first 4 million doses, out of the 15-months plan to full immunisation by Chinese solutions since these vaccines posed lower technological challenges to manoeuvre and deposit.

Such behavioural patterns, founded on partnership and trade agreements, alongside numerous visits and even donations, contour a PRC willing to deliver on its promise that vaccines should be seen as global public goods alongside a benevolent approach driven on its policy of generosity.

2. Relations with the Westerners – between cooperation and competitiveness

East-West divides and linkages seem to have oscillated, since the first case of Covid-19 was reported, from collaboration attempts all the way to tacit struggles over vaccines' monopoly. In this context, we can deduce, by compiling the data offered by Think Global Health initiative of the Council on Foreign Relations, that leading powers pledged 2.7 billion doses in donations, with US' 1.1 bil., or almost 40% of donations, which also the highest per capita donation followed by Australia, PRC's 884 mil. by July 2021,

and EU's ½ bil. (Choi and Janke, 2021). In this sense, the EU has been relatively open to form partnerships with China, albeit it preferred to keep its stance and remain at arms lengths or at least reserved in face of vaccines developed in the East. On the other side of the scale, US' approaches did not fluctuate, both Washington and Beijing keeping alive existing divergences, especially if we were to search for proof of effective cooperation, since a simple look at some of the Senate's proposals, introduced in 2021, showcase a direct reference to endeavours needed to „counteract China's vaccine diplomacy" or develop a „Marshall Plan for global vaccinations" (Congress, no date). Furthermore, the US juxtaposed its stance, although a bit late in the game, within PRC' spheres, with actions like a 10$ per capita donation to COVAX, in comparison to Beijing's 7 cents, broader appeal of Quadrilateral Security Dialogue to provide international public goods or assume, in March 2021, a collective donation of over 1 bil. doses to the Indo-Pacific partners by the end of 2022.

As such, Eurasian interactions consisted mainly of mutual assistance in punctual matters, whereas Brussels' bloc showed support to PRC by specialised equipment donations, at the peak of infections, while the latter returned the favour when it was needed. Such endeavours and deals are an open door for European investors to access a 1.4 billion customers' market and compete more fairly with mainland entities, particularly facilitated by the medical fields (European Commission, 2020). However, no matter economic or political positions, we can observe how Brussels remained reluctant to adopt Chinese-developed medical solutions, as only a handful of partners, in the likes of Hungary or Serbia (marked with even an ambassador's visit at the airport), WB6, Ukraine, Moldova, Belarus etc., opted for large-scale vaccination with Chinese or Russian doses, until alternatives were introduced (Vucksanovic, 2021; ISPI, 2021; Leigh, 2021). If we look at the data collection from 2021, we underline how the first PRC's vaccine tranches arrived in Hungary and Serbia with 1.5 mil. and 0.5 mil doses by the end of February (up to 4.5 and 4.2. mil by 2022), with another 57 mil. sold to other countries, on top of which 123 mil. doses were donated indirectly by Turkey (in comparison to Beijing's official 3 mil.) as of this year (Stec and Poggetti, 2021; UNICEF, 2022; BRIDGE, 2022).

As Western and Eastern leading powers donated through strategic lenses, rather than equitability's prism, the result was an uneven dispersion of vaccines, primarily in pivotal and focal areas, within their own regional security complexes, based on international arrangement and normative assemblages, often in bi- or tri-lateral formats, and driven by the authorities' foreign policy perspectives. (Fetahu, 2021) Only in later stages, as some actors stepped on the pedal and others entrenched themselves, that multilateral endeavours started to sprout, an example being large development banks that allocated around 30 bil. USD to vaccine rollout in developing countries (World Bank Group's 20 bil., and Asian Development Bank's 9 bil.) or vaccine technological exchanges between academic and scientific communities.

Conclusions: The vaccine' shots were silenced

During the pandemic most countries associated unique nation brands to its evolutions, in the collective imagery some nation-states were more successful as others in riding the wave, aspects which enables the later transposition of emergent socio-political and economic gains into more solidified cooperation formats or the leverage of reputational losses. If we were to extrapolate from past indicators, prior to COVID-19, PRC's global projection of smart power was somewhat gradual in nature and with a more pinpointed range or scope at its core (Nye, 2015; Cao, 2016; Yang, 2020). A pattern that was completely reverted, towards a broader instrumentalization of national imagery projections, when shifts in soft power dynamics occurred, noticed by correlating fluctuations across indexes, as PRC, alongside other of the systems' leviathans, had a drastic fell in the demos' eyes, due to early political and institutional disarray, mass-media coverages, restrictive measures, and the list can go on (University of Edinburgh, 2017; Mcclory, 2019; ETNC, 2021; Szimigiera, 2022).

From that point, a plenitude of foreign policy adjustments was made, as competitive identity began to spill-over into the medical and health-related field, which led to the emergence of vaccine diplomacy as another core of multi-track omni-directional endeavours. As medians peaked, socio-political and economic sides of these cross-border capacities and capabilities' infusions surfaced, in the form of diametral, intersected, juxtaposed or overlapped interactions between leading powers and their (now permeabilized) spheres of interests and influence. The PRC, like many actors, albeit first one of the international communities to export both the vaccine doses and such a behavioural pattern of multilateral vaccine-driven soft power network development, started to approach entire continents based on its former paradigmatic, operational and pragmatic frameworks, an aspect which can be concluded through a comparison of its overseas development finance, trade routes, commercial nodes, political affiliations etc. and early vaccine distribution or donation maps (BU, no date; OEC, 2020; Lowy Institute, 2019).

Within this mixed model of globalised specialised trade, in which doses were, initially, regarded as global sticks and carrots (tools of coercion, reinforcement or reward for entire nations), thereafter hoarded based on national or strategic interests' aegis, we can oversee some of the actor's efforts to frame the development, production and distribution of vaccines as common goods, which should be treated with equity. One of these was the PRC, which, from the first months, spearheaded a plenitude of multilateral normative initiatives across the globe, as it sought to adjacently infuse bits of its soft power further away than ever before, an approach picked up later by all other global actors, under similar virtuous flags. How effective were these measures and countermeasures of systemic influence dissipation, alongside the non-linear modulation and reverberations they brought, is beyond this paper, yet one thing can simply be extrapolated: numerous nodes, nexuses and interlinkages were created across the international communities' assemblages, how they will play out is up to what the next „x" diplomacy will be and how the curators will choose to instrumentalize what was already set in place.

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The EU Political Behavior: Concept Contextualization for Post-Economic Recession Sustainability

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Abstract
The purpose of this article is to examine the politicization of the European issue in the aftermath of the Eurozone crisis, with a focus on the impact on individual opinions and voting at the national and supranational levels. We begin by reviewing the current state of knowledge on the significance of the Eurozone crisis for EU politicization, before summarizing each paper and its contribution. While our contributors may focus on different dependent variables at times, they all address the subject of whether the Great Recession had a long-term impact and whether EU politicization is important. Most of the papers are longitudinal in nature, looking for changes as a result of the crisis. However, papers reviewing the political lessons learned from the Great Recession, as well as those examining whether EU effects can be discovered throughout the post-crisis years, are preoccupied with the Great Recession. Despite the disparities in methodologies and findings, each piece contributes to a major topic in the literature, particularly three key issues that have emerged: the influence of the crisis on European party systems, economic voting, and the degree of legitimacy of democratic institutions.

Keywords

democratic institutions; economic voting; sustainability; crisis; politization; European Union.

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Introduction

The paper's main purpose is to examine the politicization of the European issue in the aftermath of the Eurozone crisis, as well as its impact on individual opinions and voting at the national and supranational levels. The papers in this collection look at whether and how information about the EU and EU issues influences citizens' political attitudes and electoral choices. We explore the implications of EU politicization for national and supranational politics in this way.

This essential topic was first raised by Hooghe and Marks (2009) in their seminal work on European integration dynamics. These authors claimed that voters' attitudes about Europe have moved from a permissive consensus to a restrictive dissension. The passage of the Maastricht Treaty in 1993 was the primary cause, resulting in an increase in European Union politicization.

The Treaty's incremental transfers of authority to the supranational level brought Europe into political debates, making European concerns more important and improving citizen awareness of the implications of supranational decisions. This thesis has created a significant literature that has mainly agreed that EU politicization is occurring in Europe using various approaches (Kriesi, 2012; Hutter and Grande 2014).

Until recently, the majority of studies on EU politicization focused on its effects on the European integration process. There was relatively little research on how EU politicization might influence national behavior, with the major argument being that the EU was a "sleeping giant" (Van der Eijk and Franklin, 2004), with little impact on national (or even EU) political behavior. De Vries, on the other hand, warned in 2007 that

high EU issue salience could emerge in specific circumstances, influencing voting behavior. As a result, the politicization of the EU appeared to have implications for voters' political attitudes and behavior at both the national and supranational levels. Despite this cautionary note, scholars have mostly focused on the description and explanation of EU politicization to this point, with less attention paid to the research of its micro-level impacts, which is a primary emphasis of this paper.

1. The roots of the EU crisis and politicization

The onset of the Eurozone crisis, which was seen as a further moment for EU politicization at the domestic level (Grande and Hutter 2016; Hoeglinger 2016; De Vries, 2018; Hooghe and Marks 2018; Hutter and Kriesi 2019a, 2019b; Gross and Schafer, 2020), prompted a flurry of new research on the effects of "Europe" on political behavior.

In the aftermath of the Great Recession, there are various academic debates on the EU and EU contestation. On the one hand, the question of whether and how it influenced economic voting in general. On the other hand, it's unclear whether it played a role in the evolution of European political parties. And then there's the issue of political systems' legitimacy.

The authors will give a quick overview of these debates before returning to them in our conclusion.

For starters, incumbent parties suffered electoral costs as a result of the Eurozone crisis (Dassonneville and Lewis-Beck 2014; Hernandez and Kriesi, 2016, Giuliani and Massari, 2019; Lobo and Pannico, 2020). This can be interpreted as a classic "punishment of the incumbent" effect, in which negative economic trends take center stage in public discourse. During the crisis, however, supra nationalization of monetary and (increasingly) fiscal policy to the EU level may have become particularly visible to the common person, casting doubt on national political institutions' responsibilities (Gabel, 2020).

Indeed, the European Monetary Union's supra nationalization of economic policy has been viewed as a form of "blurring of responsibility" (Gabel, 2020, p.41). Using data from the 2009 European Election Studies (EES), Lobo and Lewis-Beck (2012) discovered that heightened perceptions of European Union economic responsibility reduce the amount of the national economic vote coefficient. Lobo and Pannico (2020) also discovered that during the crisis, people who read publications with a higher level of EU coverage used economic voting less.

Using comparative EES longitudinal data, Talving (2017) discovered that governments' lower capacity to direct national economic policy has little effect on electoral sanctioning or rewarding. Furthermore, Kosmidis (2014) found no indication of "little room for maneuver" lowering the economic vote during the bailout period using experimental data collected in Greece. One of the key consequences is the role of supranationalization of economic policy in the vote calculus.

Preferences on three problems arising directly from the euro crisis affect the choice of specific challenger parties: EU integration, austerity, and immigration. Ruiz-Rufino and Alonso (2017) proposed a framework to explain why people are dissatisfied with major parties. In bailout countries that have implemented austerity programs, there was a learning curve for citizens who realized there was very little room for government maneuvering. Indeed, they lacked autonomy, and as a result, the role of elections in holding governments responsible was weakened, leading to a decline in democratic satisfaction and turnout in bailout nations, particularly in Southern Europe. To summarize, the economic crisis became something deeper — a legitimacy crisis of national democracy — due to the way the Eurozone was set up and the Eurozone issue was handled.

Furthermore, Armingeon and co-authors discover that where the EU and the IMF engaged during the Great Recession, there was a decrease in trust in national and European institutions, as well as satisfaction with democracy (SWD) (Armingeon and Ceka, 2014; Armingeon, Guthmann and Weisstanner, 2016). Schraff and Schimmelfennig (2019), on the other hand, find that "the empirical data indicates to a temporary, performance-based unhappiness with democracy in the bailout countries rather than a persistent, legitimacy-based detachment in the bailout countries." Indeed, despite a continuous and increasingly negative—albeit substantively small—effect of the bailouts on democratic quality (as judged by V-dem indicators of democracy quality), they find a resurgence in democratic satisfaction and turnout.

Our paper has as main purpose to contribute to the progress of these discussions. The current works are the outcome of multiple interactions between the organizers and authors at various European conferences over the last few years. Consequently, in general, address the question of whether the Great Recession had a long-term impact and whether EU politicization is relevant.

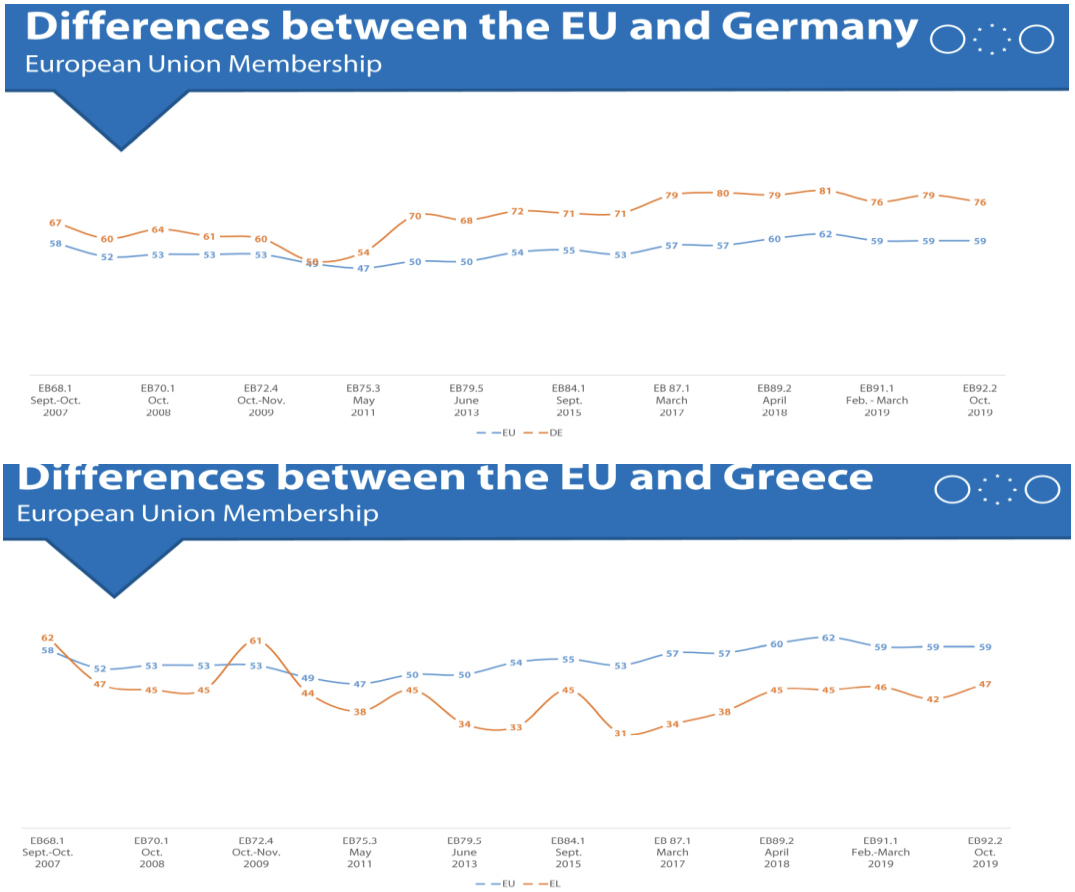


Figure no. 1. Evolution of the level of trust in the EU institution in Germany vs. Greece
Source: European Parliament, 2019

Above, we selected two graphic charts which show the level of trust in the European institutions at the level of the EU versus the level of trust registered in Germany and Greece. We selected the two countries because one of them is the main contributor to the Union budget while the other is one of the main recipient of the European funds. The analysis covers the period between 2007 and 2019 and has few interesting landmarks to be observed. The first one is the year 2007 when the EU extended, admitting few new members and consequently, increasing the budget spent with these countries. For the old members of the Union like Germany, the main contributor to the consolidated budget, the level of trust in the European institutions situated constantly above the average registered in the Union. It was a notable decrease in 2009 and 2010, most probably generated by the global financial crisis but increased substantially after 2011 and kept constantly with a median of 20 points above the average of the Union. That shows a correlation between the degree of integration between the national institutions and the European agencies responsible for investing and spending the European money.

The case of Greece is somehow different, showing a high level of trust in the European institutions in 2007, with few points above the average level. Surprisingly, after a little decrease in the next two years, it was a significant increase during 2009, most probably generated by the financial crisis and the higher level of trust in the European institutions in comparison with the local ones. The figures registered in the next year's show a constant decrease of the level of trust, the lowest level being registered between 2015 and 2017 when the country entered in financial default. It is worth to observe that the trust is built based a number of expectations from European institutions and mechanisms which if are not met, the tendency is to go lower and lower. On the other side, the level of correlation between the deliverables of the local institutions versus the European ones and their degree of integration and capacity to deliver according to the expectations is essential in keeping the level of trust high.

Summing up, a main beneficiary of European funds and management assistance like Greece, is not necessary a champion in having the trust in the European institutions at a high level. On the contrary, the main contributor to the budget keeps the indictors high mainly because of the high level of the integration between the local and Union institutions and the capacity to deliver according to the public expectations.

2. The impact of the Great Recession

Ruth Dassonneville, Michael Lewis-Beck and Alexandra Jabbour focus on whether Europe contributes to a deterioration in democratic satisfaction. The question is important for a variety of reasons. European integration has progressed, but there might be a "democratic deficit" in EU institutions. As the EU has become more politicized across Europe, countries such as France and Greece have seen Europe become a major voting issue in national elections. Is it possible that this process will have an impact on citizens' contentment with national democracy? The authors use Eurobarometer data for aggregate analysis (1970–2017, 15 member states) and EES data for individual analysis (1979–2009, 28 member states) to evaluate this link in a longitudinal study. There are several expectations that are established in the article:

- The number of European directives should be correlated with democratic satisfaction in EU countries.
- The less satisfied individuals are with democracy, the more interconnected European economies become, which means less opportunity for maneuvering (SWD).
- The lower the satisfaction with democracy, the greater the influx of immigrants into the country as a result of EU integration.
- The greater the number of countries in the EU, the lower the level of democratic satisfaction. However, the greater the number of countries in the EU, the lower the level of democratic satisfaction.
- The bigger a country's net contribution to the EU budget is, the less satisfied it is with democracy, according to Lobo and Lewis-Beck. Each of these assumptions is based on particular features of EU integration during the last few decades.

The study is aggregated, and it examines the importance of the independent factors on democratic satisfaction at the country level through time. The authors conclude that none of the models provide substantial evidence in support of the hypothesis that greater "Europe" leads to democratic unhappiness.

First, happiness with democracy is unaffected by the amount of EU legislation, the degree of economic interconnectedness, or the European Union size. Second, immigration appears to have a beneficial relationship with SWD. The authors do discover that net contributors had lower levels of democratic satisfaction, although this is a minor effect. To supplement this research, the authors look at individual-level data from the European Election Study from 1979 to 2009, which used an identical measure of democratic satisfaction and included data from all 28 EU member states. They first duplicate the aggregate study, finding that none of the macro-level variables account for national satisfaction with democracy. The writers then investigate whether political sophisticates are more informed of Europe than the general public. They use education as a proxy and interact education level with macro-level variables of interest. The findings imply that persons with a higher level of education are more satisfied with democracy. Indeed, there are substantial and positive interactions for two of our five indicators of "Europe"—labor market integration and EU size—indicating that as European markets integrate and the EU expands, persons with a post-secondary degree are more satisfied with democracy than citizens without one. Ruben Ruiz Rufino proposes and examines a theory regarding financial bailouts and their consequences on establishment politics in the second piece in this collection (Ruiz-Rufino and Alonso, 2017). According to the author, the establishment parties' electoral fall is due to their exposure to financial bailouts. Establishment parties had a 60 percent vote share in adopting countries between 1991 and 2009, but that support dropped to 48 percent between 2010 and 2019. Electoral support for establishment parties in bailout countries was 77 percent before the bailouts, but 55 percent from 2010 to 2019. The following is the mechanism: Citizens who were exposed to the macroeconomic conditions of financial bailouts not only saw the effects of extreme fiscal adjustment packages, but they may also have learned something about politics. Specifically, major parties were influenced by supranational influences and were unable to respond, preferring instead to be responsible. This shows citizens that voting for these parties does not always imply policy change. As a result of their political education, several citizens abandoned these parties in later elections. These theoretical claims are tested in two ways: first, using individual data from the sixth round of the European Social Survey (ESS) to suggest one way to approximate the learning update process experienced by citizens affected by a financial bailout; and second, using data from the European Social Survey (ESS) to suggest one way to approximate the learning update process experienced by citizens affected by a financial bailout. The empirical study' second section makes use of aggregated data from European and parliamentary elections held in eleven Eurozone nations between 1991 and 2019. Costa Lobo and Pannico tested the impact of EMU views for economic voting in two nations, Germany and Greece (Lobo and Lewis-Beck, 2012). During the Eurozone crisis, European monetary integration necessitates the pooling of economic sovereignty and, indeed, increased citizen awareness of supranational institutions for national economic

policies, particularly in bailout countries. This process of supra nationalization of policies is viewed as a blurring of accountability that may limit voters' ability to hold governments accountable for economic policy. It's crucial to put this argument to the test outside of the Eurozone crisis, when public awareness of the EU's involvement in economic policymaking is at an all-time high. As a result, the writers come up with the following hypothesis. First, in both countries, positive economic evaluations predict voting intentions. Second, economic judgments will be less important in the vote for those who believe the EU is primarily responsible for economic policies. Third, this will be especially true for people who have more political knowledge.

In both nations, the authors corroborate the baseline model of economic voting. However, in Germany and Greece, the connection between perceptions of EU responsibility and economic performance has opposing significant consequences, with the former being good and the latter being negative. Indeed, when we move from negative to positive evaluations of economic performance in Germany, those who believe the EU is extremely or very responsible for the national economy are more likely to vote for incumbents. The "blurring of responsibility" proposes the exact opposite. Greek voters, on the other hand, are following the article's predictions. These effects are particularly prominent among each country's political sophisticates.

Two further hypotheses follow from this one. First, because the Eurozone crisis was felt more acutely in bailout nations, these consequences of national government trust on EU trust should be felt more acutely in bailout countries. Second, given the severity of the crisis and its widespread impact on the population, it is no longer possible to rely on citizens' political sophistication in extraordinary times. The authors support the first hypothesis, demonstrating that support for home political institutions is far more important than national economic judgments in determining trust in the EU. They also discover a lot of evidence to support the second idea. For practically every year in their sample between 2007 and 2015, political effects are much greater than in 2004, implying that opinions toward domestic political institutions matter significantly more during extraordinary times for understanding sentiments toward the EU. The authors also indicate that the link between domestic political opinions and EU attitudes grew stronger as the crisis progressed, particularly in countries that suffered the most from the Eurozone crisis. Finally, during or shortly after the European debt crisis, the influence of political trust in national institutions on trust in the EU for low and high sophisticates tends to converge, implying that group disparities are moderated during extraordinary circumstances. When the crisis is gone, sophisticate group distinctions appear to resurface. This shows that the learning that takes place is only transitory and does not constitute a long-term change.

3. Research methodology

The authors started the article with a critical analysis of the existing worldwide relevant literature in the field. Having in mind the relatively few empirical data, together with the descriptive character of the paper, the authors focus on a qualitative analysis. Howbeit, the main research tool focus on drawing upon recent literature in order to highlight the influence of the economic recession on the EU political behavior. The keywords used were “democratic institutions” or “economic voting” “crisis” and “politization”; European Union” or “leader ethic”, the abstracts were read and we focused on those papers that were directly showing characteristics or impacts of the economic recession within the EU political behavior resulting in a total of 28 articles. Furthermore, the authors categorized the information gathered in the 28 articles explained in a research method chosen for its usefulness for seeking to develop a hypothesis. By addressing the concept of Europe and the institutional legitimacy, the articles highlight the impact of over 40 years of contentment with democracy in EU countries that suffered little, if at all, from EU political and economic policy initiatives. Therefore the 'democratic deficit' has gone unnoticed over a lengthy time and that will allow building future case studies relevant to the EU political behavior and its’ impact on a sustainable economy. This hypothesis, along with the others highlighted, points to the need to look at other important and evolving links between the European Union and political behavior. Finally, the authors will present their own observations and conclusions regarding the contextualization of political behavior for post economic recession sustainability.

4. Results and discussions

Through our research, we analyzed the correlation between the evolution of the political behavior and the performance of the European institutions. It has been observed that external factors, like economic crisis, financial crashes or any other major disruptions are not necessary the generators of a low level of trust between people and institutions. Therefore, the below table summarize a couple of articles which demonstrate that economic performance associated with a good communication and proper alignment of

the deliverables create a high level of trust, a good integration between the local and global institutions and in the end economic development and performance.

Table no. 1. Link between level of trust in the European institutions based on built expectations

The root cause	The level of trust	Relation type (Mediator, if case)	Author
Organizational & Economical	"the level of trust if directly proportional with the performance of the local institutions"	First degree relation	Armingeon and Ceka, 2014
Economical	"the correlation between the public discourse and the economical deliverables is essential"	First degree relation	Armingeon, Guthmann and Weisstanner, 2016.
Economical	"the level of trust is associated with a strong economic performance"	First degree relation	Dassonneville and Lewis-Beck, 2014.
Organizational & Economical	"the level of trust increase during a crisis is the institutions are strong and the communication is efficient"	Second degree relation (fosters healthy work environment, that allows economic development)	De Vries, 2007.
Organizational	"the degree of integration between the local institutions and the European ones"	First degree relation	Devine, 2019.
Organizational & Economical	"economic crises are perceived as opportunities if the institutions are aligned in delivering what is expected from them"	Second degree relation (fosters healthy work environment, that leads to economical development)	Gabel, 2020.
Organizational & Economical	"the role of the leaders is building the trust is essential"	Second degree relation (fosters healthy work environment, that leads to economical development)	Giuliani and Massari, 2019.
Organizational & Economical	"the contribution to the EU budget is not necessary associated with a high level of trust"	Second degree relation (fosters knowledge that leads to economical development)	Grande and Hutter, 2016.
Organizational & Economical	"the main recipients of the funds are not necessary the ones with a high level of trust"	Second degree relation (fosters knowledge that leads to economical development)	Hernandez and Kriesi, 2016.
Environmental	"correlation between economic performance and general expectations"	First degree relation	Hobolt and Tilley, 2016.
Organizational & Economical	"communication and setting up tangible targets is essential"	Second degree relation	Hooghe and Marks, 2009.
Economical	"the global economic crises influence the level of trust"	First degree relation	Kosmidis, 2014.
Economical	"local and global institutions are responsible to set up clear expectations and solutions"	First degree relation	Lobo and Lewis-Beck, 2021
Organizational & Economical	"reliability on the European institutions is higher if they are perceived as providing an increase of the efficiency on the local level"	Second degree relation (fosters healthy work environment, that leads to economical development)	Schafer and Gross, 2020

Source: Developed by authors

On the contrary, when the degree of the local and global institutions is low, the efficiency and the level of integration of the economic mechanisms is not set up properly, the gaps occur, and the level of trust decrease dramatically. It is the case of Greece, noticeably during the financial default registered during 2015-2017 when the public perception of the locals was that European institutions are somehow responsible for producing this big crisis. However, the cited articles show that the inefficient communication between the global EU institutions and the local institutions as well as not properly set mechanisms to follow up key economic performance indicators generated a vicious circle where nobody is accountable, but everybody has explanations.

Conclusions

Despite the diversity of methodologies and some discrepancies in findings, each piece contributes to a major discussion that is now raging in the literature. In this respect, we may take into consideration how were highlighted three important academic debates about EU contestation and political behavior in the aftermath of the Great Recession. First, we need to look at if and how it influenced economic voting. Second, whether it may have influenced the evolution of European political parties. And, last, whether it altered the legitimacy of political systems. Finally, we need to return to these debates and see what light the papers have cast on them. We used a central finding from each as an organizing mechanism.

We start with some important new studies on economic voting. To begin, the Costa Lobo and Pannico study shows a baseline model that claims economic perceptions determine vote intention in two different countries (Lobo and Lewis-Beck, 2012). The direction of that impact, however, is determined by public perceptions of EU economic responsibility. In Germany, a more optimistic picture of the economy boosts the incumbent vote, since Germans perceive the EU to be more accountable. However, in Greece, a more optimistic view of the economy reduces the incumbent vote because residents perceive the EU to be more responsible. The evident inference is that public are ready to 'forgive' EU domination (and thus lose some democratic control) provided it benefits national economies.

The Jurado and Navarrete (2021) report goes on to say that voting on EU issues is more important for countries that have a higher economic investment in the EU budget, implying that sensible voters are concerned about the financial costs and benefits of EU membership on a national level.

Two publications are particularly relevant when it comes to the impact of the EU on changing party structures. The Ruiz-Rufino article shows that financial bailouts contribute to establishment party electoral declines; for example, in countries receiving a bailout, support decreased to 55% (from 77 percent before the bailout) (Ruiz-Rufino and Alonso, 2017).

Finally, we addressed the concept of "Europe" as well as institutional legitimacy, specifically the institution of democratic government. The article of Dassonneville, Lewis Beck (2014), and Jabbour shows that, over a lengthy time (1970–2017), contentment with democracy in EU countries has suffered little, if at all, from EU political and economic policy initiatives, implying that a 'democratic deficit' has gone unnoticed.

Based on their analysis of 32 Eurobarometers across all member states (2004–2018), the Talving and Vasilipolou study indicates that the link between local political attitudes and EU political attitudes is higher in countries where the Eurozone crisis was more acute. This contradicts Dassonneville, Lewis-Beck and Jabbour's findings, implying that a domestic political attitude such as "content with democracy" should respond differently to EU policies and politics. What is the most effective means of resolving this conflict? One option is to look at the individual level of analysis, as both papers do. In this regard, both discover attitudes disparities between high and low sophisticates.

However, according to Talving (2017), these disparities tend to converge after a crisis, showing that the shift in trust sentiments may not be permanent. Given this, an overall result of "no democratic deficit" may be reconciled with individual changes in "pleasure with democracy" in the short term, both before and after the crisis.

Of course, the final sentences are merely a guess. However, it does pave the way for more exciting research into the micro- and macro-links between attitudes about democracy and changing EU politics and policy. This hypothesis, along with the others highlighted in this Special Issue, points to the need to look at other important and evolving links between the European Union and political behavior.

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Recovery of Biodegradable and Compostable Waste by Composting, a Solution for Sustainable Management

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Abstract
The main purpose of this paper is to identify and analyze a phenomenon that has become widespread today, namely the increase in the amount of waste and its improper storage, as well as the reduction of this amount of waste by the practice of recycling technologies, by composting, biodegradable organic waste, implicitly biodegradable packaging.
In order to achieve the fundamental objective and purpose of this paper, the specialized literature was studied. Statistical data from specialized institutions were used.
In conclusion, this paper investigates this topic, due to the huge amount of waste generated that must be reduced because improper landfilling is an acute problem that affects both the environment and society.

Keywords

Composting, organic waste, compostable, recycling, sustainable

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Introduction

The technical and operational indications given in this document are the result of the analysis of the technical-scientific literature of the sector and of the results of the experimental tests performed within the project.

The experiments looked at the effects of using quality compost as soil and mulch on soils and on some species of trees, shrubs and herbaceous plants and looked for indications for optimizing supply logistics and irrigation management.

The document therefore aims to be a guide for public administrations that have expertise in the construction, maintenance and management of public green spaces, for the use of quality compost produced by recovering organic waste from their territory. Additional users of the document can be professionals and all those who are included in the urban green supply chain.

In full compliance with the principles promoted by the European Union and implemented by national legislation, the recovery of organic fractions resulting from the separate collection of waste is materialized in the use of the product derived from their treatment. Composters are products that contribute to the improvement and maintenance of soil organic matter, promoting the maintenance of agronomic fertility, workability and better management of water resources.

The composting process has been known for over 10,000 to 12,000 years, when man became a farmer and found that the yields obtained from the same land year after year began to decline. Being a shepherd first, man did not forget the positive role of animal manure on the production of grass on pastures, and their application on agricultural land was the next logical step.

In modern times, the first scientific foundations of composters were formulated by Rudolf Steiner (1924) and later deepened by his remarkable disciples E. Pfeiffer and A. Howard.

Extensive research on the preparation and use of compost, as well as the invention of BD Compost Starter - a compost inoculant, by Ehrenfried Pfeiffer (1956), led to the development of biodynamic agriculture both in Europe and in America and Australia.

The first Westerner to document and publish sustainable farming techniques, now known as organic farming, was Sir Albert Howard (1943), a leading figure in the early organic movement.

In our country, the first information regarding composting, respectively soil fertility was stated by the first Romanian agronomist, Ion Ionescu de la Brad, who together with Gh. Ionescu - Sisești highlighted the role of organic fertilizers and manure of fermented manure on soil (Ionescu - Sisești et al., 1980).

1. Review of the scientific literature

In recent years, there has been widespread talk around the world about a "waste crisis". Huge amounts of waste have reached a critical level, with industry, trade and agriculture as the main sources.

Waste recycling has become a serious problem for the "life" of the Earth, growing with the industrial explosion of the twentieth century, which led to the development of industrial and agricultural activities, the diversification of consumption of material and food, and direct proportional growth. of waste.

Cherubini et al. (2008) states that “ecosystems recycle any type of waste, and the concept of waste itself is no longer appropriate. Products from one component or compartment are always a useful resource for another component or compartment. Ecosystems are self-organized systems in such a way that all resources are used as efficiently as possible so that no unusable resources remain. " In this way, ecological systems have the ability to self-recycle and use all resources with the greatest degree of efficiency, but anthropogenic activities disrupt all the component processes of these systems.

According to European rules, the recycling process consists of: recycling of matter and reusing energy.

Material recycling involves the replacement of primary resources with waste materials. Fricke, Kolsch and Pfaff-Simoneit (2009) consider that material recycling includes material recycling and biological recycling with compost (aerobic process) and fermentation (anaerobic process).

Recycling organic waste is an economical solution, used mainly in agriculture due to the nutrients it contains, the soil being able to degrade most of these substances.

The practice of intensive agriculture and the irrational use of chemical fertilizers to obtain rich crops result in the degradation of organic matter in the soil.

The main effects of the soil organic matter crisis are to reduce yields and increase the depth at which the soil is worked, and is caused both by the low number of soil decomposition organisms and by the increased presence of these organisms leading to accelerated decomposition due to changing factors natural and also to soil degradation.

For these reasons, the recycling of organic waste and its use as fertilizer must take into account the maintenance of an ecological balance in agriculture.

Composting is one of the most promising ways to recycle waste (Tam and Tiquia, 1999), as well as an important element in sustainable waste management (Slater and Frederickson, 2001).

Compost is an odorless organic product with no seeds or germs, and its quality can be improved.

The main purpose of the composting process is to obtain organic fertilizers from various biodegradable organic waste, such as some household waste, manure and animal manure, urban sewage sludge, sewage sludge and sanitation from septic tanks.

Composting is a biological process of transformation and recovery of biodegradable organic waste, in a hygienic product, rich in humic compounds, which allows the reintroduction of organic substances into the soil.

2. Research methodology

The use of quality compost is therefore an opportunity for public administrations and all subjects included in the urban green supply chain to implement environmental sustainability actions and to fully apply the theoretical principles that act as a context for the correct use of land and of the territory in general. By recognizing the potential arising from the use of these products and promoting actions that promote their

dissemination, Public Administrations become promoters of good environmental practices that cross-cutting the sectors of land management, waste recovery, urban landscape.

Therefore, the document provides an analysis of:

- the regulatory context and the opportunities and constraints it offers;
- technical specifications regarding the characteristics of the materials;
- areas of use;
- management methods for proper use.

3. Research results

Composting is an accumulation of microbial, physical, chemical and biological transformations that organic, vegetable and animal waste undergoes, from the initial stage to reach various stages of humification, under the action of factors (humidity, aeration, temperature, etc.), resulting in a new product that is qualitatively different from the original residue, called compost, a clean product with a high nutritional and energy value on soils and plants, and a strong amendment to the physical and chemical condition of soils (Ionescu-Sisești, Papacostea and Ștefanic, 1980).

The compost is obtained both by aerobic fermentation, the finished product being free of unpleasant odors and used as organic fertilizer, and by anaerobic fermentation, and the final product is used in the production of biogas, due to its high methane content. The effectors of this process are microorganisms represented by bacteria, actinomycetes and fungi.

The bacteria and actinomycetes involved in the composting process are cryophilic, mesophilic and thermophilic. Bacteria are the most numerous organisms in compost, being responsible for most of the processes of decomposition and heat generation. They are the most diverse group of nutrients in compost, using a wide range of enzymes to chemically degrade a variety of organic materials.

Actinomycetes, which resemble fungi but are actually filamentous bacteria, are responsible for the specific soil odor of compost and play an important role in the degradation of complex organic compounds such as cellulose, lignin, chitin and proteins. Their enzymes allow them to chemically degrade resistant organic waste, such as wood stalks, bark, paper, biodegradable packaging, etc.

Mushrooms are important in the decomposition of complex plant polymers and resistant residues (cellulose, lignin), allowing bacteria to continue the degradation process, once most of these residues have been destroyed. They can attack organic residues that are too dry, acidic, or have too low a nitrogen content for bacterial decomposition.

The microbial activity and the transformations during the composting process take place in four phases: the mesophilic phase, the thermophilic phase, the cold phase and the maturation phase.

Mesophilic phase (mesophilic fermentation stage). At the beginning of this stage the ambient temperature is usually between 4- 5 °C, reaching the upper limit of the stage to reach values of 40- 45 °C. Mesophilic bacteria and actinomycetes are active, which need both oxygen and moisture for growth and reproduction, as well as nitrogen, carbon, potassium and phosphorus. Mesophilic microorganisms use the oxygen they have to alter the carbon in compostable materials in order to obtain energy, producing CO2, H2O and heat as a result of metabolic processes. Biological oxidation of carbon from residual material gives energy to organisms (Gray, Sherman and Biddlestone, 1971).

The thermophilic phase begins when temperatures are above 40 ° C and the thermophilic bacteria take over the degradation process. At this stage the temperature rises to 60 - 70 ° C, at these temperatures most of the weed seeds, respectively pathogenic microorganisms are destroyed and the compost material stabilizes quickly. When the temperature inside the waste mixture drops, it must be turned over to ensure not only aeration, but also the introduction of the material from the surface of the mixture, undecomposed, inside to be degraded (Maynard, 2000). In this phase, resistant materials, such as cellulase, lignin and proteins, decompose.

The cold phase or hardening stage occurs when the temperature drops to values below 60 ° C and approaches the ambient temperature. When the temperature reaches 40 ° C, the mesophilic organisms reappear.

The maturation phase takes place over a longer period of time (several months). At this stage the temperature stabilizes, the mesophilic organisms dominate, and condensation and polymerization processes

take place (Gray, Sherman and Biddlestone, 1971). Macroorganisms (insects, worms, etc.) also appear, which ends the maceration and homogenization of the waste mixture, and the resulting final product is mature compost, which is a stable complex of humic acids (Zibilske, 2005).

Properly prepared and incorporated compost into the soil has beneficial effects on its quality and fertility, by increasing the intake of high quality organic matter, favoring the formation of a resistant structure with significant influences on water and air circulation in the soil, thus reducing the risks during periods of heavy rainfall and drought. In the first case, due to the organic matter in the soil, which has a high capacity of absorption and structuring of water, playing the role of surface that absorbs water, greatly increases the threshold of water content at which one can speak of excess moisture. In the second case, the large water supply achieved by inhibiting the organic matter prolongs the time of insolation and drying necessary for the appearance of the critical point of wilting of the plants.

But the organic matter introduced into the soil by composting, not only has the ability to retain water, but also nutrients that it releases as plants need. The range of nutrients that compost brings thus largely offsets the export of nutrients due to crop yields.

In order to obtain compost with superior properties to the residues from which it was formed and to increase the amount of organic matter in the soil, certain factors that influence the formation of such compost must be taken into account in the composting process. The main factors that participate in the fermentation processes of organic waste are: air, water, temperature, pH and C/N ratio, etc.

Composting is an aerobic process, which needs oxygen to perform the intense decomposition processes that take place in the early stages of the process. In the absence of a constant supply of oxygen, the process will decrease in intensity, becoming anaerobic, which involves other microorganisms and different biochemical reactions, which by their slow action will cause the emission of unpleasant odors.

A minimum concentration of about 6% oxygen is required in the pores of the mixture (the air contains about 21% oxygen). Aeration is the process of supplying oxygen to the compost material, but also the means of removing water vapor, gas and heat that resides in this mixture.

Water supports the metabolic processes of microorganisms, being a suitable environment for chemical reactions, for the transport of nutrients and, respectively, for the multiplication and dispersion of aerobic bacteria. The activity of microorganisms ceases if the humidity drops below 15%. The optimum moisture content of the mixture should be between 40% and 65%. If the value of 65% is exceeded, the water will take the place of the air in the pores of the composted material, compacting it and will lead to anaerobic conditions.

Water must be added to keep the moisture within the required limits, as the water content will decrease during composting.

Temperature

Microorganisms need certain temperatures for an optimal level of activity.

The optimum temperature of 60 - 70 ° C promotes rapid composting and destroys pathogens and weed seeds. The activity of microorganisms during composting generates large amounts of energy in the form of heat. At the same time, the water evaporates and the water vapor and gases are removed. Ventilation and turning of the mixture favors heat loss and is used to maintain temperatures in the desired range.

In some cases, the temperature may exceed the upper limit of 70 ° C due to the continuation of bacterial activity, which leads to the death of many microorganisms or their inactivity, and the process stops until they become active again.

pH

pH directly influences the activity of microorganisms. The optimum pH values for a mature compost are between 6.5 and 7.5. Composting materials have a pH that varies widely. Products derived from wood residues may have low pH values of 4.5, while animal manure is frequently alkaline (pH = 8 - 8.5). Because plants prefer a certain pH value, it is necessary to adjust it by adding lime (to increase the pH) and sulfur or iron sulfate (to lower the pH).

Compost with a very low pH (<4) should be used with caution, as low pH may be an indication of non-compliant composting practices, leading to the formation of toxic organic acids.

C / N ratio

Of particular importance in the composting process is the determination of the nutrient content of the raw materials used to obtain the compost. Of the many elements required for microbial decomposition, carbon and nitrogen (C/N ratio) are the most important.

Organic matter contains carbon atoms, which are combined with atoms of nitrogen, hydrogen, oxygen, phosphorus, sulfur, and can be said, directly or indirectly, with all the chemical elements that exist in nature. These carbon and nitrogen atoms combine in a varying ratio, optimally being 25/1, for this it is necessary that in the mixture of organic waste there are about 60% nitrogen-rich (green) and about 60% rich in carbon (brown).

4. European and national regulations on organic waste

In European and national legislation, the activity on waste management is regulated by numerous legislative documents.

Waste management activities (generation, collection, transport, treatment, recovery and disposal) must be in accordance with the rules required by European law. European directives transposed into national law have led to a new approach to waste management, emphasizing the need to protect the environment, improve its quality, make rational use of natural resources, and adopt effective solutions to reduce pollution.

EU waste policy focuses on the prevention of waste generation through the application of selective collection and reuse of organic waste. The recycling of organic waste is also intended to be used as much as possible as a raw material for the production of new products. Member States have an obligation to implement systems to achieve this goal. In many Member States, people are encouraged to compost organic waste in their own household, which is an essential part of organic waste policy.

One of the main objectives of the EU Commission 's work is to develop strategies, guidelines and directives that directly or indirectly affect the biological treatment of waste. These include the Landfill Directive, the Soil Protection Strategy and the Biodegradable Waste Directive. In addition, there is an awareness among technicians and decision-makers that composting will play a very important role in future European strategies on waste management and environmental protection.

EC Directive 99/31 on the landfill of waste

The Landfill Directive aims to reduce the amount of waste to be disposed of and to facilitate the increase in the recovery rate of biodegradable waste and to avoid its disposal.

One of the main issues related to the disposal of biodegradable waste in landfills is the generation of methane by these landfills, which involves taking measures to reduce methane in order to reduce global warming and improve the control of gas generated by landfills.

In order to replace the disposal of biodegradable waste, it is proposed to recycle, compost, produce biogas or combine them.

First of all, the levels that can be achieved after recycling must be determined. In this regard, targets should be set in line with the following key messages:

- The key elements of the municipal biodegradable waste stream are paper and cardboard; both can be collected separately at a low and affordable cost, thanks to operational integration and scheme optimization, as is the case in Eastern Europe. In Central and Western Europe, on the other hand, the very high cost of incineration makes the combination of differentiated collection + composting (or aerobic fermentation) competitive in terms of cost, despite the high costs of differentiated collection of the biodegradable fraction.

- The collection of the biodegradable fraction could be promoted by the Biodegradable Fraction Directive, and / or by the future Soil Protection Strategy and / or by the Thematic Strategy on Prevention and Recycling (whose current discussions have decided to set recycling and composting targets).

- In the Mediterranean countries, there is a pressing need for clean organic matter to be applied to infertile soils. This reinforces the need to implement differentiation at source, as a result of the strategies and forecasts of the soil strategy which highlight the need for a Biodegradable Fraction Directive to control potential contamination and to encourage the use of certified compost.

Directive on the biological treatment of biodegradable waste

In the last 5 years, the European Commission has taken the initiative to propose a Directive on the bio-treatment of biodegradable waste for the following purposes:

- Determining a balanced approach to meeting the requirements for reducing the amount of landfill waste in the Landfill Directive (99/31 / EC).
- Promoting programs for the recycling of biodegradable fractions, in order to ensure a similar development throughout Europe.
- Defining normal limits and conditions for the safe use and marketing of composted products in Europe.
- Further development of the production of the best quality soil fertilizers, which acts as a means of combating the process of "desertification" in the countries of Southern Europe.
- Covering those TMB (mechanical-biological treatment) processes for the treatment of residual waste, for defining their role in integrated waste management strategies and for defining the conditions of use or storage of stabilized final products.

One of the most important provisions included in the second Working Document for the Biodegradable Fractions Directive in 2001 was a mandate for Member States to implement programs for the separation of biodegradable waste at source. This was in line with the commission's mandate in the Soil Strategy Communication to prepare "by the end of 2004 a directive on compost and other biodegradable waste, in order to control potential contamination and encourage the use of certified compost". Undoubtedly, the most effective way to promote the use of certified compost to prevent contamination is to separate compostable waste at source.

EC strategy for soil protection

The impact on soil quality in Europe has become a major issue in recent years in the EU. The Commission points out that the reduction in the amount of organic matter in the Mediterranean countries is of great importance. Statistics show that in most regions with intensive traditional agriculture, the percentage of soils characterized by lack of organic matter and fertility has increased surprisingly.

Composting and aerobic fermentation play a very important role here, by placing on the market a humus material, of high quality, so that it can act as a continuous source of organic matter. High quality composting with valuable agronomic and microbiological properties can help restore the organic matter content in European soils.

In its Communiqué on Soil Protection, the Commission pointed out the possibility of regaining organic matter and fertility in European soils by using, in addition to other materials, composted organic waste.

An important point for the future biological waste treatment activity will be to establish the idea of humus management and maintain the quality of the soil in the EU. Maintaining the quality and structure of the soil as well as its fertilization overlap with soil protection policies.

Through the Soil Strategy, both the commercialization and the formation of a positive image for high quality compost can be ensured in the long run.

European Climate Change Program (CFSP)

In recent years, with the help of the CFSP, another major norm in environmental policy has been established in view of the need to comply with the requirements of the Kyoto Protocol on Climate Change. Some countries have begun to see the role of organic matter in soil as an important factor in the overall picture. What is to be considered is that "organic fertilization causes increases in carbon in the soil, and it acts as an absorber for carbon in the atmosphere, thus immobilized in the soil."

Another important effect of organic fertilization is the supply of nutrients, which involves the potential replacement of mineral fertilizers, and the energy and fuel savings required for their production and the reduction of related pollution, both with manufacturing and handling and application.

Other potential benefits, such as improved water efficiency and absorption, increased control of root pathogens, lower erosion and carbon loss, are difficult to quantify, but can also contribute to expanding energy resources and minimizing carbon losses in and out of agriculture and they are, as such, worthy of note.

The problems facing Romania in rural areas in the field of waste management have a major impact on society, pose a direct threat to health and have an adverse effect on quality of life. The uncontrolled storage of most of the waste is affected by the environment, directly the environment, the air, and due to the leachate from non-compliant landfills, leachate that enters the ground and affects both groundwater and surface water.

As a result, a sustainable waste management system needs to be implemented, which involves major changes in current practices, in order to comply with the requirements of the new national and European regulations.

In order to implement a sustainable waste management system in rural areas, it is necessary to inform the population as much as possible about the issues related to organic waste management, the role of municipal platforms and the negative effects of non-compliant storage of animal waste in households.

The avalanche of waste facing the Earth must be at least reduced, but more importantly, a way must be found to dispose of the huge amount of waste that is dumped in a non-compliant landfill and pollutes the environment, polluting it. The figure below shows a fairly obvious increase in the amount of waste generated between 2016 and 2021, and this proves the need to find alternative composting.

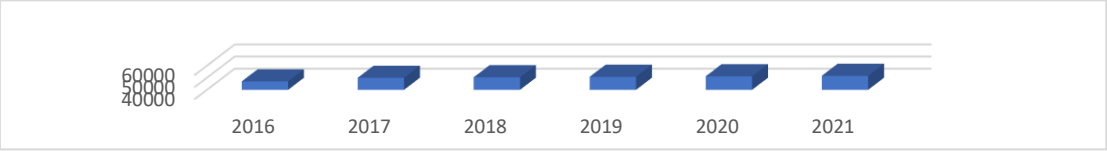


Figure no. 1. Waste in the form of packaging collected from trade, industry, institutions
Source: http://www.mmediu.ro, own processing.

Table no. 1 shows the average values of the specific weight of the packaging waste components, and it shows that paper, glass and aluminum packaging have the highest average values, but only paper can be composted.

Table no. 1. Average values of specific gravity of packaging waste components

Component of the materials	Specific weight [kilograms/m^3]
Paper	89
Carton	50
Plastic	65
Rubber	30
Wood	35
Glass	95
Aluminium	60

Source: http://www.mmediu.ro, own processing.

In order to be able to leave a legacy to our descendants, a clean environment in which to breathe fresh air and consume drinking water, it is necessary to urgently implement a waste management plan that aims to achieve the following objectives: elimination of non-compliant waste disposal; selective collection of organic waste from the population; increasing the degree of recycling / recovery of organic waste through composting and anaerobic digestion with the production and collection of biogas; reducing the amount of biodegradable waste sent to landfill, by using all possible recovery measures;

A first step in order to achieve the aforementioned objectives is the selective collection of organic waste and storage on specially designed platforms, where they will be transformed into a new, clean product that can be used as a natural fertilizer and source of organic matter for the soil. - at the same time both a saturation of the soil in organic substances and a reduction of nutrient pollution. In this way, organic waste is reintegrated into the natural cycles of transporting substances and elements through the soil.

The population must be well informed and understand the need to comply with environmental protection rules, so that concern for the environment gains ground in the face of archaic habits that affect the environment and endanger the health of all.

At county level, but also at local level, there is still work to be done, first of all, in terms of awareness, not only of the population, but also of the local and relevant bodies, of what means the non-polluting capitalization of municipal waste.

Conclusions

Proper waste management, which by its nature is both a source of pollution and a source of secular raw materials, must be done in an integrated way, with an understanding of the long-term consequences of the decisions taken. In this regard, current trends in waste management need to take into account the following issues: reducing the amount of waste; avoidance of environmental pollution.

Experience in other countries has shown that one of the ways to reduce the amount of waste generated is to replace fixed taxes with unit or mass taxes. This measure will also stimulate the recovery of recyclable materials from the population. In this context, there will be a normal tendency to reduce the amount of waste stored, it will require the introduction of separate waste collection from the population. Useful waste materials are a valuable source that should not be wasted. At county level, but also at local level, there is still work to be done, first of all, in terms of awareness, not only of the population, but also of the local and relevant bodies, of what means the non-polluting capitalization of municipal waste. Sustainable economic and social development without deteriorating the quality of the environment requires adequate waste management without depleting natural resources. Global concerns about the final disposal of waste and the concept of a sustainable society are growing. There is a general consensus on the planet's limited resources and the continuing increase in waste management costs.

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Economic and Social Cohesion in the European Union: An Empirical Analysis

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Abstract
Since the establishment of the European Economic Community, decision-makers have strived to find the optimal model of development, oscillating between economic and social cohesion and the configuration of poles of excellence. Although more and more analysts are recommending a focus on competitiveness, the remaining development gaps in the European Union require the reconsideration of the strategic objective of economic, social and territorial cohesion. On the background of the economic, financial and more recently, sanitary and geopolitical crises, solidarity was reaffirmed as a key objective of the Community and preserving the unity between Members has become more important than ever. In this paper, the authors asses some specific facets of economic and social cohesion in the European Union between 2000-2020, trying to have a complementary perspective on prosperity and wellbeing. In order to clarify some analytical and methodological dilemmas, we have used the instruments absolute and conditional β-convergence and focused on two main indicators: GDP per capita and Actual Individual Consumption per capita. Estimating β-convergence on cross-sectional regressions, we have illustrated that the initially least developed Members experienced higher GDP and Actual Individual Consumption per capita growth rates between 2000 and 2020 compared to the wealthy Members. Moreover, we have estimated conditional β-convergence using panel data and seemingly unrelated regressions and examined the influence of macroeconomic and social variables on prosperity and welfare gains at Community level. Our study suggests that increasing the level of investment, percentage of labor force with advanced education and real labor productivity has positively influenced the GDP per capita and Actual Individual Consumption per capita growth rates in the European Union. However, the Covid-19 pandemic negatively influenced the economic and social cohesion, calling into question the capacity of the European Union to achieve this objective in the short term.

Keywords

Convergence; solidarity; economic and social cohesion; competitiveness; β-convergence; Covid-19 pandemic

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Introduction

The regional integration process in Europe, advancing from the stage of customs union to that of Economic and Monetary Union, solved some problems, but obliged decision-makers and businesses in European Union to cope with a paradigm shift from war and pauperism to collaboration and prosperity, opening a new chapter for the Member States. Even if, given most of the macroeconomic indicators, European integration can be considered a success story, which changed the European destiny, as well as the global economic and political order, there are still a number of threats, and some strategic opportunities are being missed. Consequently, some of the European Union's economic potential is not being fully realized what makes that this global economic actor to not manage complex challenges that has threatened the regional stability.

In this paper, we have tested the hypothesis that there is an important change in the pan-European economic and social landscape at the beginning of the 21st century, considering that all those involved in an turbulent

economic and political environment need to answer the question if the European group can assure appropriate level of cohesion between its 27 Members. In order to determine if the European Union has managed to come closer to the objective of economic and social cohesion, the paper is based on the methodology proposed by Barro and Sala-i-Martin (1992): absolute and conditional β-convergence. We have expanded the scope of analysis by taking into consideration besides the level of GDP per capita which is representative for economic cohesion, the Actual Individual Consumption (AIC) per capita, a variable which is suggestive for the material wellbeing of the European households, thus for social cohesion. Moreover, we have analyzed the most relevant correlations and causalities between the Covid-19 crisis and economic and social cohesion in the European Union by including a dummy variable in the estimation of conditional β-convergence. Computing absolute β-convergence on cross-sectional regressions, we have found evidence in favor of the *"iron law of convergence"* (Barro, 2012), illustrating that the average catching-up speed in the European Union was 2.4% between 2000 and 2020. Furthermore, our paper confirms that the initially least developed Members from Central and Eastern Europe experienced a higher speed of improvement both in terms of GDP per capita and AIC per capita compared to the wealthy Members. Complementary to absolute β-convergence, we have determined the influence of macroeconomic variables on GDP per capita and AIC per capita between 2000 and 2020 using panel data and seemingly unrelated regressions. Our paper suggests that a high percentage of investment (Próchniak, 2011), labor force with advanced education and real labor productivity enhanced the catching up speed in the European Union both in terms of GDP per capita and the AIC per capita. In contrast, the empirical study suggests that a high percentage of governmental debt hampered the economic and social advance between 2000 and 2020. Moreover, the estimation confirms the negative impact of the Covid-19 pandemic on the annual growth rates.

The remainder of the study is structured as follows. The next section explains the concept of economic and social cohesion, bringing to the fore the main findings of the empirical studies focused on the European Union. Our research is continued with an empirical study, section 3 comprising the database and the methodology used in order to assess economic and social cohesion. Section 4 describes the results of the analysis based on absolute and conditional β-convergence. Lastly, we have summarized the main findings, presenting policy implications and suggesting future directions of research.

1. Review of the scientific literature

As the process of economic integration at Community level advanced from the stage of customs union to that of Economic and Monetary Union, from six to 28 (and starting with 2020, 27) component countries, the subject of economic, social and territorial cohesion has become increasingly debated in academia, European decision makers also trying to find the appropriate balance between competitiveness and convergence in order to merge the interests of all its Members. The theoretical studies, but also empirical research coupled with the programmatic documents adopted by supranational bodies, suggest that economic and social convergence will remain for years to come one of the European Union's key promises.

In the political discourse, cohesion is often synonymous with convergence, aiming the reduction of economic disparities between Member States and the catching-up of the least developed regions. From another point of view, the experts of Eurofound (2018) make a distinction between the two concepts, considering that the term of convergence refers to the process of narrowing the gaps, while cohesion is a status, aimed to be achieved by the European Union. Moreover, cohesion is referring to the European Union's capacity to maintain unity between Member States, but does not necessarily imply convergence, being essential in order to finally reach to objective of cohesion (Eurofound, 2018). In addition, social cohesion has become popular in the academic literature and public speeches, in order to reflect the objectives of European Union. According to Chan et al. (2006), the concept of social cohesion can be analyzed from the perspective of social sciences and public policy guidelines. From an academic perspective, social convergence is often analyzed in relation to social integration, stability, and disintegration. In the field of public discourse, social cohesion was brought to the fore through the policies and objectives of the European group, focused on promoting the principle of diversity and increasing labor mobility (Chan et al. 2006). According to Jenson (2010), social cohesion has become a debated subject in OECD, the leaders identifying the danger of sectorial transformation to cohesion. Complementary, the European Union stated social cohesion, together with economic cohesion as key objectives, aimed to be achieved through new forms of social policies and multi-layer governance, which involved the active participation of citizens. The starting point of the empirical studies in the field of convergence is represented by the economic growth theories, developed in the second half of the 20th century. The exponents of the neoclassical growth model, Solow (1956) and Swan (1956), estimated the economic growth as a function of capital and labor, with the technology being an exogenously determined factor. In this framework, poor

economies experienced higher growth rates than advanced economies, based on the higher returns on capital. According to the neoclassical growth model, all economies tend to reach the same state of equilibrium on the long term. In addition to this perspective, researchers as Lucas (1988) and Romer (1987, 1990) developed the endogenous growth theory, which tried to explain the economic growth process by the specialization in production, increasing returns to scale, learning-process and human capital. In this framework, the capital no longer includes only the physical abilities, but also the intellectual capabilities of the labor.

With the advancement of the integration process on the European Union, researches were not only interested to study the fundaments of growth, but also the capacity of the European Union to promote economic and social cohesion, as stated in the primary and secondary legislation. Having as starting point the economic growth theories developed in the 20th century, researches mainly focused on economic convergence, considering as main indicator for Member States' performance the GDP per capita. Using the methodological instruments developed by Barro and Sala-i-Martin (1992), researchers examined the relationship between the initial level of GDP per capita and the average growth rates (absolute β-convergence), the determinants of growth (conditional β-convergence) or the degree of homogeneity between economies (σ-convergence). The majority of the empirical researches (Rapacki and Próchniak, 2009; Dobrinsky, 2013; Dobrinsky and Havlik, 2014; Rapacki and Próchniak, 2019) confirm the *„iron law of convergence"* (Barro, 2012), illustrating that the European Union tend to experience an average growth rate around 2% per year. Some researchers (Rapacki and Próchniak, 2009; Dobrinsky, 2013; Dobrinsky and Havlik, 2014; Alcidi et. al, 2018; Rapacki and Próchniak, 2019) were interested to study the convergence patterns in Central and Eastern Europe (CEE), reaching a consensus that the New Member States experienced a higher catching-up speed compared to the wealthy Old Members. Regarding conditional β-convergence and the main determinants of growth, analysts have brought evidence in favor of the argument that investment played a dominant role in catalyzing economic growth (Próchniak, 2011; Marelli et al., 2019). At the same time, as shown in the studies conducted by Dobrinsky and Havlik (2014), Rapacki and Próchniak (2019) and Marelli et al. (2019) trade openness is an important driver of economic growth. At the same time, Próchniak (2011) highlighted the importance of human capital in the economic emancipation of Central and Eastern European group, illustrating that a higher proportion of employees with tertiary education will positively influence the GDP per capita growth rate, while Dobrinsky and Havlik (2014) brought to the fore the contribution of labor productivity in generating prosperity gains.

There are experts who offer a complementary perspective on the status of cohesion, focusing both on the economic and social dimensions. In this respect, Di Tella et al. (2001) and Hagerty and Veenhoven (2003) tried to determine the relationship between economic growth and wellbeing. Di Tella et al. (2001) illustrated that the increase of economic performance determines an improvement of the citizens' welfare. However, according to Di Tella et al. (2001), the welfare effects determined by the increase GDP per capita tend to reduce over time as citizens develop a sense of familiarity with the increased national prosperity. In the Eighth Report on Economic, Social and Territorial Cohesion (2022), the European Commission identified a clear trend towards improving social inclusion in the European Union, by relating to variables that are representative of the labor market (e.g., employment rate) or quality of life (number of people exposed to poverty and social exclusion). However, the gaps between regions in terms of employment rates remain higher than before the onset of the global financial crisis, while there are clear gaps in employment opportunities by gender, especially in the least developed regions.

In conclusion, economic and social cohesion represents a challenge not only for European decision-makers, but also from the perspective of researchers, given the complexity of the topic. Having as starting point the economic growth theories, analysts tried to assess the perspectives of the European Union to fully accomplish the objective of economic, social and territorial cohesion. Initially focusing on GDP per capita as a key indicator of economic prosperity, experts expanded the scope of their studies by including besides macroeconomic variables, indicators which are representative for the wellbeing of the citizens.

2. Research methodology

Our analytical approach was focused on assessing economic and social cohesion in the European Union, trying to capture the main determinants of prosperity and wellbeing and the impact of Covid-19 pandemic. In this respect, focusing on the timespan 2000-2020, we have tried to determine if the poorest Members experienced an improvement in terms of GDP per capita and AIC per capita. We have selected the first year of analysis as 2000 given the data availability for all the variables. The empirical analysis is based on the instrument developed by Barro and Sala-i-Martin (1992) and widely applied in the study of economic growth – convergence binomial: absolute and conditional β-convergence. We have expanded the scope of

these instruments, by looking besides the GDP per capita at the evolution of AIC, considered to be a more representative indicator for the material welfare than income (Eurostat). Absolute β-convergence is calculated on cross-sectional regressions with the purpose to determine the relationship between the initial level of income or consumption and the subsequent growth rates. A negative relationship between variables confirms the convergence hypothesis and the neoclassical growth model assumptions, as the initially poorer economies experience higher growth rates than the rich ones. The absolute β-convergence assumes that economies with similar initial development levels will tend towards *"a state of balanced growth"* (Solow, 1956). In contrast, conditional β-convergence takes into consideration the structural differences between economies, considered to tend towards different states of equilibrium. In order to account the differences between economies, we have included in the regression equations economic and social-related variables, studying the influence on the GDP per capita and AIC per capita growth rates. In this respect, conditional β-convergence was determined based on panel regressions and using the generalized least squares method. We have selected three explanatory variables aiming the level of investment, trade openness and public finance and two indicators representative for the labor market (labor force with advanced education and real labor productivity). Moreover, we have included a dummy variable to account the influence of Covid-19 pandemic in 2020.

We have studied the evolution in the field of economic and social convergence, by employing cross-sectional regressions and taking by turn, as dependent variables, the annual growth rates of GDP per capita and AIC per capita between 2000 and 2020. The independent variable was the natural logarithm of the variable in the initial year (2000). The equation was computed as follows:

$$\frac{1}{T} ln[\frac{y_{i,t}}{y_{i,0}}] = a + a_1 ln(y_{i,0}) + u_i \quad (1)$$

$y_{i,t}$ = GDP per capita/AIC per capita in Member State "i" in 2020
$y_{i,0}$ = GDP per capita/AIC per capita in Member State "i" in 2000
T = number of years
a = constant
u = error term

$$\frac{1}{T} ln[\frac{AIC_{i,t}}{AIC_{i,0}}] = a + a_1 ln(AIC_{i,0}) + u_i \quad (2)$$

The speed of convergence was computed based on the results of the cross-sectional regression illustrated in equation 1, as follows (For conditional β-convergence estimated on panel regressions, T=1):

$$\beta = -\frac{1}{T} ln(1 + \alpha_1 T) \quad (3)$$

In order to study the determinants of prosperity and wellbeing, we have employed panel regressions taking into consideration several macroeconomic and social explanatory variables. The regressions were estimated using the generalized least squares with robust standard errors. We studied, by turn, the impact of investment, trade openness, government debt, percentage of labor force with advanced education and real labor productivity on the GDP per capita and AIC per capital growth rates. Moreover, in order to find evidence in favor of conditional β-convergence, we have included in the equation the lagged value of GDP per capita and AIC per capita and a dummy variable related to Covid-19 pandemic (1 for 2020, 0 for the rest of years)

$$ln(\Delta GDP_{i,t}) = a + \beta_1 ln(GDP_{i,t-1}) + \beta_2 ln(GFCF_{i,t}) + \beta_3 ln(Trade_{i,t}) + \beta_4 ln(Debt_{i,t}) + \beta_5 ln(LFAE_{i,t}) + \beta_6 ln(RLP_{i,t}) + Dummy \quad (4)$$

$$ln(\Delta AIC_{i,t}) = a + \beta_1 ln(AIC_{i,t-1}) + \beta_2 ln(GFCF_{i,t}) + \beta_3 ln(Trade_{i,t}) + \beta_4 ln(Debt_{i,t}) + \beta_5 ln(LFAE_{i,t}) + \beta_6 ln(RLP_{i,t}) + Dummy \quad (5)$$

The variables, sources and the expected influence are presented in Table no. 1:

Table no. 1. Variables, definitions and sources

Variable	Definition	Source	Expected sign
Gross domestic product (GDP) per capita	GDP per capita at market prices (PPS per capita)	Eurostat	The lagged value - negative
Actual individual consumption (AIC) per capita	Actual individual consumption per capita (PPS per capita)	Eurostat	The lagged value - negative

Variable	Definition	Source	Expected sign
Gross fixed capital formation (GFCF)	Gross fixed capital formation (% GDP)	World Bank	Positive
Trade	Sum of exports and imports (% of GDP)	World Bank	Positive
Debt	General government gross debt (% of GDP)	Eurostat	Negative
Labor force with advanced education (LFAE)	Labor force with advanced education (% of total working-age population)	World Bank	Positive
Real labor productivity (RLP)	Real labor productivity per person employed (2010 = 100)	Eurostat	Positive
Dummy	Dummy variable for Covid-19 pandemic (1 for 2020, 0 for the rest of the interval)	-	Negative

3. Results and discussion

Absolute β-convergence

Figure no. 1 compares the initial level of GDP per capita with the average growth rates between 2000 and 2020. Estimating absolute β-convergence based on equation 1, we have found evidence in favor of the neoclassical growth model assumptions, as the initially less developed Members from Central and Eastern Europe experienced higher GDP per capita growth rates compared with the wealthy countries, being placed in the upper part of the graph. Considering the results of absolute β-convergence, we have identified a polarization between the Central and Eastern group and the Old Members. According to our estimation, the highest growth rates between 2000 and 2020 were registered by Romania (7%) and the Baltic States - Lithuania (6.2%), Estonia (5.6%) and Latvia (5.4%). With the exception of Slovenia, all the Central and Eastern European Members recorded average growth rates above 3% during the period under review. As far as the Old Members are concerned, the highest growth rate was experienced by Ireland (4.3%) and Luxembourg (2.6%), two wealthy countries. This result is in line with the endogenous growth model theories, that suggest that wealthy countries can continue their growth trajectory based on investment in human capital, specialization and increase productivity. In contrast, the lowest growth rates in the European Union were experienced by Greece (0.06%) and Italy (1%). The average catching up speed identified in the European Union, which was computed on equation 3, was 2.4%.

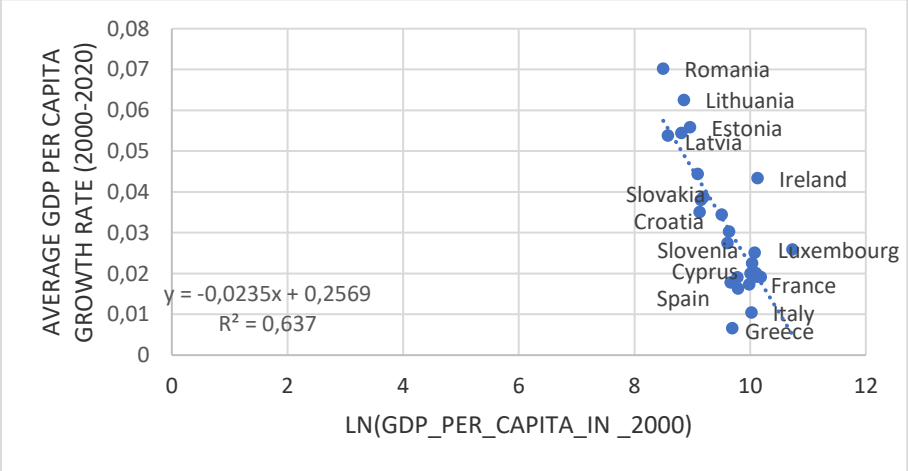


Figure no. 1. Absolute β-convergence in the European Union based on Gross Domestic Product per capita

The analysis of the evolution of GDP per capita is complemented by the AIC per capita, an indicator which is considered representative for the material wellbeing of the citizens. The negative slope of the trend line confirms that the least developed Members in 2000 experienced a higher pace of improvement of the material wellbeing compared to the wealthy Members. In this respect, the main winner of the catching-up process, was similarly to income convergence, the Central and Eastern European group. In this respect, Romania experienced an average growth rate of 7%, being followed by Lithuania (5.7%) and Bulgaria (5.3%). Moreover, the neoclassical growth model assumptions are confirmed for the social indicators as well, based on the modest evolution of the initially developed Members, such as Luxembourg. Not surprisingly, the Mediterranean countries - Italy and Greece - experienced the lowest improvement of

material wellbeing, although the growth rates were slightly higher in the case of AIC compared to GDP per capita. Overall, the average catching-up speed identified in the European Union (27) was 3%, this percentage being determined by the progress of the New Members from Central and Eastern Europe.

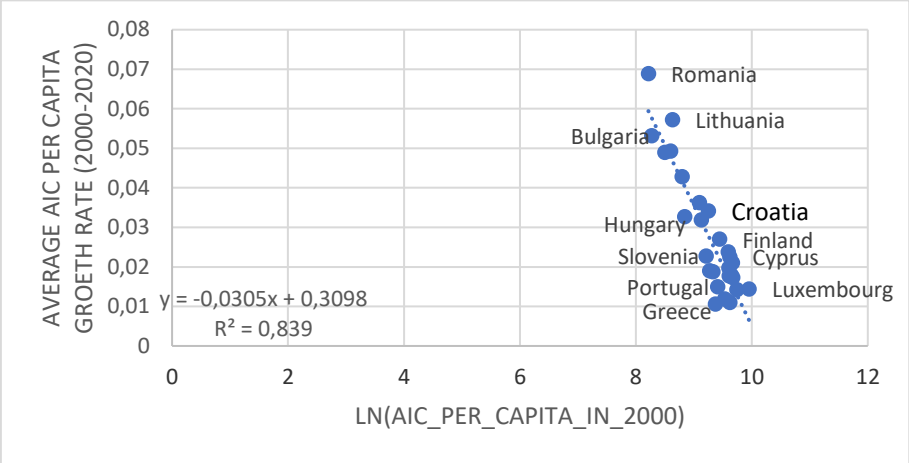


Figure no. 2. Absolute β-convergence in the European Union based on Actual Individual Consumption per capita

Conditional β-convergence

In order to account for the structural differences between economies, we have estimated conditional β-convergence based on panel regressions, as illustrated in equations 4 and 5. We have tried to determine the influence of macroeconomic, public finance and labor market related variables on the annual growth rates, selecting by turn as dependent variable the GDP per capita and the AIC per capita. With the purpose to confirm the conclusion reached on cross-sectional regressions, we have also included in the equations the lagged values of the dependent variables. We have used seemingly unrelated regressions in order to manage the heteroskedasticity and contemporaneous correlation in the errors across equations. Based on the negative relationship between the annual growth rates and the lagged value of GDP per capita and AIC per capita, we have found evidence in favor of conditional convergence in the European Union. The convergence speed, estimated on equation 3, is 1.8% for GDP per capita and 4.6% for AIC per capita. The explanatory variables have the expected signs in both equations, our study illustrating that investment, as reflected by the gross fixed capital formation (% GDP) was a major determinant of economic and social cohesion. Moreover, trade openness had a positive influence both on income and wellbeing, while the governmental debt had a negative impact. Consequently, our study draws attention to the danger of over-indebtedness, which has become rather the rule and not the exception on the background of Covid-19 pandemic. In the field of labor market variables, the paper confirms that a high percentage of labor force with advance education have a beneficial influence on the selected dependent variables, but mainly in the case of GDP per capita. Moreover, the increase of labor productivity proved to be a major catalyzer of wellbeing. Lastly, the dummy variable confirms that the Covid-19 pandemic which started in 2020 had a negative impact on economic and social cohesion. The values of the coefficient of determination illustrate that the model explains in a high proportion – of 66% in the case of GDP per capita and 82% for AIC per capita – the variation of the dependent variables. Moreover, the Durbin-Watson test confirm that there is no first order correlation between errors (values are around 2).

Table no. 2. Conditional β-convergence

Conditional β-convergence		
Method: Seemingly Unrelated Regressions		
Dependent variable	Annual GDP per capita growth rate (2001-2020)	Annual AIC per capita growth rate (2001-2020)
Total panel obs./Variable	475	475
a	-0.5662* *(0.0809) (-6.9907)*	0.3394* *(0.0405) (8.3684)*
Lagged GDP per capita / AIC per capita	-0.0175* *(0.0034) (-5.0707)*	-0.0452* *(0.0012) (-37.254)*
GFCF	0.0561* *(0.0037) (15.089)*	0.0296* *(0.0022) (13.038)*
Trade	0.0091** *(0.0036) (2.5424)*	0.0050* *(0.0009) (5.2004)*
Debt	-0.0038* *(0.0019) (-1.9901)*	-0.0071* *(0.0007) (-9.7564)*
LFAE	0.1295* *(0.0179) (7.1988)*	0.0070 *(0.0083) (0.8389)*
Real labor productivity	0.0015 *(0.0071) (0.2121)*	0.0119* (0.0043) (2.7101)

Dummy	-0.0648* *(0.0021) (-30.3832)*	-0.0657* *(0.0029) (-22.5387)*
Prob (F-statistic)	0.0000	0.0000
R-squared	0.6649	0.8250
Adjusted R-squared	0.6598	0.8224
Durbin Watson	2.0086	2.0313
β (convergence speed)	1.8%	4.6%

*Note: standard errors and t-statistics in parentheses. * - p-value < 1%, ** - p-value < 5%*

Conclusions

After seven decades since the materialization of the first initiatives of economic integration on the European continent, the European Union continues to have both opponents and supporters. In order to preserve the unity of the group and to remain a powerful political and economic global actor, the European Union has the difficult task to balance the interests of all its 27 Members. In order to preserve peace and stability on the continent, the European group has to promote its initial objectives, that have gathered the admiration of so many countries, decision makers and citizens. Among these, one of the main objectives of the European Union aims since its establishment the promotion of harmonious development and the catching-up of the less developed economies. This pillar has become even more important during the crisis generated by Covid-19 pandemic, when the European Union had the difficult task to concertedly manage unexpected sanitary and economic challenges. The aim of this paper was to study the economic and social cohesion patterns between 2000 and 2020, with the purpose to determine of European Union has made progress towards this goal. In this respect, we have considered representative for economic cohesion the GDP per capita, while the social dimension was studied by considering evolution of the AIC per capita.

Using the methodological instruments developed by Barro and Sala-i-Martin (1992) starting from the neoclassical growth model – absolute and conditional β-convergence – we have illustrated that the initially least developed Member States experienced a higher catching-up speed compared to the wealthy Members. This conclusion applies both for economic and social dimension in the European Union, although the convergence rate in terms of AIC was higher compared to GDP per capita (3 % versus 2.4%). This high speed of convergence recorded at the aggregate level was determined by the progress achieved by the Central and Eastern European group, members such as Romania an Baltic States experiencing average income and consumption growth rates above 5% between 2000 and 2020. The analysis of the relationship between the initial level of income or consumption and the average growth rates (absolute β-convergence) was complemented by conditional β-convergence, with the purpose to account the structural differences between economies. Estimating panel regressions, we have found evidence in favor of conditional β-convergence, given the negative relationship between the lagged value of GDP per capita and AIC per capita on the one hand and the annual growth rates on the other hand.

The study has a number of policy implications. First of all, the empirical model illustrated that investment was a key driver of both economic and social cohesion. Moreover, trade openness proved to have a beneficial influence on the annual growth rates, so the European decision-makers should continue the efforts of liberalization, promoting exchange of goods and services with third countries. Our study also emphasizes the role of human capital in generating both welfare and prosperity gains. Consequently, the European decision-makers should adopt policies and measures that encourage the enrollment in the tertiary education on the one hand and the life-long learning process, in order to increase the labor productivity, on the other hand. In contrast, our study draws attention on the danger of over-indebtedness, suggesting that increasing the governmental debt might hamper the economic and social progress. The empirical model also confirms the negative impact of Covid-19 pandemic on the GDP per capita and AIC per capita growth rates. The main shortcoming of the study derives from the limited perspective on economic and social cohesion. In this respect, we have mainly focused on two indicators (GDP per capita and AIC per capita), but economic and social cohesion is influenced by a wide range of factors. Similarly, in the study of conditional β-convergence, we have selected few variables, considered to be representative for the catching-up process. Consequently, the study can be expanded by accounting the influence of other macroeconomic, social or governance-related variables.

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Analysis of the Impact of the Greenhouse Gas Emissions Component of Environmental Resilience on the New European Development Model

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Abstract

Population well-being is a strategic goal for every political program. We are currently living in the new logic of sustainability which means at the same time economic efficiency, social responsibility and ecological resilience. Two of the key drivers of the new development model of the European Union are ecological and digital resilience. Ecological resilience means promoting the values of the circular economy but also neutrality in terms of emissions. To this end, an ambitious program called the Green Deal has been launched and is being implemented at European level. More and more experts are interested in following the evolution of greenhouse gas emissions and determining the factors with a high influence on their level. The identification of causalities or the relationship between greenhouse gas emissions and the most significant variables has become an interesting research topic. In order to contribute to mitigating the climate changes, both policy makers and entrepreneurs put more and more frequently in their agendas subjects as Gross Domestic Product per capita, Research & Development expenditures per capita, domestic consumption of fossil energy material per capita and red meat production per capita. The authors of this paper set out to analyze and offer some relevant insights linked to correlation and causalities between greenhouse gas emissions volumes and global warming based on Pearson correlation coefficient and the identification of similar countries using the combination of clusters in the Dendrogram using Ward Linkage. Data from the EUROSTAT database with a range from 2013 and until 2019 with a grouping of 27-EU countries were used for the calculation the Pearson correlation coefficient and the combination of clusters in the Dendrogram using Ward Linkage. The findings show there is a negative correlation between both the gross domestic product per capita, research and development per capita and greenhouse gas emissions for high income countries and generally positive correlation between both the domestic consumption of fossil energy materials, the production of red meat per capita towards greenhouse gas emissions.

Keywords

Greenhouse gas emissions, environment, GHG determinants, climate change, clustering

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Introduction

It has become a truism for the entire international community (policy makers, experts in academia and science, business and civil society representatives) that the greenhouse gas emissions (GHG) exert a continuous pressure on the environment, being the main driver of global warming, hence adversely impacting the climate change. GHG emissions may be produced by natural systems (i.e. oceans, wetlands, forest fires, volcanoes or mud volcanoes) or human activities. Although naturally produced GHG emissions represent 33.4%-52.1% of total volumes (YUE and GAO, 2018), due to the fact they are self-balanced (eventually absorbed in ecosystems) and may be influenced in an immeasurable percentage by man, we will analyze the ones coming from main anthropogenic activities with the largest share of emissions issued, namely fossil fuel material combustion (Climate Watch, 2022) and red meat production (González et al.,

2020). The objective of this paper is issuing recommendations in cases where variables have a positive correlation with the GHG emissions volumes, found by means of the calculation of Pearson correlation coefficient and the identification of similar countries using the combination of clusters in the Dendrogram using Ward Linkage.

Our research is based on 2 hypotheses:

H1: there is a negative correlation between both GDP per capita, R&D per capita and GHGs emissions per capita in case of developed countries of EU-27 countries and vice versa.

H2: there is a positive correlation between both fossil energy materials per capita, red meat production per capita and GHG emissions per capita in case of all EU-27 countries.

The paper will be structured as follows: a short review of the scientific literature, the methodology we have used, the authors' findings and conclusions and recommendations.

1. Review of the scientific literature

In the process of developing the economy a country pays less or more attention to the environment degradation or sustainability. Following the Kuznets curve, its usage being extrapolated to environmental issue from the social hypothesis advanced by economist Simon Kuznets, the countries change their less productive and high polluting equipment and activities into more productive and environmentally friendly ones especially through policy change and regulations (Panait, Voica and Rădulescu, 2019). In Romania, a country in a transition stage from efficiency driven to innovation driven economy and situated in the upward part of the environmental Kuznets curve (EKC), despite the authorities claim a sustainable growth, the primary and final energy intensity are more than three times higher than the current average levels in the EU. Moreover, in 2018 the total consumption of resources in the metallurgical industry increased by more than 48% compared to 2014, while the added value recorded a contraction of 2.8%. Regarding the oil processing industry, while the added value increased by 12.6%, the consumption of resources increased by over 50% (Iacobuta, Asandului and Cautisanu, 2020; Sarbu et al., 2020). Fathi, Ashena and Bahari (2021) have conducted a research recently, trying to find out the most efficient countries in a 25 samples group in terms of energy, economic and environmental (E3) strategies, using an integrated Data Envelopment Analysis approach and Nash bargaining game model. The findings are contradictory to the above-mentioned studies in case of Romanian as among the analyzed 25 countries in the latter, the top five countries in terms of E3 efficiency are China, Oman, Bahrain, Romania and Poland, respectively. The in-depth analyze demonstrates Brazil, Malaysia, Poland and Romania are the most efficient countries in the panel in the energy and economic efficiency, but not in the environmental efficiency.

As many researchers underlined the primary and final energy consumption have a severe and negative effect over the environment due to the polluting effect, the authorities should aim at increasing the productivity of sectors using this primary resource. Zaharia et al. (2019) found the most relevant factors with a positive correlation with both types of energy were the greenhouse gas emissions, gross domestic product (GDP), population and labor growth. By contrary, factors such as the increase of energy taxes, healthcare expenditures, research and development (R&D) funding or the proportion of female decision makers influence negatively the consumption of the energy. The study shows a 1% increase of GDP led to an increase of primary energy consumption between 0.32% and 0.38% during the period 1995–2014 depending on the model used. Corroborated with other data provided by specialized agencies (International Energy Agency, 2019; U.S. Environmental Protection Agency, 2022) the influence of GHG emissions on the energy consumption according to the same research (the models showed a 1% growth of GHG emissions led to an increase of the primary energy consumption by 0.75%–0.80% in the period 1995–2014) will palpable determine a spiral with the undisputable result which is the environment degradation.

Another important source of GHG emissions is the agriculture (about 23% of the anthropogenic GHGs), mainly through the process of ruminant enteric fermentation of livestock, which issues a volume between 12% and 18% to the total GHG emissions resulted from human activities. Besides CO2 emissions livestock production has some other negative effects on the environment, especially water footprint, water pollution and water scarcity (González et al., 2020).

2. Research methodology

In order to determine patterns of the greenhouse gas and its influence factors, 4 annual variables were selected besides GHG emissions per capita for 27 countries of Europe Union for period 2013 – 2019 based on EUROSTAT database (EUROSTAT, 2022):

- GDP per capita;
- R&D per capita;
- Fossil energy materials per capita;
- Red meat production per capita.

Using these variables, Pearson correlation has been calculated considering bivariate correlation between GHG emissions and each of the 4 variables on following formula:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} \quad (1)$$

where x_i and y_i are the values of those two variables and $\overline{x}$ and $\overline{y}$ are the mean of the values of *x* and *y* variables. The correlations between GHG emissions and the rest of 4 variables on each country for 2013-2019 period are represented in table no 1.

Classification implies the formation of clusters of statistical units according to the degree of similarity between them, taking into account the characteristics to be studied. The hierarchical classification method seeks to obtain more agglomerations in size and as homogeneous as possible. Ward's varied hierarchical classification method evaluates the distances between two agglomerations and is based on maximizing class variability and minimizing variability within classes. Using this method based on Squared Euclidean distance, homogenous groups of countries related to the correlation between different factors to GHG have been created. By applying this technique on selected data, four clusters were defined. (fig. no. 1)

Our research is based on 2 hypotheses:

H1: there is a negative correlation between both GDP per capita, R&D per capita and GHGs emissions per capita in case of developed countries of EU-27 countries and vice versa.

H2: there is a positive correlation between both fossil energy materials per capita, red meat production per capita and GHG emissions per capita in case of all EU-27 countries

3. Results and discussion

The table no. 1 illustrates a comparative overview of correlations between the anthropogenic GHG emissions and their main determinants for all EU countries, during the period 2013-2019.

From the table we can observe that the countries with high level of GDP per capita have a strong negative correlation between the GDP per capita and the volume of GHG emissions, being situated on the downward part of the EKC. At the contrary, countries with a developing economy or in transition to innovation driven economies have strong positive correlation, as situated on the upward part of the EKC. The strongest negative correlation is registered in case of Germany (-0.953), Malta (-0.88), Netherlands (-0.878), France (-0.852), Luxembourg (-0.82), Denmark (-0.815), the strongest positive correlation in case of (Czechia (0.986), Lithuania (0.944), Hungary (0.88), Poland (0.817). Romania is still situated on the upward part of the EKC with a correlation coefficient of 0.574 while Finland, Latvia and Bulgaria have almost no correlation between the GDP per capita and GHG or a very small correlation.

Similar findings are noticed in case of the variable R&D per capita, where developed countries with higher level of expenditures in research, development and innovation generate less anthropogenic GHG emissions the more expenditures with R&D they have. The negative correlation coefficients vary between -0.961 in case of Germany and -0.504 in case of Estonia and positive correlation coefficients between 0.57 in case of Latvia and 0.938 in case of Czechia. Portugal and Slovakia register very small correlations between the R&D expenditures and GHG emissions volumes.

Table no. 1. Correlations between the anthropogenic GHG emissions and their most important determinants (Pearson coefficient and clusters)

Country	GDP_per capita	R&D_per capita	Fossil_energy_materials_ per capita	Red_meat_ production_ per capita	CL4	CL3	CL2
Belgium	-0.612	-0.594	0.247	0.632	1	1	1
Denmark	-0.815	-0.780	0.778	0.813	1	1	1
Germany	-0.953	-0.961	0.964	0.916	1	1	1
Ireland	-0.224	-0.475	0.376	0.061	1	1	1
Greece	-0.629	-0.865	0.939	0.877	1	1	1
France	-0.852	-0.844	0.932	0.160	1	1	1
Italy	-0.273	-0.414	0.921	0.493	1	1	1
Malta	-0.880	-0.301	-0.284	0.910	1	1	1
Austria	-0.476	-0.568	0.533	0.326	1	1	1
Sweden	-0.426	-0.494	-0.336	0.854	1	1	1
Bulgaria	0.103	0.320	0.968	0.252	2	2	2
Poland	0.817	0.735	0.552	0.848	2	2	2
Romania	0.574	0.646	0.703	0.714	2	2	2
Croatia	0.494	0.342	0.200	0.053	2	2	2
Cyprus	0.402	0.301	0.621	-0.217	2	2	2
Latvia	0.120	0.570	-0.051	0.143	2	2	2
Lithuania	0.944	0.773	0.799	0.666	2	2	2
Portugal	0.275	0.189	0.813	0.133	2	2	2
Slovakia	0.299	0.093	-0.061	0.141	2	2	2
Finland	0.048	0.288	0.546	-0.220	2	2	2
Czechia	0.986	0.938	-0.609	-0.872	3	2	2
Hungary	0.880	0.739	-0.720	0.905	3	2	2
Slovenia	0.487	-0.610	-0.884	0.680	3	2	2
Estonia	-0.318	-0.504	0.808	-0.558	4	3	1
Luxembourg	-0.820	-0.919	-0.494	-0.866	4	3	1
Netherlands	-0.878	-0.899	0.819	-0.803	4	3	1
Spain	-0.359	-0.481	0.931	-0.312	4	3	1

Source: authors' calculation based on EUROSTAT database, extracted on 26.02.2022

Regarding the red meat production per capita and fossil energy materials per capita we can notice there are mostly positive correlation coefficients or small correlations with GHG emissions, strong negative correlations occurring in case of only 3 countries as to the fossil energy materials per capita, Slovenia (-0.884), Hungary (-0.72) and Czechia (-0.609) and also only 3 countries as to the red meat production per capita: Luxembourg (-0.866), Czechia (-0.872) and Estonia (-0.558). Almost no correlations occur for Latvia (-0.051, fossil energy materials per capita), Croatia (0.053, red meat production per capita), Ireland (0.061, red meat production per capita) and Slovakia (-0.061, fossil energy materials per capita). The strong positive correlation coefficients vary between 0.533 (Austria) and 0.964 (Germany) regarding the fossil energy materials per capita and between 0.632 (Belgium) and 0.916 (Germany) regarding red meat production per capita. This finding demonstrate that increasing the consumption of fossil energy materials and the production of red meat will generate more volumes of GHG emissions for the most part of countries.

According the resulted Dendrogram using the Ward Clustering the authors identified 4 significant clusters (cutting the tree at a distance of 5, fig. no. 1 and fig. 2).

There is a cluster of high developed countries (Germany, France, Denmark, Ireland, Greece, Italy, Belgium, Austria, Sweden, Malta) which showed negative correlations between GDP per capita, R&D per capita and GHG emissions per capita, we have a second cluster with Bulgaria, Poland, Romania, Croatia, Cyprus Latvia, Lithuania, Portugal, Slovakia and Finland, where we can notice almost only positive correlations between all variables and GHG emissions, with the exception of Latvia, Slovakia (almost no correlation between fossil material consumption per capita and GHG emissions), Cyprus and Finland (small negative correlation between red meat production per capita and GHG emissions), the third cluster formed by Czechia, Hungary and Slovenia, a less homogeneous cluster with a negative correlation between the fossil material consumption and GHG emissions and the fourth cluster with Estonia, Luxembourg, Netherlands and Spain where there are strong negative correlations between 3 or 4 variables and GHG emissions, In case of Luxembourg all analyzed variables have negative correlations with GHG emissions.

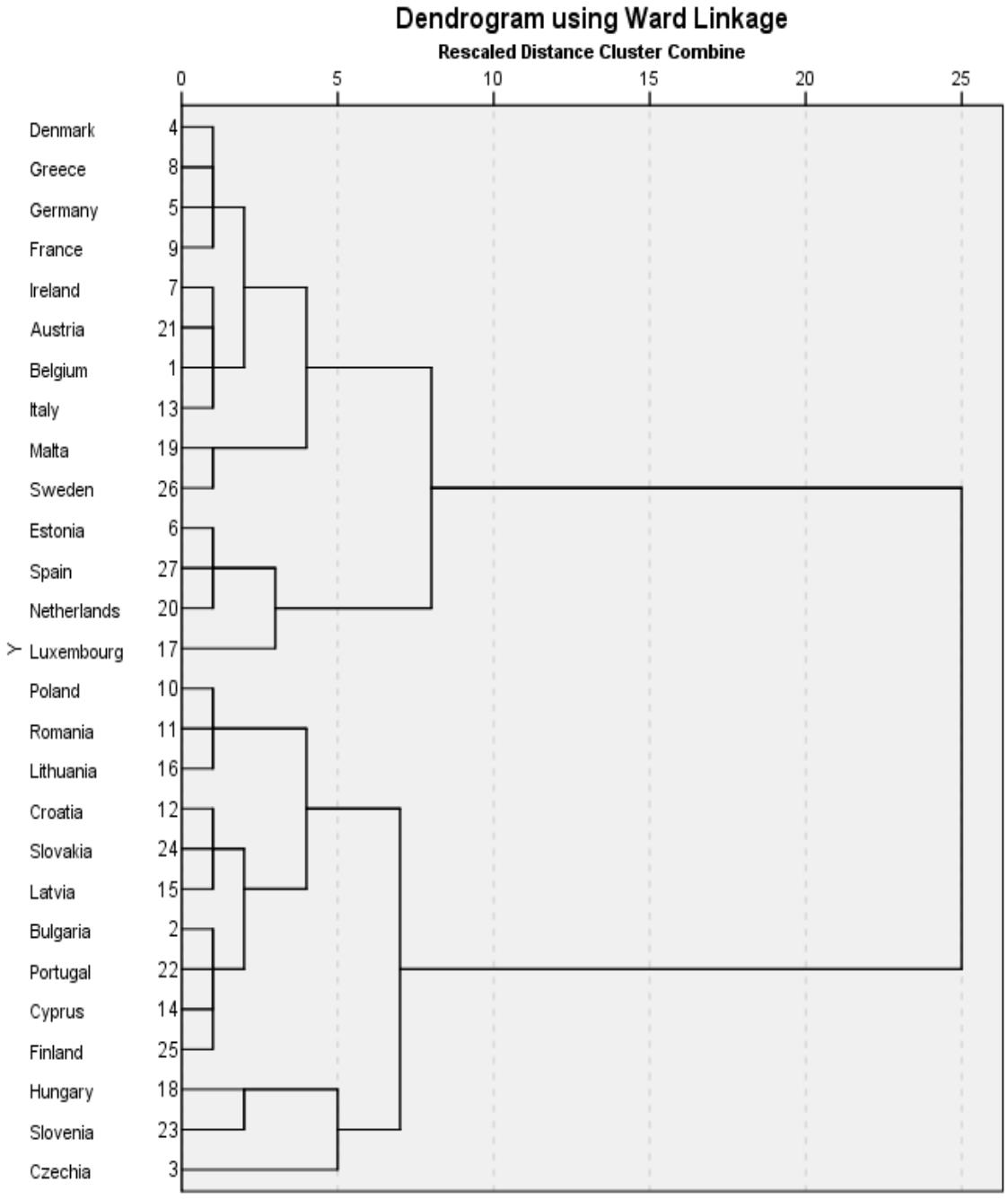


Figure no. 1. Grouping similar countries in clusters
Source: authors' calculation based on EUROSTAT database, extracted on 26.02.2022

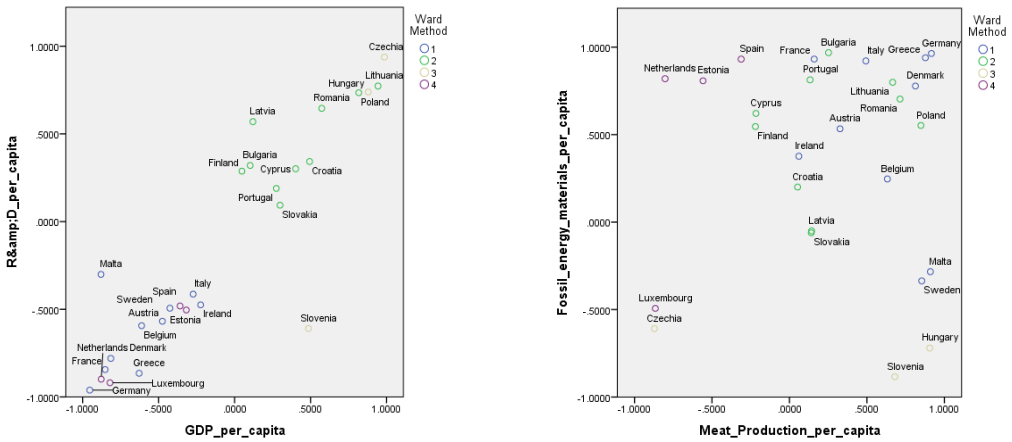


Figure no. 2. Projection of countries on the 4 indicators used in clustering
Source: authors' calculation based on EUROSTAT database, extracted on 26.02.2022

Conclusions

Starting from the scientific hypothesis and applying the announced research methodology, the authors found that H1 hypothesis is confirmed, countries with a high level of income per capita and R&D expenditures per capita generate less GHG emissions and vice versa, confirming also the validation of the U-inverted EKC, which is acknowledged by environment specialists.

The H2 hypothesis is partially confirmed as with only a few exceptions our findings show medium or strong correlations between both variables (domestic fossil material combustion and red meat production) and the level of GHG emissions. Given the fossil material price increase beginning with 2021 and the effect of pollution countries should look after renewable energy sources with no impact on the environment and better use of waste as a secondary material (Bran et al., 2021). Regarding the red meat influence on the GHG emissions and population health – carcinogenic risk (prostate, breast, hepatocellular and colorectal cancer), diabetes, chronic kidney, cardiovascular and metabolic diseases, abdominal obesity, shorter life expectancy in high and middle income countries, the authorities and private actors should move their interest into producing more fish, poultry, fruits and vegetables in order to satisfy the need for food (González et al., 2020). This can be eventually achieved supplementary to the market demands by retargeting the funding, releasing barriers or strict regulations.

Unfortunately, data drawn from EUROSTAT regarding the GHG emissions does not contain details on 2020 and 2021, which might have been very helpful in measuring also the impact of COVID on pollution and the evolution of variables. Our research might be further extended taking into consideration this relevant period and last but not least in order to analyze more thoroughly the unfavorable influence of other important GHG determinants so that climate change effect is reduced as possible.

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Employees Perception on Work from Home During COVID 19 Pandemic and Impact at Organizational Level

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Abstract
This article presents the effects of the COVID 19 pandemic on Human Resources (HR) Corporate Department of a European oil & gas company and the key mechanisms of change within the whole business. The main scope of this research was to analyze the impact of the pandemic period on employees (at individual level), on the HR Corporate department (at team level) and on the overall satisfaction level within the whole organization (at company level). The purpose of this research was a pulse check exercise to identify the key elements employees are struggling during the pandemic, to identify the most effective communication channels and improvement areas in order to increase efficiency.
Furthermore, the consequences of the new ways of working during the pandemic period drove to a transformation within the whole organization – where the impact of digital and technology innovation is combined with the execution of activities, as well as the way employee interact with one another (internally & externally). An interview with the HR Business Partner representative supported us on finding out more insights on the whole concept driven by the values of business agility, where the main 3 pillars are represented by digital subsurface, digital rig of the future and real-time digital oilfield, off 3 being enabled by digital office of the future – aiming to have everything one click away, and digital ways of working-with the purpose of doing more with the people.
The theoretical framework of the article is based on the impact on new ways of working during the pandemic period and which elements of the oil & gas changing industry determined changing the expectations from employees. The analysis of the elements influencing the new ways of working during the pandemic period is based on statistical methods, therefore, this is considered quantitative research. The qualitative research includes the literature review about the transition period when the business goes virtual, leading in the VUCA word and importance of health while working from home.

Keywords

Pandemic, new ways of working, work from home, digitalization, changing industry, oil & gas, value chain

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Introduction

Wuhan, China is the first location where COVID 19 was first identified and the pandemic started in December 2019. The pandemic context developed with an incredible speed, thus on 11 March 2020, the World Health Organization (WHO) has officially called pandemic (Hui et al., 2020).

Before start of the COVID 19 pandemic most organizations had not adopted the work from home way of working. Employees needed to work from their office on a daily business and only few companies implemented this flexible way of working as a pilot, specially in the IT services. Once the COVID 19 pandemic started, social distancing was one of the most popular measures to minimize the risk of infection. Thus, because working from home can reduce the infection rates and aims to decrease the economic costs of confinement, it became a suitable measure which has been implemented immediately.

The work from home as a new way of working may have potential benefits, but also risks (Errichiello and Pianese 2016; Anka et al., 2020; Choudhury et al., 2020; Graves and Karabayeva 2020; Yawson, 2020). When considering the main difficulties during the pandemic, keeping the balance between work and private life, in an environment where the household members are combined with the professional life might be challenging. Not only the companies switched to the work from home activity, but also schools started to teach remotely during the pandemic and this has been mirrored as one of the biggest challenges of the employees during the pandemic (Bulut and Reziyamu 2021; Chawla et al., 2020; Davis et al., 2020; Kniffin et al., 2021; Vargas-Llave, 2020).

In the present article we will present the effects of the pandemic and how the imposed now ways of working – focusing on the work from home setup has impacted the whole organizational setup.

1. The consequences of the pandemic on new ways of working

In the present article, we will present the consequences of the pandemic on new ways of working, which are the key elements with negative impact when it comes to Coronavirus restrictions and how this is reflected in the transformation process of the whole organization. The research was conducted within the HR Corporate departments of a European oil & gas company, in January 2021, aiming to hear the voice of the employees in order to identify the improvement areas and adapt the whole business concept to the new working environment.

The survey has been distributed online, in January 2021, to pulse check the HR employee's satisfaction level after one year of pandemic, working almost exclusively from home. The survey contented was designed as simple as possible, focusing on 3 main areas: employee impact, team impact and overall satisfaction level. The survey addressed to the employees covered the Net Promoter Score representative question, with the possibility of a unique answer on a scale from 1-10 ("On a scale from 1 to 10, to when extend do you agree to the following statement: I am completely satisfied by the new ways of working during the pandemic") (Reichheld, 2003), 3 ranking questions measuring the employees satisfaction level when it comes to leader support, measures at work locations and effectiveness of working from home, 3 ranking questions measuring effectiveness of working completely virtual, partially virtual or sending office / field / plant, but also single choice questions, aiming to identify the elements negatively impacting working from home during pandemic, the most popular communication channels and improvement areas while working from home or when returning to the office. The target group was HR headquarter department, where 86 employees, out of a total of 128 responded to the survey. The 67% response rate was high, reflecting the fact that such surveys are appreciated by employees. In addition, the high response rate is a proof that transparency, open communication, and feedback are main pillars when it comes to the fundaments of the organization.

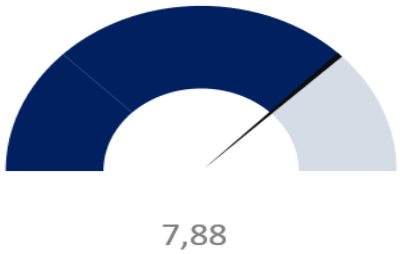


Figure no. 1. Net Promoter Score for working from home
Source: authors' data processing study

During the pandemic 92% of the HR department worked completely virtual, only 8% of the team working partially virtual. The switch from working from office to working exclusively from home was abrupt, being determined by the emergency of the Corona pandemic.

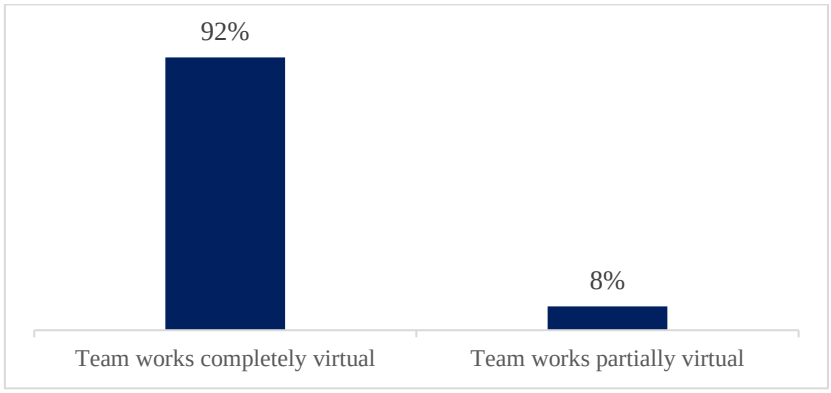


Figure no. 2. Status split on way of working
Source: authors' data processing study

When deep diving into the results of the survey, 52% of the respondents stated that "they are ok" with the current situation. 28% of respondents had a mix of feeling, saying that "some days are better then other", reflecting that they were still struggling from time to tome with adapting to the new work from home way of working. The extremes of the responses were in a low percentage, only 5% declaring that they "are struggling" during the pandemic work from home, while 15% where "completely fine" with the new working setup. During the pandemic period, many employees struggled with stress, sleeping disorders, burnout, anxiety, demotivation and even lack of sense on what they do (Bulut and Reziyamu 2021). Thus, the overall calculated Net Promoter Score was high – 7.88. Employees who scored 9-10 ratings had the highest recommendation rates and are named "Promoters". The "Passives" being satisfied, but not loyal- gave scores between 7-8 and employees with ratings between 0-6 were called "Detractors". The Net Promoter Score is defined as the difference between the percentage of promoters and the percentage of detractors. Thus, we can conclude that even if the work from home way of working was not planned, the employees welcomed this change and adapted fast.

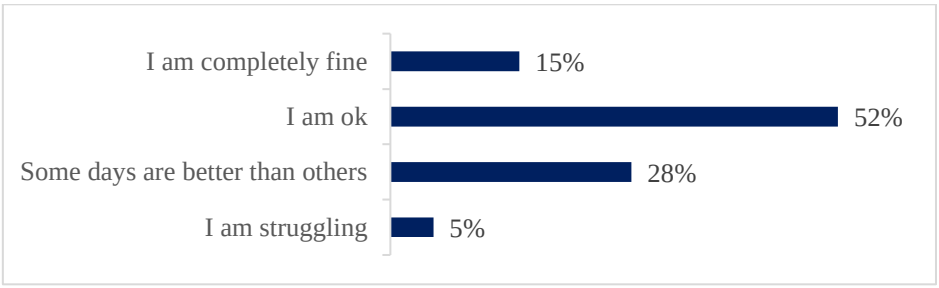


Figure no. 3. Employees status with pandemic situations
Source: authors' data processing study

When analyzing the employee impact, they survey focused on 3 main areas: management support, measures at work location and effectiveness of working from home. For this section of the survey, respondents were invited to rank their satisfaction level by granting 1-5 starts for each category. The highest score was registered by the effectiveness of working from home, having a total of 4,58/5. The findings of the research indicate that working from home effectiveness is improved by personal and family well-being but reduces when it comes to environmental and resource constraints. When employees experience higher effectiveness while working from home, they develop a preference for this new way of working and aim to continue working from home even after the pandemic. However, when asking feedback on team effectiveness at team level when working completely virtual, the registered score is 4,24/5. On the other side, the team effectiveness when working partially virtual was evaluated at 4,71/5. Thus, the results proof that the best individual effectiveness level is not affected when working from home. In the same time, the best setup for team overall effectiveness is when employees work partially virtual.



Figure no. 4. Effectiveness split on way of working
Source: authors' data processing study

Facing the pandemic waves forces the organizations to adapt working locations and increase the health security measures. Health and Security are considered a priority, specially in oil and gas organizations and aim to reduce as much as possible working accidents. Thus, implementing preventive measures was treated as a priority being physical or social distancing. New regulations and measures were designed to ensure the health and security of employees working from office during the pandemic. Ventilation system of indoor spaces has been upgraded, rules on social distancing, coughs and sneezes, hand washing, keeping unwashed hands away from face, usage of masks in common working spaces were implemented once the pandemic alert status was declared by authorities. Implementing all those measures gave employee confidence that they are save when joining the office. Separately from health, security and infrastructure changes imposed by the pandemic, the switch from working from office to working from home has successful with a consistent effort of IT support. Ensuring the virtual private network (VPN) infrastructure to sustain the continuity of business activity was successfully fulfilled and contributed to the effectiveness of working from home. Thus, a score of 4,5/5 was calculated when it came to satisfaction with measures at work location.

The pain-point of the elements ranked by the employees is represented by the lower satisfaction level with leader's support, scoring 4,33/5. The impact of supportive leadership is key during crisis periods. We can conclude that organizational leadership group was not prepared for such a change and left space for improvement when it comes to creating a clear list of priorities. Once with the pandemic crisis, the oil & gas industry was strongly affected by the oil & gas price volatility, competitor pressure for efficiency, country specific challenges and green demand from stakeholders. Business changes are always mirrored in the HR activity. Thus, many project have been put on hold, priorities changes and new improvement areas were identified – such as developing a digital signature flow, obtaining digital signature authorization, developing a paperless organization, focus on digitalization and simplification and support business to redesign the whole organization from a process-oriented approach to value change orientation.



Figure no. 5. Satisfaction score while working from home
Source: authors' data processing study

The continuous learning is one of the key elements which contribute to a successful leadership in the new reality. We identified three main areas which might be improved by specific courses, supporting leaders to manage their teams' betters, especially during periods lead by that many changes. First area is how to support the virtual way of working. Courses on how managers can support remote employees, how to manage virtual teams, how to lead successful teams when everyone is remote or which technology is best to be used while working remote are essential to support the team to adapt to the new work from home setup and integrated the team better in the digital environment. Leading in the VUCA (volatility, uncertainty, complexity, and ambiguity) world is essential during crisis periods. The leaders need to be trained how to make their teams more agile, creative, united and how to lead the change. In addition to the first two mentioned areas, the health element should always be put on the first place. Leaders need to be prepared on how to support their team from a mental health perspective while working from home. Managing stress and leading with emotional intelligence is essential for the overall team effectiveness.

The elements which highly impacted employees during the pandemic working from home were represented by the school restrictions (23%), family members – e.g., job loss, illness, long term separation (20%), travel restrictions (17%), IT restrictions (9%) and others (12%). However, 19% of respondents considered that there was no negative impact influenced by the Coronavirus during working from home.

Health problems caused by the COVID 19 pandemic, but also by the work from home may be associated with severe back pain, muscle pain, illness, lack of exercises, isolation when one of the family members got sick (Carnevale and Hatak 2020)

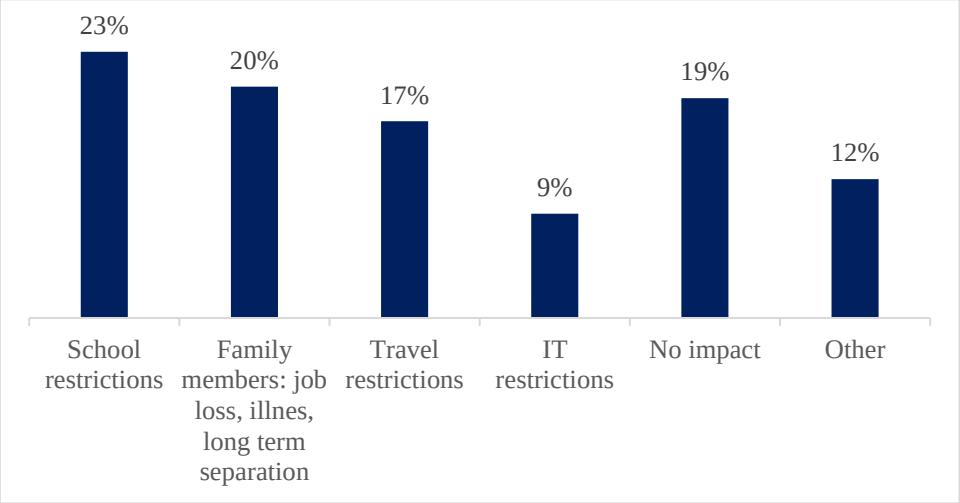


Figure no. 6. Pandemic restrictions with negative impact
Source: authors' data processing study

Under the effectiveness umbrella we analyzed also the most effective communication channels. The emails continue to be the most popular communication channel, being preferred by over 34% of respondents. The organization intranet page occurred on the second place in the top employees' preferences (29%), followed by the announcements via line managers (24%). Executive board webcasts (7%) and other communication channels were at the button of employees preferred communication channels.

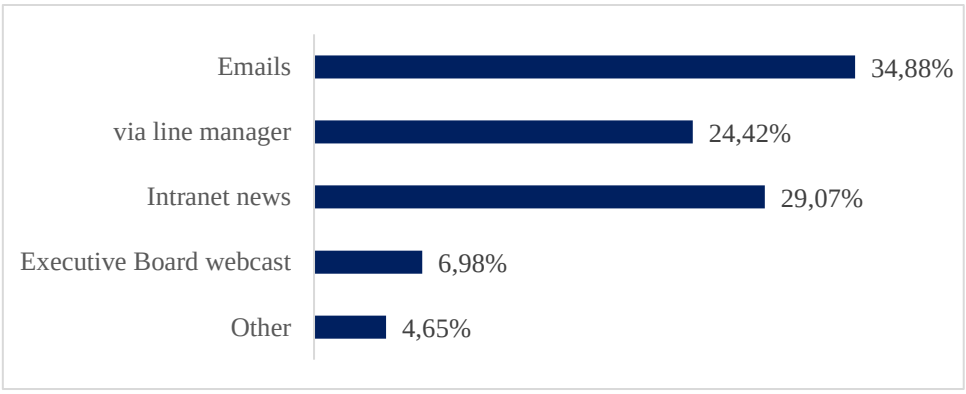


Figure no. 7. Communication channels effectiveness
Source: authors' data processing study

Overall, the working from home setup was appreciated by the employees and the business activity has not been affected by this change. However, the identified improvement areas for the work from home situation were home support, financial support (e.g., granting a monthly lump sum to cover additional utilities costs), more transparency on companies' strategy to return to office, need to develop a save time strategy (too many meetings, no meeting / online detox opportunity). When returning to the office, the employees' expectation is to benefit of a certain number of works from home days, get more flexibility when it comes to well-being, get support for managing hybrid meetings.

Complementary to the above quantitative research on how the pandemic working from home was perceived by the HR employees, we conducted an interview with the Head of HR Business Partner in order to do a deep dive on how the whole business activity of the organization changed during the pandemic. The whole concept driven by the values of business agility, where the main 3 pillars are represented by digital subsurface, digital rig of the future and real-time digital oilfield, off 3 being enabled by digital office of the future – aiming to have everything one click away, and digital ways of working- with the purpose of doing more with the people.

Considering the difficult period faced by the oil & gas industry during the pandemic, the organization took the opportunity to shape the future of the business and drive change forward. The departments became value centers, supporting business to create end-to-end accountability for value by structuring along key exploration and production portfolios. Moreover, the HSSE remained the focus activity to improve quality of business activities while protecting people, the environment, assets and organizations reputation. The

new structure of the whole company brought in focus the results, leading the customer relationship within the organization. This created transparency on ownership over delivery of a product at the required quality and time to that customer.

The organization leveraged digital tools but also a digital mindset to innovate and improve the ways of working. The business departments organized themselves in teams where various experiences and disciplines are combined and work towards a shared objective (product outcome). This can be achieved by developing virtual teams ("project-set-up" with team members from different organizational units) or remote teams (team members from different legal entities / locations and disciplines report to one organizational unit). Thus, the efficient execution is a key element, and the business focuses on work on achieving outcome in the best possible way, continuously optimizing time and resources.

Below a short overview on the differences and benefits of a product-driven organization:

Table no. 1. Differences and benefits of a product-driven organization

	Structural framework	Mode of collaboration	Evaluation of a successful outcome
From Process Orientation	Functional silos delivering discrete technical activities in a sequence Steep hierarchy	People work sequentially and focused on their respective tasks	Focus on technically accurate achievement of process, but not focused on integrated end business result
To Value Chain-orientation	Integrate activities, processes, outcomes: clustering of related activities creating a thread toward a focused objective	People work across disciplines and contribute directly to the outcome	Focus on ultimate business results Objectives (KPIs) based around success of result of all the activities
Benefits	Integrated value chains for our customers	Innovative working environment Enabling agility	Employer by giving accountability Better outcomes

Source: authors' data processing study

The results of the research proof the impact of the COVID 19 pandemic period at an organizational level. The whole organization adapted to the new working conditions from a way of working perspective, but also from a structural framework and collaboration model perspective. Overall, over 52% of the respondents confirmed that they adapted easily to the work from home model. Despite the exclusive or partial virtual working environment, the effectiveness of the employees has not been affected. However, specific pandemic elements, such as school and travel restriction, IT difficulties or illness of family members affected the wellbeing of respondents. When returning to the office, employees expect a flexible company approach, with a working schedule which includes a specific number of days to work from home and support in organizing hybrid meetings.

Conclusions

The pandemic period had a visible impact on the new ways of working and the overall business setup of many organizations. The results of the survey proofed those struggling employees are less satisfied with leaders' support, compared to ones who are all right of completely fine. Thus, indicating further support might be required. This also reflects in a lower net promoter score. School restriction have had the largest negative impact on employees who are struggling. One of the most popular proposed improvement measures was the consistent request for support with electricity, internet and office equipment. Overall, working from home worked during the pandemic period. All respondents were doing it and finding it verry effective, even when an employee is struggling. Additionally, it is the top request for continuing in the future.

The new ways of working during pandemic enabled new business models with the advantage if developing an organization by value, product and end-to-end process rather than function, integrated multidisciplinary teams, enabling agility and integration and fast implementation.

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Analyzing the risks of accidents and occupational diseases from the perspective of the work system

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Abstract
The field of occupational safety and health is focused on identifying the risks of occupational injury or illness and applying measures to reduce them until they are eliminated. Occupational risks of occupational injury or illness from the point of view of occupational safety and health are present in all areas of activity. It is true that the magnitude of the risk is directly influenced by the degree of danger of the processes that take place in that field of activity and the probability with which they occur. Over time it has developed several forms of occupational risk analysis as a dimension. In this way, events leading to accidents or occupational diseases or to the environment can be better understood. In order to be able to measure the extent of the occupational risk of occupational injury or illness, assessment methods are used that quantify the occupational risk. The main purpose of the research study is to analyze the risks of accidents and occupational diseases taking into account the four elements of the work system: performer, means of production, production environment and workload. Following the assessment of the risks of occupational injury or improvement, managers receive information on the presence of occupational risks present in the organization, as well as the evolution of these risks when there are changes in production processes. These changes are due to changes in materials, manufacturing processes, legislative changes, upgrades, technological or environmental accidents, conversions or upgrades of production lines. The importance of the research study is represented by the identification and assessment of the risks of occupational injury and illness from the point of view of occupational safety that enter into the economic equation. Thus, we appreciate that the economic interest must not take precedence over considerations related to safety at work.

Keywords
risks of injury, means of production, work environment, work task, performer, work system

DOI: 10.24818/BASIQ/2022/08/072

Introduction

The industrial revolution that has been going on in recent decades also includes the field of occupational safety and health management as a component of this development process. The participants and beneficiaries of this revolution must not benefit from a decrease in the level of protection from the beginning of this revolution. Consequently, the field of occupational safety and health management must play a role in this historic stage. Risks (of all kinds) are part of the management of the organization and cannot be ignored in making managerial decisions. Among the risks existing in the activity of the organization, there are also the risks of injury or occupational disease, which can influence the decisions of the managers regarding the development of the activities. The presence of occupational safety and health risks from the point of view of occupational safety and health must be studied in order for the management team to receive the best information on the influence of these risks on the elements of the work system. Understanding risk requires knowledge of its structure and its manifestation. Consequently, it must be penetrated into its complexity and into all areas of knowledge. This risk study requires a comprehensive approach in all aspects of the work process, throughout the work process and taking into account all phases of the existence of work equipment (from design, construction, operation, maintenance and even scrapping of equipment). The evolution of work processes must take into account the fact that there are occupational risks of illness and

injury, and these must be constantly monitored with the evolution of these work processes, because technical progress can not reduce the level of safety on the health of workers. In terms of occupational safety and health, the term *risk* can be defined as the most likely consequence of a hazard, combined with the risk or likelihood of occurrence. The essence of all methods is to identify all the risk factors in the analyzed system (workplace), based on predefined checklists and quantify the size of the risk based on the combination of severity and frequency of the maximum predictable consequence. Thus, the list of identification of risk factors (of possible consequences of the action of risk factors on the human body) is a form that includes, in an easily identifiable and compressed form, the main categories of risk factors for occupational injury and illness, grouped by the criterion of the generating element within the work system (performer, workload, means of production and working environment). Identifying all possible risks involves simulating the operation of the system and deducing those deviations, which can be done by consulting the technologies that control the processes that take place within the organization, computer simulations, filming of processes, consulting sources of information such as: files, technical books, user manuals provided by equipment manufacturers, raw materials, safety data sheets for substances and compounds used, environmental analysis bulletins and many other sources of information. The identification list of risk factors in the analyzed work system is a document that includes the experiences gained and allows to be supplemented with some risks that were not mentioned in this checklist, for a continuous improvement of the process. Today's managers ask to be informed if there is an increase or decrease in the level of risk, so that they can weigh their decisions. For this, the occupational risk of occupational injury or illness must be quantified. The probability of an event occurring is estimated by the frequency of the last similar events. Most often, the risk is measured as an expected value of an undesirable outcome.

Risk measurement is often done by using the frequency of recent similar events, using statistical methods. These methods can also be costly for the loss of human life, which is particularly difficult to achieve, although this approach puts people in a position to decide to insure against death. The use of statistical methods is difficult to achieve in areas that have very rare negative or catastrophic events (nuclear power industry, pandemics that have not occurred in recent centuries) have occurred in new industries that have not accumulated a history of illness or occupational injury. In practice, occupational risk assessment studies are developed by a group of professionals, accompanied by senior technical staff, qualified in the field of activity of the organization and job leaders, because they know the particularities of the processes carried out in the organization. These teams decide on the methods used to identify and assess the occupational risks of occupational disease or injury. The methods used to evaluate these processes must take into account the four elements of the work system, the performer, the workload, the means of work / work equipment and the work environment. These methods should give managers as clear information as possible about the range of risks encountered from minimum to medium to maximum possible (Parnell, 2014). The risk is a value resulting from the product between the probability of occurrence of the event and the maximum possible severity of the analyzed process.

Accidents at work, occupational diseases and deaths at work involve high economic costs for individuals, employers, governments and society. The negative effects of poor management of occupational safety and health management include high-cost early retirement, loss of qualified staff and absenteeism (Băbuț and Moraru, 2016). Accidents, illness, and death are associated with different types of costs. First, there are direct costs, such as healthcare costs. There are also costs resulting from lost productivity and declining production. Then there are the costs associated with the impact on human well-being - namely the impact on human life and health - which can be quantified and included in a pregnancy estimate. These elements are involved in each case of an accident at work or occupational disease, and the sum of the costs of all cases would provide an estimate of the total cost of accidents at work and occupational diseases (Moraru and Băbuț, 2018).

Countries with poor occupational safety and health systems use valuable resources to treat preventable accidents and diseases. A sound national strategy brings many benefits, such as (Oarga and Rațiu, 2018):

- increase productivity by reducing absenteeism due to illness;
- reduction of healthcare costs;
- maintenance of older workers;
- stimulating more efficient working methods and technologies;
- reducing the number of people who have to cut back on their work schedule to care for a family member.

Current methods use mathematical formulas, evaluation scales, statistical elements, graphs, matrices or diagrams and define the minimum, average and maximum risk value. All methods of assessing the occupational risk of occupational disease or injury quantify the risk. This occupational risk is compared to the risk area (minimum to maximum) and provides information on the presence, importance, and likelihood of occurrence in the organization's processes.

1. Review of the scientific literature

Etymologically, the origin of the term risk is not very clearly defined. From the time of Homer (Charter Picena-1193) appears the term *risk* which describes the threats faced by the characters, but it is not a commercial or legal term (Griffiths, 2018). The term commercial risk appears in Italy in the 13th-14th century, and the term maritime risk appears in seventeenth-century France. In the same century, the term risk appears in the context of life and fire insurance (Parnell, 2014).

The risk can be seen as referring to the probability of uncertain future events, for example, a factor defined by the frequency with which a negative event may occur and the probable magnitude of a future loss. Currently, the concept of risk has definitions given by dictionaries or scientific papers, with negative connotations and refers to the possibility of unwanted events and negative impact of examples: chemical, seismic, volcanic, economic, financial, computer or injury risks or occupational disease (Amason, 2020).

There is a requirement in practice to quantitatively analyze the risk. To meet this requirement, several methods have been developed to measure it. This is necessary in order to be able to decide on the importance of risk, of the costs arising from avoiding or reducing risks (Koufopoulos, 2012).

It should be noted that there are important authors who do not accept the quantification of risks and make references to methods of accepting unpredictable occurrences, and only that. We just have to accept the inevitable and rejoice if we gain from it (Kaplan and Norton, 2020).

In statistics, the risk function is defined as the expected value of a certain loss based on uncertainty. This value of risk takes into account all the possibilities, all the possible acts that can lead to losses. In terms of occupational health and safety, the term *risk* can be defined as the most likely consequence of a hazard, combined with the risk or likelihood of occurrence (Rothaermel, 2020). As such, risk is a function of hazard and exposure.

From the point of view of occupational health and safety, *risk* is present in all organizations, regardless of the field of activity (Petreanu et al, 2013). This *risk* can be quantified by several methods, with the aim of measuring it according to the probability of its occurrence and the maximum possible severity (Darabonț and Dăscălescu, 2011). It is true that the magnitude of the risk is directly influenced by the degree of danger of the processes that take place in the organization and the probability with which they can occur (Fred, 2017). The purpose is to reduce the risk of illness and occupational injury of workers present in the processes carried out by the organization. This risk reduction is followed at all stages of the organization's operation: at the time of designing the technological processes, at the time of purchasing the equipment, at the time of modernization of some production lines, when there are conversions of manufacturing flows, their modernization or even during the operation of this equipment. (Fayol, 2015).

There have also been identified times when radical changes in production processes have taken place, as specific legislation has become very strict in terms of occupational safety and health, which required the reduction of occupational risks. There were situations in which industries were abandoned because the measures required to reduce occupational risks were so costly that, from a financial point of view, industrial activity could no longer continue. A very good example is the asbestos industry and the materials that make up this mineral (Moraru and Popescu-Stelea, 2015).

2. Research methodology

The main purpose of the research is to analyze the risks of accidents and occupational diseases from the perspective of the components of the work system:

C1. Means of production: (hand tools, power tools, motorcycles, manufacturing, transport, verification and control lines);

C2. Work task: this is described by the following documents: individual employment contract, job description, regulations and collective bargaining agreements, administrative decisions, work tasks received verbally from the employer, those received on the organization's communication channels (email, telephone, intranet), delegations, travel orders;

C3. Work environment: At the time of the occupational risk assessment, the work environment will be described in detail. The following will be taken into account: room size, substances, chemical or biological compounds, lighting, drafts, vibrations, radiation at work, crowding;

C4. Performer: the name of the position will be mentioned, according to the individual employment / collaboration / volunteering contract. It also analyzes whether the worker has medical examinations for the job, professional qualification, correctly applies the procedures, if he has been trained in terms of safety and health at work and uses the correct personal protective equipment, respects the knowledge of safety signs at work.

The research plan includes the following steps:

1. Training - gather the necessary information, identify the situations to be analyzed, work tasks, operations, select and train all participants in the analysis.

2. Structuring - drawing up the list of work tasks and operations to be performed in order to fulfill them. The information is gathered from the workers' job descriptions, their own work instructions, machine technical books, maintenance instructions, accident reports, occupational diseases and dangerous incidents, the history of technical defects or breakdowns of the analyzed machinery or equipment. It analyzes all operations performed during the preparation-completion period, how the work is carried out under normal conditions, in the conditions of production flow disruptions, transfers within and between work tasks, how the production process, maintenance and repairs are completed, order and cleanliness, how it ends.

3. Identifying the sources of risk - is done by questioning workers, job leaders, using lists of possible risks and looking for problematic situations, technical defects or working methods. Possible deviations from the normal course of work are identified.

4. Risk estimation - this method does not estimate the risk of illness or occupational injury depending on the severity or probability of occurrence, but only makes a practical estimate of the risks, on a scale from 0 to 4 in importance.

The research team included Romanian managers in the field of occupational safety and health. The survey unit was represented by company managers from four fields of activity: automotive, IT, energy, food - who perceive occupational safety and health activities.

The data collection was carried out between December 2021 and March 2022, with the help of the questionnaire, a quantitatively structured research tool. A number of 612 valid questionnaires were obtained, thus allowing the use a large number of statistical techniques to analyze the data collected. As both the time and the interview materials and operators traditionally adopted in the surveys are quite expensive, a modern method of applying the questionnaire was used, namely its design and application online based on the Google Forms application. The obtained results were recorded, stored and structured, obtaining the database necessary for the analysis. The recorded data were subjected to adjustment, grouping, aggregation and coding operations for easier processing, analysis and interpretation. Therefore, a database was created that could be used electronically.

In the modeled socio-economic universe, the problems of assisting the economic decision are generated by the multicriteria decision-making processes that we used in the study of the research of the *maximum utility method.*

Modeling seeks to make the most of the information base scientifically, and the procedures for imitating the rational mode of decision-making are, in more or less elaborate forms, the conceptual essence of models.

The steps of the global utility method are as follows (Johnsonbaugh, 2010):

Step 1. Build the utility matrix with the elements, i = 1..., r and j = 1..., n.

Each element of the matrix is calculated for the maximum criterion with the expression:

$$x_{ij} = u_{ij} = \frac{x_{ij} - x_{i\min}}{x_{i\max} - x_{i\min}} \quad (1)$$

and for each minimum criterion with the expression:

$$x_{ij} = u_{ij} = \frac{x_{i\max} - x_{ij}}{x_{i\max} - x_{i\min}} \quad (2)$$

where:

x_{ij} = the value of indicator *i* associated with indicator *j*;

$x_{i\max}$ = the minimum value of indicator *i*;

$x_{i\min}$ = the maximum value of the indicator *i*.

Step 2. Calculate the global utility for each project as the sum of the products in the element of the utility matrix (the column vector corresponding to the project) and the important coefficient given for each indicator.

$$UG_j = \sum_{i=1}^{r} \alpha_i u_{ij}, where \sum_{i=1}^{r} \alpha_i = 1 \quad (3)$$

Step 3. Choose the project that corresponds to the maximum global utility.

$$\max\{UG_j\} \Rightarrow V_j,\ j = 1,.....n \quad (4)$$

For the division of some decision V_i variants (n variant) and for the selection of the best one offered by the simultaneous consideration of several criteria of appreciation (Cj, j = 1,…, n) and the global utility. Finding the best combination of attributes (characteristics of a variant) forms the object of the multi-attribute problem.

This involves the transformation of all numerical values a_{ij} (expressed in associated units of measure) and qualitative characteristics into utilities u_{ij}, ie numerical values located in the interval [0, 1]. The basic assumption in the correct function of the weighted sum method is the independence of the criteria. The largest of the synthesis utilities indicates the best option.

3. Results and discussion

Table no.1 presents the information base of the study, respectively the share of the importance that the managers give to each component of the work system.

Tabel no. 1. The importance of the work system

WORK SYSTEM	FIELD OF ACTIVITY			
	IT % *(v1)*	AUTOMOTIVE % *(v2)*	ENERGY % *(v3)*	FOOD % *(v4)*
C1. Means of production	14.55	28.15	17.59	12.5
C2. Work task	17.75	17.75	19.19	23.61
C3. Work environment	9.12	16.61	14.8	10.54
C4. Performer	27.05	18.60	12.12	26.95

Source: developed by the authors based on the collected data

Results show the fact that managers take into account the first *C4.Performer*; the possible deviation of the performer from the ideal line that must be followed in order to fulfill the work task is always an error. The error of the performer materializes in an inappropriate behavior from the point of view of work safety, in the form of a wrong action or omission.

In the last instance, managers take into account *C3.Work environment* (Figure no. 1). The physical environment may have deviations in the form of exceeding the level or functional intensity of specific parameters (microclimate, noise, vibration, chemicals, radiation, lighting), or characteristics that represent inadequate working conditions (physical over-bidding). The social environment is characterized by psychic risk factors whose result is the overload of the *Performer*.

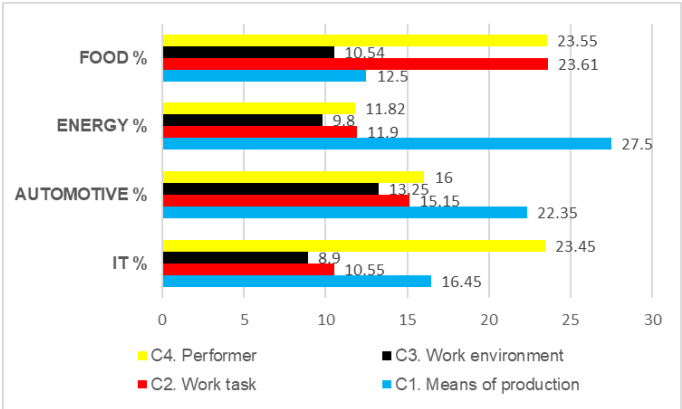


Figure no. 1. Share of work system components

Source: developed by the authors based on the collected data

Going through the calculation algorithm involved:

Step 1 - building the unit matrix with the elements x_{ij} Figure no. 2

$$\begin{bmatrix} 0.26 & 0,66 & 1,00 & 0,00 \\ 1,00 & 0,65 & 0,90 & 0,00 \\ 0,00 & 1,00 & 0,21 & 0,38 \\ 0,99 & 0,36 & 0,00 & 1,00 \end{bmatrix}$$

Figure no. 2. The matrix of units

Source: developed by the authors based on the collected data

Step 2 - Calculation of global utilities for each organization (Table no. 2):

Table no. 2. Results of the calculation of global units

FIELD OF ACTIVITY	RESULT
ENERGY	2.25
AUTOMOTIVE	2.66
IT	2.10
FOOD	1.38

Source: developed by the authors based on the collected data

Step 3 - From the analysis Table 2 highlights the greatest global utility of companies in the field of AUTOMOTIVE.

Therefore, following the application of the algorithm for calculating the maximum global utilities method, it can be concluded that the AUTOMOTIVE organization has best assessed the importance of the work system. The analysis of occupational disease or injury risks can lead to optimal decisions of managers who organize production flows without having huge costs of adapting machinery, equipment or production lines.

Thus, the employer is obliged to take all measures for labor protection, regardless of the field of activity. The main objectives in terms of safety at work should be:

- Defining the existing risks at work;
- Analysis of the nature of the risks and the necessary measures to neutralize them;
- Taking the necessary measures to rectify the dangerous situation;
- Verification of the measures taken and their effect. If the measures taken are true, the effect obtained is the desired one.
- Control of the occurrence of new risks through periodic evaluations.

Conclusions

From a theoretical point of view, the results obtained provide a perspective on managers' perceptions of occupational safety and health management from the perspective of the work system (performer, work environment, workload, means of production).

From a similar research perspective, occupational safety and health provides the employee with the necessary safety during work, helps him to maintain his health and ability to work in the work schedule. At the same time, labor protection prevents accidents at work, prevents diseases caused by the type of activity and identifies the dangers to which the employee is subjected.

The risk assessment described in the research study opens up new directions for research into the calculation methods or tools that underlie investment decisions. That is, more complex calculation tools can be developed, including occupational risks of injury or occupational improvement in terms of occupational safety and health. These occupational risks can influence work processes in terms of costs, efficiency, economic satisfaction. Thus, work scenarios can be constructed for making investments in the design / design phases, including the results obtained with the method of risk assessment of occupational injury or illness taking into account the presence at work of specific risk sensitive groups.

Managers must have information on the presence of occupational risks of occupational injury or illness, at all stages of the organization. Namely: conception, design, construction, investment, operation, maintenance, modifications, modernizations, technological accidents, crises, accidental or organized shutdowns, legislative changes. In all these phases, the information must be provided taking into account the four elements of the work system: performer, means of production, production environment and workload.

The methods analyzed so far do not cover, cumulatively, the requirement to analyze occupational risks taking into account the four elements of the work system: performer, means of production, production environment and workload, and the presence at work of workers who they are part of risk-sensitive groups, along with colleagues who are in full capacity. Another shortcoming would be that the current methods do not take into account the interaction of all positions in the work process, analyze them sequentially, which does not provide a complete picture of occupational risks of illness or injury from the point of view of the manager of occupational safety and health. .

For future research directions, an identification of a risk assessment method based on the following objectives could be an important research:

- To be stated and analyzed the job, individually, and in cohesion with the other positions that may influence it. The analysis on this post is done during the whole period of activity, respectively, the preparatory operations and those of the completion of the activities carried out on the analyzed work position must be analyzed,
- To have the way to quantify the risks, in order to be able to quantitatively analyze the evolution of these risks. Using the same method, at different times, with different equipment or personnel, it is possible to identify the increase or decrease of the risk level, so the manager has concrete information with the evolution of professional risks,
- Cover the four elements of the work system: performer, means of production, production environment and workload,
- Include workers in risk-sensitive groups. They often work in the same positions with colleagues who are not part of this group. By default, performance and occupational hazards will be influenced by this mix of workers,
- Quantify the occupational risks for each identified risk,
- To take into account the number of workers for each risk identified, as the rank of the risk factor,
- Also have a graphical interpretation of the risks identified at work,
- To provide solutions for the elimination or reduction of occupational risks, with priority for the elimination of the risk factor, its reduction, or its isolation. Ultimately, if these priorities are not met, means of personal protection for workers are provided.

In conclusion, occupational risk assessment, taking into account the presence at work of groups sensitive to specific risks, helps the manager to make decisions regarding the occupational risk of illness or injury at work.

The limits of the study undertaken are diverse, from which we point out: the time horizon chosen by us is quite narrow, because the research topics often generate studies of 10-50 years; the scientific approach was focused on the interpretation of the studies and not on the explanation of the use of the findings obtained; the inductive research methodology was easy to achieve.

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Risk from the Perspective of the Emergency Management System

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Abstract

The incredible technological development of the last decades, the globalization of at least information, the cooperation at state, regional, global level, the removal of autistic dominant centers from the planetary equation and the appetite imposed by the increasing frequency of disasters and their effects have now led to a new beginning: a beginning of the challenge of the human struggle for man, for a climatic good, not against nature, for survival. In order to reduce the destructive potential generated by a natural disaster and the analysis of risks and vulnerabilities, man can intervene both in environmental control (stopping deforestation, pollution, irrational excavations) and through a more careful, more applied approach to technological elements. which may be the premises for the occurrence of a negative phenomenon (accidental pollution, nuclear accidents, global warming, hydrological hazard) thus increasing risk resistance and reducing vulnerability. Through an analysis of risk and vulnerabilities and a package of concrete and precise data covering the entire state level of critical infrastructure, private assets and particularities of communities, an impact assessment can be obtained that adjusts both response plans. but especially financial planning and economic development projections to offset the social, economic and environmental costs of the disaster. Such a pre-event and post-event evaluation can be the foundation of a future strategy. The main objective of the article is the analysis of the main categories of risks that define the management system of emergency situations based on the connection between them.

Keywords: risk, management, emergency situations, vulnerability

DOI: 10.24818/BASIQ/2022/08/073

Introduction

The link between disaster and development is now clear to everyone, and emergency risk management is gaining ground as an effective form of investment. However, most developing countries are limited in their ability to effectively integrate a strategic approach to this issue into national policy. Poor people in disaster-stricken areas are the hardest hit by losses and failures.

Development cooperation supports not only political but also economic, environmental and social development worldwide. It helps to improve living conditions and promotes sustainable development. Natural and man-made disasters are not just a challenge for developing countries. They are also a challenge for development cooperation and therefore strategies need to be developed and implemented to reduce the vulnerability of the population, as well as taking measures to reduce the risk of disasters (Pilemalm and Yousefi, 2020).

The factors that underlie the occurrence and development of risk are endogenous or exogenous, or in some cases are progressive-complementary, the action of one type of factor causing the occurrence of the other (Peduzzi et al., 2009).

Research and study of risk initiators can create a preamble to preventive measures that can eliminate or reduce the phenomenon with dangerous valences.

Risk management is a cyclical approach, carried out during an activity or a project, involving five operational levels (Cole, 2018):

- risk planning (allocation for each type and category of risk of a dedicated decision maker, at all institutional levels, being quantified from the organizational phase, as the decisive person, by the way of approaching the risk approach, as well as by the theoretical logistics be used);
- risk identification (all potential sources of risk that could induce the production of negative effects; creation of probabilistic scenarios as cause, action, effect);
- risk analysis (quantitative and qualitative statistical preview of the outstanding effects of each type of risk in case of its occurrence);
- establishing risk approach strategies (application of a correlation of methods, scales, mathematical and imaging procedures to be the foundation for the creation and operationalization of action tactics);
- risk monitoring and control (final phase of the process, resuming operations and evaluating them as a way of perception, action, effects, having a corrective role).

When analyzing the vulnerability, you must enter the elements in the risk algorithm (Albtoush, 2011):

- The characteristics of the natural event (its component elements);
- Economic characteristics of the affected area (existence of the necessary infrastructure for prevention, alarm, response);
- The socio-psychological characteristics of the population to be affected (the appetite and rigor of the citizens of Japan or South Korea to respond to the requests of local specialists and whistleblowers);
- Accidental random factor (possibility of persons or goods being voluntarily or involuntarily in risk areas: for example a passenger plane in flight may be struck by lightning, causing a catastrophe, the plane being accidentally there and being heavy to predict the place and time of the disaster, having only the risk, but the locality at the base of a mountain, following a massive snowfall can be destroyed by an avalanche, here having a known risk, quantified and accepted by authorities and residents despite existing warnings).

The decision-making problem from which we start our research approach is the answer to the following question: *what are the factors underlying the emergence and development of risks specific to emergency management*? This study aims to analyze the way in which the risk management system is perceived from the perspective of emergencies.

The structure of the paper is focused on several chapters: Introduction in which I described the general scientific framework. Literature that presents the latest approaches of risk management, then follows the research methodology that, in processing and analyzing the data collected, we used special software, which was special statistics, which was statistical calculation collaborators. The obtained results and the discussions present the way in which the managers, from several public institutions in Romania, perceive the emergency management system. The conclusions highlight the importance of developing policies, procedures and practices aimed at identifying, analyzing, evaluating, treating, monitoring and re-evaluating the risks specific to emergency management.

In conclusion, vulnerability is the way of resisting the consequences of hazard, identifying risk as a relationship between a phenomenon and its consequences. Risk is the ability to predict a reaction to the same type of disaster with the possibility of assessing the place of production, its intensity and its consequences. Its variable in the face of the same type of threat stems from the degree of vulnerability.

1. Review of the scientific literature

Disaster risk is made up of two basic elements: danger and vulnerability. Therefore, it is clear that a risk exists only if there is a vulnerability to the danger posed by a natural event. The identification of disaster risk starts with the identification of the danger and then followed by the assessment of the corresponding vulnerability, for example the possible repercussions in case of a natural phenomenon that is about to occur - heavy rains followed by floods (Băcanu, 2017).

Danger is an extremely natural event with a certain degree of probability of having negative consequences. A distinction must also be made between a real natural hazard and a socio-natural hazard. Given the complex set of influences, this distinction is difficult to make, but it is useful to help define disaster risk management measures (Geantă, 2014).

Vulnerability is exposure to hazards. Vulnerability denotes inadequate means or the ability to protect against the negative effects of natural events and, on the other hand, to recover quickly from their negative effects (Kaveh et al., 2022). Vulnerability includes very different, often reciprocal, factors that need to be considered in determining the vulnerability of a family, village, or country (Ghica and Zulean, 2017).

The human factor cannot intervene in the production of natural phenomena, but socio-natural hazards are induced or aggravated by a combination of extreme natural events and human interventions in nature (Robbins and Steven, 2003). The hazard is that circumstance or contest of circumstances (favorable or unfavorable) whose cause remains generally unknown, being unpredictable. Chance has recently become the most common term of the bodies involved in preventing, managing and eliminating the effects of natural disasters, gaining new value precisely due to the quantitative and qualitative dynamics of the cause-effect-solutions system being the main axiom of scenarios that can predict it. (Brown and Harvey, 2016).

The hazard is the latest science introduced in the curriculum of major universities, but it tends to be one of the most important and vast subjects by its size and importance. Thus, new valences of the term were created, which is currently broken down into 3 main categories (Buckingham, 2011): natural hazard; anthropic hazard; technological hazard.

Natural hazards are a direct consequence of natural phenomena such as storms, earthquakes, floods, droughts, fires, landslides. They are classified according to the way they are formed, the period of development, the affected area, their reversible or irreversible consequences (Buckingham, 2011). If the endogenous hazard is attributed to earthquakes and volcanic eruptions and the exogenous one is dependent on climatic, hydrological, biological factors, we find that these 2 categories are complementary, an endogenous hazard earthquake can cause a tsunami, exogenous hazard producing floods, or excessive heating (Manning, 2020). The climate can lead to the release of ice floes from the Arctic Circle, which can be carried by the currents, endangering the waterways, or the eruption of a Vulcan can affect air traffic (immediate and serious impact on society).

Anthropogenic hazard - phenomena generated by human interaction in the cycle of nature, triggered or favored by human actions and generating harmful effects (Buckingham, 2011). Excessive exploitation without environmental and climate feasibility studies of natural resources (forestry, mining, hydrographic, biosphere), chaotic development of human settlements, industrial centers, intervention on river basins, excessive pollution and indifference to the environment, represent the most dangerous trigger or adjuvant of the phenomena pending the disasters, the consequences being generally catastrophic (Trijp, 2018).

Technological hazard - is the direct and exclusive intervention of man on the environment through intentional or accidental action with often irreversible effects (Buckingham, 2011).

In conclusion, a classic hazard, in the old sense, which is a risk factor in a well-defined area can turn into a multiple risk, on the principle of dominoes, causing another, and another on continental territories if not and planetary (global warming causes the melting of the ice sheet to lead to rising ocean levels and directly to rising tides, being in danger of flooding including the area in the equatorial sector). But for the purpose of an exhaustive research, we must also analyze the hazard from the point of view of the specific area affected, i.e. we reverse the polarity of the risk equation, aiming not at the force or type of hazard but at the potential predisposition of the area to human and material damage. located in areas prone to risks, constructions not adapted as safety, lack of means of prevention, reaction.

Technical cooperation defines disaster risk management as a series of actions (programs, projects and / or measures) and tools that specifically aim to reduce disaster risk in regions at risk and mitigate the magnitude of disasters (Avram, 2019).

Disaster risk management includes risk assessment, disaster prevention, operational intervention to reduce human, material and financial damage and preparedness of the population and authorities in case of disaster (Ionescu, 2012). It is used in international debates to highlight the current tendency to take a proactive approach to the dangers posed by extreme natural phenomena. The intention is to completely reduce the risk of disasters in accounting for all risk contributors (risk management), as opposed to focusing on each hazard (Eitington, 2011).

2. Research methodology

The purpose of the article is to determine how managers in several public institutions in Romania (town halls, health institutions, educational institutions) perceive the emergency management system. The analysis of the emergency management system was made from the perspective of the following types of risks:

R1. Natural risks: refers to events in which the state parameters can be manifested in limits ranging from normal to dangerous, caused by dangerous weather phenomena, due to heavy rains and snow, temperature variations - frost, drought, heat wave - storms and destructive phenomena of geological origin, respectively earthquakes, landslides and landslides;

R2. Technological risks: include all the negative events that cause the exceeding of the safety measures imposed by regulations, as a result of some voluntary or involuntary human actions, the failures of the components of the technical systems, the failure of the protection systems;

R3. Biological risks: refers to the negative consequences on human, animal and plant communities, caused by diseases or other events related to health and which affect an unusually large number of individuals;

R4. Fire risk: is the most common risk that occurs and its production is a special emergency, a phenomenon that affects important areas of economic and social life, such as construction, installations, landscaping, forests, means of transport, agricultural crops.

Based on the purpose of the scientific research, the following objectives have been drafted:

- Analyzing the emergency management system;
- Risk analysis that defines the emergency management system;
- Identifying the links between risks.

Based on studies and theories in the field of literature and personal observations, the following hypotheses have been formulated that underlie scientific research:

Hypothesis 1: There is a strong correlation between R1.Natural risks and R2.Technological risks;

Hypothesis 2: There is a very significant positive relationship between R1.Natural risks and R3.Biological hazards;

Hypothesis 3: Between R1. Natural risks and R4.Fire risk there is a very significant positive relationship;

Hypothesis 4: There is a positive relationship between R2.Technological risks and R3. Biological risks;

Hypothesis 5: Between R2.Technological risks and R4.Fire risk there is a very significant positive positive relationship.

The data collection was carried out between November 2021 and February 2022, using the questionnaire. A total of 312 valid questionnaires were obtained. The questionnaire applied was a mixed one, including both open and closed questions and control questions. It also includes: dichotomous questions (with Yes or No answers), open-ended questions that allow answers of unspecified length, questions with choice answers, named and semi-open (a limited number of specified answers), semantic questions in scale, called and questions with answers ranked in ranks (Likert scale - through which the preferences of individuals can be tested gradually). The results obtained were recorded, stored and structured, obtaining the database necessary for the analysis. The recorded data were subjected to adjustment, grouping, aggregation and coding operations for easier processing, analysis and interpretation. Thus, a database was created that could be used electronically.

In the processing, processing and analysis of the collected data, the special statistical research software S.P.S.S. (Statistical Package for the Social Sciences), with which the Spearman rho Correlation Coefficient was calculated.

3. Results and discussion

To validate the hypotheses, we used the most common and by far the most useful, the Spearman rho correlation coefficient, with the help of the special statistical research software S.P.S.S. (Table no.1).

Following the analysis of the Spearman rho correlation coefficient, we can observe the following correlations between the different process elements that make up the public management system:
1. There is a very significant positive relationship between *R1.Natural risks* and *R2.Technological risks* (rho = 0.92, df = 310, p <0.001). From the scatter plot (Figure no.1) it can be seen that the point spread is relatively limited, which indicates a strong correlation ($R^2 = 0.81$). The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one. It can be stated that Hypothesis 1 has been validated**.**

Table no. 1. Spearman rho correlation coefficient values

Correlations					
Spearman's rho		R1.Natural risks	R2.Technological risks	R3.Biological risks	R4.Fire risk
R1.Natural risks	correlation coefficient	1.000	.921**	.837**	.823**
	Sig. (2-tailed)		.000	.000	.000
	N	312	312	312	312
R2.Technological risks	correlation coefficient	.921**	1.000	.800**	.784**
	Sig. (2-tailed)	.000		.000	.000
	N	312	312	312	312
R3.Biological risks	correlation coefficient	.837**	.800**	1.000	.895**
	Sig. (2-tailed)	.000	.000		.000
	N	312	312	312	312
R4.Fire risk	correlation coefficient	.823**	.784**	.895**	1.000
	Sig. (2-tailed)	.000	.000	.000	
	N	312	312	312	312

Source: processing data obtained through SPSS program

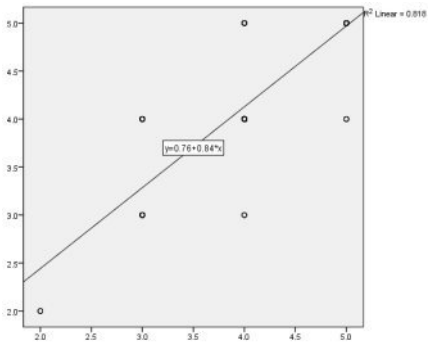


Figure no.1. Dispersion diagram - correlation between R1. Natural risks and R2.Technological risks

Source: processing data obtained through SPSS program

Technological risks are associated with industrial activities. Awareness of the dangers associated with technology, the effects on environmental factors and the social implications have arisen as a result of serious accidents, which have demonstrated the need for an integrated approach to the field. ways, but requiring a more elaborate and personalized management on each category.

2. It can be seen from Table 1 that there is a very significant positive relationship between *R1. Natural risks* and *R3.Biological risks* (rho = 0.83, df = 310, p <0.001). The scatter plot (Figure no.2) shows that the point spread is relatively limited, indicating a strong correlation (R^2 = 0.67). The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one. In conclusion, Hypothesis 2 is validated.

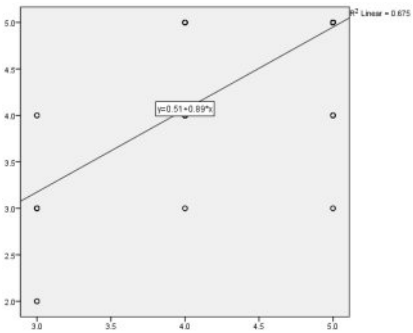


Figure no.2. Dispersion diagram - correlation between R1. Natural risks and R3.Biological risks
Source: processing data obtained through SPSS program

Recently, there has been a worrying increase, both in the world and in Romania, in the manifestation of natural hazards and, in particular, in floods, landslides and landslides, which has led to loss of life and damage. important materials. Although the occurrence of most natural hazards cannot be prevented, their effects can be reduced by proper management by the competent authorities at local, regional and central level, all the more so as, in general, their areas of manifestation can be reduced. be known. Reducing the risk associated with natural phenomena to an acceptable level requires a number of measures and actions, embodied in prevention policies and impact reduction programs, which, however, depend on the economic possibilities of practical application.

3. Between *R1. Natural risks* and *R4.Fire risks* there is a very high significant positive relationship (rho = 0.82, df = 310, p <0.001). In Figure no.3, the scatter plot shows that the point spread is relatively limited, indicating a strong correlation. The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one.

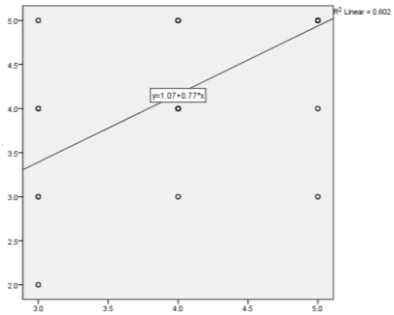


Figure no. 3. Dispersion diagram - between R1. Natural risks and R4.Fire risks
Source: processing data obtained through SPSS program

It can be stated that Hypothesis 3 is fully validated.

4. Analyzing R2.Technological risks and R3.Biological risks results in a very high positive relationship (rho = 0.80, df = 310, p <0.001). The scatter plot (Figure 4) shows that the point spread is relatively limited, which indicates a strong correlation (R2 = 0.61). The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one. It can be stated that Hypothesis 4 is validated.

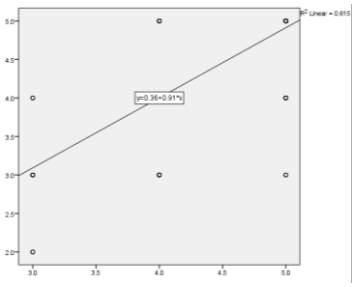


Figure no.4. Dispersion diagram - correlation between R2.Technological risks and R3.Biological risks
Source: processing data obtained through SPSS program

5. Between *R2.Technological risks* and *R4.Fire risk* there is a very significant positive relationship (rho = 0.84, df = 310, p <0.001). The scatter plot shows that the point spread is relatively limited, indicating a moderate to strong correlation ($R^2 = 0.54$) - Figure no.5 The slope of the scattering of the results is relatively straight, indicating a linear rather than curvilinear relationship - Hypothesis 5 is validated.

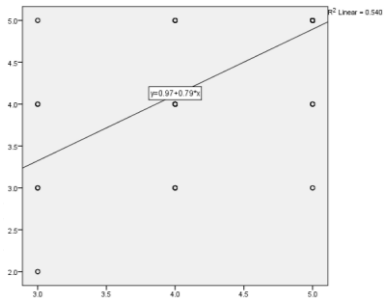


Figure no.5. Dispersion diagram - correlation between R2.Technological risks and R4.Fire risk
Source: processing data obtained through SPSS program

6. There is a very significant positive relationship (rho = 0.89, df = 310, p <0.001) and between R3.Biological risks and R4.Fire risks (Table no.1). The scatter plot (Figure no.6) shows that the point spread is relatively limited, indicating a moderate to strong correlation ($R^2 = 0.74$). The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one.

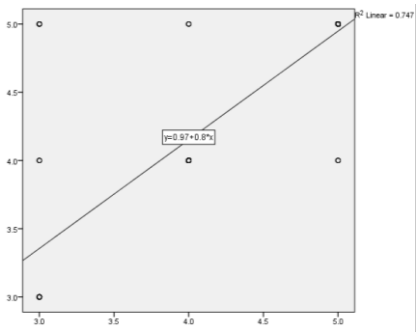


Figure no.6. Dispersion diagram - correlation between R3. Biological risks and R4. Fire risks
Source: processing data obtained through SPSS program

Fire safety is defined as the management of specific fire risks at all levels, by preventing fires, protecting the population from their effects and optimizing the intervention. Currently, it is an essential requirement for building design, fire being the determining factor in the sizing of buildings of exceptional and special importance. The technical approach to fire safety consists in the application of specific technical principles and calculation methods to assess the minimum level of protection and to design and calculate the necessary safety measures, these being included in specific regulations, established at European level by the Directive on construction products and subsequent documents, mainly EC decisions on Euroclass reaction to fire and fire resistance.

Conclusions

Emergency management should mean the application of policies, procedures and practices aimed at identifying, analyzing, assessing, treating, monitoring and reassessing risks in order to reduce them. Risk is the main challenge and threat of the emergency management system, the latter having as professional and operational desideratum: risk planning, their identification, qualitative and quantitative analysis, establishing approach strategies, monitoring and controlling it within assumed safety limits. In order to obtain this indicator of performance, study and risk eradication, the emergency management system has imposed and manages the collection of quantities and variations of data from all fields, areas and cultural and social levels, with the predestined purpose of subject to SWOT techniques, the result of which will be the basis for decisions to identify, respond and eliminate risk leading the decision maker to maximize the proposed policies.

Thus, in the context of similar research, the emergency prevention strategy forms the framework document for the preparation and adoption of specific measures and actions aimed at reducing the impact of the manifestation of specific risk factors on the population, property and environment through planning , at national and local level, in the medium and long term, of a set of specific actions and measures. A direct

asset, pending the achievement of the performance indicator targeted by the emergency management system, is the professional quality, experience and decision-making capacity of the system manager or command group. And in this case, following the study, we found that in order to be a good manager, in addition to the necessary statutory skills, it is mandatory to have an idea package based on a very varied and intercomplementary performance algorithm. In addition to basic, specialist training, the individual or group proposed to be the decision-maker must be able to analyze, quantitatively and qualitatively, the whole data package, disseminate it, prioritize it according to effects, make decisions in optimal time, but with implications and for short or long periods, to be familiar with the particularities pending the vulnerability of the target area and population, to transmit and apply decisions in a concrete, concise way, constantly trying to place themselves in the category of certain, in certain to the detriment of those at risk or uncertain. Also, his professional training must be perfect and continuous, being permanently connected to all international studies and organizations in the field. The decisions taken, preventive, immediate action, reconstruction, must be subsequently algorithmized to extract the elements of novelty, the discrepancies between the event and the reaction, the gaps and the need not covered by the risk scenarios. The conclusions must also be introduced not only in the emergency management system, but also in national, local and international policies in order to be disseminated, perceived fairly, funded and assumed by decision-makers.

In conclusion, the position of manager in the emergency management system must be assumed as important both in the architecture of institutional command of the state to obtain the character of authority, but also in the scale of multidisciplinary professional skills guided by open-minded thinking. always evolutionary progress.

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Exploring Younger Generation Sustainable Consumption in the Restaurant Industry

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Abstract
Sustainable development is a contemporary constant. Current meteorological phenomena and pollution are just two of the present elements that explain the urgent need for implementing sustainable development measures in all economic and social fields. The activity in restaurants generates high consumption of water and energy, and food waste continues to be relevant issue. In the restaurant industry sustainable measures are applied to a small extent, one of the reasons being the fact that consumers are not aware of this problem's acuity. Starting from the idea that restaurant managers have as primary objective the satisfaction of consumers' expectations, this article aims to analyze the coordinates of the sustainable behavior of young consumers in the restaurant industry. In this respect a qualitative research was conducted, based on the semi-directive in-depth individual interview technique. The sample included 32 students and master students from the Transilvania University of Brasov, the Faculty of Economic Sciences and Business Administration. The research was conducted during January 2022, and the interview guide included two topics that were discussed with each respondent. The findings highlight young consumers' attachments to features like quality, freshness, controlled origin for raw ingredients, elements which are considered more important than price. At the same time, they appreciate sustainable measures implemented in the restaurant industry, one of them being the expansion of digital menus. The article also analyzes the main elements considered valuable in the digital menus' concept. The results obtained complete the general knowledge on this subject. The practical implications are related to the detailed information about young consumers' sustainable expectations and consumption, important elements in shaping managers decisions in the restaurant industry.

Keywords
Sustainable consumption, restaurant industry, younger generation, digital menus, qualitative research.

DOI: 10.24818/BASIQ/2022/08/074

Introduction

Sustainable development is a basic coordinate of our society, being a priority for the world future. Consumption of sustainable food is a scientific issue that has long been discussed in the literature, but the current pressure to increase the consumption of sustainable food (Vermeir et al., 2020) urges to conduct further studies on this topic. Sustainable consumption is considered a broad concept including several behaviors and choices within it (Puntiroli, Moussaoui and Bezençon, 2022, p.330). Contemporary consumers appreciate companies with strong ethical behaviors (Mejia et al., 2022), especially millennials and Generation Z members, which are influenced, on a large scale, by progressive public ideas and corporations' involvement in applying sustainable development practices (Atzori, Shapoval and Murphy, 2018). They also have high attachments to the sustainability attributes of products (Vătămănescu et al., 2021). Assuming that consumers are more or less responsible (Lubowiecki-Vikuka, Dabrowska and Machnik, 2021), business entrepreneurs may appreciate that investing in sustainable development practices has a low impact on consumers' choices. Previous studies argued that in the absence of good citizens there are no good companies, but, at the same time, the idea that companies strongly attached to sustainable development goals are rewarded by consumers, was also highlighted (Valor, 2008). Moreover, Do, Wang and Gucchait (2021) argued that collective green efficacy depends extensively on consumers' pro-environmental behavior.

Being aware of the decisively importance of consumers' sustainable consumption in achieving sustainable development goals, this study aims to explore sustainable consumption in restaurants among the younger generation. A qualitative research was used, and the respondents were students and master students from the Transilvania University of Brașov.

The paper is organized as follows. First, the literature review on the characteristics of younger generation consumer behavior in restaurants was presented. Next, the research methodology was explained, followed by the Results and discussion section. In the final part, conclusions were highlighted based on the findings.

1. Review of the scientific literature

Sustainable food consumption is a major contemporary challenge (Baldy, 2019). It is also a complex phenomenon which relies on many different elements, among which sustainable consumption conscious-ness, selling and shopping sustainable products, sustainable selling methods, etc. (Hansen, 2022). Previous studies have not highlighted important differences in sustainable consumption behavior between age groups, but younger generations show high responsiveness levels to sustainable development issues (Yamane and Kaneko, 2021).

Today's younger generation includes the older cohort of Generation Z (people born in 1996-2012) and the younger cohort of millennials (people born in 1989-1995) (Yamane and Kaneko, 2021, p.1). People in this group have a distinct peculiarity, assuming the same habits all over the world, mainly to their attachment to technological devices and their communication and interaction means (Demeter et al., 2014; Pop et al., 2022). This age group is better informed, more individualistic, but also much more attracted to sustainable companies (Yamane and Kaneko, 2021; Pop et al., 2022). At the same time, younger generation cannot be considered, as a whole, the consumer group with a responsible buying behavior, their inclinations towards sustainability issues being mixed (Calderon-Monge, Pastor-Sanz and Garcia, 2020). Based on consumer behavior patterns, millennials in particular, were grouped into five distinct categories such as: aware consumers, conscious consumers, consumers under transition, unwilling consumers, and rejecters (Francis and Sarangi, 2022, p.9). Another relevant element is their greater concern for environmental issues in comparison with social issues (Calderon-Monge, Pastor-Sanz and Garcia, 2020).

Consumers' food choices are mainly based on price, convenience, taste and health, and the concept of sustainability is not an important factor in food selections (Nguyen et al., 2022; van Bussel et al., 2022). The majority of people are not aware of the environmental impact of restaurants' operations (Sarmineto and Hanandeh, 2018, p.23). The main reasons are related to the low levels of knowledge and consumers' skepticism on this issue (van Bussel et al., 2022). Nevertheless, consumers with a responsible behavior have high perceptions of the effectiveness of their buying habits (Calderon-Monge, Pastor-Sanz and Garcia, 2020, p.74). Locally and seasonal ingredients, organic produced food and food packaging are considered the main sustainability concerns in the foodservice sector (van Bussel et al., 2022).

Younger consumers in restaurants consider themselves as concerned by environmental issues, they are aware of the green restaurants' presence on the market, whilst not interested in experiencing dinners in the green restaurants (Băltescu, 2017). Findings in recent studies suggest that criteria such as origin of the raw ingredients, production procedures or sustainability certifications are not considered important in restaurant consumption (Nguyen et al., 2022). On the other hand, Băltescu (2017, p.82) identified which were the main attributes for younger generation to assess a green restaurant, i.e. the predominant use of traditional recipes based on local ingredients, origin of ingredients and production processes. The same study underlined which were the most unimportant factors, among them smaller portions, nutritional values as prerequisite for selecting restaurant meals and reduced meat consumptions. On the other hand, restaurant managers themselves do not consider the implementation of sustainable development practices as a priority, mainly due to their shortcomings in the responsible education (Băltescu et al., 2022). A relevant decision for restaurants with pro-environmental behavior consists in informing consumers on their sustainability achievements and to introduce several measures (among which the green index) in order to communicate green performances levels in the restaurant (Sarmineto and Hanandeh, 2018).

Attracting consumers is one of the principal objectives of a restaurant manager. In this line, restaurant managers are interested not only to sell, instead they seek to facilitate experiences. Among the specific means of restaurants to achieve this goal, the restaurant menu is the central component for the restaurant success (Nemeschansky, von der Heidt and Kim, 2020). Moreover, consumers highly appreciate food attribute information provided on restaurant menu and information transparency (Nguyen, et al., 2022). Digital menus are widely introduced in restaurants' operations based on their improved performances. Digital menus could be accessed through mobile apps, they present a great amount of information, images, they

may be easily adapted with small costs, meals' selection is improved, allow consumers' interaction, more enjoyment, and also increase sales (Yin and Yoo, 2020). Moreover, digital menus are efficient tool to enhance restaurants' responsible behavior. Digital menus allow consumers' easy access to provenance of ingredients, nutritional value of meals, etc. (Mu, Spaargaren and Lasink, 2019).

Based on the findings from the literature review section, the objectives of the research are the following:
O1: To explore the characteristics of respondents' sustainable consumption in restaurants.
O2: The explore respondents' attitudes towards digital menus and the benefits of using these menus.

2. Research methodology

The study presented in the paper is an exploratory research and the results were obtained through the semi-directive in-depth individual interview technique (Mooi, Sarstedt and Mooi-Reci, 2018). The respondents were students and master students from the Faculty of Economic Sciences and Business Administration, Transilvania University of Brașov.

The research took place in January 2022 in the faculty's classrooms. The sample included 32 respondents, aged between 21-30 years. The interview guide comprised two topics of discussion, each having several subtopics in order to expand the area of obtained information.

3. Results and discussion

The first topic of the interview guide analyzed *the characteristics of sustainable consumption in restaurants*. As respondents revealed, there are numerous factors taken into account. The first factor mentioned by all respondents was the raw ingredients selection, being highly appreciated elements such as freshness, quality, the fact that the raw ingredients are seasonal, offered by local producers and obtained from natural or organic agriculture. In this regard, respondents stated their willingness to pay more for dishes cooked under the above mentioned criteria. When respondents referred to the prices of restaurants' offers, they mentioned the fact that price is no longer the main element taken into account when eating-out in a restaurant, quality, cleanliness and atmosphere being more important selection factors. These findings differ from other studies (Nguyen et al., 2022; van Bussel et al., 2022) which emphasized price as the primarily decision factor.

Another factor revealed by respondents was the portions' size, which they consider a relevant issue for sustainable consumption in restaurants. The results obtained were mixed and no general idea emerged, but women prefer smaller portions and highly appreciate dishes obtained mainly from vegetables, while men still prefer larger portions and meat dishes.

The third factor which was highlighted by respondents about their sustainable consumption in restaurants was the replacement of tablecloths and napkins made of textile materials with those of paper. They mentioned these measures as essential, with an important contribution to diminishing the ecological footprint of restaurants (reduction of water and detergent consumptions).

The fourth factor mentioned by respondents was the replacement of the traditional, written on paper menus with electronic alternatives. From the 32 persons included in the sample, 5 out of them (16%) didn't consider this measure as appropriate in a restaurant, even though they emphasized that the ecological reason in applying such a practice was obvious (reduction of paper usage). Their main explanations relied on two aspects. First they noted that not all consumers, especially elderly consumers, are able to use electronic devices in order to consult the menu and their second explanation reflected their fear that electronic menus would be the first step towards eliminating waiters and digitization the restaurant services which will completely transform the consumption experience in a restaurant. On the other side, the majority of respondents highlighted the advantages of electronic menus, out of which the ease to consult the menus, the ease for placing the order, the fact that the young generation prefers the electronic information, and also the ease to update these menus. Asked by the interviewer about their choice to eat in a restaurant that applies sustainable measures versus a restaurant which does not implement sustainable practices, respondents highlighted medium attachment to restaurants that practice sustainable measures. The findings from this first topic are consistent with previous results (Băltescu, 2017; Drumea et al., 2020; Yamane and Kaneko, 2021; Băltescu et al., 2022; Nguyen et al., 2022; van Busse, et al., 2022).

The second topic of the interview guide identified *respondents' attitudes and preferences towards digital menus*. The importance granted by respondents to the implementation of digital menus in restaurants was the first issue discussed in this topic. Respondents were also asked about the relevance of the digital menus in restaurants and the answers recorded showed that they rated this aspect with 4.75 (out of the maximum

of 5). They highlighted the importance to implement digital menus considering factors like the possibility to consult the offer and order before arriving in the restaurant, consequently reducing the time spent in the restaurant, and also the functionality of this instrument.

The second element that was discussed related to the content of digital menus. Respondents highlighted that the main elements necessary to completely describe each product in the digital menu are the following: details on the content, weight, sources of the raw ingredients, nutritional information, photos, and also separate sections with special dishes for vegetarians, consumers with allergies, children, etc. Asked about the importance of each of the above, respondents rated each characteristic from 1 to 5 (1 - very unimportant feature and 5 - very important feature), the results being presented in Figure no. 1. Results obtained emphasized that the most important characteristic of the digital menus was the inclusion of special sections, which was rated with 4.9 (out of a maximum of 5), followed by photos for each product (rating 4.6), and details on the content (4.5). The least important characteristics were considered the details for the raw ingredients' sources (2.8), followed by nutritional information (3.5) and details on products' weight (3.6).

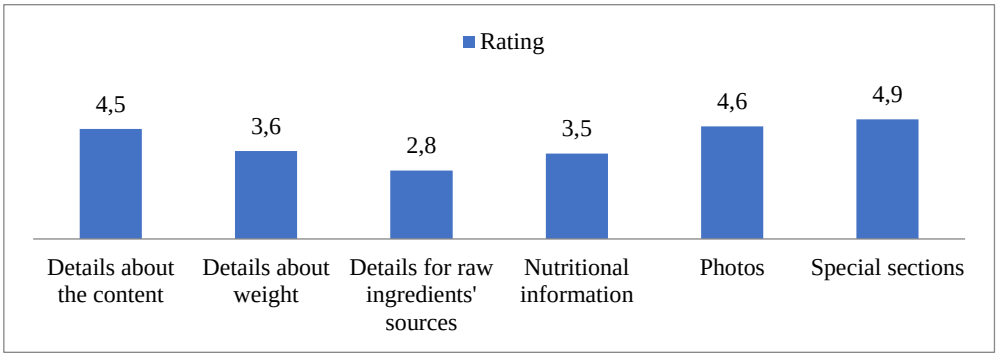


Figure no. 1. Major characteristics of digital menus
Source: Authors' own research

The last element discussed identified the concept and functions of digital menus. Respondents emphasized that they appreciate the following elements when consulting these menus: (a) zoom option, (b) product details by click, interactivity highlighted by (c) the possibility of accessing links with images for the cooking process and (d) the possibility of accessing links to present the sources of raw materials included in the recipes, (e) preferential highlighting of seasonal products, (f) updating and permanent editing the menu in order to prioritize the use of raw materials in stock and, accordingly, to reduce food waste, (g) options to adapt the content of dishes chosen by consumers according to their preferences, (h) the option to place an order before arrival at the restaurant, (i) options to include loyal consumers in a loyalty system with subsequent benefits, and (j) games included in digital menus. They also rated each of these ten characteristics of digital menus from 1 to 5 (1 - very unimportant feature and 5 - very important feature) and the results are presented in Figure no. 2.

Information obtained revealed that the most important functions of the digital menu are the products details (4.8), options to adapt the products' composition based on customers' preferences (4.4), the option to order before arrival in the restaurant (4.3), and also the zoom option (4.2). Interactivity is not considered an essential element for designing digital menus. The links to access images for the cooking process and links to present the sources of raw materials used in the recipes had scores of 3.9 and 3.1 respectively. Permanent updates of the content of the digital menu according to stocks, in order to reduce food waste (3.7) and preferential highlights for seasonal products (3.5) are features with medium appreciations from the respondents. Also loyalty systems where included into the characteristics with medium rating (3.7). At the same time, respondents do not consider games inclusion in the digital menu as a relevant feature, being the least assessed among all elements (2.7). The major arguments for their opinions on the digital menus' concept were the possibility to select recipe's components which represent the foundation for the utmost fulfillment of customers' needs and tastes, the possibility to make orders before arrival that reduces congestion in restaurants, especially during peak hours and avoiding food waste that was another revealed essential characteristic.

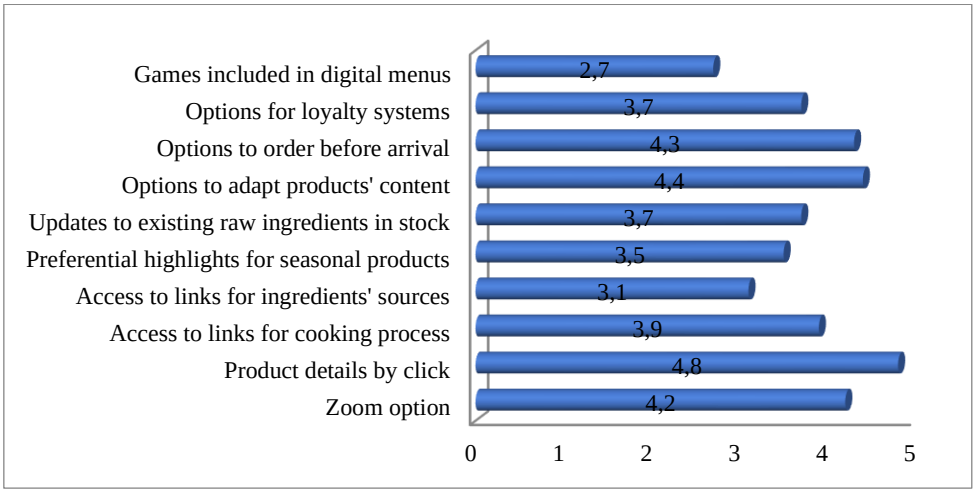


Figure no. 2. Elements describing the concept and functions of digital menus
Source: Authors' own research

Comparing the results of this research with those of previous studies, a mixed situation was revealed. On the one hand, detailed information about restaurants' offers, nutritional elements and transparency are features highly rated by young consumers (Nguyen et al., 2022). On the other hand, the provenance of raw ingredients and entertainment options in digital menus are features with lower assessments in the present study, relevant differences from previous studies (Mu, Spaargaren and Lasink, 2019; Yin and Yoo, 2020) being emphasized.

Conclusions

The present article highlights the results of a qualitative research on the coordinates of the sustainable consumption of younger generation in the restaurant industry. The findings contribute to the general knowledge on this subject, taking also into account the fact that sustainable development term and implications are difficult to assess (Madar and Neacșu, 2020). The importance of this study lies in the analysis of information about sustainable consumption in restaurants that can be useful to restaurant managers in taking decisions for the implementation of sustainable development practices.

Considering that consistency of sustainable consumption does not change rapidly, being consistent within few years (Puntiroli, Moussaoui and Bezençon, 2022), the necessity for restaurants to apply rapid measures to this end is also valid. It is widely acknowledged that the consumer is the main vector in the sustainable development process, but, at the same time, restaurants' initiatives and their high attachment to sustainable development goals is the engine in this demarche. As Calderon-Monge, Pastor-Sanz and Garcia (2020) observed, public campaigns and companies' responsible decision are meant to encourage younger generation to appreciate sustainable development values and goals.

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The Difference Between Traditional and Online Schooling on the Romanian Higher Education System During the COVID-19 Pandemic. Case Study: Bucharest University of Economic Studies Students' Perception Regarding the Effects of Online Education

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Abstract

The COVID-19 pandemic forced universities around the world to close their campuses indefinitely and shift their educational activities to online platforms. The pandemic forced various organizations to suddenly change their operations and adopt new technologies. In most of the cases, these organizations did not have enough time to think about how to implement the new strategies and associated technologies and integrate them into their existing structures. Universities around the world were no exception. We conducted a survey asking students from the Bucharest University of Economic Studies for their opinions on various aspects of online education during the ongoing pandemic. We received responses from 1952 students. However, students felt that online instruction is stressful and impacts their health and social life. This pandemic has led to widespread adoption of online education and the lessons we are learning now will be helpful in the future.

Keywords

Covid-19 pandemic, distance learning, effects of online education, stress, online education system

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Introduction

COVID-19 was discovered in China in December 2019, spread worldwide within a few months, and declared a pandemic by the World Health Organization on March 11th, 2020. Universities around the world were forced to close their campuses and move all academic programs online in spring 2020 (Bao, 2020). Universities were not prepared for such a transition from face-to-face teaching to fully online education. As any other organizations, most universities initially lacked not only infrastructure but also leadership and strategies (Săseanu et al., 2014; Săseanu et al., 2020; Zhang et al., 2020). Due to the COVID-19 pandemic, higher education institutions worldwide switched to emergency distance learning in early 2020. The less structured environment of distance learning forced students to manage their learning and motivation more independently. The COVID-19 pandemic has been accompanied by strict isolation measures that have resulted in students and professors being confined to their homes; a disruptive social life and learning in isolation has made it stressful for students and professors. The very essence of group learning, the shared

activities in the classroom, were missed by both parties and all of this has led to both students and professors experiencing stress. This paper is structured as follows: chapter 1 shows a short review of the scientific literature regarding the transition from traditional to online education and its characteristics; the 2nd chapter presents the methodology and the main objectives of the present research; section 3 presents the main results of the analysis performed, subordinate to each present objective, and last but not least, the 4th chapter sums up the main conclusions of this research.

1. Review of the scientific literature

With the closing of academic institutions, there has been a massive change in teaching and learning methods around the world. Universities, colleges, and other higher education institutions moved to online teaching methods (Amita, 2020). The universities and faculties have embraced various technology platforms where students can actively participate in learning, but the hands-on sessions that require a lab environment were not easy to manage.

A growing number of students today are opting for online courses. The traditional mode of instruction is restrictive, inflexible, and impractical. In this age of technological advancement, universities can now offer effective instruction via the Internet. This change in pedagogical medium forced academic institutions to rethink the way they wanted to deliver their course content (Paul and Jefferson, 2019). They found out that there was no significant difference in student performance between online and face-to-face students overall, in terms of gender, or in terms of class rank. The Covid-19 pandemic has challenged education systems around the world, forcing professors to shift overnight to an online mode of instruction. Many academic institutions that had previously been reluctant to change their traditional pedagogical approach had no choice but to switch completely to online teaching and learning. Online learning was a panacea during the COVID -19 pandemic (Dhawan, 2020). Similarly, Yang and Cornelius (2004) found that flexibility, cost effectiveness, availability of electronic research, easy connection to the Internet, and well-designed instructional interface were the positive experiences of students.

2. The characteristics of online education during Covid-19 pandemic

The Coronavirus outbreak has negatively impacted educational activities worldwide. The coronavirus pandemic affected educational systems worldwide and led to widespread school closures. It resulted in severe disruptions to academic activities and career plans. As part of global efforts to combat COVID-19, many countries around the world have closed schools and universities trying to contain the coronavirus pandemic. There is no doubt that unplanned school closings can cause serious problems for students, educators, professors, and society in general. They could negatively impact student academic interest and achievement. If students are not productively engaged, it could lead to idleness, which in turn could cause youth to become involved in crime, lose interest in learning, and perform poorly in school. The U.S. Centre for Disease Prevention and Control (CDC) also expressed concern about the impact of school closures. According to the CDC, "*Prolonged closures can lead to more students congregating outside of schools."*

According to UNESCO, some of the harmful effects of school and university closures due to coronavirus are as follows:

- *Disrupted learning*: schools and universities represent an important place of learning, and when they closed, students were deprived of the opportunity to grow and develop;
- *Nutrition*: many children and adolescents rely on free or reduced-price meals in schools to eat healthy. This is affected by the closure of schools due to the coronavirus;
- *Unequal access to digital learning portals*: Lack of access to technology or good internet connections to continue learning during school closures;
- *Increased pressure on schools and school systems that remain open*: Local school closures put a strain on schools as parents tend to divert their children to open schools;
- *Social isolation*: given that educational institutions are hubs of social activity and human interaction, school closures can deprive youth and children of some of the social communications and socialization that are essential for learning, development, and creativity.

Technology is a key component of education in the 21st century. The increasing use of technology in education has changed teachers' and professors' methods away from the traditional approach where they often act as knowledge brokers to a more flexible approach where they act more as facilitators, mentors,

and motivators to get students to participate and learn (Onyema and Deborah, 2019). Technology enables distance learning, distance education, virtual learning, blended learning, mobile learning, distributed learning, machine learning, pervasive learning, deep learning, cooperative learning, and collaborative learning. Most aspects of education are going digital, and education stakeholders, including students, face the challenge of making the transition to online education. The use of appropriate educational technologies increases accessibility to learning resources such as Massive Open Online Courses (MOOCs) and multiple approaches to learning to meet the needs of diverse learners (Onyema, 2020).

Online education is a general concept of teaching and learning on the Internet using technological tools and platforms. The success of online education depends on factors such as a good internet connection, educational software, digital skills, availability, and access to technology. Online education platforms are important tools that support inclusive education and online learning. Given the high penetration of the Internet and mobile technologies around the world, online education platforms can be optimally used to fill educational gaps and thus reduce the rate of global illiteracy. There is a wide range of online education tools/platforms that facilitate online education, especially in times of outbreaks such as the coronavirus pandemic, among which we mention: Skype.com; Google Classroom/Open Online education (edu.google.com); schoology (schoology.com); openculture.com; MOOC.org; easyclass.com; coursera.org and GoToMeeting.com. The use of educational technology facilitates online instruction, student-professor interaction, connection, and relationships. It enhances the teaching and learning experience, content creation, course sharing, assessments, and feedback. Professors can reach and interact with their students from anywhere, and lectures can be delivered at any time. Educators and students can make the most of these technologies to supplement classroom instruction and improve their digital skills in line with emerging trends in education. In addition, knowledge of technology increases the interest, competence, confidence, creativity, employability, and output of professors and students and prepares them for the future.

According to Education Task (2020), the majority of university students still prefer to study from the comfort of their own homes because learners have everything at their disposal without having to leave their chairs. However, the fact that formal education is delivered from home could be a major challenge for many professors and students, especially in developing countries where the accessibility, availability, and use of technology in education is not widespread. Apart from the cost of accessing online education, many other factors such as network issues, poor power supply, distractions, lack of digital literacy, accessibility and availability can also hinder smooth learning from home. Aside from the cost of accessing online learning, many other factors such as network issues, poor power supply, distractions, lack of digital skills, lack of accessibility, and availability issues can hinder smooth learning from home.

In addition, there is the problem of time to learn new technologies that may be required for learning from home, and noise, internal or external, from neighbors and neighborhoods. With unequal access to technology another serious problem in many countries, prolonged school closures could deny millions of students access to education, especially in third world countries, rural areas, and among people with special needs. UNESCO understands these challenges and has made efforts to help educators and students in affected countries teach and learn online from home by providing free software that facilitates distance learning. Coronavirus-related universities closures to improve their digital learning skills and study habits at home. The challenges posed by the coronavirus could be used by learners as an opportunity to improve their problem-solving and digital literacy skills.

During the pandemic period e-learning was commonly used as the main method to teach at the level of university institutions. The success of e-learning depends on many factors, including accessibility, usage of appropriate methods, course content, and assessment criteria. The advantages of e-learning are diverse and multiple: from epidemiological benefits to reduction of costs and air pollution. Moreover, the access to resources is possible regardless of the location and time. But there are also some limitations regarding problems with internet access, poor internet connection quality, and insufficient digital skills in some cases. Time flexibility could be a benefit for some students and a limitation for others, depending on their capacity of self-discipline (Bączek et al., 2021).

In order to explore the effectiveness of online learning among the Romanian students during Covid-19 pandemic period it was designed a survey by distributing an online questionnaire to students in Bucharest University of Economic Studies. Data gathered from the survey were analyzed with IBM SPSS statistical software. The research questions formulated for the study are as follows:

R_{Q1}: *How are the opinions of the students regarding online mode of learning related to the year of study and the domain of study?*

R_{Q2}: *How are the opinions of the students regarding online mode of learning related to the internet infrastructure for online learning and digital skills of students and teachers?*

R_{Q3}: *Is there any association between the year of study and the perception on the efficiency of online-education?*

3. Research methodology

In order to study the students' perception regarding the effects of online education, survey research was carried out among students from the Academy of Economic Studies in Bucharest, from all 11 faculties, from all educational cycles (bachelor's, master's) and from all study years (in total five years of study). The research was conducted in October 2021, by distributing and completing the online survey questionnaire, on a sample of 1952 respondents. Of the total students in the sample, 20% were from the Faculty of Accounting and Management Informatics, 14.8% from the Faculty of Cybernetics, Statistics and Economic Informatics, 13.5% from the Faculty of International Economic Relations, 13% from the Faculty of Public Administration, 12% from the Faculty of Finance, Banking, Insurance and Stock Exchanges, 11% from the Faculty of Management, etc. Because less than 2% of respondents came from the Faculty of Business Administration (in Foreign Languages) and the Faculty of Agri-food and Environmental Economics (7 students in total from both faculties), they were removed from the database (Figure no. 1).

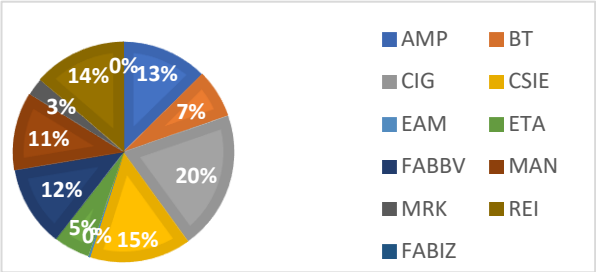


Figure no. 1. Share of respondents by the domain of study (faculty)

In addition to the questions regarding the faculty that the student attends, the educational cycle and the year of study, the questionnaire was structured in three parts, as follows:

- General evaluation of the digital teaching process and the degree of accessibility of students to digital teaching activities (electronic devices, Internet connection, etc.) - six questions;
- Assessment of the digital competences of the participants in the online educational process and the need for additional training in the field - six questions;
- The quality of the electronic platforms made available to the actors participating in the online learning process by the university, as well as the identification of difficulties encountered in accessing and using these electronic resources, or in communicating with teachers and administrative structures of the university / faculty -seven questions.

In order to achieve the established objectives, non-parametric methods were used in the paper, like Kruskall Wallis test, Chi-square test, contingency coefficients and multiple correspondence analysis.

4. Results and discussions

R_{Q1}: *How are the opinions of the students regarding online mode of learning related to the year of study and the domain of study?*

In order to study the opinion of students regarding online mode of learning three variables were selected from the questionnaire:

- *What do you think about the development of online teaching activities as a whole?* (1 = Not good at all, 2 = Less good, 3 = Not at all, 4 = Good, 5 = Very good);
- *Learning is the same when the activities are carried out with physical presence and when they are carried out online.* (5 = totally agree with the statement, 1 = totally disagree with the statement);

- *How stressful is the conduct of online teaching activities caused by the COVID-19 pandemic?* (5 = Not at all stressful / 4 = Slightly stressful / 3 = Stressful / 2 = Very stressful / 1 = Extremely stressful).

By applying Kruskal Wallis test to test if there are differences in the opinions of the students regarding online mode of learning by years of study, it could be observed that with a 5% significance level there are significant differences. The positive perception of students increases significantly with the year of study. The higher the level of education, the more satisfied students are with online education and the more they agree with the statement that online learning is similar to physical learning. Moreover, the higher is the level of study the lower the level of stress associated with online learning (Table no. 1).

Table no. 1. Kruskal Wallis Test

	Year_of_studies	N	Mean Rank	Chi square	Asympt.sig.
Overall opinion on online teaching activity	1st year Bachelor's studies	631	807.55	140.299	0.000
	2nd year Bachelor's studies	613	967.55		
	3rd year Bachelor's studies	436	1054.26		
	1st year Master's studies	150	1225.36		
	2 nd year Master's studies	115	1272.63		
	Total	**1945**			
Learning is the same online and physically	1st year Bachelor's studies	631	773.10	177.413	0.000
	2 nd year Bachelor's studies	613	976.46		
	3rd year Bachelor's studies	436	1091.71		
	1st year Master's studies	150	1169.47		
	2 nd year Master's studies	115	1345.10		
	Total	**1945**			
The level of stress generated by online learning activities	1st year Bachelor's studies	631	831.96	111.182	0.000
	2nd year Bachelor's studies	613	971.84		
	3rd year Bachelor's studies	436	1016.42		
	1st year Master's studies	150	1198.82		
	2nd year Master's studies	115	1293.88		
	Total	**1945**			

By applying Kruskal Wallis test to test if there are differences in the opinions of the students regarding online mode of learning by domain of study, it could be observed that with a 5% significance level there are significant differences. The students from the Faculty of Business and Tourism, the Faculty of Marketing and the faculty of Public Administration have a better perception about the online teaching activities as a whole, and about the statement "*Learning is the same when the activities are carried out with physical presence and when they are carried out online*" than those from the other faculties. The worst perception about online teaching activities is found among the students from the Faculty of Cybernetics, Statistics and Economic Informatics. But regarding the stress generated by online learning activities, among the students from the Faculty of Business and Tourism, the Faculty of Marketing, the Faculty of Management and The Faculty of International Business and Economics is less perceived the stress compared to other students (Table no. 2).

Table no. 2. Kruskall Wallis Test

	Faculty	N	Mean Rank	Chi square	Asympt.sig.
Overall opinion on online teaching activity	AMP	246	1071.45	38.130	0.000
	BT	138	1092.42		
	CIG	398	979.81		
	CSIE	289	860.56		
	ETA	105	931.52		
	FABBV	231	933.58		
	MAN	223	940.87		
	MRK	51	1175.37		
	REI	264	970.69		
	Total	**1945**			
Learning is the same online and physically	AMP	246	1023.38	27.519	0.001
	BT	138	1081.68		
	CIG	398	993.85		
	CSIE	289	889.02		
	ETA	105	905.46		
	FABBV	231	897.61		
	MAN	223	962.71		

	Faculty	N	Mean Rank	Chi square	Asympt.sig.
	MRK	51	1162.35		
	REI	264	994.68		
	Total	**1945**			
The stress generated by online learning activities	AMP	246	955.23	37.328	0.000
	BT	138	1078.32		
	CIG	398	962.38		
	CSIE	289	877.76		
	ETA	105	962.85		
	FABBV	231	898.40		
	MAN	223	1010.08		
	MRK	51	1253.86		
	REI	264	1038.51		
	Total	**1945**			

RQ2: *How are the opinions of the students regarding the online mode of learning related to the internet infrastructure for online learning and digital skills of students and teachers?*

In order to analyse the association between the opinions of the students regarding online mode of learning and the internet infrastructure for online learning and digital skills of students and teachers, the Chi square test was applied and the contingency coefficient was computed. The results show that there is no significant association between the device used and the opinion regarding online mode of learning. But the digital skills and the internet connectivity are associated significantly with the opinion regarding online mode of learning and the stress associated with it. Moreover, the variables the stress generated by online learning activities is strongly associated with the overall opinion on online teaching and on the fact that learning is the same online and physically. The students who have a good opinion about online education do not even consider it a source of stress (Table no. 3).

Table no. 3. Chi square tests and the contingency coefficient

	Device used to participate in online teaching activities		**Adequate internet access**		**I have the necessary digital skills**		**The stress generated by online learning activities**	
	Chi-square	Contingency coefficient	Chi-square	Contingency coefficient	Chi-square	Contingency coefficient	Chi-square	Contingency coefficient
Overall opinion on online teaching activity	16.971 (0.151)	0.093	94.456 (0.000)	0.215	106.724 (0.000)	0.228	1058.862 (0.000)	0.594
Learning is the same online and physically	12.309 (0.421)	0.079	86.237 (0.000)	0.206	144.676 (0.000)	0.263	921.587 (0.000)	0.567
The stress generated by online learning activities	17.702 (0.125)	0.095	77.375 (0.000)	0.196	107.568 (0.000)	0.229		

R_{Q3}: *Is there any association between the year of study and the perception on the efficiency of online-education?*

In order to obtain a clearer picture of the association between the year of study and the variables regarding the effectiveness of online education, an analysis of multiple correspondences was performed. The results show that students pursuing master's degree programs in first or second year of study, consider that online learning is very good, extremely efficient, feeling totally comfortable with the online communication and having the necessary digital skills. The students from the first year of study in bachelor degree, consider that the online education is less efficient that traditional education and the communication online is not always good with teachers and they are not feeling always comfortable with this kind of communication. Moreover, those that are dissatisfied with online education, are dissatisfied with the online communication,

do not have the necessary digital skills and consider that the online teaching is not efficient (Figures no. 2,3,4).

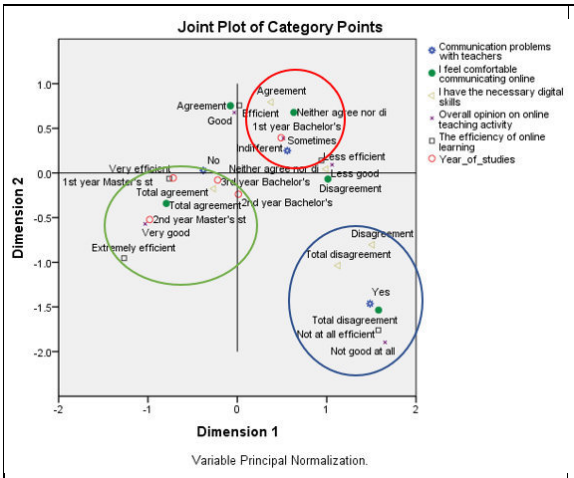


Figure no. 2. Multiple correspondence analysis results

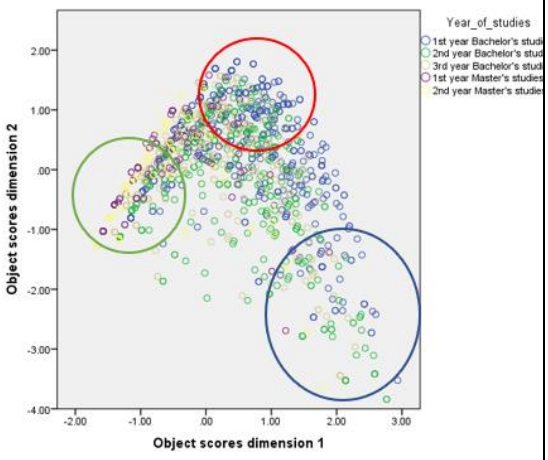


Figure no. 3. Multiple correspondence analysis results

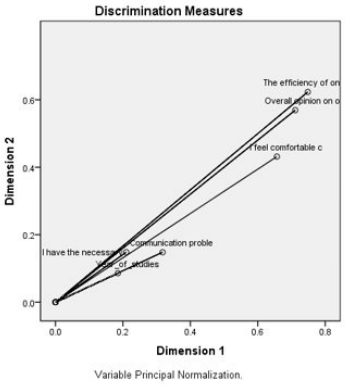


Figure no. 4. Multiple correspondence analysis results

Conclusions

While online learning has a lot of potential, it is more effective when students and professors have the time to prepare for it and get used to it, and universities have had the time to test its implementation. Unfortunately, in many cases this has not been the case, as Covid -19 forced all educational institutions to make a sudden shift to online learning. The results of our study reveal a significant difference in the students' perception on the online teaching activity depending on the domain of study (faculty). Thus, students from domains like business and tourism, marketing or public administration have a higher overall opinion than students from other domains on the online teaching activity and on the similarity of learning process when the activities are carried out with physical presence and online. The online teaching activities are perceived as less stressful by the students of the faculties of Business and Tourism, Marketing, Management and International Business and Economics. The opinion regarding the online mode of learning and the stress associated with it are significantly associated with digital skills and the internet connectivity. The students who have a good opinion about online education do not consider it a source of stress. Master students have a better opinion on the online teaching activity than bachelor students, considering it highly efficient and feeling more comfortable with the online communication. The students in the first year of study in bachelor degree programs are less satisfied with the efficiency of the online teaching activity, with the online communication process and feel less comfortable about it and have to a lesser extent the necessary digital skills.

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Corporate Social Responsibility, a Strategic Tool for Sustainable Value Creation: A Case Study of Unilever's Sustainable Living Plan

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Abstract

Strategic CSR may be described as an ongoing and complex process. Some strategic CS initiatives may be successful since the beginning while others may require improvement in order to contribute to goals achievement. A certain fact is that a responsible company should constantly learn, improve and adapt their practices considering the dynamic of markets and changing expectations of stakeholders. The journey made by Unilever, up to this point, in terms of sustainable value creation following strategic CSR approaches sustains both the concept's complexity and the company's willingness to constantly development and improve in order to remain a leading organization in the industry of fast moving consumer goods. The objective of this paper was to analyze the performance of Unilever's Sustainable Living Plan from a strategic CSR and sustainable value creation perspective, following a qualitative approach. The findings of the study revealed that even though the organization did not managed to achieve of all the stated USLP's objectives, during these 10 years plan, the firm has grown based on sustainable, durable, people-driven principles, gain competitive advantage and achieve to some extent, both economic and social goals. In addition, the results showed that Unilever should improve its ability to retain employees. Thus, the company should further consider focusing more on educating consumers regarding the implications and overall benefits of responsible consumption and behavior in order to increase the value of the brands and of the company.

Keywords

Strategic corporate social responsibility, sustainable value creation, Unilever, Unilever Sustainable Living Plan.

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Introduction

Social responsibility in the context of business dates back to the 1950s when H. Bowen stated that the measurement of a company's success will be determined by two critical aspects, respectively gained profits and its contribution to common good (Bowen, 1953). Corporations have increased significantly as business organization's forms; therefore, social responsibility (SR) is currently referred to as corporate social responsibility (CSR) (Caroll, 2008). As the concept become global in scope and institutionalized by organizations, the integration of corporate social responsibility into strategy has emerged (Toma, 2006). From a strategic perspective, CSR is strongly associated with managing the expectations of legitimate stakeholders (Toma, Stanciu and Irimia, 2011). Therefore, several studies sustain that strategic CSR may be perceived as a beneficial instrument for differentiation and sustainable value creation (Zhiyuan, Zhiqing and Canming, 2020).

Unilever represents one example of best practices in terms of strategic CSR. The company is strongly perceived as a social responsible business due to the fact that it has proven a long-standing commitment for employees and communities, as well as its environmental standards and several attempts to improve human welfare in underdeveloped countries. Base on a qualitative approach the present paper analyzes the performance of Unilever's Sustainable Living Plan from a strategic CSR perspective. Considering Chandler's (2020) developed framework for assessing the efficiency of a company's strategic CSR initiatives and the principles of sustainable value creation, the results presented in Unilever's Annual and Account Report 2011-2020 and USLP's summary of 10 years progress documents have been evaluated. The present paper is divided into several sections such as: introduction, literature review (an overview of strategic corporate social responsibility as first part and sustainable value creation principles as second part), results and discussion (the analysis of the Unilever's Sustainable Living plan performance from a strategic CSR point of view based on sustainable value creation), conclusions and bibliographic sources.

1. Review of the scientific literature

Strategic CSR is frequently defined as the integration of CSR principles into strategic planning and fundamental firm operations, considering the expectations of diverse stakeholders and aiming to enhance value in a long-term manner (Chandler, 2020). Consequently, according to Chandler (2020) the analysis of strategic CSR practices of an organization should consider the folowing aspects: is the corporate social responsibility perspective strongly rooted in the company's philosophy and the strategy shaping process?; is there a direct relationships between taken actions of a company and its fundamental operations?; does the organization acknowledge and satisfy stakeholder's demands?; how the company manages to create and improve value for the parties of interest?; is the firm focused on developing long-term relationships with its stakeholders? The first question concerns the organization's ability to grasp the principles of CSR in order to approach the concept in a strategic manner (Toma, 2012; O'Sullivan, Toma and Marinescu, 2015). As a result, CSR activities should begin within the company, taking into account and fulfilling the needs of organizational stakeholders as well as shareholders (Toma, 2008; Imbrișcă and Toma, 2020). Profit should be at the center of traditional businesses' priorities (Junsong et al., 2021). As a result, a responsible companies ensures that all parties of interest are considered and are unaffected by the methods utilized in the process of achieving certain financial goals (Roszkowska-Menkes, 2018). On the other hand, strategic CSR actions should be closely linked to a company's operations (Reza et al., 2019). These have a significant role in maintaining business activity by selecting appropriate social concerns to address, determining the extent to which an organization's operations affect the society, and determining the extent to which the environment limits a firm's operations. Strategic CSR adds value by assisting the organization in rethinking and improving day-to-day operations and resource use (Reza et al., 2019). Moreover, strategic CSR may assist managers by creating long-term competitive advantage. A broader perspective of legitimate stakeholders, as well as the acknowledgement and anticipation of their concerns may help companies obtain greater value (Ślęzak, 2020). Therefore, the scope of strategic corporate social responsibility relays on developing long-term relationships with these parties of interests (Rameshwar, Saha and Shamindra, 2020).

Sustainable value creation

Evidence suggests that sustainability may develop into a major social responsibility issue for nowadays businesses (Durand, Paugam and Stolowy, 2019). Therefore, individuals who are in a position of leadership are required to establish ways that may assist the company in becoming more perceived as social responsible, environmentally friendly and commercially competitive. Thus, sustainability has become broadly related to assets usage and environmental conservation (McWilliams, Siegel and Wright, 2006). Furthermore, considering the business domain, sustainability can be perceived also as a mean through which value and competitive advantage can be enhanced (Porter and Siggelkow, 2008). Sustainable value occurs not only when ecological principles are integrated in business strategy, but also when the company's growth overall is based on healthy, durable, economical and people-driven considerations. How organizations conduct their business activity may create value for both firms and stakeholders. Strategic CSR facilitates the creation of value by establishing a sustainable competitive advantage. Porter and Siggelkow (2008) stated that competitive advantage may not be grasped by analyzing the company as a whole due to the fact that the concept is determined by actions (small or significant) taken by the organization. Each of these may create a strong cost positioning or a starting point of differentiation from competition. Strategic CSR strives for achieving differentiation by creating sustainable value and limiting the possibility of strategy replication by competitors (McWilliams and Siegel, 2002).

Up to this point value has been divided between customers and the firms. In consequence, efforts have been made in order to understand how a company might be able to increase its own value and influence the

perception of potential clients. In the current business environment, more and more researchers promote a third type of value that can be generated by organizations, namely the societal one which focuses on influencing in a positive manner the general wellbeing (Durand, Paugam and Stolowy, 2019). Additionally, value was been extended from consumers to stakeholders overall and sustainable competitive advantage can be developed starting from the creation of economic and societal value (Chandler, 2020). Strategic CSR assists managers in harmonizing these categories of value. Value should be deeply rooted in a company's culture and philosophy. From an internal standpoint, value should create meaningfulness for those vital stakeholders and the company (Voegtlin and Greenwood, 2016). For instance, employees perceive meaningfulness as empowering due to the fact that they experience several feelings such as being valuable, appreciated and useful for the organization (Nazir and Islam, 2020). Moreover, firms which enhance value through meaningfulness seem to provide a certain purpose for their workers (Voegtlin and Greenwood, 2016). From an employee's perspective an organization's attractiveness may increase if the firm is able to provide both tangible and intangible benefits such as carried development opportunities, security and proper remuneration among others (Nazir and Islam, 2020). The firm's capability to retain its works may be perceived as a competitive advantage of the company. From a firm's perspective, McWilliams and Siegel (2011) sustain that strategic CSR represents an important asset that might increase the value of other means owned by an organization and the most suitable example provided in order to sustain this affirmation may be considerated the company's reputation. Studies have revealed that it is valuable for an organization to have a reputation for quality and CSR actions may contribute to this regard by influencing the perception of individuals, consequently the value and quality (Singh and Misra, 2021). Secondly, the value of the company's brands may be increased as a result of strategic CSR (Hyun, Wootae and Zha, 2021).

2. Research methodology

Base on a qualitative approach the present paper analyzes the performance of Unilever's Sustainable Living Plan from a strategic CSR perspective. Considering Chandler's (2020) developed framework for assessing the efficiency of a company's strategic CSR initiatives and the principles of sustainable value creation, the results presented in Unilever's Annual and Account Report 2011-2020 and USLP's summary of 10 years progress documents have been evaluated.

3. Results and discussion

The Unilever business is divided into three major segments as follows: Beauty and Personal Care (BPC), Home Care (HC), Food and Refreshments (F&R). In 2010, after a rigorous analysis of the organization's practices regarding CSR, worldwide standards and rivals initiatives so far, Unilever developed and adopted the Sustainable Living Plan (USLP). In short, the company aimed to become an environmentally friendly organization by integrating CSR practices in their main strategy and day-to-day operations, therefore improving its value chain. USLP shifted the company's attention from innovation to transformative development by committing to responsible growth and sustainable value creation, reducing its impact on the environment and generating a positive one at social level during the implementation period of the project, respectively 2010-2020. USLP had ambitious objectives (pillars) such helping 1 billion individuals have a better live by improving their health and general welfare; minimizing the company's environmental impact by half; promoting and sustaining business inclusion for millions of individuals (women and smaller entrepreneurs). For each of these goals, several actions have been taken.

A. Pillar: Improving health and hygiene for 1 billion individuals – creating sustainable value for the firm and its various stakeholders through the use of brands.

Action no. 1: Health and hygiene – a strategic CSR marketing approach to increase brand value, brand awareness and brand sales in a sustainable manner.

Unilever managed to achieve its health and hygiene target by integrating CSR principle into the marketing strategy and increasing brand value. Therefore, several brands such as Lifebouy (disinfectant soaps; brand's scope: reducing and preventing the appearance of respiratory illnesses through handwashing), Pureit (water purification systems; brand's cope: potable water), Domestos (toilet cleaning products; brand's scope: sanitation and disinfection of surfaces), Smile (oral care products; brand's scope: enhance oral health), Dove (beauty care products, brand's scope: improve self-esteem and promote natural beauty) and Vaseline (petroleum jelly based products, brand's scope: skin healing) have been associated with a certain social cause relevant for the product usage. The techniques used by the organization in order to build and promote the brands missions were strategic partnerships with globally recognized NGOs to increase the firm's credibility (for instance, Direct Relief's and the Red Cross); product donations, sponsorships, TV commercials

and consumer education. Thus, considering the presented brands, the main segment the company focused on was BCP during the 10 year plan for sustainability (Lifebouy, Smile, Vaseline and Dove). In 2011, the Food & Refreshment category accounted for nearly half of all revenue generated by product commercialization (49%, 22,467.83 mil euro), while BPC represented 33% (15, 334.11 mil euro) and HC 18% (8, 364.06 mil euro). In 2020, at the end of the USLP project, most probably due to the applied strategic CSR marketing and consumer's behavior changes, BPC become the leading segment by generating 42% of total turnover (21,304.08 mil euro) and increasing with 9% from 2011 to 2020, followed by the F&R segment with 38% share in total turnover (19,275.12 mil euro) and 12% decrease comparing 2011 with 2020; and HC owning 20% (10,144.8 mil euro) and increasing 2% since 2011 (Table no.1). Additionally, Unilever had increased its revenues since the beginning of its sustainability program with 9.16% by providing purpose to these powerful brands that the organization owns (Table no.1).

Table no. 1. Unilever's turnover per market segment during 2011-2020

	11	12	13	14	15	16	17	18	19	20
Turnover										
€ million	46,467	51,324	49,797	48,436	53,272	52,713	53,715	50,982	51,980	**50,724**
By product area as % of total turnover										
Beauty & Personal Care	33	35	36	37	38	38	38	40	42	**42**
Food & Refreshment	49	47	46	44	43	43	42	40	37	**38**
Home Care	18	18	18	19	19	19	20	20	21	**20**
Total	100	100	100	100	100	100	100	100	100	**100**

Source: Unilever's Annual Reports and Account. Charts 2011 to 2020.

In addition, in 2020, Asia, Africa, Middle East, Turkey, Russia, Ukraine and Belarus represented the regions with the highest contribution to the company's turnover (46%, 23 333.04 million euros), followed by the Americas (32%, 16 231.68 million euros) and Europe (22%, 11 159.28 million euros). From 2011 to 2020, Europe's contribution has decreased by 24.14%, while the leading countries in terms of contribution increased by 21.05%.

Action no. 2: Nutrition – quality improvement at product level, value for consumers.

The company's focus was to improve its F&R portfolio by lowering calories and removing trans fats from its products, therefore making their products more suitable for ensuring consumer's health. Within this scope, Unilever's portfolio contains 77% less salt, 33% less saturated fat, 23 % less sugar and 0% trans fats. Additionally, 99.7% of the company's goods currently have comprehensive nutrition labeling on the package meeting globally nutritional requirements.

B. Pillar: Reducing environmental impact by ½- improving day-to-day firm's operation and enhancing sustainable value creation.

Action no. 1: Greenhouse gases- reducing environmental footprint from manufacturing operations.

In 2020 Unilever managed to lower CO2 emissions produced during the manufacturing process by 75%. Additionally, the organization began to use renewable energy sources to generate electricity and sustain the operations associated with production. On product level, the multinational company has improved the formation of its laundry powder portfolio in order to reduce greenhouse emissions by 15% in 2020 and extended worldwide the liquid detergent portfolio due to its proven efficiency in cleaning clothes at lower temperatures. Additionally, Unilever made efforts in optimizing energy consumption in mostly all of the company's offices. Therefore, in 2020 the organization has reduced internal energy consumption by 56.5%. Lastly, Unilever promoted during 2010 and 2020 the "work from home initiative" (WFH, 1 or 2 days in a week per employee). As a consequence, in 54 of countries the travel footprint of Unilever has been reduced. As a downside to this, it is difficult to analyze the overall benefit due to the fact that WFH employees tend to use more utilities (gas, water and electricity). In addition, from stakeholder's perspective another issue has been identified: some of the workers felt unjustified and requested the company to cover partially the costs of their utility bills especially during the first year of the pandemic (2020).

Action no. 2: Water- reducing environmental footprint within the organization and through brands.

The company aimed to reduce its water footprint. The first initiative has been made within the organization and contributed to a reduction of 27.1 million cubic meters of water comparing with 2008. From a percentage perspective, 49% less water was been consumed in 2020 than before 2008. Consequently, several Unilever's factories have enhanced strategies and programs which enabled them to reuse and recycle water. Additionally, Unilever has been working closely with its farmers to lower water consumption in agriculture. Secondly, the organization strived to achieve this goal by collaborating with consumers. Within this scope, product formula has been improved (composition based on less water) and leave in hair products (no rinsing

required) have been promoted (for example, Love Beauty and Planet range). Even though efforts have been made to reduce water consumption, Unilever partially failed to achieve this particular objective. The main reason for this failure is that the results of this strategy were directly linked to the actions of consumers, respectively of the way in which they understand and follow the usage instructions of the products (placed on the back of the pack). For instance, considering the laundry detergent segment, Unilever took actions to obtain a more concentrated formula in order to enable consumers to use smaller quantity of product per wash and thus reduce the residues eliminated in the sewage water. Another example, relevant for the BPC segment, may be considered the leave in conditioner and cream from the brand Love Beauty and Planet. The revolutionary formula has been created to help reduce water consumption, as it is no rising after usage (as opposed to rinsing it for at least 5 to 8 minutes). The problem with this new marketing strategy based on innovative and more eco-friendly products is that consumers do not usually read the usage instructions and even if they do so, they still tend to not apply them. For example, individuals are inclined to utilize a much bigger quantity of detergent (liquid, powder or capsules) than suggested by the producer due to the fact that they perceive the recommended amount as way to small and ineffective for the volume of cloths that needs to be washed. In the case of the leave in hair products, they use again a bigger quantity of the product than necessary due to the false impression that the bigger the quantity the faster the effect. If they follow the recommendations and do not rinse it, because of the higher amount of product used, the hair usually gets greasy or it has an unpleasant aspect therefore the cream conditioner needs to be rinsed off (in doing so water is wasted). A different scenario, but with the same effect consists in those consumers that ignore from start the usage suggestions and still rinse their hair after applying the cream conditioner (again the water is wasted). These presented consumer insights are available especially for Romanian market. Therefore, a recommendation that can be made in order to improve the results of the presented strategy is for the company to get more involved in educating and changing the behavior of consumers. Brands can be used in this regard, respectively to presents the functionalities of the products and, additionally, to emphasize the environmental consequences of individual's actions. Moreover, using such an approach may also contribute to increase the value of those brands.

Action no. 3: Waste and packaging- a step towards building responsible and more sustainable brands for consumers.

Several steps have been made in order to make the organizations and its brands more sustainable and environmental friendly. Unilever has achieved several outstanding milestones in terms of manufacturing operations waste reduction. For instance, in comparison to 2010, the total garbage delivered for disposal has decreased with 34% by 2020. In addition, currently Unilever's manufacturing facilities also has 0% non-hazardous waste to landfill. Despite the progress made in waste reduction, there is still a long way to go for sustainable packaging. First of all, some improvement has been made also to lower the weight of the packaging by 18% comparing with 2010. As a consequence, the packaging of various products the multinational company sell has become more eco-friendly by using recyclable or composite plastic. Another important step the organization has followed was to promote reusability. Brands such as Dove and Cif have extended their portfolio with refill options. Therefore, in the year 2020, 52% of the company's plastic packaging was reusable, recyclable, or compostable on a large scale (genuine recyclability). As a downside to this, the company does not have yet the capability to recycle (or the infrastructure) as much as it produces, especially in developing countries. For example, in Romania there are no collection points set up by the company for used, non-reusable containers. Additionally, consumers from developing countries seem to be resilient at the idea of utilizing refill options due to the fact that they perceive them as less qualitative (diluted) and smaller than the original product they have used.

Action no. 4: Sustainable sourcing- sustainable value creation through firm's operations and suppliers.

As presented so far, all actions have been firstly initiated inside the company, mostly, within the organization's 13 to 21 top representative country offices. For instance, materials such as paper based ones that are used in these workplaces come from recycled or forests managed in a sustainable manner. 67% of Unilever's unprocessed material (raw material) is currently obtained in a sustainable manner while in 2010 only 14% were. The multinational company managed to achieve this performance by utilizing both independent smallholder certificates and physically validated sustainable sources. During these 10 years plan, the organization has focused especially on the proving healthier and responsible product to consumers. Therefore, by the end of 2020, several ingredients have been sourced following a more sustainable approach: 100% of their sugar, ice cream flavors (Ben & Jerry's), soil beans and oil; 99.6% of their palm oil volumes; 98% of cocoa for Magnum ice cream and rapeseed oil; 96% of their paper and board; 95% of their top vegetables and herbs; 86% of their tea; 79% of dairy produce and only 25% of sunflower oil was sustainable sourced according with international compliances. These accomplishments were also made feasible by Unilever's

expanded expectations and standards for raw material suppliers, which currently include CSR and environmental principles such as achieving zero deforestation in the supply chain while sustaining human rights.

C. Pillar: Enhancing livelihoods for millions of individuals – aiming for long-term relationship with employees and creating sustainable value at social level by empowering women and small business.

Action no. 1: Fairness in the workplace- a step forwards in building long-term relationships with legitimate stakeholders.

In this case, Unilever had three main approaches: equitable compensation linked to employee's performance; assisting workers in taking initiatives to improve their physical and mental health, nutrition, and overall welfare and reducing employee's possibility to suffer accidents or injuries by 70% compering 2020 with 2008.Firstly, proper remuneration is difficult to assess. The organization has developed its own framework for compensation considering several legal and ethical aspects. The amount of information accessible on this subject is relatively restricted. However, former Romanian workers have presented some of these remunerations principles followed by Unilever. For example, employees' performance is debated in a 'Talent Forum' (a meeting between some representatives of the human resources department and line or direct managers). Such an approach has raised certain issues among several workers. For instance, the individual who is analyzed is not present in the meeting. Therefore, they perceive this act as being unfair due to the fact that they are not able to speak up for themselves. Indeed, after the meeting, feedback is provided to employees and this could be a proper moment to clarify some aspects that have been discusses, but it is only a one to one conversation. Some would appreciate if they would have the opportunity to initiate a conversation with all of the individuals that provided a feedback of them. This type of evaluation may create frustration among workers and reduce individual performance. In order to avoid such scenario, transparency is recommended in managing the relation between the company and its organizational stakeholders. On the other hand, though a special program (Lamplighter) designed to provide information, tips and tricks for embracing a healthier lifestyle, the company has reached and improved the life of 32,000 employees in 42 countries. Even though initiatives have been made to improve the relationship between workers and the company, there might be still a long way ahead in achieving the aimed target, respectively consolidating the connection formed with organizational parties of interest. Since 2014 Unilever's seems to lose constantly workers. Thus, the average number of Unilever's employees has decreased by 11.24% from 2011 to 2020 (Chart no.2). In addition, if considering the evolution of revenue per employee ratio, the efficiency and productivity of the individual worker has improved by 22.91% from 2011 to 2020 (Chart no.3). Unilever's economic and social objectives during this period of time, have grown significantly, therefore the load work per employee has also increased due to the fact that fewer individuals had to contribute to the achievement of goals. In this case, employees might have felt under pressure and decided to pursue their carrier outside the company.

Action no. 2: Opportunities for women- empowering females' employees and creating long-term relationships.

Gender balance, safety matters, access to programs meant to develop professional and entrepreneurial skills for women were in scope for the company. In terms of achieving a particular balance between males and females in the workplace, the number of women managers has only increased by 12% since 2010. Efforts should continue to be made in this direction of empowering women, especially in developing countries.

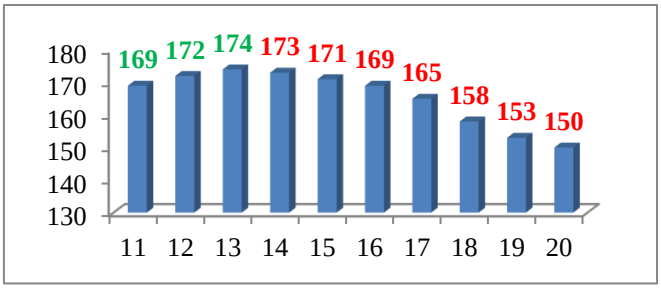


Chart no. 1. Unilever's average number of employees (thousand) during 2011-2020
Source: Unilever's Annual Reports and Account.

Action no. 3: Inclusive business- sharing knowledge and creating sustainable value for society.

The company offered support for integrating responsible practice and increasing the income of over 832,000 small farmers business and approximately 1.83 million small scale retailers.

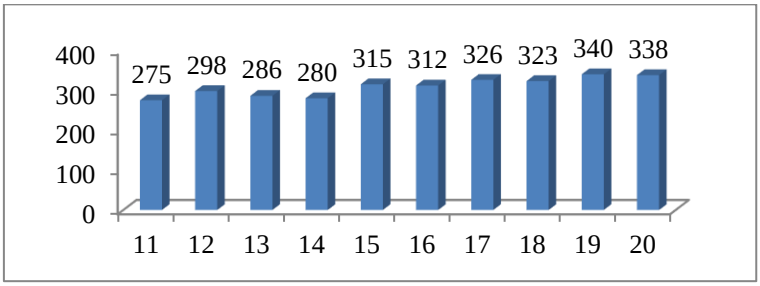


Chart no. 2. Unilever's turnover employees (€ thousand) during 2011-2020
Source: Unilever's Annual Reports and Account.

Conclusions

Strategic CSR may be described as an ongoing and complex process. Some strategic CSR initiatives may be successful since the beginning while others may require improvement in order to contribute to goals achievement. A certain fact is that a responsible company should constantly learn, improve and adapt their practices considering the dynamic of markets and changing expectations of stakeholders. The journey made by Unilever, up to this point, in terms of sustainable value creation following strategic CSR approaches sustains both the concept's complexity and the company's willingness to constantly development and improve in order to remain a leading organization in the industry of fast moving consumer goods. The present study reveals that the USLP project has been indeed a significant step made by the organization in order to consolidate its responsible business reputation. From a strategic CSR perspective, Unilever has demonstrated that CSR begins within the company by improving the firm's operations, value chain and the relationships formed between the organization and broader stakeholders. Through the appliance of strategic CSR, Unilever managed to create sustainable value for the organization itself and its employees, suppliers, consumers, communities, the environment and society overall by correlating the company's actions with fundamental operations, acknowledging and satisfying current demands and striving for creating long-term relationship with legitimate parties of interests. Furthermore, the present paper sustains that even though the organization did not managed to achieve of all the stated USLP's objectives, during these 10 years plan, the firm has grown based on sustainable, durable, people-driven principles, gain competitive advantage and achieve to some extent, both economic and social goals. Additionally, it outlines the idea that Unilever should rethink and improve its strategic CSR approaches designed for employees considering the presented and analyzed attrition rate. Thus, Unilever should focus more on educating consumers regarding the implications and overall benefits of responsible consumption.

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Innovations in Wine Sector: Evidence from Bulgaria Based on Fuzzy AHP Approach

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Abstract

Up to date wine production is challenged to adopt various innovations. Current literature systematically identifies better strategies, technological improvements and emerging market opportunities with respect to sustainable viticulture. Some lack of knowledge and practice is related with the impact on the local community for leveraging on all positive impacts of wine conventional and eco-innovations. The present paper assesses the perceptions about the relative importance of three types of innovations in the wine sector in Bulgaria - conventional, ecological and social. The tool for analysis is analytical hierarchical process (AHP) methodology and Fuzzy version of AHP. We select an equal number of managers and technological specialists from the wine industry in Bulgaria whose assessment of these three types of innovation in wine-making is decisive for both market competition and consumer behavior. The results of the study show that priority is given to conventional and eco-innovations compared to social innovations in the wine sector. At the same time, the direct involvement of wine experts in different types of innovations is emerging. Conventional or marketing innovations are better developed by sales managers, and eco-innovation as a part of sustainable production is important for technologists. The analysis is vitally important for small and middle-sized wine producers in Bulgaria who want to join worldwide wine innovation performance.

Keywords

wine sector, conventional innovations, eco-innovations, social innovations, fuzzy AHP

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Introduction

Wine industry in recent decades faces a multitude of innovations, many of them concern different aspects of production and marketing of wine. Innovations can play an important role in all cycles of wine production based on interdisciplinary approaches, empirical knowledge transfer or promotion of relevant technological solutions. Innovations in the wine industry can also generate sustainable managerial adaptation and good social decisions. The diffusion of wine innovations in Europe is becoming an important tool for small and middle-sized companies for identifying their commercialization performance and agro-organizational knowledge (Vergamini et al., 2019). For example, precise viticulture and remote observation of vineyards allow real-time monitoring of accurate weather data, vine conditions (grape surveys, phenological stage determination and plant diseases) and key cellar conditions with technology developed on the basis of the Internet of Things (IoT) (Deloitte, 2019). This approach has a consequential effect on resource efficiency as well as environmental protection by reducing the carbon footprint, reducing water and electricity use and recycling vine and wine waste (Forbes et al., 2013). At the same time, local consumers remain in a search for authentic wine as a part of innovative wine production. All these facts show that there is a need for understanding and rating of different innovations as technological, ecological and social innovations for wine producers in order to track some dynamics in the sector (Costa et al., 2022). There will be a first mover advantage for those wine producers that upskill today and develop innovative expertise.

The aim of the present study is to check the degree to which managers and technological specialists are familiar with the different types of innovations and how they assess their importance, making a subsequent evaluation of the importance of certain types of innovations. In this paper, we will first explain some conceptual frameworks related to innovations in the wine industry. Then, we will present our method of empirical study which uses a questionnaire for managers and technological specialists in Bulgarian wine-producing companies as a base for a fuzzy analytical hierarchical process (fuzzy AHP) assessment. The discussion of results will be presented into three dimensions - conventional, ecological and social, highlighting the assessment of each item. Finally, we summarize our findings for small and middle-sized wine companies in the country.

1. Literature review

Innovation is a technological-based process for production and market development, which can be studied or monitored through various methods and variables. Innovation has always been well accepted by winemakers as an approach towards successful and differentiated marketing. The results of a survey of 522 Canadian winemakers show that innovation has only positive effects on business performance through improved products, efficient use of resources and implementation of new environmental practices in the wine sector (Frigon, Doloreux and Shearmur, 2020). As noted by Calle et al. (2022) innovation is a key determinant for productivity growth in agricultural activity. The authors present a survey of winemakers in 70% of Spain's regions and underline that a successful wine strategy is driven not so much by its process motivation (e.g. being part of corporate social responsibility policy) as by its product motivation (e.g. improved quality for biological or organic wines).

By implementing the company's business strategy for competitive advantage, winemakers test various marketing tools to introduce innovations: from conventional or technological to eco-innovation, and even social innovation. Social innovation represents a dynamic part of technologies, business models and creative ideas, as well as a supporting micro-level initiative for social entrepreneurship without limitation of the sector, type or importance of actors (Choi and Majumdar, 2015). In the case of wine production, social innovation is a conductive lens and perspective change to analyze how sustainability objectives and wine-knowledge creation can be achieved for social and urban inclusion in wine regions (Costales, 2022). Social innovation is a transformation driver between conventional or technological innovations (related especially to fertilizers and pesticides for intensive agriculture) and sustainability innovations. In this sense, social innovation can provide fast and appropriate trade solutions for winemakers (Ziegler et al., 2022).

In order to study in detail the ability of wineries towards orientation purchasing of their clients, today winemakers want to include in the circle of innovations an increasing number of green or eco- innovations. Despite the growing interest in this topic, the scientific research is relatively limited, mainly due to the consideration related to scarce winemaking resources and to the traditional managerial approach in the sector, mainly at national level (Cusin and Passebois-Ducros, 2015). However, in recent years the logic of studying innovations in winemaking has considered possible correlations between consumer preferences for wine and the adoption of eco-certification, bottle recycling, reuse of washing water, emission monitoring or other environmentally friendly actions (Calle et al, 2022). Pereira and Vence (2012) identify two groups of factors that are important in the analysis of green innovation: a) conventional factors - characteristics of winemakers, technological competences and business logic, and b) management capacity and trade approach in implementing environmentally friendly strategies. Confusing results compared to the conventional factors could create difficulties in implementing ecological wine-policy actions for green innovations.

According to Fiore et al. (2017) innovations in wine production are extremely important for SMEs in the sector due to the dynamics of global competition and the existence of legal regulations for wine quality (for example, EU Regulation 2019/34 and Regulation 2019/33 regarding applications for protection of designations of origin, geographical indications and traditional terms in the wine sector). According to the same authors, SMEs wineries in the Puglia region (Italy) perceive green innovation as a normal part of their technological-based innovations, and those who have more R&D contributions can enjoy more sustainable agricultural and wine-making practices. Spadoni et al. (2019) also prove that the winemaker's potential for innovation might boost the ability of the entire production system to combine technologies, product differentiation and regional traditions. Thus, the wine sector can also employ digital innovations and encourage the creation of startups.

2. Methodology

To assess the relative importance of innovations in the wine sector in Bulgaria, we use the analytical hierarchical process (AHP) methodology. AHP is a widely used tool for managing qualitative and quantitative multi-criteria elements, it is a technique developed by Saaty (1980) and later widely applied and enriched in the literature, see Taherdoost (2017) for a review.

The AHP starts with a composition of a decision hierarchy, in the form of a tree, a unidirectional graph, with several levels. The decision-making elements are brought in this hierarchical structure, whereby the original complex problem is decomposed into the hierarchy. In the standard methodology, the top level is called the "goal", divided into "criteria" (the second level), which are further divided in "alternatives" (the third level) etc., and as a result from the pairwise comparisons are obtained "crisp" values about the importance of the elements of the hierarchy.

In a second step wine experts make pairwise comparisons of the items at each level, in order to obtain an evaluation of the hierarchy. For this purpose, a questionnaire is made, and the opinion of the experts is collected by asking about the relative difference of the items measured by a scale. The experts are assessing the relative importance of the respective items from the point of view of the upward level. All pairwise comparisons are arranged in a square matrix, called a pairwise comparison matrix (PCM).

In the next step the consistency of the results is validated, by applying to the PCM measures such as "consistency index" (CI) and "consistency ratio" (CR), proposed by Saaty (1980) or some of the wide variety of alternative measures, which were proposed later in the literature, for a good review see Mazurek (2017). In order to obtain plausible results, the pairwise comparisons have to be reciprocal, the values below and above the diagonal of the matrix have to be reciprocal, and the results have to be consistent.

Finally, the relative importance of the respective items is calculated, and relative weights are obtained.

One of the problems of the crisp AHP versions is the difficulty wine experts encounter in comparing all the items in a level at once. As it often occurs, for the experts it can be very difficult, if not impossible, to match the pairwise comparisons to the whole group of items. To relax the possible evaluations, and to allow for more room for existing uncertainty in the decisions, fuzzy variants of the AHP have been proposed. In the fuzzy version of AHP, instead of giving a "crisp" value about the difference among the items in the pairwise comparison, experts describe the difference between the items in narrative values. Further these narrative values are replaced by triads of values, the "low" (l), "middle" (m) and "high" (h) values. Values given by different experts are averaged, to obtain the final l-m-h triads, and the fuzzy AHP comparison matrix consists of these triads, instead of single values. To finalize the AHP process, the fuzzy AHP matrix is converted back to a "crisp" AHP matrix and the respective weights of the items are calculated.

In our study we apply the fuzzy version of AHP, following the methodology in Calabrese et al. (2013), who use the fuzzy comparison scale within the span from "JUST EQUAL" (1,1,1), followed by "EQUALLY important" (2/3,1,3/2), "WEAKLY MORE" (1,3/2,2), "MODERATELY MORE" (3/2,2,5/2) and "STRONGLY MORE" (2,5/2,3) to "EXTREMELY MORE" (5/2,3,7/2), the opposite comparisons are calculated as reciprocal values. We use a sparse version of this assessment scale, with 3 levels to choose from, in both directions, however, we keep the original span of the values, thus we have a scale of (5/2,3,7/2), (3/2,2,5/2), (1,1,1), (2/5,1/2,2/3), (2/7,1/3,2/5).

Our hierarchy is presented in Table no. 1.

Table no. 1. Innovations in the wine industry - a decision hierarchy

CONVENTIONAL INNOVATIONS	ECO-INNOVATIONS	SOCIAL INNOVATIONS
v Product innovation: Significant improved products onto the market, QR code/website/newsletter, wine club, training course, green activities promotion, IT technologies	v Reduction of material use: Resource efficiency per unit of output, organic certification	v Recognizing wine innovations of indigenous people and local community
v Grape-growing techniques and technologies: Use of organic, chemical and innovative substances	v Replacing material: less greenhouse gas intensive alternatives, emission monitoring	v Recognizing locally developed wine innovations and experimentation
v Grape-transformation techniques and technologies: Selective cryoextraction, wine bio-informational research	v Recycling: Reduction of consumption through recycling water, waste, materials	v Piloting and testing local policy wine innovations

Source: The authors, based on Frigon, Doloreux and Shearmur., 2020.

In fact, we use three different hierarchies, for each type of innovation, where the top levels are "CONVENTIONAL", "ECO", and "SOCIAL" innovations, the second levels are represented in the columns, with the respective item underlined, and the third level is in the respective cell, the items after the underlined text.

The proposed innovations in Table 1 are the most common innovations among wine-producing countries such as Italy, Spain, France, Australia et al. It is noteworthy to add that the widest scope is conventional or rather marketing innovation compared to the scope of social innovation, for example. Eco-innovation includes good practices with circularity application for the purposes of the whole wine production cycle.

3. Results and discussion

An important aspect of the discussion of results is the fact that the experts working in the wine sector in Bulgaria are divided into two categories: managers or sales directors and technologists, technical specialists responsible for the production process and organoleptic characteristics of wines. The choice to study these two groups is justified by the expected different attitudes to perceive the innovations according to the specifics of the activities of each of the experts.

In our survey, the first group of people engaged with marketing, sales or management will be marked as ("m"), and the second group, which is made of technical specialists, engaged with production and technology will be marked as ("t"). We represent the respective weights next to the description of the item in Table no. 2, Table no. 3 and Table no. 4.

Besides the pairwise comparisons, in our survey we also asked about the degree of familiarity of the exports with the items studied. Although in general the experts are either fully familiar, or at least well informed about the innovations we study, some minor lacks of knowledge do exist, mainly among the specialists from the group which is not directly responsible for the respective innovation.

Table no. 2. Conventional innovations

Product innovation (m) - 0.30	**Grape-growing techniques and technologies (m) - 0.27**	**Grape-transformation techniques and technologies (m) - 0.44**	**Product innovation (t) - 0.30**	**Grape-growing techniques and technologies (t) - 0.36**	**Grape-transformation techniques and technologies (t) - 0.34**
Significant improved products onto the market (0.1)	Use of organic substances (0.18)	Selective cryoextraction (0.45)	Significant improved products onto the market (0.12)	Use of organic substances (0.19)	Selective cryoextraction (0.61)
QR code/ website/ newsletter (0.13)	Use of chemical substances (0.42)	wine bio-informational research (0.55)	QR code/ website/ newsletter (0.14)	Use of chemical substances (0.40)	wine bio-informational research (0.39)
wine club (0.18)	Use of innovative substances (0.39)		wine club (0.15)	Use of innovative substances (0.41)	
training course (0.19)			training course (0.17)		
green activities promotion (0.21)			green activities promotion (0.17)		
IT technologies (0.16)			IT technologies (0.26)		

Source: The authors.

For conventional innovations (see Table no. 2), both groups of experts seem to be relatively unanimous in their opinions about the importance of the different items. Weights for product innovation and grape-growing techniques and technologies coincide to a large extent, with exception of the opinions about IT technologies, which can be attributed to their different role in marketing/management on the one hand and

production on the other hand, the base areas of expertise of the experts. The orientation of managers towards green and IT initiatives may also outline some new directions in wine sales.

The differences in the assessments about the grape-transformation techniques and technologies seem to reflect the certain lack of information about some technical details of the production process under the managers, which was discovered explicitly in their answers. More specifically, the role of the cryo techniques is more difficult to be explained to the general public than the organic culture of the grapes. Since communication to the general public is mainly a marketing task, the differences in the views of the experts are a plausible outcome.

The obtained weights can be used as a basis for an index, for measuring the relative performance of wineries in the field of conventional innovations.

Table no. 3. Eco-innovations

Reduction of material use (m) - 0.38	**Replacing material (m) - 0.28**	**Recycling (m) - 0.34**	**Reduction of material use (t) - 0.30**	**Replacing material (t) - 0.36**	**Recycling (t) - 0.34**
Resource efficiency per unit of output (0.44)	Jless greenhouse gas intensive alternatives (0.42)	Reduction of consumption through recycling water, (0.32)	Resource efficiency per unit of output (0.37)	Jless greenhouse gas intensive alternatives (0.40)	Reduction of consumption through recycling water, (0.18)
Organic certification (0.56)	Emission monitoring (0.58)	Reduction of consumption through waste, (0.33)	Organic certification (0.63)	Emission monitoring (0.60)	Reduction of consumption through waste, (0.45)
		Reduction of consumption of materials (0.35)			Reduction of consumption of materials (0.37)

Source: The authors.

Eco-innovations are assessed in a similar way by both groups of wine experts, the structure of weights practically coincides. However, the knowledge of technological specialists has a leading role in determining the importance of eco-innovation in water recycling and waste generation. The small disparity in the assessments of recycling, with technical specialists attributing less weight to waste water than to alternatives is likely to be linked to the widespread standardization of these technologies, which can be seen as classical today, and to the shifting of the agenda towards waste and use of materials, where newer technologies appear, and there is a multitude of innovations.

Table no. 4. Social innovations

Recognizing wine innovations of indigenous people and local community (m) - 0.36	**Recognizing locally developed wine innovations and experimentation (m) - 0.32**	**Piloting and testing local policy wine innovations (m) - 0.32**	**Recognizing wine innovations of indigenous people and local community (t) - 0.29**	**Recognizing locally developed wine innovations and experimentation (t) - 0.28**	**Piloting and testing local policy wine innovations (m) - 0.43**

Source: The authors.

Social innovations are likely to be more strongly driven by local influence in the future, and for the moment they are used primarily as a base for some pilot projects, at least in Bulgaria. Through piloting and testing local policy wine innovation, small and middle-sized wineries can successfully experiment production, and monitor quality at the local level the general social effects of wine production on local communities. The divergence in the assessments of the two groups reveals a possible lack of information about the importance of social innovations and their influence on the market, therefore further studies in the area can be very useful for the sector.

Conclusions

The ongoing drive for competitive advantage and sustainability in the economy has influenced many sectors, including the wine industry. In our study, we explore the degree of awareness of the decision makers in the wine sector about several types of innovations - conventional innovations, eco-innovations, and social innovations. The results of the study show that priority is given to conventional and eco-innovations compared to social innovations in the wine sector. At the same time, the direct involvement of wine experts in different types of innovations is emerging. Conventional or marketing innovations are better developed by sales managers, and eco-innovation as a part of sustainable production is important for technologists, social innovations need further research and promotion. The obtained weights in the hierarchies can be used for assessment of the achievements of the sector as a whole, which is an area of possible further research. The analysis is vitally important for small and middle-sized wine producers in Bulgaria who want to join worldwide wine innovation performance.

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The Role of Education in the Prevalence of a Responsible and Sustainable Society in Romania

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Abstract

The present paper aims to analyse the challenge of quality education through the lens of sustainability, providing a perspective on the current situation and how educational content needs to be updated and re-conceptualised. The construction of the paper is based on a logical path, starts from a general analysis of the current situation in the Romanian educational system, then, continues with an analysis of the potential ways in which Romania can achieve sustainable indicators through qualitative education, using for this projection a questionnaire addressed to the direct beneficiaries of the educational process. There are multiple reforms adopted that have had little effectiveness and applicability in changing the education system in Romania, and the contents do not propose a direct change through the introduction of curricula aimed at sustainability. The paper identifies strategic paths that can be implemented to adapt and operationalize quality education through sustainability. The originality of the paper consists in the application of the questionnaire and the results obtained on the need for flexibility and digitalisation of the education system, together with the study on the introduction of sustainable education and the step-by-step analysis highlighting the differences in advantage between traditional and modern ways of teaching. Possible practical implications refer to introducing and modifying the educational structure by initiating a broad process of realistic analysis based on this work.

Keywords

sustainability, education, responsibility, citizenship, youth, digitalisation, innovation

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Introduction

Romania currently has a traditional education system based on general sciences and concepts (Tiberiu et al, 2015) that have not been updated to address the changing learning needs of the younger generation.

Quality education is intended to be delivered in an innovative format that incorporates the sustainability mechanisms of the future (Ana Maria Suduc et al, 2014). Starting from the general framework and then conducting a portrait analysis for the future of education, we aim in this paper to reveal the critical importance of education as the foundation of a sustainable future (Mariana Iatagan, 2015) and to present in a structured way what concrete methods can ensure the successful implementation of a sustainable and resilient education that will form sustainable citizens of the society of the future.

Digitisation, improved communication systems, training of teaching staff to deliver this kind of innovative education is just a first step and a practical start to the process of building a sustainable society.

The analysis we will carry out captures the current framework, then shifts the focus to a projection for the future of sustainable education.

1. How Romania achieves the goal of "quality education"

Starting from goal number 4 formulated in the SDG and assumed by Romania, "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"(United Nations, 2015), the first stop we must make is the way the education system is organized, thus we observe in this first sector a perpetual trend of instability, the Romanian system being constantly reformed in recent years, the last existing valid reforms being marked in the years "2018, 2019 and 2020" (European Commission, 2022), and from 2021 the presidential project "Educated Romania". All these reform projects have done nothing but induce uncertainty among the population and uncertainty in school, high school and higher education environments.

These continuous reforms have also had concrete results, measurable through the 7 axes, and according to the attached table we can see that for the year 2020, Romania has managed to approach the European average, the best scores reported in the reference year 2015, being recorded in Early leavers from education and training (0.82%) and Underachievement in reading, maths, or science (0.99%). These results, however, do not represent the real purpose that education is supposed to serve, which is to move away from traditional learning paths and adapt subjects and curricula so that they can address the real problems of the future and develop mindsets and skills that can cope with a changing society.

Indicators		2015	2016	2017	2020	2030	2017/2015	2020/2015	2030/2015	Int.
Early leavers from education and training (*% of population aged 18 to 24*)	EU	11.0	10.8	10.6	9.01	4.04	0.96	0.82	0.37	NO
	RO	19.1	18.5	18.1	19.48	21.14	0.95	1.02	1.11	
Tertiary educational attainment (*% of population aged 30 to 34*)	EU	38.8	39.3	40.0	43.58	53.65	1.03	1.12	1.38	NO
	RO	25.6	25.6	26.3	27.86	33.27	1.03	1.09	1.30	
Participation in early childhood education (*% of the age group between 4-years-old and the starting age of compulsory education*)	EU	94.9	95.3	96.0	97.65	103.54	1.01	1.03	1.09	NO
	RO	87.6	88.2	87.3	87.59	88.29	1.00	1.00	1.01	
Underachievement in reading, maths, or science (source: OECD) (*% of 15-year-old students*)	EU	22.2	22.1 (*)	22.1 (*)	22.07	21.92	1.00	0.99	0.99	NO
	RO	39.9	37.2 (*)	36.2 (*)	33.14	22.47	0.91	0.83	0.56	
Employment rates of recent graduates (*% of population aged 20 to 34 with at least upper-secondary education*)	EU	77.1	78.4	80.3	76.82	74.42	1.04	1.00	0.97	NO
	RO	68.1	69.3	76.0	64.94	53.86	1.12	0.95	0.79	
Adult participation in learning (*% of population aged 25 to 64*)	EU	10.8	10.8	11.0	11.58	13.46	1.02	1.07	1.25	NO
	RO	1.3	1.2	1.1	1.09	0.61	0.85	0.84	0.47	
Young people neither in employment nor in education and training (*% of population aged 15 to 29*)	EU	14.8	14.2	13.4	14.82	15.46	0.91	1.00	1.04	NO
	RO	20.9	20.2	17.8	22.38	27.93	0.85	1.07	1.34	

Figure no. 1. SDG 4—Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all in Romania
Source: Daniela Firoiu et al., 2019, p.10

Thus, traditional ways of education and teacher centered methodologies have proved to be inefficient when applied massively (Biggs, 1999). Current reforms have focused on "quality of education, social programmes and curriculum policies" and the "Educated Romania" project is the first reform to bring resilience, STEAM education, inclusive education, digital literacy and numeracy and green schools to the fore (Guvernul României, 2021). Starting from the pre-existing reforms and continuing with Romania Educated, we see a trend showing that "The frameworks of Estonia, Romania, Sweden, Switzerland and Ukraine contain explicit elements of sustainability, but there is only low and implicit support for transformative learning for SD" (Janssens et al., 2022).

We are talking about qualitative education for sustainable development. This type of education is the functional core of the future for creating sustainable citizens and communities, and according to the learning objectives outlined by the United Nations Educational, Scientific and Cultural Organisation, the key competences to be developed through learning are: systematic thinking competence, anticipatory competence, normative competence, strategic competence, collaborative competence, critical thinking competence, self-awareness competence and integrated problem-solving competence. In its current reformed form, the Romanian education system does not address these essential dimensions for the future and does not present concrete ways in which these competences can be delivered to the beneficiaries of the educational act.

Even in the national recovery and resilience strategy, education to benefit from "six reforms implemented through 18 investment directorates with an allocated budget of €3,605 million" will adjust functional issues such as "early childhood education, reduction of school drop-out, dual education, digitisation of education, ensuring environmentally friendly safety and quality standards and professionalisation of school management in conditions of increased autonomy" (Ministerul Investițiilor și Proiectelor Europene, 2021).

Regarding higher education, "Higher education is now facing new challenges. The new generation of systems and programs duration has been shortened" (Felgueiras, Rocha and Caetano, 2017). Universities in Romania are constantly adapting their educational content so that it is in line with the European level, but the pace of updating is still slow due to the numerous bureaucratic systems involved, which is also confirmed by the fact that students consider that "there are still many institutional barriers" (Maiorescu et al., 2020) that do not allow the effective implementation of education for sustainability in universities.

2. Exploring potential ways for Romania to achieve its sustainability indicators through education

The Covid-19 pandemic has affected the whole world. Education was one of the fundamental areas that had to adapt to this pandemic resulting in a major forced unexpected change in a very short period of time. Thus, the more than 1.2 billion students, the direct beneficiaries of education, registered worldwide on 15 May 2020 (Roman and Plopeanu , 2021), were faced with many challenges. Thus, for two years now, the direct beneficiaries of education have been faced with a lack of predictability in terms of how teaching activities are carried out.

Beyond the consequences of the global Covid-19 pandemic in various sectors of activity, it must be recognised that digitisation has been a real gain. The era of digitisation in which we find ourselves has evolved further and we humans have had to keep pace with these dramatic developments.

Before the Covid-19 pandemic, in Romania, the internet connection rate of computers available in educational establishments at all levels in the 2018-2019 school year was 89.9%. According to an August 2020 World Vision Romania 25 (World Vision Study, 2020) study, low internet speed has created major connectivity problems, especially for rural schools. As a result, more than 40% of students in Romania did not participate in online learning activities. This is a significant and alarming proportion for Romania as it affects the school drop-out rate which in 2020 reached 15.6%. In rural areas alone, the drop-out rate among pupils was over 26%. These issues are targets of the Sustainable Development Goal (SDG) 4 - Quality Education. Urban-rural differences are foreseen in several SDGs aiming to reduce inequalities of opportunity.

From 25 March 2022, the Ministry of Education has decided to physically return students to educational institutions in Romania. Although educational activity is resumed in the physical form, it will not be the same. According to the Romanian Education Digitisation Strategy "95% of the respondents to the research believe that this COVID-19 crisis marks a point at which there can be no return to the previous situation in terms of how technology is used in education and training, and more than 60% of respondents believe that they have improved their digital skills during the crisis" (Ministerul Educației și Cercetării, 2020).

The Romanian Students' Union is one of the largest student federations in Romania whose statutory aim is to represent, promote and defend students' rights in relation to relevant actors at national level. In the spring of 2021 the federation conducted a survey to measure satisfaction with student life, in which more than 1500 student respondents from Romania participated. One section of the questionnaire referred to the equipment of lecture/seminar rooms, computer labs, language labs and medical labs. Respondents presented their views giving marks for each. Thus, the majority of the respondents did not give a satisfaction grade with those questioned. Most respondents were of the opinion that the lecture/seminar rooms, computer labs and language labs are not very well equipped and the medical labs are the most poorly equipped. Thus, we propose that not only ICT rooms and computer labs should be equipped, but all rooms in educational institutions should be equipped with a PC connected to the internet, video projector, audio and video system, other interactive education systems.

Leal Filho, writes that higher education institutions, in the long term, can play an important role in the sustainable development of the world (Guvernul României , n.d.) 9 years later (2020), the Sustainable Development Solutions Network (SDSN, 2020) brings up the role of universities in meeting the SDGs, arguing that "no goal will be fully achieved without university contributions in education, research, innovation and leadership" (Uniunea Studenților din România, n.d.).

Universities can become the main support for the implementation of the SDGs set by the National Strategy for Sustainable Development 2030 and can function as institutional models or living laboratories for students (Filho, 2011). Findler state that "universities can directly and indirectly influence sustainability in areas such as the economy, the natural environment, societal challenges, culture, policy making and demographics" (Findler et al., 2019). The number of universities reporting that they have an interest in sustainability and are taking action on it is increasing, but major changes are not the result of universities (Sterling , 2021).

The most important barriers encountered in trying to bring sustainability to universities, identified by Blanco-Portela, are those related to stakeholder beliefs, the internal structure of the institution, the institutional framework, external factors influencing the institution and resources (Blanco-Portela et al., 2017).

The benefits resulting from the integration of sustainability in universities are the pillars of a future that will be based on an aware, educated, engaged society, free from discrimination and inequality. The private sector will have conscious, moral entrepreneurs with values oriented towards the whole community and responding to needs in an environmentally friendly way. Last but not least, a real and tangible benefit that we can already see is the research in this area carried out by academics. The growing number of scholarly articles that report on the current situation and the target we can achieve together are really important in raising awareness of the importance of this topic.

Participants in the study by Alm agreed that sustainability should be looked at globally, and that both government and organisations are responsible for sustainability. A third of the participants believe that every individual affects sustainability and this should be the responsibility of every individual (Alm et al., 2022).

In 2012, more than 22 universities, agencies, student organisations and associations from different corners of the world met to lay the groundwork for the Peoples' Sustainability Treaty on Higher Education for Sustainable Development. This treaty was written at a time when concern for the future of the planet and its people became a major concern. The treaty also includes a vision of the 'green university' based on previous strategies and the perspective of the problems they have faced over time. Thus, in the TSP's understanding of the "green university" must consider: a sustainability-oriented university culture, the university campus to be environmentally friendly, changes to the curriculum area (subjects that help educate and raise students' awareness of the role of sustainability and its long-term global importance), the commitment of the academic community to be part of the process, connecting this complex system and achieving what is proposed (Dlouhá and Dlouhý, 2014).

Thus, starting from the 5 defining directions and corroborating SDG4 - Quality Education with other SDGs assumed by Romania's Agenda 2030, we conducted a research among young people in Romania on the current and future curriculum area oriented towards sustainable development.

In order to identify the perception of young people on this issue, between 11 and 13 April 2022, we conducted a quantitative research by applying a questionnaire consisting of 8 questions. The sample consisted of 82 respondents, the majority (92.7) aged between 18 - 25 years, female, with education as their main activity (students).

Interpreting the results, it is gratifying to note that a large majority of the respondents participating in the research (90.1%) state that they are familiar with the concept of "sustainability". This once again reiterates the importance and attention we need to pay to sustainability and the need for civic engagement in the shift towards a sustainable planet.

In the last 10 years, the field of sustainable development in Romania has enjoyed an increase in our acceptance, but the degree of implementation of some solutions is lower than we would have liked. This can also be confirmed by the fact that some higher education institutions do not have at least one subject that includes aspects of sustainability at the level of each programme. 52.4% of the respondents stated that they have not studied any subject so far, and most of the respondents do not know if they had such a subject in their programme. Fewer respondents (7.3%) stated that they had studied such a subject and were asked for examples. Thus, we received the following examples: Ecomarketing, Sustainability projects in public administration, Strengthening democracy through the development of a resilient and sustainable rule of law, Sustainable economic development.

The last aspect researched among young people was the future curriculum area. Thus, we proposed to young people a list of 7 subjects to rate according to their relevance for a sustainable future. The subjects we thought of are the result of the corroboration of SDG4 - Quality Education with the other SDGs of the National Strategy for Sustainable Development 2030 (European Commission , n.d.), namely:

- Learning with Artificial Intelligence
- Learning through digitisation and virtual reality
- Learning practices to protect and conserve the environment and ecosystems
- Learning about health management and responsible consumption and production

- Equal opportunities and anti-discrimination
- Principles of sustainable cities and communities
- Legal education

In the opinion of the young participants in the research, the most relevant issue is equal opportunities and anti-discrimination (Fig. 2). Unfortunately, in the 21st century we still have a problem in this respect, and a claim in this respect is really necessary. Romania completed the transposition of EU directives on discrimination in 2006, which is 16 years ago, enough time to remedy certain issues. According to the study "Discrimination in the EU in 2015", the majority of the population believes that discrimination is present in our daily lives, and the trend is increasing over time. This increase, which does not please us, may be due to differences in perception, lack of tolerance, the existence of stereotypes. We certainly have to learn this lesson in order to have a tolerant society where everyone has a place under the sun.

In second place in the ranking are learning health management and responsible consumption and production, principles of sustainable cities and communities and legal education. All these have in common the social responsibility and civic sense that we need more and more, and in this period, in the context of the war in Ukraine, Romania has mobilised and shown great solidarity with our neighbours. These aspects cannot be neglected, and an early introduction to pupils and students will certainly contribute to a better society.

At the bottom of the ranking is learning with artificial intelligence. We can still see a reluctance towards new and change. This more abstract and difficult to understand field would deserve a promotion to really understand the benefits as the era of digitalisation is unforgiving and we will have to adapt.

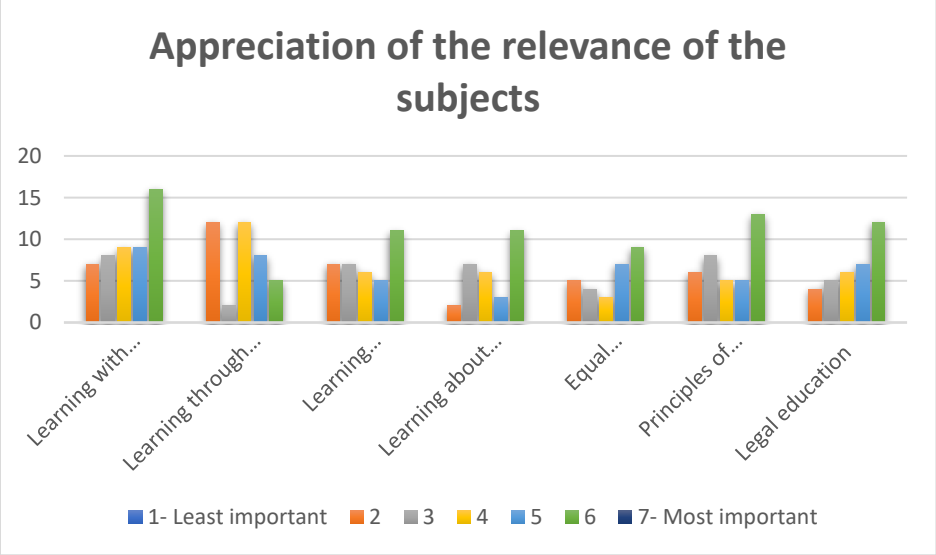


Figure no. 2. Appreciation of the relevance of the subjects
Source: Made by the authors

Conclusions

In conclusion, we can state that, although education in Romania is undergoing continuous transformation and the Covid-19 pandemic has made its mark, sustainability does not seem to be a priority for all higher education institutions. The Educated Romania project proposes adjustments in education for the 3 targets, but in higher education we do not find a sustainability-oriented vision.

Higher education institutions are one of the most important links in the formation of a sustainable community and the achievement of sustainable development goals. Through their academic autonomy, universities are vital and become responsible for the future of all. Although there are barriers, related to resources and perception, in the process of introducing sustainability in universities, we are confident that these can be tackled through examples of good practice from other universities around the world.

Universities can make a small start in embracing this area, which we will later enjoy, by introducing subjects that introduce aspects of sustainability into every curriculum. From our research among students, we have

identified the most important subjects as: equal opportunities and anti-discrimination, health management and responsible consumption and production, principles of sustainable cities and communities, and legal education.

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Supply Chain Digital Transformation

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Abstract

In the context of the 4.0 revolution and the 2-years of pandemic, many companies are reassessing their supply chains, in order to ensure their survival and increase their agility and flexibility. For this purpose, the digital supply chain is a key concept, to which managers are giving more and more importance. A digital supply chain can add more resilience to the logistic activities, as it offers more instruments for visibility, control and forecasting. The purpose of this paper is to identify the new technologies applied in the management of the supply chain, highlight their importance and research about the extent to which Romanian companies have planned/implemented a SC digital transformation. Our study is based on both theoretical and empirical research that investigates the degree of digitization of SC (supply chain) in the case of Romanian companies. A survey was sent to employees and managers working in companies operating on the Romanian market and we had 31 valid responses. While the sample is not considered representative for the Romanian economy, we can draw some conclusions about the degree of use of new technologies in supply chain management activities. The results show that most companies from Romania that were included in the study are in early stages of SC digitization. This research is addressed to both academics and practitioners in the field of SCM (supply chain management), as it can be useful for a better understanding of how the implementation of new technologies in SC activities can lead to an increase of business performance, as many previous studies suggest.

Keywords

Digital supply chain, digital transformation, blockchain technology, logistics 4.0, Romanian market

DOI: 10.24818/BASIQ/2022/08/079

Introduction

In a turbulent global business environment, characterized by economic, financial, environmental and social risks, the digitization of the supply chain is a tool designed to contribute to an efficient risk management at the level of the SC (Ivanov and Dolgui, 2019).

The effects of the pandemic have revealed several vulnerabilities in many supply chains across the globe and put pressure on companies to find solutions to increase the resilience of their logistic networks while trying to boost their competitiveness (Harvard Business Review, 2021).

New technologies enable the configuration of innovative logistics solutions, with a direct impact on costs, transparency and the resilience of the global logistics chain. Improving the management of information flow at the supply chain level is a condition of success (Christopher, 2016). The process of digitization causes changes in the business model and many companies invest in the digital transformation of the supply chain.

It is important for the actors involved in supply chain management (suppliers, exporters, importers and other auxiliary services providers in international trade, etc.) to be aware of the advantages that come with

the implementation of new technologies in current operations like international contracting, logistics and international payments (Belu et al., 2021).

One of the objectives of our research is to highlight the benefits of implementing modern technologies in supply chain management.

1. Review of the scientific literature

Digital supply chain, also known as Supply Chain 4.0., appeared thanks to Industry 4.0 designed for intelligent production units (factories), that was developed and implemented based on big data technologies and the Internet of Things (Paksoy, Koçhan and Samar, 2021). RFID, sensors, GPS, electronic data interchange (EDI) and information detection equipment are technologies that allow easy tracking of supply chain activities. For the supply chain management, important requirements are such as: the right quality at the right time and the right goods in the right quantity and the right quality and the right price. The new phrase that will underlie the reconfiguration of the supply chain will be „just in case".

Switching from Traditional Supply Chain to Digital Supply Chain (DSC)

The importance of digitization is emphasized in many papers published in the scientific literature and industry reports, highlighting the advantages of new technologies underlying the digitization process: blockchain, Big Data, Internet of Things, artificial intelligence, augmented reality, autonomous vehicles, 3D printing, cloud computing, and so on.

The phrase „logistics 4.0" involves the use of new technologies in the management of the supply chain in order to improve its performance. This new term refers to the close link between logistics and digitization, resulting in the transformation of processes specific to the supply chain. Logistics 4.0 ensures the creation of a fully interconnected supply chain, which provides transparency and visibility to the participants involved in the logistics activities.

The traditional supply chain is a complex system in which raw materials - factors of production - are manufactured into finished products and then distributed to end users (individual consumers or companies). It includes suppliers, processing centers, warehouses, distribution centers and retail outlets (Popa and Belu, 2018).

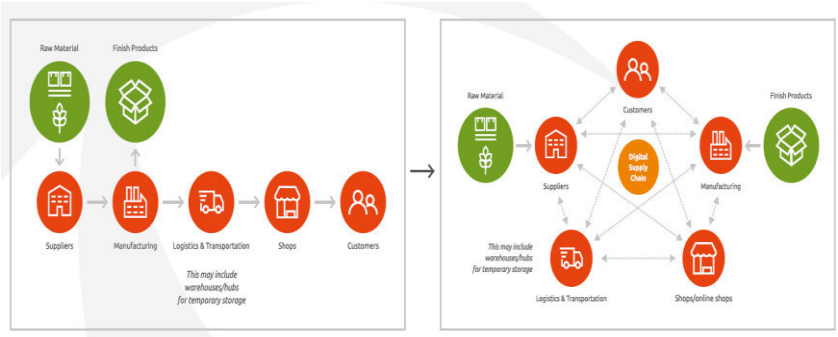


Figure no. 1. Traditional supply chain vs digital supply chain
Source: De Souza et al., 2021, p.4

There are several definitions for the notion of "digital supply chain (DSC)" and we will present the most relevant. Büyüközkan and Göçer (2018) define digital supply chain as "an intelligent best-fit technological system that is based on the capability of massive data disposal and excellent cooperation and communication for digital hardware, software, and networks to support and synchronize interaction between organizations by making services more valuable, accessible and affordable with consistent, agile and effective outcomes". Kinnet (2015) defines DSC as a smart, value-based network that uses new technologies to create new business models.

Bhargava, Ranchal and Ben Othmane (2013) state that DSC is based on systems (e.g. software, hardware, communication networks) that support interactions between globally distributed organizations and orchestrates the activities of the partners in supply chains. These activities include buying, making, storing, moving and selling a product.

Digital supply chain has a number of features such as: speed, flexibility, global connectivity, real-time management, transparency, scalability, innovative, proactive, environmentally friendly. Speed: refers to the speed with which goods are delivered, which is important for all DSC participants.

Implementation of new technologies in the supply chain

The implementation of technologies like Internet of Things, Artificial Intelligence or blockchain has made it possible to set up intelligent logistics operations that have reduced inventory costs, with investments being redirected to faster and more reliable deliveries.

1. Blockchain Technology in Supply Chain Management

Distributed ledger technology, which is the basis of blockchain, is a database maintained and updated independently by each participant (or node) in a network, and the records are built independently and maintained by each node. The entire chain of records is supervised by mathematical algorithms, ensuring data integrity and security (Berneis, Bartsch and Winkler, 2021). This ensures a complete record of all operations included in the database.

The application of blockchain technology in logistics activities has a number of advantages (Hackius and Petersen, 2017): transparency- the transport of products is easily tracked and all processes are visible; (b) efficient management of commercial, delivery, transport and customs documents; (c) optimizing supply chain activities; security of information, which is unalterable and immutable.

Smart contracts, based on blockchain technology, allow the negotiation and conclusion of contracts without the involvement of intermediaries. These contracts are self-executing when certain conditions are met. Smart contracts are identified as a source of benefits for SCM (Berneis, Bartsch and Winkler, 2021)

2. IA in Supply Chain Management

Artificial intelligence is the ability of a machine to imitate human functions, such as "reasoning, learning, planning and creativity". A supply chain generates a large amount of data, which can be analyzed, patterns can be identified and information can be generated about each SC link. Thus, companies can achieve cost reductions, but also a reduction of delivery time (Fosso Wamba et al., 2020).

AI-based innovations can contribute to real-time coordination and collaboration of activities, leading to better transparency at SC level (Bock, Wolter and Ferrell, 2020).

Machine learning can help companies discover dysfunctional supply chain patterns using algorithms meant to identify the factors that influence the success or failure in a SC. These patterns can refer to inventory management, supplier quality, demand forecasting, production planning, transportation management. IA contributes to SC resilience.

3. IoT in Supply Chain Management

The Internet of Things (IoT) enables the interconnection via internet of smart devices that share specific information and data with each other and with other remote digital platforms to support real-time decision-making processes by users or smart devices using machine communication. IoT sensors will be able to provide important information to customers, reducing the risks of non-compliant deliveries (Belu, 2019).

IoT could lead to significant changes that enable the transformation of the supply chain into a demand chain. Thanks to technology, the request can be tracked with product-based sensors, which help to detect how the product is used and the environmental demand. In practice, this means expanding the IoT ecosystem beyond traditional logistics visions to include end-user interactions, enabling companies to better align purchase orders with actual demand curves (Bonderud, 2021).

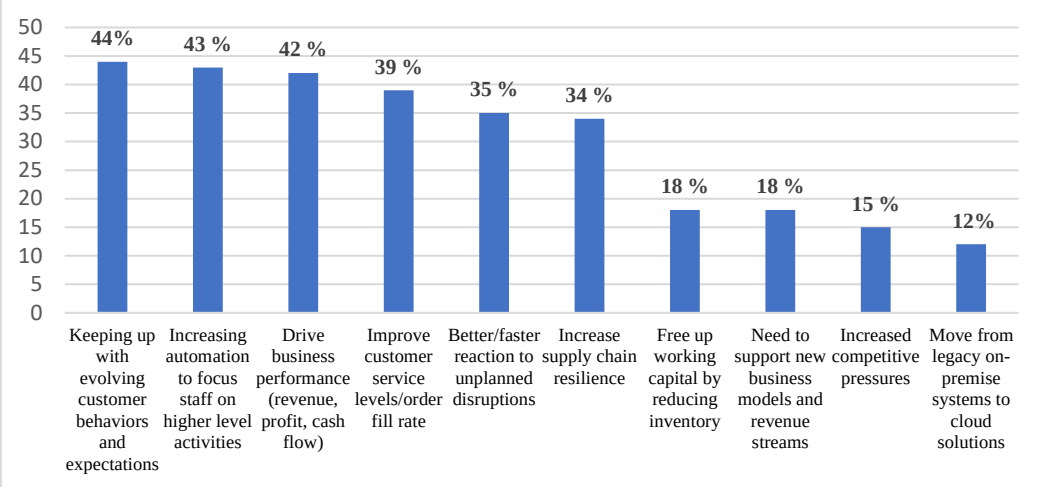
Current challenges in the process of supply chain digital transformation

1. Main trends at international level

Several studies have researched the trends in digital transformation of the supply chain at international level. The Council of Supply Chain Management Professionals together with the company ToolsGroup (global leader in dedicated supply chain software) conducted a study in 2021, with 200 respondents - professionals from different countries, involved in production, retail, logistics or consulting firms (CSCMP, 2021).

Trying to find out if companies have a strategy for SC digital transformation and if it has already been implemented, researchers synthetized the answers and found that only 12% are already enjoying the benefits of this process, while 39% are in execution phases, 39% are still exploring and 10% don't have any plans in this regard.

According to this study, the key factors that drive a digitization of the supply chain are: the desire of companies to evolve in line with customer expectations, the need for more efficiency of personnel activities and focus on higher level tasks by automation of recurrent work and overall improvement of business performance (over 40% of respondents have chosen these three objectives). Other important drivers of change are referring to the improvement of customer services, better reactions in case of SC disruptions and more resilience of SC (over 30% of respondents) – more information is detailed in Figure no. 2.



Figures add to more than 100% due to multiple responses

Figure no. 2. Key factors that drive a digitization of the supply chain
Source: Toolsgroup and CSMP, 2021

One of the issues discussed in this study was the influence of Covid-19 pandemic on the process of digital transformation of SC and 42% of respondents were of the opinion that the pandemic accelerated the process of digitization of SC, 17% of respondents felt that the pandemic shifted their organization's digitization priorities, 15% of respondents stated that the pandemic delayed the process of digitization of SC, 26% of respondents were of the opinion that the pandemic did not affect the digitization strategy of SC (Figure 3).

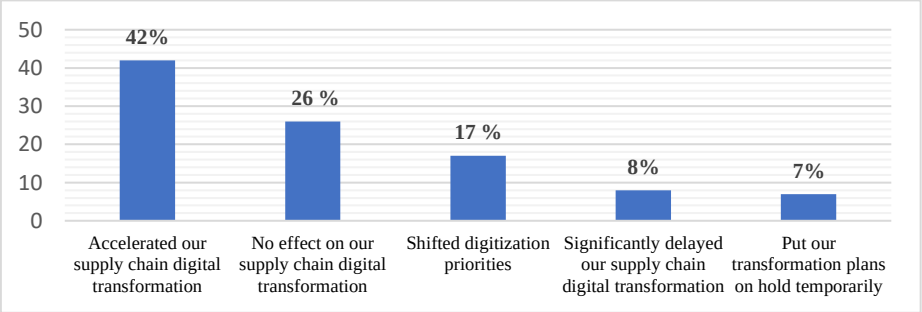


Figure no. 3. Influence of Covid-19 pandemic on the process of digital transformation of SC
Source: Toolsgroup and CSMP, 2021

The main obstacles in implementing SC digital transformation strategies were identified in this study. Among these, the most important are related to human resources: lack of specific skills (41% of respondents) and fear of change (28%). Other obstacles are related to the quality of data (34%), rigidity of existing technology (28%) and uncertainty of economic environment related to the pandemic (28%). A similar study conducted in 2019 identified fear of change, data quality/lack of data and risk aversion as top three obstacles that respondents consider important setbacks to their company's SC digital transformation. Of course, depending of the advancement of the digital transformation strategy implementation in a company, the obstacles vary in different stages.

2. Supply chain trends on the Romanian market

A study on „Trends and strategies in logistics and supply chain management - opportunities for digital transformation" was conducted in 2021 by ARILOG and MEDNET Marketing Research Center (Arilog, 2021).

The survey targeted 354 people, general managers and departmental directors of companies with the following fields of activity: logistics and transport service providers, manufacturers (FMCG, automotive, fashion, packaging), construction, pharma, retail. 118 responses were validated.

The responses showed a low degree of digitization and a slow reaction to market changes, but Romanian companies have taken important steps towards this purpose in the past year. The main goals set up by Romanian companies for the next period are: innovation, automation and process optimization.

The main challenges identified by companies for the next 3 years are: digitization of processes, increasing demand for faster delivery, cost optimization and process transformation.

The most important obstacles standing in the way of digitization process appear to be the resistance to change, a characteristic of developing economies with rather low levels of education (Figure 4).

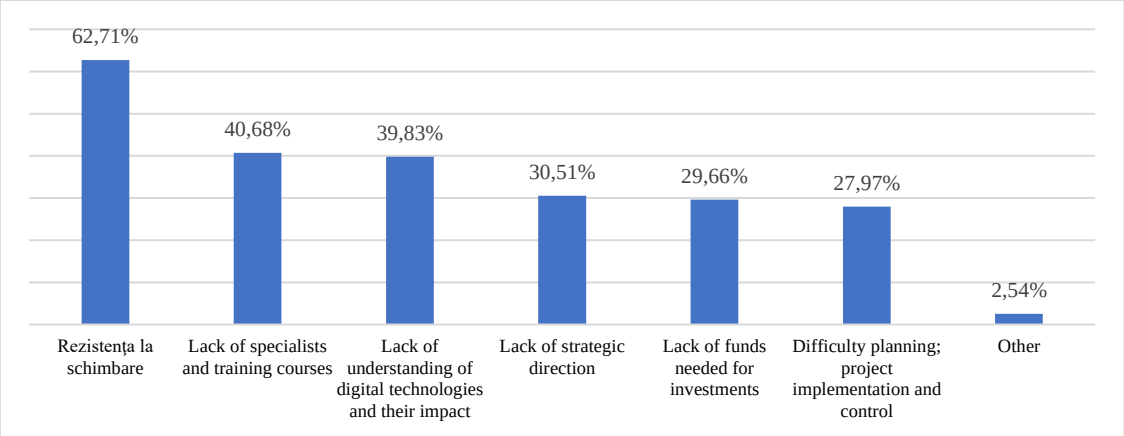


Figure no. 4. Barriers to the digitization process
Source: Toolsgroup and CSMP, 2021

For the next three years, the main directions for technologic development of companies include implementing reporting and analysis systems (almost 40% of respondents) and automating warehouse processes, such as RFIP, RPA, Pick by Voice (around 10-20% of respondents). Complex automation is on a more far away horizon, as the local market is considered not mature enough. Other directions for future development that are targeted by Romanian companies are visible in Figure 5.

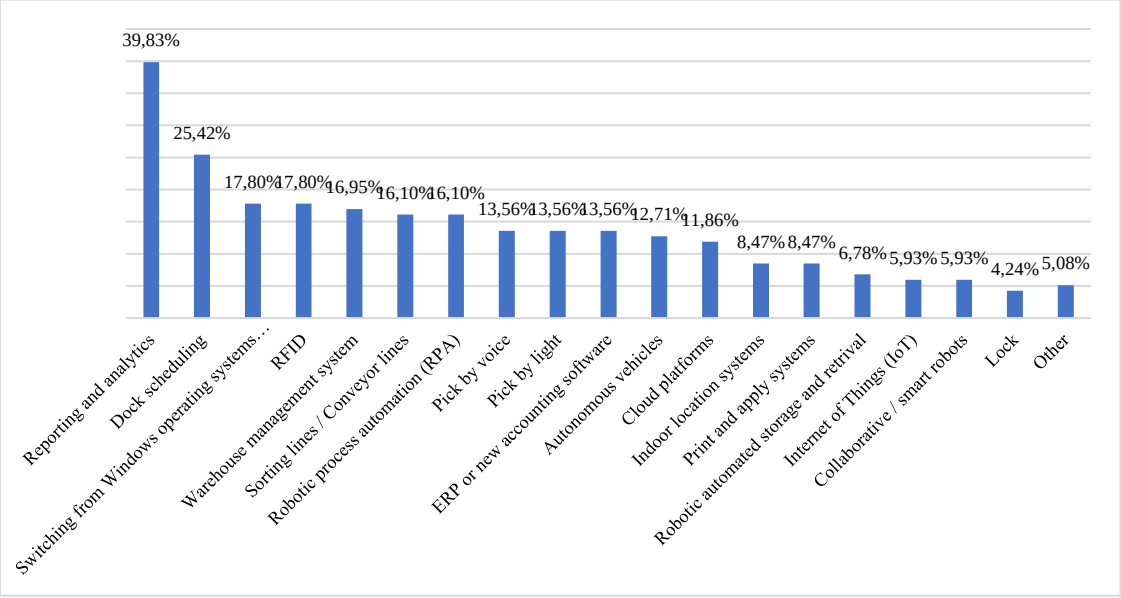


Figure no. 5. Technologies to be implemented in the next 3 years
Source: Toolsgroup and CSMP, 2021

A view into the future of Romanian logistics market is described by the answers of survey participants. By 2025, over 70% consider that automation is the main trend that will dominate the logistics market and over 60% bet on the multi-functional development of warehouse facilities.

According to respondents, digital transformation comes with new opportunities within the company and the main focus should be on the digitization of business processes and increasing transparency in the supply chain.

2. Research methodology

The first part of our research was focused on reviewing the main contributions in the field of digital transformation of the supply chain and identifying the most relevant empirical studies, at local and international level. The most important results of these studies are synthetized and presented in the literature review section of our paper.

For the empirical part of our research we used a questionnaire, consisting of two parts: the first one includes 5 questions regarding the main characteristics of the company and the second one has 7 questions focused on the main aspects regarding the status of planning and/or implementation of a digital strategy for the supply chain.

The survey targeted 50 respondents and 31 answers were validated. We analyzed the results using statistical methods. The conclusions were formulated by comparing our results to findings of similar studies, conducted on Romania or at international level. We included graphical representation of our results, and we mention that figures add to more than 100% due to multiple responses for each variant.

The sample is not considered representative for the Romanian market. The main characteristics of companies included in our sample are:

- Their main activity is in sectors like: international logistics, constructions, oil & gas, agriculture, tires production, real estate industrial logistics, banking, air conditioning sales and installation, pharmaceuticals delivery, energy, freight forwarding, supply chain, IT Fintech, audit and taxes.
- 60% of the companies are based in Romania, 20% have their headquarters in EU countries and 20% in non-EU countries
- 76,7% have only local operations and 23,3% have also international activities
- According to the number of employees over 50% are big companies (over 250 employees), 30% are medium-size enterprises (between 50-249 employees), 20% are small enterprises (between 10-49 employees) and 10% are micro-enterprises (under 9 employees)
- Approx. 32% of companies have an annual revenue in Romania of over 50 mil euro, approx. 35% between 10-50 mil euro, approx. 18% between 2-10 mil euro and over 14% have less than 2 mil euro.

3. Results and discussion

The first three questions of the second part of our questionnaire were aimed at contouring the perspective of our respondents on the digital transformation of the supply chain: main perceived benefits, key factors that drive an organization to pursue this strategy and the main obstacles identified so far.

Our results show that the main three perceived benefits of implementing a strategy for digital transformation of the supply chain are: increase automation of tasks (77,4%), increase business performance (64,5%) and reduce work with printed documents (61,3%). More benefits selected by respondents can be seen in Figure 6.



Figure no. 6. Benefits of implementing a strategy for SC digital transformation
Source: own processing according to the results of our survey

Identifying the key factors driving managers to pursue a digital transformation of the supply chain is fundamental if we want to understand future trends in this area. The answers given by our respondents are

synthetized in Figure 7. The main motivation expressed by 80% of respondents is to increase the overall business performance, followed by the desire to develop a more agile response in case of crisis (over 50%).

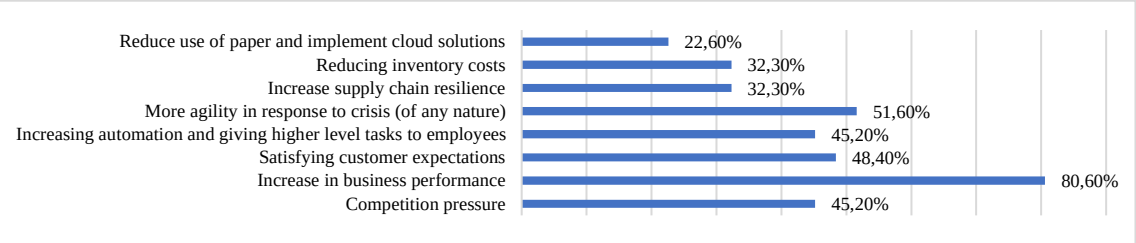


Figure no. 7. Key factors driving SC digital transformation
Source: own processing according to the results of our survey

The main obstacles that stand in the way of implementing the digital transformation are: the difficulty to implement changes in the current technologies, the uncertainty of economic and political environment and the lack of specific skills of employees. More obstacles are presented in Figure 8. The fact that Romania is included in the category of modest innovators (along with Bulgaria), while 13 EU-countries are considered moderate innovators, 7 EU-countries are strong innovators and 5 EU-countries are innovation leaders (according to European Innovation Scoreboard 2020 cited in Sarbu et al. (2020), shows that the Romanian technological environment is less developed in our country.

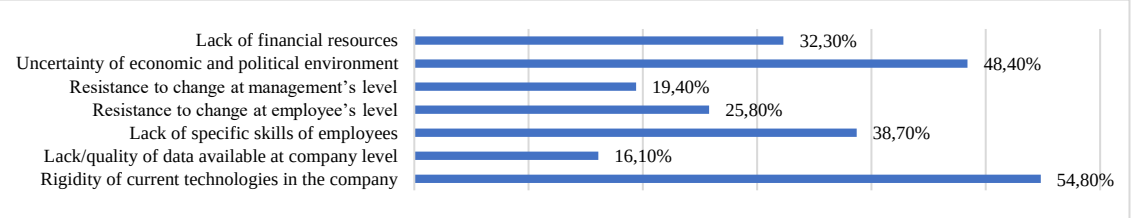


Figure no. 8. Main obstacles for SC digital transformation
Source: own processing according to the results of our survey

We also discussed the impact of the COVID-19 pandemic on companies from the Romanian market and our results show that the vulnerabilities of the supply chain were exposed, there was a greater supplier instability and these conditions actually created more incentive for accelerating the digitization process.

According to our respondents, 29% of companies are already enjoying the benefits of a digital supply chain, while over 35% are at an initial phase or have not yet taken any steps in this direction. Most companies are in middle stages: approximately 16% are planning a strategy and over 19% are already in implementation phase.

As for the future plans of Romanian companies, we identified several areas of interest in which new technologies will be implemented in the next three years: reporting and analytics (54,8%), robotic process automation, artificial intelligence and machine learning, cloud platform (35,5%). Other areas of interest with over 20% of respondent's options are: demand forecasting, planning of production and sales, warehouse management systems, ERP software, internet of things, smart robots.

Conclusions

Digitization will revolutionize the logistics industry. However, digital transformation requires new digital business models for companies that want to remain profitable and maintain their current position in the market. Large investments are required for digital transformation of the supply chain, but in the long run they will bring a reduction in costs and greater customer satisfaction. Digital transformation comes with new opportunities within the company and the main focus should be on the digitization of business processes and increasing transparency in the supply chain.

The pandemic context, but also the 4.0 revolution determined more and more companies to reconfigure supply chains based on new technologies. In fact, according to logistics specialists, the supply chain of the future is smarter, less volatile and easier to navigate.

Romanian companies face a number of barriers in the digitalization process, such as: resistance to change, considered to be the biggest barrier and low levels of digital education. Still, more and more companies are considering the digital transformation of the supply chain as a necessary process in order to optimize costs

and human resources use, keep up with competition and with customer demands. Most of them are at initial stages of preparation, but almost a third of our respondents consider the benefits of implementing a digital transformation strategy are already visible in their activity.

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How "Circular" Is the Supply Chain? Study Case: Impact of the Corporate Social Responsibility on the Circular Economy Within the Power Energy Supply Chain

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Abstract

Sustainability has become a priority in global economic and business environment in the past two pandemic years. This challenge has showcased a lesson for social responsibility and sustainability of the supply chain, however had to reflect into circular economy as well. Achieving sustainability requires moving from a traditional linear Take-Make-Waste economy to a circular economy. It requires a fundamental shift behavior based on waste reduction. One of the major challenges for the energy sector are the increased prices and the power demand. Nonetheless the need to reduce the carbon emissions are struggling all the industries including the supply chain of power energy sector. The aim of this paper is to show raising awareness of the subject of the circular economy within the supply chain of the power energy sector and the role of the corporate social responsibility over it. The author conducted a study case in order to identify the precedence of the corporate social responsibility and the potential impact over the circular supply chain. The outcome has been graphically presented to understand the growing business case for sustainable solutions. Incorporating circular economy principles into the company strategies is key to support the sustainable growth for a multi-tiered sector as the power energy industry. The behavioral of the circular economy is not a simple change, it is about all of the intricated principles related to business sustainability and the social responsibility of the supply chain, the latter being requested by the power corporate company.

Keywords

Circular economy, Sustainable supply chain, Corporate Social Responsibility, Circular power sector, Waste.

DOI: 10.24818/BASIQ/2022/08/080

Introduction

The producing of the global waste has increased massively around the world in recent decades and only pandemic period had slightly slowed it down. The pandemic has in fact made us more conscious of the merit of using sustainability to shape a better future (McKinsey & Company, 2020; Pinner, Rogers and Samandari, 2020). The general increasing trend is a matter of population and economic growth, urbanization, and consumerism habits. According to Ellen MacArthur Foundation, Center and Environment (2015) and European Parliamentary Research Service (2016), the linear model to take raw materials, to make products from them and to throw eventually away as waste, must stop and a new mindset has to be considered. There is a crucial need to establish a new relationship, and this would save resources and energy and create jobs (Stahel, 2016). People and businesses produce millions of tons of waste yearly, and this is increasingly becoming a major issue worldwide. By 2050, worldwide municipal solid waste generation is expected to have increased by roughly 70 percent to 3.4 billion metric tons (The World Bank, 2022) and the ratio municipal versus industrial waste is still questionable (Liboiron, 2016). Supply chain and its upstream suppliers of the core corporate businesses are part of the waste process as well.

The fundamental principle of the circular economy is to eliminate waste and pollution, and it has been regulated by the European Commission with a proposed new industrial strategy and developed later as a circular economy action plan (European Commission, 2015). The EU Waste Framework Directive

(European Parliament and of the Council, 2008) introduced the waste hierarchy that consist in prevention, reuse, recycling, recovery, and disposal. The concept is based on the three principles driven by design and include Eliminate waste and pollution, Circulate products and materials, and Regenerate nature (Ellen MacArthur Foundation, 2022). Prior studies and analysis for the circular economy and supply chain have different approaches but generally all of them are aligned to highlight the common areas for sustainable development. This paper focus on a specific sector highly committed to sustainability and environmental targets, namely the energy sector. The energy sector has much potential to impact on sustainable development, environment and society, its performance being linked by the decarbonization targets, digitalization, and sustainable and responsible operations. Defining corporate social responsibility in the energy sector is based on increasingly climate change and energy demand (Kerckhoffs and Wilde-Ramsing, 2010), consequently, adopting a circular thinking could lead to achieve more sustainable results and reduced impacts (Barros, et al., 2021). The corporate social responsibility is a set of policies and practices adopted by the corporate in a voluntary basis with the aim to meet the internal and external demands with an ethical behavior. Consequently, the corporate elaborates the code of conduct for its suppliers. Sustainability in the supply chain is based on a holistic approach that comprises three steps: prevent, detect, and respond.

Based on topics, the triggering questions for this research article are in a logically way as follows:

- RQ1 How Circular economy is linked with Corporate Social Responsibility?
- RQ2 How "circular" is the supply chain of the power energy sector?

In terms of terminology, there are several definitions of concepts convergent towards the same sustainable development endeavor, covered by the 17 Goals for Sustainable development (SDGs) of the United Nations. All 17 SDGs are integrated, so an action in one area will affect the other areas (Bag and Rahman, 2021). To better understand if the circular economy is to conduct towards the corporate social responsibility or vice-versa, this article paper will do a literature review comparison to balance the opinions and to draw pertinent conclusions by interviewing several suppliers.

1. Review of the scientific literature

More industries and multinational companies are embracing circular economy such like power energy sector, automotive, chemistry, healthcare, infrastructure (not limited to water, food, plastic, batteries, or other industries with high consuming end products). The companies which have committed to reduce waste and greenhouse emissions are building resilience and achieving social and environmental targets (Morea, Fortunati and Martiniello, 2021). Many articles and consultancy reports were published on the topic in past several years and many more have been published in the past two pandemic years. There are various definitions, but authors are aligned that circular economy is linked explicitly by the concept of sustainable development (Elia, Gnoni and Tornese, 2017; Pinner, Rogers and Samandari, 2020). Circular Economy is viewed by Geissdoerfer, et al. (2017) as a condition for sustainability, a beneficial relation, or a trade-off. Circular Economy is a regenerative system focused on minimizing the resource use and waste, emission, and energy drain through design, remanufacturing, refurbishing, maintenance, reuse, repair, and recycling, while sustainability is defined as the integration of economic performance, environmental resilience, and social inclusiveness for future generations' welfare (Geissdoerfer, et al., 2017). To become sustainable, the businesses have to follow a circular economy pathway and the companies have begun to offer products and services that support the transition (Gregson, et al., 2015; Dufva, et al., 2016). This means that business core is a transition from linear model to circular model. Furthermore, the business must start with the circular economy procurement as a basis framework. This circular framework was defined by the Ellen MacArthur Foundation, Center and Environment (2015) to help companies for circular economy initiatives within their procurement processes and is still a debatable topic on how the supply chain may develop further its own strategy (Dull, 2021). A circular economy support companies to control environmental challenges, including climate change, waste and pollution, so circular economy principles are based on waste and pollution elimination, retaining goods and materials in use and regenerating natural systems (Bag and Rahman, 2021). The concept of circular economy is an umbrella concept having a cross and multidisciplinary nature (Kirchherr, Reike and Hekkert, 2017; Ruiz-Real, et al., 2018), however the concept applied on the circular power sector may prioritize the SDGs in specific focus order precedence. Apparently, the circular economy seems to point towards the future, but the circular power sector is much more engaged to start proactively the journey of the green transition right away.

The circular energy sector is about the effective management of resources and offers significant opportunities to optimize the energy use, to reduce the greenhouse gas emissions and waste generation and increase renewable energy use (Pomponi and Moncaster, 2017). There are studies considering explaining

how large the concept of the circular economy is and validating more than one hundredth actual definitions (Gregson, et al., 2015; Kirchherr, Reike and Hekkert, 2017). However, the studies are aligned for the following conclusion and also, according to Google trends, the implementation in organization as a trend is constant increasing (Barreiro-Gen and Lozano, 2020).

While the pandemic major impacted the businesses and countries, the sustainability program had direct effect on the workforce health and safety and by sustainable supply chain monitoring and close collaboration (McKinsey & Company, 2020). The sustainability program monitoring is led by the company corporate towards its supply chain and suppliers are object of external sustainability audit (Latapí Agudelo, Jóhannsdóttir and Davídsdóttir, 2019; Herrera and de las Heras-Rosas, 2020). A sustainable supply chain flexibility has a positive impact on circular economy target performance, in the end increasing sustainability (Bag and Rahman, 2021). To overcome barriers and achieve the objective of sustainable supply chain operations, organizations need to explore sustainable practices as design for recycling and modularity, energy management, refurbishment/remanufacturing, product labeling, bio-based materials, life cycle assessment. To effectively run these sustainable practices, Industry 4.0 technologies should be used (Kumar, Singh and Kumar, 2021). According to Cunnane (2021), the supply chain sustainability takes various forms by different approaches. Furthermore, the circular power sector is striving for an ethical and sustainable global supply chain and the corporate social responsibility (CSR) is an agent of change, differentiation, and innovation. The corporate social responsibility has a significant impact on citizens and companies, defining the CSR as companies' responsibility for their impact on society by integrating social, environmental, ethical, and human rights concerns into their business strategy and operations (European Commission, 2011). The corporate social responsibility involves a binding code of conduct for the suppliers which requires specific human rights and labor standards, specific environmental and compliance. For energy companies CSR is a requirement, as a mix of incentives and risks set up by citizens, environmental and government organizations linked to energy companies to improve standards being considered drivers for CSR (Stjepcevic and Siksnelyte, 2017).

Comparative analyses from various consultancies show similarities for the content of the main areas of action of the circular economy as shown in the table no. 1 and will be further as Circular 4R referred:

Table no. 1. Circular Economy clustering definition – Similarities and variation

No.	Ellen MacArthur Foundation	Consulting Study 1 (TenglerGluttig Consulting GmbH)	Consulting Study 2 (Deloitte in cooperation with Utrecht University and The Copernicus Institute of Sustainable Development)	
1	Eliminate waste and pollution	Recycling Economic and ecological effect in real-time	Recycle, Waste reuse,	
2	Circulate products and materials	Design/Manufacture Upstream and downstream material tracking	Reduce, rethinking, redesigning (including prolonging the lifespan of products), minimization, prevention of resource use and/or preserving of natural capita	
3		Distribution – Information on suppliers (standard certification etc.) Data exchange between companies along the supply chain		
4	Regenerate nature	Consumption	Energy recovery, Energy from the waste	Circular 4R
5		Re-use/ Repair End-to-end transparency of the entire product life cycle	Reuse, Remanufacturing. Repairing and/or refurbishing of resources	

Source: Ellen MacArthur Foundation, 2022; TenglerGluttig – The Supply Chain Minds, 2022; Kirchherr, et al., 2018.

The sustainability program is key for the circular power sector and for its circular supply chain, circular economy being a driver of sustainability (Barros, et al., 2021). At the core of the sustainability program is the aim to deliver sustainable energy systems along the entire value chain. Our world is facing an ever-increasing need for reliable and affordable energy and electricity to support economic development and ensure stable societies (McCollum, et al., 2018; Qazi, et al., 2019). Consequently, the power companies have in focus the innovation, the portfolio transformation and sustainability and this is prerequisite of the circular economy application.

2. Research methodology

The research was carried out in the form of a case study that covered three companies within the supply chain. The presentation and interpretation of the results focuses on the analysis of these firms in a variety of aspects related to the CSR and circular economy. The study focuses on the detailed analysis of these companies and may be treated as a case study. This is a similar approach to some other studies on the subject (Kanda, Geissdoerfer and Hjelm, 2021; Rovanto and Bask, 2021; Zieliński and Jonek-Kowalska, 2021).

The analysis of the literature studies shows that both circular economy and corporate social responsibility are complex interconnected concepts. With little known information about the triggering mechanism and to understand the intricacy of these two concepts (the CSR and the CE), it was considered to address directly to the CSR responsible several questions comprising combined topics with request to prioritize and score each sub-topic. The salience and the importance of both CSR and CE give a good indication that supplier's organizations are enough mature to understand the importance of applicability, how to initiate actions and set goals. This approach it was addressed to three suppliers from the power energy sector. All the suppliers have been audited for corporate social sustainability, also they had been partially or fully integrated into their own circular economy program.

Table no. 2. Supply chain interviewed company's profiles

No.	Power energy Industry	Supply chain power energy sector	Circular Economy Integrated/Partially Integrated	Company Certificates	CSR Audit
1	Supplier 1 referred as S1	yes	Integrated/ Partially Integrated	ISO 9001:2015 OHSAS 18001	yes
2	Supplier 2 referred as S2	yes	Integrated/ Partially Integrated	ISO 9001:2015 OHSAS 18001 / ISO 45001: 2018 ISO 14001	yes
3	Supplier 3 referred as S3	yes	Integrated/ Partially Integrated	ISO 9001:2015 OHSAS 18001 / ISO ISO 14001	yes

Source: Author's own research by interview methods

The considered topics have been grouped into the following five groups related to sustainable business archetypes: 1) Sustainable economic growth; 2) Protect labor rights and promote safe working environments; 3) Improve resources efficiency in consumption and production; 4) Circular by 4R (re-cycle, waste reduce, reuse, recover); 5) Other risks and uncertainties.

Each of the topics have been divided further in subsequent sub-topics and the relevant CSR responsibles have been invited to answer with yes/no case by case and if yes to score from a scale to 1 to 7 (where 1= is very low, 2= low, 3=low-to-medium, 4=medium, 5=medium-to-high, 6=high, 7=very high). Further the sub-topics scores have been summed-up and the total scores had been by a tree-map graphically represented. The tree-map representation has the advantage to provide a proportional comparison of the rectangular surfaces where the tree-branches are but Case studies in these specific contexts can be an effective way to visualize by surface areas the precedence of both concepts CSR and EC. Generally, could be difficult to determine accurate results due to multi-case studies of several companies which are not having similar conditions. Data collections even for a limited number of three respondents is subject to various level of awareness or lack of transparencies, therefore the case study approach is applied only to draw attention high level about the potential inter-correlations.

3. Results and discussion

The survey design methodology has been structured within a table comprising the selected five topics grouped by CSR or EC or combined and each topic group have been split in several sub-topics to be addressed and scored. The unit metering of the analysis (the scale 1 to 7) is considered 1= equally for each sub-topic addressed and this simplification is a disclaimer of the study for the theoretical purpose only. The requested Topic/ Sub-topics are clustered following the main concept definitions as follows: 1) CSR= Sustainable growth/ Protect labor/ Risks& Uncertainties; 2) CE= Circular by 4R/ Improve resource efficiency. The ranking by scores of the combined aspects of the CSR and Circular economy has been structured within Table no. 3:

Table no. 3 Ranking by total scores of the combined aspects of CSR (Sustainable growth/ Protect labor/ Risks& Uncertainties) and the CE (Circular by 4R/ Improve resource efficiency)

No.	Topic	Sub-Topic	Corporate Social Responsibility CSR			Circular Economy CE		
			S1	S2	S3	S1	S2	S3
1	Sustainable Economic Growth	Sustainable business	■	■	■	■	■	■
		Business continuity	■	■	■	■	■	■
		Business growth	■	■	■	■	■	■
		Digitalization	■	■	□	■	■	■
		Innovation	■	■	■	■	■	■
		Diversification	■	■	□	■	□	□
		Total scores: S1= 79, S2=73, S3=78	41	38	33	38	35	35
2	Protect Labor Rights and Promote Safe Working Environments	Protect people (human rights, social services and social protection, minority rights, cultural diversity)	■	■	■	■	■	■
		Labor rights (legal and human rights, freedom of association, labor employment law)	■	■	■	■	■	■
		Promote safe environments (workplace safety, PPE, safe working conditions, work organization hazards, ergonomic hazards, biological and chemical hazards)	■	■	■	■	■	■
		Specific working conditions (distance, home office, remote working, travel restrictions)	■	■	■	■	□	■
		Observe health rules in specific disease case situations (seasonal influenza, low-medium-high severity flu, viral mass infections, covid19 pandemic)	■	■	■	■	■	■
		Total scores: S1=66, S2=62, S3=62	38	37	36	28	25	26
3	Improve Resource Efficiency in Consumption and Production	Improve resources and effectiveness of resource management	■	■	■	■	■	■
		Improve efficiency of resources (various actions by assessing, improving, updating, preserving, conserving for the purpose of the efficient use)	■	■	■	■	□	□
		Engineering (products and services recycle Engineering, Re-Engineering, Engineering technologies for recyclable, Reverse Engineering)	□	□	□	□	□	□
		Production and consumption by circular concepts	■	□	□	□	□	□
		Total scores: S1=31, S2=15, S3=17	19	9	10	12	6	7
4	Circular By 4R (Re-Cycle, Waste Reduce, Reuse, Recover)	Circular by Re-cycling	■	■	■	■	■	■
		Circular by Waste Reducing	■	■	■	■	■	■
		Circular by Reusing	■	■	■	■	□	□
		Circular by Recovering	■	■	■	■	■	□
		Total scores: S1=39, S2=37, S3=26	22	22	15	17	15	11
5	Other Risks and Uncertainties	Risks and uncertainties (financial risks, bankruptcy, market risk, cash-flow and liquidity risks, legal and operational risks)	■	■	■	■	■	■
		Viral mass infections, high severity influenza, Covid19 pandemic	■	■	■	■	■	■
		Geo-political (civil war, regional armed conflicts, Western-Eastern Europe geopolitics, other lessons in geopolitics)	■	■	■	■	■	□
		Force majeure (natural and unavoidable catastrophes, such earthquakes, tsunami, other disasters listed with specific clauses in contracts to remove liabilities)	■	■	■	■	■	■
		Climate change (direct effects of natural climate changes, flooding, extremes temperatures)	■	□	□	□	□	□
		Total scores: S1=45, S2=39, S3= 35	24	22	19	21	17	16

The used tree-map chart provides a hierarchical view of the collected data and by comparison of the rectangular surfaces of the branches can show the proportions, but the included values are not relevant itself. By color, proximity and surface the major areas are attributed to the topics linked to awareness and declared applicability Sustainable growth and Protect people, labor, and promote safe working environments – as direct consequence of the last year pandemic (Figure no. 1).

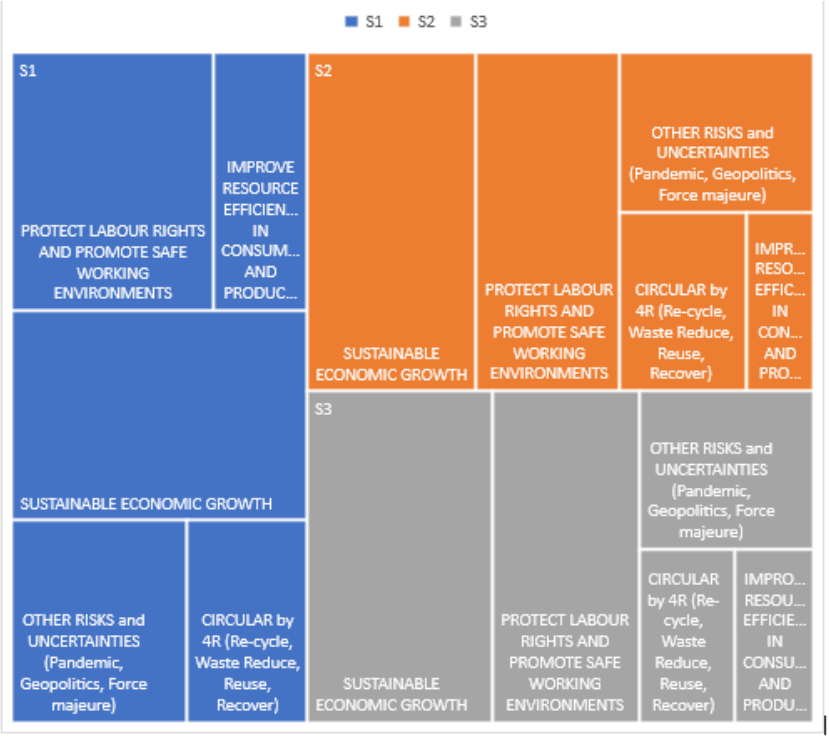


Figure no. 1. Ranking by total scores of the combined aspects of CSR and the CE

Source: Author's own research map-tree graphic representation

Conclusions

The circular power corporate sector leads by example by its corporate social responsibility and addressing the sustainable developments goals. As part of its risk analysis procedures and especially in higher risk countries it is conducted the supplier's corporate responsibility self-assessment or corporate social responsibility audit. Sustainability is part of the quality requirements towards the purchased products and services. The supply chain reacts in the same manner and struggle to become more sustainable hence more circular. Generally, all the respondents had admitted that corporate audits and social responsibilities are rising awareness and positively impacting the circular behavior. If the commitment towards corporate social responsibility is a prerequisite condition to become a qualified supplier, the impact of corporate sustainability reflects also on the supply chain to embrace the circular economy. Generally, supplier CSR audits serve to check, monitor, and continuously improve supplier's quality capability. Supplier audits also include questions about sustainability that cover the aspects and requirements of the code of conduct. Incorporating circular economy principles into the company strategies is key to support the sustainable growth of the supply chain.

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Success Factors of Airport Management Groups

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Abstract

In an era of hyper-competition, airports serve various demands and play a critical role in enhancing regional and global economic growth. But hastening economic development is the final result of the way airport management consortiums have evolved over the last quarter of a century, increasing traffic, developing market-oriented solutions and outlining responsible business commitment. Airport groups have evolved in parallel with airline multi-brand groups, allowing together the development of new destinations, impacting capacity and optimizing traffic layout. The accelerated manner in which global airport groups have progressed since the beginnings of airport privatization is analyzed by the authors and performance metrics showing business development, improved services and enhancement in international competitiveness are researched. Also, the quality of airport administration is reviewed through the strategies, objectives, activities and results. Commencing by analyzing airport companies' proficiency, financial and non-financial indicators, the authors determine if there is a connection between market experience and performance and show how the global groups have established their positions as leading consortiums, adapting to the business environment.

After studying the visions of airport investors/operators that are setting standards worldwide, concentrating their efforts on economic, social and environmental priorities, the paper addresses the strategies and programs that influence airport development and boost regional economic activity. The authors' exploratory analysis ultimately materializes in a risk assessment associated to current influences of airport groups and indicates that further challenges for global airport groups mean focusing their efforts in electing the best strategies and policies for improving efficiency through responsible business.

Keywords

Airport management groups, globalization, investments, ownership, organization.

DOI: 10.24818/BASIQ/2022/08/081

Introduction

Globalization, as well as the liberalization of air transport have had profound implications for the aviation industry, not only on the demand facet, with results in important shifts, but also on the supply side, where international policy coordination by governments and the private sector has affected the industry (Button, 2008). Aviation contributes with a considerable 4.1% (i.e. $3.5 trillion) to the global economy and is expected to provide more than 143M jobs and generate $6.3 trillion in revenue by 2038 (ATAG, 2021). This important development has impacted the organization and business model of air transport providers, including all actors: airlines, airports, ANSP, handling agents, etc.

The creation of airport groups is for the most of them also linked to deregulation and ease of access to the air transport market. Elimination of government-imposed requirements and price restrictions on airlines applies since 1978 in America, but in the field of European international air transport it was a process that took place starting from the late 1980s. From that point, providing airports organizational models that would allow improved operations than those offered by the public service became imperative. Another determinant factor for the modification of the airport network is privatization. Airport privatization seems to be a measure of success (Graham, 2020); after 34 years since it began, a great number of European airports have turned to private shareholders: 41% in 2016 and more than 50% in 2018 (Sadler, 2016), (ACI, 2019). Airport transfer in private property is achieved by different methods: shareholding, strategic

partnerships or through private management contracts. The extent of private sector participation differs in various markets globally. Although there is still a debate whether privatization has a positive impact on airport performance and efficiency, some researchers believe that it produces important benefits. (Aguirre, Mateu and Pantoja, 2019) and (Rolim, Bettini and Oliveira, 2016) consider that passenger traffic growth is the aftermath of privatization. Privatization has impacted the market structure and airport operational models, transforming the business into a proactive, adaptable and marketing-driven one (Jarach, 2001), interested in prioritizing capacity, boosting profit and helping low-cost carrier expansion (Pitt, van Werven and Price, 2011), regional economic and social development.

Differences between airport managing groups and individual operators have been noted, mirrored by the resources used, services and management expertise provided. There is a strong tendency to form airport groups with important capital, which act either nationally or globally. An unprecedented globalization of the airport industry has as consequence the raising of state-to-state connections, passenger mobility and the new relationship between the globalized airport industry and economic and labor market development, including international tourism sector.

The airport group, which consists of more than two airports under a sole ownership structure operated at least at a multinational level (ICAO, 2013), has become a popular business model, widely seen as a success story. Globalization shows a significant effect on operational performance (Kuz and Miskinia, 2021), impacting the integration of local and national economies into a worldwide market (Lioutov, 2019). On the other hand, with a profit motive, privatization brought with it the adoption of a business management philosophy, with important measurable strategic objectives. So, the paper analysis if along with globalization, airport privatization is delivering performance and efficiency in airport operations.

1. Research methodology

The research methodology outlines a qualitative approach based on the examination of data concerning the situational analysis of global airport management groups' business dynamics and was completed by the authors' discussions with stakeholders: airport management and airlines representatives, airport service providers, academics, international regulation institutions and R&D institutes during a Focus Group carried out by the UNESCO Chair of University Politehnica of Bucharest through the Erasmus+ Project: Knowledge Alliance in Air Transport (KAAT). The objectives of the Focus Group were directed towards identifying main sources and drivers of change in air transport, but also aviation professional dynamics. This way, the authors were able to clarify how changes in airport management and business models have reflected in the aviation industry.

The paper debuts with a hermeneutic approach, capitalizing on a critical interpretation of the theoretical positions presented by selected authors regarding airport privatization, the development of airport groups in the context of globalization and their impact on airport efficiency and performance. The research methodology includes an extensive documentation component, the authors consulting annual reports, existing statistics, questionnaires and case studies, which offered the perspective of an exploratory, comparative and interpretative approach. Thus, the study is supported by conceptual reconstruction and analytical observation for generating different hypotheses. After the review of secondary data (scientific research and aviation associations and regulators); the importance of airport groups, key results, prospects and potential were outlined. The top airport management consortiums goals, financial and managerial results and further expected performance have been analyzed in order to evaluate the *must-have* and *nice-to-have* factors of success, the risks and mitigation actions associated to airport groups operation and their impact on increasing airport capacity, connectivity and regional development.

2. The importance of creating airport groups

A great number of commercial airports around the world now have some type of private administration or ownership engagement, indicating that ownership and management of airports has shifted away from the state/public sector. This is not a new idea, "airport commercialization" with its debut in the 70's, was followed by the wave of airport privatizations in the 1990's, which involved a major change in optics regarding quality, competitiveness and performance. The concession model, particularly the build-operate-transfer (BOT) form and variations thereof, became the defining model of international private sector participation in the airport business, allowing foreign businesses to finance, design, construct, own and operate airport infrastructure. Augustyniak (2009) defines five types of privatization, showing that the preferred model in Europe is the sale of equity. Taking a closer look on airport privatization; purchasing, owning or investing in airports outside one's nation is a natural evolution of one's own country's growth

and development (Budd and Ison, 2021; Tang, 2021). The greater role of the private sector is that it can provide the appropriate level of business portfolio diversification while aligning their actions with current international trends for business success.

The internationalization process resulted in a successful transfer of operation and management expertise for airport groups through various types of involvement, ranging from minor advisory projects and short-term management contracts to full divestiture via asset sale (Graham, 2014). The ability to provide organizational model that would allow faster and more flexible (optimized) operations and facilitate substantial investments (for example in infrastructure) are key involvement of the private sector. Airport groups take advantage of the synergies created by their combined roles as operators and managers to predict and optimize investments. The airport groups can create open-ended investment scenarios using advanced planning tools (Master Plans) and systems for managing the infrastructure life cycle, such as BIM (Building Information Modeling), which cater to the demands of all stakeholders, allow for the prioritization of projects and the definition of airport size and capacity (EUROCONTROL, 2016; Koseoglu, Sakin and Arayici, 2018).

Airport investors might be airport operators, financial funds or infrastructure professionals (eg. Aéroport de Paris Management, AviAlliance, Ferrovial Aeropuertos, Fraport, or VINCI Airports – which are worldwide airport investors based in Europe) (ACI, 2019). The growth of airport groups occurs alongside with the growth of airline management groups, developing a relationship meant to drive business growth (Zaharia, et al., 2020), increase the number of destinations, traffic and airport capacity (Figure no. 1).

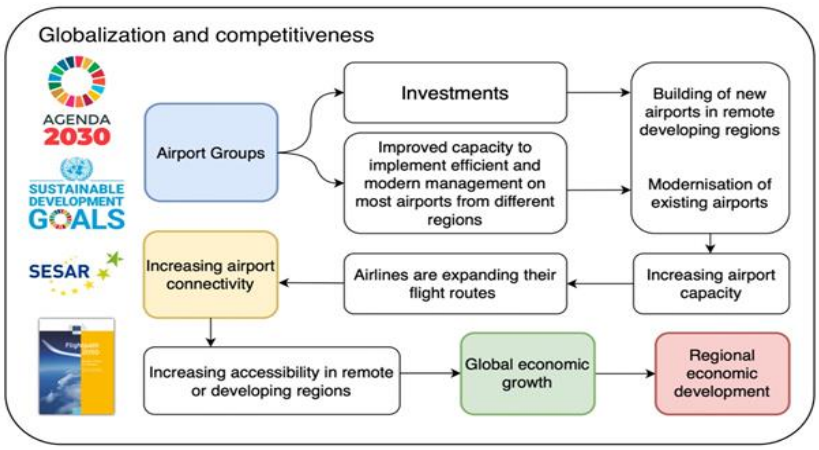


Figure no. 1. The impact of airport groups on airport capacity and regional economic development

Specialists consider that by involving airlines in the ownership structure (as did Fraport), the airport group gains more from developing new flight routes. AENA signed a contract with Air Europa and Skyteam Alliance in 2013 for the development of a hub at the 3 terminals in Madrid-Barajas airport (AENA, 2021). The largest Spanish airline, Vueling, has a total of 11 hubs, 8 of which are in Spain, owned by AENA. Iberia Lineas Aereas de Espana has 7 hubs, 6 of which are owned by AENA, and Air Europa has 2 hubs, both owned by AENA. Iberia is part of the One World alliance, and Air Europa is part of the Sky Team (AENA, 2021). The two alliances, along with Star alliance operate numerous routes to airports in the AENA network (Table no. 1):

Table no. 1. Destination and route development of airline alliances in parallel with airport groups

Destination	Spain	Mexico	Brazil	Colombia	Jamaica
Alliance	**Number of destinations**				
One World	30	7	4	2	2
Sky Team	23	10	6	6	2
Star Alliance	17	7	2	2	2

Source: AENA, 2021

Investments play an important role in the development of the group, but also have an impact on airport capacity. As a result, the airport group develops modern airport infrastructure, with sufficient capacity to meet the expected demand in the medium term with high quality standards. For example, AENA's investments associated with basic airport services for 2017-2021 amounts to €2,185.4 mil. This way, the group focuses on supporting the development of regions with prospects for sustainable development and corporate social responsibility. More so, the group makes an important contribution to the economy of each

state in which it has airports under its administration. The footprint on the economy of these states can be quantified according to its contribution to the GDP and employment rate.

The groups facilitate and stimulate tourism and also have a catalytic impact which captures the vast benefits created by developing connectivity. These companies encourage foreign investment, trade, increasing the productivity and prosperity of the states and regions in which they operate. As it was showed in figure 1, the emergence of airport groups in a global environment has a significant impact on increasing investment capacity, which has a positive influence on overall airport capacity, allowing for the rise of new destinations and, as a result, an expansion in airport connectivity as well as regional and global economic growth. Most airports being part of an airport group have developed and continue to do so by applying strategies to overcome past figures. It has also been showed that managing groups strengthened the position of airports in terms of route development and connectivity. For example, AENA introduced the following new destinations in 2018: (Short distance (domestic): 38, Medium distance: 285, Long distance: 20) and 2019: (Short distance (domestic): 69, Medium distance: 242, Long distance: 19).

AENA operates 46 of the 59 airports in Spain, including Madrid Barajas Airport which ranks 28th in the world with a score of 154 and Barcelona El-Prat which ranks 45th in the world with a score of 102 (Măzăreanu, 2021). Thus, we can say that the score obtained by Spain is mainly due to the development and investments of AENA in their airport network. One of the core elements used by the groups to increase growth and create value for their clients and regions is to invest in the airports entrusted to them for the long term. Their mission is usually to: *"…ensure that the services provided add value to customers, shareholders and society…"* (AENA), or *"Create value for the company and for customers, investors and employees"* (Ferrovial Airports).

In the administration of airport platforms, steering investment is a critical factor. However, the airport groups are not simple investors, are involved in operations, consulting, services and sometimes design & engineering or constructions. During the Focus Group carried by the authors for the KAAT project, by bringing different perspectives and expertise to the same table, the authors concluded that beside the usual aeronautical and non-aeronautical key success factors and characteristics of airport consortiums, some interesting new features can be attributed to these groups, like their will to: Cultivate innovative market-oriented solutions, Increase competitive international context, Show interest in Research, Development and Innovation, Ensure knowledge/technology transfer, Develop a network of knowledge.

For these private investors, knowledge management is involved in safety, security, environment and optimization of operations. Another outcome of the Focus Group is represented by the identification of hard constrains *(Must-have factors of success)* and soft constraints *(Nice-to-have factors of success)* considered for optimizing the airport group success (Table no. 2).

Table no. 2. Factors of success of airport management groups

	Description
Must-have factors of success	Ensure the quality of services, polices, infrastructure and facilities
	Commit to social, economic and environmental priorities
	Focus on the experience it provides to the passenger
	Prove good understanding of operating restrictions
	Develop retail, infrastructure and expansion projects
	Develop good relationship with airlines
	Demonstrate forecasting capabilities
Nice-to-have factors of success	Have a practical vision
	Balance expertise and evaluation/guidance and coordination
	Build an open-ended strategy
	Increase public interest and stakeholder communication
	Multi-modal link development
	Show openness to interdisciplinarity (interdisciplinary jobs)
	Develop precision planning tools. Prepare for the future

Other driving forces behind changes: airport groups use management knowledge from international airport operators in local markets. Investments and know-how have enabled to improve productivity, in particular key issues such as safety and security, environmental protection, savings and energy efficiency, planning and optimization of management processes. Airport groups like AENA, encourage collaboration as a success formula for its projects and exchange of know-how. AENA's activities are carried out in collaboration with organizations at national and international level, such as the Spanish Agency for International Development Cooperation, ICAO's Technical Cooperation Office, School of Aeronautics and Space Engineering at the Polytechnic University of Madrid and others. Furthermore, aware of their role as a driver of change in the environment in which they operate, the groups refer to the Sustainable

Development Goals (SDG's) and the Principles of the UN Global Compact, which, together with the Corporate Responsibility Policy, are the framework for the company to carry out governance initiatives.

3. Airport groups characteristics. Strategies, key indicators and results

Although the formation of airport management organizations has a long history, many of them can be classified as financial investors. A worldwide airport consortium's success, on the other hand, appears to be defined by a comprehensive approach, which entails not only financial engagement, but also the development of a management system that ensures the optimization of responsible business processes. Diversification might be the core element characterizing airport groups' initiatives, but not the trigger. Economic crises may set the need for airport privatization. This is the case of 14 Greek regional airports, most of them being considered efficient (Fragoudaki and Giokas, 2020).

In this paper, in order to evaluate the features (strategies and results) of the top 9 European airport investors (Table no. 3), different criteria have been used. Analyzing the evolution of the groups, although AENA has 69 airports in its portfolio and VINCI only 45, the most important increase in term of revenues is recorded by VINCI group, by 2.5 fold in the 2015-2019 period and in term of passenger traffic by 80% in the same period. This could be explained by the geographical extent of VINCI group which is double compared to AENA and the diversity of their business activity. This upward trend is also observed in other groups, which implicitly leads to the development of new routes and market share, ultimately leading to regional economic development. The highest number of passengers was recorded by Fraport AG in 2019 and in terms of revenue, by Group ADP which recorded €4,700 mil. AENA is the leading consortium considering the number of airports served (Table no. 3), Group ADP follows the lead with the highest number of countries (Zaharia, et al., 2021). Regarding airport companies' history and proficiency, the authors conclude there is no stable connection between market experience and one their performance. This is indicated by AENA or VINCI, who established their positions as leading consortiums, adapting to the business environment and excelling in marketing strategy although have less experience. The performance could be in link with the size and geographical position (Table no. 3).

Table no. 3. Countries served by the top European airport management groups

Airport group/ Countries served	Characteristics
AENA / 1+5	In Spain: 46 airports. AENA Internacional serves other 23 airports in 5 other countries: UK, Colombia, Mexico, Brazil, Jamaica.
Vinci Airports / 1+11	In France: 11 airports. Other management contracts and strategic partnerships in: Portugal, Cambodgia, Chile, Japan, Dominican Republic, Brasil, Costa Rica, Sweden, US, UK and Serbia.
Fraport AG / 1+10	In Germany: 2 airports. Fraport AG has management contracts and strategic partnerships in: Greece, India, Turkey, Bulgaria, Peru, Slovenia, Russia, US, China, Brazil.
Group ADP / 1+9	In France: 14 airports. Groupe ADP operates airports abroad through its subsidiary ADP International in: Chile, Turkey, Belgium, Guinea, Saudi Arabia, Jordan, Mauritius, Croatia, Madagascar.
Egis Airports / 1+6	In France: 3 airports. Egis Group has a global expansion, being also present in the following countries: Belgium, Cyprus, French Polynesia, Democratic Republic of the Congo, Ivory Coast and Brazil.
AviAlliance / 1+3	In Germany: 2 airports. AviAlliance is also present in the following countries: Greece, Hungary and US (Puerto Rico territory).
Ferrovial Airports / 1	In UK: 4 airports. Although it's a Spanish group, Ferrovial Airports operates only UK airports. But, Ferrovial Group serves several areas in different parts of the world: Portugal, United Kingdom, Ireland, Poland, United States, Canada, Chile, Australia.
Royal Shipol Group / 1+5	In Netherlands: 100% owns Amsterdam Schiphol Airport. Other management contracts and strategic partnerships in: U.S, Australia, France, China, South Korea.
Aeroporti di Roma / 1	In Italy: 2 airports. Aeroporti di Roma owns only airports in Rome, Italy.

Source: Airport groups reports, 2021

Integrated and centralized management implies responsibility for operations of all airports in a particular country (Park and Kim, 2021), (case of AENA who manages 46 airports in Spain). This way, the airport group has a close understanding of operating restrictions, allowing building an open-ended strategy as a function of traffic, thus effectively managing infrastructure. The group can then predict, factor in and address future difficulties due to forecasting capabilities and precision planning, resulting in projects that meet high standards, while improving services and revenues (Courtney, Kirkland and Viguerie, 2000).

All airport investors were threatened by pandemics, resulting in cut-off jobs (1350 for Fraport AG), income drops (50% for Fraport AG), traffic reduction (71% for AENA) (AENA, 2021; Fraport, 2021). All financial/non-financial indicators suffered alterations during the pandemic for all groups (Table no.4).

Table no. 4. Airport groups passenger traffic and revenues (2015-2020)

Airport Group	Passenger traffic (mil.)					
	2015	**2016**	**2017**	**2018**	**2019**	**2020**
AENA	207	230	265	280.3	293.2	82.1
Vinci Airports	52.1	132.3	156.6	240	255	76.7
Fraport AG	162	160	223	238	323	110
Group ADP	252	240	228.2	228.2	234.5	96.3
Airport Group	**Revenues (mil. €)**					
	2015	**2016**	**2017**	**2018**	**2019**	**2020**
AENA	3,518	3,772	3,960	4,201	4,503	2,200
Vinci Airports	820	1,055	1,409	1,607	2,631	990
Fraport AG	2,598	2,586	2,934	3,478	3,705	1,677
Group ADP	2,916	2,947	3,617	4,478	4,700	2,137

Source: Airport groups reports, 2021.

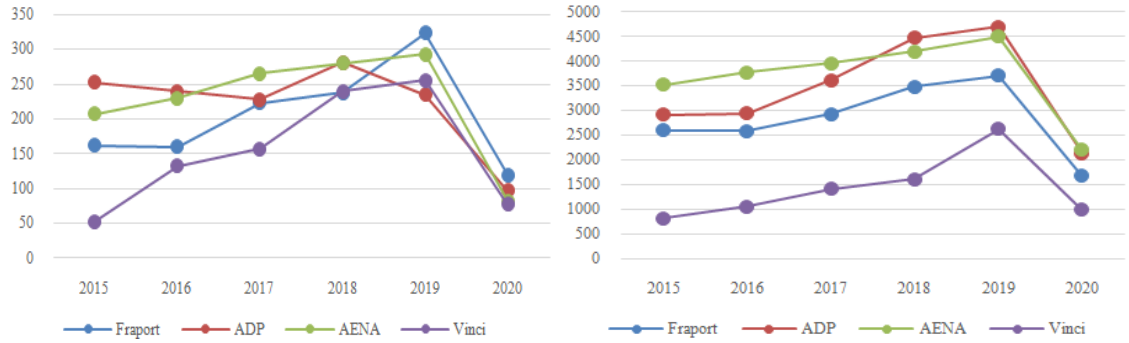


Figure no. 2. Airport groups passenger traffic (in mil. pax) and revenue (in mil. €) (2015-2020)

Table no. 4 and figure no. 2 show that the groups' revenues increased constantly by 2019. AENA's total consolidated revenue increased to €4,503.3 mil during 2019, by 4.2% more than the previous year. Of this total, 64.4% (€4,503 mil) correspond to the aeronautical activity. In 2021, consolidated operating income decreased by €255.4 mil (i.e. -23.5%) compared to the same period in 2020. The growth in air traffic and efforts to increase non-aviation revenues are critical drivers of success in this pandemic period. They have to focus on maintaining liquidity and continue to explore opportunities and partnerships globally. Another critical growth aspect is the ability to forecast and control required investment. The groups also develop new services to improve passenger experience. By maximizing airport activities on a daily basis, they contribute to the local-level development of the regions in which they operate, while paying particular attention to customizing their investments to local economic, cultural, and social context throughout time. For example, Groupe ADP is expanding its innovation capacity with the launch of the "Innovation Hub Program", aiming to design the image of an airport of the future. Aeroporti di Roma through its project *"L'innovazione, nel cuore di ADR*" aims to improve digital experience. The groups are continually investing in digital and physical infrastructure, preparing for new expanding and changing markets.

Business models aim to use their cutting-edge skills to maximize the value of the assets. Their knowledge in this area is based on operating experience, providing a unique perspective. VINCI group shows that experience and the access to a huge volume of data, allows them to accurately predict airport and market needs. Diversification provides an optimal confluence of risk and return because economic conditions can fluctuate in different parts of the world depending on cultural and institutional influence at different times. (Craig, 1999) identified 8 major categories of risks associated with airport privatization, which included concessionaire composition & culture. In the current state, the authors propose an assessment of 6 major risks; an analysis that is suitable under existing conditions and current influences (Table no. 5).

As long-term investors, the management groups want to expand airports in a sustainable manner, which can only be accomplished by pursuing growth prospects that are customized to the economic, social, and cultural characteristics of each region. Thus, considering mitigation actions for the identified risks is mandatory, because airports play a critical role in their communities for local and regional development.

Table no. 5. Risk assessment and mitigation actions for airport groups

Risk	**Risk 1. Competition**	**Risk 2. Legislative changes**
Threat	Other airport group(s) competition	International/European/national legislative changes
Consequences	Decrease in KPI's	Organizational/future prospects changes
Probability/Impact	Medium/High	Medium/Medium
Risk assessment	At the edge of intolerable	Tolerable
Mitigation strategy	Monitor	Monitor
Mitigation actions	Concession renewal. Increase group visibility, experience & management know-how	Revise the asset portfolio, in particular construction assets
Risk	**Risk 3. Political environment**	**Risk 4. Airlines specific**
Threat	Volatile political climate	Changes in airlines arrangements (Airline contracts)
Consequences	Uncertainty. Reduction in future prospects awareness/management	Service related: Contracts suspended. Low traffic/revenues. Route development/connectivity issue
Probability/Impact	Medium/Medium	Medium/High
Risk assessment	Tolerable (with existing control)	Tolerable (with existing mitigation). *A cost benefit analysis is required*
Mitigation strategy	Monitor	Eliminate/Treat
Mitigation actions	Integrate political environment dynamics and regulatory requirements into analysis	Maintain an active dialogue with airlines. Maximize customer satisfaction. Revise portfolio
Risk	**Risk 5. Pandemics**	**Risk 6. Economic recession**
Threat	Covid-19 or other pandemics	Economic recession
Consequences	Confusion/uncertainty. Reduction in: traffic, investment projects. Construction related consequences: Projects temporary suspended	The group cannot fulfill its mission in a timely manner (eg. delays in airport expansion projects). Depreciation of fixed assets
Probability/Impact	Medium/Medium (under existing conditions)	Medium/High
Risk assessment	Tolerable (with mitigation actions)	Tolerable (with existing control)
Mitigation strategy	Treat and eliminate	Monitor
Mitigation actions	Detailed rehabilitation of organizational structure: simplify operations/reduce costs	Turn to state aid/support for overcoming the crisis. Find new ways to stimulate demand.

Conclusions

The development of multinational airport management groups has led through the transfer of knowledge to a better management of large airports, but also to the improvement of the management of smaller international or regional airports in less developed geographical areas with a reduced investment capacity. The emergence of airport groups has had an impact on increasing investment capacity, with favorable impact on the increase of the airport capacity. Furthermore, this increase of airport capacity allowed the appearance of new destinations for the airlines, in other words an increase of the airport connectivity which contributes essentially to the regional and global economic growth. Some business models of airport groups are completely dedicated to airport management and investments, while others have a larger scope with subgroups dedicated to air transport. The success of an airport managing group is defined by a combination of financial investment, know-how, and innovation leadership, all of which are supported by the consortium's principles. The investments in operation lead to a higher demand for aircraft, which means a positive impact on aircraft manufacturers. The progress of these groups contributes to the growth of the aviation industry, resulting in more jobs and, as a result, a higher contribution of aviation to global GDP. The development of airport and airline groups has made it easier for airports and airlines to survive the pandemic and for aviation industry to recover more quickly afterward. Future requirements for the development of global airport groups include innovative solutions for long-term business commitment, increased competitiveness and integrated business strategy.

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Innovating the Agricultural Sector: A Digital Framework of Circular Economy for Southern Italy

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Abstract

Nowadays agriculture has to deal with many challenges, including the implementation of new production models for the transition from Linear Economy (LE) towards Circular Economy (CE). In order to develop a more efficient model of production and consumption, it is fundamental mapping the use of natural resources, as water and soil, and the relationship between positive and negative externalities, as climate condition, that influence the sector. In this particular phase of quantification, the process elaborates a large amount of data that must necessarily be recorded and digitized. The paper addresses the objectives of the main topic of Basiq2022 Conference based on *"Regional innovation for sustainable development"*. The objective of this study is to design an interactive framework for the implementation in agriculture and based on the collection of data and subsequent sharing among the private and public stakeholders involved. Through this model it is possible towards the best model of Circular Economy in agriculture. The analysis is based on the stakeholder engagement guidelines (AccountAbility, 2018) which includes the use of the survey to build a model with sustainability indicators that can be replicated in other applications. In order to conduct the survey, it was involved the Regional Department of Public Administration with expertise on agriculture and supply chains. The results obtained are useful for establishing priorities in regional funding programs and establishing intervention areas.

Keywords

Agricultural sector, Southern Italy, Innovation, Digital Framework, Circular Economy.

DOI: 10.24818/BASIQ/2022/08/082

Introduction

The concept of Linear Economy (LE) explains a conventional model based on the *"take-produce-consume-waste"* approach characterizes the Circular Economy (CE) and consists of the sharing, rental, reuse, repair and recycling of materials and products that have already had a life cycle (European Parliament, 2021).

Therefore, Circular Economy focuses on the circular approach to the energy and materials use, providing environmental, economic and social benefits for the stakeholders involved in production, distribution and consumption chains.

The fundamental transition from a Linear Economy to a Circular Economy, especially in agricultural sector, requires an updated database with information on the waste of natural resources, on the production of waste, and on the climatic conditions, which have influenced this sector.

Among the economic sectors, agricultural sector strongly contributes to the consumption of resources (e.g. water, soil and energy), to the greenhouse gas emissions and waste (e.g. wastewater) generation. For this reason, is need to switch from Linear Economy to a Circular Economy in agricultural sector.

The data required to implement and optimize the transition to Circular Economy are often disaggregated, difficult to find, out of date, expired and complex to consult by some agricultural stakeholders, for example farmers and ranchers.

Analysing the scientific literature associated with this new topic, it emerged a shortage of papers (Klerkx, Jakku and Labarthe, 2019). Then, in order to address this gap, we presented this analysis regarding the sixty topics group named *"Regional innovation for sustainable development"*.

The aim of this paper is to identify a data-set model in order to enable all private and public stakeholders along the chain of agricultural activities to apply the most suitable sustainability indicators for the Circular Economy model.

We used a large quantity of digital sources, including bibliographic platforms, international and digital tools, regulations and standards.

The methodological path includes the following phases:

- questionnaire administration to a sample of stakeholders for mapping the potential lack of data concerns the planning the Circular Economy in the agriculture
- manipulation and analysis of data derived from this ad-hoc survey
- building of a matrix composed of reusable sustainability indicators
- modelling a digital virtuous framework towards a Circular Economy in agricultural sector.

The results obtained thought the survey will be used for planning activities and development interventions inserted in the future funds programme.

This new framework supports the stakeholders' decision-making process (Wolfert et al., 2017), achieve a Circular Economy approach and lead to a better collaboration in the agricultural sector.

Furthermore, the application of this Circular Economy knowledge model enables to overcome obstacles in data procurement (Newton, Nettle and Pryce, 2020).

Hence, digital transformation is a fundamental aspect in economic sectors, within the design phases of Circular Economy models, especially in primary and agriculture sector (Lajoie-O'Malley et al., 2020).

For this reason, starting from the theory of Chehri et al. (2020), the data collection activity must be organized and be functional to the stakeholders in order to move easily to the Circular Economy.

Additionally, the building of a replicable framework allows to widespread a digital learning and soft culture among stakeholders, create an effective and adoptable model in the Mediterranean regions, especially in agricultural sector.

Scholars, stakeholders, public administration and private business owners can use this framework to design a common language of data collection, identify the information gaps to be filled and plan Circular Economy strategies in agriculture.

1. Review of the scientific literature

We have analyzed the interest of scientific research on the topics of sustainable agriculture, Circular Economy and suitable tools through the Web of Science (WoS) platform. The scientific interest is quite recent and has highlighted only two certain results concerning the fundamental digital transformation to implement the Circular Economy.

For this reason, Klerkx, Jakku and Labarthe (2019) proposed a study with a twofold objective: to increase scientific production and to propose a new model for the implementation of the Circular Economy in agriculture.

A data collection model on agricultural activity would have ensured complete monitoring of sustainable practices and the design of implementable development plans as Della Chiesa et al. (2019) stated.

Chehri et al. (2020) also stated that coordination between information technology tools and agriculture can improve the management of farms and their practices, especially sustainable and circular ones.

2. Research methodology

The methodological path used is based on the AccountAbility guidelines (2018) which adopts an approach on the involvement of stakeholders, as contained in the AA1000 SES regulation.

Particularly, the main phases of this methodology are three:

- basing the first part of the analysis on the involvement of actors and stakeholders with the aim of understanding their expectations on aspects of governance, policies, strategies and practices,
- reporting the questions asked and the answers received with transparency and clarity,
- Create an innovative data collection and dissemination model to implement sustainable and circular practices.

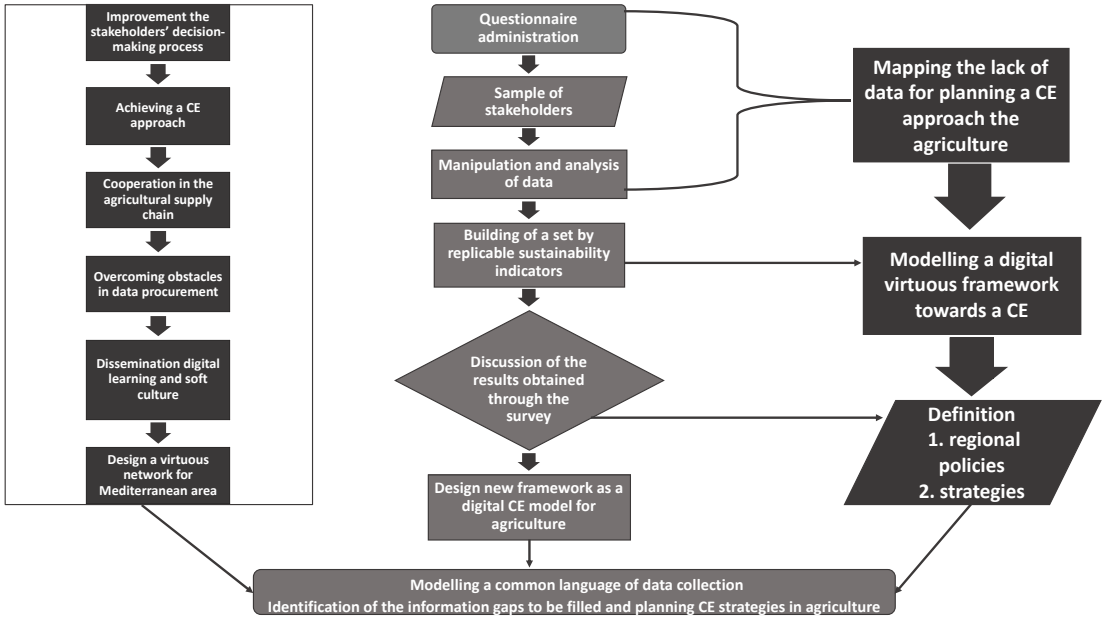


Figure no. 1. The methodological path
Source: Authors' elaboration.

Figure no. 1 explains the methodological path adopted in order to:

- elaborate a model, based on a common language, of data collection in agricultural sector
- identify the information gap reveled after the survey process.

The stakeholder engagement methodology (AccountAbility, 2018) is focused on the administration of questionnaires to analyze the needs of actors and stakeholders with the aim of effectively planning projects on sustainability and Circular Economy. The questionnaire was developed jointly with the public administration.

Therefore, the data gathered, processed and transformed through a statistics tool were inserted into a shareable and replicable framework.

Figure no. 2 shows the topic contained in the questionnaire administered and organized in four areas of investigation:

- General Information of stakeholders interviewed,
- Information about the relationship with Circular Economy practices implemented,
- Information about use/consumption and reuse of water resource,
- Interest in planning and funds activities.

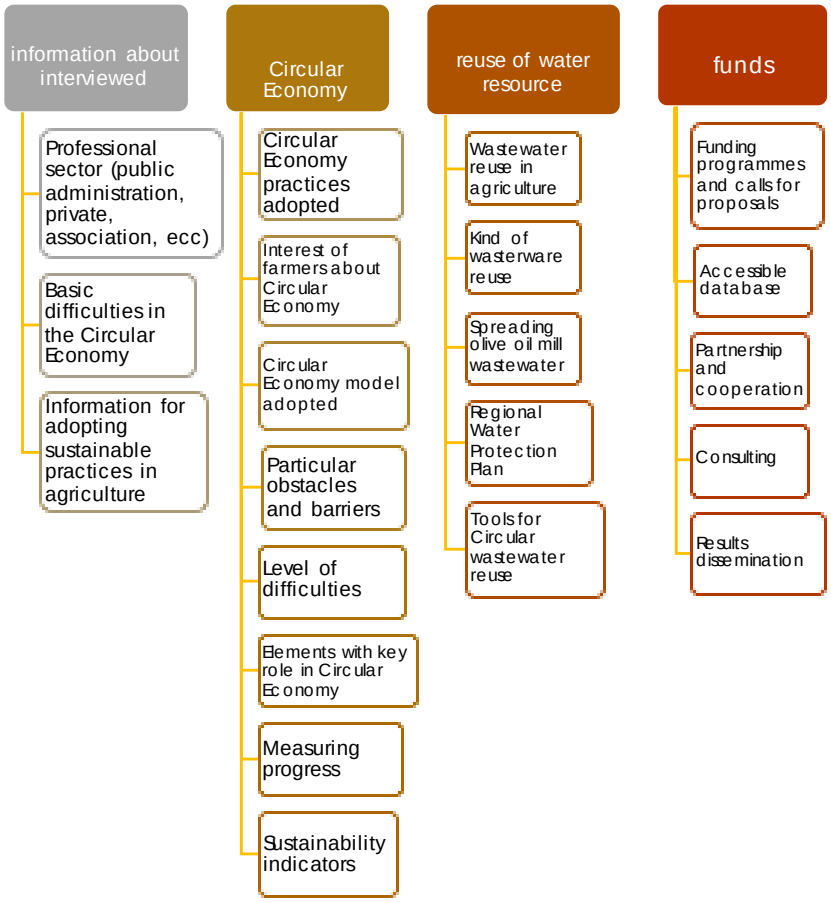


Figure no. 2. The structure of the topics and questions
Source: Authors' elaboration

Jointly with the regional body that deals with agriculture and supply chains, we have organized a list of public and private actors to be involved in the analysis.

The sample consisted of 60 public and private sector stakeholders working for the agricultural industry. Furthermore, the questionnaire was administered via email through a link that can be quickly shared and also reachable from a smartphone o personal computer.

3. Results and discussion

Compared to the initial sample, 52% of the interviewees answered.

Concerning question no. 2, 50% of the stakeholders highlighted the absence of direct tools to collect information on the implementation of the Circular Economy in agriculture; moreover, 40% noted the lack of technical training.

The 67% of the answers for question no. 3 stated that farmers often ask for information in order to implement the Circular Economy and Sustainable practices.

Furthermore, according to 3/4 of our sample investigated, some CE models have been activated in the agricultural sector and, although few, some industries have experimented with this innovation.

1/3 of the stakeholders interviewed stated that have been contacted in the past regarding wastewater reuse practices.

The sample stated that farmers encounter some difficulties in implementing the adequate production model of Circular Economy. Two thirds of the stakeholders highlight that the is the difficulty in finding specific information and receiving adequate training.

Furthermore, the sustainable use of water plays a key role in achieving the objectives of the Circular Economy, starting with the reuse of wastewater and agricultural waste.

Notwithstanding the purposes associated with Circular Economy practices, it is necessary to adopt participatory processes between actors and stakeholders, bottom up or top down, to facilitate the achievement of results.

2/3 of the sample is informed of the existence of sustainability indicators, while just over 1/6 adopt the reuse of waste water based on the storage of rainwater.

1/3 sample collaborated with farmers who also practice an agronomic use of vegetation waters.

On the contrary, however, no farmer knows the regional water protection plan drawn up by the regions. Almost 60% of the sample reiterated the need for coordination between the various bodies involved in the implementation of the Circular Economy and sustainable practices.

Furthermore, to better manage planning and financing activities, it is essential to digitize information and use a connected network even in agricultural spaces.

Currently, according to almost all of the sample, farmers encounter some difficulties in finding information, including digital, in the short term and easy to understand.

Nevertheless, 2/3 of the sample is ready to collaborate to design a participatory model of information collection for the implementation of the Circular Economy.

It should be emphasized that all the stakeholders interviewed in this first phase agree to share the results of this survey as they consider them useful and fundamental for the improvement of planning and project activities.

Finally, with the last part of this study, there were developed some indicators to be included in a useful framework for all actors and stakeholders in order to facilitate the implementation of an effective Circular Economy model.

Figure no. 3 displays the most important topics, such as data set, monitoring activities, implementation instruments, sustainable indicators, design framework, incentives and financing, planning activities, training and dissemination. These elements compose the innovative framework fundamental to meet the needs highlighted by our sample.

Then, this framework is useful to implement Circular Economy model in agriculture through the adoption of bottom-up processes for the actors in the agricultural supply chain.

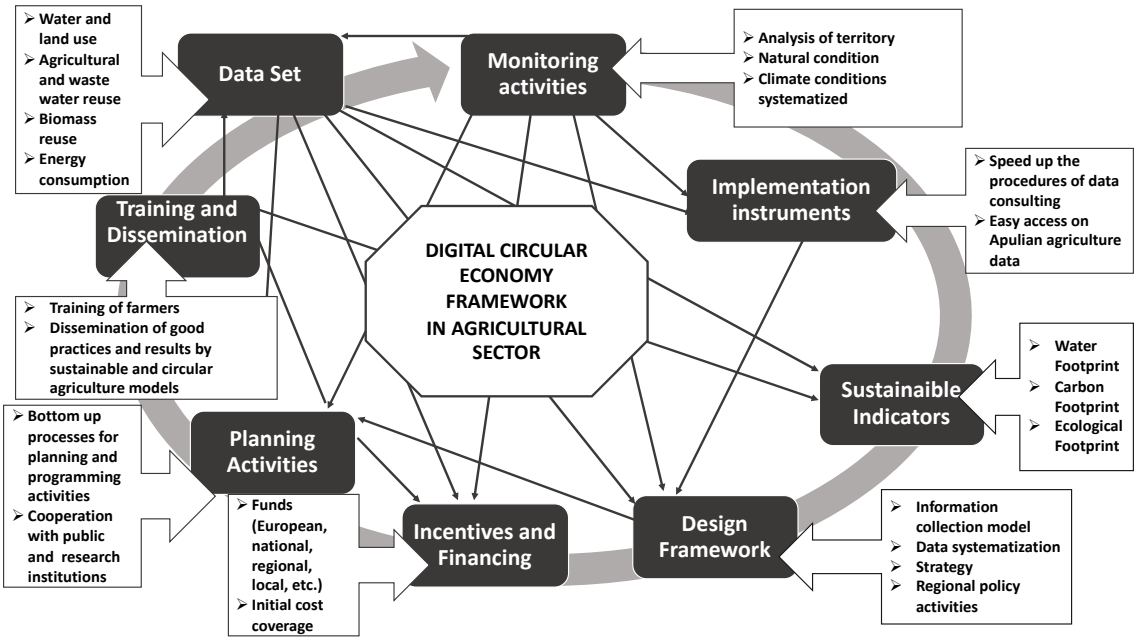


Figure no. 3. The digital circular economy framework
Source: Authors' elaboration

This paper deals with some useful ideas starting from the short scientific literature with the aim of creating a digital framework for the collection and sharing of data in agriculture towards responsible innovation, as Lajoie-O'Malley et al. (2020) proposed.

This investigation was conducted through the use of digital tools (link for the questionnaire and for data manipulation). The questions focused on the consumption of natural resources (such as water resources) and on the knowledge of some sustainability indicators.

This information obtained from the questionnaire is essential for planning activities, creating financing policies and activating suitable tools for sustainable and circular agriculture in Southern Italy.

Therefore, from this first questionnaire administered to this sample made up of public, private and agricultural associations, the urgency emerged to train and disseminate good sustainable practices through both bottom-up and top-down approaches.

The collaboration between actors, farmers and stakeholders, is crucial for implementing Circular Economy practices. Therefore, through a digital model of information, knowledge and skills it is possible to activate this step.

Conclusion and practical implications

We have proposed this dynamic architecture to design a transition model towards a Circular Economy approach.

This digital framework as Newton, Nettle and Pryce (2020) can improve stakeholder decision-making and lead to greater cooperation in the agricultural sector, especially in the southern regions.

It is an operational and knowledge model that allows stakeholders to overcome the obstacles in obtaining data associated with the agricultural supply chain as highlighted by Wolfert et al. (2017). The limitation of this research is the small sample of stakeholders involved, so the next research insights foresee to enlarge the sample.

Furthermore, this replicable model, creating a virtuous network between actors and stakeholders, allows the diffusion of soft culture and digital learning not only in Southern Italy but in the Mediterranean.

Thus, through this study we have strengthened the capacities of public administrations by involving scientific research methodologies and the public interest of the administrative regions, for the purpose of implementing the Circular Economy approach.

Therefore, starting from this new framework, the public administration would find greater stimulus to design strategies and financing programs to allow stakeholders to implement a better Circular Economy model, evaluating the data of the sustainability indicators.

Finally, the digital transformation especially in the agricultural industry will support the various strategies that can be implemented to favor the transition from the Linear Economy to the Circular Economy.

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The Prospect of the Utilization of Hydrogen as a Viable Renewable Energy Source, in the European Union

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Abstract

The Paris Agreement from 2015 brought together 196 countries, from around the world, in pledging to reduce carbon emissions at a level able to limit global warming below 2 degrees Celsius, compared to pre-industrial times, withing 40 years. Thus, the light is now shining on the decarbonization of the energy and transport sectors. An aggressive push, considering not 20 years earlier, most countries did not even consider global warming a reality. It has sparked a revival in interest for the utilization of hydrogen (the most abundant element in the universe) as a zero-carbon electricity producer. Whilst hydrogen has been in use in the chemical and energy industry for decade, renewable hydrogen has become an economically viable option, only in the past few years. This article will analyse the geopolitical impact and market potential that hydrogen's adoption will have on the European Union, presenting possible scenarios in terms of costs, energy security and independence. The research method was a mix between qualitative and quantitative techniques, by analysing documents, official studies, articles, and research papers, coupled with document screening, to assess the potential, impact, and costs of the transition to hydrogen. The paper concludes that the attainment of self-sufficiency in the production of hydrogen is achievable, but the investments represent a significant obstacle in the development of an efficient hydrogen market.

Keywords: Hydrogen, EU, Green, Energy, Independence, Transition.

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Introduction

The European Union has determined that hydrogen is a key element its strategy of becoming a global leader in the unions push to become cardon neutral whilst ensuring a stronger, cleaner, and more secure economy is working to become a leader in the development.

In this sense, this article ponders what would it be necessary for the EU to become hydrogen independent; if existing gas infrastructure can be retrofitted to transport hydrogen; what areas of Europe are best suited to produce the fuel; what the risks are and how can they be diminished. By answering these questions, we will be better able to evaluate the geopolitical and economic implications of the adoption of hydrogen.

The process of splitting water has several uses, of which renewable hydrogen is one. It can be used to resolve most of the problems stemming from the utilization of fossil fuels in industry, aviation, short and long-distance transport and even heating. All these sectors add to more than 37% of the global emission of carbon dioxide (CO2) (IEA, 2020).

While the production costs of green hydrogen have, resulting from electrolysis, been traditionally higher that the extraction and processing of fossil fuels, with the unprecedented increase in gas and oil prices in early 2022, the renewable fuel has unexpectedly become price competitive much faster. Standards and Poor reported in October 2021, that green hydrogen produced at 4$/kg in Norway (Burgess, 2021), had reached cost parity with gas, at 1000$/m3 (Eurasia Business News, 2021). By March, due to the war between Russia and Ukraine, natural gas had reached the price of 2200$/m3 (Economica.net., 2022).

The EU sees renewable hydrogen as the key to achieving carbon neutrality in 2050 (H2GreenTECH, 2021). With the pressure of decoupling from the Russian natural gas supply and economy, as well extreme gas prices, Europe find itself in a situation in which the energy transition must happen sooner than expected. The EU hydrogen strategy envisioned the launch of mass utilization of hydrogen in the European economy, in 2030 (European Commission, 2022), painting a picture of how to create a competitive and open market. The strategy stipulates that full maturity for the utilization of hydrogen is to pe expected by 2050, in all sectors, with natural gas acting as an intermediary. In the new post pandemic and post Russian economy decoupling, this strategy most certainly must be revised and be made more ambitious. While the EU is one of the global leaders in hydrogen technology development, it must push further and faster than ever. And while full adoption will not be possible for many years, a 2050 term is a luxury the EU cannot afford anymore.

1. The utilization of hydrogen in the European Union

In the 2020 European Commission strategy on hydrogen, the EU proposed a 34-step plan beginning in 2020 and ending in 2050, split into 3 phases (2020-24, 2024-30, and 2030-50 (European Commission, 2020)), to produce green hydrogen from solar and wind powered electrolysis of water. The strategy also encompasses the utilization of low-carbon hydrogen, or blue-hydrogen, which results from natural gas refinement, which could play an intern role on the short and medium term.

In the two first phases, the strategy plans the construction of electrolysers (hydrogen production plants) of 6GW (by 2024) and 40 GW (by 2030) (European Commission, 2020), which are estimated to produce 10Mt (million tons)/year of hydrogen. But the EU's needs by 2050 they currently stand, envision that approximately 50Mt/year will be required, to achieve net zero emissions. In the third phase, the ambition is to increase production from 10Mt to the required 50Mt, but there are not clear specifications in the strategy that would detail how Member States can produce and from where they can import this difference of 40Mt. Yet, the EU aims at building "an open and competitive hydrogen market, with unhindered cross-border trade and efficient allocation of hydrogen supplies among sectors" (European Commission, 2020), with the belief that Member States that are abundant in resources will develop hydrogen production industries which will surpass internal needs and become exporter towards less fortunate Member States.

As it currently stands, demand for hydrogen in the EU amounts to around 9.7Mt, or about 11% of global demand. Of these 9.7, 42% are utilized for the production of fertilizers and 52% are used in refining, with a measly 2% utilized in energy production and transport. At the forefront as the largest consumers, are the Lower Countries and Germany, utilising around 40% of the EU's demand, with France, Belgium, Italy, Spain, and Poland utilising over 0.5Mt/each. The remaining 25% of EU demand is split between the remaining 20 Member States. Currently, the EU's production capacity stands at 11.3 Mt/year of dirty hydrogen (resulting from the utilisation of fossil fuels) (EU Joint Research Center, 2019). At the moment, internal EU hydrogen needs are more than met by internal production, resulting from dirty industrial processes. Therefore, it is of the essence that policies must be hastened and a new strategy to be adopted to not only convert current hydrogen production capacities to electrolysis, but to achieve the required 50Mt needed by the EU sooner than 2050, in line with new objectives from Germany and France of renouncing natural gas as soon as 2040 (Euractiv, 2021). Achieving green hydrogen's potential necessitates a careful balancing of what the EU currently demands and what it will need. Thus, the moment to act is now, as today's policies will translate in results that will be visible in years and decades, as infrastructure will need to be built.

2. Green hydrogen in 2050

While the quantity of green hydrogen needed by the EU has been estimated at around 50 million tonnes annually, this remains but an estimate. The EU's strategy does not specify concrete levels of hydrogen consumption in 2050, it does cite numerous projections in which energy demand will vary between 6 and 12 PWh (50Mt/year), of which hydrogen will provide 25%, with the rest of 75% being covered by renewables such as solar, wind, hydroelectric sources (European Commission, 2020). Regardless of this wide projection, the need to decarbonise the European economy will boost demand for hydrogen. Guaranteeing that green hydrogen is available for future demand requires the envisioning of a clearer strategy than the one put forward in 2020. As stated earlier, with current targets, by 2030, Member States will have a production capacity of 10 Mt/year, a far cry from the 50 Mt/year envisioned in 2050. Thus, production capacities will need to increase more than 5 times by 2050 (European Commission, 2020). To this end, a scenario of completely meeting hydrogen needs from internal production in the EU, while desirable, seems unlikely. Internal, regional, and long-distance supplies must all be taken into consideration

for meeting hydrogen needs. Thus, three scenarios emerge for the hydrogen future of the EU: 1. Imports from long distance hydrogen producers; 2. Regional imports from third party countries; 3. Internal production independence. All three scenarios pose geopolitical, geo-economic and strategic effect, which need to be considered when evaluating the cost, security, and independence of the energy supply. Below we shall see what all three scenarios entail.

3. Internal production independence

In this scenario, the European Union would sufficiently prioritise resources and organise its strategy in a manner which would result in the development of self-sufficient green hydrogen production and markets. While more costly, it would move the EU towards energy independence Energy independence would require, according to the EU strategy, for Member States to be able to produce more than 70% of internal demand, thus almost fulfilling the needs of the internal market. Not only would the security provided be benefitting from energy independence ensure a stronger internal market, but also stronger economic development and cheaper prices. The main producers of hydrogen would be the Baltics States, Ireland, Denmark, and the Iberian Peninsula, providing close to 90% of the internal production capacity. Of particular note would be the Iberian Peninsula, as Spain and Portugal would be able to produce an estimated 22 Mt/year, ensuring 45% of 2050 estimated required amounts and 75% in the worst-case scenario. Ireland would be second, by providing close to 12 Mt/year to the mainland, or 23% of 2050 estimated amounts. The Baltic States a close third with 11 My/year, or 22%. And Demark would provide 5 Mt/year, or 10% of 2050 estimated requirements (European Commission, 2020).

The EU benefits from a partial advantage for internal distribution as existing gas pipelines could be retrofitted for the utilisation of hydrogen transport. But the system is not completely interconnected and is more clustered at the moment. Substantial investments would required not only to retrofit the existing systems, but also interconnect them to ensure better distribution, especially to the centre of the continent, where resource starved, and resource poor countries will reside (example: Germany). An integrated infrastructure is of the essence for the EU to become self-reliant and allow optimal distribution of green hydrogen where is needed.

4. Regional imports from third party countries

In this scenario, the EU would be more price conscious and seek to invest only in the most optimal and low-cost internal production options, seeking to satisfy the rest of the EU's demand by importing from Norway, Iceland, Egypt and Morocco, countries which have abundant green hydrogen production potential. But this would incur higher costs due to the need to transport hydrogen via shipping, but not as high as transporting it from long distance providers. Morocco, Norway, and Iceland are the most resource reach of the EU's neighbours, having the potential to provide 30Mt/year (Wettengel, 2021), each, providing more than ample capacity to satisfy the expected 50Mt/year in 2050. Together with internal production capacities, the utilisation of regional exporters as a means of supplementing the remaining green hydrogen needs, would allow for accessible prices to be practiced in the EU. With neighbouring countries competing to access the EU's internal market, competition would allow for lower prices to be practiced. Yet, the risk is that internal production, if unable to keep up with the lower prices practiced by neighbours, will be affected and risk needing support to stay afloat or become too uncompetitive to survive. Thus, a careful management of the situation is required, balancing internal production with regional imports, otherwise risk duplicating a situation where the EU becomes too dependent on a provider, such as is the case with Russian gas.

5. Imports from long distance hydrogen producers

In this scenario, the European Union is uncapable of offering complete internal production security and thus must import large quantities from countries such as the United States and Australia (which have proven high capacities of production), supplementing regional imports and internal production. This scenario would be dependent on the EU having the opportunity of importing large quantities at low costs due to lower shipping costs. Currently, long distance imports of hydrogen stand at 0.1 Mt/year, while the amount could increase to 18 Mt/year (KPMG, 2020). Due to its proximity, the United States would be the most viable option to become the largest supplier of green hydrogen for the EU. While Australia has very high potential, transportation costs would dilute any decreases in demand that can be achieved through production scaling. In comparison to the scenario in which regional imports are highly important for the EU, in this scenario, the United States would provide most of the resource need to western European states

such as Belgium, the Lower Countries, France and Germany, whilst import from Marocco, Norway, Iceland or Egypt would likely be reduced due to their inability to completely fulfil EU needs.

In essence, long-distance imports are the least desirable of all three scenarios as it would require the EU to be put into a situation in which it is dependent on shipping and far away partners, as well as the whims of shipping costs which, as we have seen with COVID-19 can be highly disrupted due to unexpected shocks and explosive prices. The United States would be expected to cover close to 25% of the EU's need in this scenario (EU Joint Research Center, 2019). The security risk would be too high to bare and put it in a precarious position such as the EU is today with the Russian Federation and gas imports.

Conclusions

Achieving secure and competitive supply sources for green hydrogen is now more than ever an important strategic policy for the EU, due to the need to decouple from gas dependence of the EU economy. The union must thus increase its efforts to transition to a net zero economy and achieve it sooner than 2050. Utilising hydrogen at full capacity requires evaluating not only the production capacity but also the environmental, geopolitical, and economic impact. For the moment there exists no hydrogen electrolysis production plants, no mass transport liquefied hydrogen ships and no retrofitted or purposely built hydrogen pipeline. Thus, significant amounts of investments are required to full transition to hydrogen utilisation.

Previously in the article, the three scenarios were presented as the possible sources that the EU could tap into for the obtaining of green hydrogen. From analysing these three possible scenarios and due to current event in which Russia is utilising gas as a means of coercion, it becomes apparent that Member States must work together to achieve energy dependence and supplement the differences in hydrogen requirements from multiple neighbouring countries, ensuring they do not become dependent on a sole provider. The EU must therefore work to become a leader in green hydrogen innovation, to not only ensure robust economic growth, but also achieve the EU's energy and climate goals. This would require the coordination of society, policies, capital, and technology. In this sense, a transition that could be considered successful would require the following:

- Investing in research and innovation which would be able to help attain more efficient hydrogen production technologies as well as fuel cell engines able to utilise the resource at higher potential.
- The EU and Member states would elaborate clear standards and regulations for the transport and production of hydrogen. Adapting national regulatory frameworks as well as harmonising laws with the EU and amongst themselves would ensure a more coherent environment able to attract investors.
- Policies would be enacted to address commercial barriers, decrease market risk and boost the development of economies of scale.

The earlier these steps are met, the faster will they create effects that would allow market forces to dictate and internal policies to develop the most advantageous scenario for the EU. Policymakers will be wise to keep watch and ensure legislation will be designed to encourage the internal production capacities to flourish. They must also pay attention to:

- Create clearly defined policies that encourage the development of energy resources.
- Decrease market *risk and* remove barriers to commerce to ensure the development of economies of scale.
- Coordinate the development of infrastructure across the continent.
- Invest in innovation and projects to accelerate the development of competitive green hydrogen.
- Synchronize standards and national frameworks to ensure a seamless flow across borders.

The article works to show that the attainment of self-sufficiency in the production of hydrogen is achievable. Yet the investments required in the order of trillions, on a projected period of 30 years, could represent an additional obstacle in the success of developing of an efficient hydrogen market. Policymakers will need to clearly define a new EU hydrogen strategy, to increase investments and the development of new and existing infrastructures across the continent, while stimulating growth in renewable energy generation, which is mandatory for the production of green hydrogen through electrolysis.

Green renewable hydrogen is an integral piece in puzzle of the EU's primary objective of attaining a low carbon, net zero emissions economy by 2050. Its deployment faces enormous challenges from both the private and public sectors, which need to be addresses by both parties. Only though their cooperation will

the EU be able to become an innovation leader in green hydrogen production, transport and utilisation, contributing to the union energy independence and the creation of a more robust economy.

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R&D - An Innovation Catalyst for Achieving the Sustainable Development Goals

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Abstract

Innovation is a critical instrument for achieving the SDGs, playing a key role in promoting a sustainable society. In this context, technology and innovation could simultaneously integrate the three dimensions of sustainable development: economic, social and environmental. The present paper explores the impact of innovation from the perspective of R&D on these three pillars, pointing out its role for economic progress, social advancements and environmental conditions, in the case of the European Union countries. The paper starts with qualitative research of the latest specialized literature regarding the SDGs and their relation with technology and innovations, highlighting important outcomes brought by innovation on economy, society and environment. The research continues with a quantitative analysis conducted on the basis of a correlation model along with three regression analyzes that aim to capture the influence of the level of R&D on the sustainability pillars. Thus, this paper affirms and strengthens the catalytic role of innovation for sustainable development. The added value of the paper is brought by the contribution to studies on the situation of EU states in terms of R&D and their potential to achieve the SDGs. Findings from regression analyzes can provide valuable information for parties involved in public policy or private companies. This information could be a starting point for a better allocation of resources towards the innovation area, but also for the formulation of integrated strategies in the R&D sector.

Keywords

Innovation, SDGs, Research and Development, Sustainable Development, Sustainability Pillars

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Introduction

Unfolding throughout human history, we see that transitions have been driven by technological as well as institutional innovations, which resulted in new forms of social and economic organization that have gradually expanded the energy and material use. The 2030 Agenda together with its Sustainable Development Goals (SDGs) promote sustained economic prosperity, social inclusion and environmental sustainability, along with technological innovation (García Zaballos, Iglesias Rodriguez and Adamowicz, 2019). According to UNDP 2020, empowering people and promoting stewardship should become central to what it means to live a good life alongside easing planetary pressures. It is largely accepted among researchers and stakeholders that innovation is a key driving force for sustainable development, which is why the implementation of the SDGs shall be made through an integrated global innovation system that connects regions, joins production alongside with relevant information and technology (YiĞiT, 2021).

In this context, the paper discusses the catalytic role of innovations, with respect to Research and Development (R&D) in achieving the SDGs, by analysing the impact of innovation on each of the three pillars of sustainable development at the European Union level. Throughout this paper, we aim to examine to what extent the economic, social and environmental dimensions are interconnected and how the R&D of new technologies can influence the magnitude of their impact on society and the planet. We define the

concept and the context of sustainable development, then we explain the place of innovation in the equation, with respect to each sustainability pillar. The research continues with a quantitative analysis based on three regression models that are going to prove the role of innovation for sustainable development pillars and, consequently, for sustainable development as a whole.

The paper contributes to the studies on identifying the importance of innovation, from the perspective of R&D, in achieving the SDGs at the level of the 27 EU states. We consider that the findings on the analysis of these dimensions can provide valuable information for the policy and decision makers. In this way, key players will be able to elaborate and implement policies that will lead to a better allocation of resources supporting R&D and investments in ICT (Information and Communication Technologies) sector. This will create a safe and favourable environment for emerging technologies and innovations.

1. Review of the scientific literature

The 2030 Agenda for Sustainable Development adopted in 2015 by 193 heads of government at the United Nations General Assembly represents a holistic approach to global efforts for achieving sustainable development, emphasising strategies for ending poverty, promoting peaceful and inclusive societies as well as helping tackle climate changes. It was designed as a plan of action which encompasses a comprehensive list of 17 SDGs and 169 related targets which integrate the economic, social, and environmental dimensions of sustainable development (García Zaballos, Iglesias Rodriguez and Adamowicz, 2019). Although the SDGs are not legally binding, governments are called for a global partnership to ensure its implementation and they are expected to establish national frameworks for achieving the 17 goals. The EU together with its Member States pledged to play an active role in maximizing progress towards the 2030 Agenda, fully integrating the goals into the European policy framework (Eurostat, 2021).

Today's challenge is to achieve a sustainable future for all in a safe and equitable operating space. However, there are significant inequalities between and within societies, with billions of people left behind and overwhelming evidence of global risks due to increasing human pressure on Earth. Ensuring future sustainability will require social and economic development that will improve overall human well-being while maintaining the resilience of the planet (Nakicenovic, et al., 2019). Beyond its key role in a country's competitiveness, innovation will lead to optimal use of limited resources, providing relevant answers to the challenges of our commitment to sustainable development in terms of economic growth, environmental preservation and social progress (Omri, 2020).

Sustainable innovations can be defined as the development of a new process, service, product or technology that contributes to the development and satisfaction of human needs and with respect to natural resources and the ability to recreate them in the environment (Tello and Yoon, 2008). Therefore, innovations are not just a key to achieve the economic growth and improvement of the standard of living, but they are also essential for orientation towards the path of sustainable growth. Supporting innovations is one of the aims of the 2030 Agenda for Sustainable Development, included in the Goal 9 - *Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation* (Szopik-Depczyńska, et al., 2018).

European Union indicates that the development of ICT is vital for Europe's competitiveness in today's digitalized world economy. During the 2014–2020 funding period, the European Regional Development Fund (ERDF) set aside more than 20 billion euros for investments in ICTs and the European Commission established the Digital Europe 2021–2027 program, which aims to support the digital transformation of Europe's economy and society, and thus bring its benefits to European citizens and businesses (Mozas-Moral, et al., 2020).

According to numerous studies, the concept of sustainability includes three interconnected pillars, environmental, economic and social, which are also called the "Triple Bottom Line" (TBL) (Jum'a, et al., 2022). Given the challenging nature of sustainability, the TBL concept was proposed to support and operationalize sustainable development implementation, also employing to attain a proper balance between the goals and targets at different levels (Ranjbari, et al., 2021).

As we can see in figure 1, all three pillars are highly interconnected. A socially resilient society is the place where basic human needs are fulfilled within stable yet dynamic societies. Economic pillar focuses primarily on healthy economies that can provide a high quality of life for people, but usually it also involves identifying alternative economic paths that could provide a safer future without compromising the natural systems. Environmental sustainability involves defining an existing boundary to meet people's current needs without sacrificing the ecosystem's quality (YiĞiT, 2021).

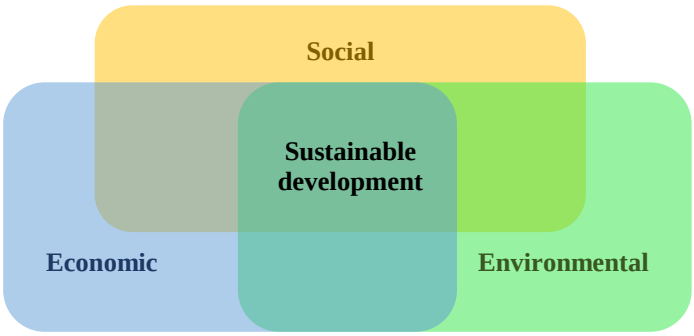


Figure no. 1. Overlapping pillars of sustainable development

Source: (Howaldt & Scwarz, 2017), (Cook & Davíðsdóttir, 2021), (Ardiwinata, et al., 2021)

Social progress - Innovation is a precious tool for developing human potential that can break the cycle of poverty. It has a positive impact on people's productivity, as well as on access to better quality goods and services and on life expectancy, providing solutions such as self-management tools that are accessible in people's living environments (Omri, 2020). Internet and technology access provide new and free online educational resources, eliminating barriers to achieving universal quality education. Moreover, innovations in healthcare have provided physicians with new resources to improve patients' health. Real-time patient monitoring provides physicians with real-time data on patients' health, leading to improved diagnostics, cost and time savings (García Zaballos, Iglesias Rodriguez and Adamowicz, 2019).

Environment sustainability - The climate change is causing dangerous and devastating effects on the world. Recent studies have shown that climate change is jeopardizing progress on all the SDGs, as their findings suggest that climate change mitigation would directly benefit goals that are related to welfare, poverty eradication and employment, energy and water availability, health or ecosystems quality (Fuso Nerini, et al., 2019). Current mitigation pledges fall short of the Paris Agreement's temperature goals of limiting warming below 2°C, leading instead towards at least 3°C of warming by 2100. Limiting warming requires stabilizing atmospheric concentrations of greenhouse gas (GHG) by achieving net-zero global GHG emissions (Honegger, Michaelowa and Roy, 2021) and innovation together with R&D can help reduce these emissions by using more energy-efficient production technologies, changes in fuel mix and the installation of end-of-pipe technology (Omri, 2020).

In agriculture, IoT solutions can monitor environmental and soil conditions, helping farmers decrease production costs and waste and contribute to a more sustainable agriculture by predicting the optimal amount of water and agrochemicals. Innovations for Life Under Water (SDG14) include satellite maps that help track endangered animal migration patterns, monitor oxygen levels, global fish stocks or ocean currents. Innovations for life ON LAND (SDG15) help monitor waterflows, wind patterns, desertification, floods, terrestrial ecosystems and the state of the planet (García Zaballos, Iglesias Rodriguez and Adamowicz, 2019). As climate change related challenges are the biggest environmental problems humanity is facing, a sustainability roadmap needs to be urgently adapted (Mauree, et al., 2019).

Economic growth - According to growth theory, innovation leads to increased technological progress and, consequently, to economic productivity. Moreover, it has been found that a greater number of patents leads to technological progress, which promotes economic growth (Omri, 2020). In addition to this, innovation is closely linked to the company's performance and represents one of the driving forces for a country's economic and sustainable growth. The entrepreneurship literature recognizes that companies that adopt and develop innovations are more likely to thrive in highly competitive environments (Tóth, et al., 2020).

The interconnectivity between SDGs - Achieving the sustainable development requires the complex interaction of environmental, economic and social processes, from local to global dimensions. Investigating the interlinkages among SDGs is key to unlocking their full potential as well as ensuring that progress in one area is not made at the expense of another. Interlinkages can be identified as negative (trade-offs), when improvements in one dimension can constrain progress in another one, or in contrast, positive (synergies), when achieving one target, can also help achieving another one (Eurostat, 2021). It is particularly important to have control over the consumption of natural resources, especially non-renewable ones, and to monitor the state of the natural environment (Yigitcanlar and Teriman, 2015). Researchers claim that the success of a sustainable environmental policy requires first and foremost cooperation between the public and private sectors (Arbolino, et al., 2018).

2. Research methodology

According to specialized literature and to past performed analyzes, innovation seems to be a catalyst for all the other SDGs. In accordance with this idea, this study aims to examine the impact of R&D, as a key component of innovation, on the pillars of sustainable development for the 27 EU states.

Throughout the study, nonparametric correlation methods as well as regression models were conducted using SPSS software (26 version) in order to analyze the interdependencies between innovation, through the research and development component and the variables specific to each pillar - economic, social and environmental. The data for variables refer to the most recent year available for each of them (varying from 2018 to 2021).

The variables belonging to R&D dimension (innovation) chosen for the analysis are R&D personnel and Scientific and technical journal articles, included in the specific indicators corresponding to Goal 9. In order for the indicator related to *Scientific articles* to become comparable, it refers in this paper to the number of scientific and engineering articles published in various fields, divided by the number of researchers in a specific country expressed as per million (World Bank, 2022). *The R&D personnel* data are presented in full-time equivalents as a share of the economically active population and refer to the personnel hired in several institutional sectors: business enterprise, government, higher education, private non-profit (Eurostat, 2021).

The social variable is represented by EU Social Progress Index (SPI) and includes 55 indicators and 12 components, representing a direct metric of social progress. The score is calculated based on a 0-100 scale, with 0 meaning the worst performance, 100 the best (ideal) performance (European Commission, 2022). The economic variable is the *GDP* per capita defined as Gross domestic product at market prices and it has as unite of measure chain linked volumes (2010), expressed in euro per capita (Eurostat, 2021). For environmental pillar, we considered *GHG emissions* per capita, which measures total national emissions of the so-called 'Kyoto basket' of greenhouse gases, including carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and the F-gases, and it is expressed in units of CO2 equivalents per capita (Eurostat, 2021).

Given the proposed specifications, the hypotheses we test in this research are the following:

- #1 The first hypothesis assumes that R&D as part of innovation is a determining factor for social pillar in the EU countries.
- #2 The second hypothesis is affirming that the states with a favourable economic situation are the states which also have a higher level of R&D.
- #3 The third hypothesis assumes that innovation is related to the amount of GHG emissions, so the higher level of R&D as part of innovation, the lower the amount of GHG emissions should be.

3. Results and discussion

This paper is seeking to examine the ability of R&D as part of innovation to influence the three pillars of sustainability, thus leading to economic growth and improved environmental and social conditions. The variables included in the analysis are presented in Table no. 1.

Table no. 1. Descriptive statistics for the variables included in the analysis

Variables	Code	Source
Scientific articles per Researcher - total number of scientific articles divided by the number of researchers engaged in R&D in a specific country, expressed as per million	SAR	World Bank
R&D personnel (% of population in the labour force)	RDP	Eurostat
GDP per capita (euro)	GDP	Eurostat
GHG emissions per capita (units of Co2 equivalent)	GHC	Eurostat
EU-SPI (score from 1 to 100)	SPI	European Commission

Source: made by authors based on research.

According to the analyzed data, the smallest number of articles is registered in Malta (422), though if we are to divide it to the number of researchers engaged in R&D, we can see that the minimum value is registered in Luxembourg. On the other hand, the maximum value for the SAR indicator is recorded by Italy, though in terms of number of articles, Germany and France are in the first positions (with 104 and 71 thousand articles, respectively). The largest *R&D personnel* is in Denmark with 2.1% comparing to 0.4% in Romania which has the lowest number, while the average is a shy 1.2% at the EU level.

Regarding the *GDP*, the lowest value is in Bulgaria, approximately 6690 euro per capita, while Luxembourg has the highest GDP, of approximately 8,6550 euro per capita, followed by Ireland (70920 euro per capita) and Denmark (50200 euro per capita).

It is worth noting that Luxembourg is at the top of the EU states ranking of GHG emissions (20.3 metric tons of CO2 equivalent per capita), followed by Ireland (18.8 metric tons per capita) and the Czech Republic (11.7 metric tons per capita). Sweden (5.2 metric tons), Malta (5.3 metric tons) and Romania have the lowest values (5.9 metric tons).

Concerning the *social progress* level, we see important discrepancies among EU states. Finland, Sweden and Denmark are in top 3 with the highest scores of approximately 82 out 100 all three of them. On the opposite side, Romania has the lowest SPI score with only 47.9, outran by Bulgaria with 50.1, and at a greater distance by Greece (56.5).

Table no. 2. Nonparametric Correlations

			SAR	RDP	SPI	GDP	GHG
Spearman's rho	SAR	Correlation Coefficient	1.000	0.131	-.150	-0.001	-0.171
		Sig. (2-tailed)	.	0.514	0.456	.996	0.394
		N	27	27	27	27	27
	RDP	Correlation Coefficient	0.131	1.000	0.769**	.789**	0.381*
		Sig. (2-tailed)	0.514	.	0.000	0.000	0.050
		N	27	27	27	27	27
	SPI	Correlation Coefficient	-0.150	0.769**	1.000	0.853**	0.355
		Sig. (2-tailed)	0.456	0.000	.	0.000	0.069
		N	27	27	27	27	27
	GDP	Correlation Coefficient	-0.001	0.789**	0.853**	1.000	0.398*
		Sig. (2-tailed)	0.996	0.000	0.000	.	0.040
		N	27	27	27	27	27
	GHG	Correlation Coefficient	-0.171	0.381*	0.355	0.398*	1.000
		Sig. (2-tailed)	0.394	0.050	0.069	0.040	.
		N	27	27	27	27	27

Notes: **. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: made by authors based on own research.

Following the application of the non-parametric correlation analysis, a direct, strong and statistically significant link between GDP and SPI is identified (Tabel no.2). At the same time, innovation, from the perspective of R&D staff, is directly correlated with the variables specific to the three pillars. The results of the regression analysis as well as the correlation results determine the elimination of the variable SAR - Scientific articles per Researcher from the following regression models conducted in order to validate the research hypotheses. The diversity of topics addressed in the scientific articles may justify the lack of correlations between SAR and other variables used in the analysis. In this regard, a future direction of research can be outlined to allow the analysis of the interdependencies between the SAR variable - determined on specific topics for each pillar and specific variables to each dimension of sustainable development.

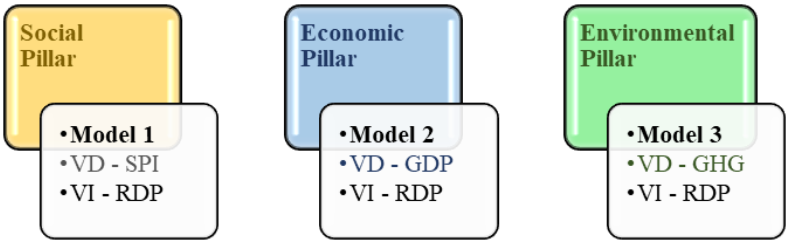


Figure no. 2. Regression models

Source: made by authors based on own research

Thus, for the validation of the research hypotheses, the regression analysis was used having as exogenous variable (VI) RDP - R&D personnel (% of population in the labour force), and as endogenous variable (RV) the specific indicators of each pillar of sustainable development resulting thus three regression models (Figure no. 2). The results of the analysis (Table no. 3) show the validity of the three regression models (sig. <0.05), indicating an influence of innovation, from the perspective of R&D, on the three dimensions of sustainable development, for the 27 states included in the analysis.

Model 1 (Table no. 3) analyzes the regression between research and development as part of innovation and the social dimension. The result obtained validates the first research hypothesis (# 1) thus confirming that R&D influence the social pillar of sustainable development, leading to progress. The positive value of the regression coefficient, indicating a direct link between the two indicators, translates into the idea that the interest shown for the R&D sector is positively correlated with social progress that aims to increase the quality of life.

Table no. 3. Regression results for the three models

Model[a1]		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	48.943	3.111		15.732	0.000
	R&D personnel	14.671	2.348	0.781	6.249	0.000
Model[a2]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
2	(Constant)	-3444.383	7385.549		-.466	0.645
	R&D personnel	25616.105	5573.949	0.677	4.596	0.000
Model[a3]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
3	(Constant)	5.858	1.557		3.763	0.001
	R&D personnel	2.433	1.175	0.383	2.071	0.049

Notes: a1. Dependent Variable: SPI
a2. Dependent Variable: GDP
a3. Dependent Variable: GHG

Source: made by authors based on own research.

Testing the extent to which research and development have an influence on the value of GDP and therefore on economic growth is carried out through the second regression model, which shows that the influence of innovation on GDP is about 70%, which confirms that a high degree of R&D in a state also indicates a high level of economic well-being thus validating the second hypothesis (# 2).

Regarding the last regression model, the focus is on the environmental component of sustainable development. The hypothesis aims to show that R&D leads to a change in the level of GHG emissions. Unlike previous models, the model explains less than 50% the variability of GHG emissions per capita depending on R&D personnel. Although the validity of the model is confirmed, innovation from a R&D perspective does not seem to have a significant influence on the environmental pillar. Moreover, the positive correlation of the two variables indicates an increase in GHG emissions as the level of R&D increases, which dismisses the third hypothesis (# 3). An explanation of this result will be offered in the following rows based on results in other studies from specialized literature.

Recent studies explored the impact of innovation on environmental quality. There are mixed results in terms of the association between innovation and the environment, with a positive, negative or no significant relationship. The heterogenity of findings may be due to the endogenous variables employed, with no clear trend identified for carbon emissions and air pollution (Mongo, Belaïd and Ramdani, 2021).

Although the air emissions intensity of industry has improved since 2013, innovation and developments are rather harmful. For example, in the sector of sustainable transport, new passenger vehicles increased CO2 emissions between 2016 and 2019, having the EU derailing from reaching the 2020 target (Eurostat, 2021). Moreover, the existence of the energy rebound effect should not be ignored. In Xu, et al. (2021) research, it was found that energy output induced by energy rebound effect grow faster in energy-intensive industries, decreasing the carbon emission performance. Innovations may also affect carbon emission performance through urbanization, which can be considered a key factor in the performance of carbon emissions.

While there is no standard method for calculating internet related energy consumption, estimates suggest that approximately 10% of global electricity in 2018 was consumed by ICT. It was found that the carbon footprint of a single Artificial Intelligence system is five times the lifetime emissions of the average car, while the digital economy has a growing material footprint, including electronic waste (UNDP, 2020).

According to Omri (2020) research, the impact of per capita GDP positively contributes to environmental degradation. The magnitudes of 0.094 indicate that a 1% rise in economic growth raises carbon emissions by around 0.1%, confirming that economic growth increases CO2 emissions. In this context, UK economist Nicholas Stern calculated, in his landmark 2006 review, that decarbonisation of more than 3–4% is incompatible with economic growth.

A cornerstone instrument would be *decoupling of economic growth from environmental impacts.* The disconnection between the benefits of economic activity and its costs is not inevitable, but it can be addressed. Decoupling the benefits of economic activity from its costs is essential and its outcome could help put people, societies and nature on the path to sustainable development. The world needs new economic models such as the circular economy with production system that enhance planetary resilience and biodiversity while reducing consumption and waste, ultimately decoupling economic growth from environmental impact. New techniques and substitute technologies help reduce the stress on the global environmental commons (Independent Group of Scientists appointed by the Secretary-General, 2019).

Conclusions

A common agreement of the existing literature is that innovation has a positive impact on the quality of the environment, which is often referred to as a technological effect. Investments in innovation, through R&D, must be made compatible with the environment. In addition, data from the Global Footprint suggest that GDP growth per capita may increase on the long-term CO2 emissions (Mongo, Belaïd and Ramdani, 2021). However, there is no doubt that digital technology is a critical enabler in development. Innovative technologies may ease planetary pressures and advance human development, however, not without associated risks (Omri, 2020).

As a note of caution, inequality contributes to limiting the potential for innovation and increases vulnerability to climate change and environmental threats. A major problem is that development choices are often framed in a set of narrow paths, which ultimately prove to be unsustainable. Therefore, in the face of this complex society, progress must be made in an adaptive quality of learning through practice, fueled by broad innovations and anchored in shared decision-making. Investing in new technologies and their deployment are essential parts of the process, yet embedding them into broader and more fundamental economic and social changes must also be considered. That is why it is important to pursue innovation together with increasing governance and equity.

Although in this paper we looked at the scientific articles in general, which proved not to have a significant influence on our models, in the future studies we will look for the most cited scientific articles, which are more relevant both for their areas of interest, as well as from a practical point of view. Thus, they will become a starting point for identifying policies in a certain field. Likewise, the R&D component itself covers only a small part of the innovation dimension, which is a possible reason why the goodness of fit for the environmental regression model has not been probative. In the future, we will consider an index that integrates more indicators relevant for innovation.

As a closing remark, but with an open ending we can affirm that the transformation towards sustainability must be harmonized with the threats, opportunities and dynamics of the digital transformation, as well as with the goals of the 2030 Agenda.

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The COVID-19 Pandemic and Its Influence on Human Resources

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Abstract

As a result of the Corona Pandemic, the use of digital technologies has increased in importance, favouring the flexibilization of various forms of work such as teleworking and remote working as a substitute for office work (within the Company).
This paper resulted from the analysis of several international studies and my activity as a personnel manager in a multinational company. The aim of the paper is to analyze the current situation of the work process, the ability of managers to adapt in terms of how to lead employees in the current context, focusing on telework and work from home. The following issues will be in the spotlight: use telework and remote working in an intensive way; avoiding the risk of declining employee productivity; changing the work process to ensure the physical and mental health of employees; implementation of the hybrid work system on a large scale; highlighting important trends in human resources and their application in the work process; the current crisis caused by COVID-19 can be used as an opportunity to create more humane jobs.

Keywords

Remote Working, employee productivity, employee motivation, physical and mental health of employees, hybrid work.

DOI: 10.24818/BASIQ/2022/08/085

Introduction. Intensify the use of telework and work at home

Both employees and employers face major organisational challenges. The way of managing employees has changed, so the question arises: will companies continue to use teleworking and remote working intensively? What will the future normality look like, will it be different than in the past?

It is very likely that employees will no longer want to do their work only in the office, that their work will be done in a hybrid way = office + telework + home/remote.

The employee's obligation to work while being present in the company will decrease alternating with working at home, depending strongly on the factors necessary to perform the work tasks. Thus, while taking advantage of the benefits of weekly meetings at work, employees will also take advantage of digital technologies such as online meetings, trying to create a balance between work at the company and remote work so that social life does not suffer.

Post-Corona, a large proportion of companies did not support the idea, or the will of employees to work 'remotely', at home, wanting employees to work entirely at work due to the bureaucratic tradition of strict hierarchical management styles.

An important role is played by the strict separation of work and leisure time, a contrast which in Germany has started to diminish rapidly over the last three years. In countries such as the Netherlands and Finland, 14% of employees usually worked at home, while in Germany only 5% do.

In 2021, in one of the studies carried out by the Hans Böckler Stiftung, in which 6200 employees were regularly questioned, it emerged that many employees with jobs suitable for remote working are required to work at the company's premises. Thus, the percentage of employees who stated "I work exclusively/mainly from home" during the corona pandemic stood at 24% in January 2021. Compared to

the period before the Corona crisis, the proportion of German employees working from home has risen sharply: according to the survey. In the same survey, 71% of those surveyed expect that remote working will continue to be more widespread in the future. Lately a number of companies have introduced in their job descriptions the possibility for employees to work at home at least two days a week.

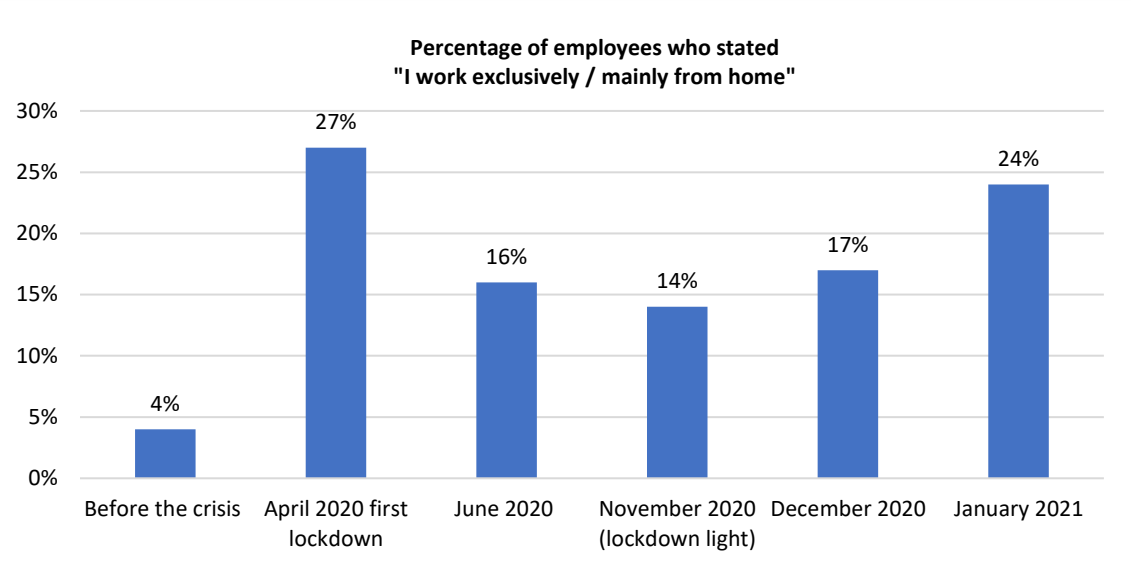


Figure no. 1. Percentage of employees who stated "I work exclusively / mainly from home" during the corona pandemic

Source: Suhr, 2021

1. Avoiding the risk of declining employee productivity

Fear of infection, economic pressure, working from home are a feature of the last two years of the pandemic: companies around the world fear a massive drop in employee productivity, based on the resulting risks to employees' mental and physical health.

Companies can no longer ignore the burden on the psyche to which employees are exposed, an influence that will definitely lead to a drastic reduction in their productivity, a statement supported by the study carried out and published on 30.12.2021 "Risk Outlook 2022" by the International SOS association (study carried out annually). The study surveyed around 1,000 professionals in 75 countries, with the main focus of the questionnaire being employee health (International SOS GmbH, 2022).

2. Changing the work process to ensure the physical and mental health of employees.

Indeed, working at home hides a number of dangers, such as mental overload, loneliness, reduced social interaction, career disadvantages, etc. However, these risks can be avoided by creating clear, transparent work rules that comply with the framework conditions necessary to carry out the work, which is the result of a study in April 2021 carried out by researchers from the Institute for Economic and Social Sciences (WSI) and the Hans-Böckler Foundation's Institute for Codetermination and Corporate Management (I.M.U.). In companies where employees can choose between working at home and at the company's premises, they report positive experiences on working at home. In companies where trade unions have a high degree of decision-making power, on average 77 percent of employees choose home working. Almost half of those surveyed who work from home would like to continue working from home in the future. According to the researchers, this indicates a "high level of satisfaction and openness to working from home, making it a very effective employee motivation tool.

In this context it is found that mothers who work at home invest more time per week in childcare than mothers who cannot work from home. The situation is different for fathers: they work more overtime at home but do not devote more time to childcare (Samtleben, Müller and Lott, 2020).

For companies, health management has gained increasing attention during the pandemic. The study shows that companies need to protect their employees by taking measures that can prevent illness, while also taking into account the psychological stress that employees may be under. More than a third of respondents,

more precisely 36% of those surveyed, expect mental health problems to lead significantly to lower employee performance in 2022 (Abendroth, et al., 2022).

In order to strengthen/enhance "physical and mental health as a result of working at home", Miriam Landes and her colleagues recommend paying particular attention to salutogenic factors: comprehensibility, feasibility and meaningfulness. The sociologist Aaron Antonovsky calls this phenomenon of salutogenesis, which is based on the question "What keeps people healthy?" Antonovsky describes the three factors as follows (Landes, et al., 2021):

- "Comprehensibility: the need for job tasks and goals to be clearly defined and unambiguous;
- Feasibility: tasks are managed according to the respective skills, abilities and resources held;
- Meaningfulness: The job tasks experienced as having a significant role in the overall short, medium and long term context."

The authors of "Working successfully and healthily in the home office. Impulses for employees and teams for successful cooperation" (Landes, et al., 2021) argue that both employees and their managers need to maintain social contact**, teamwork**. In 2005, Google had already defined, as a result of the results of an internal study, the factors that characterise successful teams, which are partly similar to the salutogenic factors for maintaining health. The characteristic factors of successful teams are:

- Psychological safety,
- Reliability,
- Structure and clarity,
- The significance of the work,
- Effectiveness/impact.

Returning to the question of defining the factors influencing employee productivity, Marc-André Weber names the qualitative criteria underlying these factors (Weber, 2021):

Quantitative Input	Qualitative Input
personnel related	**Immaterial**
• Labor costs (incl. costs for leaving and replacing employees) • number of workers • labor recruitment costs • Number of job rotations • Number of job descriptions • overtime • work error	• skills and abilities of employees • employee motivation • employee stress levels • employee satisfaction • qualification offers • recruiting measures • organization structure • workplace design • division of labour • corporate culture
Equipment related	**Material**
• Invested chapter (fixed assets) • IT infrastructure used • IT errors / breakdowns	• number of branches

Figure no. 2. Employee productivity has many influencing factors

Source: Weber, 2021, p. 18

3. Implementation of the hybrid work system on a large scale

Companies can no longer afford to impose a culture of doing the job only at the company premises. Restoring the old "status quo" system would not be plausible and is no longer feasible. "The New Work" must

be adapted to the new demands, situations, opportunities occurred during the Covid 19 pandemic. Employees are no longer willing to commute daily from home to the company's premises, with both lost personal time and transport costs being two factors that cannot be ignored. The will to have more free time, to save on transport costs, to have some flexibility in terms of time-sharing for job tasks is already playing an important role.

Companies can no longer impose a 'face-to-face' culture, rigid working methods without losing their attractiveness. The lack of skilled workers, the demographic changes, etc. are forcing employers to offer hybrid, i.e. flexible working models such as home working. It is precisely in the case of these models that employers in Germany fear losing control over their employees. This fear must be countered, precisely because it is unfounded, because if an employee fails to perform the duties of his/her job regardless of where he/she works, the results can in any case be evaluated. However, managers who have previously assumed that whoever is in the office is working and whoever is not there is not working, have probably paid little attention to the actual productivity of employees before.

The term "REMOTE" comes from English and could translate to "remotely". Therefore, the term "remote" in this context means remote working. Companies that are fully geared towards remote working often do not have a central office. Work is therefore decentralised and does not necessarily take place in the home office, but also, for example, in other places, in the park or elsewhere.

But what are the requirements for an effective remote working? Among the most important requirements are the following:

- A connection to the World Wide Web (internet) is essential,
- The working environment (location) must fully meet the job requirements,
- The tasks must be able to be performed entirely online,
- Internal communication within the company must be well-defined, precise and effective, etc.

But what are the advantages and disadvantages of remote working?

Following the compilation and evaluation of several studies from Germany, Norway and the USA, PhD Beatrix Behrens and Prof. Lutz Bellmann were able to draw conclusions for the benefit of modern HR work by defining the advantages and disadvantages of remote working.

In many countries, the proportion of employees working from home increased during the first Covid-19 pandemic wave. While 12% of employees in Germany worked from home before the pandemic, this proportion had increased to 35% during April 2020 (Steffgen, 2021).

Remote working is arguably one of the most coveted employee benefits of this time, and those who offer this work model collect plus points in terms of company branding.

Some of the biggest **advantages** of telework include:

- Global talent pool - Opportunities are no longer tied to a specific location, which means the employee can be working from any corner of the world, being able to join and integrate into the team without the stress of relocation and complex onboarding programmes.

- Less stress, higher productivity - the commute to work costs many employees several hours a day and also leads to stress and reduced productivity. With remote workplaces, the commute to work is usually eliminated completely and allows for a much more relaxed approach to completing tasks, the employer is more relaxed, leading to significantly improved productivity,

- A better work-life balance for employees,

- Resource savings - everyone who does not have to maintain an office space, saves a lot on rent, electricity, heating and maintenance costs, and can invest in other essential areas of the company - such as employee health and ergonomic equipment in their remote workplaces,

- Beneficial for the planet's environment - remote working completely eliminates increased CO2 emissions in many ways - whether through high electricity consumption, waste or commuting between home and office, making it one of the greenest working patterns during the day,

- Employee risk of exposure to infection - by avoiding contact with the team, the employee can no longer infect themselves, or others at work.

Among the biggest **disadvantages** of remote working are:

- Not suitable for every job
- Difficult onboarding
- Complicated team building
- Complicated communication between employees,
- Feelings of isolation among employees,
- Distraction by external influences (e.g. separation of work and free time becomes much more difficult and can decrease concentration and work productivity quite a lot when employees have children, or do not have a room exclusively used for work, etc.).

4. Important trends in human resources and their application in the labor process

In 2022, HRM needs to provide answers on how trust, cohesion, motivation and the will to perform can be created and maintained within teams, even when working from home, or applying hybrid forms of work (McKinsey, 2020).

Hybride work

Hybrid work gains 'ground' - In a hybrid work environment, mobile and office work are combined.

Is hybrid work ideal? It also has advantages and disadvantages:

advantages	disadvantages
• High flexibility and self-determination (eg division of working time without being dependent on the manager), **• Higher labor productivity,** **• Lower office costs,** **• Onboarding possible at the office,** **• Lower risk of infection,** **• Reduced travel costs for employees.**	**• Risk of exhaustion (example: non-compliance with breaks)** **• Increased dependence on technology, high requirements, costs for software and hardware, data security is difficult)** **• Costs caused by redesigning the look of the office to meet the needs of employees** **• Some tasks cannot be performed at home** **• Teamwork can be difficult** **• Separation from work is no longer strict**

Figure no. 3: Hybrid Work, advantages and disadvantages

Source: author, own depiction

Employee experience

Redefined with COVID-19, the concept of employee experience has moved towards life experiences that are not tied to an office or the physical presence of a team in the company premises. A recent McKinsey report states that in 2021 companies will focus on building leadership and trust among employees (McKinsey, 2020).

Upgrading/improving employee skills (Upskilling)

This method has been the focus of HR for some time. A survey conducted by Udemy (UDEMY, 2020) notes an increase in the need for upskilling from 14% in 2019 to 38% in 2020.

Employee upskilling/upgrading has developed into one of the most important trends in HR, helping HR managers reduce fluctuation, retain employees, boost morale and reduce the costs invested in recruiting and onboarding.

The past year has brought challenges such as mass layoffs, an increased number in sick leaves and the widespread practice of remote working. To remain agile and adapt to market challenges, many companies have taken major steps to improve the skills of their employees and keep them competitive in the labour market. One example of the importance of employee upskilling is the consulting firm Pricewaterhouse-Coopers (PwC), which has spent $3 billion on training its employees.

Digital analysis of HR databases

The presence of recruitment automation tools, AI-based technologies, screening tools make the company more attractive

Diversity, equity and inclusion (DEI)

The diversity of the workforce has become very high. Organisations recognise the impact of diverse teams (e.g. diversity given by teams with employees coming from different corners of the world) on business innovation, profitability and team morale. In fact, companies with a highly diverse workforce report up to 19% higher sales than companies with less diversity.

5. The current crisis caused by COVID-19 may be an opportunity to create more humane workplaces

The answer is clear: Yes, it can be an opportunity for a more humane workplace. We have become more sensitive, more concerned about the health of those affected or at risk, the continuing spread of the virus, the economic impact and the effects of social isolation. However, at the same time, the experience of working remotely, the much greater use of digital communication tools are bringing about positive changes in the way we socialise, interact as a team, etc. By working from home, taking part in meetings using digital software (Teams, Zoom, Skype, etc.) we unconsciously allow our work colleagues to take part in our private lives. This openness makes us more understanding and empathetic towards each other. People we used to communicate with only on the phone, we now see during online meetings. We try to emphasise trust rather than control, thus becoming more independent in performing the job tasks.

Conclusions

Employee development in today's working world does not stop at HR departments with cost-saving self-service for administrative processes, followed by outsourcing or offshoring. The HR department as an archivist and source of information has had its day. Tasks such as succession and career planning, personnel development or talent management: the tasks are becoming a very important part of the direct relationship between managers and employees that can no longer be ignored.

The existence of companies will largely depend on their policy, their openness to adapt to the requirements of the current situation in the field of work, the ability to maintain and promote managers who will not return to old habits, managers able to apply certain practices used in a state of emergency, methods proven to have positive influences on the effectiveness of employees' work.

Managers will need to maintain these changes behaviourally and mentally, being forced to master the “Alpha Intelligence” skills set, defined by Institut für Führungskultur im digitalen Zeitalter (IFIDZ), Frankfurt, together with Frankfurter Allgemeine Zeitung Institute (F.A.Z. Institut), namely the three competency domains (Institut für Führungskultur im digitalen Zeitalter, 2015):

- personality intelligence,
- relational intelligence,
- digital intelligence.

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Implementing SDGs for Sustainable Tourism Development

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Abstract

Tourism plays a key role in development and in the economy redistribution, but also generates negative effects. Its impact concerns environmental pollution, increased demand for fossil fuels and energy intensity (Katircioglu, 2014). In the year 2015 there was a strategic turning point for global development and tourism, as governments of many countries have adopted the Sustainable Development Goals (SDGs) in their national development policies. The SDGs correspond to the 17 Sustainable Development Goals of the 2030 Agenda. This research provides some indicators connected with the assessment of the sustainability of the tourism sector in some targets of 8 and 12 SDGs. This study aims to identify effects and opportunities for tourism industry on the economy at global level starting from an analysis in terms implementation of some sustainability tools in tourism industry at country level. Thus, we covered a structured methodological path that consists of an overview of the implementation of the measurement standards, particularly referring Tourism Satellite Accounts (TSA) and System of Environmental-Economic Accounting (SEEA). This assessment, based on international standards, ensures the international comparability of values between countries and time periods. The results show that the tourism industry is receiving particular attention from countries, but there is a need for greater awareness at local level in the communication of the instruments implemented and the levels of sustainability achieved. This framework aims to become a structured instrument for private and public stakeholder who analyze tourism according to the three dimensions of sustainability (economic, social and environmental).

Keywords

Tourism, Sustainability, SDGs, TSA, SEEA.

DOI: 10.24818/BASIQ/2022/08/086

Introduction

The Sustainable Development Goals (SDGs) correspond to an interdependent structure of 17 goals and 169 targets (Figure no. 1) ratified in September 2015 by 193 countries under ONU in the Resolution 70/1 (UN, 2022). The aims of this indicators are to measure the progress globally towards for a long-term sustainable and inclusive development, focusing on inclusivity, shared prosperity and shared responsibility (ONU, 2015).

According to 2030 Agenda, ONU countries "are also determined to promote sustainable tourism, to tackle water scarcity and water pollution, to strengthen cooperation on desertification, dust storms, land degradation and drought and to promote resilience and disaster risk reduction".

For this reason, Goal 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" contains 8.9 target that aims to "devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products".

Instead, Goal 12 with the caption "Ensuring sustainable consumption and production models" and the target 12.b provides the implementation of tools to monitor the impacts recorded by tourism in terms of job creation and promotion of culture and local products (ONU, 2015).

With the income growth in some developing countries, tourism has achieved surprising growth despite the global economic crisis (Wang, 2014), net of the blockade recorded in this pandemic period due to Covid-Sars 19.

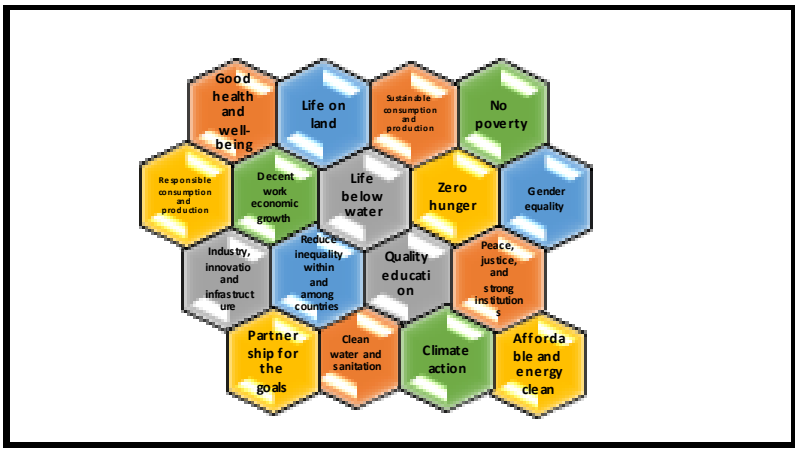


Figure no. 1. Interdependent view of the Sustainable development Goals (SDGs) of Agenda 2030
Source: Authors' elaboration on data United Nation (2017)

Therefore, this paper deals with the framework for measuring sustainable tourism development using some indicators and their potential application in some global destinations.

It aims to provide also an empirical note that focuses the interdependence relationship between tourism and sustainable development, in order to observe the effects of tourism on the policies adopted by countries and included in the SDGs (United Nation, 2017).

1. Review of the scientific literature

Globally, the positive economic effect of the development of the tourism sector has also been confirmed by other recent studies. Other authors, on the other hand, have highlighted the lack of a univocal approach to assess the impact of the development of entrepreneurial innovation in the tourism sector with respect to the macro indicators of the countries, especially in terms of achieving sustainability objectives (Azivov, 2021).

Therefore, a mission of the SDGs is to support the economic, social and sustainable growth of territorially balanced regions such as Romania and other Eastern European countries, for example, in order to reduce the economic and social disparities between the regions of Eastern Europe (Manole and Tache, 2015).

Finally, seven years after the Declaration of the United Nations 2030 Agenda, tourism still does not have sustainable and open-source management criteria that allow them to *"walk the talk"* to contribute to the SDGs (Rubio-Mozos, Garcia-Muina and Fuentes-Moraleda, 2020).

However, the positive contribution of tourism to sustainable development and mitigation of potential negative effects in the economy can be exploited by activating strong partnerships and decisive action by all actors in the supply chain in line with the 2030 Agenda. It should not be forgotten that the sustainable development of tourism is commonly measurable using sustainable development indicators (Gucik and Marcis, 2018). To analyze the application of the frameworks to measure the role of tourism, in some studies the Delphi method is used, which makes use of a panel of experts. On this basis, the last study analyzed the objectives that focus attention on the creation of decent employment, economic growth (O8) and gender equality (O5).

In the existing literature there are only a few studies (about forty) aimed at estimating the ability of countries and, especially of emerging ones, to implement every tool associated with the sustainable development goals, also demonstrating how they are achieving the levels envisaged in these goals (State et al., 2019).

2. Research methodology

Considering that the UNWTO (2022) elaborated the values of two indicators of the SDGs, we have analyzed the implementation of the indicator 12.b.1 (Figure no. 3) in the world countries, "Implementation of standard accounting tools to monitor the economic and environmental sustainability of tourism".

Starting from Goal 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all", with the Target 8.9 (Figure no. 2), that invites "By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products", the Indicator 8.9.1 is based on Tourism direct GDP indicator, measured in proportion of total GDP and in growth rate of a given country.

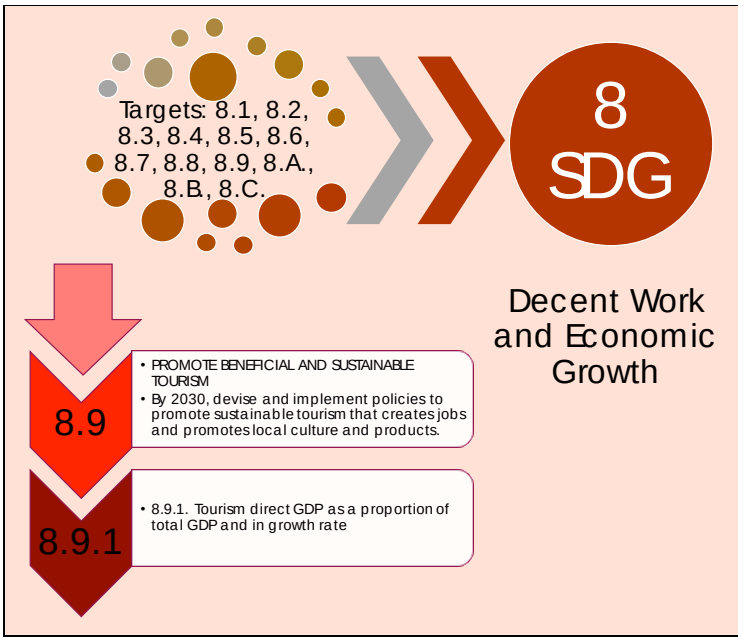


Figure no. 2. Targets and indicators of 8 SDG
Source: Authors' elaboration on data SDGs (2021)

Furthermore, the indicator 12.b.1 (Table no. 3) focused the "Implementation of standard accounting tools to monitor the economic and environmental aspects of tourism sustainability" (UNWTO, 2021) and covers the implementation of standards for measuring the environmental aspects of tourism.

In this context, the UNWTO also collects information on the total number of relevant accounts from the Economic and Environmental Accounting System (SEEA) being compiled for the reporting year.

The SEEA accounts analyzed are water flows, energy flows, greenhouse gas emissions and solid waste accounts. Hence, we made observations for Indicator 12.b.1, concerning the implementation of standard accounting tools to monitor the economic and environmental aspects of tourism by world countries in the period 2016-2019 UNSTATS (2022). The queries system regarded data from the Tourism Satellite Account tables and Economic and Environmental Accounts System tables.

Particularly, scores from 0 to 7 were given to the economic aspect of tourism sustainability, where 0 corresponds to no implementation and 1 to 7 to the kind of Tourism Satellite Accounts (TSA) adopted (UNWTO, 2010). As regards to the environmental issue of the tourism sustainability, scores are in the range 0-4, where 4 indicates that all SEEA accounts considered and above mentioned are filled in for the reporting year (UNSTATS, 2022).

3. Results and discussion

We recognized 613 observations for the Indicator 12.b.1, concerning the period 2016-2019 UNSTATS (2022), focusing the different types of accounting models adopted by 156 different world countries. In the "TSA account" columns we have provided data on the evolution of virtuous countries (Table no. 1), over four years and in terms of the sustainability tools implemented. The aim is to monitor the sustainability issue associated with the tourism sector globally from an economic point of view.

For the Tourism Satellite Account (TSA) we provided an evaluation in terms of kind of TSA considered by a single country in Table 4. However, in 2019, 78% of 156 countries analyzed that haven't communicated the adoption of TSA and 89% of these that haven't considered information for Economic and Environmental Accounts System (SEEA).

The countries that consider this indicator are Australia, Belarus, Bermuda, Botswana, Brunei Darussalam, Canada, Colombia, Costa Rica, Czechia , Denmark, Ecuador, Guam, Hungary, Japan, Jordanian, Lithuania, Kazakhstan, Malaysia, Luxembourg, Philippines, Portugal, Puerto Rico, Qatar, Romania, Slovakia, South Africa, Spain, Thailand, Uganda, United Kingdom and USA.

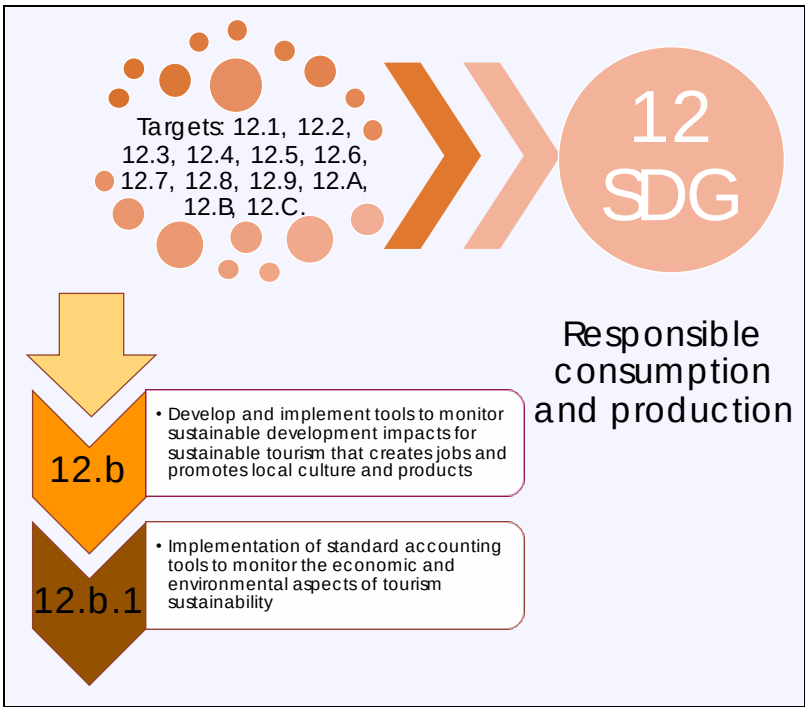


Figure no. 3. Targets and indicators of 12 SDG
Source: Authors' elaboration on data SDGs (2021).

Furthermore, in terms of Economic and Environmental Accounts System (SEEA), we provided an evaluation al the level of water consumption, energy use, GHG emissions and solid waste.

This analysis highlights that there are still few tools implemented to assess the impacts on tourism in terms of water consumption, energy, GHG emissions and solid waste produced. It is pointed out that not all countries with TSA also have SEEA too because awareness of environmental impacts is lower than that of economic accounting.

Generally, in most cases, the countries confirmed the same TSA in the 4 years analyzed (e.g. Australia, Colombia and Salvador). Whilst, over the years, some countries (e.g. Australia, Colombia and Germany) changed the associated information of SEEA, demonstrating a slight evolution in this sense.

Other countries, like Sierra Leone, on the other hand, are careful with sustainability information and have not adopted TSA, or Switzerland which focused only on economic data.

The significance of TSA is revealed by the fact that they are included in the national bank account structure, which provides a consolidated view of the government's cash resources. SEEA, on the contrary, is an indicator that organizes environmental and economic data in an integrated way to produce useful information for defining public policies for sustainability.

However, there is a large negative impact of tourism development on host communities (Sheng and Tsui, 2009; Wise, 2016). The investor advantage in tourism may outweigh the interest of communities and some public works may respond more to the needs of tourists than to local residents (Al Haija, 2011)

Table no. 1. Accounting tools implemented in the different virtuous countries of the world

	Geographical area	ACCOUNT TSA				ACCOUNT SEEA			
		2016	2017	2018	2019	2016	2017	2018	2019
Virtuous countries	Antigua and Barbuda	1	1	1	1	0	0	0	0
	Argentina	6	6	6	6	1	1	1	1
	Australia	7	7	7	7	4	4	3	3
	Austria	6	6	6	0	2	2	1	0
	Bahrain	0	7	7	0	0	0	0	0
	Belarus	7	0	7	0	1	1	1	1
	Belgium	6	0	0	0	2	2	2	0
	Bermuda	7	7	7	7	0	0	0	0
	Bhutan	0	0	0	3	0	0	0	0
	Botswana	7	0	0	0	0	0	0	0
	Brazil	3	3	3	3	1	1	0	0
	Brunei Darussalam	7	0	0	-	0	0	0	-
	Bulgaria	4	4	0	0	2	2	2	0
	Canada	7	7	7	7	2	2	0	0
	Chile	5	5	5	5	0	0	0	0
	China, Hong Kong	5	5	5	2	1	1	1	1
	China, Macao	4	4	0	-	0	0	0	-
	Colombia	7	7	7	7	4	4	3	0
	Costa Rica	7	7	0	0	2	2	0	0
	Croatia	6	0	0	0	4	4	4	3
	Cyprus	0	0	0	0	2	2	2	0
	Czechia	7	7	7	7	2	2	2	0
	Denmark	7	7	7	0	4	4	3	1
	Ecuador	7	0	0	0	0	0	0	0
	El Salvador	5	5	5	5	0	0	0	0
	Estonia	0	0	0	0	2	2	2	0
	Fiji	0	0	0	0	3	3	3	3
	Finland	5	5	5	0	2	2	2	0
	France	3	3	3	0	4	3	1	0
	Germany	0	0	0	0	3	2	2	0
	Greece	0	0	0	0	1	2	0	0
	Guam	7	0	0	0	0	0	0	0
	Guatemala	0	0	0	0	4	4	4	-
	Honduras	6	6	6	-	0	0	0	-
	Hungary	7	7	0	0	2	2	2	0
	Iceland	5	5	5	3	2	2	2	0
	Indonesia	6	6	6	6	2	2	2	0
	Ireland	0	0	0	0	2	2	2	0
	Israel	5	5	5	0	0	1	0	0
	Italy	0	7	0	0	2	2	0	0
	Jamaica	4	4	4	0	0	0	0	0
	Japan	7	7	7	0	0	0	0	0
	Jordan	7	0	0	0	0	0	0	0
	Kazakhstan	7	7	7	0	2	2	2	0
	Lao People's Democratic Republic	2	2	2	2	0	0	0	0
	Latvia	5	5	0	0	2	2	2	2
	Lithuania	7	7	7	0	2	2	0	0
	Luxembourg	7	0	0	0	3	3	3	0
	Malaysia	7	7	7	7	0	0	0	0
	Maldives	1	1	1	-	0	0	0	-
	Malta	0	0	0	0	2	2	2	0
	Martinique	1	1	1	1	0	0	0	0
	Mauritius	0	7	0	0	0	0	0	0
	Mexico	7	7	7	7	3	3	3	3
	Monaco	0	0	0	0	4	4	4	3
	Mongolia	0	0	0	0	1	0	0	0
	Morocco	6	6	6	6	0	0	0	0
	Mozambique	6	6	6	6	0	0	0	0
	Myanmar	1	1	1	1	0	0	0	0
	Namibia	2	2	0	0	0	0	0	0
	Netherlands	5	5	5	5	4	4	4	1
	New Zealand	6	6	6	4	1	1	1	0
	Norway	6	6	6	0	2	2	2	2
	Oman	6	6	6	6	0	0	0	0
	Palau	2	2	2	-	2	0	0	-
	Philippines	7	7	7	7	1	1	1	1

	Geographical area	ACCOUNT TSA				ACCOUNT SEEA			
		2016	2017	2018	2019	2016	2017	2018	2019
Virtuous countries	Poland	0	0	0	0	4	2	3	0
	Portugal	7	7	2	0	2	2	2	0
	Puerto Rico	7	7	7	6	0	0	0	0
	Qatar	7	7	7	0	0	0	0	0
	Romania	7	7	0	0	2	2	1	0
	Russian Federation	0	0	0	0	2	2	1	0
	Samoa	0	0	0	0	2	1	0	0
	Serbia	0	0	0	0	1	1	1	0
	Sierra Leone	3	0	0	0	4	4	4	4
	Slovakia	7	7	0	0	2	2	2	0
	Slovenia	0	7	0	0	2	2	2	0
	South Africa	7	7	7	0	2	1	0	0
	Spain	7	4	4	0	3	3	3	1
	State of Palestine	4	4	4	0	0	0	0	0
	Sweden	5	6	6	6	2	2	2	1
	Switzerland	0	0	0	0	2	2	2	0
	Thailand	7	7	7	7	0	0	0	0
	Togo	0	0	0	0	0	4	0	4
	Turkey	0	0	0	0	2	2	2	0
	Uganda	7	0	0	0	0	0	0	0
	United Kingdom and Northern Ireland	7	7	0	0	2	2	2	0
	United States of America	7	7	7	0	0	0	0	0
	Uruguay	5	5	5	5	0	0	0	0
	Uzbekistan	3	3	3	3	0	0	0	0
	Vietnam	5	5	5	5	0	0	0	0

*Notes: *nature of data: Country data; *reporting type: Global and from 0 to 7= Tables of account*
Source: Authors' elaboration on data UNSTATS, 2022

Conclusion, future, and practical implication

The results suggest that, in general, the 27 EU member countries show better values for the sustainability indicators associated with employment and the wage gap. This study urges for improved tourism research to provide greater support for sustainability policies and businesses. Through this interdisciplinary approach, a replicable analytical methodology was provided to judge different objectives and criteria for making decisions in sustainable tourism development and achieving the sustainability levels contained in the SDGs.

This study also provides an alternative way to address the problems of (non) sustainability useful for formulating future tourism policies, better management of tourist destinations for tourism stability and sustainable development. Per capita GDP highlights economic growth, and it is also the main trigger for tourism. It is also necessary to raise awareness of the sustainability of tourism businesses and public administrations with the aim of reviving stable and decent employment, reducing the current wage and gender gap.

The role of well-developed countries is significant because these territories attract tourists and generate significant profits from tourism development. However, these countries also generate a high volume of CO_2 emissions, ecological risks, pollution that affect local communities and tourism development.

This critical information sheds light on future growth in tourism relative to the national greenhouse gas inventory and establishes the required mitigation trajectory for destinations to move onto a sustainable emissions pathway.

Furthermore, if political measures are not put in place to also reduce the incidence of conflicts, economic growth in these countries could suffer setbacks and affect the achievement of the SDGs.

In conclusion, through this study, we invite governments and public decision makers to pursue possible technological installations to further increase the use of renewable energy and the use of green services in their tourism sector. Finally, the study supports reflective community participation, according to a bottom-up approach, along with national and local institutional changes in order to achieve a significant impact on the performance of community-based partnerships.

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An Overview of Computer Assisted Learning Systems in Computer Science

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Abstract

Having the pandemic restrictions applied almost worldwide (including Romania), the educational system was necessary to be changed, so all activities have moved online. The main objective of this paper is to highlight the importance of eLearning tools and propose two methods that can assist students during their educational process. Both methods are inspired by the Computer Assisted Learning System (CALs) literature, and they are based on the student's behaviour analysis and providing adaptability to it. The first component is an example of a Computer Adaptive Test System (CATs) which was built using the Item Response Theory (IRT) methodology and its scope is to help students to find what is their understanding level for a subject and to answer questions which are corresponding to their current learning progress. Furthermore, a lot of research suggests that testing your knowledge right before you start learning can improve your performance during the exam itself, more so than if you used the same time to read the subject. The second component that we propose is a users' recognition system which has the objective to identify if a student is cheating during an exam from the way he/she is typing. The key for this type of system is to define an algorithm that compares the keystroke dynamics. Overall, this study contributes to the scientific literature by revealing mechanisms for adapting to user behaviour and the positive effects that occur using this type of application.

Keywords

eLearning, CALs, CAT, assisted, adaptive, keystroke dynamics.

DOI: 10.24818/BASIQ/2022/08/087

Introduction

During the last decade, the interest in various CALs (Computer Assisted Learning System) has increased and now, going throw the pandemic restrictions, schools are more using online platforms which are integrated with learning resources tools for audio, text, video as well as chat, forum discussions, email, and assessments tools (Mtebe and Raisamo, 2014). Thus, the eLearning method is more complex than traditional one, since it is not restricted by time and space, however one does not exclude the other. In fact, both methods could lead to a positive and better result. The student profile is a portrait analysis based on big data and labelling. The scope is to collect, process, and analyse the data generated by the students' behaviours. According to the theory of behavioural psychology, the use of the student's profile to analyse the data on student's behaviour can reflect the student's characteristics and psychodynamics (Liang, et al., 2017).

This research proposes two ways of building a computer assisted learning system. The first one is an adaptive assessment based on the students' responses and feedback. The second one is an anti-cheating solution because it is concentrating on validating the user's identity during the exam by comparing it with his profile during the seminar activities. The structure of this paperwork is systematized into five sections. The second section is a literature review dedicated to the proposed two methods of Computer Assisted Learning. The third section establishes the methodological framework. The fourth section presents the proposed solutions and highlights results and discussions. The fourth section draws the conclusions.

1. Review of scientific literature

A computer assisted learning system (CALs) can be viewed as an adaptive learning system, because one of the requirements is to change its actions and provide learning content and methods for every student corresponding to their level and behaviour. These types of eLearning platforms should focus on the personalized and adaptive learning style of learners rather than just content delivery (Rani, Nayak and Vyas, 2015). Thus, we can say that user modelling system is the kernel of an adaptive learning system (Nguyen, 2014).

Adaptive testing algorithms, also known as CATs (Computer Adaptive Tests) or CAAs (Computer Adaptive Assessments), have a relatively recent practical implementation, but it seems that the number of uses is increasing significantly in the United States compared to the rest of the world. This type of assignment is different from one student to another, because it is adjusted based on their abilities and knowledge (Molins-Ruano, et al., 2014). Pluralsight has become a well-known company through its testing algorithms, which has improved a lot over time. These algorithms are based on the CAT principle, more precise the test changes in a dynamic way depending on the answers that the tester offers (Figure no. 1).

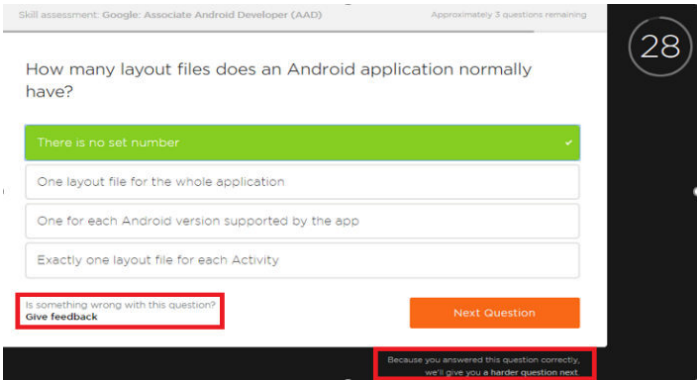


Figure no. 1. Pluralsight test
Source: Pluralsight, 2022.

From another point of view, not only could learning or testing be adaptive, but plagiarism testing methods could also be adapted based on user's typing behaviour. For example, Microsoft offers the opportunity for any student to take the exam at home, but only under certain conditions. First, the candidate is obliged to install on his/her computer a Microsoft licensed system through which he/she can take the exam. This system blocks access to any other applications and documents on the computer, leaving only the exam available. At the same time, the system creates a video conference with a supervisor and the candidate is obliged to keep the camera and microphone on during the entire session. Thus, a supervisor is responsible for verifying each candidate does not use alternative sources to cheat. This type of approach used by Microsoft cannot be implemented also in the education system due to the unequal ratio between the number of students and the number of teachers.

A part of high education institutions is paying attention to remote proctoring technologies, but they are also considering using an application which validates the keystroke dynamics of the user. For example, TypingDNA is a Romanian start-up, and their concept is about how to identify a person based on their typing signature. Their algorithm works with a minimum of 4 characters to over 100 characters and it uses two methods. One method can be used for different texts (any text pattern) and the other method has the condition that texts need to be identical, even if there could exist some typos that the users will correct. Also, the longer the text is, the better the algorithm works, by avoiding getting a high false acceptance/rejection rate.

2. Research methodology

Our research objective is to perform an analysis of literature in the field of computer-assisted education. We chose to study two main branches: adaptive testing and typing behaviour analysis during exams. Our motivation was that there is no complex product on the market that encompasses multiple functionalities to support computer-assisted education. Thus, between 2018 and 2019, our focus was to implement a solution for adaptive testing, which could be used by students for accelerated learning. This type of testing is not intended to create a ranking of student grades, but it is used by students to observe their level of learning by testing. During 2020-2021 our goal was to implement an anti-cheating solution for online evaluation. The scope was to observe how a student is typing during the exam and to compare this behaviour to the previous three seminars.

3. Results and discussion

3.1. Proposed solution for the adaptive online assignments

We took the scenario where the test contains only 20 questions, and where these questions are grouped according to their difficulty: low, medium, or high. The requirements are that the professor must create at least one subject that students can access and within that subject, the professor must introduce at least 10 questions of medium difficulty, at least 17 questions of low difficulty and at least 17 questions of high difficulty. Even though the difficulty of the question is set by the professor, the system is also recording how the students are answering every question and it is classifying again the questions using the number of correct and wrong answers. The adaptive assessment algorithm can be defined by the following schemes (Figure no. 2, Figure no. 3):

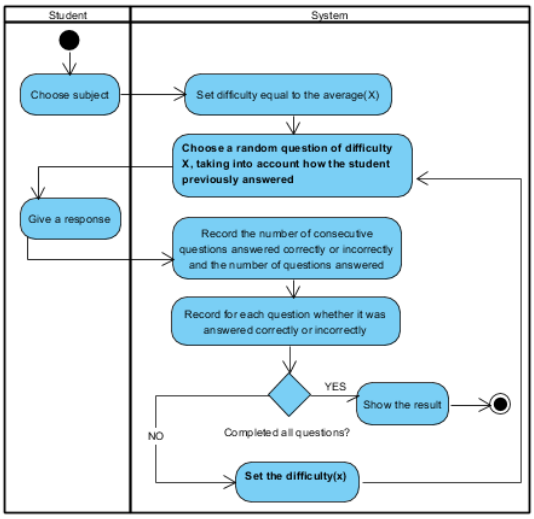


Figure no. 2. Activity diagram for performing the test
Source: Diagram implemented based on the algorithm created

The principle, on which this algorithm is based on, is recursion, as it can be seen in the diagram above. The first step that a student must take is to choose the subject from which he/she wants to be tested. Once chosen, the system will look for a medium difficulty question and set it as the starting difficulty. Subsequently, if the student answers the questions, the system will execute the function until the student has completed all the questions in the test (e.g., 20). The next step is to change the difficulty of choosing the next user-appropriate question. If the student answered three consecutive questions correctly in the current difficulty, then the difficulty will be increased, otherwise, if the student answers three consecutive questions incorrectly, then the difficulty will be reduced. If the student does not meet the above conditions, the difficulty is kept at the same level. The last step in each iteration is to search for the next question. In this case, the difficulty for the student will be considered as follows:

a) If the student has three consecutive correct answers, the next question from a higher difficulty will be chosen at random, but it will be a question that more than 70% of the students knew how to answer correctly. If there is no question with a percentage above 70% in that category, one with a percentage between 30% and 70% will be randomly searched. Otherwise, a question will be chosen at random.

b) If the student has three consecutive wrong answers, a question with a lower difficulty will be chosen at random, at the same time considering that it is a question to which more than 70% of the students knew how to answer correctly. As in the previous case, if no questions are found, the next 30% -70% difficulty range will be searched. If it is still not found then, a question will be searched randomly from the new difficulty category. The same algorithm from point a) applies.

c) If there are two consecutive wrong answers, then the difficulty will be kept, a question will be looked for which over 70% of the people knew how to answer. If none are found in that range, it will be searched in the range of 30% -70%. If it is found, then that question will be returned, and if not, a question of that difficulty will be chosen at random. The algorithm from point a) will be applied.

d) If the student has two consecutive correct answers, the difficulty will be kept, but the algorithm will try to find a more complicated question, by the simple fact that it will look for a question to which more than 70% of the people answered incorrectly. If there are no questions that meet these requirements, then

one with a 30% -70% error rate will be searched. If it is found, it will be returned, otherwise a random question will be chosen with that degree of difficulty.

e) If the student has the consecutive wrong and correct answers equal to zero, then it will proceed as in the previous case from point c).

f) If the student has only one correct answer or only one wrong answer, then the algorithm will randomly extract the next question from the same difficulty, but with the percentage of correct answers in the range of 30% -70%. If no question is found that satisfies this condition, one is chosen by the random function.

If the student has passed all the questions, then the results during the test will be recorded and displayed. A very important aspect of the adaptive assessment algorithm is how the level is determined. We decided after some analyses performed on other specialized tests as IRT (Item Response Theory), that this algorithm distinguishes four levels of knowledge, namely: beginner, intermediate, upper-intermediate and advanced (Abdullah, 2003). In this case, to be able to estimate for each student where he/she is situated in terms of knowledge, the Levels values for that student are extracted and interpreted after an analysis carried out following some possible case examples. For example, if a student answers all the questions correctly, he/she deserves the title of "advanced", having at the end more correct than wrong answers for the questions of medium and high difficulty. Conversely, if a student makes a mistake in all the questions, he will have more wrong than correct answers to all the questions of medium and low difficulty, and his level can be classified as "beginner".

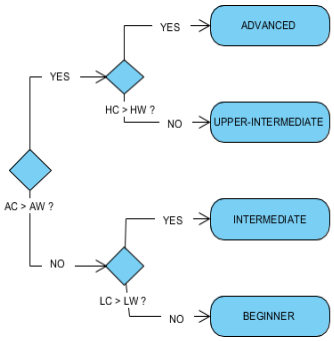


Figure no. 3. Student level determination diagram

Notes: AC = number of correct answers the student gave to each medium difficulty question; AW = number of wrong answers the student gave to each medium difficulty question; HC = number of correct answers the student gave to each question of high difficulty; HW = number of wrong answers the student gave to each high difficulty question; LC = number of correct answers the student gave to each low difficulty question; LW = number of wrong answers the student gave to each low difficulty question.

Source: Diagram implemented based on the algorithm created

In the end, an indicative score is calculated from all the questions that the student answered correctly, considering that a low difficulty question has 5 points, a medium difficulty question has 10 points, and a high difficulty question has 15 points.

The result of such an application can be seen in communication between students and teachers. The experience that the user (student) has during the evaluation is a better one by the simple fact that he/she receives only questions relevant to his/her level of knowledge. At the same time, the adaptive tests are more advantageous than the traditional tests, because the student's answers will be considered during the evaluation, the result being a much more concrete and precise score.

3.2. Proposed solution for online evaluation

The main objective of this system is to analyse the student's typing behaviour in order to authenticate him/her only under certain conditions. This system describes a product that can be used during class hours as an IDE (Integrated development environment), where programs can be written in a programming language (e.g., JavaScript). Considering everything presented so far, before using this application, it is necessary to meet the following requirements:

- The professor needs to create a session which can be a seminar, or an exam and the students can access it using a password that is generated by the system.

- Each student needs to participate in a minimum of three seminars in order to be eligible to take the exam.

- The professor needs to close each session at the end of each class hour. Otherwise, the students can continue to write the code, which could affect the results.

If all these requirements have been met, then the student can take the exam, and at the end he will receive an analysis based on the way he/she typed, compared to the way he/she used to type during the seminars (Douhou and Magnus, 2009). In order to analyse the identity of a user, it is mandatory to compare two types of profiles: "training profile" which is created during the seminar and "test profile" which is created during the exam, one that needs to be validated.

The first algorithm is being used during seminars and exams and has the role of collecting the typing behavioural data and saving it to the database. The indicators that are measured are the following:

- timestamp for each keypress;

- how the student is choosing to use capital letters (Caps Lock or Shift);

- how the user chooses to delete the text (Delete or Backspace);

- how often the student is using the following commands: cut (Control and X), copy (Control and C); paste (Control and V), run the code (Control and B).

These indicators are measured during each session and saved to the database in real time. At the end of each session, the algorithm of the student profiling starts, and this result too is saved in the database. In the same manner, during the exam, the collecting data process is running again and at the end of the exam the profile is created. This profile is compared to the last three profiles in order to validate the student. If the profiles are mismatched, then the student is not identified, and he receives 0 points. In case the authentication is successful, then the student's exam can be evaluated by the professor (Zamfiroiu and Ciurea, 2017).

a) Algorithm for creating the student's profile

The professor needs to close the session a the end of each seminar or exam and then the system starts to analyse the collected data and creates the profile. Starting with the first characteristic, the distance between each keypress is calculated and it is taking into consideration if it is less than or equals to 6 seconds, because anything that takes more than 6 seconds will be considered as a pause. This characteristic is called TS for a data set that contains only distances less than or equal to 6 seconds, and the average will be calculated using the following formula:

$$TS = \frac{\sum_{i=0}^{n} x_i}{n}, x_i \leq 6 \text{ seconds (distances)}, n = \text{number of distances} \quad (1)$$

For example, hypothetically, we have two students with the following data sets for typing distances: *{2 seconds, 2 seconds, 6 seconds, 2 seconds}* and *{3 seconds, 3 seconds, 3seconds, 3seconds}.* As can be seen in the figure no. 4, the average on the first data set is equals to 3, but it is not entirely representative because in the same manner we have the second student that has all the distances equals to 3 seconds, so in the end, their average time is the same:

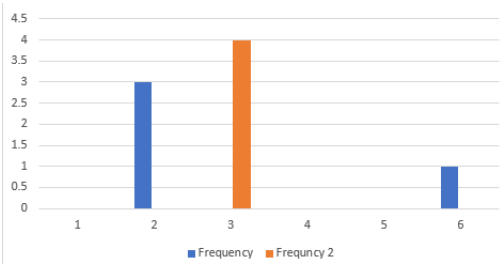


Figure no. 4. Distribution graphic example
Source: Graphic implemented based on the example taken

In this situation, the system applies the histogram principle, and the distances are divided according to the frequency of occurrence. The algorithm uses three intervals: (0,2], (2,4], (4,6] to distribute the distances. At the end, when the system is calculating the average, it is taking into consideration only the distances from the interval that have the highest frequency.

The second characteristic is called DB and it shows in percentages how many times the student used Delete, comparing to the Backspace during the entire session. The third characteristic is called BD and it uses the same mechanism, only vice versa. In the same manner are calculated the next characteristics called CS (how many times the student uses caps instead of Shift) and SC (vice-versa). For the last characteristics (CX, CC, CV, CB) regarding how many times the student used Control+X, Control+C, Control+V, Control+B, the system divides the frequency of occurrence by the time spent for typing. Having all these characteristics calculated, a profile will be created containing a list of the values resulted during a specific session. To summarize, hypothetically, in a Nine-dimensional space, a profile has as coordinates the following characteristics: {TS, DB, BD, CS, SC, CX, CC, CV, CB}.

b) Algorithm for comparing profiles

The first step is to get the last three profiles created during the seminars (ps1, ps2, ps3) and current profile from the exam (pe). In general, to compare two profiles (p1, p2), the algorithm calculates the Euclidean Distance using the following formula:

$$dist(p1,p2) = \sqrt{\begin{matrix}(TS_1 - TS_2)^2 + (DB_1 - DB_2)^2 + (BD_1 - BD_2)^2 + (CS_1 - CS_2)^2 + (SC_1 - SC_2)^2 \\ +(CX_1 - CX_2)^2 + (CC_1 - CC_2)^2 + (CV_1 - CV_2)^2 + (CB_1 - CB_2)^2\end{matrix}} \quad (2)$$

Where: *{TS_k, DB_k, BD_k, CS_k, SC_k, CX_k, CC_k, CV_k, CB_k}, k=1,2* are the profile's characteristics.

Based on the Euclidean distance results, the algorithm sets a score that represents whether the user identity is validated or not. From the beginning, this score is set to 100% and the system decreases this value if some of the rules are not applied. These rules are used for the distances between seminar profiles: S = {dist(ps1, ps2); dist(ps1,ps3); dist(ps2,ps3) } and also for the distances between exam profile and each seminar profile: E = {dist(pe, ps1); dist(pe, ps2); dist(pe, ps3)}. For each set of values S and E the average is calculated (seminarAvg, examAvg), and the minimum and the maximum values are determined (seminarMax, seminarMin, examMax, examMin). Because the students do not type the same code during the exam as they did during the seminar, the algorithm should be more permissive and should not be sensitive to small changes. Hence, the rules that the algorithm is using are the following:

- If the examAvg is greater than seminarMax, then the algorithm cannot validate the identity of the student and decreases the score by 20%.

- If the examAvg is greater than seminarAvg the system can validate the identity, but with low accuracy. Here the algorithm is decreasing the score by 15%.

- If the examAvg is less than seminarAvg, it means that the algorithm can validate the student's identity.

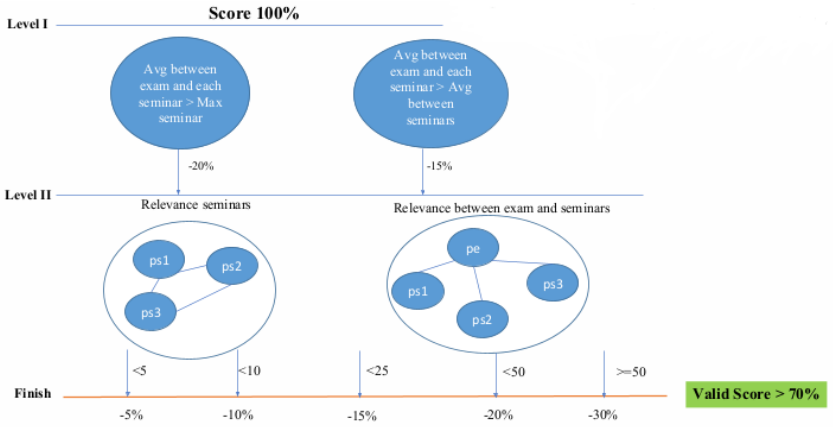


Figure no. 5. Representation of the rules to validate identity
Source: Schema implemented based on the algorithm created

Another important aspect is that these three rules may be applied to unrepresentative data sets, but then the result cannot be taken into consideration. It is necessary to evaluate the ratio between the maximum value and the minimum value in both data sets S and E to check the relevance of the seminars and the relevance of the exam compared to each seminar. The rules described above (Figure no. 5) were adjusted based on the results that we got so far:

- If $\frac{valMax}{valMin} \geq 0 \; and \; \frac{valMax}{valMin} < 5$, then the score is reduced by 5%;

- If $\frac{valMax}{valMin} \geq 5 \; and \; \frac{valMax}{valMin} < 10$, then the score is reduced by 10%;
- If $\frac{valMax}{valMin} \geq 10 \; and \; \frac{valMax}{valMin} < 25$, then the score is reduced by 15%;
- If $\frac{valMax}{valMin} \geq 25 \; and \; \frac{valMax}{valMin} < 50$, then the score is reduced by 20%;
- If $\frac{valMax}{valMin} \geq 50$, then the score decreases by 30%;

Considering that the behaviour can change over time, the process always needs to recollect the data to rebuild a more accurate data set. Thus, if the score at the end of the exam is equal to 90%, then the algorithm will mark that exam profile to be considered as well as a training profile for the next evaluation.

To test the quality of this system, three students were asked to use this application (Table no. 1). Each of them completed three seminars and then started the exam ("Authorized person"), but they were also switched (replaced) in between for the second exam ("Unauthorized person"). When all the students tried to validate their identity, only student A was rejected. However, the second time, another person took the exam in their place, the system did not validate the identity for any of them.

Table no. 1. The results of the test for all students

	Student A	**Student B**	**Student C**
Authorized person	✗ 70%	✓ 75%	✓ 80%
Unauthorized person	✓ 70%	✓ 60%	✓ 70%

Source: Table implemented based on the algorithm tested

For example, having all the profiles of the student B, the system calculates the Euclidean distances and analyse those values to get the final score 75% as follows (Table no. 2):

Table no. 2. The results of the test for student B

Seminars		**Exam**	
dist(ps1,ps2):	0,1606780541	**dist(pe,ps1):**	0,0604770062
dist(ps1,ps3):	1,00200201	**dist(pe,ps2):**	0,1745344426
dist(ps2,ps3):	1,0131008805	**dist(pe,ps3):**	1,0030986262

Source: Table implemented based on the algorithm tested

Based on the results of the students A, B, and C, we can only validate the solution using the FAR (False Acceptance Rate) and FRR (False Reject Rate) indicators (Nguyen, Le and Le, 2010):

$$FRR = \frac{Total\ false\ rejection}{Total\ attempts} = \frac{1}{6} * 100 = 16,(6)\% \quad FAR = \frac{Total\ false\ acceptance}{Total\ attempts} = \frac{0}{6} * 100 = 0\% \qquad (3)$$

By testing the algorithm using this set of rules, we obtained the most favourable case, FAR=0%, and FRR=16,66%. In this paper (Zamfiroiu, et al., 2020) a detailed analysis is made on several user detection techniques, which are classified into two categories: static and continuous authentication. The static authentication behaviour refers to how the user types the username and password, but the results are not as good as those of continuous authentication thus, the values obtained by our algorithm are better than the ones from the first category. Hence, because continuous authentication uses the random text written by the user, it is more accurate than analysing the static one. The examples analysed for this category in this paper (Zamfiroiu, et al., 2020) are based on different methods such as using Euclidian distance and probabilities together or the method of nearest neighbour. All the methods are using keyboard dynamics and mouse usage dynamics, so multiple user behavioural indicators are covered. As a result, for the nearest neighbour the FAR value is 3,17% and FRR is 0,03%. By comparing these with our results (16 and 0), there are still many possibilities to improve the algorithm as using more user characteristics (e.g., mouse dynamics). In addition, if the number of sessions (seminars and exams) is more and more increasing, then we will see a decrease in FRR and FAR indicators over time, which determines this algorithm to become more accurate.

Conclusions

In this paper, our motivation was to build a complex eLearning system that can be used to assist students in their educational process. Statistics have proven, time after time, that we need to use new technologies

to improve our quality of life, not just in educational field. In this regard, we have formulated two different components for computer-assisted education. A system that is based on assisted education, we see it as a puzzle that contains several pieces. In this paper, through the solution of detecting the user through the typing mode, we have the remote evaluation component that gives us the certainty that there are no chances to cheat. Also, through the adaptive assessment component, we offer an interactive way for students to learn and progress. But despite all these components, there are still missing puzzle pieces. Many studies showed that there is a strong relationship between learning style and eLearning and the learning outcomes are improved if the learning style motivates the students. For future work, we aim to implement the assisted eLearning system based on the framework described in this paper (El-Sabagh, 2021). In addition, we continue to investigate how computer technologies can improve the field of education in Romania.

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Pressure Valves for the Oil Market in EU in the Context of Ukrainian War

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DOI: 10.24818/BASIQ/2022/08/088

Abstract

The purpose of this paper is to make some predictions related to the oil market, considering the context of the invasion of Ukraine by the Russian Federation.
In order to meet the objectives of the article, we have used quantitative and qualitative analysis, interpreting both the data and the global oil market context in a suitable way to show possible evolutions.
Our main insights for the future of the global oil market reveal important evolutions which may change the world as we know it. The emerging global political separation, which would drive an economic segregation, would directly impact the Russian Federation oil exports. As a consequence, the income from oil and oil products exports for this country would be highly impacted; the most likely scenario is that the Russian Federation exports oil towards China and India. These two oil importers are in a position to buy oil at much lower prices than the market.
The sanctions on Russian oil exports already have an impact on the European Union (EU). This impact will be limited by the fact that the Russian oil will be delivered elsewhere (China and India), giving the opportunity to other oil suppliers to fill in the gap and deliver to European market, this functioning like a re-arrangement of the present oil trade flows.

Keywords: crude oil, Russian Federation, Ukrainian War

DOI: 10.24818/BASIQ/2022/08/088

Introduction

The invasion of Ukraine by the Russian Federation, an act of a nature which we thought to be obsolete for the civilized mankind, has the effects of an earthquake, most of the countries condemning this attack.

One of the most affected industries is the Oil&Gas (O&G) industry, and in this paper we address especially the oil market.

Russia is one of the most important oil extractors, its exports summarizing 11.4% of all the oil exported in the world. The lack of this oil on the market can create issues; however, if there will be some countries (as we assume later in the paper, it can be China and/or India) which would buy oil from Russian Federation, the impact would be reduced.

The impact of the sanctions imposed by the civilized world on the Russian Federation would have impact on the EU, but we estimate that the impact would be less important than assumed previously.

1. Review of the scientific literature

There are lots of papers on Russian economy, also on the O&G market. Both are strongly influenced by a strong trend – the drive given by the 'rapid deployment of renewable energy' (Bradshaw, Van de Graaf and Connolly, 2019) on one hand and measures taken against Russia, as a response from the Civilized World to the Russian aggression on Ukraine.

Russian Federation internal prices differ from the free market prices, which perhaps will not be applied any more, putting a supplementary pressure on the Russian economy (Figure no. 1).

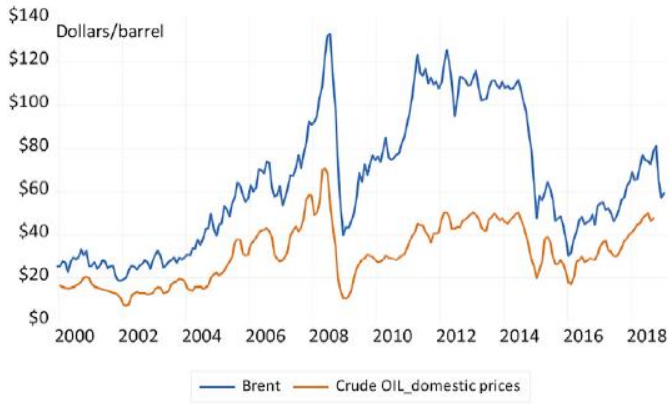


Figure no. 1. Oil price difference between Brent and Russian domestic prices
Source: Balashova and Serletis, 2020

For the Russian Federation are important on one hand the exported quantity of oil, on the other hand the price, because these two factors determine the bottom-line oil export income for Russia; but "Financial specialists believe that the forecasting the path of crude oil prices are extremely challenging since they are unstable and complex and rely on different conditions" (Sedighi, et al., 2019). So it is difficult to forecast the oil price.

In this context we need to mention as circumstance the Russia-Saudi Arabia oil price war, which began in March 2020 when Russia and Saudi Arabia didn't have an agreement on cutting oil production by Russia, and as consequence Saudi Arabia increased production (Ma, Xiong and Bao, 2021); now, knowing about the Russian invasion of Ukraine, we can assume why.

We can compare the return on operations for several countries, in terms of Oil Rents – which represent "the difference between the value of crude oil production at world prices and total costs of production." (Basher, Haug and Sadorsky, 2018), illustrated in Figure no. 2. As per the figure, the Russian oil industry has a low rent, which shows low efficiency.

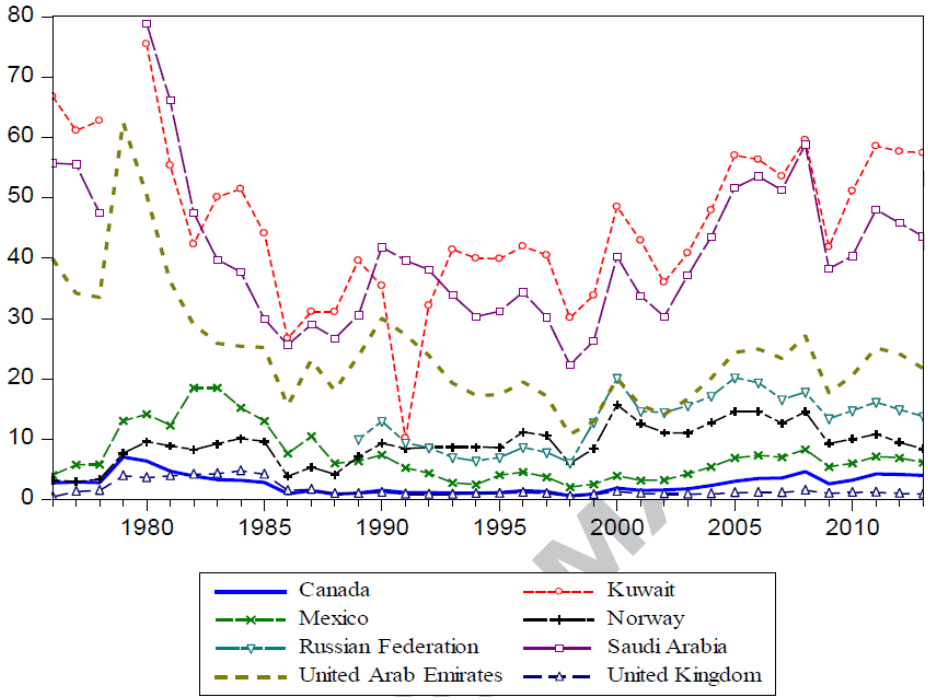


Figure no. 2. Oil rents (% of GDP), annual figures
Source: Basher, Haug and Sadorsky, 2018

2. Research methodology

We have analysed several aspects related to the Oil market, which we consider would influence the future energy market.

In this research we have used quantitative and qualitative methods, graphical illustrations showing the main aspects important to the economic side of the oil market.

The quantitative data supported the inferences used to draw qualitative conclusions, some of them already getting substance in the flow of actual events.

We used historical data to define the trends, shown with suggestive graphs, and superposing our assumptions of changes due to the actual context.

For this paper we compared Russian Federation figures with other countries, in order to highlight different aspects considered relevant, or we highlighted specific aspects. We kept into the picture also the European Union, in order to get a meaningful perspective for us.

3. Results and discussion

An underlying trend is towards green energy, putting pressure on the oil market volume. A lot of countries have announced and started green energy policies, and all the main auto manufacturers are shifting towards electrical transportation.

Russian GDP is based primarily on exports of raw materials, mainly of oil, gas and some O&G products, but also other materials as cobalt etc.

Below you can see the exports profile of the Russian Federation, divided by products categories (Figure no. 3):

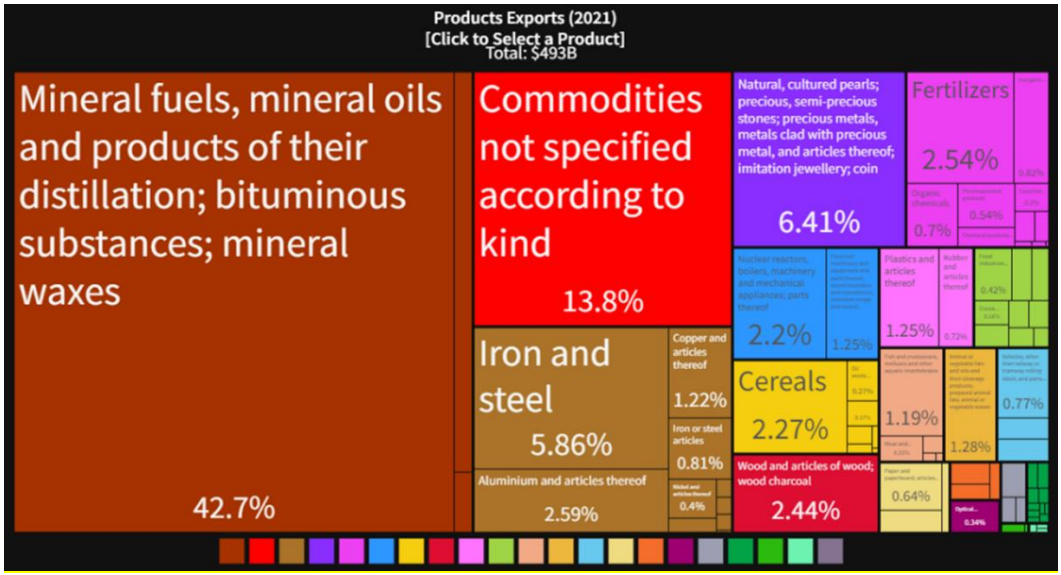


Figure no. 3. Exports Profile of Russian Federation for 2021
Source: OEC - The Observatory of Economic Complexity, 2022

The Russian Federation exports destinations are variate, most important destinations being China (13.6%), the Netherlands (8.63%) and Germany (6.02%), as in Figure no. 4:

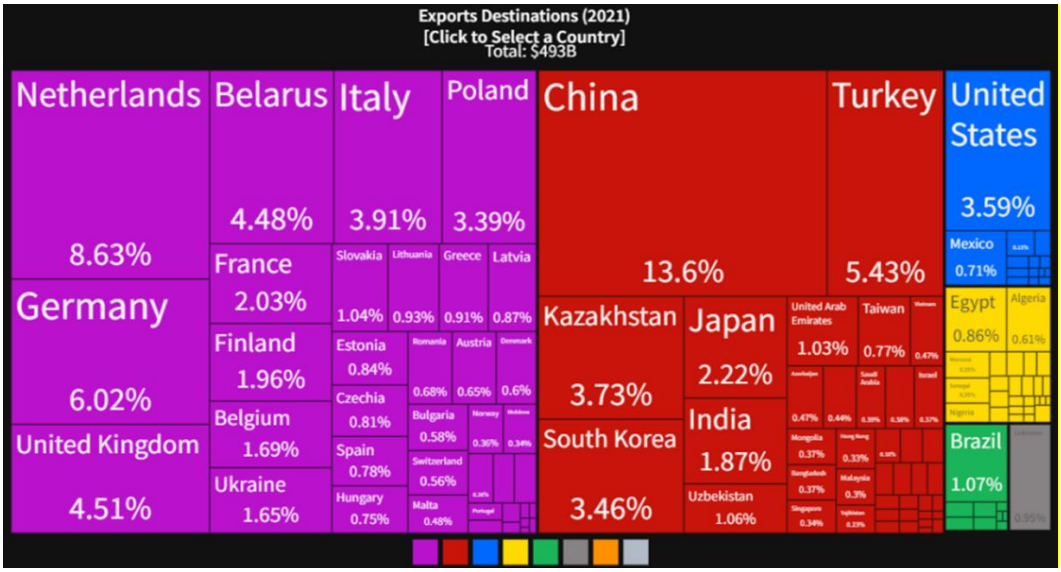


Figure no. 4. Russian Federation Exports Destinations for 2021
Source: OEC - The Observatory of Economic Complexity, 2022

We examine the reserves available and how they are distributed in the world. As expected, the main proved reserves, almost 50%, are in the Middle East (48%), the CIS region summing 8% (Figure no. 5).

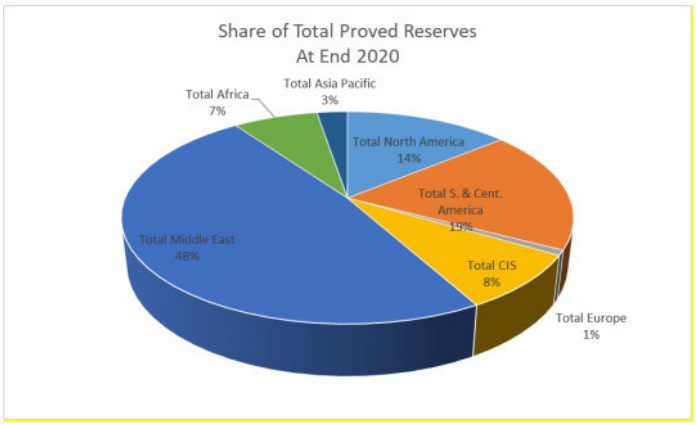


Figure no. 5. Share of World Proved Reserves, 2020
Source: BP Statistical Review of World Energy, 2021

We highlight that Russia has only 6.2% of the overall proved reserves in the world, and almost three quarters of the CIS reserves (Figure no. 6):

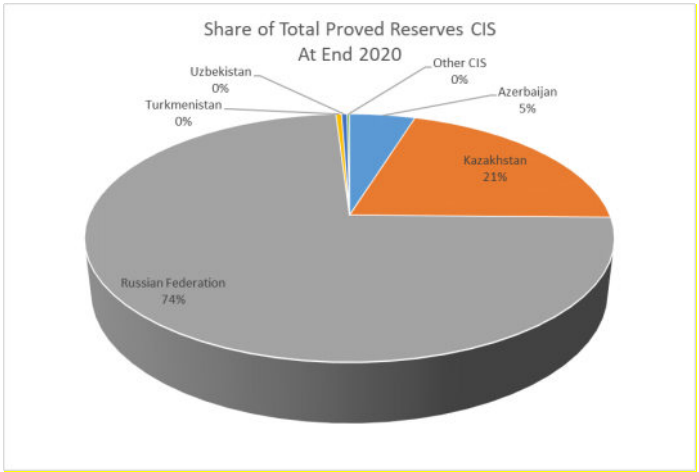


Figure no. 6. Share of CIS Proved Reserves, 2020
Source: BP Statistical Review of World Energy, 2021

Russia's reserves are comparable with those of Kuwait (similar proved reserves), Saudi Arabia (similar production) and EU, as shown below in Figure no. 7:

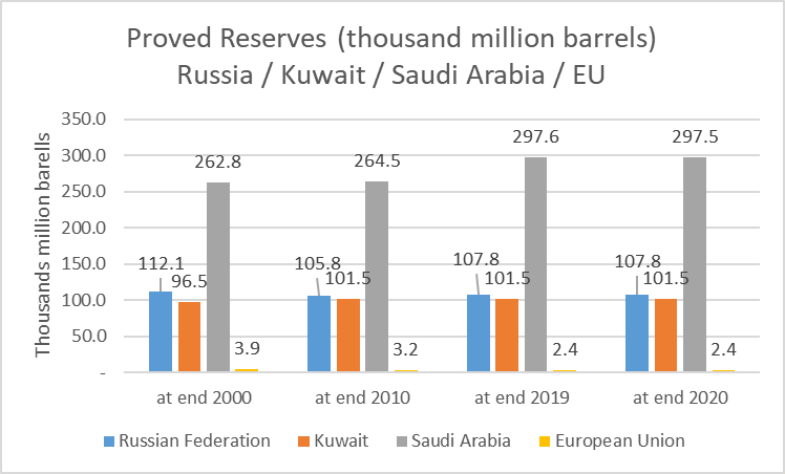


Figure no. 7. Comparison of Proved Reserves for Russia, Kuwait, Saudi Arabia and EU
Source: BP Statistical Review of World Energy, 2021

The difference is in the intensity of production, as seen in comparing the R/P ratio. The R/P ration (Reserves to Production) can be interpreted as the number of years to extract the remaining reserves if the production is maintained at the same level, as illustrated in Figure no. 8 bellow.

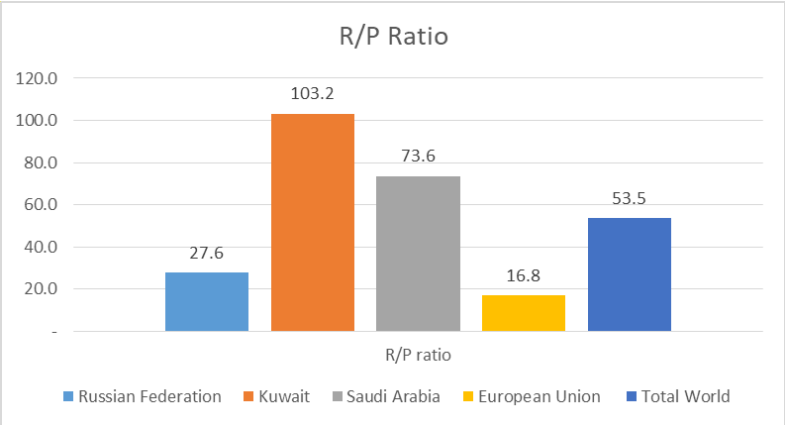


Figure no. 8. Comparison of R/P ratio for Russia, Kuwait, Saudi Arabia, EU and World, 2021
Source: BP Statistical Review of World Energy, 2021

Regarding the production of oil, the intensity for Russian Federation is kept up, between 10 and 12 million barrels per day, much higher than Kuwait and at the same level as Saudi Arabia (Figure no. 9):

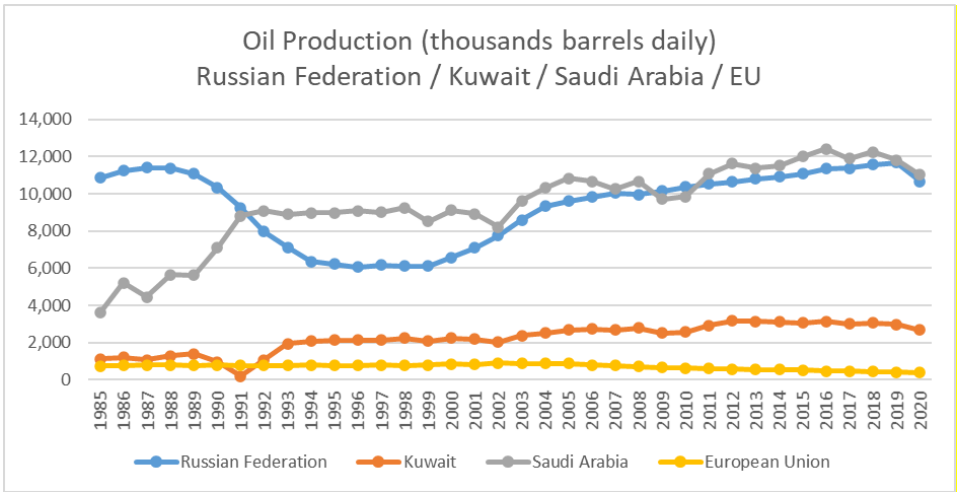


Figure no. 9. Comparison of oil production for Russia, Kuwait, Saudi Arabia and EU
Source: BP Statistical Review of World Energy, 2021

The Russian Federation production shows an overexploitation of their reserves, which comes with associated costs, some in extraction technology and some ecological, through the abuse of the resources.

At a rough estimation, the Russian oil production is ~3 times more aggressive than the extraction in the Middle East (you can see this by the fact that at similar reserves as Kuwait, the production is triple and at one third of the reserves of Saudi Arabia, the production is comparable). This strategy is in a way better in the context of the world shifting more and more to green energy, therefore lowering the need of crude oil.

The oil export market (Figure no. 10) shows Russia sharing the 4th place with Asia Pacific region, after ME (without Saudi Arabia), US and Saudi Arabia.

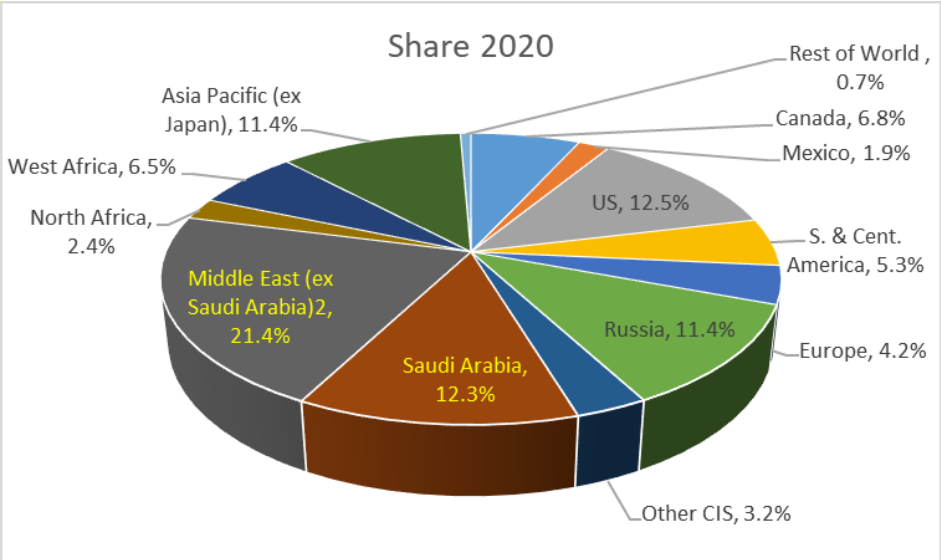


Figure no. 10. Oil Export market profile, 2020
Source: BP Statistical Review of World Energy, 2021

So, the Russian portion of the pie representing the exported oil is 11.4%, meaning that this is the maximum impact on the market. However, even if Russian Federation is sanctioned and banned from the international market, they still can deliver some quantities to selected countries, like China, India, perhaps even Hungary.

In bellow Figure no. 11 is a comparison of the main oil exporters, compared with Europe. Saudi Arabia and the rest of Middle East export three times more oil than Russia.

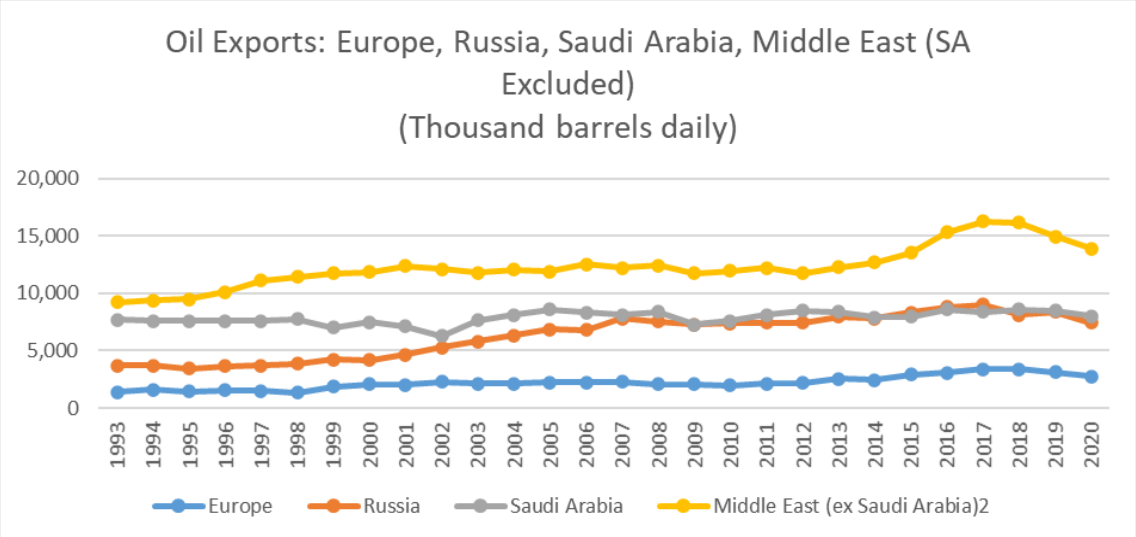


Figure no. 11. Comparison of oil export for Russia, Kuwait, Saudi Arabia and EU
Source: BP Statistical Review of World Energy, 2021

On the receiving side, as it can be seen in Figure no. 12, the most important country importing oil is China, followed closely by Europe, US on the third place at some distance:

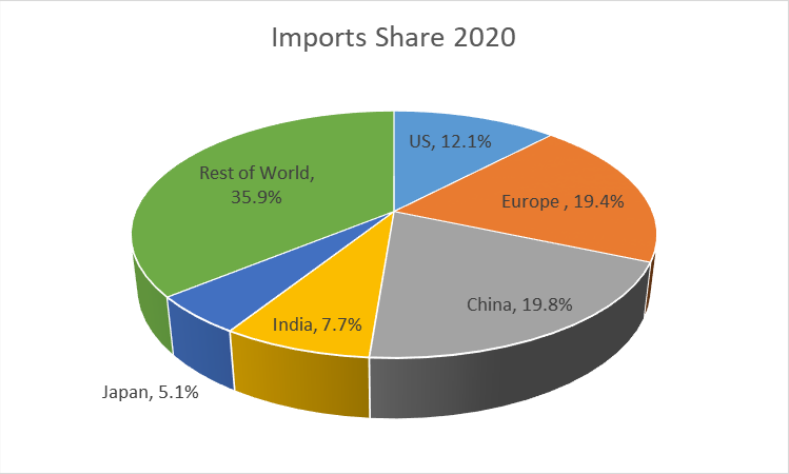


Figure no. 12. Oil Import market profile, 2020

Source: BP Statistical Review of World Energy, 2021

This shows that China and India together are able to absorb 2.4 times the total oil exported by Russia, should they support Russian Federation. However, if this happens, it functions as a pressure valve for the oil price, as it would lower the request on the market; on the other hand, China and India could – and perhaps would – put harsh conditions on the oil prices, lowering also the prices paid to Russia for oil.

Conclusions

There are two main influencers for the oil market:

- A shift towards green, renewable energy, renouncing at the fossil fuel as much as possible and as fast as possible, for environment reasons;

- An isolation of Russia of the international markets, including the oil market, due to the repeated aggression against neighbouring countries.

The shift towards green energy would lower the demand of oil, which would lead to a decrease of oil production. Here we need to mention that all the important players in the automotive industry are shifting towards electric vehicles.

The oil production and export of Russia shows the following:

- Russia has proved reserves comparable with Kuwait, but it produces 3 times more, at the level of production of Saudi Arabia; this shows an extraordinary intensity of the Russian oil production;
- The Russian oil industry has a low efficiency;
- China and India, two of the main oil importers in the market, can absorb 2.4 times the oil exported by the Russian Federation.

The sanctions against Russian Federation and its isolation from the free oil market generate some interesting perspectives, from which we highlight:

- If on the long term the oil demand will diminish, then this would be correlated with the export of Russian oil, due to the sanctions. This releases some pressure of the oil market; though we need to see that a low oil price is not in the interest of OPEC, so the big Middle East oil producers would want to keep high prices through controlling the oil output;

- Due to the sanctions, Russia is going to have a high oil surplus, with some predictable effects:

- In order to gain money (oil export constitutes a huge part of the Russian GDP) will try to find other ways to sell the oil, and this can be done through countries which do not respect the sanctions. The most probable candidates are China and India, able to absorb 2.4 times the present export capacity of Russia. This would come with an associated price, as in this situation China and India can blackmail Russia and impose low prices. It would be necessary to mention that Russia, with an oil production close to that of

- The sanctions have a high probability to lower and limit the oil exported by the Russian Federation, however this can lead to the necessity to lower the oil production in the near future, which means less return on the investments and also could lead to the necessity to lower the production capacity, so sacking people working in this industry, and by this putting additional pressure on Russia's social system;

The sanctions for Russian Federation concern also technologies, which would affect also the oil industry. Russia would be barred from Occidental technology; however, they could be supplied by China, which has access to almost everything produced by the developed countries. Considering the context that China's market is constituted by the developed Occidental countries, it is to be assumed that China would not risk these markets only to sell to Russia. As a consequence, it could be very difficult for Russia to develop new exploring and production technologies without access to the right tools, in oil industry or in any other industry.

The impact on EU regarding the crude and refined oil supply by the Russian Federation would be minimized if some countries, like China and India, would import oil from Russia; the pressure would be only in the form of remapping / contracting with different suppliers and perhaps would create some issues regarding new oil transportation routes.

Of course, there are other impacts which are not treated here, for example the increase of prices and the increase of inflation; such subjects would be treated in future papers.

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Genders' Fascinations and Fears Towards the Use of Cognitive Computing

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DOI: 10.24818/BASIQ/2022/08/089

Abstract

Cognitive computing are intelligent systems that have been designed by companies in order to enhance customer experiences by providing personal advice and guidance for the everyday life buying decisions. The ability of cognitive computing systems to analyze huge amount of consumer data and their ability to learn from experience by machine learning systems, will revolutionize the interaction between consumers and companies. Therefore it is important to determine the major factors that impact the consumers' willingness to use cognitive computing systems. The objective of our research is to determine the perception and preferences of consumers regarding cognitive computing systems based on gender. The results of an online survey show that the two genders have more similarities than differences in the perception of cognitive computing. However women tend to be more reluctant to cognitive computing systems, as they don't know the processes behind the system and they don't have a control over the information shared with the intelligent system. These results are in accordance to previous research and they have important implications for the implementation of cognitive computing systems and for future research.

Keywords: cognitive computing, artificial intelligence, cognitive virtual assistants, data, consumer.

DOI: 10.24818/BASIQ/2022/08/089

Introduction

As new technologies emerge, information remains a valuable resource of power for companies and consumers (Gupta, et al., 2018). The new technological developments allow the exchange and creation of data through virtual communication, information transferring, media transmission, sharing and all access to different kinds of data, but simply collecting and storing data is not enough, as data has to be transformed into information. In itself, data actually only represent raw material that has to be further processed and understood. Researchers agree on the fact that both computing power, and analytical methods, allow this at an unprecedented level (Huang and Rust, 2018; Holmlund, et al., 2019; Zaki, 2019; Wiener, Saunders and Marabelli, 2020).

The complexity and diversity of the existing data types combined with the increased volume and delay in the analysis and processing by human forces, makes data analysis a time-consuming and tiring activity (Gupta et al., 2018). In addition, existing human behavioral distortions and cognitive biases (Chen, Elenee Argentinis and Weber, 2016) contribute as further inhibitors. At this point, however, the so-called concept of cognitive computing (cc) and the underlying computer-aided methods of automated data analysis and data base analysis come into play (Civita, 2017) and remove the existing human limitations. In this regard, both cognitive computing and big data are related and are to be characterized by the same 5V-characteristics often acknowledged by literature: Volume, Variety, Veracity, Velocity and Value (Fosso-Wamba et al., 2015; Grover and Kar, 2017; Gupta et al., 2018; Hurwitz, Kaufman and Bowles, 2015; Pelau and Barbul, 2021). According to Chen, Elenee Argentinis and Weber (2016), these five main data properties are also to be seen as five inherent challenges that need to be overcome with the help of advanced technology and analytics.

Given the consistent and wide applicability of cognitive computing and of its derived cognitive computing systems, the present work aims to investigate the consumer experiences with the help of cognitive computing. The focus of the research is put on the perception of consumers regarding the ability of

intelligent systems to consumer profiling as well as their ability to determine the deriving preferences of the consumer and to deliver suitable product recommendations and contouring the consumer experience when interacting with companies. In the following sections of the present article, we discuss the concept of cognitive computing, with regard to its meaning for multiple, diverse data streams and types. We then empirically investigate consumers' enthusiasm for cognitive systems and especially for the so-called cognitive virtual assistants (CVAs). The present paper also assesses consumers' fear of intrusion of cognitive systems into their private spheres. In this regard, we discuss based on a discriminant analysis the differences in perceptions between two gender groups (male and female).

1. Literature review on Cognitive Computing

Cognitive computing systems are thinking, reasoning and remembering systems, designed to work together with humans in order to provide them with helpful advice in making decisions. Cognitive computing systems are used by companies in order to provide customers with a personalized online shopping capability that makes it easy to find what they are looking for online. Previous research almost always connects the concept of cognitive computing to the concept of (big) data (Reynolds, 2015). As a synergy between data science and cognitive science, cognitive computing was developed as an interdisciplinary approach and become the field of study that incorporates both research areas into advanced computer technologies (Hurwitz, Kaufman and Bowles, 2015; Varadarajan, et al., 2020). In search for a solution to manage the above-described volume of data and to keep up with the still ongoing data generation, the concept of cognitive computing came to life. Not only do cognitive systems solve these two problems, but in addition they try to unlock and find meaning of data in all its varieties and contexts, eliminating unwanted data noise. Furthermore, human incapacities, such as biases and time limitations are obstructed, allowing faster, more accurate data processing.

Chen, Elenee Argentinis and Weber (2016) describe the concept of cognitive computing as a subset of AI-technology that has the ability of mimicking specific human cognitive behavior (e.g. sensing, observing, interpreting, learning adapting and reasoning). In this regard, the cognitive technologies find their main deployment in problem-solving and assisting humans for decision-making processes. Cognitive computing is therefore shortly to be described, as a comprehensive approach to assess data challenges (Ogiela and You, 2013; Chen, Elenee Argentinis and Weber, 2016; Gupta, et al., 2018; Pramanik, Pal and Choudhury, 2018). Without an actual formal agreement on its definition, researchers seem to only partially agree on the meaning of cognitive computing (Reynolds, 2015). Probably the most accurate definition simply unveils the ability of such technologies to create cognition (Appel, Candello and Gandour, 2017). Gupta et al. (2018) have explained the resemblance, even the subordination of cognitive computing to artificial intelligence (AI). While technologies based on AI are working under specific parameters and rules, cognitive technologies work by detecting commands, asserting presumptions, and suggesting possible solutions (Gupta, et al., 2018). Cognitive systems use AI in their core, in order to break down and understand different data sets. These kinds of systems try to find connections between countless streams and types of structured and unstructured data, to carry out in-depth analyses, to formulate predictions and to convey insights to people in a comprehensible way.

As a fundamental component of cognitive systems, the wide applications of machine learning represent an innovative method for data mining of large databases and for creating accurate predictive models. Machine learning is based on the idea that a system can learn from data, recognize patterns on its own, and make decisions with minimal human intervention (Chahal and Gulia, 2019). Fast and precise the automated models of machine learning enable a more detailed analysis of the aforementioned huge databases and the surrounding big data characterized by the 5Vs (Cui, Wong and Lui, 2006). As sub-areas of machine learning, deep learning methods and artificial neural networks further enable the automation and digitization of human-like tasks. Advances in deep learning are to be observed in numerous AI-driven activities, ranging from gaming and precise computer vision to speech and pattern or problem recognition by machines. Deep learning methods and programmed algorithms inspired by the human brain are actually able to learn from large amounts of data, work and adapt by gaining experience and thus solve complex problems faster than actual people (Quinto, 2020, p. 289). Artificial neural networks are based on studies of biological models and relate directly to the cognitive process for mimicking the processes and capabilities of the human brain. This means that complex structures, interactions and non-linearities can be investigated and recognized as patterns by machines and be further used in the decision-making process (Cui, Wong and Lui, 2006).

According to many studies (e.g. Reynolds, 2015; Chen, Elenee Argentinis and Weber, 2016; Gupta, et al., 2018; Zaki, 2019), cognitive systems, which are built with the help of the operating technologies discussed

above, take data from their environment, convert them into information with the help of pre-programmed learning algorithms, and furthermore use the generated information to create valuable knowledge, just like humans do. The act of gaining experience leads to influencing and improving the performance of both people and computers. In the same way as the human thinking process, cognitive systems invest their self-built knowledge in a certain pre-defined goal and thus in the direction of an exact performance in the environment from which they collect the data (Dietterich and Langley, 2007). Respectively, cognitive learning systems and algorithms are able to convert what they have learned into a problem-solving process and lead to precise, evidence-based results (Dietterich and Langley, 2007).

Often used as an overall description of several technologies, such as IT infrastructures, software solutions and algorithms, cognitive computing aims to make problems that are characterized by ambiguity and uncertainty more approachable and thus also solvable by machines and computers. Cognitive systems are able to deal with natural language through natural language processing and possess the necessary specialist knowledge so that they can learn, understand and evaluate content by themselves. As mentioned earlier, the most important aspect of the cognitive system is the ability to learn on its own. The cognitive computing-based services in the background are characterized by adaptability, interactivity and contextuality, with the help of cognitive algorithms, in which imprecise, controversial situations are formulated in an understandable manner (Baumbach and Ketterer, 2017). In addition, developed with regard to technologies of neuromorphic computing and neural network accelerators, cognitive systems can cope with the processing challenges caused by noisy, unstructured surrounding data (Gudivada, 2016) and obtain valuable information out of such data.

Having the above-mentioned characteristics und underlying technologies in mind, research concludes (e.g. Fosso-Wamba, et al. 2015; Appel, Candello and Gandour, 2017; Gupta, et al. 2018; Lytras, et al. 2020) that cognitive systems are suitable for the investigation of various data sets, including rich media and texts, the identification of conflicting data, information discovery, pattern recognition, clarification of ambiguous situations, creation of complex solution alternatives in the big data environments and not only. It is therefore fair to admit that cognitive computing offers a new approach to uncovering the potential of data (Reynolds, 2015), with data being perceived right from its context, with temporal, spatial and personal characteristics directly influencing the meaning and consistency of the information.

Perhaps the most common form of cognitive systems is the Cognitive Virtual Agent (CVA), which has a human-like, intelligent digital assistant function and cognitive abilities in order to understand the diverse relationships in the environment. By definition, cognitive assistants and CVAs are generally software agents that can interpret and process text, speech, gestures or visual inputs. They have different abilities to understand the data input provided, to interpret it and, with step-by-step programmed logic, to check the user for the intention and context of a conversation and to provide information as a result or to carry out the intended task (Sabharwal, et al., 2020, p. 3). The wide applicability for cognitive agents and assistants ranges from the finance and investment sector to the healthcare industry and to the education sector. Examples therefore include: monitoring and analyzing physical health, assisting medical staff for problem diagnosis, screening and suggesting appropriate treatment, simulating human conversation, understanding and responding to customers' needs and desires, responding to questions and offering support.

2. Consumer experiences using cognitive computing

Cognitive systems are continually evolving based on new information, results, and undertaken actions, so they act as advisory systems by presenting human users the information and suggesting a range of options. More and more companies use cognitive computing to generate insights and to implement fundamental business changes (in areas such as marketing, consumer support, and product development) (Davis, et al., 2016). As previously established, cognitive systems are able to capture the human thinking process, imitate it and also learn from mistakes made over time (Gupta, et al., 2018). Numerous companies from data-driven industries (e.g. healthcare, retail, financial services, education, marketing, social media etc.) have integrated cognitive systems into their processes. There is no doubt that cognitive systems, like for instance IBM Watson, have extensive application potential. The fact that they are used to help launch new products and draw conclusions about how people in different geographic and demographic groups will respond consists in a precious advantage. This enables the product alignment to be adapted and facilitates direct addressing of the appropriate target group throughout the marketing campaign.

With the help of advanced cognitive computing systems, companies are provided with meaningful insights derived from the abundance of data and are thus facilitated with relevant information for future strategic and economic decisions. It is only fair to say that cognitive computing systems have fastened the anticipation of global trends of today's newly defined experience economy (Dziewanowska, 2015). The

transition to a cognitive-based/optimized consumer experience lays important ground for research in terms of the whole re-design of consumer experience, as in interaction, perception, emotion (McColl-Kennedy, et al., 2019; Lytras, et al., 2020). The complexity of collected data proves the hard work companies have to do, in order to meet the consumer expectations. In terms of data-driven initiatives by companies, marketers need to focus on meeting consumers exactly where and how they want to get involved in long term relationships (Glass and Haller, 2017; Stanescu, Pelau and Barbul, 2021).

Current advances in the field of cognitive computing in the retail industry are not actually just a fad, but an increasing trend, an actual necessity, as cognitive systems demonstrate in many situations efficiency and time advantages, as well as service quality over human employees. This is due to extended data storage functions, high processing speeds and precise personalization capabilities. From an operational perspective, AI and cognitive devices can substantially lower costs by increasing operational efficiency and effectiveness and by also reducing the workload of human employees (West, Clifford and Atkinson, 2018). As mentioned, and also proven, cognitive APIs have human-like intelligence. In addition, these cognitive systems are designed to interact and manage relationships with consumers just like regular employees. They have functional, social and emotional pre-programmed capacities (Lu, Cai and Gursoy, 2019), with performance advantages such as accuracy, reliability, efficiency and consistency of communication and marketing structures being brought to the fore (Gursoy, et al., 2019).

Currently, most people have a hard time understanding how and why exactly intelligent, cognitive systems do what they do. As industries are still transitioning to the so-called cognitive era, making more and more room for cognitive systems, both companies and consumers need to further adapt to this increasing trend. It is therefore important to examine and assess the coexistence of the consumers and the cognitive systems from different perspectives, see the extent to which it is recognized and desired and also what attitudes exist about it. Accordingly, our research results in this direction it will be presented in the following sections.

3. Methodology

Acknowledging the ongoing trend and increasing implementation of different forms of cognitive computing in interaction with customers in various contexts, the focus of the present study is to determine the attitude of consumers towards cognitive systems from a more personal point of view. The conducted empirical research aims to offer some meaningful insights into consumers' enthusiasm for cognitive systems as well as to investigate the consumers' response towards the intrusion of cognitive systems into their private spheres. In order to test these objectives, a questionnaire has been developed containing 50 questions about the attitude of consumers regarding cognitive computing and data protection. The above-mentioned items have been measured via an online questionnaire, with Likert Scale questions, having values between 1 (total disagreement) and 7 (total agreement). A total of 140 randomly chosen respondents, profiled by different characteristics, such as age, gender, education and income have been involved in our study. The Cronbach Alpha coefficient of $\alpha = 0.894$ shows the good reliability and internal consistency of the used scale. For the purpose of the study, the results of the survey have been concluded based on a discriminant analysis conducted with the help of IBM SPSS Statistics 25, in order to determine significant differences between the two sample groups: male and female. The sample includes a total of 63 males and 77 females.

4. Results and discussions

Our research mainly focuses on the difference between the two genders of consumers. Both previous and present results show that in the case of cognitive computing, which is still a rather unfamiliar set of interacting and interactive technologies for most consumers, there are only average significant differences (Pelau and Barbul, 2021), as can also be observed in the Table 1. Results marked in bold writing show where significant differences arise in the comparison between female and male perception regarding the tested aspects related to cognitive computing.

After performing the discriminant analysis on the data set for the items listed in table 1, regarding the independent gender-variable four significant differences emerged. First, female respondents seem to be generally more affected by their lower understanding of what actually lays behind cognitive systems (question 4, where $\bar{x}_{women}=4.34$ and $\bar{x}_{men}=3.17$). Accordingly, women tend to be more worried than men for this reason (question 5). This behavior is proven by significant differences between the two groups ($F_4=16.249$, $p_4=0.000$ and $F_5=7.031$, $p_5=0.009$). While both sample groups wish to understand the technology behind CCS, the lack of knowledge on how these technologies work seem to be a source of concern for women. This could cause worries that CCSs may seem to overtake their capabilities, as one may not be able to evaluate competences of cognitive computing.

Regarding the fear of invasion of privacy, as already expected, some differences between men and women occur. Considering the security of an interaction with a CVA (question 11), the two groups assess and behave differently with regard to personal data communication (F_{11}=4.280, p_{11}=0.040). Female respondents show higher feelings of uncertainty in this regard, compared to male respondents. Likewise, when evaluating item 13, significant gender differences emerge between gender occur (F_{13}=8.247, p_{13}=0.005). While men tend not to be manipulated by such systems or are less likely to worry about it - women, on the other hand, show more vulnerability or awareness towards the power of influence CVAs are likely to pursue. As also previously observed and discussed, the fact that women show to some extent a tendency to feel insecure, even inferior, towards cognitive systems also holds true with the evaluation of statement 13. Compared to the male side of the sample, women are more likely to show concern, anxiety and awareness towards the idea that they can be manipulated by cognitive computing. This could also be caused by the fact that they somehow feel overwhelmed by cognitive systems, probably unsecure or exposed in the presence and during the interaction with such systems. An interesting direction of investigation would be to analyze the possible reasons for the different behavior of the two genders in this context and the underlying causes.

Table no. 1. Discriminant analysis regarding the perception of consumers regarding cognitive computing

Item	$\bar{x}$ Male	$\bar{x}$ Female	$\bar{x}$ Total	F	p-Value
1. I am pleasantly impressed by the technology of cognitive computing systems.	4.89	5.23	5.08	1.810	0.181
2. I am fascinated by the possibility of human-computer interaction.	5.23	5.08	5.15	0.337	0.563
3. I want to be able to understand the technology behind cognitive computing systems.	5.25	5.32	5.29	0.068	0.794
4. I believe that cognitive computing systems are beyond me, because I do not understand what is exactly behind them.	**3.17**	**4.34**	**3.81**	**16.249**	**0.000**
5. The fact that I do not understand what is hidden behind cognitive computing systems worries me.	**2.38**	**3.13**	**2.79**	**7.031**	**0.009**
6. The evolution and applicability of cognitive computing systems seem to me to be areas that need to be further exploited.	5.98	5.92	5.95	0.095	0.758
7. I believe that cognitive computing systems must not be absent from companies' interaction with consumers.	4.78	5.13	4.97	1.642	0.202
8. I believe that cognitive computing systems are important for shaping companies' relationships with customers.	4.61	5.03	4.84	2.546	0.113
9. I consider that cognitive computing systems can maintain my private sphere.	4.50	4.26	4.37	0.588	0.444
10. It bothers me that cognitive computing systems use my data.	4.25	4.44	4.35	0.382	0.538
11. I consider that the transmission of personal data to a CVA (Cognitive Virtual Assistant) in the dialogue with a company is uncertain.	**3.58**	**4.19**	**3.91**	**4.280**	**0.040**
12. I believe that interacting with a CVA (Cognitive Virtual Assistant) can invade my private sphere.	4.05	4.04	4.04	0.001	0.981
13. I consider that the suggestions received from a CVA (Cognitive Virtual Assistant) influence my purchasing decisions in a direct way that I do not want.	**3.17**	**3.97**	**3.61**	**8.247**	**0.005**
14. I consider that the purpose of cognitive computing systems applied in interaction with consumers is to control consumers.	3.70	3.79	3.75	0.071	0.790
15. I believe that the purpose of cognitive computing systems applied in interaction with consumers is to help firms move towards coherent processing of large volumes of data.	5.72	5.70	5.71	0.006	0.940

Source: Authors' own research

Overall, both men and women show enthusiasm and fascination toward cognitive systems and human-CC interaction, with no significant differences between the two groups. On one side, both female and male respondents agree that cognitive computing systems seem need to be further exploitation and acknowledge

the fact that such kind of systems are important for shaping companies' relationships with customers. On the other side, both groups show some concern regarding their private sphere and privacy in connection to CC. However, the majority of respondents show strong believe that the purpose of cognitive computing systems applied in interaction with consumers is to help firms move towards coherent processing of large volumes of data and not to control consumers.

Conclusions

With clear advances being made towards implementation of cognitive computing in various consumer interactive contexts, unlimited possibilities for further research arise. Although the present research only addresses a very brief part of the whole discussion, it underlines some differences in perception between men and women, reaching the conclusion that the two groups are related in many more aspects, than they are differentiated. Consumers in general need to familiarize themselves with the concept of cognitive computing and with the idea and actual interaction with cognitive virtual assistants. As our study shows, consumers' perceptions of cognitive systems are now somewhere near the middle point (on a scale from 1 to 7) with an answering tendency of little above or around the middle scale point – but this could of course also be attributed to a common central tendency bias respondents often face when confronted with a not so familiar concept or subject. Although there are not many differences between the two genders, it can be observed that women are more reluctant to these new systems as they don't know and don't control the systems behind them. Moreover women worry more about providing their personal data to these cognitive systems in comparison to men. As the results reveal, women fear more that their buying decision might be influenced in undesired way. This result is in accordance with previous research, where the willingness of providing data to intelligent systems is predicted by the consumer's control over the data (Stanescu, Pelau and Barbul, 2021). This study confirms that women are more concerned about not having control over the intelligent or cognitive system they interact with. This result has important implications for the development of intelligent cognitive systems, as developers should consider the need of the consumer to control at least to a certain degree the data shared with the system. Letting the consumers know the general principle on which the cognitive system is based on, will increase their acceptance in the everyday life of consumers and it will increase the frequency of using intelligent cognitive systems.

It may seem now that there is little evidence of significant differences between men and women, but as awareness of such technologies rises, so will the contrasts between sample groups. Considering the rapid technological developments and the dynamics of reshaping consumers' experiences, further studies need to be undertaken, in order to keep research on consumers' perception up to date. The more cognitive computing is used by companies to interact with consumers, the more relevant it is to assess the differences between different consumer groups and their various impressions and understandings of this concept.

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Are Men More Affected by AI Anthropomorphism? Comparative Research on the Perception of AI Human-like Characteristics Between Genders

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Abstract

Anthropomorphic characteristics at AI devices and robots are an important topic for the development and their future acceptance in the business environment and society. Human like characteristics at AI devices can increase their friendliness and social acceptance, but at the same time the interaction with a human like AI device can be unnatural. In this paper we focus on the empirical comparative analysis of the perception of physical anthropomorphic characteristics at AI devices between genders. Based on an online survey with two conditions (anthropomorphic vs non-anthropomorphic) we measured the perception of men and women towards human like features at AI devices. In comparison to previous research the analysis has been done within the gender groups, so we analyzed the two conditions for women and men separately. The results show that men are more sensitive to physical anthropomorphic characteristics of AI devices. While for women no significant differences for the two conditions have been observed, for men there are significant differences for the two conditions. Men perceive a higher emotional involvement for the anthropomorphic AI device, but they rather trust and are willing to buy the robot with less anthropomorphic features.

Keywords

Artificial intelligence, anthropomorphism, gender, consumer, robot, consumer-AI interaction

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Introduction

Disruptive is the word associated with the present business environment technological trends. From attended or unattended robotic process automation to chatbots or virtual voice assistants (Ashfaq, et al., 2020; Adam, Wessel and Benlian, 2021; Crolic, et al., 2022), intelligent service robots (Bertacchini, Bilotta and Pantano, 2017; Song and Kim, 2021) and advanced AI devices (Anica-Popa, et al., 2021; Longoni and Cian, 2022), all these emerging technological innovations continuously boost the business settings and, at the same time, they oblige companies and consumers to adapt to this new technological waves' outcomes in order to be competitive. The implementation of AI devices comes with several challenges and changes for both business and consumers. The most important challenge refers to the acceptance and integration of AI in the everyday life of consumers and business. Much of the recent research has focused on the factors and contexts affecting the acceptance of AI (Araujo et al., 2020; Chang and Kim, 2022; Longoni and Cian, 2022). The predominant factors can be divided in utilitarian factors such as the efficiency, reliability, ease of use (Venkatesh, Thong and Xu, 2012; Gonzalez-Jiminez, 2018; Gursoy, et al., 2019) and hedonic factors referring to the pleasure and perceived experience of using AI (Wirtz, et al., 2018; Chiang, Trimi and Lo, 2022; Seo, 2022). Several authors describe more and more the relation between consumers and AI as being similar to human relations, involving complex psychological aspects. About the social relation between consumers and AI, the scientists investigate in how far robots can show or mimic empathy and affection towards the human consumer (Kervenoael, et al., 2020; Pelau, Dabija and Ene, 2021a; Crolic, et al., 2022). For this social relation, Puntoni, et al. (2021) describe two directions in which the individual can feel connection or alienation towards the AI and in how far consumer act according to ethical rules in the parasocial relation. Another aspect describes the power relation between consumer and AI and the extent to

which the consumers feel exploited or served in the relation to AI (Bryson, 2010; Puntoni, et al., 2021), depending also on the way consumers want to express power (Hu, Lu and Wang, 2022). The discussion goes even deeper in describing the future structure of the society with integrated AI and robots. Therefore, whether consumers will be empowered by the use of AI or they will be replaced remains a question at the center of scientific debate (Huang and Rust, 2018; Puntoni, et al., 2021). All these changes and challenges ascribe human-like characteristics to AI devices and robots. In our research we focus on analyzing the different types of anthropomorphic characteristics and the way they impact the para-social relation between humans and AI.

1. Literature review on the anthropomorphic characteristics at AI devices and robots

The concept of anthropomorphism in technological area is defined as the tendency of attributing humanlike characteristics to AI devices and robots (Waytz, Cacioppo and Epley, 2010). From the business automation perspective, anthropomorphism is stated as a basic psychological process that can facilitate social interactions between human and nonhuman entities, being considered as an essential construct for understanding people' perception of robots and by sustaining the humans' natural needs for social connection, understanding and control of their environment (Blut, et al., 2021). The anthropomorphic characteristics of AI devices cover a wide variety of elements, starting from the physical appearance and form of AI devices (Lu, Cai and Gursoy, 2019; Song, 2020; Song and Luximon, 2020; Chong, et al., 2021), the use of human voice and conversational skills (Feine, et al., 2019; Ashfaq, et al., 2020; Adam, Wessel and Benlian, 2021) to the transfer of a human-like behavior, psychological traits and characteristics (Lu, Cai and Gursoy, 2019; Mohanty, 2020; Pelau, Dabija and Ene, 2021a) and even to a social role conferred to them (Damiano and Dumouchel, 2018). We have identified some key challenges for each category of anthropomorphic AI devices.

For the physical anthropomorphic appearance of AI devices, several authors (Lu, Cai and Gursoy, 2019; Blut, et al., 2021; Chong, et al., 2021) confirm the fact that there is no clear implementation advantage for a human like form, the two appearances remaining indecisive. Recently, in the case of digital assistants, researchers show that an automatically activated non-anthropomorphic digital assistant leads to higher levels of satisfaction and user experience than a human-like, consumer-activated digital assistant, even the users acknowledge their potential freedom of choice threats. Henceforth, authors recommend that managers analyze the reactance to level of AI applications' anthropomorphism and the activation option use, in order to optimize the final consumers' satisfaction (Pizzi, Scarpi and Pantano, 2021).

An important category of AI devices are chatbots which have the ability to interact with consumers by voice and by having conversational skills. From the point of view of the chatbot-human interaction, a critical issue for a positive or a negative reaction of consumers are certain social characteristics such as verbal approach, visual emphasizing of the words' meaning, auditory presence components like voice and vocalizations, or invisible behavioral added traits like a certain response time (Feine, et al., 2019; Ashfaq, et al., 2020). Other researchers studied the way in which verbal anthropomorphic design cues (like identity, small talk, and empathy) of an AI-based chatbot affect user request compliance. It was shown that more human-like qualities can influence the users' willingness (consciously or unconsciously) to conform with or adapt to the recommendations and requests given by such an AI-enhanced chatbot (Adam, Wessel and Benlian, 2021).

For AI-chatbot assistants, the use of voice-based assistants as voice commands, and not specialized commends that people need, can be unnatural. The coach role of AI-chatbots comes, among others, with services requirements for comprehensive learning abilities, design and service expectation. A special case is the implementation of AI-chatbot co-workers. In this particular situation the main challenge represents the way in which companies should overcome the fear of employees to be replaced by robots or to become redundant and avoid situations of customer dissatisfaction or service failure caused by a potential misalignment of AI-co-workers and employee tasks (Chong, et al., 2021). Several researchers have shown that actually the physical human appearance by form or voice are rather used in order to enhance the psychological characteristics of AI devices (Tan, et al., 2020). Measuring consumer willingness to integrate AI devices and robots as a long-term agent in service delivery, Lu, Cai and Gursoy (2019) consider the anthropomorphic characteristics as a provoking variable, due to its divergent views: the consumers expressed both acceptance and rejection of robots having human appearance and behavior. In their SRIW scale, the anthropomorphic dimension includes elements influencing the consumers' perception of human-like AI devices like a mind of their own, consciousness, free will, emotions, intentions and even the sensation that they are either inanimate, computer animated or living and real (Lu, Cai and Gursoy, 2019). Other scholars have determined animacy, intelligence, likability, safety and social presence as critical

anthropomorphic factors which influence the consumers' use intention related to service robots (Blut, et al., 2021).

The human characteristics of AI devices can be categorized in cognitive and emotional ones. In the cognitive category there are included traits like increased efficiency of activities, higher capacity of memory and the capability of AI devices to learn from experience. Bringing machine learning from statistical analysis purposes to the computational intelligence and AI areas, Angelov and Gu (2018) announced as anthropomorphic the next generations of machine learning methods and algorithms, emphasizing the need for implementing imitations of humans' learning-from-data mode. As opposed to the deep learning neural networks, which are not transparent or adaptable to new scenarios and require huge data volume and computational power, the concept of anthropomorphic machine learning is presented by the authors as being endowed with eight human-like learning abilities. These include learning from new examples, learning collaboratively, being aware of what has been learned and what is known, what is unknown and why (Angelov and Gu, 2018). A human-like behavior exhibited by AI applications aiming at becoming appreciated by consumers are named humanitics. In this field, manufacturers registered the tendency to endow intelligent systems with more and more human characteristics, such as believing, trusting, predicting, learning, being emotional (Mohanty, 2020).

The emotional behavior of AI devices is related to their ability to show empathy, care and feelings of friendship in the relation to the consumer. In this sense, trustworthiness is considered a main characteristic for the perception of AIs' dominance, friendliness, and attractiveness. Mathur and Reichling (2016) also consider trustworthiness as having a key-role in human-robot interaction (HRI) for several reasons. On one hand trustworthiness is crucial for persuasion and people's intention to follow suggestions. On the other hand social robots have assigned characters for communication and reaction to communication, providing both physical help and emotional support to a human consumer. Consequently, the specialists have determined some potential dynamic and emotional features that could improve the facial anthropomorphic trustworthiness for social robots, such as symmetrical feminine features, direct gaze design or head nodding for positive emotions. All these AI enhancements can be integrated without affecting the face harmony of the AI (Song, 2020; Song and Luximon, 2020).

The consumer's perception of anthropomorphic attributes like warmth and mind attribution, was also studied in relation to the proactivity in social robot behavior, in order to contribute to the Human-Robot Interface (HRI) design for domestic robots (Tan, et al., 2020). It seems that the user perception of humanlike warmth can be increased with the proactive behavior levels. Nevertheless, when AI devices' behavior does not include proactive elements, the mind attribution may be perceived more. Damiano and Dumouchel (2018) distinguish between ascribing and inferring, by the consumers, the humanlike characteristics to different types of robots. While for AI devices with anthropomorphic projections evoked by objects, such as traditional dolls, cars or computers, the consumers ascribe human traits to non-human entities, for social robots it is the AI entity behavior from which these human specificities are inferred.

The most elaborate form of anthropomorphic AI devices is by attributing them a social role. By conferring robots "social presence" and "social behaviors", it is expected to generate the consumer's illusion of reciprocal social and affective potentially long-lasting relations with the AI devices (Damiano and Dumouchel, 2018). These social inclusion of AI devices is in accordance to the Computers as Social Actors Theory, according to which computers are seen as social actors and are treated as such (Davis, Bogozzi and Warshaw, 1989; Venkatesh, Thong and Xu, 2012). A big topic in this sense is their future integration in the hierarchy of the society. Using the Social Cognitive Theory (Bandura, 2018), Chong, et al. (2021) inventory the current AI-chatbot applications and classify them in three categories, from their social anthropomorphic role viewpoint in three categories: AI-assistants, AI coaches and AI co-workers.

2. Methodology

The objective of our research is to determine the impact of the physical anthropomorphic characteristics of AI devices on the consumers' perception depending on gender. More precisely we have analyzed if men and women have different perception of human-like characteristics at AI devices. For the empirical testing of the proposed hypotheses, data was collected with the help of an online questionnaire from 678 respondents in September-October 2021. In order to measure the anthropomorphic physical characteristics, the questionnaire has been developed with a between-subjects design measuring the constructs for two conditions: an anthropomorphic condition (N=335 respondents out of which 205 were women and 130 were men) and a non-anthropomorphic condition (N=343 respondents out of which 209 were women and 134 were men). For each of the conditions, the respondents had to watch a picture of an interaction between a

human and the anthropomorphic Sophia robot designed by Hanson Robotics (for the anthropomorphic condition) and an interaction between a human and a classic robot (for the non-anthropomorphic condition). After watching the picture, the respondents had to imagine that they have to solve a task with the help of the AI device they have seen in the picture. Based on this they had to evaluate the subsequent constructs. For each of the constructs, several items have been measured with the help of a 7-point Likert scale, where 1 represents total disagreement and 7 represents total agreement. For measuring the emotional relation between the consumer and AI we used 2 items adapted after Kim, Ratneshwar and Thorson (2017), 4 items adapted after Leach, Ellemers and Barreto (2007), Kirmana, et al. (2017) and presented in Bruner (2019). For the friendliness of relation between consumer and AI devices a scale has been adapted after Bagchi and Ince (2016) and Bruner (2019), while for the willingness to buy a scale has been adapted after Kumar and Pansari (2016) and by using self-determined items. Efficiency of using AI has been measured using a scale adapted after Pelau, Ene and Pop (2021b).

3. Results

In comparison to previous research, when we compared the two gender groups, in this analysis we tested empirically the differences within the group. For instance, we analyzed with the help of the discriminant analysis the differences for the two conditions (human vs. non-human) for female respondents and we did the same with the male respondents. The results of our discriminant analysis for the two gender groups can be observed in table 1.

The first analyzed factor was the *emotional relation* between people and robots. When asked if the interaction with the robot would affect emotionally the individuals, men which interacted with robots with humanlike characteristics agreed more with this question than women ($M_{\text{Human women}} = 2.57$, $M_{\text{Non-human women}} = 2.38$, $F = 1.234$, $p = 0.267 > 0.10$, $M_{\text{Human men}} = 2.60$, $M_{\text{Non-human men}} = 2.14$, $F = 5.175$, $p = 0.024 < 0.05$) and they were slightly more able to connect emotionally with the robot with anthropomorphic features than women ($M_{\text{Human Women}} = 2.36$, $M_{\text{Non-human women}} = 2.11$, $F = 2.720$, $p=0.100>=0.10$, $M_{\text{Human men}} = 2.46$, $M_{\text{Non-human men}} = 2.03$, $F = 5.343$, $p = 0.022 < 0.05$). We can observe also that both genders were more able to connect emotionally with the robot with humanlike characteristics in comparison with the one without these features. Regarding the ability of AI devices to establish a relationship with a human being, there are significant differences in finding it sincere ($M_{\text{Human women}} = 3.43$, $M_{\text{Non-human women}} = 3.46$, $F=0.018$, $p=0.892 > 0.10$, $M_{\text{Human men}} = 3.63$, $M_{\text{Non-human men}} = 4.06$, $F= 2.864$, $p= 0.092 < 0.10$) and trustworthy ($M_{\text{Human women}} = 3.69$, $M_{\text{Non-human women}} = 3.68$, $F=0.002$, $0.961> 0.10$, $M_{\text{Human men}} = 3.81$, $M_{\text{Non-human men}} = 4.39$, $F= 6.171$, $p= 0.014 <0.05$). The items concerning the ability of robot to manipulate people ($M_{\text{Human women}} = 3.90$, $M_{\text{Non-human women}} = 4.09$, $F=1.157$, $0.283 > 0.10$, $M_{\text{Human men}} = 3.91$, $M_{\text{Non-human men}} = 4.29$, $F = 2.532$, $p = 0.113 > 0.10$) and the honesty of robots ($M_{\text{Human women}} = 3.40$, $M_{\text{Non-human women}} = 3.50$, $F= 0.251$, $p= 0.617 > 0.10$, $M_{\text{Human Men}} = 3.65$, $M_{\text{Non-human men}} = 3.90$, $F = 1.119$, $p=0.291 > 0.10$) is considered moderate by both genders, having scores above moderate. We can also observe a preference of both categories for robots who don't have humanlike characteristics. Concerning the items that reflect the ability of robot to show empathy, there is only one item which shows a significant difference. There is a higher belief in the case of men that robot with humanlike characteristics is more caring that one without these features ($M_{\text{Human women}} = 2.24$, $M_{\text{Non-human women}} = 2.08$, $F=1.099$, $p= 0.295 > 0.10$, $M_{\text{Human men}} = 2.51$, $M_{\text{Non-human men}} = 2.15$, $F = 3.038$, $p = 0.083 < 0.10$), which reflects that they trust robots and their capacity to help people. The average scores reflect that friendship ($M_{\text{Human women}} = 3.99$, $M_{\text{Non-human women}} = 3.79$, $F=1.140$, $p= 0.286 > 0.10$, $M_{\text{Human men}} = 3.65$, $M_{\text{Non-human men}} = 3.68$, $F = 0.010$, $p= 0.921 > 0.10$) and kindness ($M_{\text{Human women}} = 3.78$, $M_{\text{Non-human women}} = 3.58$, $F=1.305$, $p= 0.254 > 0.10$, $M_{\text{Human men}} = 3.49$, $M_{\text{Non-human men}} = 3.55$, $F = 0.054$, $p= 0.816 > 0.10$) are the only qualities that can be considered appropriate to be found in robots in comparison to other characteristics, specific for human, and in consequence not attributed to devices.

The second factor which has been analyzed was the respondents' *willingness to buy* an artificial intelligence device with or without anthropomorphic features. While having to evaluate the wish of having a robot to help them with their daily activities, the results are very similar to both genders ($M_{\text{Human women}} = 5.11$, $M_{\text{Non-human women}} = 4.84$, $F = 2.001$, $p =0.158 > 0.10$, $M_{\text{Human men}} = 4.79$, $M_{\text{Non-human men}} = 5.12$, $F = 2.175$, $p = 0.142>0.10$). There is a significant higher score in the case of men regarding the willingness to buy a robot. The score of men ($M_{\text{Human women}} = 4.65$, $M_{\text{Non-human women}} = 4.62$, $F = 0.023$, $p =0.880 > 0.10$, $M_{\text{Human men}} = 4.51$, $M_{\text{Non-human men}} = 5.03$, $F = 5.460$, $p = 0.020 < 0.05$) is higher than the average, which reflects the trust in artificial intelligence devices and the wish of having a robot in their life, however they prefer robots without humanlike features. When asked if they would continue to interact with the robot in the near future, men showed more enthusiasm than women ($M_{\text{Human women}} = 4.65$, $M_{\text{Non-human women}} = 4.62$, $F = 0.023$, $p =0.880 > 0.10$, $M_{\text{Human men}} = 4.51$, $M_{\text{Non-human men}} = 5.03$, $F = 5.460$, $p = 0.020 < 0.05$). Finally, the enthusiasm or contentment of purchasing and using a robot was higher in the case of men than women,

but again, surprisingly, men prefer artificial intelligence devices without human features. ($M_{Human\ women}$ = 3.87, $M_{Non\text{-}human\ women}$ =4.07, F=1.072, p= 0.301 >0.10, $M_{Human\ men}$ =3.85, $M_{Non\text{-}human\ men}$ =4.35, F=4.314, p=0.039<0.05)

Table no. 1. Results of the discriminant analysis

Item	Women				Men			
	M_{Human}	$M_{Non\text{-}human}$	F	p	M_{Human}	$M_{Non\text{-}human}$	F	p
Emotional relation to AI								
The interaction with the robot affected me emotionally	2.57	2.38	1.234	.267	2.60	2.14	5.175	**.024**
I was able to connect with the robot emotionally	2.36	2.11	2.720	.100	2.46	2.03	5.343	**.022**
I fell that the relationship to the robot is honest	3.40	3.50	.251	.617	3.65	3.90	1.119	.291
I fell that the relationship to the robot is sincere	3.43	3.46	.018	.892	3.63	4.06	2.864	**.092**
I fell that the relationship to the robot is not manipulative	3.90	4.09	1.157	.283	3.91	4.29	2.532	.113
I fell that the relationship to the robot is trustworthy	3.69	3.68	.002	.961	3.81	4.39	6.171	**.014**
To what extent to you believe the robot is caring	2.24	2.08	1.099	.295	2.51	2.15	3.038	**.083**
To what extent to you believe the robot is friendly	3.99	3.79	1.140	.286	3.65	3.68	.010	.921
To what extent to you believe the robot is kind	3.78	3.58	1.305	.254	3.49	3.55	.054	.816
To what extent to you believe the robot is warm	2.95	2.79	.876	.350	3.00	2.74	1.305	.254
Willingness to buy								
I wish I had a robot to help me with my daily activities	5.11	4.84	2.001	.158	4.79	5.12	2.175	.142
I am willing to buy a robot which can help me with my daily activities	4.65	4.62	.023	.880	4.51	5.03	5.460	**.020**
I will continue my interaction with the robot in the near future	4.14	4.44	2.277	.132	4.21	4.79	5.942	**.015**
The purchase and usage of a robot make me content	3.87	4.07	1.072	.301	3.85	4.35	4.314	**.039**
Efficiency								
The robot performs the activities more efficiently	4.99	5.14	.787	.376	5.09	5.56	4.576	**.033**
The robot completes the duties more accurately	5.13	5.15	.016	.901	5.14	5.41	1.656	.199
Less errors occur when duties are fulfilled by robots	4.68	4.80	.453	.502	4.73	5.22	5.191	**.024**
The robot fulfills the activities faster	5.36	5.51	.948	.331	5.39	5.56	.683	.409
Activities completed by the robot are making my life easier	5.06	5.21	.854	.356	5.07	5.42	2.921	**.089**
I have more free time thanks to the robot	5.01	5.11	.313	.576	5.06	5.21	.488	.485
I can concentrate on more complex activities, if the robot is helping me out with some of the duties	5.12	5.39	2.893	**.090**	5.10	5.38	1.845	.176

The last category analyzed contains 7 questions regarding the *efficiency* resulted from the interaction with AI devices. When both categories were asked if the robot would perform daily activities more efficiently, men agreed more with this question as women while the interaction with robots without human characteristics was rated higher by both genders than the one with anthropomorphic characteristics ($M_{Human\ women}$ = 4.99, $M_{Non\text{-}human\ women}$ =5.14, F=0.787,p=0.376>0.10, $M_{Human\ men}$ = 5.09, $M_{Non\text{-}human\ women}$ =5.56, F=4.576, p= 0.033 < 0.05) The accuracy in which the robot can complete the tasks better than a human being was rated higher by the men who interacted with a robot without anthropomorphic characteristics ($M_{Human\ women}$ =5.13, $M_{Non\text{-}human\ women}$ =5.15, F=0.016,p=0.901<0.10) The third question concerned the fact that less errors occur when the duties are fulfilled by robots. There is a significant higher belief in the case of men concerning the accuracy when duties are fulfilled by robots. The score of men ($M_{Human\ women}$ = 4.68, $M_{Non\text{-}human\ women}$= 4.80, F= 0.453, p=0.502 >0.10, $M_{Human\ men}$ = 4.73, $M_{Non\text{-}human\ men}$ =5.22, F=5.191,

p=0.024<0.05) which interacted with robots without human being characteristics is higher than the average which means they trust AI devices and they accept robots in their life because they consider that these devices tend to improve their life ($M_{\text{Human women}}$ =5.06, $M_{\text{Non-human women}}$ =5.21, F= 0.854, p=0.356>0.10, $M_{\text{Human men}}$ =5.07, $M_{\text{Non-human men}}$ =5.42, F=2.921, p=0.089<0.10). The items which concern the rapidity ($M_{\text{Human women}}$ = 5.36, $M_{\text{Non-human women}}$ =5.51, F=0.948, p=0.331>0.10, $M_{\text{Human men}}$ = 5.39, $M_{\text{Non-human men}}$=5.56, F= 0.683, p=0.409>0.10) and the free time resulted from the usage of robot instead of human direct action ($M_{\text{Human women}}$ =5.01, $M_{\text{Non-human women}}$ =5.11, F=0.313, p=0.576>0.10, $M_{\text{Human men}}$ =5.06, $M_{\text{Non-human men}}$ =5.21, F=0.488, p= 0.485>0.10) show a low enthusiasm in both genders' behavior below the average score. The concentration on complex activities while robot performs some of the duties represent a significant belief in the case of women than men. ($M_{\text{Human women}}$ =5.12, $M_{\text{Non-human women}}$ =5.39, F=2.893, p=0.090<0.10, $M_{\text{Human men}}$ =5.10, $M_{\text{Non-human women}}$ =5.38, F=1.845, p=0.176 >0.10).

Conclusions

The results of our research show that men are more sensitive to anthropomorphic AI devices in comparison to women. Although there is an under average value for the emotional involvement of men in a parasocial relations to AI devices, men are more emotionally involved with AI devices with stronger anthropomorphic features. This means that for interactions in which emotionality is involved a stronger human like look might have a positive influence on the relation especially to male consumers. In opposition to this, men trust more to AI devices with a weaker anthropomorphic look. The perception of trustworthiness, sincerity are higher for classic robots. They also trust that a non-anthropomorphic AI device will perform activities more efficiently, with less errors and that they will increase their quality of life. Besides men are more willing to buy AI devices with weaker human like features. For the women the average values for the analyzed items are similar, but there are no differences between the two conditions. This result does not contradict the previous studies that men and women have similar perceptions on AI devices and robots, but the within the gender group analysis shows that there is a clearer delimitation of perception for men in comparison to women. This topic can be further researched in future studies in order to determine if this is related to the psychology of genders or if it is related to the gendered robot, as the anthropomorphic robot used in the research has had feminine features. These results have important managerial and practical implications, because depending on the situation and context in which the AI devices is involved, there will be needed stronger or weaker anthropomorphic features. For instance for emotional roles the AI device has to have stronger human like features, while for functional purposes these features are not that important.

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Analysis of Knowledge and Implementation of Business Intelligence Solutions in Romanian SMEs

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Abstract

The present article has as main objective the analysis of the current situation concerning the knowledge and implementation of Business Intelligence (BI) solutions in Romanian SMEs, while also focusing on negative and positive aspects related to BI. The research was conducted in SMEs from Romania, ranging from different sectors, with the final aim of pointing out drivers and barriers as far as corporate business intelligence tools are concerned, in order to increase business efficiency. The method used was quantitative and descriptive research, being used a sample of 37 managers of Romanian SMEs. The questionnaire was used in order to be able to characterize the degree of knowledge and implementation of BI in the researched corporations as well as BI impact on the decision-making process. The study concluded that 70% of the companies surveyed have been using business intelligence solutions for less than 5 years, meanwhile the rest, respectively 70% have been implementing BI for more than 5 years. The most critical risk factors for the implementation of a BI are the number of active BI users and improvement of business performance. Also, the SMEs surveyed stipulated that the reasons for using BI are: improvement of business performance and time, increased profitability improvement of processes and increase of client satisfaction. The research could lead Romanian SMEs to intensify their BI implementation in order to make more informed decisions that could increase the overall competitiveness of SMEs.

Keywords

Business intelligence; business efficiency; decision-making process; SMEs; informed decision-making.

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Introduction

Today the issues that move the world, and that are studied on a large scale, are all those related to technology and business competitiveness, which is due to the gradual awareness of the importance of implementing management systems: information and communication (Barba-Sanchez, Calderón-Milán and Atienza-Sahuquillo, 2018; Domazet, Zubović and Lazić, 2018; Singh, et al., 2019). In this sense, the growing concern for business problems and solutions in terms of competitiveness and development processes, is connected to the continuous increase of specialized studies (Koprivnjak and Oberman Peterka, 2020; Zauskova, et al., 2022) that allow the creation of ideas and initiatives for the management of innovation, science and technology, as well as for the strategic business processes implemented in the different types of companies and economic sectors.

Obtaining competitive success and sustaining it, permanently requires from corporations to have the capacity to react/respond (Carcary, Doherty and Conway, 2016; de Araujo, et al., 2021) and to adapt quickly (Stone and Woodcock, 2014; Sousa and Rocha, 2019; Awawdeh, et al., 2022) to the constant changes and developments that occur in the economic, social and technological environment. Therefore, it is necessary to implement dynamic and efficient processes to visualize the changes, to make decisions leading to sustained success, to constantly evaluate the results, ensure that the entities are innovative and, thus, achieve competitive advantages (Lopes, Guimarães and Santos, 2020; Tavera Romero, et al., 2021). It is stated that the context of the information society has led to the need for better, faster and more efficient methods for extracting, filtering and transforming an organization's data into useful information and distributing it

throughout the organizational value chain (Lopes, Guimarães and Santos, 2020; Lateef and Keikhosrokiani, 2022). All these requests are fulfilled by business intelligence (BI).

The goal of the article is to assess the degree of knowledge and implementation of BI in Romanian SMEs, while also finding information on challenges and drivers of BI. Therefore, it aims to answer the following questions:

- Which is the degree of knowledge and implementation of BI in Romanian SMEs?
- Which are the drivers and barriers of corporate business intelligence in Romanian SMEs?
- Which are the reasons for using BI in Romanian SMEs?

This research provides an innovative perspective regarding the BI knowledge, implementation, drivers and challenges of Romanian SMEs, regarding the trends of educational innovation, contributing to the literature by reflecting the degree of implementation of educational innovation in Romanian HEIs and its impact on students. The study highlights also the necessity for the evaluation of the effect of EI in the Romanian higher education institutions, which could help to establish a country pro-file for EI implementation as far as students are concerned. Additionally, this study can inspire other HEIs both from Romania and on a global scale since EI is seen as a tool to improve quality and increase competitiveness.

1. Review of the scientific literature

Today, SMEs represent the backbone of the international economy. In addition, they collect huge amounts of data from their operations and processes, daily. In order to efficiently use these data they need to make informed decisions, which leads us to the concept of business intelligence. The term business intelligence was used for the first time by Howard Dresner in 1989. However, currently, talking about business intelligence involves the integration of information for planning that leads to the optimization of company processes. According to Alnoukari, et al. (2012) BI stands for "the use of all organization's resources: data, applications, people and processes in order to increase its knowledge, implement and achieve its strategy, and adapt to the environment's dynamism". In recent years, this term has evolved significantly, since today more and more companies implement business intelligence models to improve their performance and to be competitive. According to Ayoubi and Aljawarneh (2018), "business intelligence (BI) is an umbrella term that combines tools, architecture, analytical tools, applications, data-bases and methodologies" (p. 1). One of the most complex definition was provided by Negash and Gray. According to them, „business intelligence systems combine operational data with analytical tools to present complex and competitive information to planners and decision makers. The objective is to improve the timeliness and quality of inputs to the decision process. Business Intelligence is used to understand the capabilities available in the firm; the state of the art, trends, and future directions in the markets, the technologies, and the regulatory environment in which the firm competes; and the actions of competitors and the implications of these actions" (Negash and Gray, 2008, p. 175). Therefore, business intelligence is defined as the set of tools and technologies that allow end users to quickly and easily access and analyze information and to make informed decisions aiming at improving the company's performance (Yiu, Yeung and Jong, 2020; Eriksson and Ferwerda, 2021; Huang, Savita and Zhong-jie, 2022), by constantly changing and adapting the processes and procedures in order to achieve the desired objectives (Martins et al., 2020). The purpose of information management and communication for decision making is to serve as a business strategy that aims to increase the performance of the company or the competitiveness of the business by intelligently organizing its historical data (transactions or daily operations). Business Intelligence (BI) is a tool under which different types of organizations can support decision-making based on accurate and timely information, guaranteeing the generation of the necessary knowledge that allows choosing the alternative that is most convenient for the increase of the organisational efficiency (Al-Eisawi, 2020). As far as the technologies of business intelligence are concerned, According to Wu et al., (2013), the concept of BI can be decomposed into three elements: data capture, data storage, and data access and analysis. The data is collected from both internal sources that come from the organization's operational systems and external data is obtained through customers, suppliers, government agencies, competitors, the internet, among others. (Yu, 2022). BI systems organize data collection, data storage, and knowledge management with analytical tools to understand and elucidate complex information to efficiently process and deliver results so that the sequence of business activities continues its usual course. The main components found in these systems are the sources of information- Operational database (OLTP) ETL (Extract, Transform, Load), data mining, analytical applications, data tray, Data Warehouse (DWH), OLAP technologies and others (Badgujar et al., 2022; Ilmudeen, 2022).

Due to the wide range of services it offers, BI allows knowing the income levels that a company obtains in different accounting periods, in addition to measuring the level of sales, knowing which is the best-selling

product at a general level or in a focal way, in short, IT helps to know many parameters in a short time just by applying the formulas or indicators for each variable that a company wants to know. In this way, scholars (Wani and Jabin, 2018; Shubho, et al., 2022) mention some advantages that are acquired with BI:

- Browse data from multiple database or cloud sources, allowing you to correlate data and make more convenient, informed decisions.
- Have access to the data that is required from any place only on the condition of having internet.

Other researchers state that other benefits offered by business intelligence are: saving time to find specific information, in addition to generating graphs and indicators for managerial knowledge (Srivastava and Venkataraman, 2022). In addition, with the information entered into the database by each department, administrators can determine which are the weaknesses or critical points that generate higher expenses in order to apply appropriate strategies to reduce expenses/costs (Mehanović and Durmić, 2022) and also decide on effective marketing strategies (Utomo, et al., 2022). It helps to stipulate realistic goals by comparing historical and current financial results or also by comparing the results of similar businesses. Only in this way can be elaborated projections possible to achieve.

2. Research methodology

To carry out this research, a descriptive type of research was used. The population under study is made up of 55 companies that are legally registered with the Chamber of Commerce of Bucharest. The sample used was of 37 companies and a 67% response rate was obtained (because the rest of the companies did not have a BI tool implemented so far). The techniques used to acquire the information correspond to a questionnaire structured in five dimensions: knowledge, implementation, use and tools related to business intelligence and identification data. For the processing of the questionnaires, a statistical software, SPSS 24, was used for the tabulation of the data obtained and their analysis through tables and graphs. The answers collected were turned into graphs using the Excel program belonging to the Office 365 package, using descriptive statistics.

3. Results and discussion

The first two questions were tabulated independently, being necessary to determine the number of SMEs that have a business intelligence tool (BI) they work with. Out of 55 SMEs registered at first for the research, only 37 used BI, which meant that 77% have a business intelligent system, while 23% lack this tool that helps in decision-making. Further on only these 37 respondents filled in the questionnaire. In addition, 30% of the companies surveyed have been using business intelligence solutions for less than 5 years, meanwhile the rest, respectively 70% have been implementing BI for more than 5 years.

It was found that the respondents consider that the implementation of Business Intelligence is important when applying it in any company, since it acts as a factor that generates strategies and a great potential for competitive advantage; that is, BI can be defined as privileged information used to respond to business problems.

Table no. 1 records that the most critical risk factors for the implementation of a BI.

Table no. 1. BI challenges in Romanian SMEs

Challenges	Frequency		Percentage
	Yes	No	
User perception	22	15	59.4
Investor Support	19	18	51.4
(Knowledge) Active BI users	37		100.0
Cost savings	27	10	73.0
Improvement of business performance	37		100.0
Better information access	9	28	34.3

Source: Survey applied to entrepreneurs from Romanian SMEs.

The number of active BI users and improvement of business performance with 100%, followed by cost savings with 73%, then the user perception variable with 59.4%, followed by the variable investor support, 51.4% and better access to information 34.3%. Although the option of having better access to information is the one with the lowest percentage, it can be seen that the difference between the other options is actually small. In this sense, it can be inferred that, given the results of the survey, there is a balanced perception of the risk factors to implement business intelligence.

In Chart 1, Reasons for using BI, it is observed that 100% consider the variables: improvement of business performance and time, as the most important, followed by the variable increased profitability with 91,9%, then the variable Improvement of processes with 86,5% and increase of client satisfaction with 81,1%. Two other variables: improved quality of decision making and improved agility had more than 50%, meanwhile the last of the variables (cost reduction) got 32,4%. In this sense, they consider the implementation of BI essential, as a valid reason to improve business performance, profitability and client satisfaction while reducing time of processes and operations with this technological tool.

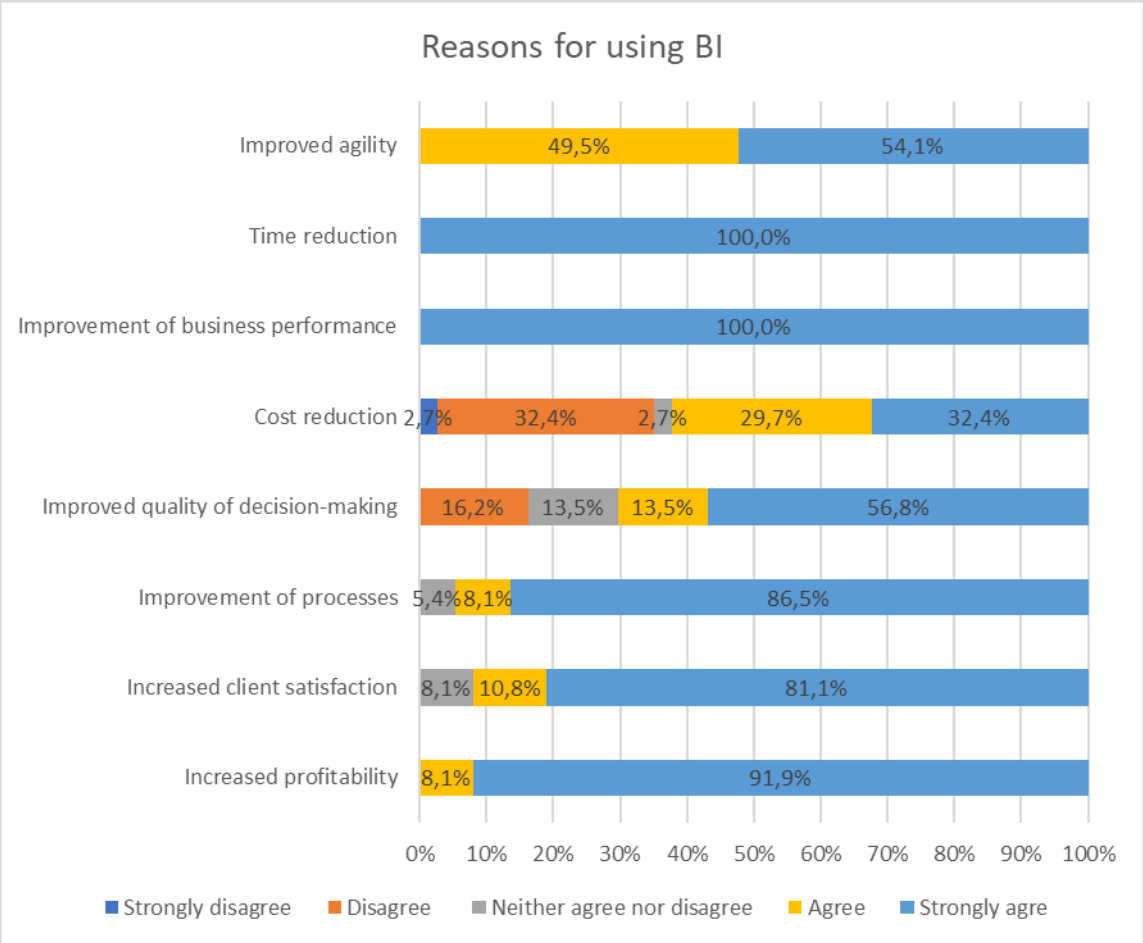


Chart no. 1. Reasons for using BI
Source: Survey applied to entrepreneurs from Romanian SMEs

As can be seen in the graph below (Chart no.2), the variable: I have access to reports and analyzes (86,5%), followed by the variable: I create my own reports and analyzes with (43,2%). In other words, they know very little about taking advantage of the use of BI. Having knowledge and managing data administration properly highlights that information is a valuable resource that must be accessible so that all users, that must be stored safe, as a valuable resource.

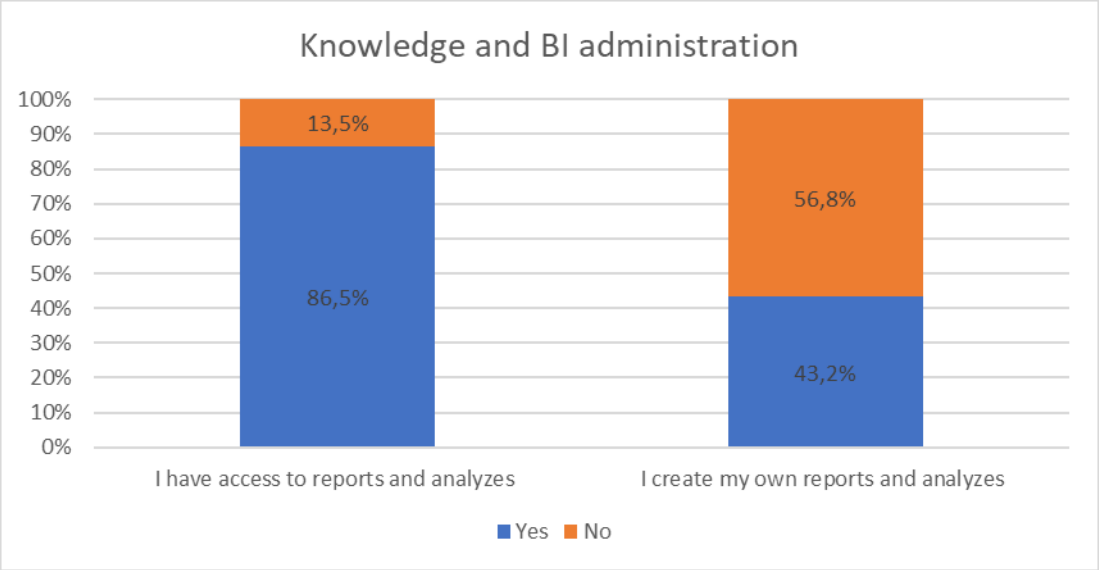


Chart no. 2. Reasons for using BI
Source: Survey applied to entrepreneurs from Romanian SMEs

Conclusions

The development of the research revealed the current state of knowledge and implementation in Romania in relation to business intelligence in the internal processes of the analyzed SMEs. Out of 55 SMEs registered at first for the research, only 37 used BI, which meant that 77% have a business intelligent system that helps in decision-making. Also, the research proved that respondents, in spite of the fact that have access to reports and analyzes, hardly create their own reports and analyzes (43.2%). These results of the research show that SMEs from Romania, are far from making efficient use of BI in their processes, in spite of their knowledge that BI provides greater control in the handling of information and improvements in the decision-making process. The study revealed research gaps and opportunities for Romanian SMEs as far BI is concerned. Future researchers may take up qualitative researches in order to evaluate the knowledge and BI implementation either on SMEs or on large enterprises.

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Designing a Communication Model for Sustainability in the Post – Pandemic Era

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Abstract

Sustainability is one of the global key trends amplified by the Covid-19 pandemic. The main economic players took action in setting the sustainability goals in their organizations and bringing sustainability at the top of their priorities. Sustainability is now at the beginning of all innovation and development processes.
The way sustainability is understood by all involved actors will drive the success of the sustainability projects. From the last study we have conducted, one of the most important conclusion was the fact that as long as consumers are educated and informed about sustainability measures they are open to get involved and are enough motivated to take action. The main goals are compelled by authorities and underlined by NGOs, implemented and adopted by the economic environment, the producers and the retailers or trade channels. Their task is to set the main measures for implementing the proper sustainability related projects, so they should be called drivers in the communication process of sustainability and the consumers could follow, becoming the followers in this important task.
The purpose of this paper is to identify the main players of the sustainability communication process, to find a way they could act together and to design an original model for communicating sustainability. The model could be used by the main sustainability players in order to find a common ground, for creating motivation and setting the main objectives and measures for reaching the sustainability goals.

Keywords

Sustainability, communication, key trends, marketing-mix.

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Introduction

Covid-19 pandemic gave us time to rethink our priorities and goals. We as individuals, the companies as business and the governments and NGOs as authorities. Together we could contribute to a sustainable future development. We started to be more sensitive at the environment protection issues; we have set sustainability measurable goals, we placed sustainability at the beginning of our management strategies and innovation processes. We've approached sustainability from all levels: our environment, our people and our economy, involving our companies, our products, our processes and digitalization.

In terms of context, Bodenheimer and Leidenberger (2020, p. 68) stated "lack of ecological sustainability contributed to the coronavirus outbreak," "lack of economic sustainability contributed to its rapid and global spread," and "lack of social sustainability contributed to its severity." As a result, the authors concluded that 'it is therefore important to proceed with the utmost care in designing communication strategies that create any type of association between the COVID-19 pandemic (which is a threatening situation with highly negative connotations) and sustainability transitions (which should ideally be associated with positive connotations)'.

A similar study was ruled out by El-Sharif (2021), who stated that "improved tracking, assessment, and communication around the sustainability agenda would catalyze the requisite political buy-in to turn green transition plans into actions."

The need to shift from a 'carbon neutrality" to a "carbon regenerative' economy was elaborated by Lelievre (2021), resulting in a process that 'restores, renews or revitalizes an organization's sources of energy or materials; and integrates business needs with the integrity of nature". According to the author, 'this strategy demonstrates how sustainability is becoming strategically integrated not only into a company's operations but extending into its products and services in a way that benefits communities.'

What we have learned from the last study we have conducted is that consumers pretend that authorities and companies or brands are responsible to start and communicate the sustainability projects and issues and they should act in order to start the education process for consumers. The main objective is to getting them involved and finally to take action.

Brands considered the consumers attention to sustainability and rethink the way they innovate and communicate. They started to be as transparent as possible, offering consumers as many information as needed. Still innovation is at the start of their growth strategies confirming the statement that there is no sustainable development without innovation (Maier et al., 2019).

The specific problem that we would like to address in this paper is the fact that all communication on sustainability is done decentralized. Each of the main players approach sustainability individually. The governments set the legal requirements/ approach, and the companies tried to set their objectives in line with the government's requirements. No matter the company profile, producer, retailer or services provider, all of them tried to comply. Moreover, after setting their compliance approach, in the next step they communicate their sustainability approach strategy to consumers, by taking public engagements and setting their own sustainability goals. Still, there is a decentralized communication. Even the objectives are common and the deadlines are the same, each of the players which take action do this on his own.

In this paper we offer a model for identifying the convergent projects for sustainability communication and the way communication could be done in order to have the same message, reason to believe, proper communication channels and proper approach strategy.

We've structured our paper in four parts. After setting the context and reason why in the first part of the paper, in the second part we've analyzed the empiric research data on consumers for confirming their bidding to get involved and to find the best way to do that. In the third part of the paper, we have pointed out the need of a common approach in sustainability communication and offered a model for a successful approach. In the last part we draw conclusions on the proposed model, giving recommendation on how this could be used.

1. Review of the scientific literature

Green deal set the plan for transforming our economy, our way of doing business, and the society transformation in order to meet the challenges of the future, because the climate change is one of the biggest challenge of the moment. We are considered the generation that still can act. When we think on sustainability, we have to take into account projects from all the three dimensions on which this is developed and implemented: economic, social, environmental.

The blueprint given by the Green Deal was translated in businesses objectives (such as reducing food waste, reducing plastic use, improving the nutritional profiles of produces food, zero carbon foot print) for some years already, but this was never as visible as in the pandemic period. It seems that the pandemic gives us more time to offer sustainability the importance it deserved.

Past studies on sustainability in the agri-food sector were focusing on the sustainability of farming, and not on the supply chain as a whole (Andreoli and Tellarini, 2000; Pannell and Glen, 2000). More recent surveys seem to focus on the whole agri-food supply chain. For example, Blanke and Burdick (2005), compared two apple supply chains (from the farm level to consumer), one local and one international. A supply chain view of sustainability was also followed in a research by Vasileiou and Morris, (2006). In their research on the British fresh potato supply chain identified and explained the perceptions of the importance of sustainability attributes held by key participants in the supply chain. Yakovleva (2007), approached the concept of sustainability also in a broader, non firm-based view, by assessing the UK chicken and potato supply chain comprising stages of agriculture, food processing, food wholesaling, food retailing and food catering. Sustainability indicators, need to be easy to measure, understandable and meaningful – especially as we move to cover the entire supply chain. Not surprisingly, the literature review identified that most of the efforts in developing sustainability indicators tend to focus on environmentally related strategies and practices of business but not on their social practices (Sharma and Ruud, 2003; Collins et al., 2007).

2. Materials and research methodology

As a first step we have analyzed the context of the sustainability and the way it is communicated. We had in focus the main producers from the Romanian market and the way they implement and communicate their sustainability projects, goals and measures.

In the second step, we use the quantitative research method (survey research based on questionnaire) for analyzing a part of the answers from our empiric research conducted in December 2021. The researched tried to find out the Romanian perception on sustainable packaging. In the last part of the questionnaire, we had questions regarding the responsible parts for the sustainability communications and how the consumers perceived the involvement of producers, retailers or traders and authorities. We analyzed all relevant questions and answers for pointing out the need of consistent communication and design of convergent projects.

In the last part we developed the communication model of sustainability after Covid-19, taking into consideration the main actors for that and the steps that are necessary to go through.

3. Results and discussion

3.1 Context of the sustainability and the way it is communicated

Many of the brands had shared their sustainability goals and the measures to achieve these goals, with their consumers, becoming more transparent in their decision making processes, in their innovation process and in their strategic development process, proposing the proper public messages (Jurconi, Pamfilie and Lupu, 2021). Goals are aligned with the 2030 Sustainable Development Goals of the United Nations.

Table no. 1. Published sustainability goals of main producers on the Romanian market

Company	Goals (Economic, Social, Environmental)
Nestle	Bottles with 25% recycled plastic Until 2030, zero environment impact 100% of packaging to be recyclable or reusable 2025. Until 2050 zero carbon emissions
Unilever	50% virgin plastic reduction by 2025, including an absolute reduction of 100,000 tonnes 25% recycled plastic by 2025 Collect and process more plastic than we sell by 2025 100% reusable, recyclable or compostable plastic packaging by 2025 Halve food waste in our operations by 2025 Maintain zero waste to landfill in our factories
Mondelez	Cocoa Life: 100% volume for chocolate brands sourced through Cocoa Life by 2025* Palm oil forest monitored: 100% by 2025**** Palm oil RSPO certified: 100% by 2025 (since 2013) CO2: 15% reduction in CO2 emissions across manufacturing operations by 2020** Recyclability: 100% of packaging designed to be recycled, labeled with recycling info by 2025 Human Rights: 100% human rights due diligence system coverage in own operations & tier-1 suppliers by 2025 Cocoa Life communities in West Africa by 2025*** Increase representation percentage of women in executive leadership roles by 2024**
Danone	net zero carbon emissions by 2050 across our full supply chain. packaging 100% reusable, recyclable or compostable by 2025. By 2025, to reach 50% of recycled material on average in our plastic packaging, going up to 100% r-PET for our water business in Europe. Danone's ambition is to reduce the use of virgin plastic in packaging by 33% by 2025 (baseline 2019). Promote a shift to flexitarian diets through increased sales of our plant-based products. By 2025 we aim to triple the sales revenue from our plant-based products to reach €5 billion (baseline 2018).

Company	Goals (Economic, Social, Environmental)
	For ingredients grown in highly water stressed areas, Danone commits to the following by 2030: Reduce total water use 25% and optimize fertilizer usage at the farm level for 75% of volumes of milk, fruit, almond & soy; reduce food waste within our operations and supply chain by half by 2030. 100% recycled or certified virgin paper (FSC, PEFC or equivalent) ▪ 100% traceable soy for our plant-based products; and 100% RSPO Segregated palm oil.
Mars	packaging 100% reusable, recyclable or compostable by 2025. reduction in CO2 emissions across manufacturing operations with 27% by 2025 and with 67% until 2050.
Ferrero	100% of our packaging to be reusable, recyclable or compostable by 2025 Until 2030 reduce absolute Scope 1 and 2 emissions by 50% from a 2018 base year. Until 2030 reduce Scope 1, 2 and 3 emissions intensity by 43% per tonne of product produced from a 2018 base year.
Dr. Oetker	By 2025 to optimize the nutritional profiles of its products and reduce the use of salt, sugar and fat by up to 20 %. By 2022 the company will achieve climate neutrality at all locations The amount of food waste that Dr. Oetker can directly influence will be re-duced by 25 % by 2025. all packaging materials can be recycled by 2025 Dr. Oetker plans to make its supply chains sustainable - both socially and ecologically. aim of completely pre-venting occupational accidents, will implement a management system that complies with the internationally recognized certification standard ISO 45001 at all production sites by 2025.
Coca Cola	Reduce direct carbon emissions ratio by 30% 50% of our refrigerators in customer outlets will be energy efficient 50% of total energy used in our plants will be from renewable and clean sources 100% of the total electricity used in our plants in EU and Switzerland will be from renewable and clean sources Help secure water availability for all our communities in water risk areas Source 100% of key agricultural ingredients in line with sustainable agricultural principles Reduce water use in plants located in water risk areas by 20% 100% of our consumer packaging will be recyclable Reduce by 25% the calories per 100ml of sparkling soft drinks Source 35% of the total PET we use from recycled PET and/or PET from renewable material Help collect the equivalent of 75% of our primary packaging Target zero fatalities and reduce (lost time) accident rate by 50% 50% of manager positions will be held by women 10% community participants will join first-time managers' development programmes 10% of employees will take part in volunteering initiatives

Source: The producers' websites. Published sustainability goals.

During pandemic period, setting the short-term priorities was quite challenging and even harder the plans and priorities for mid- to long-term, so bringing sustainability at the top of priorities and innovation processes was the right thing to do. Even this will drive decreases in profitability in short term the expectations are like all these efforts to drive a healthy growth on long term.

The way sustainability is communicated does matter. The messages were adjusted in communicating the positive impact with creative stories on mass-media and visible product claims in-stores much more than before the pandemic period and for sure this will increase in the near future. The businesses commitments will be more visible and linked to their sustainability activities.

The mandatory ESG (Environmental, Social and Governance) reporting will drive companies' transparency and will increase the perceived value of the companies and is expected to have impact in investing decisions or employee preferences for certain companies.

3.2 Key aspects regarding communication during the pandemic period

During pandemic period, the brands/ companies should rethink the way they communicate with consumers and they decrease the number of new products launches. The communication during the pandemic period was done with care, with focus on brand value and purpose and less focus on products or promotions. Another effect during the pandemic period was the decrease in number of innovations. During that period were launched and communicated less innovations or new products launches. For sure in the near future, as compensation innovations will increase and will be more consistent in terms of needs that will cover.

3.3 Why do we need a model for sustainability communication?

We have conducted an empirical study on 280 respondents, with the following profile: Men and women, aged between 30-65 years, living in the urban area of Romania, with medium and high incomes (75% with incomes for 5000 lei). Fields of activity in production, trade or consulting and education, with professional status as an employee (66%), high level of education (94% university and post-university), who often read the labels of the food they buy and want to live in a less polluted environment. Followers of the latest trends in fashion, cooking or lifestyle. Not always able to keep up, but positive and eager.

Considering that for the end-consumer one of the most tangible part of sustainability is the environment protection, we wanted to find out how they perceive the food sustainable packaging and what the main benefit of using sustainable packaging is. Another aspect we wanted to investigate was their expectations regarding the actions the main players could implement in order to proper communicate the sustainability of packaging.

Out of the total number of respondents 201 (72%) are preoccupied by the impact of food packaging on the environment, answering with (I am preoccupied a lot and I am extremely preoccupied on the impact of food packaging on the environment).

A consistent part of the respondents 81%, identify living in a less polluted environment, as the main benefit of using sustainable packaging.

Regarding the responsibility, cost and communication of the transit from the classic to sustainable packaging, we could not point out only one responsible part, as the opinions were quite balanced splitted between food producers, traders, education system, NGOs. Still the education system was the highest rated, pointing out the necessity of an entire chapter in "Ecological Education" textbooks. (The possible answers were: Food producers should bear the full cost the transition from classic to sustainable packaging; It is the exclusive role of the traders to organize campaigns to educate consumers about it; sustainable food packaging Sustainability should cover an entire chapter in "Ecological Education" textbooks; Civil society trust in non-governmental organizations Government justifies their key role in promoting the principles of the circular economy in the ranks citizens; Talking about sustainability is a fad, for as long mankind has so many other problems).

Regarding the role of the State Authorities in the domain of sustainable packaging, the most important one was the one related to mass-media communication: *to be included in the program schedule of the national television weekly shows dedicated to the circular economy* (the other possible answers were: To create the legislative framework necessary for the transition of the industry food to sustainable packaging; To check the correct application of the unique marking and distinctive feature of food sustainability sustainable packaging; To regulate the price of sustainable packaging through subsidies to producers of biodegradable raw materials; To provide state aid to producers who wish to invest in sustainable food packaging technologies;)

One of the research conclusion is that we need a common approach for communicating the food packages sustainability, starting from the authorities, continuing with the implementation in production companies and in-stores, communicating a consistent and clear message by the education system and after purchase, taking action in house-holds.

4. Communication Model for Sustainability in the Post – Pandemic Era

The main actors for a successful communication model are all active parts, directly involved in the process: the State Authorities, Non-Governmental Organizations, companies and brands, retailers and consumers.

Governments should start to play a greater role to facilitate the transition not only with targets and policies but also with communication on their specific channels. The implementation of European Directive by developing a national legislative framework and propose an action plan or developing a guide for the companies about how the law requirements should be implemented in their activity.

Facilitating meetings with the representatives of main actors from the action plan: authorities, NGOs, retailers, production companies, consumers. This could be easier implemented through their national organizations.

Taking into consideration that all communication will start from the Authorities together with the Retail and Production companies and NGOs, we consider that these entities could be defined as the driver of our communication of sustainability.

The main beneficiary of all sustainability communication of drivers are the consumers, which should continue the sustainability related efforts in their daily activities, from outside of home and at home, so we consider that they can be called followers in the communication process.

1. Mapping the importance of the main sustainability communication actors

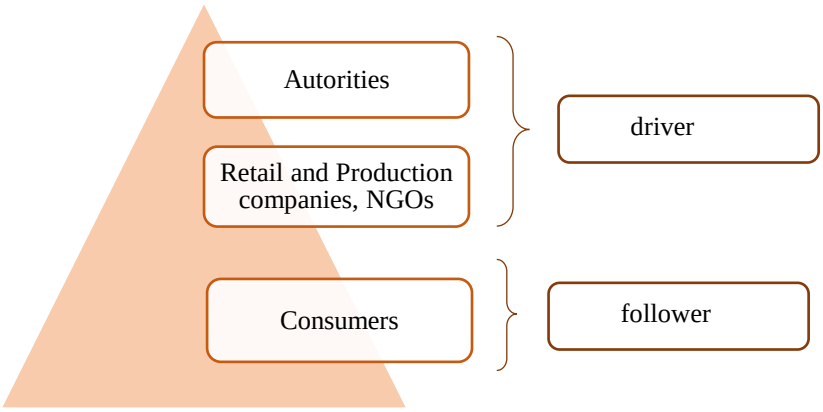


Figure no. 1. Mapping the importance of the main sustainability communication actors

In order to create a consistent message to all involved parts, is required to bring together all needed resources: sustainability activities, well defined in the sustainability related projects, with clear goals, measures and timings, the clear message or reason to believe for credible and relevant communication and the proper communications channels.

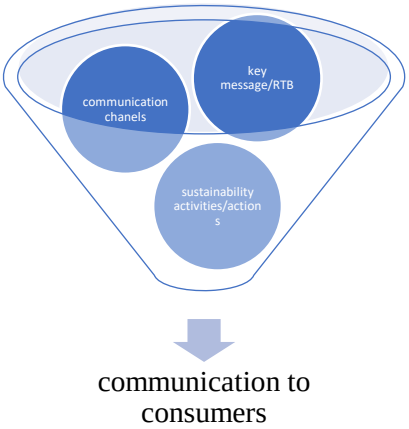


Figure no. 2. Bring together all needed resources for relevant communication to consumers

2. Finding the convergent projects for all involved parts.

Creating an alignment of the commitments at the same set of values and goals for:

- developing projects together
- developing key messages for communicating the sustainability projects and goals
- identifying the right channels for communication
- developing the in-store implementation strategy
- developing a plan for communication on shelfs or on products packages using the same symbols or layout sustainability graphics

3. Financial commitment, in order to start the implementation of convergent projects.
4. Projects implementation and on-going efficiency improvement
5. Ending the projects and communicating the results on the right channels and with the relevant message
6. Assessment / Evaluation of all implemented projects

For generating the communication model for sustainability we've made a possible projection using the 4P marketing-mix:

Product – in this model we considered that the products is the Sustainability

Price – are all financial resources in order to find, implement and communicate the convergent projects related to sustainability

Promotion – are all the communication efforts of the convergent projects

Placement – is the entire process of identifying the convergent projects, their implementation, the conversion to the right message for communication

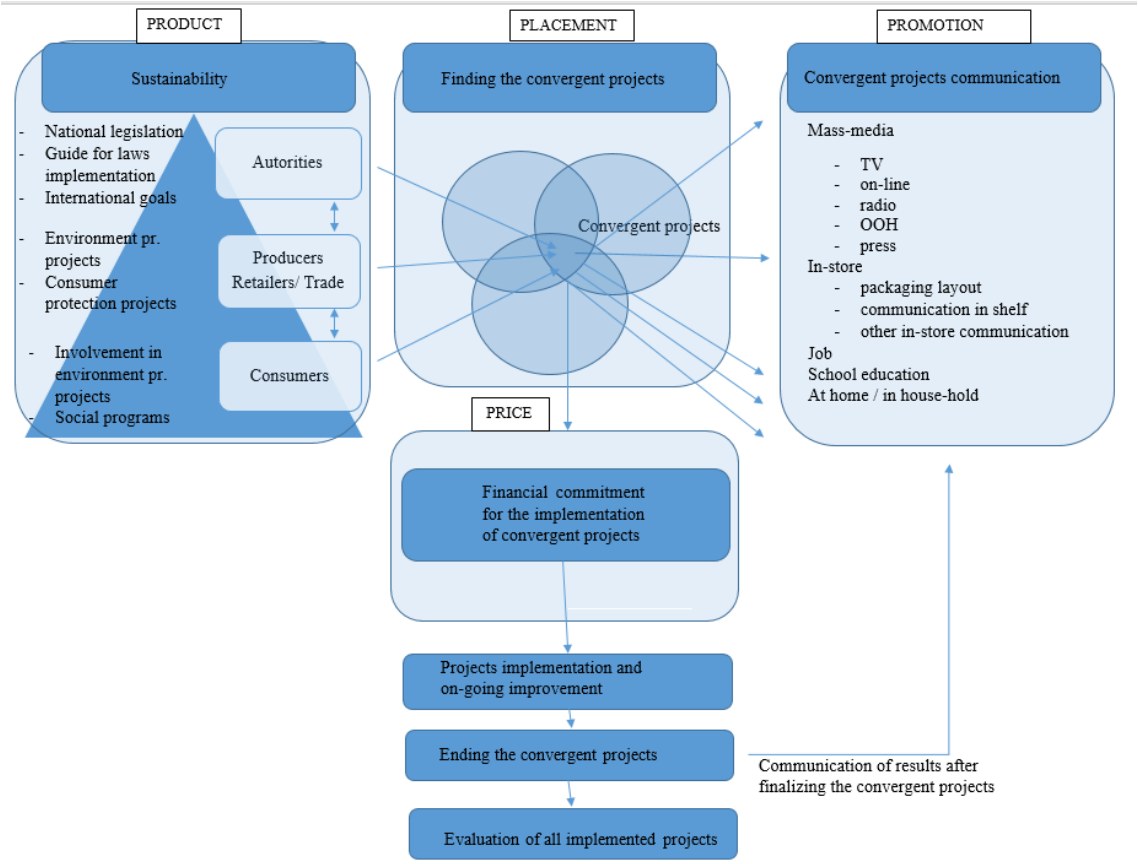


Figure no. 3. Representing the communication model for sustainability

Conclusions

The main objective of the paper was to confirm that we need a communication model for sustainability. For that we have analyzed the results of our empiric research and confirmed that there is a need for implementing sustainability related projects and to communicate them properly. In the next phase, we identified the main players for the communication of sustainability and advanced a possible common approach of the projects and communication. We consider that, at this moment, there is a lack of information at consumer level regarding sustainability and one of the reasons could be the fact that communication of sustainability projects and goals is done decentralized. Our challenge was to point out a way of how this could be done centralized. The 4P marketing-mix was use for fulfilling the Communication model and we tried to answer at the main communication questions, what? "how, who, when, where, why, and to whom?" (Xiong, et al., 2020). We conclude that sustainability should be communicated and the best way to do this is to have a common approach. For that, in our model, after defining the main actors for communication we identified the convergent projects as the common action and communication tool. The next step in our model was to finance and implement the convergent projects and to communicate the progresses and results. The communication of sustainability projects should be clear and transparent. The model could be adopted by the sustainability projects owners which could enlarge the project promoters base and could implement the proper communication to consumers in order to achieve their involvement on short and long-term.

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Cyber Range as a Competency Based Education Instrument in Cyber Security

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Abstract

The importance of Cyber Security is becoming more and more widely known among companies and government institutions. This came at a cost that many business and public administration entities have paid in recent years. This indirect cost is due to the multitude of cyberattacks to which they have been subjected, attacks directed to the IT infrastructures of these entities. Recent studies show that most cyberattacks were based on vulnerabilities caused by the human factor: either directly, through the mishandling of technology (hardware and software), or indirectly, through the misconfiguration of cyber services exposed on the Internet. Cyber Range systems can offer multiple functionalities depending on the field of activity for which they are implemented. One of the main advantages of Cyber Ranges is that these systems can make a major contribution to the digitization of educational platforms, regardless of the field of study. This study aims to contribute to the process of educational environment optimization by addressing the influence of implementing Cyber Range systems as part of the digitalization of the educational process, particularly in the sphere of cybersecurity training. The conclusions presented in this article might have a major positive influence on educational effectiveness if they are implemented. The immediate impact in the field of cybersecurity is a financial one, as trained users reduce the risk of costly cyberattacks.

Keywords

Cyber Range, Cyber Security Awareness, Educational Cyber Instruments, Competency-based-Education.

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Introduction

According to recent studies performed by many companies from the cybersecurity field, human factors are responsible for approximately 95% of the data leaks through cyberattacks. Even if there are many implications of the human factor regarding cyberattacks vectors, two main types of human errors can be mentioned, from the cybersecurity breach vectors: IT systems misconfiguration and users misleading, convincing users to perform malicious actions without them being aware of the consequences (IBM, 2021). While lowering the chances of error is critical, there must also be considered the causes of error from a human perspective. Educating company/government institution staff about security fundamentals and best practices allows them to make smarter decisions, keep security in mind, and seek more guidance when they're unsure of the ramifications of a certain action. Employees should be trained on all core security issues (US Bureau of Labor Statistics, 2022). Because human error can manifest in a variety of ways, it's critical to provide employees with a basic understanding of any security topics they might encounter in their day-to-day work activities. Email, the internet, and social media, as well as phishing and malware training, are all issues that should be covered throughout training (Columbus, 2020).

For an employee who has access to a secure computer, training must be engaging and relevant: your employees have short attention spans, and you must guarantee that their training does not put them to sleep. Image and video-based interactive training courses are considerably more successful than hour-long PowerPoint sessions. Training should also not be delivered in yearly sessions that your employees will

forget a week later, but rather should be delivered in a quick and simply digestible format on a regular basis throughout their working lives (Pham, et al., 2016).

Cyber ranges are complex IT systems used in different activity fields. They consist of multiple modules being able to offer network infrastructures as a service (IaaS) combined with specialized software responsible for the customization of the system according to the activity field implementing it. From the cybersecurity perspective, cyber range systems can make a significant contribution to cyber security training ensuring cyber security virtual scenarios development. Cyber ranges are used in cybersecurity training to allow learners to obtain practical experience through hands-on activities. This type of activity will certainly increase the level of user training and cyber security awareness, thus reducing the risks of successful cyberattacks.

1. Research methodology

The research was conducted in phases and was based on the major processes in scientific investigation:

i. Formulation of the hypothesis: Cyber Range systems as a competency-based education instrument in the cyber security field;
ii. Conducting a specialized bibliographic study in the field;
iii. Conducting a study on statistics on recent years cyber security incidents; Analysis of human causes - employees and cyber security experts;
iv. Elaboration and development of arguments regarding the working hypothesis;
v. Formulation of conclusions and future work elements.

2.. Literature review

Cyber range systems are already successfully used as a competency-based education instrument in the cyber security field. There are many implementations of cyber ranges in large companies or government institutions of some states. There are also businesses implemented based on cyber security training through cyber range systems (Offensive Security, EcCouncil, Hack the box, etc.).

There are numerous cybersecurity courses available now for both beginners and advanced learners. The major goal of the courses for beginners is to increase their knowledge of cyber threats and to assist them develop their skills in safeguarding themselves and their businesses. Advanced courses, on the other hand, concentrate on profound security topics (European Cyber Security Organisation (ECSO), 2020). Most of the curriculum necessitates trainees dealing with difficult and hands-on experience with real-life events. A cyber range is a virtual world that participants can access and study during training to find answers to questions and learn practical skills. It is specifically built for a training session, as it includes all the infrastructure (machines, networks, tools, and so on) as well as security settings connected to the course's content. It must also be well-controlled from the standpoint of networking, which must be isolated from the outside to prevent traffic leakage and divided among trainees to prevent access to each other's environment. Currently, preparing cyber ranges for cybersecurity training is done manually, which is time consuming, requires a great deal of effort and talent, and is prone to errors (Pham, et al., 2016; European Cyber Security Organisation (ECSO), 2020).

It's worth noting that human mistake is to blame for 95% of data breaches. Businesses may address this growing tendency in data breaches by focusing on effective cybersecurity training for the company's personnel - increasing the awareness level and decreasing the risks (Irwin, 2022).

Education is changing continuously by trying to adapt to technology, demographic trends, and social changes. Human society is in a continuous change and that affects the way we learn or the expectations of others on the results of these processes. Last years, especially the unexpected embrace of online learning and other online communication technologies in the light of the COVID-19 pandemic, has again shift the focus of the society on the required changes that must be made in education. Despite it is not a new concept, Competency-based Education it has seen a surge of interest in recent years, based on its core philosophy, that education must focus on what students know and what practical skills they have, rather than how long they need to acquire the knowledge (Klein-Collins, 2016). For technical fields like computer science this approach has been proven to deliver better results as the main objective is to train the student to be able to do something (Dieck-Assad, Ávila-Ortega and González Peña, 2021; Malonda, 2022).

3. Cybersecurity recent years statistics

Not only has the number of exposed records from data breaches increased in 2020, but so has the number of phishing and malware attacks. Over 27 billion records were revealed in the first half of the year, vastly outnumbering the total amount of records disclosed in the entire year by 12 billion. These data breaches impacted a wide range of companies, including the hotel and technology industries. For example, in March 2020, 5.2 million guests of the hotel chain Marriott had their data breached by hackers. Marriott's internal data system, which contained contact information, names, and addresses, was targeted by the hackers. Hackers targeted Zoom, a video conferencing service that has grown in popularity because of the pandemic, in April. On dark web forums, over 500,000 Zoom account credentials were offered for purchase (Purplesec, 2021).

The situation imposed by the covid-19 pandemic has led to the implementation of the work-from-home concept for numerous companies in all fields of activity. This factor has involved an artificial acceleration of the development / reconfiguration of IT infrastructures so that IT services can be available both on-site and remotely. Given the fact that this transition process, from work at the company headquarters to remote work, was carried out in a short time and without a consistent training of staff (from the perspective of cyber security and not only) an increase was identified to successfully block cyberattacks that cause data leaks.

Training should be employed as a crucial risk reduction in the fight against cybercrime. To tackle the threat of cyberattacks, cybersecurity training is the best option. Cyber dangers can be considered and blocked before they develop using cybersecurity training for personnel. COVID-19 changed not only how people work and communicate with one another, but it's also causing a surge in cybercrime. Upskilling and reskilling are being addressed as continuous cybersecurity professional training is critical and the most effective method of combating cybercrime (Purplesec, 2021).

According to the research report publicly revealed by IBM research division, the average total cost of healthcare grew by 29.5 percent from $7.13 million in 2020 to $9.23 million in 2021. Energy went from second to fifth place in terms of cost, dropping from $6.39 million in 2020 to $4.65 million in 2021. (27.2 percent decrease). Services (7.8% increase), communications (20.3% increase), consumer (42.9 percent increase), retail (62.7 percent increase), media (92.1 percent increase), hospitality (76.2 percent increase), and the public sector (76.2 percent increase) were among the other industries that saw significant cost increases (78.7 percent increase). The top five industries for average total cost were: healthcare, financial, pharmaceuticals, technology and energy (IBM, 2021).

Another IBM research results reveal that the compromised credentials were the most common first attack vector in 2021, accounting for 20% of all breaches. Next, the entire range of the attack vectors and the impact regarding the costs associated with the data breach are presented.

In 2021, the most common initial attack vectors were (1) compromised credentials, which accounted for 20% of breaches, (2) phishing, which accounted for 17% of breaches, and (3) cloud misconfiguration, which accounted for 15% of breaches. Only 4% of breaches were caused by business email compromise, yet the average total cost of $5.01 million was the highest. Phishing ($4.65 million) was the second most expensive first attack vector, followed by malicious insiders ($4.61 million), social engineering ($4.47 million), and compromised credentials ($4.37 million). In 2021, the top four first assault vectors were the same as in 2020, however they were significantly re-ordered. Phishing has risen from fourth to second place, while cloud misconfiguration has dropped from second to third place. Figure 2 graphically illustrates the attack vectors impact from the data breaches cost perspective:



Figure no. 2. Data breach costs by cyber attack vectors - IBM 2021 data breach statistics

Source (IBM, 2021)

The conclusion made according to these results is that human factor is responsible for 6 out of 10 attack vectors, as it follows (Purplesec, 2021):

● *Social engineering, phishing and compromised credentials*: all these three categories represent attack vectors based on the lack of awareness of the situations in which an attacker uses social engineering means to obtain confidential information; recognizing and dealing with these situations is particularly important and can only be achieved by educating / training the employees - users of the IT infrastructure;

● *Business email compromise:* the prevention of such situations can be achieved by training the staff in such a way as to comply with the security procedures regarding accessing and handling the work email,

● *Accidental data loss/lost device:* even if the data/device is accidentally lost, the information cannot be disclosed if proper cryptographic mechanisms are implemented and data protection procedures are followed;

● *Cloud/IT infrastructure misconfiguration:* cybersecurity training should be part of the network infrastructure administration specialists' curricula; internet exposed services configuration need to be performed taking into account the exposure to cyber security risks.

Training staff to be aware of cyberattacks is a lengthy procedure. It is very important that the training process is largely based on practical, concrete, real-world situations - the environment in which they work daily. By simulating situations in which their actions play an important role in preventing a cyber-attack, they will be able to identify real cyber-attack attempts and act according to procedures learned and already practiced in a simulated environment. On the other hand, cybersecurity experts need to be trained based on current situations, using advanced technologies and techniques (which an attacker would have at their disposal). Performing training and testing in a simulated environment, configured according to current requirements is a key factor in anticipating critical situations in terms of cybersecurity.

4. Cyber range as a cyber security training platform

Cyber range systems can be successfully implemented and configured to serve as a training platform for cyber security engineers but also to educate regular users to anticipate their involuntary participation in a successful cyber-attack. Figure 3 shows an overview of the use of cyber range systems as a training instrument for users and experts in cybersecurity, on the one hand, and the testing of IT infrastructures (from the perspective of cybersecurity) on the other (European Cyber Security Organisation (ECSO), 2020).

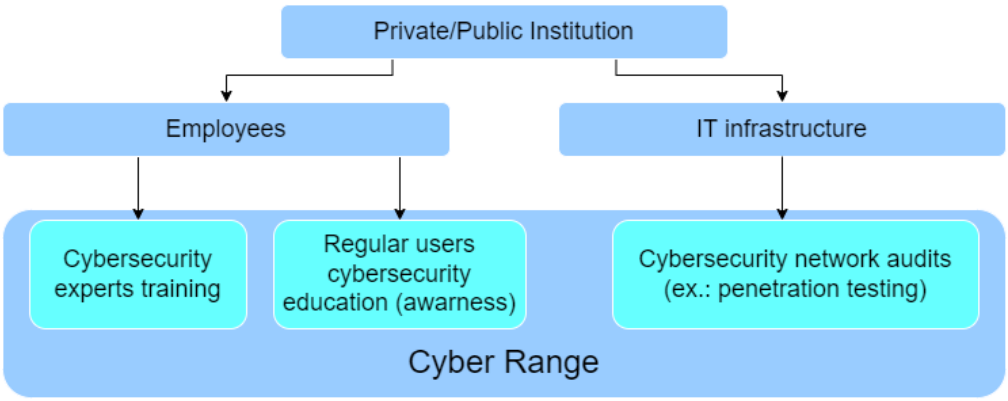


Figure no. 3. Cyber Range as a cybersecurity platform

When it comes to a company's/public institution's cyber security, there are two main players: IT infrastructure and employees (users - from the IT perspective). As previously presented, recent studies show that the lack of awareness of the risks regarding cyberattacks and computer systems misconfigurations are the main factors in computer data breaches. Cyber range systems implementations may serve both as a training instrument and network audit platform. Employees (as IT infrastructure users) training through practical methods can be easily done using a cyber range system. Within a cyber range, multiple and diversified scenarios can be developed. During the execution of these scenarios, the students can be part of some simulations of real-life situations that they might face during the activities performed at work. Moreover, the computer network in which the users carry out their activity can be replicated so that the scenarios played are as realistic as possible. In this way, users will participate in these training sessions without having to contact an unknown network, in which they would not feel comfortable or would not find themselves with the undertaken activities. From the perspective of training cybersecurity specialists, complex and current scenarios can be implemented within cyber range systems, configuring virtual networks that have diversified technologies and software applications. In this way, specialists will learn skills that will facilitate the prevention of cyberattacks and prompt and effective response in case of detection of such attacks. Last but not least, cyber range systems can be an important factor in preventing cyberattacks and data leaks by providing IT network replication mechanisms for cybersecurity auditing. Network auditing process may contain dangerous actions which can directly affect the production environment. The ability to make a virtual copy of the target network is an important advantage as complex infrastructure tests can be performed without considering the problems created by a possible down-time of the network. From stress tests to exploiting complex vulnerabilities (identified in the audited network), all actions are performed on the virtual replica of the network. Also, to simulate a complex scenario, network auditing can overlap with user involvement and their reaction testing in a cyberattack situation.

Recent studies reveal a classification of the cyber range systems, from the provided IT infrastructure perspective:

- *Simulation cyber range systems* - the implemented system offers virtual network infrastructures that are deployed according to the requirements of the present scenario or purpose; virtual environments are not replicas of actual IT infrastructure and do not provide a mirroring of production systems and services;

- *Emulation cyber range systems* - unlike simulation CRs, emulation provides virtual infrastructure copies of real networks, systems, and services; it can be used to deploy virtual copies for critical network infrastructures in order to perform security audits that would have a significant impact on performance if run on the production environment; it can also be used to implement and test hypothetical scenarios without putting the production network at risk;

- *Mixt cyber range systems* - this approach combines simulation and emulation to provide complete solutions tailored to an organization's needs; it can be used to deploy virtual infrastructures that are based on real networks but also enhanced with simulated new systems and services; it provides a proper infrastructure for testing simulated scenarios on virtual copies of sensitive real networks; it is the safest way to perform risky audit actions, to test the integration of new systems, and to test the integration of new systems.

To fulfilling the purpose for which it is implemented, a Cyber Range must provide a set of characteristics regarding (European Cyber Security Organisation (ECSO), 2020):

● *Realism and fidelity* - must be folded as much as possible for training purposes - in network testing, CR must allow 1:1 virtualization of the real network (physical or virtual); in simulation cases, CR must provide the complete set of tools and methods to deploy sophisticated virtual networks;

● *Accessibility and usability* - accessible in order to participate in a service or training offered on such a system; adaptable to a new group of users; depending on the level of information access, accessibility may vary from organization to organization - CR implementation must be tailored to the specific needs and regulations of the organization;

● *Scalability and elasticity* - the system must be able to grow both structurally and by building new components / features that can easily be integrated with the existing system, as well as the ability to swiftly embrace new technologies.

Self-paced learning courses are another area where cyber range systems may be employed successfully. This time, the configured scenarios will be dependent on the course curriculum that the user is enrolled in. In cybersecurity classes, situations may be identical to those mentioned above, or they may include practical exercises to reinforce theoretical concepts acquired concurrently. There are several cyber range systems that successfully service such corporate tasks. Offensive Security, EcCouncil, HackTheBox, and other well-known firms provide high-quality cyber range instruction.

5. Cyber range in Competency-based-Education

● on-the-job experience by simulating real life scenarios that can cover a wide range of environments, from simple to critical ones (Kellogg, 2018);

● real time performance feedback as the cyber ranges participants can be monitored by trainers or experts in this field while going through the exercises; also, participants get real time feedback on their progress and results

● training exercises intended to a wide range of participants, from non-technical staff to Cybersecurity professionals; there is great flexibility on designing scenarios that can fit any training goals and any participant profile;

● a dynamic training environment that can be easily changed and adapted to cover classic scenarios or new technologies

● a low-risk and a low-cost training environment that can simulate real infrastructures;

● a collaborative learning environment as participants can work in teams or individually against other teams or against actors managed by Artificial Intelligence.

From a CBE perspective, Cyber Ranges provide a dynamic and skills-oriented environment that can cover multiple learning approaches:

● problem-based learning as trainees need to solve independent problems which have clearly defined goals;

● project-based learning that cover complex scenarios that can require interdisciplinary knowledge and in which trainees go through a series of interconnected stages and interact with different systems and solutions

● experimental learning as the cyber range allows participants to test new technologies, new environments and new techniques for defense and attack;

● challenge-based learning environment where private or public companies can provide real-life scenarios, relevant for different industries and public infrastructures.

Some of the most important principles of the competency-based education (CBE) are reflected in the way a cyber range provides the learning environment:

● participants can learn at a variable pace as the resources are always available locally on students' computers, in the institutional private cloud or in public ones. Deadlines and limited time frames to access those resources can be imposed but for Cybersecurity training the quality and the volume of the acquired knowledge is more important than getting as much information as you can in a limited time;

● participants are supported in their learning getting real-time feedback from instructors that can monitor their activities or from software tools;

- effective and practical-skills oriented learning resources are available all the time
- exercises are reusable and new ones can be derived with minimum effort
- problems to be solved reflect real-world problems
- assessments are secure and reliable as they evaluate the practical ability of students to solve problems and not to reproduce knowledge.

Studies done by Kellogg (2018) and Strategy Labs (2021) have highlighted the main differences between traditional education and Competency-based-Education. Cyber Ranges as educational tools fit in the CBE environment as their role is to help students to get practical knowledge and skills. Table 1 describes the perspective provided by cyber ranges.

Table no. 1. Comparing Traditional Education and Competency-based-Education in Cybersecurity with cyber ranges

Traditional Education	Competency-based-Education in Cybersecurity with Cyber ranges
Course that delivers facts	Competency and practical skills/abilities
Based on in-person or online courses, laboratories. Has a limited time and it covers a predefined set of problems	Students can use every available source of information or open education resources as many exercises and problems may require interdisciplinary knowledge covered by different computer science courses. Can take place online or face-to-face in laboratories. Can be self-paced. It is a dynamic environment that can be flexible and tailored to adapt to different requirements
Assessment based on exams and projects. Focused on solving predefined sets of problems in a limited time.	Evaluation based on determining the level of competencies and skills gained at the end of the program. The evaluation environment provided by the cyber range can be dynamic, it can adapt and react to student actions. The assessment is outcome-based.
Mostly individual	Individual and collaborative (team-based) activities
Teacher centered	Student or team centered
Progress is measured by reaching course milestones in a fixed time. Students must demonstrate they know the presented facts	Progress is done by demonstrating that they can apply what they learned.
Based on passive and active learning	Based on active learning
Driven by accumulating as much information from textbooks and other provided resources	Driven by research as information needed to solve the given scenarios can't be provided by a single course. Many bits of information is provided by white papers, software documentation, technical blogs, forums and other outside the class resources.

Conclusions and future work

The accelerating progress in the cyber sphere necessitates ongoing training in cyber security, both at the user and expert levels. The more complicated the environment in which users operate, the more difficult it is to create a suitable training environment in which they are finally effectively educated to considerably enhance the degree of cyber security inside the organization. Hands-on activities carried out in a simulated/emulated environment, very comparable to trainee's day-to-day activity settings, are more effective than traditional training methods. Cyber Range systems, when used as a competency-based education instrument, may significantly improve training performance in the field of cybersecurity. Cyber Range systems may be developed in such a manner that the training scenarios are as realistic as possible, up-to-date, and impactful, regardless of the level at which the training is carried out: people who handle existing technology in the work environment or cybersecurity specialists prepared to handle latest threats/vulnerabilities that can harm their networks. To summarize, cyber range systems cover a wide range of cybersecurity scenarios and sub-domains, which is why they can be used to effectively support cybersecurity training programs. The current study is beneficial because it exposes elements that might

increase computer system users' awareness of the risks of cyber security incidents, on the one hand, and cybersecurity specialists' training, on the other. This research limitations consist of the lack of a practical study on a group of users and cybersecurity specialists who are trained using cyber range systems and monitored to see whether there is significant progress compared to a similar group who have gone through the conventional learning process. This work may be expanded by performing a study to determine the influence of cybersecurity training on cyber security incidents minimization. Following that, a study based on this data may be performed to determine the impact of adopting cyber range systems vs traditional training techniques. Also, research to compare the expenses of implementing a cyber range system for cyber security training to the resources (time and money) saved by staff training can reveal real advantages of such educational instruments.

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Human Capital Development in Crisis Conditions. Evidence from Romania

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Abstract

Human capital is a very powerful contributing factor in the success and sustainability of organizations, being considered the most valuable resource of companies. This study aims to find out to what extent the development of human capital has evolved in pandemic conditions in Romania. Furthermore, because today, in accounting practice, the human capital is treated in financial statements as an expenditure rather than as an intangible asset that is expected to generate future economic benefits for organization, this paper also explores the current view point of chartered accountants and professionals in the field on whether or not human capital should be measured and included on the financial statements, respectively on the balance sheet. Therefore, in order to achieve these objectives, a descriptive research was implemented, structured through a survey that was distributed to the members of The Body of Expert and Licensed Accountants of Romania (C.E.C.C.A.R.) and professionals in the financial-accounting field, thus obtaining a number of 165 answers. The results show that most of respondents feel support in terms of professional development from the company in which they perform and believe that it is necessary to quantify human capital for the company's image to be presented in a more accurate and real way. At the same time, most respondents do not consider that once measured human capital it should be included on the financial statements, respectively on the balance sheet. This paper can provide a starting point for future steps of entrepreneurs in terms of human capital development, but also for institutions that regulate the relevant professions in the financial-accounting field, to outline new directions in the measurement and evaluation of human capital and to highlight once again the importance of this resource for business sustainability.

Keywords

Human capital development, sustainability of organizations, crisis conditions, development trends and training areas, responsibility for professional development, measurement of human capital, financial statements.

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Introduction

Today we are facing irreversible processes of interest for both human resources and accounting, such as: globalization of economies, development of capital markets, the emergence of new financial products, digitization and automation of employees activity, their development and improvement to cope with change. Accounting, as a social science, has been modeled and perfected in such a way as to meet the information requirements of the moment (Ristea, Jianu and Jianu, 2010).

The functionality of the national economy depends on two types of resources: physical capital and human capital (Olaniyan and Okemakinde, 2008). An economy with a higher total stock of human capital will experience faster growth (Romer, 1990), and the growth of organizations and, implicitly, of the economy, is positively related to the quality of human capital and the investments of organizations in it (Santos-Rodrigues, Dorrego and Jardon, 2010). Human capital is also a factor supporting innovation (Leiponen, 2005) and sustainability, through constant adaptability. Researchers has identified that the formation of a

management that encourages the adoption of an innovative climate and openness to technological innovation influences the innovation process and, implicitly, the sustainable development of companies.

The recent health crisis caused by Covid-19 shook the global economy. The market reaction to the pandemic is considered unprecedented even compared to previous major outbreaks such as the Great Depression and the Spanish Flu (Baker et al., 2020). If the objectives of the companies before the pandemic were to obtain a better market share, a higher turnover or a higher profit, in the pandemic period the only objective of the companies was firm survival. Due to the economic uncertainty, managers were put in a position to make quick decisions regarding the activity of companies, so that their managerial ability and, implicitly, human capital played a key role during this period. For this reason, the development and continuous preparation of human capital is the quintessence of adaptability in the face of uncertainty and the reorientation towards the identification of new opportunities in the market.

All the periods of economic insecurity and, implicitly, of crisis aroused the interest of researchers in terms of business sustainability, especially in such conditions. Sustainable development is considered „the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environmental Development, 1987, p. 41). According to Kumar and Zbib (2022), the organizational level, the vision of sustainable development has led to concepts such as sustainability management, corporate sustainability (Schaltegger and Burritt, 2005), sustainability innovation and sustainable entrepreneurship (Schaltegger and Wagner, 2011), and social business (Yunus, Moingeon and Lehmann-Ortega, 2010).

1. Literature review

Human capital is the main engine of action of the company, being the most important resource that leads to the achievement of the set objectives and, implicitly, of the performance, but also one of the elements that influence the innovation. The significance of human capital in a hypercompetitive environment like the one that exists today is undoubtedly extraordinary (Liepė and Sakalas, 2014). Thus, the role of human capital is a vital one in the existence, survival and development of the company, being considered „the most important capital" (Hitt and Duane, 2002) and „a central element of the theory of economic growth" (Storper and Scott, 2009).

However, in practice, good results are achieved in those more developed countries, which have remarkable natural resources and a high-tech material base. This does not negate the role of human capital in the process of economic development but must be based on appropriate economic calculations (Liepė and Sakalas, 2014). The value of resources is always dependent on knowledge, individual or managerial, and human capital outlines new ways of thinking about technology and its economic and social impact (Galabova and McKie, 2013). This impact of human capital in the process of value creation is recognized internationally as an important issue (Baron and Armstrong, 2007; Hsu et al., 2007; Crook et al., 2011; Coco, Jamison and Black, 2011; Liepė and Sakalas, 2014).

Over time, economists have defined the concept of human capital as largely associated with the terms: knowledge and intellectual capital, but it has subsequently been proven that this emphasis on knowledge does not fully capture the whole concept (Arvanitis and Stucki, 2012).

In recent years, the notion of human capital has evolved significantly. Currently, the concept of human capital includes a wide range of human attributes relevant to performance and productivity in the workplace, ranging from personality traits, attitudes and values to characteristics such as creativity, well-being, self-efficacy and resilience (Lenihan, McGuirk and Murphy, 2019).

In addition to the set of skills, knowledge and other capabilities that people have and that can be translated into productivity (Abel, Dey and Gabe, 2011; Fulmer and Ployhart, 2013), adopting an innovative thinking style can be a determining factor in the development of companies.

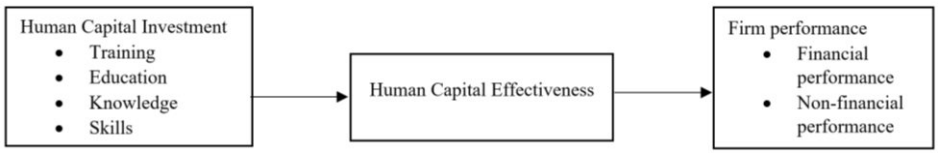


Figure no. 1. Conceptual Model linking Human Capital Investment, Human Capital Effectiveness and Firm performances

Source: Marimuthu, Arokiasamy and Ismail, 2009

In the new era, human capital – the time, talent and energy of employees, together with the ideas they generate and implement – is the fundamental element in achieving superior performance. In other words, human capital has become the main source that determines the creation of a competitive advantage, a daily competitive advantage that can only be achieved with the help of the knowledge that employees have (Siddiqui, 2012), and the companies that manage this source with the same attention with which they treat financial capital will perform much better than the rest of the entities.

Iulia Jianu (2007), in her Assessment, Presentation and Analysis of Enterprise Performance, define performance „as a state of competitiveness of the enterprise that ensures sustainable market presence. Performance is an indicator of potential future outcomes that occurs due to meeting strategic objectives. So performance does not characterize a situation of the moment, it always refers to the future".

2. Research methodology and data

The main purpose of this research is to bring to the fore the development of human capital in crisis conditions, more precisely the determination of the impact that the pandemic situation had on its development and, at the same time, whether its quantification can contribute to obtaining a more accurate image of the company's financial position. A qualitative-descriptive research approach was used, by submitting for completion a form containing the key questions referred to in this study.

The population to which this form was sent consists of members of C.E.C.C.A.R. with legal personality, whose visa to practice the profession for the current year (2022) is valid, excluding freelancers and affiliated members whose email addresses can not be found on the Membership Table, available on www.ceccar.ro. Therefore, a sample size comprises 2,177 C.E.C.C.A.R. members, of which only 129 respondents. 112 companies did not have the correct email address or it was missing. The survey was also distributed through networking groups and to professionals in the financial-accounting field or related fields, who do not have the qualification of expert accountant. Therefore, the total number of respondents is 165. The Microsoft Office - Excel program was used for data processing, analysis and discussion.

3. Results

The study that was delivered to the expert accountants and professionals in the field included, as the case may be, a maximum of 32 questions. 72.12% of the respondents mentioned that they operate within a private company, with (predominantly) romanian capital, 7.27% in a multinational, 6.67% in a private company, with (predominantly) foreign capital, 6.67% are freelancers, 6.06% work in a public institution, and the remaining 1.21% are active in an NGO.

97.58% of the respondents have completed higher education (bachelor's, master's, doctoral or MBA program completed), and 82.42% hold a professional qualification in the field. Also, 89.70% of the respondents have an experience in the field of over 5 years.

Taking into account the pandemic situation, 44.24% of the respondents mentioned that it was not at all difficult for them to adapt to the transition to an intensive use of technology, but for 1.82% the difficulty level was raised. The rest of the respondents considered the intensive use of the technology to be mild.

Among the activities that registered an increase in the workload during the pandemic period were the following:

Table no. 1. Activities increased the most in pandemic

Activity	% of respondents who consider an increase in the volume of activity
Management of customer relations	23.64%
Relationship management with colleagues and superiors	13.33%
Legal monitoring	10.91%
Management of professional tools	4.85%
Data management	13.94%
Day-to-day tasks	33.33%

Also, among the elements that have been influenced by the pandemic situation, we mention:

Table no. 2. Impacted elements because of remote work during lockdowns

Elements / Number of respondents	1 – To a very small extent	2 – To a small extent	3 – Average	4 – To a large extent	5 – To a very large extent	Total respondents
Hierarchy relations	55	40	47	18	5	165
Customer relation	28	31	61	31	14	165
Working hours	36	32	50	28	19	165
Democratization of remote working	31	29	63	29	13	165
Required professional skills	39	43	44	29	10	165

Therefore, most of the respondents believe that hierarchical relationships have been least influenced by remote work. Also, most of the respondents consider that the relationships with the clients were affected to an average extent, depending on the relationships they had with them before the pandemic situation. In the same situation there are elements such as working hours, democratization of remote work and the necessary professional skills.

Asked to what extent they consider that their professional development, constantly, is important for the activity they carry out, 78.18% of the respondents consider that this is extremely important. With ratings from 1 to 10 at their disposal, all respondents have given ratings starting with grade 5, which means that, in one manner or another, no respondent considers professional development to be unimportant. This result reinforces the theoretical aspects that emphasize that the lack or disinterest in the formation of human capital is linked to low competitiveness.

Over 59% of the respondents said they felt support from the company in which they operate, about 12% of them said they did not benefit from any support, and the remaining 29% said they were their own business leaders. Most of the participants who did not feel the support from the company in their professional development work in companies with a number of employees between 1-50.

Therefore, taking into account the number of employees, we can say that these companies are small, and the lack of support can be justified also by the limited resources available to the company, but also by the lack of vision and concern of the management towards achieving performance. 7 of the respondents who did not feel supported in this endeavor say that the pandemic situation influenced this aspect, the company and the management having other objectives set to overcome the crisis situation. For the remaining 13 respondents, the situation persists before the beginning of the health crisis.

Out of the total number of respondents, excluding freelancers, 46.61% say that the pandemic situation has influenced the support provided by the company, both morally and financially.

27.19% of the respondents said that they benefited only from moral support, through understanding and flexibility in the treatment and organization of activities.

Regarding the training areas of interest for the specialists in the financial accounting field, among the most relevant topics to be addressed in the following training courses are:

Table no. 3. Areas for future trainings

Areas for future trainings	% of respondents
Social and environmental impact management	16.36%
Social capabilities development	27.88%
Teamwork and collaboration training	60.61%
Professional knowledge development	79.39%
Data analytics	47.88%

As stated by the studies in the field carried out by important researchers, 69.09% of the participants consider human capital to be extremely important for the companies' activity, and a percentage of 85.45% consider that this resource so important for the company should be quantified. But once measured, only 36.17% of respondents consider it useful to present this quantification in the company's balance sheet.

Conclusions

After analyzing these answers, it is confirmed once again that one of the most important resources available to the company is represented by human capital. It occupies a very important role in the development of companies' activity and in business development, and investments in this resource should not be neglected. Professional training and investing in quality human capital is the key to a sustainable business that constantly evolves and adapts to the needs of the market, bringing added value and producing innovation.

At the same time, investing in human capital should also include resources as effort, time, not only financial resources. This can be a good start for small companies to get out of anonymity, to make themselves visible and to achieve performance in the activity they carry out. Taking into account that in the last two years we have faced a lot of pressure and uncertainty from an emotional and psychological point of view, moral support for employees can be the starting point or the moment of welding of the relationship between employers and employees.

Also, by training and educating the human resource, the key to sustainable businesses can be obtained, which brings added value to the community in which it operates.

This study presents the position of practitioners regarding human capital and its development in conditions of the health crisis caused by the spread of the SARS-CoV-2 virus. Also it creates possible directions for the development of professional accountants. However, the main limitation is related to the number of respondents: 129 C.E.C.C.A.R. members out of a total of 2,177 CECCAR members (companies, with visa for 2022).

The results of the research show us the desire of professionals in the field to measure human capital in order to provide a more accurate image of the resources available to the company, but most of them are convinced that this measurement of human capital should not be introduced in the financial statements, respectively in the company's balance sheet, because there is no clear way to achieve this and in the same unitary way in all companies.

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Viable Business Models in Global Retailing: The Case of Walmart

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Abstract

The end of the Cold War and, consequently, the fall of the Berlin Wall in 1989 represented a huge impetus for the expansion of the globalization process all over the world. The age of globalization has brought hyper competition in all industries and among companies around the world, irrespective of their size. The last decades have witnessed the presence of retailers at the forefront of the globalization process since they can use numerous business mechanisms and methods to penetrate foreign markets. As a challenging research field and a dynamic industry, global retailing provides several valuable examples of business organizations that have shown the supremacy of their viable business models. The purposes of the paper are to define the concept of the business model and to illustrate its application in the case of Walmart. The research methodology was based on a quantitative research method and a case study. The findings of the paper show that there is no universal definition of a business model in the literature. However, its several characteristics can be revealed, such as the fact that it illustrates the logic of making money for any company and represents an organisational framework for value creation, delivery and capture. From a theoretical point of view, it brings some clarifications concerning the concept of the business model. From a practical point of view, the paper analyses some of the key features of Walmart business model, emphasizing their importance in achieving business success. It also presents the clear interconnection between Walmart strategy and its business model.

Keywords

business model, global retailing, retailer, Walmart, company

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Introduction

The end of the Cold War and, consequently, the fall of the Berlin Wall in 1989 represented a huge impetus for the expansion of the globalization process all over the world. Although the emergence of globalization may be attributed to the changes of the mid-1970s (Reich, 1998), the aggregation of several economic phenomena, such as the liberalization of trade or the deregulation of markets, that has been specific to the last decade of the last century, highly contributed to its expansion in the last decades.

The age of globalization has brought hyper competition (D'Aveni, 1994; D'Aveni, 1999) in all industries and among companies around the world (Harvey and Novicevic, 2002). In order to face this challenge, organizations from every domain have used in their activities and processes, a plethora of business tools, techniques, methods and practices, such as Six Sigma (Toma, 2008), marketing mix (Grădinaru, Toma and Marinescu, 2016), quality assurance and models (Toma and Naruo, 2009; Catană and Toma, 2021a), training programs (Marinescu and Toma, 2013) or social responsibility initiatives (Catană and Toma, 2021b). This is why their leadership, either masculine or feminine (Săseanu, Toma and Marinescu, 2014; Săseanu et al., 2020), has designed and implemented different flexible and sustainable business models and

strategies based on creativity, innovation, digitalization or environmental protection (Toma, 2013; Toma, Felea and Dobrea, 2016; Toma, Marinescu and Grădinaru, 2016; Toma and Săseanu, 2017; Tohănean, Toma and Dumitru, 2018; Toma and Tohănean, 2019).

The last decades have witnessed the presence of retailers at the forefront of the globalization process (Burns, 1997) since they can use numerous business mechanisms and methods to penetrate foreign markets (e.g., licensing, joint ventures, franchising). As a challenging research field and a dynamic industry (Dekimpe, 2020), global retailing provides several valuable examples of business organizations that have shown the supremacy of their viable business models like that of Walmart.

Starting from the above discussion two research issues emerge:

- What does a business model represent?
- How can a viable business model be implemented in global retailing?

The purposes of the paper are to define the concept of the business model and to illustrate its application in the case of Walmart. The research methodology was based on a quantitative research method and a case study.

The paper is structured as follows: the literature review is displayed in the second part. The third section of the paper exposes the research methodology. The results of the research are presented in the fourth part of the paper. The paper ends with conclusions.

1. Review of the scientific literature

The conceptualization of business models is relatively a new phenomenon in the management and business literature. However, the notion appeared for the first time in an article written by Bellman et al. (1957). Consequently, numerous articles and books have begun to focus on this subject, especially since the 1990s. As a consequence, a plethora of definitions related to the concept of business model has appeared in the literature, especially in the last two decades. A business model is defined in various ways as follows:

- "the method you use to acquire customers, service them, and make money doing so" and "the framework of rules and "moral" imperatives within which the business operates" (Muehlhausen, 2013, p.11).
- "a simplified and aggregated representation of the relevant activities of a company" (Wirtz et al., 2016, p.41).
- "the master plan that charts the way in which a company can reach its goals" (Chernev, 2017, p.4).
- "the organisational design used to exploit an opportunity and create value" (Bock and George, 2018, p.6).
- "a sort of map; a plan of where we are and where we can go" (Hague, 2019, p.1).
- "rationale of how an organization creates, delivers, and captures value" (Osterwalder et al., 2020, p.348).
- "designed to capture a perceived market opportunity in a way that creates value for all stakeholders" (Amit and Zott, 2021, p.10).
- "a framework for finding a systematic way to unlock long-term value for an organization while delivering value to customers and capturing value through monetization strategies" and "a holistic framework to understand, design, and test your business assumptions in the marketplace" (Cuofano, 2022, p.1).

Thus, there is no universal definition of a business model in the literature. However, starting from these definitions several features of business models can be highlighted in short. Firstly, business models are seen as a sort of plan that guides any company throughout its existence and facilitates the achievement of its goals. Secondly, they display simply the key activities of a company. Thirdly, business models allow any business organization to perceive and exploit a market opportunity. Fourthly, they represent an organisational framework for value creation, delivery and capture. Fifthly, business models illustrate the logic of making money for any company. Sixthly, they are linked with the monetization of any offering of a business organization. Seventhly, business models supply any company with the capability to survive and grow in its existence. Eighthly, they comprise building blocks, each of them being a key element that shows how business organizations carry out a part of their business. Ninthly, business models and strategies have

to be taken together into consideration by any business organization in order to achieve long-term competitive profitability (Braun, Latham and Cannatelli, 2019).

A business model comprises nine building blocks (Table no. 1), specific to the so-called "business model canvas" that cover four main sections of a business as follows:

- customers;
- offer;
- infrastructure;
- financial viability (Osterwalder and Pigneur, 2010).

Table no. 1. The building blocks of a business model

No.	Name, description
1	Customer segments designate "the different groups of people or organisations an enterprise aims to reach and serve" (p.20).
2	Value propositions show "the bundle of products and services that create value for a specific customer segment" (p.22).
3	Channels present "how a company communicates with and reaches its customer segments to deliver a value proposition" (p.26).
4	Customer relationships illustrate "the types of relationships a company establishes with specific customer segments" (p.28).
5	Revenue streams describe "the cash a company generates from each customer segment" (p.30).
6	Key resources designate "the most important assets required to make a business model work" (p.34).
7	Key activities show "the most important things a company must do to make its business model work" (p.36).
8	Key partnerships illustrate "the network of suppliers and partners that make the business model work" (p.38).
9	Cost structure presents "all costs incurred to operate a business model" (p.40).

Source: Osterwalder and Pigneur, 2010, pp.20-40.

During the time, an impressive amount of effort has been devoted to demonstrating the applicability of business models in any domain. In retailing, a business model expresses "how a retailer creates value for its customers and appropriates value from the markets" (Sorescu et al., 2011, p.S3) and encompasses the following three interrelated components: retailing format, activities and governance (Sorescu et al., 2011). The rapid expansion of retail internationalization has imposed global retailers to design and implement viable business models that had to take into account several particularities of retailing, such as its size and the mix of products and services Burt, Johansson and Dawson, 2016).

2. Research methodology

In order to attain the aims of the paper, the authors used a quantitative research method and a case study. In this regard, they identified and collected the information through desk research from different sources, mainly journals (e.g., Journal of Retailing) and books published in renowned publishing houses (e.g., John Wiley & Sons), from the domains of retailing, business administration, and marketing. Then, these data were systematized and analysed utilizing a comprehensive literature review. Ultimately, the authors synthesized them and composed the text of the paper.

3. Results and discussion

After reviewing the literature, the authors have analysed and synthesized the data, and eventually, obtained several outcomes of their research. As the retailing industry has become highly competitive and cost-oriented, mature and big retailers aimed to enjoy greater market power at a global level.

Established in 1962 by Sam Walton, one of the greatest American entrepreneurs of the XXth century, the retail chain succeeded in rapidly growing all over America (Grădinaru and Toma, 2017). After 1990, Walmart expanded internationally and increasingly became a major player in global retailing (Walmart,

2022). In 1991, it opened its first store abroad in Mexico City through a joint venture creation with Cifra, a Mexican retailer. Nowadays, Walmart encompasses the following three distinct areas:

- Walmart US;
- Walmart International;
- Sam's Club.

At the end of January 2022, Walmart operated 10,593 retail stores and 364 distribution facilities all over the world (Statista Research Department, 2022). Its phenomenal business success is based on several elements. Among them, its business model has proved to be a viable one in long term, starting from some of its key characteristics as follows:

- Customer-focused approach. From its humble beginning, Walmart has applied the principle "Sell more for less" throughout its businesses. Also, the American colossus has always expressed its commitment to maintaining prices as low as possible to provide access to its products for a large proportion of the whole population. The so-called "everyday low prices (EDPL)" program constitutes the core of its strategy. In order to implement and sustain a low prices strategy, Walmart has unceasingly made significant efforts to purchase goods in large volumes from its numerous networks of suppliers located worldwide. Furthermore, it has succeeded in satisfying customers' need for retail convenience and diversifying access of customers to its products and services.

- Highly diversified offer. Taking into account the existence of huge networks of suppliers, Walmart has constantly provided a broad assortment of products, such as food, clothing, tablets, laptops, desktops, footwear, furniture, pet supplies, toys, video games, phones, beauty, books, cameras, home décor, bikes, and batteries. This deep assortment is supplied to its customers through both online and in-store facilities.

- Solid retail infrastructure. As shopping can be done by its customers in a store or through one of its mobile apps, Walmart is an active and strong retailer in both physical and digital markets. The following three types of store format are mainly used by Walmart:

  - supercenters;
  - discount stores;
  - neighbourhood markets.

By providing a one-stop shopping experience, its supercenters have become highly appreciated by various customer segments. Its e-commerce websites show that Walmart has identified new opportunities to implement technological advances in retailing. In this regard, innovations like Built for Better and Mobile Scan & Go allowed Walmart to attain the status of a very dynamic and fast-growing e-commerce business organization. Thus, the American retailer has created a unique shopping experience for its customers through physical and digital omni-channel. In the last decades, Walmart has increased the speed and efficiency of spreading products to its stores due to the advantageous location of the distribution centers and the computerized control of inventory and distribution.

- Transparent financial viability. During the time, the so-called "everyday low cost (EDLC)" has enabled Walmart to control its expenses and, consequently, to obtain better financial results. Its annual reports from the period 2018-2020 have shown a strong financial position as follows:

  - 2018: total assets= 204,522 $Mil, gross profit margin= 24.7%;
  - 2019: total assets= 219,295 $Mil, gross profit margin= 24.5%;
  - 2020: total assets= 236,495 $Mil, gross profit margin= 24.1% (Walmart, 2020).

In recent years, Walmart has been by far the world's largest corporation in terms of revenue. In this respect, its total revenues surpassed 514 $bn in 2018, 523 $bn in 2019, and 559 $bn in 2020 (Fortune, 2019; Fortune, 2020; Fortune, 2021).

Moreover, it can be pointed out the strong interconnection between the strategy of Walmart and its business model. Including main components such as resources, trade-offs, operational effectiveness, and positioning, its strategy seeks to obtain a sustainable, long-term competitive advantage over its national and international rivals (e.g., Amazon, Schwarz Group, Aldi, Alibaba, Target, Costco) whereas its business model is concentrated on value creation for customers (Figure no. 1).

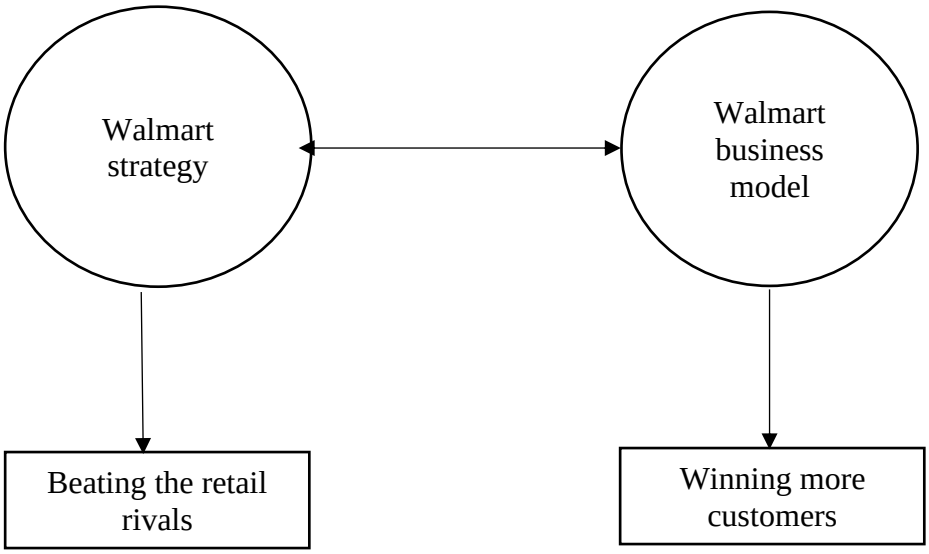


Figure no. 1. The interconnection between Walmart strategy and business model
Source: authors' contribution

In essence, Walmart's outstanding business success owes a lot to its viable business model.

Conclusions

The fall of the communist regimes in the European countries at the end of the 1980s constituted a major event in the history of humanity. It entailed the rapid diffusion of the globalization process in the whole world. Since then, globalization has created a business environment where companies, irrespective of their size and industry, are facing incessant changes and hypercompetition. This new business landscape, characterized by uncertainty and risk, has imposed companies not only the way they address customer needs and expectations but also the manner they create and capture value by providing various products and/or services to customers.

Many retailers worldwide have significantly participated in the expansion of the globalization process and become some of its key players since the beginning of the 1990s. The main reason lies in the fact that they can use various business arrangements, tools, and methods to enter foreign markets. Thus, global retailing has progressed very rapidly in the last decades. On the one hand, it allowed the development of huge retailers at a global scale such as Walmart, Amazon and Schwarz Group. On the other hand, global retailing led to the exacerbation of competition among these retailers. This is why they had to design and implement competitive and viable business models in their business activities and processes.

The paper contributes to the development of the literature related to business models. From a theoretical point of view, it brings some clarifications concerning the concept of the business model by analysing several definitions and highlighting some of the main features of this term. The paper also presents the building blocks of a business model, defining each of them. Moreover, it illustrates the way Walmart, the world's largest retailer, has designed a viable business model. From a practical point of view, the paper analyses some of the key features of Walmart business model, emphasizing their importance in achieving business success. It also presents the clear interconnection between Walmart strategy and its business model.

One of the limitations of the research is given by the fact that other features of Walmart business model can be identified and analysed. Also, the relationship between its strategy and business model may be expanded by taking into account other elements.

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Investigating the Entrepreneurial Intentions of Young People to Initiate and Develop Businesses Related to Industry 4.0

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Abstract

Transformations due to the 4.0 industrial revolution have changed the face of the world economy, and adapting to the digital age is essential especially in terms of start-up businesses. In this context, it is necessary to coordinate efforts to stimulate entrepreneurship, particularly among young people. The article proposes an analysis on the entrepreneurial intentions among young people in Romania, focusing on the case of students from the Faculty of Business and Tourism, Bucharest University of Economic Studies. The objectives of the research were to identify general attitudes and perceptions in relation to professional and career goals, entrepreneurial motivations in general and those aimed at digital economy, in particular. In order to achieve the objectives, a quantitative survey was conducted – a statistical survey, among 368 young people, aged between 18-26 years. Data was collected through an online platform, using a self-administered questionnaire, and processed in SPSS, testing three statistical hypotheses. The results show, among other things, that young people have a penchant for work that requires creativity and new ideas – a particularly important factor in identifying opportunities for new business development. The practical implications of the research are directed towards understanding the attitude and perception of young people towards entrepreneurship in the digital economy and can be useful both from an academic perspective (for training future entrepreneurs) and for governments (developing support programs) or the business environment (creating disruptive innovations).

Keywords

Entrepreneurship, young people, industry 4.0, digitalization, quantitative research, survey

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Introduction

Entrepreneurial initiatives are a source of economic growth (Schumpeter, 1911, 1934, cited by Ahmed et al., 2020; Holmgren and From, 2005, cited by Tuan et al., 2019), as they have a positive impact on the economic and social environment, contribute to the creation of new jobs and help increase economic competitiveness (Liñán et al., 2011, cited by Ahmed et al., 2020), being known that disruptive innovations are often implemented in new businesses, compared to large firms, which may show resistance to change or risk aversion. Stimulating entrepreneurship in the digital economy sector is even more important, as according to a survey conducted in the Romanian business environment, over half of the interviewed entrepreneurs stated that digitalization will bring disruptive changes in their field of activity, 89% understanding the importance of digital transformation and 49% planning to develop new technologies or digital solutions until the end of 2022 (Internet Mobile World & Ipsos, 2019). Hence, this presents the opportunity to develop start-ups that meet the needs of existing companies on the market. The aim of the article is to investigate the entrepreneurial intentions of young people in Romania, in the context of the expansion of the digital economy. Thus, the research carried out took into account identifying general attitudes and perceptions in relation to professional and career goals, entrepreneurial motivations in general and those aimed at the digital economy.

1. Literature review

Entrepreneurial education has a special influence in stimulating entrepreneurial initiatives, by changing the attitude towards entrepreneurship, but the barriers imposed by the external environment may prove stronger (Ahmed et al., 2020). Liu et al. (2022) have proven the importance of perceived university support in enhancing students' entrepreneurial intentions, highlighting also that educational programs should customize their approach based on students' need for autonomy. Thus, identifying the elements perceived as barriers in setting up a business is critical, as the academic and governmental environment must collaborate in this regard to counteract them, in order to stimulate the development of the entrepreneurial process.

Increasing entrepreneurship among young people is, in fact, a strategy that should be followed by all countries in order to increase their employability (Tuan et al., 2019), which is why decision-makers should introduce facilities to encourage young people to develop their own business. Șchiopu, Vasile and Țuclea (2015) have studied the importance of business incubators for start-ups, and appreciate that they are an important tool for enhancing entrepreneurial intentions. Voinea, Stăiculescu and Schileru (2016) have investigated young people's interest in their socio-professional future and showed that they have an open and proactive attitude towards business opportunities, the business orientation being more pronounced in the case of men.

But how can governments do this needs to be researched for each country, given that entrepreneurial intentions are significantly influenced by differences in individual, social, cultural and economic aspects (Ahmed et al., 2020; Tuan et al., 2019; Syed et al. 2020; Liu et al., 2022). In addition, existing research indicated that young people have a moderate interest in becoming entrepreneurs, in contract to the level of appreciation they have for this activity (Tuan et al., 2019), hence identifying ways in which they can be stimulated to create new businesses becomes even more useful.

In this context, the concepts of Industry 4.0 and the Digital Economy need to be clarified. Thus, "Industry 4.0" "refers to a group of rapid transformations in the design, production, operation and service of manufacturing systems or products, through the complete transformation of industrial production through the implementation of digital technologies and the Internet in traditional industries" (European Parliament, 2015), "this referring to advanced technologies such as: Internet of Things (IoT), cloud manufacturing, digital technologies such as 3D printing, augmented reality, Big Data, autonomous robots, new bio- or nano- production process, based on data, cybersecurity and synthetic biology" (OECD, 2017). „Digital economy", in the broadest sense, is defined as "the implementation of communications technology in business models and products that transform the economy or social interactions" (International Monetary Fund, 2018). Entrepreneurial intentions in the context of the digital age can be analyzed based on several influencing factors:

- Young people's attitude towards their professional career: attitude towards change, attitude towards failure, taking responsibility on results, inclinations towards study, entrepreneurial intentions (Tuan et al., 2019);
- Ability to start and develop a business (Tuan et al., 2019);
- Ability to manage a successful business (Ahmed et al., 2020; Tuan et al., 2019);
- Motivational factors in entrepreneurship: independence, skills development, challenge, authority, control (Ahmed et al., 2020).

2. Methodology

To reach the purpose of the study, a quantitative research was used, based on a self-administered questionnaire. The questionnaire included nominal and ordinal questions, on the Likert and semantic differential scale, with either single and multiple answers, characterization/classification, respectively opinion and factual questions. The research variables were defined based on the literature review, the items measuring: young people's attitude towards their professional career, self-assessment of their ability to start and develop a business, self-assessment of motivations for starting a company, perception of digital business.

Data was collected between November 2019 and January 2020, the sampling method being a non-probabilistic, convenience one, as for the survey there were recruited young people aged 18-29, the age group being recognized by the European Union (Perovic, 2016). The questionnaire was distributed to the students of the Faculty of Business and Tourism within the Bucharest University of Economic Studies, as the faculty has in its curricula the subject „Entrepreneurship".

The statistical hypotheses of the research were:

H1 = There are no significant differences between the attitudes of young people towards different aspects of their professional career according to their sex, occupation or income level.

H2 = There are no significant differences in the entrepreneurial motivations of young people according to their sex, occupation or income level.

H3 = There are no significant differences in young people's attitudes towards digital businesses according to their sex, occupation or income level.

The hypotheses were established based on the literature (Karimi et al., 2013), as there are studies that indicate sex and the level of education as influence factors of the perception on entrepreneurship and of the motivational factors in choosing this career path.

3. Results and discussions

368 young people, aged 18-26, have answered the survey, 91% of whom stated that their last school graduated was high school. Also, two thirds stated that they have at their disposal a monthly income up to 1500 lei, another 21% between 1500 and 2500 lei, only 9% having a monthly income between 2500 and 3500 lei and only 5% more than 3500 de lei. Most of the respondents – 96,47% were students (bachelor's or master's degree), 91 (24,73%) of them being also employed. There is a small proportion of those who are already entrepreneurs – 3,26%.

Regarding the degree of knowledge of the concepts of Digital Economy and Industrial Revolution 4.0, only a quarter of the respondents stated that they are familiar with the first concept (with a score of 4 or 5 on a Likert scale from 1 – not at all, to 5 – know them in detail), slightly less (just over 20 percent) being familiar with the latter (Fig. no. 1).

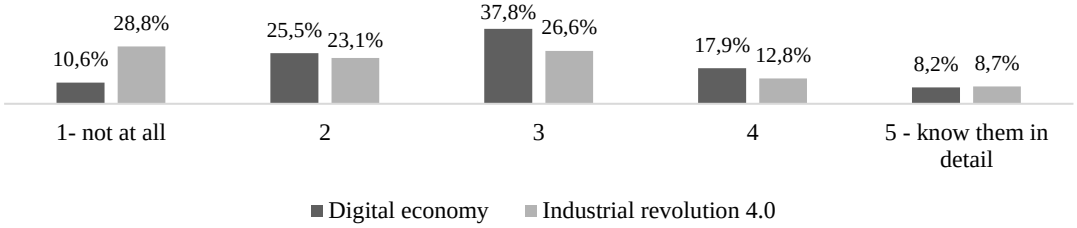


Figure no. 1. Knowledge of the concepts of „Digital Economy" and „Industrial Revolution 4.0"

In fact, the weighted average of all the recorded answers – 2,86, indicates a relatively low level of knowledge of the concept of „digital economy", the situation being similar in the case of the degree of knowledge of the concept „industrial revolution 4.0" – average 2,49.

3.1. The attitude of young people towards their professional career

The extents to which some statements regarding various aspects of the professional career characterize young people (table no. 1) was assessed on a 5-step Likert scale (1 – not at all, 5 – to a very large extent).

Table no. 1. Attitudes of young people towards career

Characteristic	1 – not at all	2	3	4	5 – to a very large extent	Average
Attitude towards change	1.6%	8.7%	54.6%	28.3%	6.8%	3,3
Motivation for a professional career	0.0%	0.5%	7.9%	29.1%	62.5%	4,54
Attitude towards failure	0.5%	5.2%	33.4%	42.1%	18.8%	3,73
Owing the results	0.5%	4.9%	36.1%	42.7%	15.8%	3,68
Inclination towards study	0.3%	6.8%	40.5%	40.2%	12.2%	3,57
Entrepreneurial intentions	5.7%	20.1%	32.1%	24.7%	17.4%	3,28

The answers show that over 60% of the young people participating in the survey rated their motivation for success and career performance as maximum or at least high (29,1%). Although more than a third of respondents consider that their success or failure is also related to other conjectural factors that influence their professional results, 43%, respectively 16%, consider that these outcomes are exclusively or to a large

extent based on their actions. A similar distribution was found for the opinion that assessed the attitude towards failure – although a third of respondents consider failure as a natural part of business only to some extent, most of them, about 60% of the total, do not see it as an impediment to business success. More than half of respondents have a neutral attitude towards change, but the tendency to tolerate change and see the process of change as an opportunity (in a large extent) was found in the options of a significant percentage of respondents – almost 30%. Similarly, about 50% of respondents appreciate that they dedicate a good part of their time to always learning new things, while 40% consider that they do this only to a certain extent. The distribution of answers regarding entrepreneurial intentions shows that just over 40% of young people have, to a large or very large extent, as a professional goal to become entrepreneurs; 31% of all respondents are rather undecided, while a quarter do not envision themselves as managing their own business. Respondents were also asked about their job preferences and how they see efficiency in gaining skills and experience. The answers reveal a predominantly creative inclination of young people, almost 70% of them appreciating, to a large or very large extent, that they are satisfied when they gain experience and develop their skills following activities that require new and creative ideas. On the other hand, with regard to the skills acquired through practical activities, opinions are divided and show a rather neutral attitude.

3.2. Self-assessment of the ability to start and develop a business

The respondents were asked to self-assess the degree to which they feel ready to start, develop and manage their own business (table no. 2). The distribution of answers and their weighted average show a high level of trust among young people, 45% of them being largely or very much convinced that if they opened their own business, they would be successful. They are also more prepared to become entrepreneurs, as 80% of them appreciate to a large or very large extent that they will do everything possible to achieve this goal.

Table no. 2. Self-assessment of the ability to successfully manage a business

Self-assessment statements	1 – not at all	2	3	4	5 – to a very large extent	Average
I can start and manage a company without difficulty	5.7%	24.5%	45.4%	20.4%	4.1%	2.93
I can control the process of starting a new business	7.1%	25.5%	40.5%	20.7%	6.3%	2.93
If I start my own company, I will most likely be successful	1.9%	12.8%	39.9%	30.2%	15.2%	3.44
I know what I need to do to develop a business	5.2%	26.9%	35.9%	22.8%	9.2%	3.04
I am ready to do my best to become an entrepreneur	8.7%	20.9%	30.4%	19.6%	20.4%	3.22

Regarding the awareness of the ways of developing a business, the opinions of young people are rather neutral, most of them (36%) appreciating that they know only to a certain extent what they have to do in this direction. The self-assessment of the ability to start, manage and control a new business is also highlighted through two statements, towards which young people have a series of reservations: over 30% of them appreciate they do not have the required abilities, while only 5% are convinced of their knowledge in this regard.

3.3. Entrepreneurial motivations

In relation to the motivations for starting a business and appreciating the benefits of the satisfaction that this would offer (table no. 3), most young people clearly appreciate that starting their own business will provide them with the opportunity to understand and control the entire business, while having the opportunity to discover and develop different skills. Thus, 80% of the respondents largely or to a large extent agree with the statements regarding the control and development of skills by starting a new company.

Table no. 3. Self-assessment of the motivations for starting a company

Motivation statements	1 – not at all	2	3	4	5 – to a very large extent	Average
Independence	0.5%	4.3%	23.1%	41.6%	30.4%	4.05
Skills development	0.3%	2.7%	17.1%	40.2%	39.7%	4.16
Challenges	0.0%	4.1%	25.5%	39.4%	31.0%	3.97
Authority	0.0%	2.7%	20.4%	39.7%	37.2%	4.11
Control	0.0%	3.0%	16.8%	39.4%	40.8%	4.18

In addition, young people clearly appreciate the decision-making authority of being an entrepreneur, with 87% of them agreeing to a large and very large extent with this issue. Financial independence is seen as a motivational factor to a high (42%) and very high (30%) extent, and opinions about the possible challenges met while managing a business are quite similar.

3.4. Attitude towards digital businesses

The attitude of young people regarding businesses in the digital economic sphere was also tested, by using four statements (table no. 4).

Table no. 4. Perceptions of young survey participants regarding digital businesses

Attitude towards digital businesses	1 – not at all	2	3	4	5 – to a very large extent	Average
Assessing the feasibility of starting a company	5.8%	23.6%	46.9%	17.5%	6.1%	2.94
Confidence in identifying an opportunity	5.0%	26.9%	44.2%	19.2%	4.7%	2.92
Determined attitude	5.0%	19.7%	39.7%	26.4%	9.2%	3.15
The professional goal	15.8%	34.4%	35.3%	11.1%	3.3%	2.51

Only 6% of respondents believe, to a large extent, that starting a company in the digital economy is an achievable goal, with a high share (47%) having an uncertain position (believe only to some extent). Also, a very small proportion of young people surveyed are convinced that they will identify a business opportunity in the digital economy in the next period (5%), with over 30% stating that this is only possible to a small extent or not even at all. Even the identification of such an opportunity does not seem to turn into an idea and a business plan, as only a third of young people were claiming that they would act in this direction, most remaining undecided (40%). Half of young people do not seem to have a goal of starting a business in the digital economy, with less than 15% of survey participants having a plan in this direction.

3.5. Testing research hypotheses

Hypotheses H1 = There are no significant differences between the attitudes of young people towards different aspects of their professional career according to their sex, occupation or income level.

To validate this hypothesis, the Hi square test of variable independence was applied (table no. 5).

Table no. 5. Hi square test of independence for attitudes of young people towards different aspects of their professional career

	Respondents' sex		Respondents' income		Respondents' occupation (students)	
Variable	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)
I tolerate unexpected changes in the business environment	**11.372**	**.023**	16.640	.409	.283	.991
The desire to achieve performance at work	**8.379**	**.039**	10.915	.536	1.751	.626
Failure is a natural part of business	1.508	.825	**48.889**	**.000**	**11.121**	**.025**
It is the person who influences the failure or success	5.262	.261	9.071	.910	2.608	.625
The desire to learn new things	3.204	.524	13.048	.669	1.179	.882
Skills/practical experience required at a job	3.504	.477	10.844	.819	3.700	.448
Gaining new skills/experience through creative ideas	9.376	.052	**29.173**	**.023**	7.161	.128
The professional goal is to become an entrepreneur	2.778	.596	**34.499**	**.005**	2.698	.610

The eight variables related to aspects of an individual's professional career were compared in relation to the sex, income and occupation of the respondents. The results show that *there is a significant difference between men and women in terms of tolerance for unexpected changes in the business environment, as well as the desire to achieve work performance*. In both cases, the sex of the respondents has an average impact on the two variables (V Cramer's value being between 0.151 and 0.176) (Zaiontz, 2014).

The results also highlighted a *difference between people with different incomes and how business failure is being perceived, the acquisition of new skills through creative ideas as well as the professional goal of becoming an entrepreneur*. In all three cases, revenues have an average influence on respondents' options (V Cramer's value being between 0.141 and 0.182).

It was also observed that *there is a difference between the status of the respondents (students or not) and the perception of failure as an integral part of a normal development of this activity*. In this case as well, the status of the respondents has an average influence on the perception of the respondents (V Cramer's value being 0.174). For the rest of the associations, the *initial hypothesis was confirmed*, namely that there are no significant differences between the attitude of young people towards different aspects of their professional career and their sex, occupation or income.

Hypothesis H2 = There are no significant differences in the entrepreneurial motivations of young people according to their sex, occupation or income level.

To validate this hypothesis, the Hi square test of variable independence was applied (table no. 6).

Table no. 6. Hi square test of independence for entrepreneurial motivations

	Respondents' sex		**Respondents' income**		**Respondents' occupation (students)**	
Variables	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)
Starting and managing a company without any difficulty	5.359	.252	**38.790**	**.001**	**11.572**	**.021**
Control of the process of starting a new business	3.855	.426	**26.999**	**.041**	5.862	.210
Success in starting your own company	1.024	.906	**27.359**	**.038**	6.222	.183
The science of doing the right thing to grow a business	6.573	.160	20.843	.185	8.220	.084
I do my best to become an entrepreneur	3.275	.513	**35.917**	**.003**	6.784	.148

It is observed that if sex of the respondents is taken into account, there are no significant differences between men and women in terms of entrepreneurial motivations, as a result *the hypothesis is confirmed*. *However, income tends to influence entrepreneurial motivations*, by having an average impact. In this case, V Cramer's value is between 0.135 and 0.162. Having this in mind, the hypothesis is rejected, as the respondents' income tends to make a difference in the entrepreneurial intentions of young people. However, the value of the income does not influence the science of doing the right thing to grow one's business. *The occupation significantly influences the perception on the ability to start and manage a company* – consequently, the hypothesis is rejected; for the rest of the issues, no significant impact was registered, hence the hypothesis was accepted.

Hypothesis H3 = There are no significant differences in young people's attitudes towards digital businesses according to their sex, occupation or income level.

To validate this hypothesis, the Hi square test of variable independence was applied (table no. 7).

Table no. 7. Hi square test of independence for digital businesses

	Respondents' sex		Respondents' income		Respondents' occupation (students)	
Variables	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value	Pearson Chi-Square Value	Asymp. Sig. (2-Sided)	Pearson Chi-Square Value
Starting a company in the field of digital economy	3.407	.492	24.029	.089	1.054	.901
Identifying opportunities in the digital economy	4.905	0.297	10.034	.865	2.219	.696
Taking advantage of the identified opportunities	1.636	.802	24.136	.087	1.782	.776
Entrepreneur in the field of digital economy	2.060	.725	12.045	.741	1.719	.787

The results did not show significant differences in attitudes towards digital businesses, if the sex of the respondents, their income or their occupation (in the case of students) were taken into account. In contrast, in the case of respondents in the "*employed or not*" category, only one result changes, namely: there is a significant difference between those who are "*employed or not"* and the opinion that they are able to identify a good business opportunity in the field of digital economy. In this case, the *Value for - Pearson Chi-Square = 9.498,* and *Asymp. Sig. (2-Sided)= .050.* The results confirm the hypothesis, unless respondents are "*employed or not*", when it could be argued that there are significant differences in attitudes towards digital business, depending on the occupation of respondents.

Conclusions

Based on the presented research, one can argue that there are premises for stimulating entrepreneurship among young people. First, they stated a preference for work that involves creativity and new ideas – a particularly important factor in identifying opportunities for new business development (Lahuía, Moriano and Gorgievski, 2019; Nwosu et al., 2022). In this regard, it is essential that the academic environment continuously adapts and promotes creativity and critical thinking among students. There are already initiatives in this regard, as the Entrepreneurship Students Society within the Bucharest University of Economic Studies has been organizing the GoBiz business plan competition for 5 years now, with a special section dedicated to the IT&Tech sector. In addition, implementing national projects, supported by the Government, such as *Innotech Student* (started in 2022) is a very important step in stimulating and encouraging entrepreneurship among those under 30 and beyond.

Obviously, the research has a number of limitations, which derive mainly from the method chosen for sampling. Based on a more generous volume of resources, it would have been interesting to conduct a research involving young students from several universities in different cities of the country, to test for possible differences in perceiving entrepreneurship. Research already conducted (Yildirim et al., 2016) indicate differences in perception and motivational factors related to entrepreneurship, depending on education, for example, as economists may be stimulated differently compared to engineers. In addition, the research could be extended to other age groups. Another limitation of the research could be the self-assessment of entrepreneurial capacity, thus there is a risk that the results be of a subjective nature, derived from the way young people perceive themselves in certain situations. However, the results of the present study contribute empirically to understanding entrepreneurship and, more specifically, entrepreneurship in the digital economy. The results can be useful for both academia, government and the business environment.

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Ukraine Crisis: The Trigger for the EU to Cut Its Dependence on Russian Fossil Fuels

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Abstract
The escalation of the conflict in Ukraine in February 2022 has added new concerns about the EU's energy security. By promoting renewable energy sources and using various methods of environmental protection, the EU is committed to becoming climate neutral by 2050. In this context, the main pillars and drivers of EU energy policy are focused on improving energy security, reducing CO2 emissions and sustainable economic development.
The aim of this paper is to assess the impact of the crisis in Ukraine on EU-Russia energy relations and the achievement of the EU's climate neutrality target.
In order to achieve the proposed objectives, this paper is the result of a mixed research design, based on a quantitative and qualitative component, respectively. The topicality of the debate on EU-Russia energy relations is reflected in the field of scientific research through significant literature. Official documents of the European Commission and the European Parliament, academic articles and studies by various prestigious think tanks were analyzed. The research is also based on data published by Eurostat.
It has been established that the crisis in Ukraine (2022) and its consequences require a thorough reassessment of how the security of energy supply throughout the Union will be guaranteed. The new reality could be a trigger for the EU to reduce its dependence on fossil fuels in a shorter time than originally planned and to accelerate the use of renewable resources.

Keywords

European Union, Russian Federation, energy, restrictive measures, natural gas, oil.

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Introduction

The European Union is currently facing many energy challenges, including import dependence, limited diversification, volatility in energy prices, reduction of greenhouse gas emissions and security of supply (Ciucci, 2021).

The EU is heavily dependent on imported energy resources, which makes the EU bloc vulnerable to risks of supply disruption and rising fossil fuel prices. Gas supply interruptions in the north and east of the old continent in 2006 and 2009 (Siddi, 2015, 2017) and the crisis in Ukraine (2014) (Loskot-Strachota and Zachmann, 2014) have exacerbated the European Union's over-reliance on Russian energy resources. The escalation of the conflict in Ukraine in February 2022 has added new concerns about the EU's energy security. In this context, the main pillars and vectors of EU energy policy are the focus on improving energy security, reducing CO2 emissions and sustaining the economy. Thus, in the transition to a more competitive economy and a more secure energy system, sustainable energy plays a significant role.

In recent years, the European Union has set ambitious goals, the achievement of which will allow for more efficient and cleaner use of energy. The EU is committed to becoming climate neutral by 2050 (European Commission, 2019b). By promoting renewable energy sources and using various methods to protect the environment, the EU bloc aims to become a world leader in green energy.

The crisis in Ukraine (2022) and its aftermath call for a thorough reassessment of how the security of the entire Union's energy supply will be guaranteed. The new reality may be a trigger for the EU to rethink its

energy strategy, reduce its dependence on fossil fuels in a shorter timeframe than originally planned, and accelerate the use of renewable resources.

1. Review of the scientific literature

The energy field plays an important role in studies on EU-Russia relations. In the context of climate change, but also of the crisis in Ukraine, this topic has enjoyed increased interest from the scientific community. Ensuring energy security has become a major challenge for the European Union over the last two decades. At the heart of researchers' concerns is the European Union's energy security and the diversification of its natural gas supply.

Sullivan and Northam (2022) consider the rapid implementation of alternatives to natural gas to be a challenge for the EU. Studying the impact that changing the source of supply would have on economic competitiveness, Mäe (2020) determined that replacing Russian natural gas with gas imported from elsewhere in the world would reduce Member States' GDP by an average of 0.13%. According to the same author, replacing Russia as a source of supply would be a heavier burden for Central and Eastern European countries than for Western European countries (except Austria). Rodríguez-Fernández, Fernández Carvajal and Ruiz-Gómez (2020) analyzed the level of security of energy supply of EU Member States in the period 2005-to 2010. The results of the study show that in order to improve the external dimension of the EU's energy security, it is necessary to diversify gas suppliers and reduce external dependence. Medlock, Jaffe and O'Sullivan (2014) indicate that reducing dependence on Russian natural gas involves diversifying suppliers through both pipelines and LNG regasification terminals. Dickel et al. (2014) consider that by 2030, the EU's main alternative energy source for Russian gas imports will be LNG. Analyzing the problems that the EU may face in the event of a prolonged supply disruption, Mcwilliams et al. (2022) pointed out that the most effective solution in this case also includes adjustments on the demand side to reduce gas dependence, rather than just replacing Russian gas with imports from another country. Jaller-Makarewicz and Williams-Derry (2022) emphasize that looking to the future, the EU must redefine energy security not as a diversity of gas infrastructure, but as a true diversity of energy sources that is immune to political influence and may reduce the risk of future energy crises.

2. Research methodology

This paper, which is an analysis of the cooperation between the European Union and Russia in the field of energy, is based on two components: qualitative and quantitative. The study of information gathered from official EU documents (directives, regulations, strategies and reports of the European Commission), academic articles and studies published by various think-tank organizations (Bruegel, Institute for Energy Economics and Financial Analysis (IEEFA), Oxford Institute for Energy Studies (OIES)) make up qualitative research. The processing of statistical data, collected from the website of the EU Statistical Office - Eurostat is the quantitative component. Following access to Eurostat databases, statistical data on trade in goods between the European Union and the Russian Federation for the period 2010-2020 (quantity, value and type of fuel exported from Russia to the EU) were collected and processed.

3. Results and discussion

The main sources of primary energy used in the EU in 2020 were oil and petroleum products (32.65%), natural gas (24.38%), renewable energy (17.9%). Nuclear power accounted for 13.06% of domestic primary energy consumption, solid fuels - 10.46%, and non-renewable waste accounted for 1.06% (see Figure no.1). About 2/3 of the energy consumed in the EU during 2020 came from fossil fuels: 32.65% from oil and its derivatives, 24.38% from gas and 10.46% from solid fuels.

Energy is one of the areas where competencies are shared by the European Union and the Member States. Therefore, each EU Member State has full freedom to decide what primary energy resources it uses to meet the needs of its population and national economy. Thus, in the Netherlands, Italy, Hungary, Slovakia, Romania, the main source of energy is natural gas. France is the main consumer of nuclear energy, and Poland, Estonia and the Czech Republic use solid fuels as their primary energy resource. Estonia has a unique energy mix among the EU Member States. Estonia's main energy resource is domestically produced bituminous shale, which gives this Baltic country a high degree of energy independence. However, the burning of oil shale also has certain side effects such as very high carbon dioxide emissions and the formation of a large amount of slag. At the other end of the scale are Sweden, Finland, Denmark and Latvia, which have the highest share of renewable energy in their energy mix. (see Figure no.2)

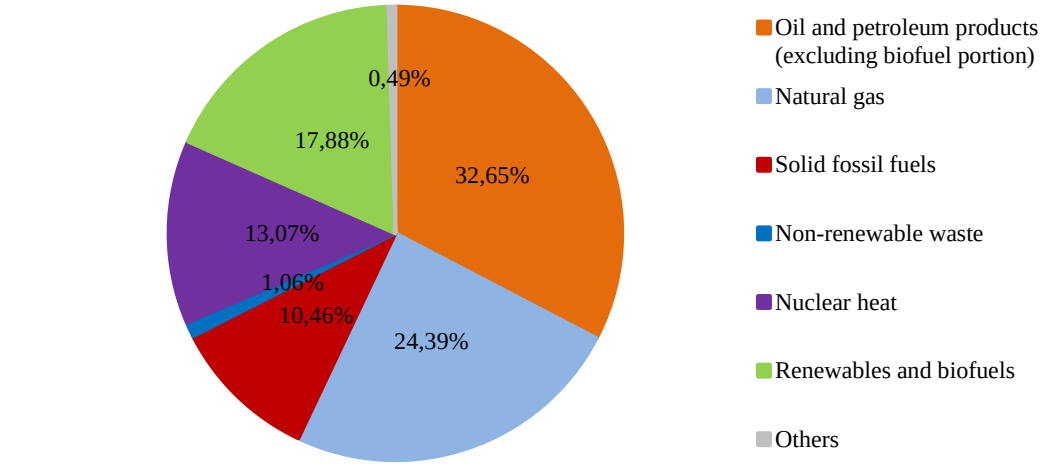


Figure no. 1. EU Gross inland consumption 2020
Source: Author's projection using Eurostat database, 2022

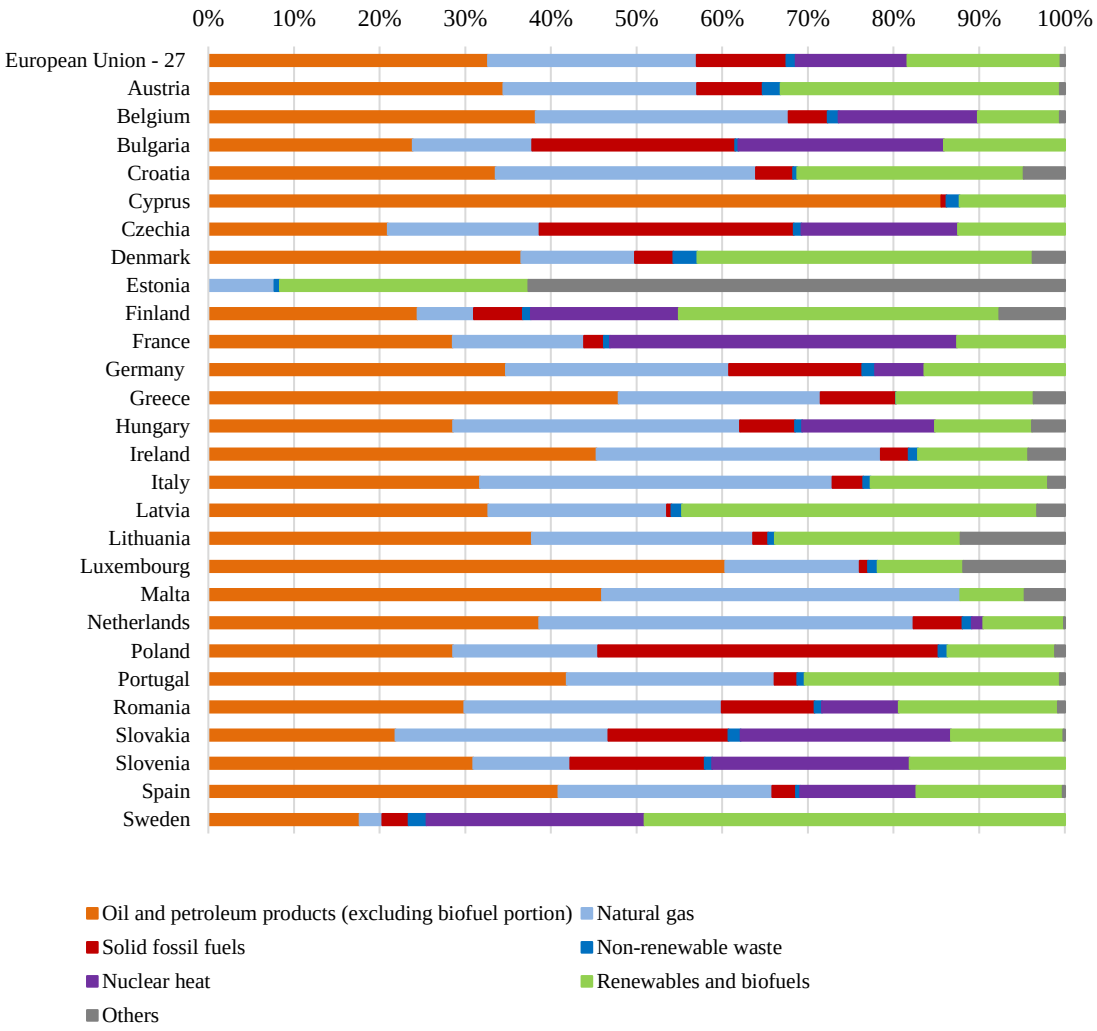


Figure no. 2. Energy Mix 2020
Source: Author's projection using Eurostat database, 2022

In 2020, according to data provided by the statistical office of the EU – Eurostat (European Commission, 2022a), 43.20% of the total volume of natural gas imported by the EU came from Russia. Also, imports from the Russian Federation (see Figure no. 3, 4, 5) accounted for 25.85% of oil imports and 53.96% of total coal imports.

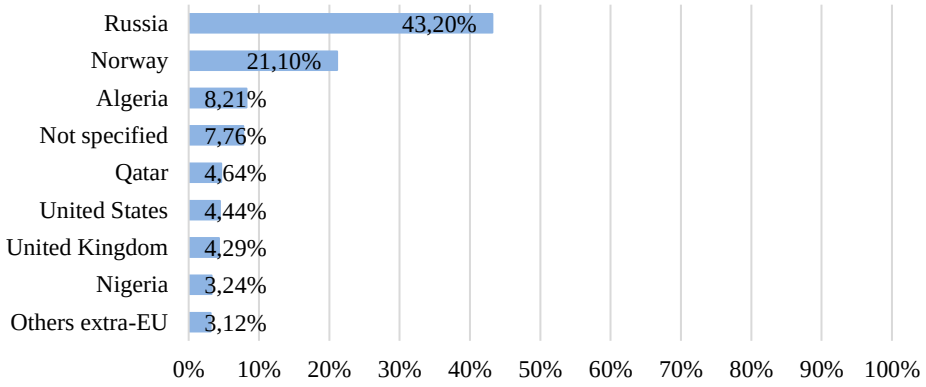


Figure no. 3. Extra EU imports of natural gas – 2020
Source: Author's projection using Eurostat database, 2022

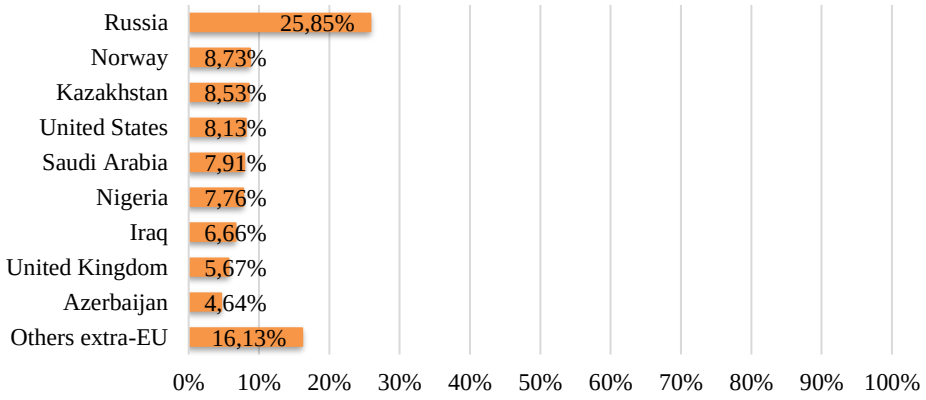


Figure no. 4. Extra EU imports of crude oil – 2020
Source: Author's projection using Eurostat database, 2022

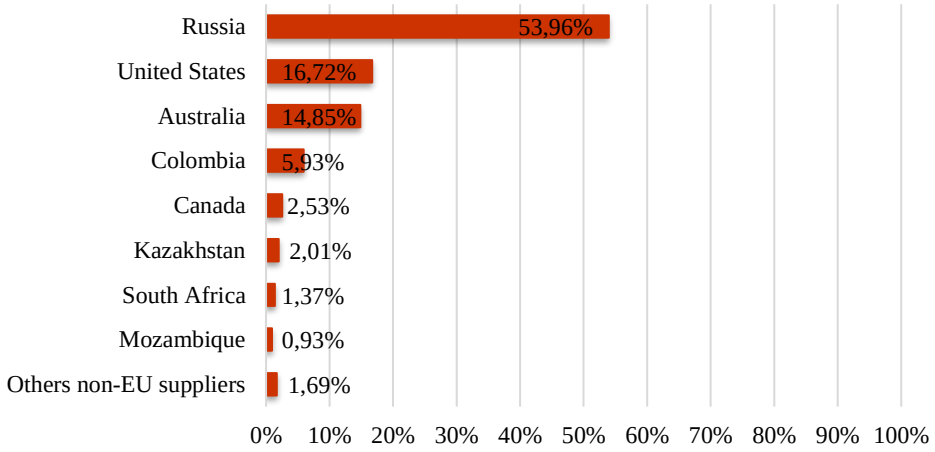


Figure no. 5. Extra EU imports of hard coal – 2020
Source: Author's projection using Eurostat database, 2022

Import dependence, energy price volatility, limited diversification, the decarbonization of the economy, the threats posed by climate change and the need for stronger integration and interconnection in the internal energy market are the EU's recent energy challenges.

Over the last 10 years, the EU has made a number of commitments in the field of energy, adopting legislation that sets out the vision and strategies of the Community bloc and at the same time sets out the guidelines and steps for the Member States.

The European Energy Union Strategy was adopted by the European Commission in February 2015 and validated by the European Council in June of the same year. The strategy focuses on five dimensions: *energy security, solidarity and trust; a fully integrated European energy market; energy efficiency contributing to moderation of demand; decarbonising the economy, and Research, Innovation and Competitiveness* (European Commission, 2015).

In 2016, the European Commission proposed the adoption of the legislative package entitled *Clean energy for all Europeans*. This package is an important component of the Energy Union Strategy, which aims to provide affordable, secure and sustainable energy for European citizens and businesses. The main objectives of this initiative are: to give priority to energy efficiency, to become a world leader in renewable energy and to ensure a level playing field for consumers (European Commission, 2019a). The purpose of this strategy is to facilitate the transition from a fossil fuel-based energy sector to one based on clean energy and to ensure compliance with the EU's international commitments under the Paris Agreement (2015) in the field of climate change.

The Clean Energy Package includes proposals on important areas such as the organization of the electricity market, energy efficiency, security of supply, renewable energy sources and governance rules. The overall goal of this legislative package is to transform the EU into a low-carbon economy by 2030. In May 2019, the latest regulations that make up this legislative package were adopted.

Another European Commission initiative, launched in December 2019, is the European Green Deal. It sets out a growth strategy, which aims to transform the EU into a modern, competitive and resource-efficient economy with no net greenhouse gas emissions by 2050 and economic growth. be disconnected from the use of resources. Achieving the EU's neutrality target implies a significant decrease in current levels of greenhouse gas emissions over the next decades. As an interim step towards achieving this goal, the European Union has committed itself to reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990. In order to meet the proposed targets for 2030, the European Commission has launched the legislative package *Fit for 55*. The purpose of this set of proposals for revising and updating European Union legislation and implementing new initiatives is to ensure that EU policies are in line with the new climate targets set (European Council, 2022b). In 2021, the European Climate Law was adopted as part of the European Green Deal. Thus, the goal of achieving climate neutrality in 2050 has been transposed into law.

Following the escalation of the armed conflict between the Russian Federation and Ukraine, the European Commission has proposed a REPowerEU plan aimed at increasing the resilience of the EU energy system and ensuring the EU's independence from fossil fuels in the Russian Federation before 2030. In March In 2022, the Commission outlined the outline of this initiative. In addition to accelerating the transition to clean energy, the REPowerEU plan sets out a series of measures to mitigate the impact of rising energy prices in the EU and diversify the natural gas supply for the winter of 2022-2023. The REPowerEU plan will focus on two pillars: diversifying the supply of natural gas and reducing the use of fossil fuels in homes, buildings and industry. Increased imports of LNG and pipelines from suppliers outside the Russian Federation and increased production and imports of biomethane and hydrogen will lead to the achievement of the first pillar, namely the diversification of gas supply. Improving energy efficiency, making greater use of renewable energy sources and removing bottlenecks in infrastructure will help achieve the objectives of the second pillar (European Commission, 2022c).

The European Commission estimates that the full implementation of the proposals in the "Ready for 55" legislative package will help reduce annual fossil fuel consumption by 30%, the equivalent of 100 billion cubic meters, by 2030, and the adoption of REPowerEU measures would phase out at least 155 billion cubic meters of fossil gas, which is the equivalent of the volume imported by the EU from the Russian Federation in 2021. Applying these measures will reduce the EU's over-reliance on a single supplier (European Commission, 2022c).

Shortly after the Communication on the REPowerEU Plan, an informal meeting of Heads of State or Government took place on 10-11 March 2022 in Versailles, France. During this meeting, three key dimensions for the EU were addressed, including the reduction of energy dependencies. In this regard, the leaders of the European Union agreed that the dependence of the Community bloc on gas, oil and coal imports from the Russian Federation should be phased out as soon as possible (European Council, 2022c).

Subsequently, in order to ensure security of energy supply, the European Commission presented a legislative proposal providing for the introduction of an obligation for the Member States to store natural gas at a minimum level of 80% for winter 2022-2023 and 90% for subsequent years (European Commission, 2022b).

Since March 2014, the EU has gradually imposed restrictive measures against Russia in response to the crisis in Ukraine. In turn, the Russian Federation has adopted counter-sanctions, which have largely targeted Western agricultural exports. In February 2022, the EU significantly expanded its sanctions against the Russian Federation in response to Russia's decision to recognize the independence of the Donetsk and Luhansk regions and the escalation of military conflict in Ukraine. The EU has imposed various types of restrictive measures: diplomatic measures, individual restrictive measures (asset freezes and travel restrictions), restrictions on economic relations with Crimea and Sevastopol and areas not controlled by the government in the Donetsk and Luhansk regions, economic sanctions, restrictions on the media and restrictions on economic cooperation.

The economic sanctions adopted against the Russian Federation by the European Union target the financial, trade and energy sectors, as well as the transport, technology and defense sectors. EU restrictive energy measures do not allow coal imports from Russia, ban exports to Russia of petroleum refining products and technologies, and prevent new investments in the Russian energy sector (European Council, 2022a).

The United States has banned all imports of natural gas, coal, oil and petroleum products from the Russian Federation. Canada, Australia and the United Kingdom have also restricted imports of Russian oil. Among fossil fuels, the first target of EU restrictive measures against Russia was coal. The European Union has decided to stop delivering Russian coal from August 2022.

The construction of the Nord Stream 2 pipeline, through which Russian gas was to reach Germany directly, bypassing Ukraine, was completed in September 2021. The pipeline was to become operational following approvals from German and European Union regulators. However, due to the crisis in Ukraine, in February 2022, Germany suspended the approval process, thus giving up the commissioning of the controversial gas pipeline.

As of April 2022, Latvia, Estonia and Lithuania stopped Russian gas imports. On April 2 of the same year, the Lithuanian government declared that the country had completely given up importing gas from the Russian Federation. Shortly, on April 7, 2022, the Tallinn government also announced that it would cease importing gas from Russia by the end of 2022. The Baltic countries have been trying for several years to reduce their dependence on energy imports from Russia, especially on Russian gas. To strengthen Lithuania's energy security, an LNG terminal was launched in 2014 in the port city of Klaipeda. Neither of the other two Baltic countries currently has its own LNG terminal. Thus, in order to solve this problem, Estonia decided to cooperate with another country in the region, namely Finland. In order to guarantee the supply of gas to Estonia and Finland, the two countries jointly agreed to the joint leasing of a floating LNG terminal. The establishment of this floating LNG terminal is planned to be by fall of the 2022.

The simplest solution that the EU Member States can apply in the near future to diversify energy sources and reduce the bloc's dependence on the Russian Federation is to reopen and extend the period of use of coal-fired power plants. If until now it was considered that in order to replace the conventional resources with the renewable and sustainable ones, first of all, the coal-burning will be given up, in the current context several EU countries have announced that they will continue to use this type of fossil fuel. Member States planning to use coal to replace Russian gas will have to take into account the EU's climate targets. Given the European Union's strategy to reduce carbon emissions, coal is not a reliable long-term solution. In the short term, one solution would be to use conventional fuels in combination with sustainable resources.

Conclusions

In the light of recent events in Ukraine, the EU's main energy goals are to increase the resilience of the energy system at the EU level and to reduce its dependence on fossil fuels in the Russian Federation. In the medium and long term, the objectives of the European Green Pact coincide with those related to the European Union's energy security. Maintaining existing EU sanctions, adopting other restrictive energy measures against Russia, and implementing the REPowerEU plan represent the starting point in reducing dependence on fossil fuels in Russia, while also contributing to the EU's energy transition. The diversification of EU energy sources, the development of LNG stations, the development of the internal transmission network and the development of domestic renewable energy production are the main ways in which the EU can eliminate its dependence on Russian oil and gas. The economic sanctions and the implementation of the REPowerEU plan involve certain financial costs that will affect both the budgets of the EU Member States and the final consumers. It also takes time to achieve your goals. Thus, Russian gas will continue to be important for the European Union, at least until the development of alternative sources of supply.

At the time of writing, the latest available information has been studied but taking into account the fact that, in the current context, new circumstances arise every day, the subject needs constant updating. The paper complements current studies in the approached field and can be a starting point for constructing evolutionary scenarios on EU-Russia energy relations and/or the EU's energy transition.

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Critical Success Factor for Integration of Cyber Security in Context of Managed Services

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Abstract
The increasing frequency of cyber security attacks and their impact on value-added business processes requires companies to appropriately address cyber security risks in the Risk Management Process (RMP). In the context of cybersecurity risks, companies can identify, assess and manage their business aims by applying 4C (Consultation, Communication, Coordination, Cooperation).
With this paper an increase in the efficiency of the RMP is proposed through an adaptation of the management activities by means of categorization of the information and group consolidation as well as the prioritization of measures. Trough adaptation it possible to establish a Cyber Security RMP (CS-RPM). The result is a predicted balancing of the benefits of the technology with the potential consequences of a CS risk threat event that drives proactive CS risk management. A system of guidelines for an information security-, cyber security- and data privacy-specific document structure of the managed services (MS) is also considered and be looked. The use of risk registers to map CS risks and the application of risk metrics is considered in more detail. Risk values to be quantified and their determination from risk measurements are explained in parts.

Keywords

Cyber security management, risk management process, cyber risk, managed services

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Introduction

The ISO/IEC 27002:2013 provides best-practice requirements for ISO/IEC 27001:2013 and is therefore the second most important international standard when it comes to introducing an ISMS in a company. In combination with ISO/IEC 27005:2018, which describes the RMP for information security, the criteria for assessing, prioritizing and accepting risks are dealt with. The applying of RMP is applied by the risk managers, who assume responsibility for the residual risks, e.g. for the "supporting assets". If risks are not correctly managed since the beginning, a project may encounter issues even before it starts (Fogoros et al., 2021). The RMP is mostly limited to statistical threat catalogues and one-off risk assessments (Lampe et al., 2021). This also affects the risk assessments for the asset register. The financial impact increases due to cyber-attacks on vulnerabilities in information technology systems (Proofpoint, 2021). Due to the limited perspectives, relevant risks are out of focus and lead to a high willingness to take risks. Therefore, the RMP management activities for Information Security (IS) and Data Privacy (DP) related measures must be adapted. According to previous research (Ande et al., 2020; Bhamare et al., 2020; Ganin et al., 2020; Pandey et al., 2020), the RMP approaches to information security are indispensable for the application and management of cybersecurity (Fuertes et al., 2017). The paper is intended to present the management of cyber security risks using an RMP and to show a method for quantifying the risks. It can be assumed that there will be an improvement in risk measurement and risk analysis methods. The consultation as an iterative process causes a constant conditioning of the participants through communication, coordination and cooperation. In particular, the addressing of risks is addressed in order to more clearly delineate the involvement of those responsible for risk in cyber security risk management.

1. Literature review

Strategies, methods and their application of measures regarding Information Security (IS), Cyber Security (CS) and Data Privacy (DP) are challenges for every company. Cyber-attacks are increasing due to the digital transformation, opening up new areas of attack in all fields (Senol and Karacuha, 2020; World Economic Forum, 2021). The risks posed by digital globalization in the transport and traffic industry has made keeping business processes running a struggle for companies (Bakator, Đorđević and Ćoćkalo , 2019). In addition to these dynamic conditions, the COVID-19 pandemic has put additional strain on companies (Juergensen, Guimón and Narula, 2020). Besides to the globalization of markets, the modern business environment is characterized by constant changes in the field of Information and Communication Technology (ICT) (Sunday and Vera, 2018). Furthermore, it should be noted, that international framework conditions are constantly renewed or redefined, such as the revised ISO/IEC 27002 standard, which was newly adopted in February 2022. ISO/IEC 27002:2022 lists new controls, which are also indicators for the new thematic priorities. It is advantageous that the topics of avoiding, detecting and reacting to cyber-attacks as well as the protection of data come to the fore.

An understanding for risks and adapting efficiently to business changes are essential for the companies to maintaining a stable position within the industry. Through the requirements, companies have to consider the implementation of different management systems, which may bring additional risks to business performance (Vulanovic et al., 2020). Those responsible roles must establish management activities, which are necessary to identify and prioritize supporting applications, business processes and measures in order to conduct a business and risk impact analysis. In addition, these are linked to their probability of occurrence and their impact on the business process and must be quantified in order to adequately deal with cybersecurity problems due to the rapidly increasing attacks and vulnerabilities (Štitilis et al., 2020).

The TOP management of the companies must consider the trend changes as well as the risks in order to face the sustainable achievement of business goals (Popescu et al., 2020). This implies the need for effective decision-making and an adequate supporting information system (Elbashir et al., 2020; Rahimnia and Molavi, 2021). For a structured management, it is essential to better manage cyber security risks at the system and enterprise level. The responsible roles are to describe the technical and organizational measures in terms of processes in order to establish preventive and reactive measures for business processes relating to information technology. In addition, cyber security risks must be categorized in cyber security risk registers and the measures must be consolidated, prioritized and tracked in groups. The current literature addresses the mentioned business metrics and factors in different contexts however these do not describe how the RMP approaches to information security can be implemented for the application and management of cybersecurity for managed services.

2. Research methodology

Qualitative research as a process of analysis and interpretation was applied to achieve an appropriate combination of theoretical approaches and practical implementations. Based on ISO/IEC 27001:2013 and ISO/IEC 27002:2013 (latest version published in 2022), the generic requirements for the ISMS were formulated as questions. The industry-specific requirements for companies in transport and traffic were selected from the main part and the associated ANNEX A, which contain more than 140 controls. Company-related individual questions ensured that the focus was on information and cyber security. Existing management systems were questioned with regard to their process orientation and risks. In addition, questions were created to obtain further and supplementary information (Stake, 1995; Yin, 2008). The evaluation on which this study is based only includes transport and traffic companies with a turnover of more than 100 million euros, whose questions are largely congruent. Only congruent questions were evaluated. Their results were processed for the practical implementation of suitable measures (Walsham, 1993; Strauss and Corbin, 1994). Overall, the results of seven Europe-based companies in the logistics sector were included.

3. Results and discussion

3.1. Interviews and roles

The interviewees, who are located at the strategic and operational level in the respective company, were guided through a standardized and predefined questionnaire. The fact that within the organizations the interviewees have different roles regarding information and cyber security (CS) and data protection was taken into account as shown in Table no. 1.

Table no. 1. Specific roles in organizations - transport and traffic - rail transport company

Case	Employees	Responsibilities (interviewees)																	
		Roles							*Other roles*										
		TOP mgmt..		*Management*			*Administration*		*TOP mgmt.*			*Management*						*Administration*	
		Chief Executive Officer	*Head of IT*	*Information Security Officer*	*Data Privacy Officer*	*Logistic support manager*	*IT system administrator*	*database administrator*	*Head of IT infrastructure*	*Head of digitization*	*Head of management systems*	*Risk manager*	*Information systems manager*	*Innovation manager*	*Systems support engineer*	*Logistic engineering manager*	*Project manager*	*Product manager*	*Solution architect*	*ICT system owner*
1	*>10k*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
2	*>1k*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	-	-	-	*x*	*x*	*o*	*x*	*o*	*x*	-
3		*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	*x*	-	-	-	*x*	*x*	-	*x*	*x*	-
4		*x*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	-	-	-	*x*	*x*	-	*o*	*o*	-
5	*<1k*	*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	-	-	*x*	*x*	*x*	-	-	*x*	-	-
6		*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	-	-	*x*	*x*	*o*	-	-	*x*	-	-
7		*x*	*x*	*x*	*x*	*x*	*x*	*x*	-	-	-	-	-	-	*x*	-	-	*x*	-	-
*Legend: mgmt. management, **x** present, **o** partially, - not present*																				

Any conflicts of interest were treated separately. The roles with the comparable field of activity were assigned. The roles that cover a more extensive field of activity were identified. The tasks of the risk manager employed by a company include recognizing, analyzing and evaluating as well as monitoring, managing and controlling risks of all kinds. This means that the risk manager focuses on technical and financial risks as well as software /System and environmental risks. In the other companies, the tasks are distributed more individually, so that relevant risks are out of focus due to a limited perspective and can lead to a higher willingness to take risks.

In addition, additional internal company documents were viewed. These consisted of business process and system documentation as well as guidelines and procedural descriptions. The data collection was limited to supplementary information on the results of the interviews. If there were differences between the interviews and the documents viewed, an additional consultation was carried out.

3.2. Structured policy system

Formal and structured management of responsible roles is crucial for the successful use of technical and organizational measures. Therefore, the use of a hierarchical framework with clear definitions of relevant roles and responsibilities is necessary to assign and systematically implement the measures. A structured policy system should include preventative, detective, and corrective actions and controls, ranging from manual to fully automated. These should be developed in the relevant policies and procedures, documented and communicated via a more appropriate board. Structured policy system is recommended as shown in Figure 1. It is made up of three levels, the abstract level, a level with overarching concrete valid specifications and the level with implementation specifications for each area. The IS guideline is to be seen as an entry point into the document structure. This includes the overarching aims and principles for IS and CS as well as DP.

The management aims are to be agreed with the management, published internally and checked regularly. Based on the IS guideline and the Statement of Applicability (SoA) according to ISO/IEC 27001:2013, a large number of guidelines (topic-specific guidelines) and supporting documents must be established, which detail the regulations and instructions regarding information and cyber security as well as data protection describe and specify.

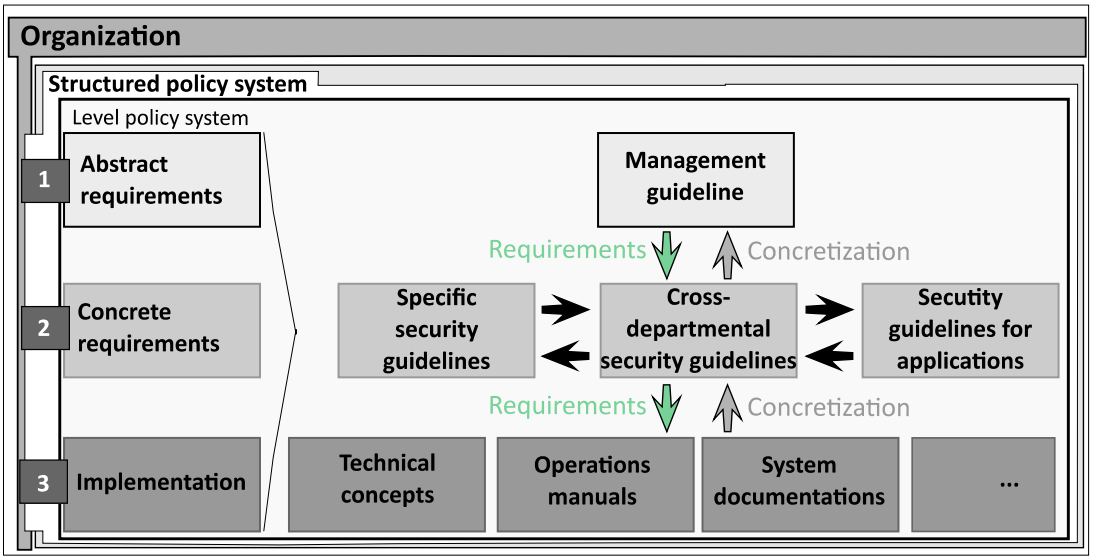


Figure. no. 1. Elements of structured policy system

On top of that, the use of further process-oriented specifications through area-specific or topic-specific guidelines is required. For example, the guideline for ensuring the information security (IS) of managed services is aimed in particular to

- customers and interested parties (stakeholders),
- the manager and executives responsible for information technology and information security,
- IS- and DP-officers, IT-coordinators, key-user as well as
- all employees regarding to or activities related to IS, CS, DP.

IS, CS and DP classified documents must be marked as such (e.g. public, internal, confidential, strictly confidential). All guidelines are to be aligned in a systematic and structured manner in order to enable a holistic approach to information and cyber security as well as data protection. These documents are subject to document control, regular review and are communicated to the relevant target groups after each change. Process-oriented reviews and approvals of documents as well as archiving and deletion must be defined. The associated processes are to be used in a goal-oriented manner, checked, cyclically trained and documented. In addition to the technical aspects, the guidelines also have to consider infrastructural, organizational and personnel issues in order to identify and implement the necessary security measures. Under these conditions, the structured system of guidelines with the associated measures is regularly checked, adjusted and can be used as part of an internal/external audit in accordance with ISO/IEC 27001:2013 certification.

3.3. Objectives of Managed Services (MS)

The ISMS regulates the security objectives as well as the general technical and organizational measures to ensure IS. An important part of the ISMS for MS is the description of the IS objectives and the comparison with the requirements for CS and DP.

The principles for dealing with IS, CS and DP are to be transferred to the structured policy system and assigned to the Managed Services division. One of the objectives is to continuously improve the security level of all aspects that are necessary for the operation of the customer's services or that affect this operation in any way. In addition, the systematic examination of risks, weak points and threats is seen as an essential part of establishing targeted technical and organizational measures and proactively avoiding threats. In general, these aims for MS can be summarized as follows:

- the highest priority is the protection of integrity and confidentiality of customer data as well as the authenticity of customers;
- another is to ensure the availability of the service according to the agreed service and operation level;

- the systematic examination of risks, weak points and threats is an essential part of the ISMS and a prerequisite for targeted technical and organizational measures with the aim of proactively avoiding threats and being able to ward off threats quickly if necessary;

- the basic objective of the ISMS is the continuous improvement of the security level of all aspects that are necessary for the operation of the services for customers or that influence this operation in any way.

With regard to the measures used for the scope, these are focused and goal-oriented procedures, definitions and regulations that are compared with the requirements of ISO/IEC 27001:2013 Annex A and ISO/IEC 27018:2019.

3.4. Pro-active management of cyber risk

Cybersecurity risk management means

- to weigh the benefits of applying information and technology against the potential negative impacts;

- to estimate their likelihood of the consequences resulting from the deployment of this application at the system, organizational or corporate level.

Risks are defined in terms of the likelihood of an event occurring and the potential adverse consequences of such an event (Kendrick, 2009). These estimates are often made subjectively. Therefore, it is often difficult to reach a consensus between the stakeholders involved. In addition, care must be taken not to ignore the risks (Kutsch and Hall, 2010). Since the responsible roles usually have limited resources, these are only used when the risks become hazards and occur. Therefore, proactive management of cybersecurity risks is recommended. Proactive management involves balancing the benefits of the technology with the potential consequences of a threat event within the RMP and is to be established within the organization. The following must be observed:

- the responsibility of a Cybersecurity Risk Officer (CRO) must be defined;

- the impact of cybersecurity risks in the RMP must be objectively assessed;

- the economic consequences as well as strategic and operational IS-, DP-aims must be taken into account in the risk treatment plan. Other dependencies such as relevant political decisions and regulatory implications must also be considered;

- a cybersecurity register is to be created so that the content of the register can be classified, aggregated with the IS and DP risk register (ISO/IEC 27005:2018), prioritized as follows and fed into the RMP for IS, CS and DP.

3.5. Adapted risk management activities

In many companies, the assessment of cyber security risks is largely spontaneous (ad hoc) and not process-oriented in the sense of ISO 27005:2018. The risk assessments only partially related to the protection goals and there were insufficient risk treatments. Applying a cybersecurity risk register, based on the organization's cybersecurity objectives, allows for the alignment of cybersecurity risk data with the organization's risks. Furthermore, the transfer of cyber security risks and knowledge into IS and DP-related risk management is made possible. With this cyber security risk register, the standardization of risks and their associated measures are compared with the addition of the IS- and DP- risk register. The risk reduction measures are controlled and communicated by the RMP. This is an advantage because it allows the risk owners to take the risk-treating measures expeditiously. The classification in the CS risk register was based on ISO/IEC 27001:2013 and ISO/IEC 27002:2013, taking IS/DP aims into account. In addition, the cyber security risks were quantified to create IT budgeting for TOP management.

3.6. Cybersecurity risk register template

Cybersecurity risks shall be documented and tracked in cybersecurity risk registers to enable better management of cybersecurity risks at enterprise level. The following template, table 2, lists the most significant elements of a cybersecurity risk register.

Table no. 2. Elements of cyber risk register

Elements of risk register	Description in detail
ID	Identifier number used to reference a risk in the risk register, which is continuous.
Priority	Criticality within the risk register (number or scale-related).
Description	Short explanation of the impact of the cyber security risk including root cause analysis.
Category	Multiple risk register entries are grouped together, such as for the Access Control (AC) category. Significant for comparison between individual risk registers during the grouped risks.
Valuation — Likelihood	Estimation of the probability of the risk occurring before any immediate action (first iteration of the risk cycle).
Valuation — Effects	Analysis of potential consequences or opportunities
Valuation — Risk level	The risk level is calculated on the basis of the probability estimate and the identified benefit/consequences of the risk.
Risk treatment	Dealing with the identified risk. Values for risk treatment are 3x3, 4x4 or 5x5 matrix (very low, low, moderate, high, very high).
Risk response	Short description of how to deal with the identified risk. Listing and comparison of measures for consolidation of measures (checklist).
Risk owner	Responsible and accountable for managing and monitoring the risk response.
Risk-status quo	Tracking the current state of this risk and any next activities.
Cost Risk treatment	Estimated cost of applying the risk treatment measures.

By applying the above template, the CS risk management methodology for risk measurement and risk analysis as well as the register entry for CS risks is adapted. The approach ultimately leads from the assessment of potential consequences or opportunities of cybersecurity risks to the application and management of measures in which the cybersecurity risks are fully quantified. In addition, the results of the risk treatment are fully traceable and can be reproduced retrospectively.

3.7. Conditioning to Cyber Security RMP (CS-RMP)

Through a targeted transfer of treatment measures to cyber security risks, these can be conditioned by the responsible person in such a way that these measures have a more coordinated and more effective effect on specific risks for risk reduction. The following steps apply to the conditioning of cybersecurity risks from the cyber security risk register:

1. Information categorization: Categorized information and its consistent presentation within the company creates a uniform understanding: a) to measure cybersecurity risks, b) their negative impact on company aims; and c) the required measures treatment.

2. Redundancy reduction: Is the elimination of information/data duplication.

3. Grouping of measures: Risks that exploit the weak points of the "supporting assets" through generic threats and endanger sensitive and/or comparable information (information objects) are to be grouped in the first step.

4. Consolidation of measures in groups: The compromised information/data that lead to system failures are consolidated. i.e. the grouping of similar or related measures leads to a consolidation in which redundancies of measures are eliminated.

5. Prioritization of measures: The measures that are taken immediately (ad hoc) and/or at different times (change) to deal with operational risks must be assigned to a security program. Any necessary budgeting must be prepared for the approval process.

The consequence of the above conditioning is therefore an efficient and effective Cybersecurity RMP (CS-RMP). The CS-RMP is intended to help companies realize these added values while meeting the requirements of corporate aims, compliance with IS and DS-related topics (e.g. ISO/IEC 27001:2013) and the expectations of interested parties in relation to meet the protection objective. For this it is necessary to establish an internal and active control system as a process with the associated responsibilities in order to offer an appropriate guarantee for the achievement of goals and requirements. The concrete security controls serve the management for information, cyber security and data protection to establish, check and

condition the technical and organizational methods for reacting to cyber security risks. The detection, prevention or correction of security gaps and vulnerabilities is imperative for maintaining operational security.

Conclusions

The impact of cyber risks on business processes can vary within a company's industry. If protective measures for the information to be protected are based on the organizational and technical RMP approach for IS, then a structured system of guidelines can be applied procedurally. This results in a reproducibility of the partial results and consequently a complete transparency for the risk assessment and risk treatment, which can be operated sustainably. If the process of applying the structured system of guidelines is cyclical, an iterative minimization of the residual risks can be achieved in the sense of a successive approximation to the minimal residual risks. The quality of the risk information can be improved by adapting the methods of the CS-RMP for risk measurement and analysis, including and using the cyber security risk register template with the assessment specifications. In this way, the cyber security risks within the organizations are analyzed and their impact quantified, and the risk-reducing measures are determined and implemented. As a result, system-level cybersecurity risk management is consolidated at the enterprise level. This means that the cyber security risks are collected and analyzed at the system level in order to align them with the strategic aims of the company. That promotes the entrepreneurial understanding of cyber security risks and has a positive effect on the definition of strategic company aims and associated operational measures. Based on RMP steps – Identify, Protect, Detect, Respond and Recover – that organize the basic cybersecurity activities, conditioning can support the responsible person in designing, assessing, managing and responding as well as reporting risks within the business units. This also means that CS analyzes can lead to missing or incorrect risk information that CS professionals are confronted with. It is therefore important to identify and eliminate the incorrect risk information within the CS-RMP. By consulting those responsible, a constant conditioning of those involved is brought about. Through comparing the endangered "supporting assets" they are assigned to the relevant risk category. In addition, it could be shown whether risk consequences can be measured by cyber security risk indicators and whether the integration of a cyber security risk management process (CS-RMP) brings advantages. Finally, the understanding and awareness of risk officers directly impacts risk and performance outcomes, and hence the "duty of care and proof" of vulnerabilities and exposures within the organization.

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Applying the Circular Economy Principles in the Wood Construction Industry

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Abstract

The purpose of this paper is to investigate the possibilities of implementing the principles of circular economy in the wood construction industry. The general context of the research is characterized by the new and more demanding challenges regarding the environmental protection issues arising from the current rhythm of development of modern society. One way of responding to these challenges is to transform our consumption society into a more sustainable one. The circular economy has recently become a focal point of European Union policy for transforming production and consumption toward a more sustainable and environmentally friendly direction. The circular economy is mainly related to the use of materials after their life cycle and must be implemented at the design stage of a product or system. However, the meaning and implementation of the concept often remain vague and ambiguous. The construction industry is one of the sectors that use a lot of natural resources, put a lot of pressure on the environment, and generates large amounts of waste. The focus of this research is on wood construction and the possibilities of better use of the potential of wood. Through the implementation of the circular economy principles, wood waste can be used furthermore in the product industry and if further research will be carried out it will bring great benefits to businesses, including economic gains in addition to the environmental ones.

Keywords

Circular economy; construction industry; buildings materials; wood constructions; wood waste; sustainability

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Introduction

In recent years people are more aware of the environmental challenges that limit the continuous process of development in all areas of society. Environmental protection and the issues regarding climate change are one of the challenges that are becoming more and more present in our everyday life. The construction industry is one of the human activities that put a lot of pressure on the environment as it needs to deliver more and better spaces for a growing population. The process of construction also generates pollution and waste all over the world.

The current level of growth for the modern society and the pressure exerted on the environment led to the consideration more and more of the "circular economy" idea and solutions to implement the 3R's (Reduce-Reuse-Recycle) are beginning to take shape. The principles of the circular economy are based on reducing the use of natural resources through efforts to increase efficiency through reuse, reduction, recovery, redesign, and remanufacturing. In this context, the scientific community aims to reach a consensus on the significance of this concept and on the approaches that will allow its successful implementation. The construction industry is adhering to this idea (López Ruiz, Roca Ramón and Gassó Domingo, 2020) and is focusing on developing various solutions to better use the construction and demolition waste. The waste resulting from the construction activity is very diverse and not all the waste can be used for energy production so the focus of this research is on wood waste.

Forests are a huge treasure, as sought after and necessary as other sources of raw materials. Tree trunks and crowns are true accumulators of solar energy and stores of precious organic matter. Wood has been used since the earliest times of human existence, sharing with stone and clay the glory of being born of the first tools, the first homes, and the first means of human defense. Wood is a natural, renewable building material, having inhomogeneous (anisotropic) characteristics, made up of a large number of plant cells organized into specialized tissues, also called anatomical elements, which are very diverse. They differ in their lifetime and tree functions, shape and size, position in the tree, and quantity or number. Many of the cells die during the life of the tree, retaining only the role of ensuring the mechanical strength of the tissues in its composition. How the anatomical elements observable to the naked eye are grouped is called the macroscopic structure. It is important to know it because, depending on its appearance, the various species of wood can be identified, and also the most convenient areas of technological use of wood can be established (Maier, 2021). At this point, it is necessary to point out that all the discussions implying the use of wood are referring to the wood resulting from sustainably managed forests, wood harvested responsibly from the forest where there is continuous replanting, and that the harvest of the wood did not damage the surrounding environment, or to native flora and fauna.

Even if the wood is the most abundant biodegradable and renewable material there is a need to optimize its use. Garcia and Hora (2017) highlight economic, social and environmental issues, such as greenhouse gas emissions and forest threats, which may be effectively combated by increasing the use of wood waste. Wood waste is a mass of wood that cannot be used in a production stage, it can be distinguished according to the location of the waste, the waste from wood harvesting in the forest, and the wood processing waste that is located in the industry. Worldwide, large quantities of wood waste are produced, most of which are not used, and their disposal in landfills creates major environmental problems. The further use of the wood waste besides eliminating the ecological problems has the advantage of dealing with a very low-cost raw material.

The general research question that arises from the described context can be formulated as: *What are the possibilities of implementing the principles of circular economy in the wood construction industry?* To answer this research question, the existing literature was investigated in search of reported practices and the presentation of alternative practices for those less developed areas. The structure of this study is specific to a scientific article. The first part is dedicated to the presentation of the initial considerations around the approached topic. The next part is dedicated to the presentation of a short theoretical context on the circular economy and sustainable development. The next section will present the current context of wood waste research and then present a suggestion for the use of wood waste in the context of the circular economy. The final part of the paper is reserved for conclusions and bibliographic titles used.

1. The research methodology

The research objectives pursued in this paper involve the use of a descriptive analysis of some principal papers published in the field. The literature was interrogated to understand and present the main concepts related the circular economy and sustainable development. For the description of the wood waste context one of the main scientific databases, the Clarivate Web of Science, was interrogated. To better understand the main topics covered in the field of "wood waste" the most important articles that resulted in the interrogation of the Clarivate ISI WoS database was exported and further processed. The analysis of the raw data was performed by exporting the journal articles identified in the scientific database in a plain text file format. The format of the export data file was chosen based on the files supported by the software used. For data processing, the software Bibliometrix was used. This software was developed by Massimo Aria and Corrado Cuccurullo, from the Department of Economics and Statistics, University of Naples Federico II, Italy(Aria and Cuccurullo, 2017).

2. The concepts of circular economy and sustainable development

The sustainable development of modern society implies changes in the way humans relate to the planet. The consumption society where the natural resources are used irresponsible to produce more than we need has negative effects on the environment and solutions to reduce these effects must be developed. In this sense, the concept of circular economy is becoming more and more important.

According to the European Parliament, the circular economy is a model of production and consumption that involves sharing, reusing, repairing, renovating, and recycling existing materials and products as much as possible. The notion of circular economy is based on ideas from scientific and semi-scientific concepts that include industrial symbiosis, cleaner production, and the concept of zero emissions (Korhonen, Honkasalo and Seppala, 2018). According to the Ellen MacArthur Foundation (Macarthur, 2017), the circular economy is based on three principles (Figure no. 1): design out waste and pollution; keep products and materials in use; regenerate natural systems.



Figure no. 1. The circular economy principles
Source: Fernandes, 2020

Although there is no single concept of circular economy, it can broadly be defined as a model in which the value of materials, products, and components remain in the production cycle for as long as possible. Thus, at the end of the life of a product, it can be used repeatedly as a secondary resource, while avoiding and reducing the input of raw materials, materials, energy and minimizing waste generation (Maier et al., 2018). The circular economy has many benefits for both the environment and society. On the one hand, it contributes to reducing waste, increasing resource productivity, and ensuring a more competitive economy, and on the other hand, by significantly reducing waste, it helps to reduce the impact on the environment, production, and consumption, allowing resources to be regenerated. Eco-design and reuse can bring significant savings not only to organizations but also to society, with consumers benefiting from more sustainable and innovative products that will enhance their quality of life and help them save money in the long run.

The term sustainable development designates a way of using resources that allows human needs to be met while protecting the environment so that these needs can be met not only now but also in the future. Thus, in this defined context, it can be stated that the circular economy is an integral part of sustainable development; both policies pursue a common goal, which is to protect the environment.

3. The current context of wood waste research

Lately, there is an increased interest in the research field for developing solutions to protect the environment. In this direction, the subject of using waste generated in the construction industry is becoming more and more important. A search in the primary scientific database Clarivate ISI Web of Science using "wood waste" as search criteria reveals a growing number of papers dealing with this subject in the last years (Figure no. 2). The graph is formed by the number of articles published in journals indexed in the ISI WoS, from the period of 1975 up to 2021.

The graph reveals that in 1975 were published five articles addressed the subject of "wood waste" and since then the number of articles published each year was quite small, a maximum of 10 articles were published in 1979, 13 articles in 1998, and 17 articles in 2004. The interest in this topic increased in 2008 when 26 articles were published. Since then the number of articles continued to grow, reaching 44 articles in 2011, followed by a decrease in the published articles in 2012 and 2013, and starting from 2017 the trend continued to grow, 69 articles in 2018 and reached 109 articles in 2021. Considering the growing interest in subjects related to environmental protection, the number of articles published annually on this topic is expected to continue to grow in the coming years.

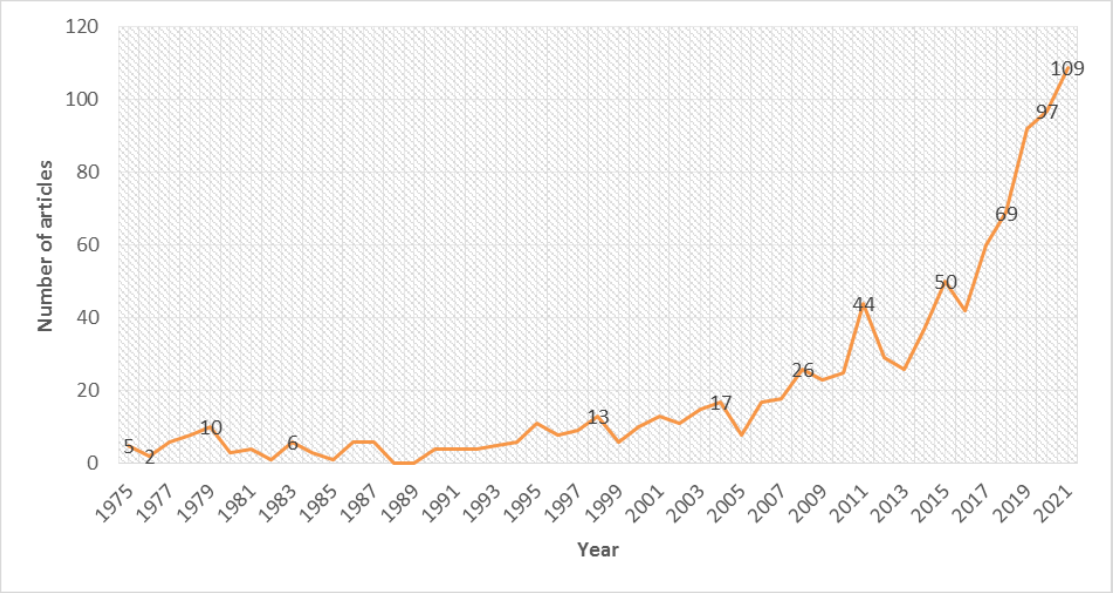


Figure no 2. Evolution of the number of articles published on "wood waste"

With the help of the Bibliometrix software a trend topic plot was generated (Figure no. 3). In the generation of the trend topics were introduced only papers published from 2008 up to 2021. Other graphical parameters refer to the use of the author's keywords field, a minimum word frequency of 5 and the number of words to be considered per year was set to 5. Under these conditions, the main keywords used each year can be seen. The lines represent the years when that word was used, and the time when that word was used most frequently in a year was highlighted by a bubble. The size of the bubbles is the frequency of use for each term, the larger the bubble, the higher the frequency of use.

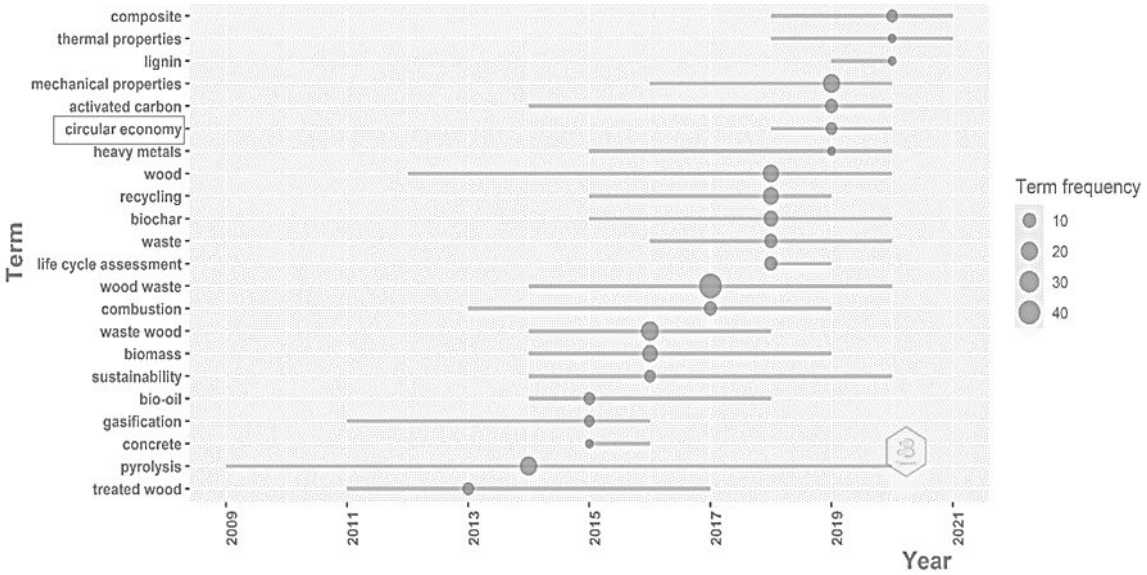


Figure no 3. The trend topic plot for articles dealing with wood waste subject

Analyzing the graph can be observed that in 2013 the most frequent word was "treated wood", then the research evolved and in 2014 "pyrolysis" was explored more, followed by words like "bio-oil", "biomass", "sustainability" or "wood waste". In the last years, words like "recycling", "circular economy", "mechanical proprieties" or "composite" appear. Just by reading these keywords, it can be seen that in the early 2010s the wood waste was analyzed mainly from the combustible point of view, from solutions to generate energy, in the last period, last five years, in the context of rising the challenge of environmental protection, the researchers try to look at the wood waste as solutions to be used in the construction industry as building materials.

The topics covered in the field of wood waste research are focused in several directions and most of them have a general context based on the rapid growth of the population and the need to provide more diverse

living spaces, to ensure more energy to maintain a constant temperature, especially during the cold periods of the year and all of this should be made with proper waste management. From the wood construction point of view, most of the wood waste is disposed of in landfills which creates other problems because the disposal of wood could lead to methane emissions and/or leakage of hazardous constituents that pollute water or soil. Wood waste is a low-cost source of wood biomass (Joshi, Grebner and Khanal, 2015), making it suitable for use in a variety of ways, to reduce environmental impact or to reduce the cost of building elements.

There are multiple possibilities for using waste wood in the composition of several building materials. The most used way is in the composition of wood particle boards. Particleboards can be obtained by using waste wood formwork, as shown in (Hossain et al., 2018) or in (He et al., 2019), and can be transformed into cement-bonded particleboards using MOC (magnesium oxide cement) as a green cement-based binder (Maier and Manea, 2022), so it presents a practical and environmentally friendly option for the management of construction wood waste. Other materials, such as tire fibers or biomass ash, can be added to the mixture of chipboard in addition to wood waste(Amiandamhen et al., 2021).

Another use of wood waste is in the mixture of building materials, such as concrete or mortar. The study of (del Río-Merino et al., 2021) addresses the use of residual aggregates in gypsum mortars. Another way to use wood waste is in the form of ash and then it can be added to the mortar or concrete mixture (Grabowski and Smoliński, 2021). Researchers (Ramos, Matos and Sousa-Coutinho, 2013) state that "wood waste ash appears promising to be used as a partial replacement material for ordinary cement, without loss of strength and leading to increased durability and thus contributing to sustainable construction. In (Ince, Tayançlı and Derogar, 2021) it is demonstrated that "the use of residual wood materials both in the form of wood powder and in the form of wood fibers offers a more environmentally friendly alternative for the recycling of industrial waste compared to existing waste, options management, as well as the saving of natural resources and CO2 emissions necessary for the production of raw materials for the manufacture of cement mortars ". The use of bio-coal as a component in the concrete mix can be another solution and (Sirico et al., 2021) it has been shown that, if used in an optimal percentage, its addition can have a positive effect on concrete and thus help to develop construction material of the circular economy.

The main limitation of this approach is the incompatibility between the cement and the wood. The cement needs a certain humidity to activate and to increase its strength while the wood is acting as absorbance of humidity thus the concrete obtained from this combination can significantly decrease mechanical strength and also a large number of cracks appear on the surface of the elements. A lot of studies show that there is a need for a proper mix of ingredients and finding that ratios still need further investigations. The incompatibility between wood and cement is analyzed and it has been shown that "alkaline hydrolysis is the most effective treatment for the suppression of inhibitory substances and the greatest decrease in the mechanical properties of the resulting composites". There is an obvious need to find an appropriate balance in the composition of wood and cement, which is quite difficult to determine (Quiroga, Marzocchi and Rintoul, 2016). A solution to this problem is proposed by(Caprai et al., 2018) by developing a model for calculating the water absorption of natural fibers (wood wool) and cement from wood-cement composites.

The thermal insulation properties of wood products are another topic addressed in the literature (Cintura et al., 2021) or (Huang and Sun, 2021). In (Chikhi et al., 2013) it is shown that the use in the gypsum mixture of 5% of palm fibers can lead to a composite material with good mechanical and thermal properties. The possibility of using wood waste as a renewable energy resource is another topic addressed in the literature. In (Derčan et al., 2012) and in (Dodić et al., 2012) the importance of a better use of wood biomass both as a renewable energy source and the involvement of the development of the modern way of production and use of wood is studied.

4. Suggestions for the use of wood waste in the context of the circular economy

Nowadays, due to the growing population, the need for shelter is increasing and among the materials that can be used in construction, wood is becoming more and more popular. Because wood resources are depleted and wooden houses can have a long shelf life, there is a multitude of possibilities for using wood waste other than that of a heat generator. Wood waste can be returned to the production process to add value to the composite material, such as becoming wood panels at the end of its life cycle, which aims to bring economic and environmental benefits to the industry instead of being disposed of improperly (Figure no. 4).

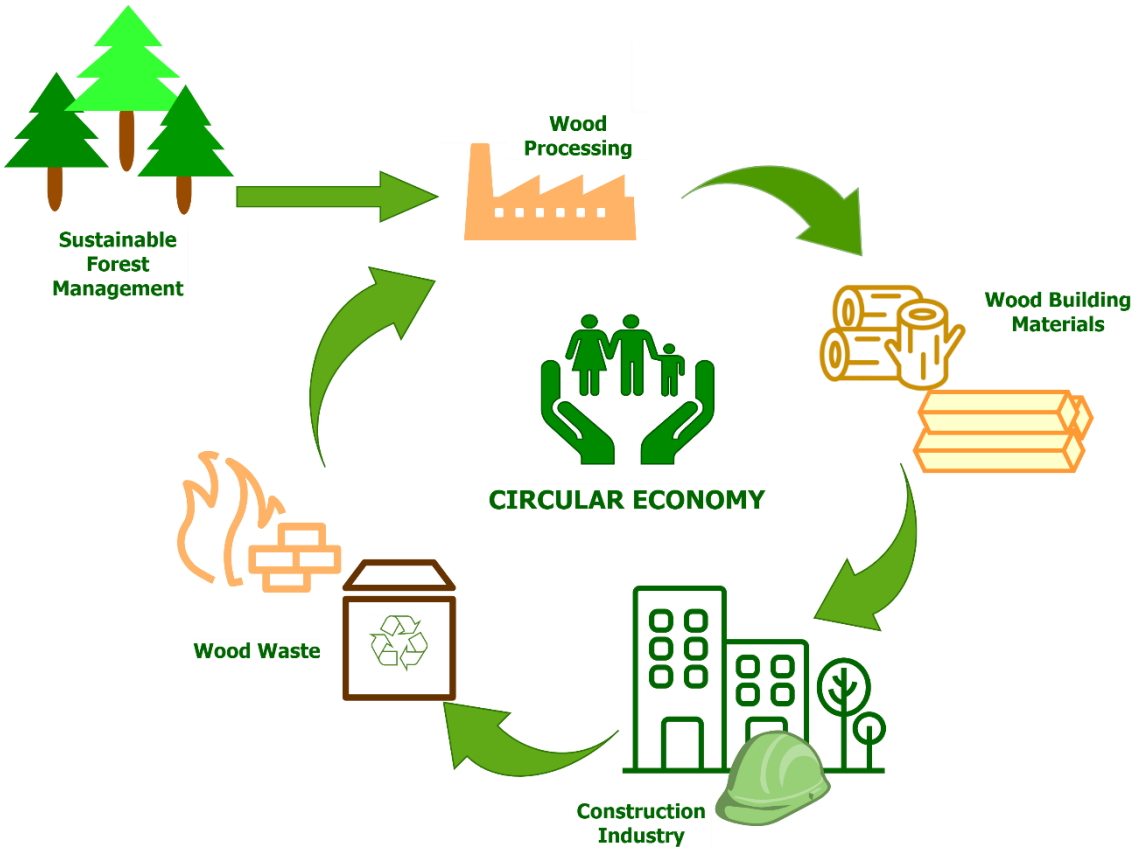


Figure no 4. The circular economy in the field of wooden construction

Large quantities of wood waste are produced throughout the entire cycle of using wood, starting from the harvesting of the wood through sustainable forest management, its cutting in the lumber factories, and later to be used in the production of semi-finished products or the construction of wooden houses. According to the source of waste, the following categories can be observed: from forestry (bark, sawdust, fine wood), from the wood processing industry - from cutting, carpentry, furniture factories, parquet (chips, sawdust, scrap), and scrap (construction wood, railway sleepers, pallets, formwork wood, etc.). The condition of the wood waste can be: natural wood (bark, sawdust), wood residues (resulting from carpentry, construction, planning chips), used wood (beams, windows, pallets), and treated wood railway sleepers.

According to the principles of the linear economy, all this waste is used either as fuel and incinerated or stored in a landfill. According to the new vision, the implementation of the principles of the circular economy involves intervention in the last phase, before incinerating or storing the waste and reusing some of it for repair, reconditioning or recycling, and automatically being reintroduced into the circuit of using wood products or in the production of semi-finished wood products, in the construction of wooden constructions or directly in their use to the final consumer.

From the point of view of construction materials, the best results can be obtained by using wood waste in the production of particleboards. Particleboards can be obtained by using wooden formwork and can be turned into cement-bonded particleboards using MOC (magnesium oxide cement) as a green cement-based binder (Maier and Manea, 2022).

Conclusions

The rapid growth of urbanization and construction increases the demand for cement and aggregates, especially for concrete production. However, the production of cement and concrete increases the emission of carbon dioxide and the source of natural aggregates is depleted. Wood is becoming more and more popular as it is the only sustainable building material and it can decrease the negative impact of the construction activities on the environment. A big challenge in the construction industry is represented by the management of waste generated in various stages of execution. Recycling wood waste can bring multiple benefits to the environment, by decreasing the pressure of cutting trees and reducing the consumption of materials such as water and energy used in manufacturing processes.

Through the implementation of the circular economy principles, wood waste can be used furthermore in the product industry. There are several possible applications of the circular economy in the wood industry, as a result of reuse and recycling of what could be considered waste, by reusing it in the process or even as a raw material for a by-product. The knowledge level in this field is yet in its initial phase as the number of articles dealing with the subject of wood waste has increased only in the last five years. If further research will be carried out, involving the circular economy mainly in the end-of-life phase, as if applied in this industrial field, it will bring great benefits to businesses, including economic gains in addition to the environmental ones. The forest and implicitly the wood is an immense natural treasure and finding ways to better use it, developing solutions for the integral use of the wood from trees, including the remains, surely can lead, not only to the fulfillment of the sustainable development goals but also to better great welfare for all humankind.

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"Cryptocurrencies" Phenomenon and Geopolitical Risks

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Abstract

This exploratory study attempts to capture a new and emerging phenomenology, namely the relationship between cryptocurrencies, as an expression of global digitization, as a new business model - a process catalyzed against the backdrop of the Covid-19 pandemic - and the geopolitical, tension-ridden and sanctioned world in which we live. It is from this context that the aim of the study derives, namely to create a theoretical framework that captures the "crypto phenomenon" in an interdisciplinary approach. Being an incipient phenomenon, but booming during the pandemic period (2020-2022), the results of this study are based on an extensive and critical literature review, in order to synthesize, on the one hand, the phenomenology related to cryptocurrencies at the business/geopolitical interface, and, on the other hand, to propose in the literature a convincing and comprehensive phrase defining the new theoretical framework, namely "cryptogeopolitics". The results attest to this double relationship: 1. geopolitical risks have major effects on the crypto market (due to high speculation and increased volatility of cryptocurrencies) and 2. the inverse relationship, where cryptocurrencies become a geopolitical tool or can trigger a geopolitical crisis. Thus, the "added value" of this study lies both in the theorization of the concept of "cryptogeopolitics", filling a gap in the literature, and in the interdisciplinary approach to the business/geopolitics interface. The applicability is evident, both in the theoretical realm, by conceptualizing a current phenomenology, and in the practical realm, given the emergence of the cyber phase of humanity.

Keywords

Cryptocurrencies, Geopolitical risks, Geopolitics, Cybergeopolitics, Cryptogeopolitics.

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Introduction

Phenomenological context: In several recent studies (Neacșu, 2021; Neacșu and Chiciuc, 2021a; Neacșu and Matei, 2021) we have shown that humanity has entered a new phase of geopolitical evolution, namely the cyber phase. This is not a matter of choice or theoretical 'arrogance', as the globalization of the cyber dimension is as real as can be in all areas of life, with new phenomenologies, such as the one that is the subject of this study, testing our capacity for understanding.

The idea and the succession of the geographical phases of mankind, which have also determined the model of the world geopolitical system, through the types of geopolitical powers that have been strengthened, was developed by the great Romanian geographer and scientist Simion Mehedinți (1940), based on an idea of the German philosopher Herder, namely: history is geography in dynamic (Neacșu 2018). Thus, five phases have succeeded so far: I. continental (continental powers), II. maritime (maritime powers), III. aerial (air powers) - elaborated by Mehedinți (1940) -, to which were later added IV. space (space powers) and V. cyber (cyber powers), mentioned in Neacșu and Chiciuc (2021a). Each of these five dimensions cumulatively brought new attributes of power to the main actors on the world stage and shaped the geopolitical pattern. For example, the existence of the two space and nuclear superpowers during the Cold War (US and USSR) led to a bipolar world, followed by a unipolar one (after the USSR imploded in 1991), with a tendency towards a multipolar or nonpolar one (Haass, 2008), "turbulent" (Rosenau, 1994) or

"visqueux" (Heisbourg, 2007), characterized through complexity and tense dynamic. It is precisely this latter cyber dimension that has given rise to these characteristics of the world we live in. Moreover, it is an "increasingly geopolitical world" (Neacșu, Neguț and Vlăsceanu, 2018, p. 870) or a "geopolitical society" (Munoz, 2013, p. 4). This phenomenological overlap - geopolitical/geo-economic and cybernetic (see also Neacșu and Chiciuc 2021a, 2021b) - constitutes the substrate of our study, from which we follow a single direction: the crypto boom as a geopolitical enabler and vice versa, the effect of geopolitical risks (developed in Neacșu, Neguț and Vlăsceanu, 2018) on cryptocurrencies.

Academical and theoretical context: These current realities have been under study for a long time in the formal framework of the MA Geopolitics and Business within Bucharest University of Economic Studies, where, among other things, the spatial and cyber dimensions of geopolitics have been thoroughly studied and have derived concepts such as: *exoeconomics* (Șapera 2013, 2015), *exobusiness*, *exopolitics*, *exostrategy* (Neacșu and Matei, 2021), *cybergeopolitics*, *cybergeostrategy* (Neacșu and Chiciuc 2021a, 2021b). The emergence of the cryptocurrency phenomenon and the geopolitical risks identified as such (until a few years ago, they did not appear separately in the reports of large insurance companies, see Neacșu, Neguț and Vlăsceanu, 2018) requires a new concept and a new term to capture the current phenomenology, the most appropriate being *cryptogeopolitics*. Accordingly, the present study is structured in three sections: 1. The "crypto" phenomenon - review of the scientific literature, 2. Research methodology, 3. Results and discussion: the effect of geopolitical risks on cryptocurrencies; cryptocurrencies as a geopolitical enabler; the emergence of *cryptogeopolitics*.

1. "Crypto" phenomenon – review of the scientific literature

1.1. Premises

The global economy has demanded fast and flexible payment instruments and the Covid-19 pandemic (2020-2022) has led to a globalization of digitalization. The effect? The development of previously non-existent platforms and technologies, individual access to them and investment "from home" (due to health isolation and traditionally unspent financial resources). In one phrase: crypto boom. A new "El Dorado", speculative, attractive by its easy access (from any laptop, tablet or ordinary smartphone) and high capitalization, without the regulations of a centralized system. A set of financial tools adopted by individuals, but also by big players, which, even in the case of the current war started by Russia on 24 February 2022 against Ukraine, have also become geopolitical tools: Russia accepts payment in cryptocurrencies for oil and natural gas sold, while the crypto space is also a refuge from the unprecedented international sanctions (removal from SWIFT), while Ukraine has received financial aid in cryptocurrencies and NFT (Non Fungible Token).

1.2. Brief history of crypto phenomenon. Definitions. Terminology

Brief history. Attempts to create an alternative virtual financial environment began as early as 1998, with projects such as B-Money and Bit Gold being the first attempts to offer an encrypted financial system. A decade later, a geo-economic risk - the subprime mortgage crisis in the US, resulting in the bankruptcy of the Lehmann giant (2007), which became an international financial crisis and then a global economic crisis (2008) - led to the rise of the first digital cryptocurrency, namely Bitcoin - an entire history of Bitcoin can be traced in Desjardins (2014) - "introduced peer-to-peer (P2P) alternative transactions that eliminated the need for financial intermediaries, allowed for anonymity, and also rewarded crypto miners with currency" (Raskin, 2022). Thus, in 2009, Satoshi Nakamoto (pseudonym) mined the first Bitcoin in a single network, laying the foundations of cryptography. It is the trading mode of this cryptocurrency that really reveals the ingenuity of its creator, namely blockchain technology, i.e. a system that stores information in such a way that it is impossible to alter or break it, plus the speed with which it is transmitted. In 2013, one Bitcoin was worth USD 1 000, in 2017 the number of listed digital currencies reached one thousand, and by 2020 the number will exceed 5 000 (Neufeld, 2020). In 2021, the crypto market would have a market capitalization of over $3 trillion (Conte, 2022).

Definitions. Terminology. A *cryptocurrency* is a "digital currency derived from cryptographic encryption techniques designed to protect the network" (Investopedia cited in Neufeld, 2020) and the *blockchain* is regarding "the underlying technology for cryptocurrencies, a public ledger that records transactions digitally" (Bankrate cited in Neufeld, 2020). Cryptocurrencies were just the beginning, innovations such as NFTs followed: assets identifiable by unique numeric codes (IDs) stored on the blockchain, unlike Bitcoin, for example, which is a fungible asset (one Bitcoin is the same as another Bitcoin). The fungibility of cryptocurrencies allows them to be traded, because by being identical the exact value is known. In the case

of NFTs this is not possible given the uniqueness of each asset on the blockchain (the price represents an exclusive bid of a buyer; used in art, in particular, but, for example, Ukraine has also received donations in the form of NFTs). The latest trend, which is booming in the crypto market, is P2E (Play to Earn) games, which combine NFT technology with conventional coins.

To capture this new and dynamic phenomenology, the literature has seen a whole series of terms and concepts such as *techonomy* - "technology has become a central part of the economy in which we operate and the society in which we live" (Kirkpatrick, 2011) or *crypto economy* (Viens, 2019a) for the virtual economy, while McCormack (2021) speaks of *mass cryptography* and Melinon (2022) of *tokenization of society*. Digital finance has been enriched with specialist terms such as *crypto tokens, crypto currencies, crypto commodities* (Frankenfield, 2021; Sharma, 2021) or *cryptocurrency ecosystem* (Viens, 2019a). Even tourism has entered the "crypto era" - *crypto tourism* - Seth (2021) defining it as: "a form of tourism that caters to cryptocurrency enthusiasts by offering a packaged travel tours that can either be paid for with digital currency or offer lectures or classes about cryptocurrency as part of the tour". A term very close to the subject of our study is crypto politics (Ledbetter, 2021), but given the global reach of power games, economic games and digital finance, we propose the notion of *cryptogeopolitics*.

2. Research methodology

This research, mainly investigative and qualitative, was based, given the newness of the phenomenology addressed, on an extensive and critical review of the literature, in order to understand, on the one hand, the "geopolitical risks" (Caldara and Iacoviello, 2018, also measuring a specific index of geopolitical risk), and on the other hand, the crypto phenomenon. As a result, recent academic studies and research in geopolitics, reports and studies by several institutions, agencies, transnational companies and think-tanks have been used to reveal the emergence of cybernetics in general and cryptocurrencies in particular, which reconfigure the great global power games and bring new power advantages. Also, in order to outline a theoretical framework that analyses the phenomenology at the cryptocurrency/geopolitical risk interface, the study proposes the notion of *cryptogeopolitics*, to be tested in the literature through future research.

3. Results and discussion: the emergence of cryptogeopolitics

3.1. Effects of geopolitical risks on cryptocurrencies

As we have seen above, at the very root of the emergence of the first cryptocurrency (Bitcoin) was a geo-economic event, namely the global economic crisis of 2008. Thus, Nunes (2022) places the emergence of cryptocurrencies in a "turbulent geo-economic context" and, at the same time, paradoxical: as globalization was supposed to lead to an increasingly integrated and interconnected world - see the theory of complex interdependence (Keohane and Nye Jr., 1973, 2000) - as all actors became dependent on the financial market and the global supply chain, and as the liberal economic order was supposed to enhance and outweigh the national interest - a scenario imagined as early as the late 1980s by Fukuyama (1989) through the end of history - this did not happen. In reality, globalization has not only failed to enhance the global interest, but it has catalyzed tensions between certain states and international institutions, it has led to the centralization of power within global institutions such as the International Monetary Fund (IMF), the World Bank - real "private empires" (Neguț and Neacșu, 2022) -, the current conflict between Russia and Ukraine demonstrating that the SWIFT interbank system can also become a weapon or a geopolitical instrument ("the weaponization of international payment" in Nunes, 2022) used by one state against another (we disregard context and premises).

Then, every major geopolitical event (geopolitical risk) had immediate implications for the crypto market. For example, the Greek crisis (2009-2013), a government debt crisis that generated the so-called PIGS/PIIGS states phenomenon (Portugal, Italy, Greece, Spain, whether or not including Ireland) and even Grexit - the likelihood that Greece would have exited the Eurozone (see also Nelson, Belkin and Jackson, 2017) -, caused Bitcoin to rise by 87% (Raskin, 2022). Likewise, the Covid-19 pandemic led to a 50% collapse in March 2020, from $10,000 to $5,000 (Roberts, 2020), subsequently bursting to record highs and reaching over $66,000 for a Bitcoin in October 2021 (Bovaird, 2021). Escalating geopolitical tensions, the massing of Russian troops on the Ukrainian border and the perspective of war in Europe in early 2022 resulted in another collapse of around 50% in the value of Bitcoin to $35,000 (Ostroff, 2022), but the failure of a blitzkrieg desired by Vladimir Putin and the drawn-out military conflict led to further increases to around $45,000 (Makheel and Kharpal, 2022) as cryptocurrencies became a geopolitical tool. Moreover, a number of studies show evidence of a direct link between the the predictive power of global geopolitical

risks (GPR) index and price volatility of Bitcoin (Aysan et al., 2019) or between geopolitical risks and the cryptocurrency market (Cheng, Yen and Chiu, 2022).

Geopolitical risks not only influence the evolution of cryptocurrency prices, but also lead to internal reconfigurations of financial systems, with the ouster of Iran (2021) and Russia (2022) from the global financial system (SWIFT) forcing both the Islamic State and Russia to adopt Bitcoin as a legal means of payment (Nunes, 2022), and the equivalent of $63 million in digital currency donations in March 2022 pushing the Ukrainian government to legislate the cryptocurrency field (Patel, 2022).

3.2. Cryptocurrencies as a geopolitical weapon

Several studies (Allyn, 2022; Dempsey, 2022) have put forward the idea of cryptocurrencies, and crypto-assets in general, as a geopolitical weapon or tool, especially in the context of the ongoing conflict between Russia and Ukraine. "Russia's invasion in Ukraine is the first crypto war" stipulated Allyn (2022): on the one hand, Ukraine was receiving financial assistance in cryptocurrencies, both to fight against Russian invasion and occupation and for humanitarian purposes, and on the other hand Russia could avoid international sanctions using the same tool. Also, Numbrs (2021) announced: 'Bitcoin has become a geopolitical phenomenon', firstly by turning it into a financial weapon against centralized systems, in order to gain independence from American global financial dominance, and secondly by geopolitical reset, with states/players getting on an equal monetary footing, which could lead to some kind of balance by boosting financial diplomacy.

Other studies have captured the effects of cryptocurrencies in the field of domestic geopolitics, with Sim (2020) investigating the impact of blockchain through the creation of the secure digital ballot box (a smart solution for electronic voting specific to any democracy), while Nunes (2022) highlighted the risks of using centralized financial systems as "an attractive model to even control citizens domestically, such as the case in Canada with the Trucker's Convoy".

Moreover, the resilience of centralized financial systems to the emergence of the crypto phenomenon has also been highlighted in the literature McCormack (2021) citing the IMF and Fleming and Pickford (2021) the G7 as reluctant to the new phenomenon: "a growing number of crypto investors can trigger a crisis that could potentially ruin the global economy" (McCormack, 2021).

“New kinds of digital money might become geostrategic vectors” CryptoMinded (n.d.) also states, referring to a kind of "Thucydides trap" (Allison, 2022) in a "digital Atlantis - a new continent floating in cyberspace where old powers fight and new powers emerge". It is also known that some countries have banned cryptocurrencies, e.g. China in 2021: "China is reportedly planning to prevent payment systems with outside technology, such as cryptocurrency development, from playing a major role inside China because... they have recognized... that this could be a direct threat to sovereignty." (former Secretary of State Hillary Clinton, cited in Numbrs, 2021).

3.3. The emergence of *cryptogeopolitics*

In addition to the above, we cite another example that illustrates the relationship between crypto and geopolitics, the case of Kazakhstan. In January 2022, large-scale and violent protests took place, which could have turned into a kind of "colorful revolution" (overthrowing the government, getting out from the influence of the Kremlin - which, incidentally, also intervened militarily to put down the protests and in the light of the upcoming events in Ukraine - and bringing about a trend towards Westernisation). Initially, the reason given was the rising price of natural gas, but there was another factor: many of the companies that were mining cryptocurrencies migrated to Kazakhstan, as the price of electricity was low (since mining is an energy-intensive process), but this led to an increased demand of energy. Kazakhstan had to import to cover this demand, and the price of electricity went up, and the victims were Kazakhs who were forced to pay over the odds. This is how the crypto phenomenon has triggered the manifestation of geopolitical risk, another example of the emergence of cryptogeopolitics (see Figure no. 1).

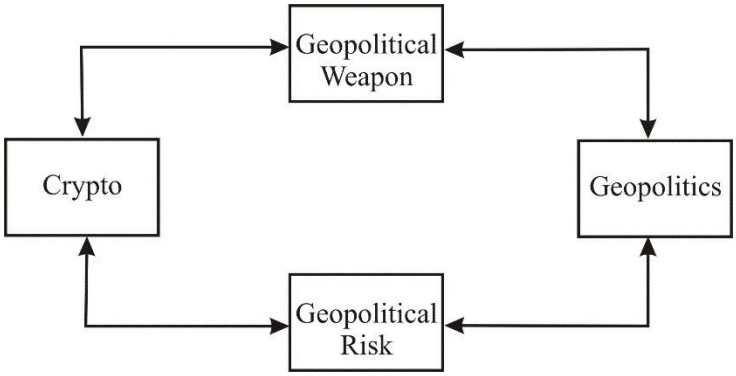


Figure no. 1. A simple schema of Cryptogeopolitics

Features of the cryptocurrencies that can increase their geopolitical potential. These (see also Viens, 2019a) include: (a) border lessness; (b) decentralized financial activities cannot be blocked by governments or relevant institutions (censorship-free), which can be a safety gate in case of international sanctions (see the cases of Iran or Russia), as the owners of these digital wallets have full control over the funds; (c) they are quite secure against cybercrime; (d) the transaction costs of cryptocurrencies are low, with few or almost no intermediaries; e) they are global in nature, with no spatial restrictions; f) they can provide a financial alternative to cyber or hybrid wars, which have this cyber component, given the vulnerability of traditional banking systems to cyber attacks on one side, and blockchain technology on the other, in an interconnected but globally decentralized information system used by cryptocurrencies; g) they can be traded offline/without internet access, via "meshnet"/"mesh networks" (Nunes, 2022), i.e. local networks connected directly to each other.

Crypto powers. Among the stakeholders owning and using cryptocurrencies are both state actors - governments (Venezuela), central banks (China, Sweden, Saudi Arabia) - and non-state actors - private investment funds (Harvard Endowment Fund, Crypto Hedge Funds), cryptocurrency exchanges (Coinbase, Bitstamp), banks and private financial institutions (J. P. Morgan, Fidelity Investments, Swissquote), transnational companies (IBM, Microsoft, RWE etc.), other organizations (Crypto Valley Association, Global Digital Finance etc.), see also Neufeld (2020). In fact, in 2020, the main countries mining Bitcoin were: 1. China 59.33%, 2. Russia 6.72%, 3. USA 6.68%, 4. Kazakhstan 4.63% of the world total (from Statista, 2022). After China banned both mining and trading of cryptocurrencies in the summer of 2021, a few years before being an "el dorado" of their own (in September 2019, mining 75.5% of the total), thanks to lack of regulation and low-cost electricity, their place was taken by the US (1st place), which reached over 35%, followed by Kazakhstan 18% (2nd place) and Russia 11% (3rd place) in August 2021, followed by Canada, Malaysia, Germany, Iran and others (Lu, 2021). Thus, in just two years (from September 2019 to August 2021), the US grew from 4% to over 35%, Russia from almost 6% to over 11% and Kazakhstan from 1% to 18% (for more details on annual medium values see Table no. 1).

Table no. 1. Distribution of medium Bitcoin mining hashrate (%), by country (09.2019-08.2021)

No.	Country	2019	2020	2021
1.	China	74	59	35
2.	Russia	6	7	8
3.	USA	5	7	21
4.	Malaysia	4	5	4
5.	Iran	2	3	4
6.	Kazakhstan	2	5	10
7.	Canada	1	1	5
8.	Germany	0,5	1	3
9.	Ireland	-	1	3
10.	*Others*	*5,5*	*11*	*7*
11.	**Total**	**100**	**100**	**100**

Source: adaptation after Statista, 2022.

Also, the main cryptocurrency regulations, at the national level, were mapped by Viens (2019b) and can be split into three categories: 1. banned (China, India, South Korea), 2. grey area - partial or pending regulations (UK, Lithuania, Russia in Europe, USA in America, Singapore, Japan in Asia, Nigeria in Africa), 3. regulated (Switzerland, Luxembourg, Malta, Estonia in Europe, Canada, Mexico in America, Australia).

The main dimensions of cryptogeopolitics. The current cyber-geopolitical world involves new configurations, which individualize, at least at the level of conceptual framework, cryptogeopolitics, as follows: A. *new players*: "those nations that will be able to absorb and accommodate bitcoin, through sensible legal frameworks, will have an advantage over those unable to compromise by virtue of their centralised systems" (Numbrs, 2021); B. *new game*: Bitcoin *versus* USD, as a store of value; for example, El Salvador used cryptocurrencies as a tool to achieve independence from US financial dominance (US dollar as the world's reserve currency, US Federal Reserve, gold standard, SWIFT etc.); C. *new rivals*: using Bitcoin and other cryptocurrencies as a *financial weapon* (Thiel cited in Numbrs, 2021) against USD and US financial hegemony; D. *new system*: a new international world order which is based on a multipolar or non-polar reality – "a world dominated not by one or two or even several states but rather by dozens of actors possessing and exercising various kinds of power" (Haass, 2008); Bitcoin strengthens decentralised liberal democracies to the detriment of authoritarian regimes; E. *new equilibrium*: from geopolitics and geoeconomics to multilateral financial diplomacy (Numbrs, 2021).

Conclusions

The present research enriches the scientific literature with a new theoretical concept and term - cryptogeopolitics - to be tested by further studies, which have the potential to deliver a comprehensive and relevant theoretical framework for the analysis of a current and dynamic phenomenology at the interface between crypto and geopolitics. In the cyber phase of humankind that we are now experiencing, a geopolitical event may be local or regional, but the outcome is global and with immediate impact.

Cryptogeopolitics brings significant inputs on one side in analyzing and understanding the relationship between geopolitical risks and the crypto phenomenon, and on the other side it investigates how the crypto boom can provide additional geopolitical tools, e.g. the use of cryptocurrencies as a weapon. Moreover, we are now living in an era of a hybrid conflict (conventional conflict is combined with economic, cyber, informational, imagological conflict, all of which is well illustrated by the current war between Russia and Ukraine and its global implications).

In both the theoretical and practical aspects, the results presented in this study may constitute a mini-guide towards an understanding of current international phenomenology, which is useful for business as well as for any public official, in a framework with a strong international component and beyond.

The results presented in this study have some limitations, given that the phenomenology approached (the complex relation between cryptocurrencies and geopolitics) is current and in manifestation and this means: a gap in the academic literature, the volatility of the crypto and its unknown manifestation possibilities as both, finance and geopolitical tools, with all implications, uncompleted understood by now etc. Possible future research directions should aim at developing and enhancing the concept of cybergeopolitics, elaborating a specific definition and outlining the main components and areas of application and manifestation.

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Managing Businesses in a Digital World – Covid-19 Impact: Innovation Tools and Techniques

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Abstract
Since the pandemic started, in March 2020, people' personal and professional lives changed unexpectedly. Everything happened gradually, the pandemic had several stages and continues also today. The pandemic has gone through several stages, which have forced companies across the world to adapt more to acerbic conditions of working and implement different solutions with the purpose to guarantee business's profitability, but also maintain a safe environment for all the employees. The digital transformation at the company level will accelerate economic and social progress - if we act immediately.
Digitally advanced states are more innovative, have more competitive and efficient savings, but also a lower level of pollution. The paper objective is to highlight the need of new business models and proper labor regulations to comply with the hybrid work. We select the significant studies that are pleading for innovative, flexible, hybrid working system. The companies as well as the administration should evaluate in term of efficiency and quality of life the new work environment and to create the legal framework.
The methodology used is a critical analysis and the findings highlights the importance of incorporating the gain in digitalization generated by the COVID-19 crisis, as a vital step in reshaping the business models and environment to the upcoming digital era.

Keywords

COVID-19; digital era; crisis; managing businesses; rethinking strategy.

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Introduction

The COVID-19 pandemic forced all most the companies to consider the remote work as an option of handling the business. People could perform their tasks from anywhere, thanks to internet connection and many online tools which facilitate communication and team working. One of the many aspects of working from home is the flexibility and freedom of finding a balance between working and personal life, now it seems its smart working and makes it easier to build culture, improve communication between teams, and focus on building our career without physically visiting the office (Hyvönen, 2021). Online tools make it possible building a real connection with the team members, as a main benefit it can be the one related to a more balanced life. Setting specific goals and milestones become massively important especially now, while people are working from home full or part time (Grigorescu and Mocanu, 2020).

A simple scheme of setting goals is proposed by LinkedIn Learning (Clark, 2017). As a quickly general approach, defining goals and milestones has four pillars: the first one is to determine stakeholders, preparing a brief analysis with the right and adequately potential stakeholders and picking the best one; the second pillar would be to set team members' expectations, very important aspect in managing a team and also being clear from the beginning; the third pillar is to establish how to track goals, what kind of tools/methods to be used to rightly follow the initial goals and the last pillar is to periodically check the outcomes, the results at that moment, to be able to decide the way you modify or continue the project from the same stage.

Because we are working remotely, most of the communication will not be in person, as it was while working from the office, which means we need to use some alternative platforms: email, phone calls, tools such as messenger, teams, video conferencing tools, online meetings etc. How do we keep everyone on track /focused, on the same page and connected, especially for a large project? There are several project managements tools, mostly used: Agile, Wrike, Kanban. No matter how the project is being developed, physically or through online platforms, it is important to follow standard objectives: Specific, Measurable, Approved, Resources (determined) and Time (also determined) SMART (Dăneț, 2002; Grigorescu and Bob, 2007).

To build culture, trust, and transparency within your remote team, we can consider some general advice: don't micromanage coworkers; provide access and updates on projects. It is fundamental to be open with your team and always ask for help or provide support when it is needed.

With the acceleration of the digital environment, all the processes in a company are starting to be affected, in a positive way, in terms of process automation. In the medium-long term there are tangible forecasts that demonstrate savings at the financial and economic levels, from the moment of replacing the activities performed by humans, with the activities performed by robots, in a much shorter period.

1. Literature review

Studying CIMA and Finance management in a Digital World, we have noticed that the technology path is affecting business in general, and finance particularly is changing in the last years, in an alert way, calibrated with the pace of the markets. How finance departments are using technologies in different digital ways in the present but in the long-term vision, too, is affected by the digital world we everybody are in, and we need to adjust, keep up with the rapid changes, rethink strategies, whether personal or business.

Technology and automation will play an important role in all the activities of the businesses with largest impact on the "assembly" and "analysis" activities, leadership skills are difficult to be automatized. The technology evolution allows automatizing the most complex activities, and the automatization of the processes is becoming more and more significant for a business and its finance department.

Low skilled tasks and manual/repetitive as entry data, processes which add minimal value to the final users of the business information and duplication are the most probably to be automatized by new evolution of the processes software's. In this way the time will be free up and resources for a superior level on value adding tasks (CIMA, 2019).

Many business leaders didn't clarify yet what transformation on the digital side means. Which are the steps specific to the actual environment? Which sides of the present business strategy need to change? Is it just a way catchy to propose moving to the cloud? (The Enterprisers Project, 2016).

Historically speaking "Leadership" is related to "industrial leadership" – management structures and styles which served very well at industrial companies' level for a century. But to manage and lead digital enterprises in the post-industrial century are very different and defined by five elements. Approaching and implementing these can aid leaders from digital environment to find and deploy the capacities they will need to help the enterprise transforming from a traditional to a digital company.
For managing the new transformation, they need:

- To innovate radically meanwhile working on operations optimization;
- Complete in sprints while offering value for long-term;
- External partners' integration meanwhile working as a single entity.

Immediate digital value is provided when value is having a large role in businesses, but also more value is handed over time. While focusing on value adding, not on technology especially, is providing enabled offerings on technology side (Nielsen and Meehan, 2015). New patterns of consumers and producers have changed from the first week of the pandemic crisis. Unfortunately, many businesses have closed their activities or accommodated changes for social distancing. The consumers are able to pay more for security elements and an increase in the perception of the risks is observed, this giving to the producers' bigger stimulants to commercialize and deploy new technologies that are addressed to the safety of the customers' demands (Islam, Jebarajakirthy, and Shankar, 2021).

Companies have the possibility to reevaluate their opportunities, in the actual process. Forced experimentation and learning from it but also activating crisis management and technologies in the mitigation of risks could help companies to become more flexible and smarter. Actually, companies are somehow forced to

be smarter now. Before crisis arrived, investments in resources and time to adopt home office work were considered too expensive but because of COVID-19 most of the enterprises remained with no other options. A combination of short- and long-term responses in the innovation side is able to give a hope for companies, in the middle of massive disruptions (Hong and Galasso, 2020).

Technology has helped us stay connected with others during the pandemic and this period has transformed the way we build and maintain relationships. Investments in digital infrastructure and the classification of companies according to the degree of "digital competitiveness" are closely linked to the results of an economic and societal nature in general. Also, the adoption of cloud solutions, in particular, is closely linked to a higher degree of innovation and productivity. In other words, digital companies are an engine of progress (O'Neil et al., 2020; Alzadjali and Elbanna, 2020). Not only investment in technology is important, however. In order to thrive and be successful, companies should also prioritize the development of digital skills among their employees, shaping digital leadership and an organizational culture focused on the hybrid work model (Grigorescu et al., 2021).

To deal with the dynamics of the business environment, companies need dynamic capability to adapt. Dynamic capabilities are described as the subsection of capabilities or competence, which accept the firm to generate new processes and products, to react to dynamic market situations. Digital capability as a part of dynamic capability is an imperative requirement to achieve business success. In digital economy, business success is highly determined on how good a firm could explore and exploit digital technologies. Technological based capability is viewed as organizational capacity to create and build new products and related processes. It becomes an important and essential building block for reconfiguring business models, operational processes, and customer experience. No matter how perfectly technology has been utilized within an organization, it still needs to be handled effectively and efficiently. Digital capability is defined as organizational competence, expertise, and talent to operate digital technology for developing new products or services. Although it is related to digital technology, digital capability is not about technological capability only. It also related to capability of human resources to develop collaboration and innovation by utilizing digital technology. Previous studies found that digital capability have positive effect indirectly on financial and non-financial performance; digital innovation mediates the effect of digital capability on firm performance. Digital related capability impact indirectly on firm performance, performance management system plays as mediator on the relationship. An open-ended online survey with 49 recognized digitalization experts found that changes in work-life and health, the use of information and communication technology (ICT), performance and talent management, and organizational hierarchies have impacted on work design and leadership development (Saputra et al., 2022; Nambisan, Lyytinen and Yoo, 2020).

2. Research methodology

The present paper is based on a critical analysis of the findings and perception about the reshaping the business models after the impact of the COVID 19 pandemic. The lockdown determined by the health crisis was overlapped, in many cases, by the digital facilities and the remote work. The long-time of restrictions creates the conditions to implement the new ITC technologies (hardware) and applications, as well as procedures for on-line work. The present paper is based by the existing studies and is developing a critical analysis about the return to the previous/classic business models and the opportunity of an innovative model, at least hybrid, a a step forward to a digital business environment.

3. Results and findings

Working from home acceleration – the impact of the pandemic crisis

The impact with which COVID-19 came, made many employees to depend on a single question: Am I bounded on my workplace or am I allowed to work from home? Lockdowns, quarantines and self-isolation forced millions of employees to have home office, by accelerating a workplace experiment who gained “ground” before COVID-19 hitting.

The benefits and limitations of home office are clearer now Lot of employees are returning to the workplace, the economies are coming back to the ‘classic’ model. One of the main questions is if the businesses will totally return to the models used before the pandemic or they will adopt various models. Part of the surveys’ leads indicated that models of hybrid remote work for many of the employees will be considered based on the advantages. An example is the survey of hipo.ro in December 2021 - January 2022, on a total number of 329 Romanian companies, the results are presented in figure 1.

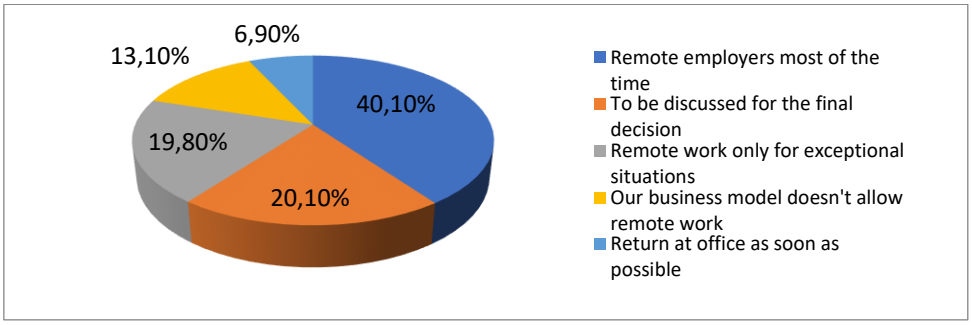


Figure no. 1. The opinion of Romanian companies about the hybrid work
Source: reproduction after p. 8 Report Hipo.ro – Labor market 2022

The cultural and technological barriers were broken by the virus, same who prevented in the past the remote work, moving a structural changing from workplace perspective, at least for some employees (Lund et al., 2020).

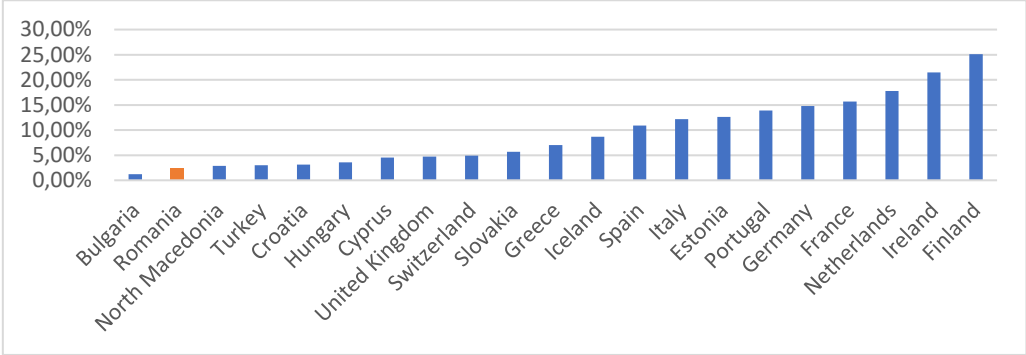


Figure no. 2. Employees share temporarily working from home in Europe 2020
Source: Authors representation based on Statista.com

It can be observed (figure 2) that countries from North Europe are open to working from home fact, meanwhile Romania together with Bulgaria, Turkey, Croatia, have a small rate. Even if in Bucharest the international companies had, most of them, a couple of days per month of home office, in present, almost all these enterprises started to adopt this path and after the pandemic will end, most probably this benefit will remain. If the companies don't align to this new path, part of the employees will change their jobs.

Working at home – advantages and disadvantages and approaching a hybrid way of working

Home office is opening new series of possibilities for the path in which enterprises can work and can be structured. (COVID-19) pandemic showed that home office is offered by employers giving flexibility not only for the employees but also to continue their business activities, with health and wellbeing of the people being prioritized, as part of businesses' responsibility and public health (LRA, 2020; LRA, 2021; nibusinessinfo.co.uk.).

After increasing number of employees working from home or using home as base for work for at least a part of the week, is it very clear that more benefits are raising for businesses, such as: improving staff health, better balance between life and work, less absences from daily work, staff motivation increase, raising a better productivity, attracting new talents, improved employee retention, agility, financial benefits and wellbeing, employee's comfort.

Even if some disadvantages exist for employees using home office, the majority of these are related to the persons who fully adopted working from home, in comparison with a part who adopted only a couple of days from their working week: home office is not for everyone, some of the employees are feeling the isolation, it is difficult to monitor the performance, at home there are distractions, burnout potential - sometimes, the cost of home working, employees' development problems, slow speed of the broadbands, negative aspect on psychical side, security risk for information, staff morale is decreased and not all the jobs suit, of course, to home office.

Romanian labor market 2022 hipo.ro report is showing the effects that the pandemic and the remote work had on Romanian companies: they consider that these two aspects hadn't a negative impact on employees' productivity, also on collaboration for new projects and innovation of the offered products/services; remote

work had negative effects for the teams and for communication within the teams; induction of the new employees, overtime hours, companies' culture – these were affected in the pandemic period.

Having the benefit to work from home doesn't mean that employees must work only at home. Splitting time between workplace and home is often the most productive way and everyone wants that the employee who is working from home to attend calls and meetings and to keep them informed and involved fully.

Studies about teleworking showed that there are advantages like: no longer spend time in traffic, more flexible working hours, spend more time with their family, create a better balance between work and family, but also disadvantages like: lack of privacy when working, less efficiency, difficulties in managing office at home, burnout and (Karácsony, 2021; Vrchota, Maříková and Řehoř, 2020; Predotova and Vargas Llave, 2021; Ipsen et al., 2021).

Crisis management

COVID-19 pandemic forced the companies to activate their crisis management departments, increased these departments and transmitted frequent communications from this area. At the same time, companies' management crisis has developed as the pandemic passed to different stages.

In a synthetic sense, problem solving management consists of "the process of identification the problems that an organization faces and the management of organizational activities devoted to these issues" (Coman, 2001). Problem solving management must be perceived and realized in close interdependence with crisis management. In fact, due to its quintessentially proactive nature, what it follows that problems are anticipated and addressed before they generate crises, problem solving management is the first and most powerful weapon fight against crisis situations (Galloway and Kwansah-Aidoo, 2005).

One of the important activities specific to this mode of management is in problem control, a research function that aims to identify and keep under observation of developments and events that could worsen, evolving towards crisis situations (Newsom and Carrell, 2011).

Assessing the crisis in our organizations and think about building a crisis plan represents a strategically important fact. For any entrepreneur and manager, the crisis is an extremely stressful experience because first he must manage all the panic spread all around him. However, a first assessment of the crisis in our organization is essential. In the role of entrepreneurs or managers, it would not be bad to establish two priorities, generic directions for approaching the crisis: one related to the emotional, psychological part and another related to the rational, economic-financial part.

Kim, Cha and Kim (2008) in the article "Developing a Crisis Management Index: Applications in South Korea" , summarized the approaches to defining crisis management. They grouped these approaches into four models: a) management models of the crisis in stages: they divide the evolution of a crisis into stages and, according to their specific notes, propose appropriate action strategies; b) synthetic crisis management models, which take taking into account the social and organizational variables such as the technological factor, the socio-political factor and the psychological factor, delimiting several major types of crises; preparing for Crisis requires the organization to develop crisis management models for each crisis type; c) systemic crisis management models, which take into account the variables organizational and crisis management programs, combining the following elements: technology (presence or absence of computerized systems for managing their information during the crisis); structures at organizational level (regulations, norms and procedures for crisis management); the human factor (behavior of members of the organization during the crisis); corporate culture (representations, values, beliefs created around the organization); management psychology (the ability of leaders to react lucidly to crisis management); d) Crisis management communication models, focused on communication strategies used to get out of the crisis.

Managing Businesses in a digital era

The COVID-19 pandemic has widened the gap between bottom and top companies, on the economic profit side, by accelerating digital adoption, amplifying winners dynamic and separating digital leads from the most important ones. More than ever, now the competitive differentiation is resulted from superior digital capabilities and technology elements by a faster and agile delivery of the products/services. The ascendancy in digital area is noticed not only in the top technology companies but also in the success of non-digital companies like Bosch, BHP, John Deere, BHP, Goldman Sachs and many others. The mentioned companies have massively invested in new models of businesses and new digital strategies. They entered in the pandemic environment with stronger technology pillars than their competitors and peers but also continued to decrease their rhythm meanwhile the pandemic went along (Murgia et al., 2020).

It will become more difficult to catch up with the market leaders, especially to overcome their results, because the best economic performers have already taken lot of actions in comparison with their industries

colleagues, to sustainably achieve their technology purposes. Top performers have also adopted a bolder view of innovation and now they are obtaining a much higher part from selling their products and services which didn't exist one year ago. The responses from such organizations show that they have more chances to invest in talents, to increase their spending for research and development and to create new business partnerships with their rivals, too (Williams, Galvin and LaBerge, 2021).

Companies looking to improve a lot their performance should revise first the traditional strategies movements that combined or individually, have been proven to raise the curve power of their economic profits. Adapting these classic strategies in counterpart with their intuitive ways, companies can create a strategy which will win in a digital disruption era (Gauger, Bachtal and Pfnür, 2022).

All these new differentiation sources are not lost on leads, from which the majority can observe that the new digital way is a competitive factor of differentiation, strategically speaking, not only for the innovation in the business-model but also for the excellence of the cost, productivity, efficiency and many other aims (Blackburn et al., 2021). On the digital side, the investments started to be made before the pandemic arrival by the companies, at this moment it is noticed an accelerated investments trend.

In addition, the top performance players are preparing more aggressive strategic plans to get differentiated together with the technology; some of them planning to 100% reinvent their value added. As we presented before, the digitalization and automatization happen step by step in all the involved processes of a company. Most of the companies will be forced by the environment to rethink their strategy and to approach the actual era, of investing in new tools, new elements, and new machineries for a sustainable and a going concern business.

Below, is just an example of an actual trend plus forecast on how warehouses will be automatized worldwide.

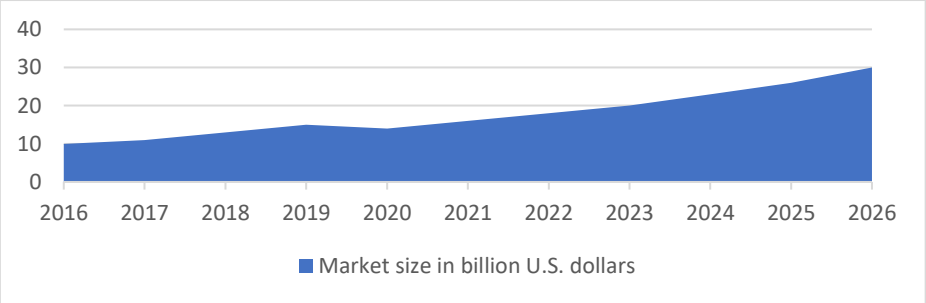


Figure no. 3. Warehouse automation market size worldwide 2016 – 2026
Source: adaptation after Placek, 2022

Conclusion

Process automation when considered in the context of a large-scale conglomerate organization can generate time, cost and resource savings as well as generating significant efficiencies. Compatibility issues between the multiple systems across many operating locations led the company to investigate the potential benefits process automation could deliver. Artificial intelligence and machine learning are anticipated to lead to significant impacts on the future of businesses. A digital mindset is also a mandatory element for implementing a digital way in the businesses.

The European Council set out 4 priority areas in its 2019-2024 strategic agenda to guide the work of the EU institutions over the next 5 years. These areas seek to respond to the challenges and opportunities that the current global situation has thrown up. By focusing on them, the EU can strengthen its role in today's challenging environment. The strategic agenda also identifies the need of embracing digital transformation, and developing a robust, resilient economy. A Europe fit for the digital age - embracing digital transformation by investing in businesses, research and innovation, reforming data protection, empowering people with the skills necessary for a new generation of technologies and designing rules to match (EU priorities).

To conclude, the pandemic had a huge impact in a personal way but on the other hand also in our professional lives. Most of the people had to adjust and find the most appropriate solutions to overcome the challenges faced due to the Covid-19 crisis. People's creativity and resilience has helped those developing opportunities from a difficult time, and this is the reason why the pandemic has also brought a positive impact on businesses' performance. Employees have improved both team working and communication skills, while learning how to combine work related tasks with personal activities.

The existence of many new technologies and online platforms have facilitated businesses' capability to perform from remote locations, while keeping co-workers safe, connected, and focused as much as within a normal working environment. The Covid-19 pandemic demonstrates that the business models has to be more flexible and capable to face various disruptions; digital era being on of it that has to incorporated.

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Information: Another Perspective on Cultural Heritage Management

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Abstract

The area of Prahova County, with all its values-cultural, social, and economic, allows approaching, in a widely accessible way, the connection between the investors' community and the institutions empowered in the protection of cultural heritage. Cultural heritage is a concept in continuous expansion and development, which sometimes makes it difficult to identify components that need to be protected. How can I protect if I don't know what? Following the connection of conditioning how-how-when-why, this paper aimed to identify the role of information in this logical approach that overlaps with the directions of the approach to cultural heritage management. The research methodology focused on the analysis of preventive archaeological excavations carried out under commercial contracts between the Prahova Museum of History and Archeology and beneficiaries. It highlighted the main opportunities and challenges that rescue interventions may face, emphasizing the role of information beyond rules and procedures. Added value is given by the peculiarities of the investigated archeological sites, i.e the burial mounds from the Bronze Age attributed to the Yamnaya populations.

Keywords

information, Archaeological heritage, burial mound, management

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Introduction

Archaeologically protected areas include fragile elements in their perimeter, vulnerable to the use of space, so the range of human activities with a negative impact on them is very wide - agriculture, industry (exploitation), construction infrastructure, transport, utilities, services. In order to establish the priorities for the conservation of the archaeological heritage, it is necessary to know the answer to four questions: What needs to be protected? Where should it be protected? How should it be protected? By whom should it be protected? The lack of correct answers to these questions leads to ignoring the value of cultural heritage, to its destruction and loss, therefore, the most important step in saving and preserving it is good information.

Economic arguments can lead to the destruction of cultural heritage, but its economic evaluation can influence the decisions that cause this destruction (Ruijgrok, 2006). However, this assessment cannot be correct in the absence of calibration of instruments and units of measurement for the two components (Iorgulescu, Alexandru and Crețan, 2011), therefore, seen as an important source of income (Zbuchea, 2008), the cultural heritage benefits from double imposition of protection principles.

In Romania, the chapter on saving and protecting cultural elements has been reopened and supplemented countless times in recent years, either due to the strong impact of industrial and infrastructure

development or as a result of Romania's accession to various European and international conventions that aim at heritage protection.

1. Review of the scientific literature

The protection and conservation of cultural heritage components have gained new significance and have become an important research topic in the context of society's growing openness to the environment and its interest in cultural identity. The specialized literature focuses on the following main analytical dimensions - environment, economy, social impact, and cultural capitalization. In this context, the concept of cultural heritage can be identified either with "... the element that defines sensitively the antiquity and originality of the traditions of each human community" (Musteață, 2016, p.7) or with "... a good or set of patrimonial objects, a service, a program, activities in the service of the company or of some private groups, volumes of documents or studies. To attract customers, the product offered must comply with the needs and expectations of the public and/or the local community" (Zbuchea, 2008, p.18). It has "... an open character, it is constantly evolving, adding discoveries in the archaeological, historical, ethnographic, artistic, scientific, as well as contemporary artistic, scientific and technical creations" (Opriș, 2000, p. 22), which allows factors such as environmental damage, globalization, technological change and financial constraints to generate a complex concept. This is why "…the preservation of assets from the past has an objectively set limit - not everything can be preserved" (Iacob et al., 2012, p.58), which implies integrated management, the result of collaboration between economists and specialists in the field. "...the integrative vision of a site, meant to enhance and preserve, and sometimes even to restore the environment, the context, the subtle intertwining between the built environment and the natural environment" (Oberländer-Târnoveanu, 2013, p.9) complicating its management and calls for modern tools that need to be adapted to new situations. "The transition from a normative-objective approach to one based on the ability of an object to produce values and meanings that would lead society to consider it as cultural heritage" (Vecco, 2010, p. 324) is the phase of expansion of the concept which, from a socio-economic perspective, allows its identification as a common responsibility.

The vision of shared responsibility has brought the issue of cultural heritage to the attention of national (e.g. Presidential Commission for Built Heritage, Historic and Natural Sites) and international bodies that have drafted laws and conventions to define both this concept and establish principles and norms to protect him. Identifying itself as a major factor in defining Europe's identity and its place in the world, its cultural heritage and protection have become important policy areas of the European Union. This is reflected in numerous actions, projects, and strategies that establish regulatory frameworks, define concepts and outline directions (e.g. risk prevention, participatory governance), issue opinions and information reports, and organizes initiatives and events focused on the participation of civil society and citizens. By Decree no. 187/1990, Romania accepted the Convention on World Cultural and Natural Heritage, adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization on November 16, 1972. Article 1 defines the notion of cultural heritage which represents "sites: works of man or works resulting from the combined actions of man and nature, as well as areas including archaeological lands that have an exceptional universal value from a historical, aesthetic, ethnological or anthropological point of view". Seen as a resource for promoting social cohesion, diversity, a drive for innovation, sustainable growth, generating individual and community well-being, cultural heritage is supported by financial policies (e.g. EEA Grants 2014-2021).

The complexity of the cultural heritage, reflected in these works, is found in the management that its protection requires. Based on the principles enunciated by Petzet, of reversibility and authenticity, as a reflection of the main categories of interventions-maintenance, repair, rehabilitation, conservation, restoration (Petzet, 2000), cultural heritage management is differentiated by the directions that define the content of the object. The literature addresses the legal aspect of protection (Vieriu, 2021, Mauch-Messenger and Smith, 2014), protection through tourism (Frînculeasa and Chițescu, 2020; Pedersen, 2002), integration in the socio-economic context through public policies (Chițescu et al., 2019 Trosby, 2015; Barthel-Bouchier, 2012), as well as particular cases of historical monuments, archaeological sites or monumental cities (Frînculeasa et al., 2014).

Information is the link between us and the past, between cultural spaces, between losing and protecting. Capitalizing on information to protect cultural heritage is a strong point of effective management. Thus, "… the sustainable management of this resource with the help of new information technologies is a strategic option for the 21st century" (CEU, 2014).

2. Research methodology

Prahova County is a Romanian territory with a rich cultural heritage but at the same time a space where economic development is very dynamic. The economic structure is characterized by the domination of industry (about 50% of the entire economy of the county), complex and diversified (extractive industry, crude oil processing, and coking coal, food, beverage and tobacco industry, machinery and equipment industry). The economic stability of the county and its geographical position, the interest and involvement of the local public administration led to the boost of the local and regional business environment. Support structures have been developed by setting up industrial park structures (for example, Industrial Park Ploiești which has four locations developed on the outskirts of Ploiești, Ciorani, Urlați, Mizil), technological (for example, those near Ariceștii-Rahtivani, Păulești, Blejoi), business and logistics. Their impact on economic growth has been positive, not only by creating new jobs but also by expanding into less developed or declining areas. Starting from the premise that an adequate infrastructure is a dynamic factor for the development of the economy and the integration in the national and international markets, the Prahova and national administration contributed through the implemented and ongoing projects to the creation or improvement of this component - transport infrastructure, public utilities. New residential buildings appear (for example, the permits issued for residential buildings in Prahova County, in September 2021, hold a share of 2.9% of the total permits for residential buildings in Romania, i.e. the 11th place - INSS) and the process of restoration and modernization.

The economic size of the territory is doubled by its cultural potential. In this context, information becomes the balancing factor between growth and conservation. Being part of this paradigm, archaeological research is the element that can easily define a model of cultural heritage management.

In this paper, the discussion focuses on the archaeological heritage, ie the Bronze Age burial mounds specific to the Yamnaya populations. This site type was chosen because the Yamnaya phenomenon covering the period between 3250/3100–2500 BC (Anthony, 2021; Alexandrov, 2021) is based on a certain socio-economic scaffolding, namely the mobility of populations with origins in Eurasia moving in successive stages, with different intensities, towards Central and South-Eastern Europe (Heyd, 2011; Frînculeasa et al., 2015). The landscape is similar to that of the Eurasian steppe, located on both sides of the Lower Danube valley, continuing with the Tisza river basin (Frînculeasa et al., 2015; Koledin et al., 2020), has provided a favorable environment for the pastoral economy. Therefore, its presence in the studied area is significant (Frînculeasa et al., 2017; Frînculeasa, 2021). Furthermore, the experience of the authors, especially archaeologist Alin Frînculeasa, in the process of investigating/protecting some archaeological sites in an imminent context of destruction due to the exploitation of the property on which it is located (industrial and residential constructions, exploitation of mineral aggregates, transport infrastructure) it is important. Research of 30 burial mounds in the last 15 years (out of a total of 70 such mounds researched in Muntenia and Oltenia in the last hundred years) (Frînculeasa et al., 2015a; Frînculeasa, 2021). Moreover, the impact that the natural elements characteristic of territory have on these human communities presupposes an obligatory stage in the evaluation of the structure and functionality of these ensembles. The circumscription of human, cultural, and natural elements in a multifunctional system leads to the application of inter-and transdisciplinary techniques and methods, an approach that becomes both beneficial and mandatory.

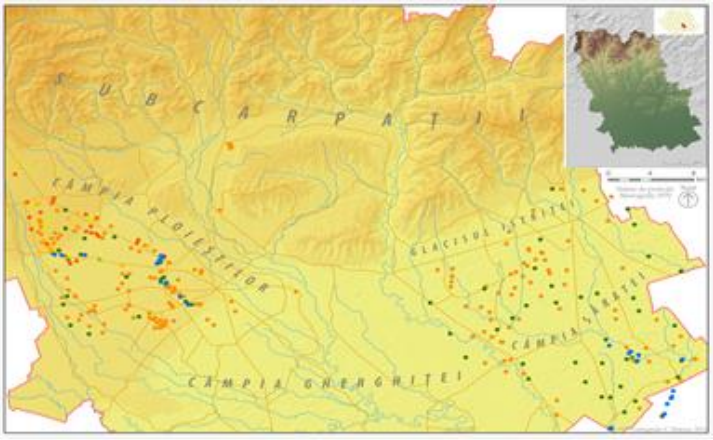


Figure no.1. Map of Prahova county (1) with the location of the mounds in the Ploiești Plain and the Sărata Plain (2)

The research methodology has a bivalent character and is the result of participatory analysis (over 30 archaeological projects), as well as documentation on legislation.

3. Results and discussion

Following the Yamnaya phenomenon through the perspective offered by the relationship between economic development and heritage conservation, we tried to answer the following questions:

What needs to be protected? By Government Ordinance no. 43/30 January 2000 on the protection of archaeological heritage and the declaration of archaeological sites as areas of national interest defines the area of priority archaeological interest as that area "comprising those archaeological sites whose scientific research, protection and enhancement are of exceptional importance for the history and the national culture, through the material testimonies, the movable or immovable goods" and which "is established on the territory of the administrative-territorial unit" of which it is part. In the case proposed for analysis, the archeological sites are the burial tombs from the Bronze Age, on the territory of Prahova County. The Yamnaya phenomenon is characterized by several characteristics: burials under mounds of earth, ocher deposits, a not very diversified inventory, rather austere, consisting of ornaments, vessels, weapons, rarely wooden ones. The assets identified by archaeological research indicate contacts over large areas made by knowing and frequenting older routes or opening new ones. Mobility was also explained by the absence of permanent settlements, but also by the presence in the graves of horses, small horses, and cattle specific to this way of life (Morgunova and Khokhlova, 2006).



Figure no. 2. Burial Standard (1) and Funeral Inventory of Yamnaya Research Tombs in Prahova County (2-7)
Source: Frinculeasa, 2019, p.131

How should it be protected? The field of archaeological cultural heritage requires an intersectorial approach and the development of scientific research activities to substantiate the various decisions on how to protect/save. The mounds, as morphological forms with average heights between 1.5-4m, are highlighted in the plain (Ploiești High Plain, Sărata Plain) or its contact area with the sub-Carpathian hills (Frînculeasa et al., 2017), can be approached for rescue/protection either by carrying out archaeological excavations in case they may be affected by economic activities (for example, mineral aggregates, foundation of some constructions, utility routes - gas, water) or by permanent monitoring when it is considered that they are not bothered by what is happening on the surface (for example, crops). Achieving an effective strategy, in this case, involves, as a sine qua non, the promotion of diversified forms of public-private partnerships (Grigorescu, 2008).

By whom should it be protected? By us, all. That's the simplest and most correct answer. In the case of Bronze Age tombs, the main actors are specialists, but in collaboration with the Ministry of Culture, its competent institutions in the territory (Prahova County Directorate for Culture), and local public administration institutions (City Halls, Prahova County Museum of History and Archeology).

How can it be capitalized? The results of archaeological research can be exploited in situ, through museum exhibitions, by attending conferences, or by publishing scientific articles by the legal holders of primary information. The access of the general public can be virtual or through active participation in specially arranged places. Artifacts from Yamnaya burial mounds cannot be preserved in situ but may become, after preservation, elements of thematic exhibitions. The main artifact, i.e. the human skeleton, is not exposed for ethical and conservation reasons, but it benefits from numerous analyzes and appears in scientific publications.



Figure no. 3. Mounds from the southwest of Prahova county from Floresti and Ariceștii Rahtivani localities (1-2); aerial images with mound research methods from Târgșoru Nou (3) and Ariceștii Rahtivani (4)

The answers to these questions are the perspective through which the information was highlighted as an essential element of efficient management of the cultural heritage.

The archaeological research mentioned in this study is preventive (in Romania, after 2005 the number of preventive archaeological research constantly exceeds systematic research), resulting from commercial contracts between the Museum of History and Archeology Prahova and various beneficiaries, owners of the land on which they found the sites in a model of public-private partnership. This involves several aspects of the information:

- the archeaological sites were registered in the centralized system of the Ministry of Culture (Archaeological Repertory of Romania) as a result of the information sent from the territory through the site file;

- its introduction in PUZ/PUG to the localities through the exchange of information between decentralized institutions of the Ministry of Culture and City Hall;

- informing the landowners in case of requesting the land exploitation permits for the existence of the archaeological load;

- a partnership between specialists in the field (assigned to institutions such as museums, institutions, universities, private companies) and potential beneficiaries of an archaeological research service necessary to obtain the archaeological discharge permit;

- requesting an opinion for the archeological excavation to the National Commission of Archeology (as a body of the Ministry of Culture) regarding the new status of the archeological site.

- establishing an information flow between the County Directorate of Culture, the institution providing archaeological services, the Ministry of Culture, and the beneficiary.

The lack or alteration of the information in this cycle can lead to a wrong approach to the management of the situation that involves saving/protecting the archaeological heritage. In this regard, we can mention the location of the site according to the permanent updates of the National Agency for Cadaster and Real Estate Advertising on the property regime (for example, in a plot there is the possibility to have the site framed on several properties), professionalism in PUG execution/PUZ, mishandling of information by local public administration officials, circumvention of the owners' law, erroneous information present in the site file and ignorance or misinterpretation of the legislation, legal inaccuracies in issuing administrative acts.

Beyond these bureaucratic aspects, the management of an archeological site presupposes a correct approach to archeological excavation. The rescue of archaeological artifacts is, in essence, a good knowledge of the practice by the archaeologist who coordinates the research team. In such partnerships and civil contracts, the information must flow correctly between the two entities engaged in the rescue process - the team of specialists and the team of workers, together with the technical system - material available and the entire financing mechanism. Each excavation is unique, it does not represent the exact reproduction of anything already done, because it takes place in a certain space (m2 area) appreciated by the information gained from previous experiences, in certain pedogeological and meteorological

conditions, has a well-defined goal that dictates some research limitations, moreover, are based on a non-permanent micro-organization, ie a team built temporarily to carry out the set of actions undertaken.

The peculiarity of the excavations of the tumular tombs is given by the respect for the one who represents the reason for carrying out the excavation, meaning elite of the Yamnaya populations who transited the space of today's Romania and left their mark on the cultural environment of that period. Any inventory item saved from these graves is a step closer to our knowledge as Europeans, so preserving objects and capitalizing on all the information obtained through laboratory investigations (DNA, C14, N13) are valuable.

The connection between man and the environment can be positively speculated in the sense of protecting it by extending the capitalization of the archaeological heritage. Analyzes are made that allow the issuance of prevention scenarios against water and climate phenomena. For the Yamnaya communities, late 4th and early 3rd millennium, the main environmental approaches are focused on paleoclimatic and paleoecological research, through pollen and paleobotanical study (Horváth et al., 2013), strontium isotope analysis 87Sr/86Sr, oxygen δ18O, nitrogen and carbon δ13C13 (Gerling, 2015; Shishlina et al., 2009, 2012).

Cultivating and developing the feeling of cultural belonging by enhancing the cultural value of the archaeological heritage can be done through integrated management of information, through all the means now available to technology and the virtual environment of socialization. The ongoing dialogue between the community and state institutions is a necessity because communities must play a major role in preserving the local archaeological heritage. However, local perspectives, often focused on immediate well-being, differ from experts' views. This is also due to the discrepancy between policy rhetoric and the level of their implementation.

The natural hesitation between the relevance of the archaeological heritage for the well-being of individuals and communities and the benefits of economic development (especially job creation) must be constantly combated by policymakers, culturales managers, and professionals. In this context, reliable tools are needed to provide comprehensive information to support the fact that the value produced by investments in cultural heritage justifies the costs incurred. Even if the profit is not direct and immediate, the promotion of heritage can develop tourism, can increase the profit of cultural institutions, economic agents providing services, and therefore local budgets will have higher revenues that can be reinvested to increase the living standards of the population.

However, following the experiences, the authors noted that, in the context of sustainable development and the need to identify with a particular cultural space, the business community is gradually aware and accepts the need to implement a policy of protection of movable and immovable cultural heritage. The protection of cultural and archaeological heritage is no longer considered an area reserved exclusively for the state and the scientific community, but rather a common responsibility of several interest groups: researched companies, financial institutions, consumers, and the general public. The financial consequences and the risk of destroying the reputation of companies are important reasons for investors to comply with ethical standards and the protection of cultural heritage imposed by law.

However, the Romanian legislation regulating the protection of heritage is either not sufficiently known, it is ignored, or it is poorly transmitted by the employees of the local public administration, so that, practically, it is not used. In this context, the primary role of information is justified because it provides the two communities - the administration and investors with some regulations and models necessary for better facilitation of bureaucratic development that promotes the approach to saving heritage.

Rehabilitation of cultural institutions by capitalizing on the entire heritage of which it benefits requires time and money. The national and international visibility of artifacts can turn a museum into a multi-sectoral policy tool, but the coordination and convergence of resources towards research is not yet a priority.

The information is based on the understanding of the managerial approach regarding the protection of cultural heritage and its value. The choice and the indicative balance of its promotion as an important factor in the correct and efficient management of the cultural heritage are based on the aspects identified and presented in the paper. Summarized, they are:

- explaining the need for the protection and conservation of cultural heritage;
- knowledge of the main national and international bodies with concerns in the field of protection and conservation of the cultural-archaeological heritage, as well as of the main protection and conservation programs at the national level;

- the correct knowledge and understanding by investors of the meaning of the notions with the most frequent use in the field of cultural heritage conservation;
- identification of the impact vectors of human activities on the cultural-archeological components from the area of Prahova county, especially the proximities of Ploiesti Municipality;
- bringing the archaeological heritage close to the public's understanding by knowing the methodological path of interdisciplinary research;
- promoting good practices in investment development as solutions to reduce heritage damage.

Conclusions

Cultural heritage management is a complex process, but a delicate one to approach in some respects. The information is identified as a vector of balance between the primary needs of a constantly evolving society (construction, transportation, and security) and a dynamic but fragile cultural heritage, through the authors' experience with archaeological research of Bronze Age burial mounds. This approach to information allows a new perspective on the management of archaeological heritage that can be traced through studies aimed at another type of heritage (e.g. architectural heritage) or other cultural spaces (e.g. Transylvania or Dobrogea). The evolution of cultural demand on an upward trend justifies investments in the field of heritage, but which must be made efficiently, with respect for all components of the environment and while maintaining the benefits offered by this company with high economic values. The limits of the research are due to the analyzed model, both as a space and as elements of the national archaeological heritage - the Yamnaya mound in Prahova County. The issue of archaeological cultural heritage (especially that which cannot be preserved in situ or spectacular as artifacts) is complex not only due to the cultural phenomenon, but also to the superficial legislation and general understanding. That is why the study offers the perspective of conducting similar research on some archaeological sites with a much greater cultural impact on the collective mind or those involved in restoration and capitalization projects.

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The Role of Social Media in Selecting Touristic Destinations – A COVID-19 Context

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Abstract

Social media has been occupying much of our lives lately and that is because of the availability of nearly anything only one click away, and, sometimes even a little bit more. Due to its significant spread into people's lives, why not using social media in a positive way, such as spotting different touristic destinations. In this respect, the hereby research paper is aiming to gather data and analyze specific factors that have influenced the tourism industry in the last years, in particular how social media and the existent technologies have disrupted the normal flow of choosing a destination and the way it is now seen through the help of other travelers that are revealing their thoughts, feelings, and opinions trough their pictures, videos and posts over the social media platforms. In doing do, we have distributed a questionnaire by means of social media by using a non-probability sampling method. The main findings indicate that there have been changes in the behavior of tourists when considering traveling in the context of a pandemic, and even though safety might have been the most prominent factor when choosing a travel destination, the quality of the services provided outranked safety. For businesses, the findings of the paper hint towards fully integrating social media with the other elements of the marketing in order to assure a successful use of the value-added technology.

Keywords

social media, tourism, travel destinations, COVID-19.

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Introduction

Because we wanted to capture how people's experiences are surfing worldwide in a fast pace, changing one's decision and shifting their ideas with what we can call "perceptions", we consider it important to know something about how it all started. This is why, our paper will be organized in three main parts, with the purpose to show similarities between past times and now and to demonstrate that even though the tourism industry is such a large sector (Rasool et al., 2021), it can grow and find new opportunities every day, nonetheless it is still very fragile and can get easily impacted by the mere evolution of social-economic factors (Kronenberg and Fuchs, 2021).

The first part of the paper we will introduce the reader to some theoretical aspects about how tourism functions and the challenges brought to the world and its people along the time. It will also present travelers' purposes to explore and what motivated them to travel and in which way. The second part will be focused on the data found on the United Nations agency of World Tourism Organization or shortly UNWTO (2020), that shows how intense the traffic in terms of arrivals around the world is, from all the airports and what is influencing their choices to fly and where. The last part will be analyzing the findings of the research conducted in this paper, shedding light onto how people are organizing their trips in the pandemic context and what is more important having in mind the new health regulations that we all have to follow. However, we must take into account the fact that the effects over the destination image will be visible only after a

more in-depth analysis made over specific areas or localizations of the most important cities. After all, this study will help the readers to understand more about the role of social media in the tourism industry by addressing more questions regarding the travelers' behavior and expectations corresponding to their final destination when planning a trip.

1. Review of the scientific literature: social media, tourism and crises

The pressing desire of having permanent touch into the *pre*-digital world started in 1844 when someone started to tap arranged dots that would eventually make sense, into a telegraph machine. Later on, in 1969, the existence of what we call now internet was proved through the American program ARPANET - Advanced Research Projects Agency Network, a well-developed communication system. The very first social media platform is called Six Degrees and was founded in 1997 with the purpose of keeping contacts close to one's self, by registering with an email address and setting up a simple, basic account. (Anon., 2020). The diversity of social network represents a whole type of movement for teenagers, young adults and elderly too. Nowadays, it is so propagated into our daily lives and we cannot imagine a scenario from where this precious tool is missing.

Stepaniuk (2015) found that an emotional connection is strongly related with the content of the network sites which triggers the users how to act and project their values and beliefs into the online world of tourism when thinking about what activities are chosen for the sake of the photographs and videos that are meant to be shared over the internet using different types of sources such as: social media platforms, blogs, travelling websites, guidebooks and tourist events. The stimulation varies, depending on the individual, from the benefit of getting more likes and comments and evolving in the social popularity to the simple fact as keeping images and videos as sweet memories, in a virtual journal (Fotis, Buhalis and Rossides, 2012). The impact of the content will help users in choosing their destination just by reading other's opinions, thoughts and impressions related to similar events that also happen to them or to a very close person such as relatives which will lead to a positive or negative destination image. Controversial stories or funny moments are having a huge influence over one's opinion just by the simple fact that they can easily make the connection that somehow an individual can experience the same thing in that specific destination so, electronic word of mouth (Buhalis and Law, 2008) and recommendations represent two important factors in choosing one's place to go, being empowered by details such as traditions, local cultures and cuisines, local products and businesses, sustainability, people and religion.

Sabate et al. (2014) demonstrated in their paper that there is a correlation between the posted images and the number of comments, all resulting in a positive outcome. With all the technology and continuous advancements that are everyday elevating the customer's satisfaction along with their needs and wants, the competition in the tourism sector in fierce and definitely social media has one of the most important roles in promoting destinations to its travelers. And this is what Nag and Gilitwala (2019) have succeed to demonstrate through their research having as target market the country of Thailand, a poor and not so well economically endowed country, but with an extremely blossoming tourism. They have showed a link between motivational factors, destination image and social media that is affecting one's decision of where to travel.

When it comes to the people who travel, the types of tourists are divided into four main categories by their purpose of traveling: *for recreational activities* - here we can include all the nature based tourism, the resorts and those geographic areas where one can find a peaceful environment, music festivals or hobbies based tourism, *for cultural purposes* – here we can include dark tourism for example or destinations full of historical traces, places where religions, traditions and cultures are unique, preserved well from the obstacles that might jeopardize its values and importance and that can only flourish as time goes by, *for adventure purposes* – here we can include the backpackers, the nomads or wildlife seekers, and *for business purposes*.

Seabra, Reis and Abrantes (2020) states that Portugal is one of the most chosen country as a destination recording a high tourism demand, in the same time being a terrorism-free country where peace dominates among its people (National Consortium for the Study of Terrorism and Responses to Terrorism, 2021). Although terrorist events from Spain seam to impact the overall perspective over Portugal's image, tourists coming from France, UK or Germany might have a deeper sense of safety in a country like Portugal and that is because the three of them share the same type of tourism market.

The sudden slowdown in business has, for the previously presented reasons, led companies to seek (primarily financial) support from Member States and the Union to get through the crisis; only that the granting of aid has begun to be conditional: relocate production to the country, or at least to the territory of the Union. The European Union has once again been able to see how dependent it is on the freedom of transport within the Union and to what extent it is based on the tourism industry and its horizons. The Covid crisis shows it with a peak and, moreover, raises great signs of concern for the future of tourism in Europe,

because the new normality indicates in the most optimistic scenario, somewhere around 2022, a turnover in European tourism to reach somewhere at most 80-85% of the level of 2018-2019 (Wall Street, 2020).

It is not unusual that, when talking about a specific destination, our brain already defines that place with certain details that has been seen and interpreted along a period of time through the social media platforms, slowly transforming the beliefs and interpretations into a stereotype, attached to a region, city but most likely country. This process is called COI image or country of origin image (Dedeoğlu et al., 2020) and it is manifested through the hallo effect which projects the visions of certain people over a whole destination by attributing an element, a story or a tourist site which over time becomes a brand image for that specific place. Brand awareness and destination quality perception are two factors that influences directly the COI image showing a positive destination response. Choosing from all the existing traveling alternatives it is not an easy task to do but in order to select the best destination choice suited for one's own preferences, the decision making will be done based on the highest emotional and desirable needs to make sure one will enjoy and have a unique life experience (Tham, Croy and Mair, 2013).

When it comes to disasters, in 2003, there was a SARS crisis when everything in China crashed and its population was severely affected and that eventually led to sudden changes in each possible domains, among which, tourism was one of the most impacted. The thing is, so much uncertainty could never be fully coped with in means that we are aware of. It will be about how we can manage stress in this catastrophic environment so we can save as many lives as possible by giving and using all: routines, frameworks, rules of the system and organizations. It will be challenging, tedious and one above the other, with no fully chances of warranty (Škare, Soriano and Porada-Rochoń, 2021).

So, all effects are reflected also upon tourism market which probably was the most affected, from the hotels and other accommodation providers like Airbnb or Booking.com, to the airline agencies, trains or public transportation and much more. Speed of recovery depends on the type of response mechanism and ways to manage efficiently the crisis' flows in order to integrate new and ideal solutions that can work on the moment with the existent resources, both for businesses and for people (Gössling, Scott and Hall, 2020). On the other hand, there can be different crises having repercussions over this soft industry called tourism. Because of the last 20 years full of events of terrorists' attacks or unexpected riots that happen, tourists are becoming more and more flexible when choosing their final destination just to be able to skip and avoid all the risk that is threating their lives and could switch their beautiful vacation into the worst nightmare. So, they become highly sensitive to everything that moves around them and any possibly sign of destruction can affect their whole decision making and because of interdependency, if an event happens in point A it will most likely have an impact in point B as well, this phenomenon being known also as spillover effect which transforms some destinations into unwanted choices. Due to this, different countries' economies can be severely affected, as well as negative spillovers can affect the social-cultural environment. It is critical to find the strength, translated in the strategy and action plan, and necessary resources to help those countries deal with the disruptions in the tourism field.

In 1950's top 5 worldwide destinations were USA, France, Italy, Switzerland and Canada (Drew, 2021) that welcomed more than 70% of the tourists, followed by a decline of 20% because more and more countries were selected as their destination for recreational time or business leisure. Tourism was fast becoming an important factor for growth and job opportunities, offering support to emerging countries in different fields such as education, technology, science and more. In 1967, UN declared that year to be "The International Tourism Year" having as motto "Tourism: a passport to peace". United Nations agency of World Tourism Organization or shortly UNWTO went through major transformations starting with 2003 and 2004 and opened their gates to the digital world so it can bring even more close the people traveling by offering support through their social media platforms. In 2012, the number of arrivals passed 1 billion putting tourism in the spotlight for building a better world and giving hopes for people who didn't even dare to dream about having one. Five years later, was the year of "International Year of Sustainable tourism for Development" with a number of 1.3 billion international tourists just to reach 1.5 billion in 2019.

Tourism is not about just one part of the society but about all of them, people stepped up in the battle against climate change, racism, safety and diversity across the globe. Facing the pandemic in 2020 motivated people to come closer and share their innovative ideas in order to survive and make life easier to bear when the closest ones were not where they were supposed to be (Qiu et al., 2020). As a basic human need, safety is one of the key factors that defines the tourism industry and helps in maintaining the balance when concerns are becoming too high to keep the mind risk-free and aware of the perceptions, sometimes misinterpreted. Risk perception refers to the possibility that something bad might happen and as an outcome one could suffer from it and affect its life in a negative way. Not to forget to mention there are still usual risks that a tourist should consider before planning such as health issues or specific diseases that a country is known

for, political incidents and orientations that might provoke violence and the most common but still to take into consideration: language limitations and cultural barriers.

Previous researches showed that people are intimidated by the risk of a potential terrorist attack due to the fact that one cannot have full control or knowledge if and when or where will some event like this occur, putting their lives in the hands of destiny. Related to the destination, past attacks are also related in one's decision, memories bringing back all the negativity about a specific place and attributing details heard from others that are in correlation with an already designed scenario. Here also intervenes a generalization behavior, judging neighbor places by just one unfortunate, passion over the fear and anxiety. Although these memories will not stay for too long in one's mind, their effects will be a controverted point in changing the destination with a less unstable environment (Lutz and Lutz, 2020).

2. Research methodology

This part of the paper presents the way the data was collected and put it all together in order to allow interpretations and analysis of the found information used to reach the objective set for this study. We are using a quantitative research method, more specifically, survey research based on questionnaire. In this sense, we have defined three suitable research questions for study: 1) Does social media influence people's choices when it comes to the tourism destination? 2) Which are the factors involved in the decision making of travelers? 3) Is traveling an actual option having in mind the restrictions imposed by the COVID-19 pandemic? Sample size and research instrument - As for finding proper evidence for the research questions we have formulated a 14-question questionnaire which was distributed by means of social media by using a non-probability sampling method: convenience sample. In order to have meaningful data to be further analyzed a questionnaire must be completed by 30 people at least (Messick, 1995). The questionnaire was structured as follows: the first section would provide information about the demographic data; the second section would give a perspective on the type of tourism each person embraces and the last section offers information about the adaptability of the travelers during COVID pandemic. It used closed-ended questions including Likert-scale type of questions having 5 options, starting from SD and ending with SA, where SD is strongly disagree, D is disagree, N is neutral, A is agree and SA is strongly agree. There were also ranking questions rated from 1 to 5, where 1 represents a least considered factor and 5 represents the most considered one. Some of the questions were also designed to be as check boxes in order to facilitate user's time and willing of completion.

3. Results and discussion

When closing the questionnaire, we were able to collect 114 answers which were analyzed by using SPSS. Given the space limitations, we are not able to illustrate all the questions, but we will be providing the results as explanations derived from the processing of the data In terms of the demographics, we had 65 females and 49 males with an age distribution pertaining to the following cohorts: 72 respondents (1996-2003), 39 (1977-1995), and 3 respondents (1965-1976), these results reflect also the age distribution of social media users. Education level is defined by those who successfully finished their bachelor degree (47 people), followed by those with a master degree (38 people) and high school (25 people) and only 3 with a vocational/technical school. In terms of employment, 78% of the sampled persons were listed with a labor contract.

When it comes to the variable time invested in traveling, while 2.6 % of the respondents say that they are not taking any free time to travel, the rest of them who are traveling at least 1 time/year (20.2%) or even 2-3 times/ year (30.7%) are almost equally distributed with those going into trips more than 3 times/year (46.5%).

Table no. 1. Time invested in traveling

Time invested in traveling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2-3 times	35	30.7	30.7	30.7
	At least 1 time	23	20.2	20.2	50.9
	More than 3 times	53	46.5	46.5	97.4
	None	3	2.6	2.6	100.0
	Total	114	100.0	100.0	

Following to the information regarding the time invested in traveling, the next section comprises questions concerning the impact of social media in each person's life when planning a trip or while they are already traveling. Digital marketing tools refer to the available websites and mobile phone applications with sufficient resources in the means of free information and content suitable for searching traveling destination, tourist recommendations, reviews and pieces of advice from previous travelers, public prices and regulations to the places, policies that need to be followed etc.

As social media had a powerful boom in the past years, we can observe that respondents prefer to get inspired from *Instagram* (67.5%) where they can see exactly how the places are looking like, including secret spots or accommodation facilities and utilities. They can get a better sense of how it will be for them in person to visit the location and from there they can start the selection and switching between the available options by favoring one of the critical elements when arriving at the destination such as location, in-house facilities, transportation and ways of access, local restaurants or shops, depending on traveler's interest and purpose of the trip. After Instagram, *traveling blogs or websites* are the most popular (62.3%) for their accessibility to one's personal story and experience, where unique details and different point of views are projected into stories with character and exposed feelings supported by personal pictures and videos that will best express and show the past situation, one from many others. On the third position we identified *Facebook* with a 47.4% which is attributed to the daily feed that people are distributing because their application is easy to access and use, with a friendly design and well organized for all age categories.

Table no. 2. Crosstabulation on type of traveler and social media

		Type of traveler					Total
		Adventure traveler	**Back-packer/Nomad**	**Business traveler**	**Holidaymaker (resort-type)**	**I don't consider myself a traveler**	
Social media posts	1	3	0	1	0	3	7
	2	5	1	0	6	2	14
	3	12	1	1	6	2	22
	4	8	2	0	9	4	23
	5	31	1	0	9	7	48
Total		59	5	2	30	18	114

Further, a crosstabulation was made between the types of travelers and their preference in using and looking at the social media posts on the digital platforms that people are using them day by day to show for each type of traveler how much they prefer to use this tool to find out more about their interests in choosing their final travel destination. The main takeaway from this crosstabulation is that adventure travelers are the keenest on social media posts (31, five posts), followed by holiday-makers (9, five posts), whereas the ones that do not consider themselves travelers (7, five posts), are still using social media, nonetheless their research interests might be different.

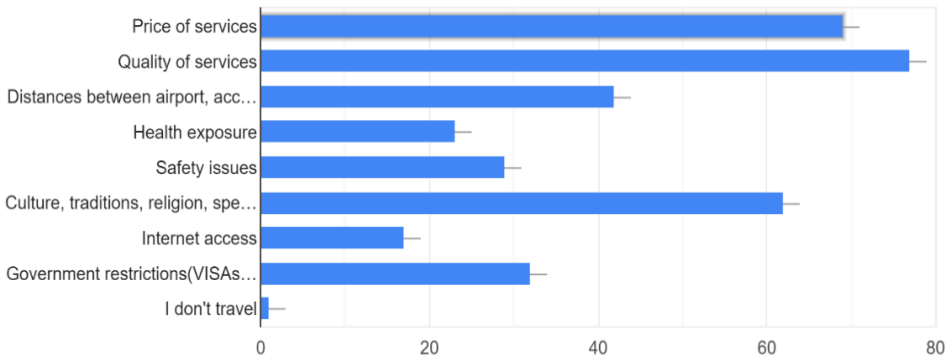


Figure no. 1. Factors influencing decision making when choosing touristic destination

According to the results from the questionnaire, when it comes to the classification of the factors that affect their decision making concerning a final travel destination, on the first place in respondents' minds is the quality of the services offered (67.5%) and only after that comes the price of the services (60.5%). The item culture, traditions, religion or the specific aspects of the chosen place comes on the third place with 54.4%.

When conducting a crosstabulation of the type of traveler and the factors that can influence their decision making, prices of services 43 of the respondents rate this factor with a high intensity of 5, quality of services 62 of the respondents rate this factor with 5, safety issues – 47 of the respondents rate this factor with an intensity of 5, culture, traditions religion – only 40 of the respondents rate this influencing factor with a high intensity of 5. Therefore, the results are unexpected or surprising in the context of the pandemic, considering we expected safety to be marked with high intensity by the majority of the respondents, case that did not happen. A consideration for this issue could stem from the fact that when choosing a trip destination, travelers expect somehow safety to be included in the quality of the services rendered. However, may infer that the sample is represented by educated customers in the sense that they do actually know for what they pay, and what they expect in return.

Conclusion

The three research questions we have formulated from the beginning of the paper have been answered and as we demonstrated previously, the age of people does not really reflect the frequency of traveling because the final decision is influenced by many factors amongst which we mention: the financial resources which some teenagers might not have it yet as well as some of the adults does not have the time to manage all of their responsibilities so they can afford some time off to explore or relax their minds and bodies. The quality of the services still remains one of the biggest factors taken into consideration when planning a trip, besides the culture and traditions that could be perceived during the travel. In terms of sources people prefer using social media platforms over traveling websites or to call on travel agencies' services to gain more information about their next destination details. The word-of-mouth is still very trusted but can manipulate people's minds at a deeper level of conscientiousness without even to notice major changes driven by the thirst of greeting the best information regarding the facilities, travel routes or any economic and social changes.

The gradual opening of the borders for sure will give new hopes to the tourism sector, where some locations are expected facing tourist booms that will help them in reconstructing the economy and give a fresh view over the world's treasures and beauties. Thus, social media must be included more by the marketing strategists so they can catch traveler's eyes through the digital channels that now can definitely change the decision making for the final destination. Of course, this implies to fully integrate social media with other elements of the marketing in order to assure a successful use of the value-added technology that can be reached in an instant with our access to the innovation and more and more to the sustainable resources.

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A Multi-Level β Convergence Analysis for Romania in a European Framework

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Abstract

Romania belongs to the countries less developed in the European Union and the main desire is to reach the performance of the most developed countries. The β convergence is measured by the time needed to reach the desired level, in our case highest development level. The present study is calculating the β convergence for Romania at the NUTS0, NUTS1 and NUTS2 level with the most developed countries in European Union considering de annual average GDP/capita, considering as target value maximal and median values. The first issue we are looking for is the convergence existence among the European countries. The contribution of the study reveals the time needed to overcome the gap as a starting point for the strategies and the public policies design. In our opinion, a reasonable convergence time is a base for adjusting and speeding the existing policies, since a high period could be perceived as a need for disruptive measures. At the same time the study offers a perspective at the EU level about the time skyline of reaching the homogeneous regional development.

Keywords

Beta-convergence, disparities, regional development, economic growth, public policies, strategies

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Introduction

The desire of the European Union is to create approximately the same life conditions in all regions, for all citizens, this objective being mentioned by the EU Treaty. Unfortunately, the EU countries know different development in time and they are characterized by significant differences in natural resources and cultural behavior. This mandate of reducing disparities was developed in Cohesion Policies strongly implemented by the EU. Monfort (2008) in his analysis, about the convergence of EU regions, concluded that the disparities were significantly reduced and the convergence gets a contour. Any strategy or policy could be strongly disrupted by the crises, phenomenon recorded for the economic crisis from 2008-2010. Monfort (2020) evaluates the post crisis state and the evolutions of the regional disparities. His main conclusions are that the crisis stopped the convergence process; the disparities trend to increase in some countries; the crisis impact is on long-lasting for convergence despite the economic recovery process.

Nowadays the convergence issue is more current than ever considering the fact that we were hit by the health crisis of pandemic COVID-19, 2020-2022 being a period of tremendous restrictions and changes (lockdowns, slowdowns). The energy crisis started in 2022 and the potential food crisis are new challenges for European countries, but not only, forced to focuses on specific resilience, minimization the effects and recovery, than on a broad, generous objective as convergence. Even so, to be able to create the best framework to face the challenges and to blueprint out the policies we should have a view about the regional disparities in EU and especially the Romania's position. The existence of the disparities and the

increasing trend could be a reason to question the cohesion policies and their success. The EU cohesion policy for the new strategic programing period has to be adjusted in accordance with the resilience and recovery policies. The present study aims to find an answer to the question if Romania is connected to the convergence process in Europe, are we in the mainstream of reducing disparities. The research hypothesis is that the Romanian regions at the level of NUTS0, NUTS1, NUTS2 are belonging to a specific pattern of convergence, based on the time needed to reach the maximal or medium level of development.

1. Literature review

Club convergence was considered by Apergis, Panopoulou and Tsoumas (2010), they consider that the EU countries are split in two Clubs: old and new members (EU 14 and EU 27-14), it was the time of the "two speed Europe". Another convergence analysis (Monfort, Cuestas and Ordonez, 2013) drives to a similar conclusion of 4 Clubs, this time the EU-14 seems to belong to 2 clubs and the new Eastern European countries to 2 other clubs. Definitely the disparities between the old and the new EU countries represent a concern after the EU enlargement, but there are also differences between South-East and North-West countries (Borsi and Metiu, 2015). GDP/capita structured the EU countries in two clusters and the GDP deflator in three in Fritsche and Kuzin study (2011). Cutrini (2019) using a clustering approach combined with a logit regression structured the EU regions in 4 clubs: Club 1 - Metropolitan areas and capital regions; Club 2- Central European Manufacturing Core; Club 3- De-industrializing regions with intermediate average per capita income levels; Club 4- Mediterranean lagging-behind regions. She placed Romania's regions in Club 2 and Club 3 and concluded that the structural changes are the root of growing the regional disparities. Club convergence was studied by the Barrios et al. (2021) for Serbia at the NUTS3 and the findings highlights 2 distinctive clubs. Mazzola and Pizzuto (2020) analyzed the club convergence after the great recession and highlighted the evidences supporting the „multi speed Europe". The clustering of the EU countries are pronounced geographically, the disparities between north and south being considerable, also at NUTS2 income and GDP differences are pleading for multi-speed Europe (von Lyncker and Thoennessen, 2017). Butkus at al. (2018) find out that the convergence at the EU countries still persists, but the speed is slowing down after the economic crisis, conclusion reconfirmed by Monfort (2020). From the perspective of Euro zone convergence there was a convergence among the countries that join the euro. β convergence analysis of the EU regions reveals a discrepancy between three club countries: EU-28, EU-15 and EU-13, the spacial effect come to the conclusion that, despite the efforts of cohesion policy, there are disparities between the new and old EU countries (Pietrzykowski, 2019). Employing Phillips and Sul's (2007) nonlinear dynamic factor model Cavallaro and Villani (2021) found out that EU countries do not converge to a unique path; the Central and Eastern European (CEE) countries are willing to catch up the Western countries; the asymmetries were increased after the economic crisis; there is a clustered pattern; the heterogeneity economic states in specializations.

The enlargement of EU in 2004 and 2007 generated the existence of EU-15 (the old members), CEE-8 and EU-12 (Malta and Cyprus being closer to the old than the new) determined also the interest of analyzing the catching up process. Cieślik and Wciślik (2020) studied the CEE-8 convergence to the EU-15 and among them and find out that inside CEE-8 there is convergence since between CEE-8 and EU-15 there is no convergence, except convergence to France and Germany. The cohesion policies are having a wide positive result in terms of growth and employment, not only on the disadvantaged regions or less developed, but the impact is not the same, there are consistent differences (Crescenzi and Giua, 2020; López-Bazo, 2021). The positive effect is visible on the CEE countries as new EU members (Dyba et al., 2018).

Żuk and Savelin (2018) studied the Central, Eastern and South Eastern European countries (CESEE) including 3 categories: new EU member state + euro zone, new EU state and candidate states, the common characteristics is the former centralized economy. One of the conclusions was that the CESEE countries succeeded in diminished the gap in terms of GDP/capita towards E-15. A club convergence was analyzed from the perspective of innovation activities and the findings are confirming the existence of seven clubs (Barrios, Flores and Martínez, 2019) as a potential leverage of growth and employment tool.

2. Research methodology

The method used to calculate the time needed to reach the convergence is the intersection of the development curves (Iancu, 2007). The development equations for Romania and European countries are:

$$Y_{tR} = Y_{0R}(1 + r_R)^t \quad (1)$$

Where: Y_{tR} is the Romanian GDP at the time 't'

Y_{0R} is the Romanian GDP at the time '0'

r_R is average region rate of growth for GDP

The same equation is used for the European countries:

$$Y_{tE} = Y_{0E}(1 + r_E)^t \quad (2)$$

Where: r_E is elevation rate

The convergence is reached when:

$$Y_{tR} = Y_{tE} \quad (3)$$

$$Y_{0R}(1 + r_R)^t = Y_{0E}(1 + r_E)^t \quad (3')$$

't' being the time of the equilibrium, that can be calculated with the equation:

$$t = \frac{log\, Y_{0E} - log\, Y_{0R}}{\log(1+r_R) - \log(1+r_E)} \quad (4)$$

The data used are for 2000 and 2018, offered by Eurostat for EU26+UK+IS.

3. Results and discussions

3.1. β Convergence for NUTS 0

Assessment of the time needed for convergence between Romania and the richest EU countries, EU average in relation to annual averages of GDP / capita at NUTS level 0 represents the convergence at the country level.

Table no 1. Romanian β Convergence for NUTS 0

Year		**2010**	**2018**
Y Maximum UE (26+UK-IS) NUTS0, ($PPP 2015)		**101148**	**106675**
name NUTS0		LU Luxembourg	LU Luxembourg
Elevation rate rE max NUTS0 (%):			5.46
Y Medium UE (26+UK-IS) NUTS0, ($PPP 2015)		**36314**	**41447**
name NUTS0		calculated	calculated
Elevation rate rE medium NUTS0 (%):			14.13
Convergence time NUTS0		**t max level Y NUTS0 (LU00 Luxembourg)**	**t medium UE (26+UK-IS) NUTS0**
Ro	Romania	5.1	2.8

Based on the convergence time Y max we can see from the Map 1 that:

- Romania time is 5.1 years, placing us in the Baltics countries cluster: Lithuania, Estonia and Latvia with times between 0.1-5.5 years. This cluster has the highest rates of growth of GDP/capita for 2010-2018, higher than 42%;
- Italy and Greece are having negative growth rates for 2010-2018, of -1.46%, respectively -13.64%. Keeping this trend there are less chances to reach the convergence GDP/capita;
- Finland has a high GDP/capita of 43,236 $PPP for 2015, but has a low rate of growth for PIB/capita 2010-2018 of about 4.88% driving to a large period of time to reach the convergence;
- France, Spain, Austria, Portugal and Belgium are having a similar pattern with Finland. The GDP/capita is lower, but the growth rates are higher of about 7-8%, figures that are driving to a convergence time of about 29 years.

The convergence time to the Y_{medium} (Map 2) highlights:

- The time for is Romania 2.8 years, including it in the same cluster with Poland, Czech Republic, Belgium and Lithuania with values between 2.4-3.3 years;
- Italy and Greece with the mentioned above negative growth rates are having a low expectation to reach the convergence;

- Spain, Portugal and Slovenia (in blue color) are close to the medium level, even if the elevation rate is under the median;

- Ireland reached the target 3.5 years ago;

- For France, UK, Italy, Estonia, Finland and Latvia the GDP/capita in 2010 is about 36 mii de $PPP 2015, and the growth rates are positive, they reach the convergence from the beginning;

- Germany, Denmark, Slovakia, Austria, Netherland, Luxemburg are having growth rates above the elevation rates, but they already have high GDP/capita. Bulgaria could be included in this cluster even if it has a lower GDP/capita but a very high rate of growth.

Map 1 – Convergence time at the NUTS0 level, 2010-2018, Maximum elevation rate

Map 2 – Convergence time at the NUTS0 level, 2010-2018, Medium elevation rate

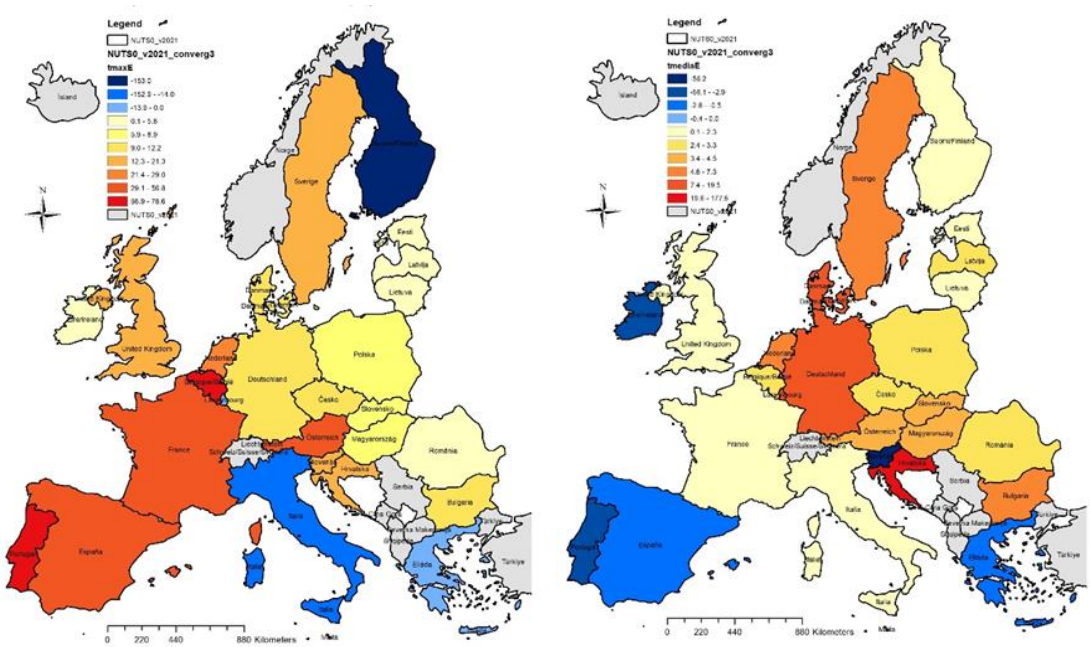


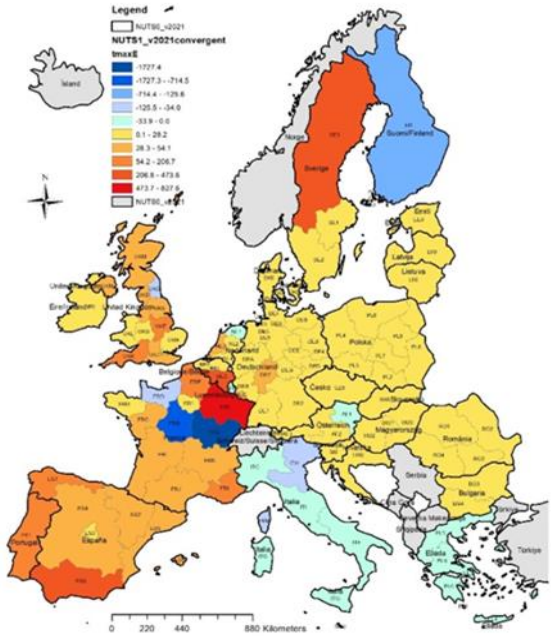
Figure no. 1 Convergence time for EU 26 + UK + IS, at the NUTS0

3.2. β Convergence for NUTS 1

Table no 2. Romanian β Convergence for NUTS 1

Year		2010	2018
Y Maximum UE (26+UK-IS) NUTS1, ($PPP 2015)		**101148**	**106675**
name NUTS1		LU0 Luxembourg	Mainland Finland
Elevation rate rE max NUTS1(%):			5.46
Y Medium UE (26+UK-IS) NUTS1, ($PPP 2015)		**36205**	**39969**
name NUTS1		calculated	calculated
Elevation rate rE medium NUTS1 (%):			10.40
Convergence time NUTS1		**t max level Y NUTS1 (LU00 Luxembourg)**	**t medium UE (26+UK-IS) NUTS1**
RO1	Macroregion one	5.3	2.7
RO2	Macroregion two	5.9	3.5
RO3	Macroregion three	4.2	1.3
RO4	Macroregion four	6.1	3.1

Map 3 – Convergence time at the NUTS1 level, 2010-2018, Maximum elevation rate



Map 4 – Convergence time at the NUTS1 level, 2010-2018, Medium elevation rate

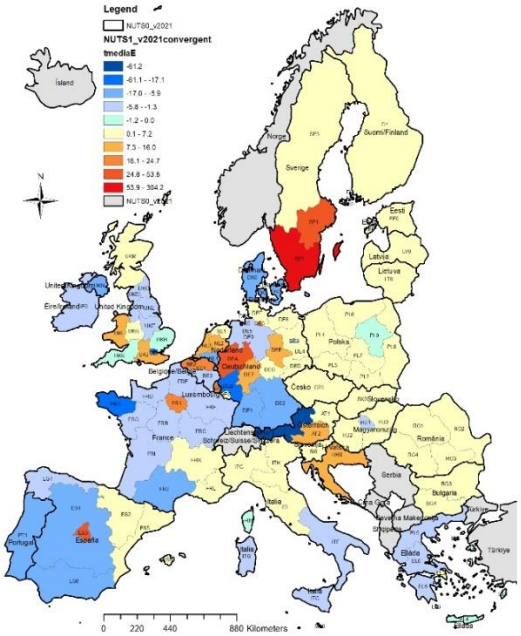


Figure no. 2 Convergence time for EU 26 + UK + IS, at the NUTS1

The spatial pattern at the level of NUTS1 with convergence objective Y_{max} NUTS1 for EU countries is structured in 4 clusters:

- Central and Eastern Europe, including South regions of Sweden, is homogeneous, with a low time to reach the convergence target and a high rate of GDP/capita growth;
- Mediterranean zone, Italy and Greece are characterized by negative initial rate of growth for GDP/capita;
- France partially, Spain, Portugal and UK are in the area with large convergence time based on the relatively small growth rates of GDP/capita between 5.046% to 7.6%, with an elevation rate of 5.46%;
- Regions France B, C, D, Y, M, Finland 1, Portugal 2, UK C, Italy H, Spain 7 are having growth rates of GDP/capita between 1.76%-5.46%

If we consider the convergence with Y_{medium} NUTS1 the pattern for EU countries are simpler:

- One cluster with relatively short time to convergence 0.1-7.2 years, including Central and Eastern Europe, North of the Mediterranean Basin (yellow). *Romania belongs to this cluster;*
- Second cluster (in blue) including the regions that locks like already reached the convergence including West and North Europe, partially South Italy and Greece. This cluster has to be deeply analyzed to confirm the finding.
- The Outlier cluster including regions with extreme values:

- Minimal values with t<-17.1, including Austria 3, Germany B, UK I, France H (dark blue)

- Maximal values with t>7.3, including UK J, L, Germany 5, 6, 7, A, E, Netherland 2, 3, Hungary 0, Austria 2, Belgium 2, Luxemburg 0, France 1, Spain 3, Slovenia 1, 2.

3.3. β Convergence for NUTS 2

The spatial pattern for NUTS2 level having as objective of convergence Y_{max} NUTS2 is structured in 4 clusters for EU countries:

- Cluster with problematic time of convergence from – 4264 to -31 years. It is a cluster characterized by small rates of GDP/capita growth between 2.72% to 5.5%, including east Germany (dark blue);

Cluster with negative/problematic time of convergence from -31 to 0 years, cluster characterized by small rates of GDP/capita growth between -24.95% to 1.2%, including Scandinavian Peninsula, Iberian Peninsula, Italy, Greece and UK (light blue and green);

Table no 3. Romanian β Convergence for NUTS 2

Year		**2010**	**2018**
Y Maximum UE (26+UK-IS) NUTS2, ($PPP 2015)		**101148**	**106675**
name NUTS2		LU00 Luxembourg	LU00 Luxembourg
Elevation rate rE max NUTS2 (%):			5.46
Y Medium UE (26+UK-IS) NUTS2, ($PPP 2015)		**35817**	**39357**
name NUTS2		calculated	calculated
Elevation rate rE medium NUTS2 (%):			9.88
Convergence time NUTS2		**t max level Y NUTS2 (LU00 Luxembourg)**	**t median UE (26+UK-IS) NUTS2**
RO11	**North-West**	5.2	2.6
RO12	**Centrum**	5.5	2.6
RO21	**North-East**	6.2	3.8
RO22	**South-East**	5.4	2.9
RO31	**South - Muntenia**	6.7	3.7
RO32	**Bucharest - Ilfov**	3.0	-0.5
RO41	**South-West Oltenia**	5.7	3.1
RO42	**West**	6.7	2.9

Map 5 – Convergence time at the NUTS2 level, 2010-2018, Maximum elevation rate

Map 6 – Convergence time at the NUTS2 level, 2010-2018, Medium elevation rate

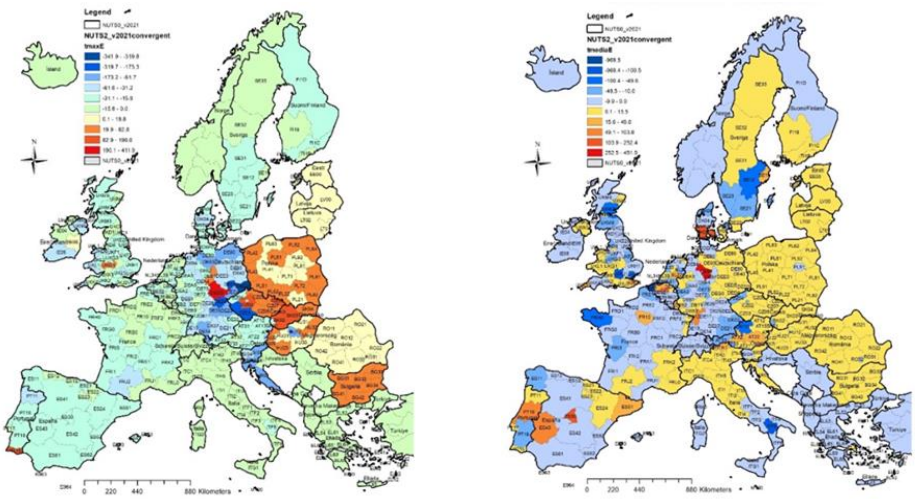


Figure no. 3. Convergence time for EU 26 + UK + IS, at the NUTS2

- Cluster with time of convergence relatively short, between 0.1-19 years, characterized by high rate of DGP/capita growth from 8.2% to 52% (higher than the elevation rate), including Eastern Europe, especially Central Poland and Hungary, and Baltics (Lithuania, Latvia, Estonia), a region of Ireland (yellow). *Romania belongs to this cluster;*

- Cluster with the time of convergence long, between 19-82 years, cluster characterized by high rates of GDP/capita growth from 5.53% to 13.37%, including Eastern Europe, especially borders regions of Poland, Hungary and Bulgaria, and Outliers Spain 61, UK E3, UK J2, UK K1.

The convergence objective pattern Y_{medium} NUTS2 is structuring the EU countries also in 4 clusters:

- Cluster with problematic convergence > - 969 years (dark blue), characterized by small rates of GDP/capita growth, represented by the Eastern Germany;

- Cluster with negative/problematic convergence time from -969 to 0 years, cluster including Scandinavian Peninsula, Iberian Peninsula, Italy, Greece and UK (light blue);

- Cluster with relatively short time of convergence from 0.1 to 15.5 years (yellow), cluster grouping the Eastern Europe, especially Central Poland, Hungary and (Lithuania, Latvia, Estonia), a region of Ireland. ***Romania belongs to this cluster;***

- Outliers with a convergence time very long over 165 years (red, light red), characterized by high rates of growth, between 9.7% and 9.9%. Among the outliers are Spain 30, Belgium 24, Denmark 03 and Germany 92.

Conclusions

The evolution of Romania in the studied period 2010-2018 was to convergence at all NUTS levels, based on a high and continues GDP/capita growth. Romania comply with the cohesion policies and there are particular findings are the convergence with the maximal and median values. The spatial patterns of β convergence are having a high grade of similarity for all studied levels.

For the convergence with the median values, in the studied period of time 2010-2018, all Romanian regions are convergent with the EU, regardless the disaggregation level (NUTS1, NUTS2). The national average at NUTS 0 is close to the EU NUTS 0 minimum.

The situation is different for the convergence of the Romanian territories from the EU maximal, depending on the level of territorial disaggregation. The convergence trend is manifested only for the most aggregated level (NUTS1), for the NUTS 2 level there are situations of opposite directions (divergence).

Romania is in the cluster with high convergence rate, the short duration of convergence is supported by the hypothesis of maintaining high rates of GDP/capita growth at all 3 levels of disaggregation. The pattern of β convergence given by the duration estimate for reaching the objective is different between average and maximum:

- Pattern for maximum, regardless of level, indicates the move of the Performance Center to the geographic center of the continental shelf. The parent is strongly influenced by the ability to achieve high GDP / capita growth rates. With the increase in the level of granularity, the transition to NUTS3 level, the trend of increasing regional disparities at this level becomes visible, especially in Western Europe, especially in France, Spain, Portugal and the United Kingdom;

- The average pattern, regardless of level, indicates the presence of the Performance Center in Baden-Wittenberg and Bavaria.

We can appreciate that Romania followed a "catching up" process with the EU countries at all levels of regional disaggregation, with different speeds. Being a CEE country (new member), Romania had the target of reaching the convergence with the Western countries (old members). At first site, it looks that the cohesion policies were at least partially successful and the process should continue.

Also, the studied literature highlighted that better results are obtained using different tools of measuring the convergence process. This is one of the limits of the study and further developments have to be done.

A second limit is related to the crisis, as Monfort (2020) demonstrated the convergence is affected, slowdown or jeopardize the results. The nowadays are at a presumptive end of health crisis COVID-19 and there rate consistent signals of an energetic crisis, a food crisis and a large scale military conflict. They are affecting the economic growth and probably the convergence, but not necessarily in the way it does before, there are, in our opinion plenty chances to have at the end of this disruptions period a new economic framework ant the EU level.

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Seasonal Deviations in Tourist Accommodation Establishments in Romania and Portugal - A Quantitative Analysis

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Abstract

This article aims to characterize the hotel industry in Romania and Portugal. For this purpose, the authors use a set of statistical indicators, also applying the Buys Ballot model. The results show that, between 2015 and 2020, in Romania and Portugal, in the months of June, July, August, September and October the seasonal factor deflected the number of nights spent by domestic tourists over the trend line. Thus, the seasonal factors varied between 0.065 and 0.454 in Romania and between 0.02 and 0.388 in Portugal. It should be mentioned that, in the period 2015-2019, on average, the share of domestic tourists' overnight stays reached 29.2 percent in Portugal and 79.3 percent in Romania of the total overnight stays, the first country being mainly focused on non-residents tourists originated from EU Member States. Moreover, the GDP per capita at constant 2010 prices stood at EUR 17,628 in Portugal, 2.1 times higher than in Romania. In this context, in the case of hotels and similar accommodation, the turnover had an annual variation rate of 10.8 percent in Romania, compared to 11.6 percent in Portugal. Instead, in 2020, due to the COVID-19 pandemic, in Portugal and Romania, domestic tourists held 52.0 percent and 91.8 percent respectively of nights spent in hotels and similar accommodation. These results may allow better decision-making by hotel managers in Portugal and Romania, particularly in this post-pandemic period in which it is necessary to relaunch the strong dynamism that characterized the sector.

Keywords

Tourism, Hospitality Industry, Tourist Accommodation, Financial Performance, Buys Ballot Model.

DOI: 10.24818/BASIQ/2022/08/105

Introduction

Tourism is considered the most coveted activity in the world, considering the growing number of destinations around the world that have been investing in this activity over the past decades, making it the major driver of socioeconomic progress through the creation of jobs and companies, export revenues and infrastructure development, leading to a continuous expansion and diversification that reveals it as one of the fastest growing economic sectors in the world. In this context, it is worth noting the strategic role of the hotel industry (Mucharreira et al., 2019).

The macroeconomic context is an extremely important factor for the growth and development of companies, and tourism sector organizations are particularly exposed to economic cycles, namely hospitality companies. In addition to many other factors, seasonality influences tourist demand and consequently financial performance (Mucharreira et al., 2019). The expansion and growth of tourism can also have a strong influence on the business performance of the hotel industry. On the one hand, the

expansion of industry or tourism activities directly increases the development of the hotel industry, increasing the occupancy rate and, consequently, sales revenue. On the other hand, the development of

tourism can significantly improve the business environment, which has an indirect effect on the business performance of hotel companies (Chen, 2010; Mucharreira et al., 2019). Seasonality is largely considered as a physiological characteristic of tourism, and it has been taken for granted as an inevitable feature of this economic sector of activities, being a factor with very wide-ranging causes and impacts (Cannas, 2012).

This research intends to carry out a brief characterization of seasonal deviations in tourist accommodation establishments in Romania and Portugal in recent years, prior to the pandemic crisis. For this purpose, the authors implemented a Buys Ballot Model to characterize the situation of these two countries in the period between 2015 and 2020. The COVID-19 pandemic crisis has severely affected the entire economy, but the tourism sector has been particularly affected. Any pandemic crisis has a social, political and economic impact which put any nation into a difficult state and brings huge challenges to the modern world (Lima Santos et al., 2021; Gambara, Basco and Mucharreira, 2021).

The paper is structured as follows. After the introduction, a section describes the evolution of hotels and similar accommodation demand in Romania and Portugal. Section 3 presents the employed methodology and the fourth data used and the model estimation. Fifth section discusses the results, and the paper ends with the conclusions.

1. Hotels and similar accommodation, in Romania and Portugal

Table 1 presents some indicators that help to characterize the hospitality sector in Romania and Portugal.

Table no. 1. Main economic indicators by CANE Rev.2 activity - 5510 Hotels and similar accommodation in Romania and Portugal, 2015-2019

	Enterprises (number)		Persons employed (number)		Value added at factor cost in production value (percent)		Turnover (EUR mill.)		Investment rate (percent)	
	RO	PT	RO	PT	RO	PT	RO	PT	RO	PT
2015	2,339	4,180	37,078	51,380	40.5	47.5	931.7	2,876.90	51.6	53.3
2016	2,382	4,334	38,917	55,277	44.3	48.6	1,009.50	3,340.70	46.9	54.5
2017	2,403	4,405	39,136	59,506	47.1	50.6	1,079.20	4,013.10	37.5	51.5
2018	2,439	4,511	39,843	63,504	48.4	49.7	1,205.70	4,149.10	39.1	49.9
2019	2,466	4,686	40,596	66,410	50.0	48.9	1,407.00	4,463.50	65.4	54

Source: EUROSTAT

At level of CANE Rev.2 - 5510 Hotels and similar accommodation, in the period 2015-2019, the number of enterprises rose gradually from 2,239 to 2,466 in Romania and from 4,180 to 4,686 in Portugal. The turnover had an annual variation rate of 10.8 percent in Romania, compared to 11.6 percent in Portugal. It should be mention that the number of persons employed per enterprise ranged between 15.9 and 16.5 in Romania and between 12.3 and 14.2 in Portugal. Moreover, in Romania, the investment rate decreased from 51.6 percent in 2015 to 37.5 percent in 2017, followed by an ascending trend during the interval 2018-2019 up to 65.4 percent. On the other hand, in Portugal, the investment rate was 53.3 percent in 2015 and 54.5 percent in 2016, oscillating around the value of 50 percent during the next three years (Table 1).

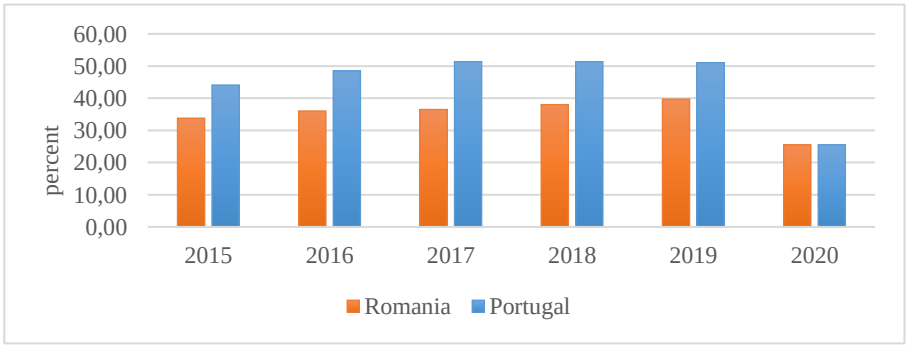


Figure no. 1. Net occupancy rate of bed-places in hotels and similar accommodation in Romania and Portugal, 2015-2020

Source: EUROSTAT

In Romania and Portugal, the net occupancy rate of bed-places in hotels and similar accommodation was less than 52.0 percent, between 2015 and 2020 (Figure 1).

Table no. 2. Number of overnight stays in hotels and similar accommodation in Romania and Portugal, 2015-2020

	Overnight stays, total		of which:			
			Foreign tourists		Domestic tourists	
	Romania	Portugal	Romania	Portugal	Romania	Portugal
2015	19,749,508	50,627,129	4,100,387	35,474,514	15,649,121	15,152,615
2016	21,232,963	55,258,227	4,399,597	39,326,453	16,833,366	15,931,774
2017	22,241,911	59,534,386	4,799,993	42,852,697	17,441,918	16,681,689
2018	23,335,367	58,700,513	4,854,167	41,517,325	18,481,200	17,183,188
2019	24,328,701	59,946,819	4,804,038	42,043,190	19,524,663	17,903,629
2020	11,320,667	21,496,853	931,467	10,324,556	10,389,200	11,172,297

Source: EUROSTAT

In 2020, in hotels and similar accommodation, due to the COVID-19 pandemic, the overnight stays totaled 11,320.7 thousand in Romania and 21,496.8 thousand in Portugal, down 49.9 percent and 62.2 percent respectively versus 2015-2019 average. Moreover, it is noteworthy that, in the 2 countries mentioned above, domestic tourists held 91.8 percent and 52.0 percent respectively of the total overnight stays (Table 2).

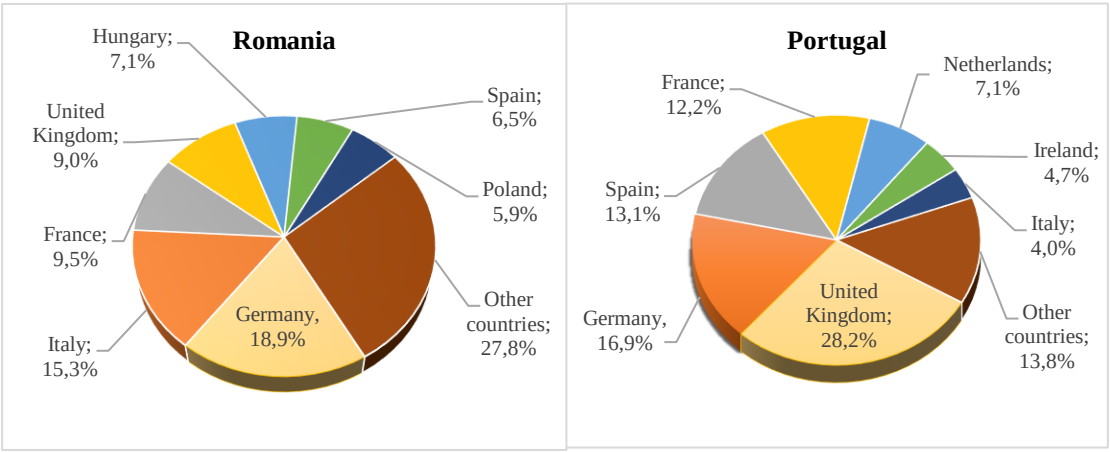


Figure no. 2. The distribution of the overnight stays of foreign tourists from EU countries in hotels and similar accommodation in Romania and Portugal, average 2015-2019

Source: EUROSTAT

Regarding the overnight stays of foreign tourists from EU countries in hotels and similar accommodation, between 2015 and 2019, on average, in Romania, the largest share was held by those coming from Germany (18.9 percent of the total of EU foreign tourists), followed by those from Italy (15.3 percent) and France (9.5 percent). Instead, in Portugal, the highest weights had visitors arrived from United Kingdom (28.2 percent of the total of EU foreign tourists) and Germany (16.9 percent) (Figure 2).

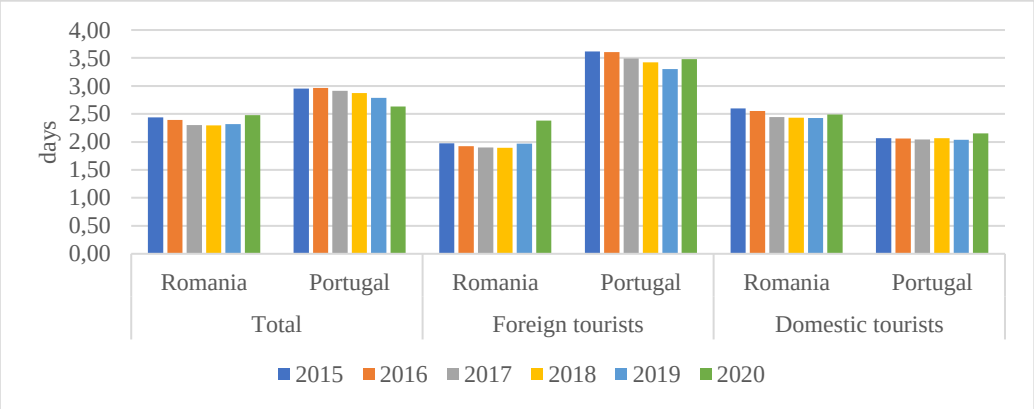


Figure no. 3. The average time of stay in hotels and similar accommodation in Romania and Portugal, 2015-2020
Source: EUROSTAT

In the case of hotels and similar accommodation, in Romania, in the period 2015-2019, the average length of stay was 2.3 days (1.9 days for foreign tourists), compared to 2.9 days (3.5 days for foreign tourists) in Portugal. In 2020, the average length of stay for domestic tourists equaled 2.5 days in Romania and 2.2 days in Portugal, amid tightening restrictions due to increasing COVID-19 cases (Figure 3). It should be noted that, as of December 30, the total number of confirmed cases of people infected by coronavirus reached 627,941 in Romania and 406,601 in Portugal.

2. Research methodology

In this paper, we will use the Buys Ballot model, that consists in the simultaneous investigation of the trend and the seasonality. According to Enache (2015), the model can be utilized if the time series satisfy 3 conditions:

- the evolution of trend is linear: $Y_t = \Theta_1 t + \Theta_2$
- the seasonal variation is relatively constant over time: $s_j = s_t = ct$

where:

$t = j + k(i-1)$

$j = \overline{1,k}$ the number of subperiods

$i = \overline{1,p}$ the number of periods

s_j – the seasonality coefficients of subperiod j

$s_t = s_{j.i}$ - the seasonality coefficients of subperiod j in periods i

- the investigated phenomenon shows a random nature (type bruit blanc) e_t.

In these conditions, the additive decomposition method is appropriate for modeling time-series data.

$$y_t = \Theta_1 t + \Theta_2 + s_j + e_t \quad (1)$$

Or:

$$y_t = \Theta_1 t + \Theta_j + e_t \quad (2)$$

Where: $\Theta_j = \Theta_2 + s_j$

Replacing in the model $t = j + k(i-1)$, by using the method of least squares, we estimate parameters Θ_1 and Θ_j on the basis of which we will calculate the coefficients of seasonality, s_j, and the value of term Θ, which can be determined in the following way:

$$\hat{\theta}_1 = \frac{1}{p(p^2-1)}\left(\sum_{i=1}^{p} i \sum_{j=1}^{k} \frac{y_{ij}}{k} - \frac{p+1}{2k}\sum_{i=1}^{p}\sum_{j=1}^{k} y_{ij}\right) \quad (3)$$

$$\hat{\theta}_2 = \sum_{i=1}^{p}\sum_{j=1}^{k} \frac{y_{ij}}{pk} - \hat{\theta}_1 \frac{pk+1}{2} \quad (4)$$

$$\hat{s}_j = \sum_{i=1}^{p} \frac{y_{ij}}{p} - \sum_{i=1}^{p}\sum_{j=1}^{k} \frac{y_{ij}}{pk} - \hat{\theta}_1 \left(j - \frac{k+1}{2}\right) \quad (5)$$

The model (1) can be equal to a multiplicative model after performing the logarithmic transformation as the linear relationship does not affect the variables, only the parameters:

$$\ln(y_t) = \Theta_1 t + \Theta_2 + s_j + e_t \quad (6)$$

Where:

$\Theta_1=\ln(1+\Theta_1')$; $\Theta_2=\ln(\Theta_2')$; $s_j = \ln(s_j')$; $e_t = \ln(u_t)$.

As a result, the multiplicative model will be as follows:

$$y_t = \Theta_2' s_j' u_t (1+\theta_1')^t \quad (7)$$

A supplementary condition, related to the seasonal factors postulates the presence of offsetting seasonal movements per cycle:

$$\sum_{j=1}^{k} s_j = 0 - \text{for additive model;}$$

$$\sum_{j=1}^{k} s_j = \sum_{j=1}^{k} ln(s_j) = 0 \rightarrow \prod_{j=1}^{k} s_j = 1 - \text{for multiplicative model.}$$

3. Data description, model estimation and results

The Buys Ballot model is used to study the variation in the nights spent by domestic tourists in hotels and similar accommodation in Romania and Portugal, in the period 2015M01-2020M12.

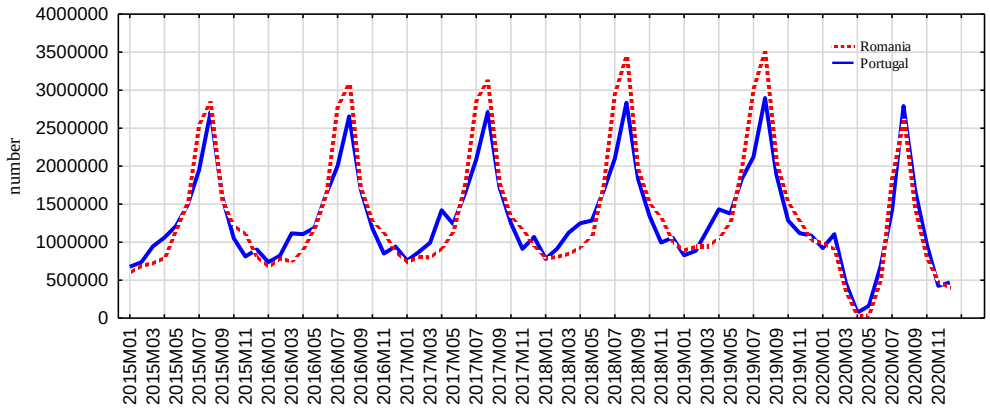


Figure no. 4. Nights spent by domestic tourists in hotels and similar accommodation in Romania and Portugal, 2015 M01-2020M12

Source: EUROSTAT

In the period 2015-2020, the monthly average number of nights spent by domestic tourists at tourist accommodation establishments (which includes hotels and similar accommodation) equaled 1,365,531.5 in Romania and 1,305,905.4 in Portugal. In addition, the coefficients of variation stood at 59.9 percent for Romania, compared to 47.7 percent for Portugal, indicating that the two series investigated are not homogeneous. The kurtosis values were found to be 0.48 in the case of Romania and 0.6 in the case of Portugal. In addition, the skewness values reached 1.08 for Romania and 0.86 for Portugal, illustrating that the 2 distributions are highly and moderately skewed respectively. The autocorrelation and partial autocorrelation coefficients show that the both investigated data series are not stationary and they have been affected by seasonality (Figure 5).

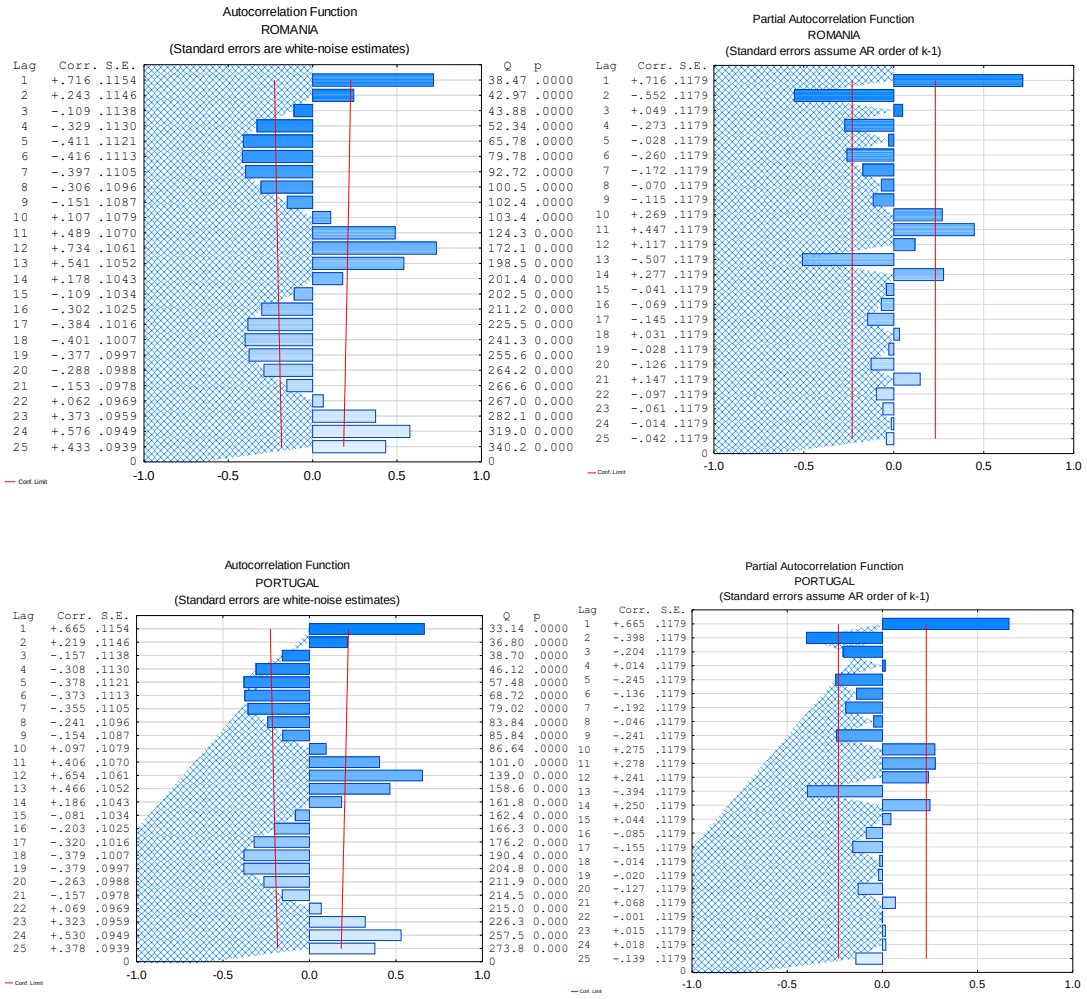


Figure no. 5. Autocorrelation and Partial Autocorrelation Functions
Source: Own calculations based on Eurostat data, using Statistica 13.0

The estimation of the 2 components of the investigated time series (trend and seasonality) based on the Buys Ballot model in the multiplicative variant, is done with the help of the relations:

- for Romania:

$$\ln\left[\hat{y}_{j+m(i-1)}\right] = 6.1813 - 0.038[j + k(i-1)] + \hat{s}_j$$

- for Portugal:

$$\ln\left[\hat{y}_{j+m(i-1)}\right] = 6.1539 - 0.026[j + k(i-1)] + \hat{s}_j$$

Where:

$\hat{s}_j$	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12
RO	-0.178	-0.144	-0.213	-0.334	-0.212	0.104	0.381	0.454	0.204	0.065	-0.013	-0.114
PT	-0.18	-0.124	-0.101	-0.173	-0.111	0.093	0.229	0.388	0.188	0.02	-0.134	-0.095

The results show that in Romania and Portugal in the months of June, July, August, September and October the seasonal deviations were positive. In August, the seasonal factor deflected, on average, the number of nights spent by domestic tourists at tourist accommodation establishments (which includes hotels and similar accommodation) with 0.458 nights in Romania and 0.388 nights in Portugal over the trend line (peaks of activity). At the same time, in all the months between November and May the seasonal deviations were negative (below the trend line).

The 2 models are statistically valid, as long as the calculated values of the F-test are 241.22 (Significance F: 0.000) in the case of Romania and 316.29 (Significance F: 0.000) in the case of Portugal, explaining 77.5 percent and 81.9 percent respectively of the variation in the nights spent by domestic tourists in hotels and similar accommodation. The coefficients of the 2 models proved to be statistically significant after the Student's t-test was applied.

4. Discussions

The tourism and hotel sectors are the sectors that suffer the most fluctuations throughout the year, and it can be divided into three seasons - high, medium, and low. Seasonality is the phenomenon that implies the variation in the number of tourists in a region, consequently threatening regional development. With a greater or lesser impact, seasonality extends across all tourist companies, regardless of industry, location, target audience or quality of service provided (Nunes et al., 2021).

In Romania and Portugal, in the period 2015-2020, the seasonal factor deflected the number of nights spent by domestic tourists in hotels and similar accommodation over the trend line during June to October. At the same time, in all the months between November and May the seasonal deviations were negative (below the trend line).

These results were achieved in the condition that, on average, during the period 2015-2019, the share of domestic tourists' overnight stays reached 29.2 percent in Portugal and 79.3 percent in Romania of the total overnight stays, the first country being mainly focused on foreign tourists from EU countries. An analysis of the annual variation rate for the number of nights spent by domestic tourists reveals that some of the highest growth rates were recorded in the Região Autónoma dos Açores (12.8 percent, reaching 872.0 thousand nights), the Nord Vest region (7 percent, reaching 2,419.3 thousand nights), Alentejo (6.9 percent, reaching 1,356.3 thousand nights) and the Sud-Est region (6.4 percent, reaching 5,373.3 thousand nights). Another point worth noting is that, from 1 to 3 nights accommodation, on average, the Romanian tourists paid, EUR 22.31 per night, while the Portuguese tourists spent EUR 34.14 per night. Moreover, the GDP per capita at constant 2010 prices stood at EUR 8,212 in Romania, compared to EUR 17,628 in Portugal.

Instead, in 2020, due to the COVID-19 pandemic, in Romania and Portugal, domestic tourists held 91.8 percent and 52.0 percent, respectively, of nights spent in hotels and similar accommodation. In the two countries mentioned above, the most popular destinations were the Sud Est region and the Região Autónoma dos Açores. However, the bed occupancy net rate equalled 22.9 percent in Romania and 25.5 percent in Portugal. It should be noted that the number of confirmed cases on December 30, 2020 exceeded the threshold of 620,000 in Romania and 400,000 in Portugal. In fact, in Romania, 35.8 percent of hotels and similar accommodation were registered in towns and suburbs (down 0.3 percentage points against the average for 2015-2019), 35.4 percent in cities (down 0.3 percentage points) and 28.8 percent in rural areas (up 0.6 percentage points). Simultaneous, in Portugal, 38.7 percent of hotels and similar accommodation were reported in towns and suburbs (down 0.2 percentage points) and 24.8 percent in rural areas (down 1 percentage point). The revenue per available room was EUR 11.62 in Romania and EUR 22.6 in Portugal.

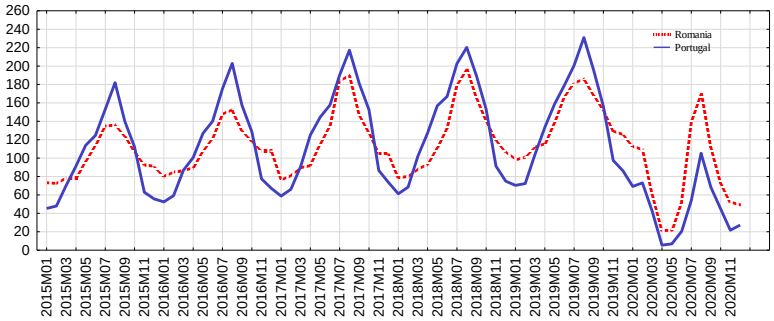


Figure no. 6. Index of turnover for accommodation in Romania and Portugal, 2015 M01-2020M12 (2015=100)

Source: EUROSTAT

Against this background, the monthly turnover index for a subset of tourism industries (accommodation) indicates a relatively stronger growth in Portugal in the period 2015-2019 than in Romania. In 2020, compared to Portugal, Romania's tourist accommodation activities were much more seasonal (Figure 6).

According to Nunes et al. (2021), seasonality must be studied and understood, so that the adaptation process to this factor is easier, thus allowing it to be possible to mitigate its negative effects and, also allowing to take advantage of the positive seasonality that exists throughout the year to create loyalty in the hospitality at various times of the year.

Conclusions

In the present study it was obvious the significant growth of the Romanian and Portuguese hospitality sector. Such growth is evidenced in the period 2015-2019, among other indicators, by the increase in the number of hotels and similar accommodation companies, the overnight stays recording a positive annual average dynamic. In fact, the overall picture of the total overnight stays spent by domestic tourists in hotels and similar accommodation is pretty comparable in the 2 investigated countries. Thus, in Romania, 40.5 percent of overnight stays were registered in cities, 38.9 percent in towns and suburbs and 20.6 percent in rural areas. At the same time, in Portugal, 42.0 percent of overnight stays were recorded in towns and suburbs and 38.6 percent in cities. Despite its geographical location, in Portugal only 20.3 percent of all nights spent by domestic tourists were recorded in coastal areas, compared to 19.3 percent in Romania. In 2020, due to the COVID-19 pandemic, in Romania and Portugal, domestic tourists held 91.8 percent and 52.0 percent, respectively, of nights spent in hotels and similar accommodation.

The use of the Buys Ballot model pointed that in August, on average, the seasonal factor deflected the number of nights spent by domestic tourists in hotels and similar accommodation with 0.458 nights in Romania and 0.388 nights in Portugal over the trend line (peaks of activity), for the period between 2015 and 2020.

The results may allow better decision-making by hotel managers in Portugal and Romania, particularly in this post-pandemic period in which it is necessary to relaunch the strong dynamism that characterized the sector.

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The Potential of Non-Fungible Tokens (NFTs) in Higher Education as Perceived by Romanian Students

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Abstract
Non-fungible token (NFT) is a distinctive, digitized, and encrypted token fabricated and stored using blockchain technology. Artists, filmmakers, photographers, game developers, and fashion designers sell their work on the NFT marketplace. Nevertheless, NFTs are no longer a concept associated with art and design and they are starting to be used in different sectors. Now, NFT is branching out to higher education, where students, tutors, and institutions can use NFTs for different purposes. Given these coordinates, in this article we have chosen to discuss the applicability of NFT related to higher education.
Thus, our paper presents, in the introductory part, the conceptual delimitations regarding NFTs. Areas of application, and the main ways of use in education, are presented next, showing that adoption of NFTs in higher education has been too little addressed in the literature. Most of the work in the field insists on the technical aspects and only subsidiarily deals with the issues regarding the level of understanding of the NFT concept by potential or actual users and the degree of adoption and use of these as solutions to some problems of higher education. In order to cover these gaps identified in the literature, we presented, in the second part of the paper, the methodology and results of an exploratory research, conducted on a sample of 383 students from Faculty of Business and Tourism – Bucharest University of Economic Studies, which allowed us to identify the level of understanding the concept, the degree of openness to the adoption of NFTs as diplomas/certificates/attestations for the recognition of studies/knowledge/skills/competences acquired in the formal education system, and, also, the associated benefits and challenges, from the perspective of the Romanian students.

Keywords:

NFT (Non-Fungible Token), blockchain, higher education, Romania.

DOI: 10.24818/BASIQ/2022/08/106

Introduction

According to Stătescu, Olteanu and Anghel, 2022, an *NFT (non-fungible token)* is a cryptographic code stored in the form of a smart contract that joins a static or dynamic icon, a sound, a combination of the two, or even an object with physical materiality. Their trading is done through digital markets using blockchain technology, trading is done freely. They are unique, indivisible, and non-fungible, and must belong to a virtual wallet to be traded.

Their uniqueness is that each transaction is integrated into the *blockchain*, so that you can always identify who the owners were and who owns it at any given time. Due to this transformation, the original cryptographic code is no longer entirely the same as it is today, if it has gone through at least one new transaction and thus the succession of transactions can be easily proven. The transfer of ownership is done through smart contracts that contain all the terms and conditions agreed by the parties regarding the operation involving the NFT.

Following a transaction of an NFT, the ownership of the artwork is not transferred, just a digital copy of the artwork is sold together with all the information about the transactions that have been made with it. The artwork remains the property of the creator and he can always create another digital copy to sell.

There are three ways we can own and use them. The first and most widely used is holding them in the form of virtual assets. Another way to use them is in the form of virtual keys. Holding an NFT provided by a virtual community allows access to the community only to those who hold such an item. The holder of an NFT can use it as collateral, which is the third way it can be used. It is important to mention that if a transaction takes place, the collateral is transferred to the new owner.

One of the applications of NFT is related to the field of *education.* NFTs can substitute for diplomas, recognitions, or certificates and securely verify academic credentials and achievements. Another benefit of non-fungible tokens is attributing authorship to the creators of different content or works, such as teachers and students. Given that these issues are addressed only in a few scientific papers (Sousa-Vieira, Ferrero-Castro and López-Ardao, 2022; Alammary et al., 2021; Pandey, 2021; Chen et al., 2018), we have considered them in this article. Thus, our paper presents, in the literature review part, the conceptual delimitations regarding NFTs and main areas of application, focusing on applicability in education, and then, the methodology and results of an exploratory research, conducted on a sample of 383 students from Faculty of Business and Tourism – Bucharest University of Economic Studies, which allowed us to identify the level of understanding the concept and the degree of openness to the adoption of NFTs in higher educations, from the perspective of the Romanian students.

1. Literature review

Blockchain is an emerging technology introduced in 2008, as part of an electronic payment system for the transactions of bitcoin cryptocurrency. Gilder (2018, p.241) describes blockchain as a "database, like a cadastre of real estate titles, extended to events, covenants, patents, licenses, or other permanent records. All are hashed together mathematically from the origin of the series, each record distributed and publicized on decentralized Internet nodes".

Recent research (Delgado-von-Eitzen, Anido-Rifón, and Fernández-Iglesias, 2021) has found that there are three main *blockchain types*:

- *Public*: these are open to anyone who wants to be part of the peer-to-peer network (i.e., Bitcoin and Ethereum).
- *Private*: participants may only join if they are invited and they have to follow the rules set by the organization that controls the network (i.e., Hyperledger).
- *Consortium*: a combination of private (participants may only join if they are invited), but there is a group of organizations that controls the network.

Blockchain technology has the following *major features*:

- *Immutability*: Blockchain's immutability consists of its impossibility for the data stored in the blocks to be changed (Raimundo and Rosário, 2021).
- *Dependability:* Blockchain technology provides a secure distributed ledger that is kept by all participants in the blockchain where it provides efficient, secured, reliable, and transparent systems (Bhaskar, Tiwari and Joshi, 2021).
- *Decentralisation:* Blockchain is decentralized because all nodes are joined together in an interconnected network (Shen and Pena-Mora, 2018) and anybody can directly access the system and store their assets such as cryptocurrencies, legal documents, licenses, and credentials (Son-Turan, 2022).
- *Traceability*: Blockchain traceability feature promotes the ability to recall of an event as each stored information is saved in blocks secured by the cryptographic unidirectional hash function (Chen et al., 2018).
- *Consensus algorithm*: Consensus algorithm refers to the mutual approval of all nodes associated with the blockchain network and uses the techniques of Proof-of-Work (PoW), Proof-of-Stake (PoS), and Delegated Proof-of-Stake (DPoS) (Balpande and Patil, 2021).

The progress in blockchain technology led to the development of two *main types of tokens*, fungible, and non-fungible tokens (Regner, Urbach and Schweizer, 2019)). *Fungible tokens* are identical and interchangeable tokens, while Non-Fungible Tokens (NFTs) are tokens that represent digital assets with a unique identifier that is stored on a blockchain. Valeonti et al. (2021, p.4) define a *non-fungible token (NFT)*

as a "cryptographically unique, indivisible, irreplaceable and verifiable token that represents a given asset, be it digital, or physical, on a blockchain".

In their current format, *NFTs* was implemented in 2017, when it was introduced the ERC-721 smart contract standard, which enables the birth of a new type of Ethereum tokens, with additional functions to ensure that tokens based on it are distinctly non-fungible and thus unique (Entriken et al., 2018). Afterwards, other ERC (Ethereum Request for Comments) standards for creating NFTs have also been proposed. The ERC-1155 multi-token standard outlines a smart contract interface that can represent any number of fungible and non-fungible token types (Radomski et. al., 2018). Another standard is EIP-2981, which enables universal support for royalty payments in all NFT marketplaces and ecosystems (Burks et al., 2020).

From its emergence until now, the non-fungible tokens (NFT) market has experienced a meteoric growth (Stătescu, Olteanu and Anghel, 2022), reaching a market capitalization of 21.33 billion USD in 2022 (The Business Research Company, 2022), with a forecast growth of more than 50% compared to 2021 when it was 14 billion USD (Dowling, 2022; Ko et al., 2022; Yousaf and Yarovaya, 2022).

With the emergence of this phenomenon has come a new way for content creators, and especially artists, to sell their works without the need for an intermediary. Those who buy can do so for two reasons, on the one hand to help artists to monetise their work, on the other they will buy with the hope that their value will increase over time and they will be able to sell at a profit. We must understand that their value only increases if someone is interested in them. There are many cases where resale has been done at prices much lower than the purchase value. Price movements do not depend, as in the case of shares on the stock exchange, on certain economic or technical indicators, but on the public's interest in them.

NFTs became one of the most widespread applications of blockchain technology that covers various domains. Rehman et al. (2021) found diverse applications of NFTs that are summarized in Table no. 1.

Table no. 1. Various applications of NFTs

Categories	**Applications**
Digital Art	Cryptokitties
Fashion	Luxurious digital wearables
Licenses and Certifications	Course completion certificates Degrees Licenses
Collectibles	Trading cards Memes Tweets
Boosting Gaming Potential	In-game objects In-game lands Avatars
Domain Names	Candy.com Sushi.com
Virtual Worlds	Metaverse, Decentraland
Sports	Digital autographs Avatars, Stickers, Tickets Game Highlights.

Source: Rehman et al., 2021, p. 4

Based on a systematic review of the scientific literature, Alammary et. al. (2021) show that the *key applications of NFTs for education* are related to: issue and verify academic certificates, share students' competencies and learning achievements, and evaluate their professional ability. In addition, blockchain technologies for education include securing a collaborative learning environment, protecting learning objects, fees, and credits transfers, obtaining digital guardianship consent, competition, and copyright management, enhancing students' interactions in e-learning, examination review and supporting lifelong learning. These blockchain technologies have great potential for education due to *benefits* like empowering learners, enhancing security and efficiency for educational institutions and students, and giving trust and transparency in our society (Pandey, 2021).

The use of tokens reduces the possibility of falsification while managing student records and credits, tracking lifelong learning progress, and preserving educational data. Also, in the educational field, copyright

protection for students' works and projects is not considered. For this reason, creative recognition is necessary. NFTs allow these achievements to be known and shared, giving the corresponding credit to the authors.

Vilchis (2022) sugests that the range of opportunities for NFTs stored reliably on the blockchain goes far beyond the classroom. For example, if a student lost their academic record or certificates, their credentials could be checked. Another added value of NFTs, mentioned by Bohnke (2022), is verifying non-formal learning. Information such as research experience, projects, skills, mentoring, and online learning can be added to the student's portfolio.

Employers, in turn, can more easily verify the qualifications and studies that graduates pass on in their resumes. Thus, a simpler path, facilitated by NFT, could create significant time savings for applicants and employers.

Also, NFTs could help students, who are in possession of evidence of their achievements, to support their arguments more easily in order to benefit from scholarships, internships, study opportunities abroad.

Nevertheless, we should also consider one of the disadvantages of NFT - it is tied to a platform where the link between an NFT and its owner is established. If that platform becomes non-existent in the future, information about the NFT's creator could be lost forever. But VCs (Verifiable Credentials) have no such dependency since they are not platform-specific.

2. Methodology

The *aim* of the research was to highlight the Romanian students' perception regarding the applicability of NFT in education.

Subsequent to this goal, the *main objectives* of our research were to:

- establish the level of understanding of the NFT concept;
- highlight the benefits and challenges related to NFTs, from the perspective of Romanian students;
- identify the extent to which respondents would consider it appropriate to receive diplomas/certificates/attestations and digital badges in NFT format.

This research was based on a *standard methodology*, which is applied in *opinion survey*. The method of data collection was the use of a *self-administered questionnaire*. The questionnaire was posted on the website *www.isondaje.ro* and was distributed as a link by e-mail to students and master students from Faculty of Business and Tourism – Bucharest University of Economic Studies. The beginning section of the questionnaire provides a brief explanation of its purpose to provide a common frame of reference for all potential respondents.

The *sample* used in the research was *383 persons*. Given the limited sample size, this online questionnaire-based study is exploratory research. Data collection took place *between March and April 2022*.

3. Results and discussions

The sample of our research consisted of 383 young people from Romania, 86.4% students and 13.6% master students at the Faculty of Business and Tourism – Bucharest University of Economic Studies. Most of the respondents (66.1%) are women - the explanation lies in the fact that the courses of this faculty are mainly attended by women.

45% of respondents had only a *basic understanding* of NFT. Also, most respondents did not sell (96%), buy (94%), or create (97%) NFTs.

Given the purpose of our research, it is important to note that very few students (4%) consider *education* as an area of applicability for NFTs, while most respondents appreciate that art (24%), marketing (23%), or gaming (22%) are areas where NFTs find their applicability.

However, respondents associate NFT with an original digital or virtual creation (28.5%), cryptocurrency (19.1%), digital asset (16.7%), or blockchain registry (15.2%). The association with blockchain is obvious, given the fact that, as shown in this paper, their uniqueness is that each transaction is integrated into the blockchain. Also, the association with cryptocurrencies occurs because their trading is done through cryptocurrencies. However, the difference between cryptocurrencies and NFTs is fungibility. NFT-utilities

are not interchangeable, mean that they cannot be exchanged for other items, which makes them unique and therefore valuable. Cryptocurrencies, on the other hand, are nothing more than virtual money that can be transferred from one owner to another, their code remaining the same no matter how many transactions they go through. The relationship between NFTs and cryptocurrencies is that you need a virtual wallet to be linked to. The virtual wallet can belong to a person or a marketplace.

The main reason for the use of NFTs by Romanian students is related to a *potential financial gain* (66%), followed by reasons like interest in emerging technologies, owning a genuine digital asset or entertainment. Again, we note that no answer correlates the purpose of using NFT with education, obtaining diplomas, certificates, assessments, etc.

The respondents were asked about the *advantages* of NFTs, considering as their main benefit the capitalization of an authentic digital work, as can be seen in Figure no. 1.

Regarding the *disadvantages*, the respondents consider as the most important the lack of regulations and control mechanisms, as can be seen in Figure no. 2. However, in our opinion, the fact that the NFT trading market is not yet regulated is both an advantage and a disadvantage. The advantage is that there are no restrictions on access to them, anyone can create and trade such digital assets, the disadvantage is that there are no regulations by which the authorities can intervene if legal disputes arise or illegal transactions take place.

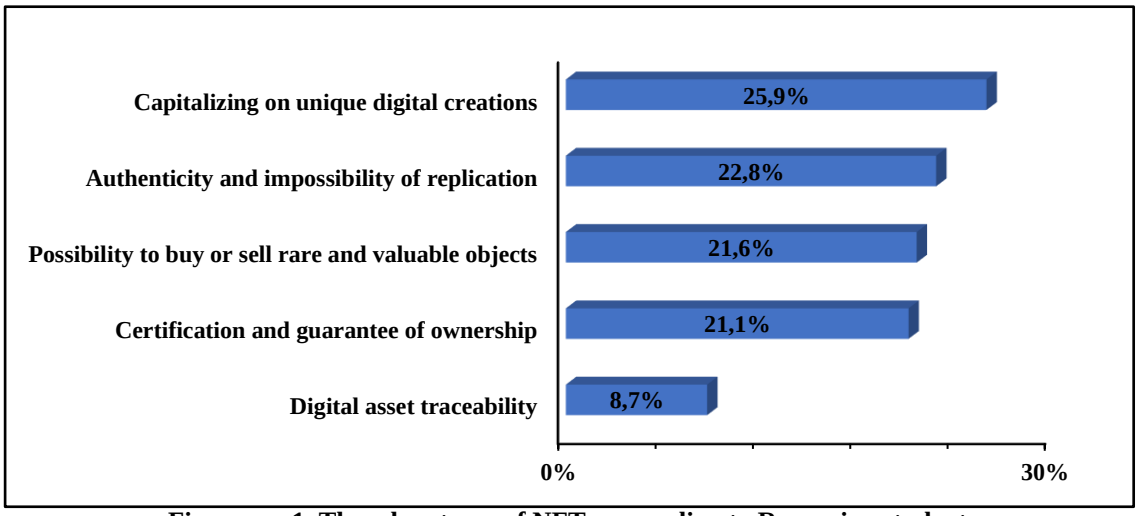


Figure no. 1. The advantages of NFTs, according to Romanian students
Source: Authors' own research

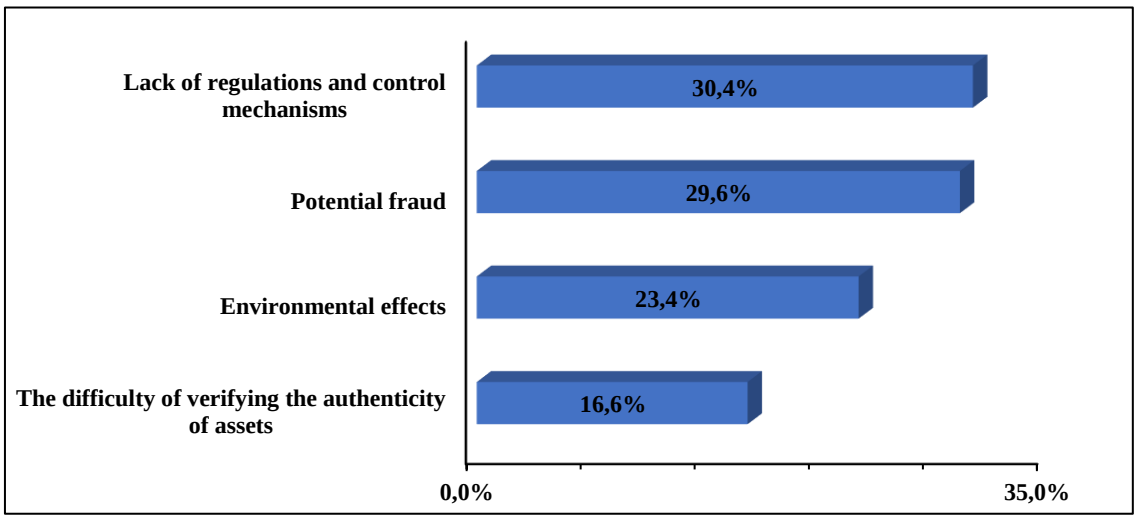


Figure no. 2. The disadvantages of NFTs, according to Romanian students
Source: Authors' own research

Universities world-wide have begun to offer NFTs. In this context, Romanian students were asked about the extent to which they would consider it appropriate to receive in NFT format *diplomas, certificates, and attestations* for the recognition of studies/knowledge/skills/competences acquired in the formal education system. A 5-levels scale was used for this question, from 1 ("to a very small extent") to 5 ("to a very large extent"). Most of the answers (32%) indicated a moderate openness regarding this approach, as can be seen in Figure no. 3. However, it is worth noting that 26% of respondents considered it appropriate to a large extent to receive diplomas and certificates in this format.

Likewise, respondents were asked about the extent to which they would consider it appropriate to receive *digital badges* as a result of fulfilling some criteria of reference in the learning experiences or for the accomplishment of some themes/projects/activities on the e-Learning/blended learning platforms. A 5-points scale was also used. In this case, most respondents (29%) chose the option "to a very large extent". Also, many respondents (28%) indicated the option "to a large extent", as can be seen in Figure no. 3. Thus, it is noted that Romanian students are more willing to receive digital badges in the form of NFTs than they are willing to accept diplomas and certificates in this way, which is understandable, given that these digital badges are not practically official documents.

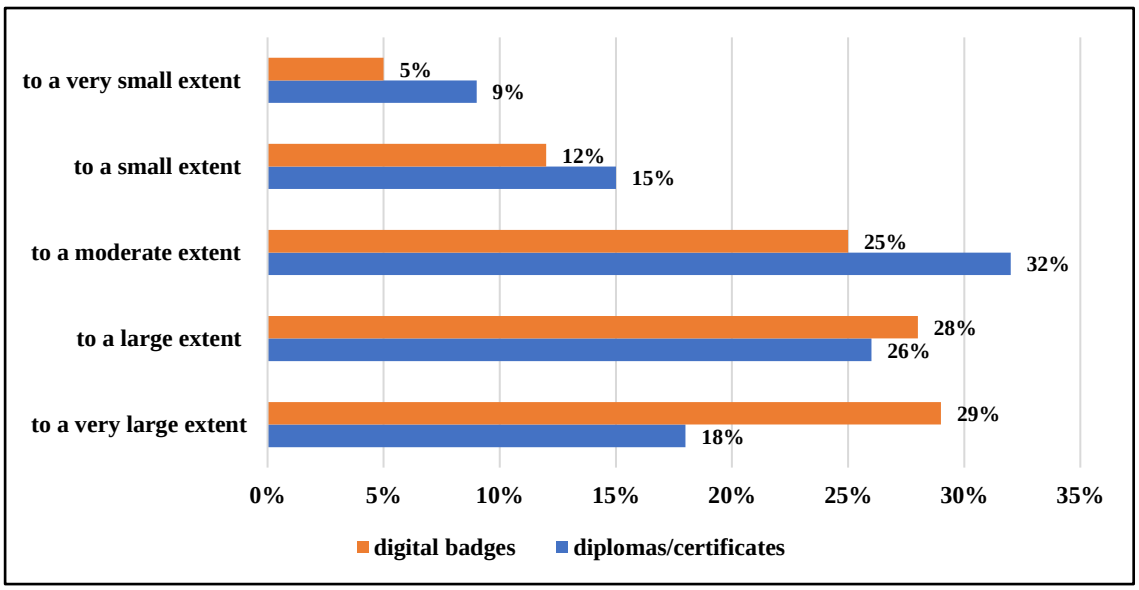


Figure no. 3. The extent to which Romanian students consider it appropriate to obtain diplomas/certificates and digital badges in NFT format
Source: Authors' own research

Conclusions

Our research has shown that Romanian students are open to using NFTs and would like an evaluation and reward system based on NFTs but are not as open to the idea of adopting NFTs as diplomas and certificates.

The adoption of such an evaluation and reward system based on NFTs would also mean the implementation of *gamification in higher education*. Evaluation and incentives are critical elements of the educational process. In addition, these are key ingredients for improving students' knowledge acquisition. For evaluation to be effective, an incentive must be linked to an achievement, or the process becomes meaningless. One of the most successful positive mechanisms known is gamification. In these systems the learning process is transformed into a game with a positive reward system. Historically, the implementation of such a gamification system it was very difficult to achieve due to the inadequacy of the support technology. Thus, a new approach to the use of non-fungible token (NFT) would be to implement a stimulus mechanism related to student assessments to positively stimulate both students and their teachers. This approach allows positive incentive reinforcement through the bragging rights and special access to benefits granted to the NFT holders, as the study of Sousa-Vieira, Ferrero-Castro and López-Ardao (2022) confirms.

The reluctance of Romanian students to obtain diplomas and certificates in the form of NFTs is understandable, given that respondents do not know very well the meaning and characteristics of NFTs and do not fully understand the benefits of using NFT in this domain. In fact, they do not even consider education as a main area for the application of NFTs, as our study has shown.

Obviously, our research has its limits, being carried out on a statistically insignificant sample. New research carried out on a larger number of students, from different specializations, but also taking into account other possibilities of application in education and the opinion of teachers and representatives of higher education institutions in Romania, would complete the overall picture regarding the perspective on the use of NFTs in higher education.

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Gender Differences in the Perception of Online Higher Education During COVID -19 Pandemic

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Abstract

Because of the COVID-19 pandemic, numerous countries introduced severe restrictions for social interaction, work, education and travelling. Education was abruptly transferred to online environment, without preparation time for taking into consideration the learning needs of students, generated by their personality, learning style, ICT skills and gender. As such, the perception of the higher education quality might have been impacted by this emergency online learning. The current paper aims to identify if the sudden experience of online education generated by pandemic is differently perceived by students of different genders. For this, the results of a quantitative research deployed on students from Bucharest University of Economic Studies, after one year of experiencing online learning, were analysed and interpreted in the light of previous research in the field. These results point to the fact that there are differences between genders in what concerns the time required by online learning and the perception of future perspectives of employment, as a result of the received online education.

Keywords

Gender perception, online learning, higher education, quality, Covid-19 pandemic

DOI: 10.24818/BASIQ/2022/08/107

Introduction

COVID-19 pandemic brought across the globe a crisis that required emergency measures. Almost all areas of activity were affected by these measures, the higher education making no exception from it. On campus education – including here teaching, learning and all related administrative activities, was disrupted, authorities aiming to limit as much as possible the social interactions, to stop the spreading of COVID 19 virus (UNESCO, 2021a).

It is debatable whether programs, methods, and materials designed for face-to-face interaction between professors and students, managed to be equally effective in this emergency online teaching. The rapid shift of courses and laboratories to online environment brought a certain heterogeneity in the methodology of teaching, as in in many cases professors had to use whatever was available and easier from their point of view, to communicate with students (Aguilera-Hermida et al., 2021).

Online learning, just as is the case of on-campus learning, should be crafted according to the particularities of the users. Personality traits, learning styles, previous educational background and gender can influence how the quality of the education is perceived (Bhagat, Wu and Chang, 2019; Yu, 2021; Hsiao, 2021). As such, the current paper aims to investigate whether there are differences between genders in the way quality of education is perceived, after one year of online education in pandemic.

In the first part of the paper, the review of the scientific literature focuses on the pandemic context and its effects on the quality of higher education processes, with particular accents on the research studies about gender differences in the perception of online education.

The second section of the paper presents the design and the results of a quantitative research that was deployed in February 2021, after two semesters of shifted education in online environment, with the purpose of assessing genders' perception about the quality of online education, as experienced through pandemic.

Conclusions of the paper, underlining the main points revealed by both the scientific literature and by own quantitative research analysis and, consequently, future directions of research, are presented in the last part of this paper, which contributes thus to extending the understanding of pandemics effects on human behaviour.

1. Review of the scientific literature

Before 2020 -2021 pandemic, it is estimated that 20% of all worldwide countries had digital learning resources in teaching; however, this was available only in some schools. About 10% of countries were evaluated as having robust digital learning capacity to be offered to students outside campus and no country had a totally digital curriculum for teaching and learning (EU, 2021).

The expectations of stakeholders about the quality of the educational services offered by higher education institutions vary from one culture to another, since quality is the synergic result of many factors. According to ISO 9000:2015, quality means fulfilling the needs and expectations of customers and of organization's all relevant stakeholders. Regardless of differences in the way education quality is perceived by scholars, business environment and academia, there is one common point: the capacity of the higher education institutions to really transfer knowledge and competences to students, according to the advertised and promised standards (Arambewela and Hall, 2006). The transfer of knowledge and competences from professors to students greatly depends on how the professor skills and teaching materials adapt to the needs of the learner.

During coronavirus pandemic, all affected countries reported an increase in online, distance or hybrid learning. These induced significant changes in the manner of teaching and learning (UNESCO, 2021a). This emergency instituted online learning in higher education is not over, as the threat of pandemic is still present in various countries of the world (Leung and Sharma, 2022). The more that higher education institutions understand the factors affecting the use of emergency online learning, the easier it will be to continue offering high quality online classes to students (Aguilera-Hermida et al., 2021).

The quality of higher education has most likely decreased in those institutions who lacked the infrastructure, the trained personnel, and the experience in running online programs, as these were found to be critical issues (UNICEF and UNESCO, 2021). At the same time, the lack of mobility and the decrease in research activities of the academic staff during this period (UNESCO, 2021b), impacted the normal status and the quality of education.

To the time professors and students previously needed for preparing their classes, it had to be added the extra time required for getting familiar with procedures, technologies, and challenges of online learning. Thus, the pandemic forced both parties to "work harder than before, which negatively impacted the educational process, the pleasure of the teaching/learning process, the level of enthusiasm, and sometimes even the academic results" (Barbu, Popescu and Moiceanu, 2022).

Students had to learn how to use the new learning technologies and software, so that they can connect to their classes. Wang, Shannon and Ross (2013) emphasize the fact that students having more experience in online learning tend to apply more effective learning strategies when taking online courses and they have higher levels of motivation. Nevertheless, acquiring ICT skills, does not necessarily mean that students will have appropriate academic outcomes in online learning (Aguilera-Hermida et al., 2021).

Research studies indicate that there are differences between genders in the way they navigate, communicate, and learn online (Rovai and Baker, 2005; Yukselturk and Bulut, 2009), but not in what regards the educational outputs (Yu, 2021). Other studies indicate that there are differences in what concerns the attitude towards technology - as males have a more favourable attitude towards using it (Cai, Fan and Du, 2017). Also, female students place more importance on the planning of learning, as well as on being able to contact the professor (González-Gómez et al. 2012).

In what concerns certain aspects of online education, such as online learning readiness, research results on gender differences are quite inconsistent. While some research indicates that there are no differences between genders in what regards online learning readiness (Tang, et al., 2021), other studies, on the contrary, found that either the female respondents are more ready to accept online learning (González-Gómez et al., 2012; Chung, Subramaniam and Christ Dass, 2020), or the male respondents are the ones that rather prefer the online learning to the traditional face-to-face system (Yu, 2021).

2. Research methodology

Starting from the relevant issues referring to quality of education and online learning, as identified through the analysis of the scientific literature, and placing them in the 2020-2021 COVID 19 pandemic context, a quantitative research was designed, aiming to analyse whether there are associations between gender and the perception of quality in online education during pandemic. The research focuses on students' perspective, as they are key stakeholders in assessing the quality of learning and providing the needed future premises for improvement of online higher education.

This quantitative research, online questionnaire based, was deployed on Bucharest University of Economic Studies students belonging to the 2nd and 3rd year of bachelor studies and to master programs of Marketing Faculty and Business and Tourism Faculty. The questionnaire was created using Google Docs platform and it was distributed to students in February 2021, after two semesters of online learning in pandemic. It was considered important that students should have had at least one year of normal on campus academic activity, in order to be able to assess the quality of education received during pandemic, against previous on campus experiences. The sampling was non-probability based, with a total of 337 complete and valid questionnaire responses, out of the 389 distributed. There were 232 female and 105 male respondents.

Data retrieved from Google Docs platform hosting the questionnaire composed of 19 questions were first processed with Microsoft Excel and then analysed with the statistical software Minitab 16.

3. Results and discussion

The research questionnaire focussed both on evaluating the importance of aspects specific to quality of online learning during pandemic, and on comparing the quality of online education received during pandemic with the quality of education received on campus before the beginning of pandemic.

As such, respondents were asked to assess on a scale from 1 to 5 the importance of various items for the quality of their online learning. The results were tested to see whether there are differences between genders answers. Because data is not normal and because the shape of gender distributions is quite similar, Kruskal Wallis was applied, with the purpose of assessing whether there are differences between the groups of masculine and feminine respondents. The results are presented in Table no 1.

Table no. 1. Kruskall Wallis test applied to quality components variables cross gender

Null hypothesis (H_0) - statistic context	**Tested variable**	**Cross variable**	**Decision**	***P-value****
The distribution of the tested variable is the same in all the categories of the cross variable	Communication platform professor – student with video capabilities	Gender	Accept H_0	*0.699*
	Resources for individual study text based (.pdf, .ppt, .doc etc)		Accept H_0	*0.336*
	Resources for individual study in audio format (audio books, courses etc.)		Accept H_0	*0.377*
	Resources for individual study as video files (i.e., YouTube)		Accept H_0	*0.688*
	Communication platform between administration/ secretary office and students		*Reject* H_0	*0.022*
	Access to international scientific research papers		*Reject* H_0	*0.033*
	Security of online communication connection		*Reject* H_0	*0.048*
	Professors with ICT skills		*Reject* H_0	*0.029*
	The same platform and teaching method for all courses		Accept H_0	*0.294*
	Invited professors from abroad universities		Accept H_0	*0.184*
	Invited speakers from business environment		Accept H_0	*0.491*

Note: *significance level for p-value: 0.05

These results state that there are differences between genders, in what concerns the variables Communication platform between administration/ secretary office and students, Access to international scientific research papers, Security of online communication connection and Professors with ICT skills.

Further on, a Mann Whitney test for comparing the medians of these variables was applied, its results being presented in Table no. 2.

Table no. 2. Mann Whitney Test for comparing the median of quality components, by gender

Tested variables	N	Median	Results
Professors with ICT skills (F)	232	4.0000	W = 41020,5.0
Professors with ICT skills (M)	105	4.0000	Test of ETA1 = ETA2 vs ETA1 > ETA2 is significant at 0,0144
Communication platform between administration/ secretary office and students (F)	232	5.0000	W = 41108,5
Communication platform between administration/ secretary office and students (F)	105	5.0000	Test of ETA1 = ETA2 vs ETA1 > ETA2 is significant at 0,0109
Security of online communication connection (F)	232	5.0000	W = 40848,0
Security of online communication connection (M)	105	5.0000	Test of ETA1 = ETA2 vs ETA1 > ETA2 is significant at 0,0239
Access to international scientific research papers (F)	232	5.0000	W = 40969,5
Access to international scientific research papers (M)	105	5.0000	Test of ETA1 = ETA2 vs ETA1 > ETA2 is significant at 0,0168

Note: *significance level for p-value: 0.05

According to these results, although the medians of the two genders are equal, there is a higher proportion of female respondents, than male respondents who consider very important the *Access to international scientific research papers, Security of online communication connection, Communication platform between administration/ secretary office and students* and important and very important *having Professors with ICT skills.*

Because 2020- 2021 was the first academic year with online education during university, respondents could not compare these quality components specific to online learning with what was before pandemic. These results reflect their opinion about quality, after one year of continuous online education experience. Hence, further on, they were asked about other general issues, reported in the scientific literature as important for the quality of education. Respondents were requested thus to compare different aspects of online education against the traditional on campus education, before pandemic (table no.3).

Table no. 3. Aspects of online education compared with the "normal" on campus education, before pandemic, in terms of quality

Variables	The same as before (% of respondents)	More than before (% of respondents)	Less than before (% of respondents)
Professors' involvement in teaching	59,35%	17,21%	23,44%
Understanding the concepts explained	44,51%	10,39%	45,10%
Communication with secretary office and university administration	23,74%	7,42%	68,84%
Free time	20,47%	37,69%	41,84%
Working for case studies/homework	33,83%	59,05%	7,12%
Exams grading reflecting the reality	63,80%	10,98%	25,22%
Trusting the quality of education received	54,01%	9,79%	36,20%
Having perspectives for getting a good job	53,12%	12,17%	34,72%
Being prepared for the real practice within business environment	50,45%	13,35%	36,20%

It can be remarked that while 54% of respondents trust the quality of online education received during pandemic, about a third (36%) state they trust it less, a compared to the quality of traditional, on campus education they received before pandemic. It seems that „understanding the concepts explained" less than before pandemic is a quality issue reported by 45% of respondents, while the communication with administration and secretary offices – another important quality characteristic of education, according to scientific literature, was considered lower than before pandemic by 68% respondents.

These variables were tested to see whether there is an association between gender and the perception of online education quality, as compared with the normal, before pandemic education quality. Pearson Chi Square test was applied, the results being presented in Table no. 4.

Table no. 4. Pearson Chi Square Test of association between variables "aspects of online education during pandemic" and "gender"

Variable	Pearson Chi-Square coefficient	Degrees of freedom	P-value *
Professors' involvement in teaching	0,954	DF = 2	0,621
Understanding the concepts explained	4,969	DF = 2	0,083
Communication with secretary office and university administration	4,441	DF = 2	0,109
Free time	*20,864*	*DF = 2*	*0,000*
Working for case studies/homework	*14,873*	*DF = 2*	*0,001*
Exams grading reflecting the reality	1,878	DF = 2	0,391
Trusting the quality of education received	2,138	DF = 2	0,343
Having perspectives for getting a good job	*7,132*	*DF = 2*	*0,028*
Being prepared for the real practice within business environment	*10,540*	*DF = 2*	*0,005*

Note: *significance level for p-value: 0.05

By analysing the distribution of counts in the table for those variables which show a statistically significant connection with gender (p value < 0.05), it resulted that during pandemic online education female respondents declared, in a higher-than-expected number, they had less free time than before - when attending courses normally, on campus. On the contrary, male respondents declared in a higher-than-expected number they had more time when attending online courses, than before. Though, there are studies that indicate that in general, online learning is more time consuming than on campus traditional learning (Cavanaugh, 2005), this difference between genders may be partially explained by the fact that male gender seems to be more comfortable when dealing with technology in online learning, than female gender (Cai, Fan and Du, 2017), and navigating and learning in unfamiliar environments takes more time.

When analysing the distribution of "working on case studies/ homework" variable across gender, it results that, women declare in a higher-than-expected number that they work more on case studies/homework in online education during pandemic than before, while male respondents claim the other way around.

By calculating the Spearman correlation coefficient between these two variables: "free time" and "working at case studies" with ordinal scales (1- less than before, 2- the same as before and 3- more than before), it was obtained a negative, but quite weak correlation, of - 0.220, hence no strong premises for a future look for causality could be formulated.

In a similar manner, by looking at the distribution of cells in the table for the variable "having perspectives for getting a good job" cross tabulated with gender, it is shown that the feminine gender is more pessimistic about perspectives for a good job, as they consider – unlike masculine gender, in a higher number than expected, that the online education provides less opportunities for a good job, than the normal on campus education.

The distribution of variable "being prepared for the real practice within business environment" across variable "gender" indicates that, again, feminine respondents feel less prepared for the challenges of the business environment reality, in a higher number than expected. Masculine gender, on the contrary, declares in a higher-than-expected number that education during pandemic provides better insights in the real business environment, than it had done before.

Conclusions

Because of the pandemic, emergency online education has been introduced in universities, replacing the traditional face-to-face, on campus education. The lack of prior preparation for an online system of education created difficulties for both professors and students.

The quality of education depends on many factors, and it is important when designing procedures and methodologies of learning to consider the particularities of the learners- gender included. The current paper analysed the associations between gender and the perception of quality in higher education during pandemic, through a quantitative research.

Data analysed indicated that feminine respondents perceived online education as taking more time and implying more projects and homework than before pandemic, but with lower perspectives of obtaining a good job and with lower training for the realities from the business environment.

The research *limitations are* due to sample specificity. The respondents belong to a university that had previously developed for educational support a platform for blended learning, even though it had not been used on mandatory, regular basis by professors and students. This platform was used together with other popular communication platforms such as Zoom, Google Hangouts etc. Also, all courses and exams were held online. As such, results should be regarded in this context.

A further direction of research will consist in analysing the change of students' perception about quality in their education along pandemic stages, as well as after its ending, to provide a better understanding about the effects of such a major global event upon education and society.

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STEM Strategies for Economic Growth

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Abstract

This paper aims to raise awareness of the importance of education in economic growth and not just education in general, but mainly of STEM (Science, Technology, Engineering, Mathematics) education. Such signals are always useful, in order to align ourselves with other countries that have already acquired experience in implementing STEM education and can measure positive effects for the economy.
The present research proposes to approach STEM education through the perspective of the most effective strategies applied so far in various regions of the world and that can be adapted to the Romanian reality. This is also useful for the steps needed to implement the recently adopted project "Educated Romania" (2021), which essentially aims to support education based on STEM competencies.
The micro-research in the second part of the paper is a quantitative one that verifies whether there is, at the population level of parents in general, an awareness of STEM education competencies. It was investigated in what extent people are familiar with STEM education, if they can describe it and how interested would be to encourage their children to learn science, technical subjects, engineering and math skills. Moreover, the respondents' perception regarding the impact that such an approach would have on the economic development of a country was questioned.

Keywords

STEM, education, transformative competencies, economic growth.

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Introduction

STEM education in innovation and economy has numerous benefits mentioned by many specialists in both economy and education "we need (...) more STEM professionals (...) if the country is to retain its historical pre-eminence in science and technology" (PCAST, 2012, p.2). We start from the guidelines, supported by the OECD Learning Compass 2030 and the definition of "transformative competencies" as "the types of knowledge, skills, attitudes and values students need to transform society and shape the future for better lives. These have been identified as creating new value, reconciling tensions and dilemmas, and taking responsibility" (OECD, 2019, p.4). We are trying to create a vision of what is efficient and effective for a country's economy, to analyse a new design in education that can positively influence the economy. Shaping so-called transformative competencies, through activities that generate the competencies needed for future jobs, is of paramount importance. This predictability of transformation in education and learning being also predicted by specialists in the field of economics "because of today's dynamics of economy and living, and also, because of the easy access to the Internet, education and learning are changing" (Pamfilie et al., 2012, p.4029). The U.S. President's Council of Advisors on Science and Technology in 2012 decided to implement public policies on the grounds of "increasing the number of students receiving STEM bachelor's degrees by approximately 34% annually over current rates" (PCAST, 2012, p.2) in order to maintain technology innovation and economic success. The path can also be reversed, i.e. from a strong economy to another type of learning "as Taiwan's economy has progressed, its educational reformation has also undergone major transformation" (Lin, Huang and Lin, 2021).

The content, which relies on science, technology, engineering and mathematics, as well as the ways in which information is conveyed, repeated and acquired, is tremendously important in the reorganisation of the new curricula. The influence of technology and well-paid jobs also has effects on a country's economy, as specialists consider that they "understand the critical importance of reforming the education system as a cornerstone for accelerating Romania's economic growth and development in the medium and long term" (Guda, 2020, p.336). According to a Canadian study (Pagani et al., 2010) it was found that early math skills were stronger predictors of overall academic success than reading skills or social-emotional skills. Findings from such research, along with psychology studies according to which brain architecture develops 80% prenatally, have led to numerous concerns about early math education (Clements and Sarama, 2014; Setyowati, Firda and Kasmita, 2021; Abramovich and Connell, 2021). Other concerns on this topic (CERME11 working group, conferences such as TWG13, POEM4, ICME 13, ERME, etc.) have also been developed in order to support and promote the inclusion of mathematical activities at the youngest ages as a daily and very important task. Nowadays, it goes without saying that the development of mathematical skills and becoming familiar with notions about numbers, geometric shapes, spatial positions are essential for mathematics education and long-term developmental progress, which consequently lead to further significant growth (Duncan et al., 2007; Krajewski and Schneider, 2009; Aunio and Niemivirta, 2010; Aldemir and Kermani, 2017; Björklund, van den Heuvel-Panhuizen and Kullberg, 2020). Equal access to education, namely STEM education, is pursued from the earliest ages to generate visible results and progress in economy.

The acquisition of specific STEM skills/competencies are supported by numerous conferences, books, private schools. They are to be integrated: at primary level: STEM Robotics, Mobile Apps in Early Childhood and Primary Education (Prinsley and Johnston, 2015), middle school (Wyss, Heulskamp and Siebert, 2012; Chiu, Price and Ovrahim, 2015), high school (Means et al., 2018.) even at university level (Bianchi and Giorcelli, 2020).

Numerous recent researches from prestigious publications support the benefits of STEM education (in developing countries) but also the positive effects of STEM education on human resources, implicitly on the economy. "Science, Technology, Engineering, and Mathematics (STEM) education has been viewed as foundational to economic growth by many countries in the world and has thus received continuous attention from ministries of education" (Lee, Chai and Hong, 2019, p.1). The effects of implementing STEM education can also be seen today due to the fact that many countries have adopted supportive policies and experimented with this type of education much faster than in our country.

As early as 2009, the Governor's STEM Advisory Council was set up in the Commonwealth of Massachusetts to develop a STEM plan from pre-K through higher education that would result in workforce with STEM skills (Proudfoot and Kebritchi, 2017, p.3). Since 2018 and 2019 projects that use elements of artificial intelligence and lead to STEM competencies have been implemented in formal schools: AI Singapore, National AI Strategy- Korea, Technology Education from Primary 1 to Secondary 6 - Hong Kong, AI Textbooks - Mainland China (Su, Zhong and Ng, 2022).

At the macro level, the positive impact of STEM education on the economy of various regions is reflected in numerous publications: America (STEAM and American workforce; The impact of STEM on the US Economy); Asia (STEM Education from ASIA, The Asia-Pacific Education Researcher) and Turkey (An overview of STEAM Education and Industry 4. 0; Europe (UNESCO International bureau of Education-Exploring STEM competencies for 21st Century, STEM education and Growth in Europe), UK (Council for Science and Technique); Australia (Office of the Chief Scientist, Australian Business Community Network). For a thorough picture of STEM, we can mention the relevant statistical reports by Hurst et al. (2019). After analysing numerous articles, the authors present, from their point of view, the leading countries in releasing publications related to STEM education: the US, Australia, the Netherlands, Israel, the UK.

1. Effective STEM strategies in the world

In order to best define, transmit, and assess STEM knowledge and to acquire the necessary skills, various strategies have been approached to try to be efficient and effective in STEM education. Thus, one strategy is actually problem-based learning, known in the field by the abbreviation PBL. Problem-based learning as defined by researchers at Indiana University "is perhaps the most widespread and popular approach to problem-cantered instruction". They discuss under the instructional model category "The Problem as a Guide", "The Problem as an Integrator or Test", "The Problem as an Example", "The Problem as a Vehicle for Process", "The Problem as a Stimulus for Authentic Activity" (Duffy and Cunningham, 1996, pp.21-22). All these metamorphoses of the problem have a well-defined purpose, as the name of each subtype of

problem indicates, that is to start everything from a debate, to end as a test, to be taken as a model, to develop critical thinking, creativity, to mathematically model STEM problems.

Another contemporary approach which is favoured by Asians is the TPACK (Technological Pedagogical Content Knowledge) strategy. The latter is undergoing a phase of implementation and automatic refinement in several countries. For greater effectiveness Thohir, Jumadi and Warsono (2022) recommend an improved version of this strategy, namely the 4D-TPACK package. According to the authors Qiu, He and Xiong (2022) the TPACK package contains other subcomponents necessary for its implementation namely CK (knowledge from the table of contents = content knowledge), PK (pedagogical knowledge), TK (technical knowledge) and it would be recommended, according to Taiwanese and Hong Kong researchers Wu, Chai and Wang (2022) to combine it with the VFL package.

Robin Fogarty (1991) in "Ten ways to integrate curriculum" ingeniously presents ten ways of connecting information even during the so-called "computer science classes". These strategies are later taken up for STEM education by many education specialists. The strategies involve knowledge from several fields and receive specific names, but it is the graphic representation that I think is eye-catching and memorable, staying in the reader's memory, given all the transformations that are image-based. This has been demonstrated both scientifically (Veen and Vrakking, 2006; Buzan, 2009) as well as through telephones which explore iconic abilities.

The first models, *The Fragmented Model*, *The Connected Model*, *The Nested Model*, refer to a single school subject; *The Sequenced Model*, *The Shared Model*, *The Webbed Model*, *The Threaded Model*, *The Integrated Model* refer to several school subjects and hold our attention and *The Immersed Model*, *The Networked Model* refer to group learning.

Lin, Huang and Lin (2021) presents the ideal trajectory which Taiwan has undergone in order to directly boost economic growth. R. Lin, Professor in the Graduate School of Creative Industry Design, National Taiwan University of Arts, along with his team presents the algorithm they implemented which could be briefly presented as follows: STEM - STEAM (with SAD) - CEER. SAD (science, arts and design) in higher education and CHEER (collaboration, humanity, empathy, ecology and renaissance) in design practice.

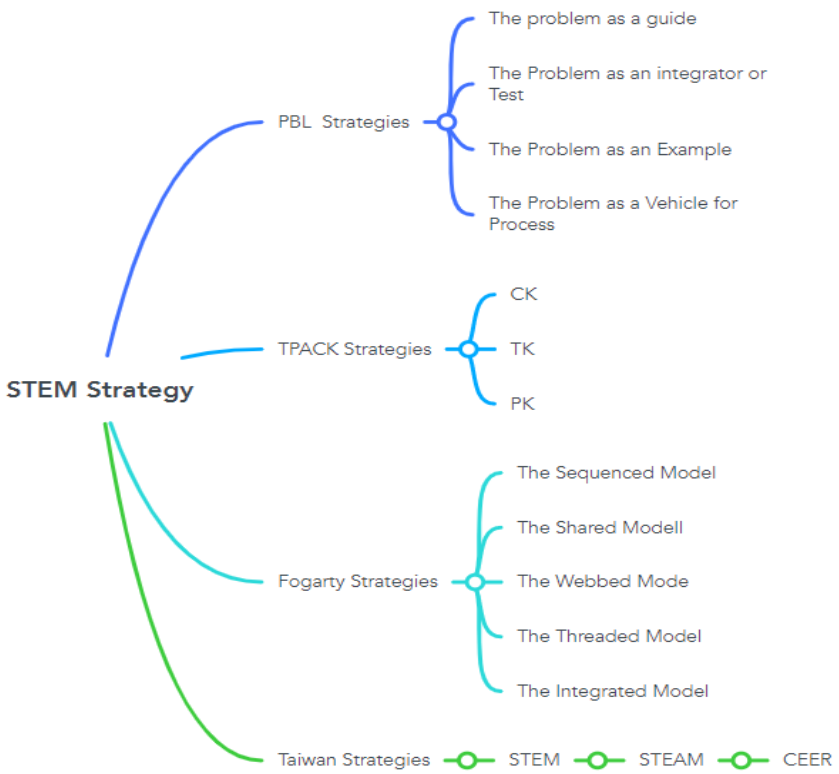


Figure no. 1. Effective STEM strategies in the world
Source: Author own research results

2. STEM strategies in Romania

Theoretical ideas for STEM initially appeared in the Romanian online environment as early as 2017: "unfortunately, from what I know, there is no institutionalized STEM education in Romania, there are no procedures, programs, methodological guidelines or pilot projects" (Bararu, 2017, p.2). Later on, in August 2020, we find out that "the subjects that support STEM education (natural sciences, mathematics, technology, engineering) should be a long-term priority of the development and modernization of education in our country and therefore, their importance should not be diminished by reducing the number of hours allocated" (Center for Educational Assessment and Analysis, 2021).

The advocacy later materialised in non-formal activities but also in activities supported by kindergartens, schools, universities:

- Associations supporting after-school activities: CreSTEM (based on the STEM Association founded in 2016 -crestem.org); "STEM will be a major part of his/her daily activities" 2017 - www.bricks4kidz.ro.; "JA STEM program is supported in Romania by: the European Institute of Innovation & Technology, Honeywell, Johnson & Johnson, ExxonMobil, Waters" - www.jaromania.org; "Robotics on" - 24software.ro, STEM Kids Robotics;

- in articles: Baldea, Garabet and Prisacariu (2017), Tribuna invatamantului (2018), Popovici, Istrate and Mironov (2019);

- STEM educational resources for Romanian teachers: www.esa.int, www.twinkl.ro/resources/romania-teaching-resources;

- partnerships with kindergartens, schools: "a steam to STEAM" - steamwithsteam.eu; "Developing STE(A)M skills of educators through online tools and communities" - eos.ro;

- universities: ASE Bucharest - Garrett Motion continues to invest in STEM education in Romania by launching two new interactive student projects in partnership in the 2021/2022 academic year - garrettmotion.com; Technical University of Cluj - specialization in Robotics;

- the "Educated Romania" project (2021) which supports STEM orientation starting from pre-school level;

- there are also activities that do not mention STEM but they still exist and support the development of specific science and technology skills such as artificial intelligence labs, after-school programming clubs (Scratch, C++, Python), theme camps, robot building and programming clubs, etc.

3. Research methodology

The balance in favour of qualitative or quantitative methods has long been debated by specialists. Here, quantitative research was chosen to collect data using a questionnaire, because it involves an objective measurement of the opinions of the respondent population. The questionnaire consists of questions with a simple, clear syntax in order to obtain the correct answer without interpretation and to avoid taking a long time to complete. The questionnaire follows the scientific structure as the key questions were repeated in a different form to check the veracity of the answer. The simple and to the point design resulted in more relevant and on time responses. The sample chosen was 89 parents (grandparents, legal guardians) who have children in kindergarten or school. The validity of each item in the questionnaire was given by the Cronbach-Alpha coefficient calculated for each item, as follows: 1) To what extent have you heard of STEM education? Cronbach-Alpha coefficient value .8365; 2) To what extent can you describe what it means? Coefficient value .9652; 3) To what extent is your child more attracted to lessons presented in other ways (through projects, computer discussions, etc.)? Coefficient value, .8293; 4) To what extent do you think it will be helpful for your child in the future to learn science, technical subjects, engineering, math skills? coefficient value .9395; 5) To what extent do you consider these fields useful for the economy of a country? coefficient value .8772.

4. Results and discussions

What we observe, after centralising the results from the questionnaires that 69.7% of the parents/legal guardians have heard of the STEM phrase but can describe it in a much lower proportion 14.7%; but they mention that their child is attracted to active ways of learning in a percentage of 89.2%. A percentage of

79.3 of the respondents consider only STEM fields to be useful and 94.5% think they have a positive influence on a country's economy.

It should be noted that the parents who were interviewed are residents in both rural and urban areas. Since all these children attend extracurricular activities such as dance, robotics, languages, it is possible there might be some influence in the answers given, even though they live in rural areas.

Mention should be made that we have noticed that a first step towards STEM education has been taken, thanks to information they had read, changes in technology or other personal experiences. It is also very important to support parents to acquire skills in STEM fields, this is even stated by countries that have implemented STEM education long before us (e.g. Singapore, Massachusetts etc.).

5. Limitation and future research

At the country level there can be multiple limitations when it comes to STEM education, but if there is effective collaboration among specialists in multiple fields, then we can achieve a result with positive outcomes in the economy as well.

We should keep in mind some of the limitations encountered in the past in various past projects so as not to repeat them, namely:

- in some cases, not all the competencies of science, technology, engineering, and mathematics are covered;
- the interdisciplinary implementation of the four areas requires additional technology and pedagogical skills;
- too few training modules specific to STEM implementation;
- other additional activities "required" by the education system (certificates of attendance earned with students, lifelong education courses, appendices and documents required on various occasions, activities demonstrating community involvement, etc.).
- too many changes, adaptations and time needed for self-training with the electronic platforms recommended by ministries to use post-covid as well;
- solid knowledge for designing lessons with the most appealing software tools;
- showing creativity in integrating activities and engaging learners;
- in-depth knowledge of mathematical modelling and beyond;
- thematic labs;
- conditions to explore nature and understand certain phenomena;
- educational policies that support STEM implementation;
- synchronization of activities at micro and macro levels;
- mobilizing companies to train students with STEM skills faster than students, because they are closer to the moment of employment and therefore more interesting than sponsoring and training students, schoolchildren, pre-schoolers;
- there is also a certain time and funding barrier, as the latest STEM education outputs and products do not reach the teacher's desk in time;
- there may also be a reluctance on the part of some students but also on the part of some teachers to work with the latest technologies.

Conclusions

It is interesting to note that, although most of the parents/legal guardians have heard of STEM, a small part of them really understands what it is and know how to describe it. Even if parents are aware that their child is attracted by active ways of learning, they do not match this need with the solution that STEM education represents in this case. A significant majority believe not only that STEM fields to be useful but also it can have a real impact on a country's economic development in the future.

It should be a full recognized statement that education is one of the engines of the economy and that the phrase "you reap what you sow" is a fact.

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Innovation in Nutrition Labeling: Consumer Perceptions of the Usefulness of Front of Pack Labeling Schemes

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Abstract
The managerial responsibilities and resources required to implement the methods of nutrition labeling of foods lie with the whole food system. The use of back-of-pack (BOP) nutrition labeling in the form of the nutrition declaration is widespread in commercial practice, and in the EU it is even mandatory for most products. Detailed numerical information on the nutrient content of the product makes it difficult for consumers to understand. Through a quantitative exploratory research, this paper focuses on the descriptive analysis of different voluntary front of pack (FOP) labeling schemes, assessing their impact on consumers' perception of the nutritional quality of products and determining their usefulness in terms of understanding the declared nutritional information. We are interested in increasing the usefulness of these systems in the context of a low level of consumer understanding of nutritional information (especially BOP), as indicated by the results obtained. This will facilitate the process of selecting more nutritionally balanced products to meet the need for education and healthy lifestyles. We start from the premise that the harmonization of front of pack labeling schemes, which tend to take the form of graded indicators, could be considered a necessary and useful innovative solution in the process of selecting and comparing food products on the market according to their declared nutritional profile. A single, voluntary, interpretative traffic light system, as the EU proposes, would harmonize the nutritional labeling of foods, as a condition for putting social policy on consumer nutrition education into practice, but also for facilitating the reformulation and promotion of healthier foods, beyond the controversies over the discrimination of some of them.

Keywords

FOP labeling schemes, FOP usefulness, nutrition labeling innovation, consumer perception, FOP harmonization.

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Introduction

The need for regulation of nutrition labeling is a matter of public interest, involving national, regional and international bodies. According to European regulations, the mandatory nutrition declaration on the back-of-pack (BOP) can be complemented by a voluntary nutrition labeling scheme, which is a voluntary repetition of its main elements in the principal field of vision on the front of the packaging. In this way, consumers are helped to quickly notice essential nutritional information when purchasing food. Front-of-pack (FOP) nutrition labeling schemes may also use other forms of expression and/or presentation, e.g. colors, symbols or graphics, in addition to the nutrition declaration, which generally contains words and/or numbers (EC, 2020a).

The variety of nutrition labels has led to many obstacles in consumers' understanding and analysis of them. These difficulties are due to a number of reasons including lack of knowledge or information related to

nutrition or too little time allotted to the purchasing process. In May 2020, the European Commission produced a final report on the use of additional forms of expression and presentation of the nutrition declaration, including their impact on the internal market and the opportunity for further harmonization of these forms of expression and presentation (EC, 2020a).

Labeling schemes can measure the nutritional value of a product based on compliance with a nutritional standard, either by meeting a threshold or a criterion, influencing consumer perception (Prada et al., 2021). In the specific European context, FOP nutrition labels are gaining increasing interest, a growing number of countries are implementing these labeling schemes and discussions on the harmonization of labeling at European level are ongoing (Egnell et al., 2021).
Recent research shows that FOP nutrition labels, such as the Nutri-Score, can be used to improve food choices, but at the same time can be used as an incentive to improve food products through reformulation (Ter Borg et al., 2021).

Other research (Bollinger et al., 2022) points out that FOP nutrition labeling schemes have a weak influence on the purchase of healthier foods, but educational campaigns can increase the usefulness of these types of product labels if there is a lack of consumer awareness and/or understanding of labels.
These are arguments for the relevance and timeliness of the present research on the perception of the usefulness of FOP labeling schemes from the perspective of consumers lacking the nutritional knowledge of a specialist in this field. But is this type of indicator a solution to the equation: nutrition education + consumption decision = healthy diet?

1. Literature review: EU - towards a single voluntary nutrition labeling scheme

According to EU regulations (European Parliament, 2011) most food products must be accompanied by a nutrition declaration, usually placed on the back of the packaging, as a part of the mandatory food label claims. It is allowed to repeat, on a voluntary basis, on the front of the package (FOP) the information provided in the nutrition declaration, either the energy value or the energy value and the amounts of fat, saturated fatty acids, sugars and salt. FOP nutrition labeling schemes emphasize the information provided in the nutrition declaration and provide information on the nutritional value/nutritional profile of foods, using symbols, colors and/or letters. (EC, 2020a) Interest of public authorities in FOP nutrition labeling has grown significantly in recent years due to the alarming increase in the number of people suffering from obesity and the significant incidence of diet-related diseases in most EU Member States. Therefore, FOP labeling is increasingly seen as a tool to support strategies preventing diet-related health problems (Farrand, 2021).

By definition, all FOP evaluative labeling schemes, whether "nutrient-specific" or based on "summary indicators", are intuitive tools (Muzzioli et al., 2022) , based on nutritional profiling models, which involve classifying foods by chemical composition and based on well-defined criteria; these may include simple nutrient thresholds, and the system assigns colors -green, yellow, red- or algorithms that result in a summary score. At EU level, the trend in recent years has been to introduce and promote a single European FOP nutrition labeling system, studies showing that Nutri-Score has proved easy to understand and to take into consideration. Consumers are increasingly concerned about their health (GFK, 2020) by making careful food choices. According to GFK (2020) almost 60% of consumers in Europe read the ingredients of the food and drink they buy and half of them are aware of the Nutri-Score labeling system.

It is acknowledged that Nutri-Score acts as a food grading criterion and is an argument for manufacturers in reformulating the nutritional quality of existing and new products in the food supply; its adoption by large companies indicates market engagement out of a desire to remain relevant. Research provides new insights into the positive effect of Nutri-Score, i.e., decreasing purchases of processed products and increasing proportions of unprocessed and un-packaged foods, in line with public health recommendations (Egnell et al., 2021). The advantages of Nutri-Score are also recognized as a possible tool to reduce calorie intake, trans fat, salt and sugar in consumption, simplifying consumer choice (National Institute of Public Health, 2016) in order to adopt a more balanced diet, although Medina-Molina and Pérez-González (2021) consider that different interpretative ways of nutrition labeling such as Nutri-Score do not moderate the relationship between perceived health and purchase intention. Sarda et al. (2020) obtained useful results demonstrating positive developments in awareness and use of this type of label, although the authors would have expected a higher proportion to report improved eating behavior, and the overall impact on the selection of healthier eating patterns has not yet been demonstrated (Savoie et al., 2013).

Nutrition labeling schemes clearly have the potential to empower consumers to make healthy purchases. However, the nature of the schemes is often confusing and nutritionists complain of potential misinterpretations among consumers, with information being general rather than objective (Sijm, 2021).

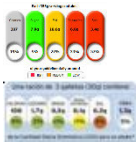
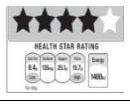
2. Operational implications in the innovation of nutrition labeling systems - research methodology

2.1. Normative, cognitive and pragmatic approaches to nutrition labeling schemes

The analysis of the usefulness of nutrition labeling schemes must take into account societal values, resources involved, feasibility and acceptability by stakeholders, equity and consumer rights, as well as socio-cultural acceptability (WHO, 2021). Integrated approaches are more effective when they respect different individuals and cultures, thus making tailored assessments, interventions and changes possible (Trovato, 2012).

While initially, additional ways of nutrition labeling emerged in the form of a single symbol, such as the "Heart Guide" symbol for heart-friendly foods (Tarabella and Voinea, 2013) or the "Keyhole" symbol drawing attention to healthy food, they have advanced and various schemes have been set up. To date, various front-of-pack labeling schemes have been developed and used around the world, including simplified versions (Table no. 1).

Table no. 1. Major differences in technical documentation

Taxonomy presented in the scientific literature				FOB labeling schemes		Developer	States
Nutrient-specific labels	Numerical	Non-directive character	Reductive/ non-interpretive	"Guideline Daily Amounts" (GDA)		Private	EU
				NutrInform Battery		Public	IT
	Color coded	Semi-directive character	Evaluative/ interpretive	"Traffic light" (TL)		Public	EU
	Mixed: numerical and color coded	Semi-directive character	Evaluative/ interpretative	„Multiple Traffic Light" (MTL)		Public	EU and the UK
				Other traffic light type labels		Private	Various states in EU (Portugal, Spain)
Summary labels	Logos with a positive message (promotional)	With a directive character	Evaluative/ interpretative	Keyhole		Public	Sweden, Denmark, Lithuania
	Scaled indicators			Heart Guide		Public NGO	Finland, Slovenia, Croatia
				Healthy choice		Private	Czechia, Poland, gradually eliminated in the Netherlands
				Nutri-score		Public	France, Belgium, Spain, Germany, the Netherlands, Luxembourg
				Health Star Rating		Public	Australia, New Zealand

Source: adapted from EC, 2020

FOP nutrition labeling schemes can be classified into two broad categories:

- "nutrient-specific" systems that provide nutritional information on specific nutrients, which can be divided into "numerical" – GDA, "color-coded" - TL and "numerical and color-coded" - MTL;

- "summary indicator systems" that provide a synthetic assessment of the nutritional value and "healthiness" of the product in general (Savoie et al., 2013), which can be divided into "positive" indicators (promotional acronyms) applicable only to foods that meet certain nutritional criteria (Keyhole, Heart Guide) and "graded" indicators that provide general, graded information on the nutritional quality of foods, applicable to all foods (Julia and Hercberg, 2017), such as Nutri-Score or Health Star Rating.

They can also be classified according to other criteria:

- depending on the level of "directiveness" of the scheme, i.e. the extent to which the label provides a direct indication of the nutritional benefits of the product for the consumer (non-directive - TL, semi-directive - MTL or directive - Keyhole, Heart Guide, Nutri-Score or Health Star Rating) (Hodgkins et al., 2012);

- depending on the mode of representation (numerical - GDA, color-coded - TL, numerical and color-coded - MTL, positive message logos - Keyhole, Heart Guide, graded indicators - Nutri-Score or Health Star Rating);

- depending on the interpretative nature of the labeling systems ("reductive"/non-interpretive TL or "evaluative"/interpretive- the others) (Newman, Howlett and Burton, 2014).

FOP nutrition labeling schemes can bring order to the sometimes rather chaotic and confusing consumer behavior, giving consumers the confidence that, based on the information provided, they have the right attitude, they make the right food choice, by making their own informed decisions.

2.2. The usefulness of FOP labeling schemes from a consumer perspective

Based on the normative, cognitive and pragmatic approach to FOP nutrition labeling schemes, we conducted an exploratory research to identify consumer perceptions of the usefulness of FOP, with the following objectives:

- identifying the determinant factor in the decision to consume a food product and determining the level of understanding of the BOP nutrition label and the level of consumer nutrition education;

- identifying the level of awareness and use of voluntary nutrition labeling schemes FOP and deciding the main nutrition information of interest to the purchaser;

- deciding the most suggestive model of voluntary FOP nutrition labeling schemes and determining the need for harmonization and improvement of nutrition labeling from a consumer perspective.

Questionnaires were used as a tool for data collection and the sources of information used to achieve the goal were external and primary, obtained directly from consumers and intended for research purposes. The sample size is 145 respondents, randomly selected and grouped according to five criteria: gender, age, education level, background and monthly income, resulting in the following profile of respondents: female respondents predominate (63%), aged between 18 and 25 years (57%), with higher education (72%), living in urban areas (77%) and having a monthly income between 1500 lei and 3000 lei (45%).

In the present research, the following assumptions were made:

H 1a: Respondents are aware of the nutrition-food-health relationship;

H 1b: The determinant factor in food choice is psycho-sensory value;

H 2: Most consumers want to be informed about the nutritional profile of the food they buy, but the level of understanding of the information on the BOP nutrition label is still low;

H 3: Respondents do not have a high level of nutrition education, so action is needed to improve consumer nutrition education;

H 4: Voluntary BOP nutrition labeling schemes are known, useful and improve consumers' perception of the nutritional profile of the food;

H 5: Nutri-Score labeling scheme is considered the most suggestive FOP model.

H 6: Consumers consider it necessary to find innovative solutions to harmonize FOP nutrition labeling schemes at EU level and increase their usefulness.

We note that although most respondents (87%) are aware of the influence of food on health, they still choose to consume food based on its psycho-sensory value (78%). Most consumers thus make subjective choices about food consumption, although they are well informed and aware, they forgo adopting a balanced diet for the hedonistic value of food. Consistent with the results, hypotheses H1a and H1b are validated.

The analysis of the data shows that the majority of consumers feel the need to be informed about the nutritional profile of foods, which is confirmed by the high number of respondents who read the nutrition label when purchasing food but find the information not easy to understand (68%). Thus, according to the results presented above hypothesis H 2 is validated.

In order to identify the level of nutrition education of consumers, a scale from one to five was used and the sample average is 2.42, which shows that respondents have an average level of nutrition education, which is also underlined by the fact that 53% of consumers do not know the harmful effect of hydrogenated (trans) fats on the body's health. These results lead to the validation of the following hypothesis H 3.Therefore, the level of understanding of the information is directly proportional to their level of nutrition education, but inversely proportional to consumers' perception of the usefulness of the data on the label.

Most respondents (86%) recognize FOP nutrition labeling schemes and find them useful. In terms of establishing the usefulness of FOP nutrition labeling schemes among consumers, the results show that almost all respondents (97%) consider them to be a source of information about the nutritional profile of the food product. Most respondents are interested in energy value (42%), then carbohydrate content (35%), followed by fat (24%), protein (14%) and salt (10%). This also validates hypothesis H 4.

The Multiple Traffic Light (MTL) system is considered the most suggestive FOP labeling model, being preferred by 44% of respondents, followed by the Nutri-Score model (32%), Guideline Daily Amounts (15%) and Traffic Light (9%). These results can be justified by the advantages of the MTL system, i.e. the color coding of nutrients and the labeling of the degree of coverage of daily requirements; the lack of transparency of the information makes the Nutri-Score and Traffic Light systems not considered suggestive. Consistent with the results presented above hypothesis H5 is invalidated.

A high percentage of respondents (70%) consider it necessary to find innovative solutions to increase the usefulness of FOP nutrition labeling schemes, from a normative, pragmatic and cognitive point of view, so hypothesis H6 is validated.

3. Discussions and proposals on increasing the usefulness of FOP systems

Colour-coded food labeling FOP is effective in improving consumers' understanding of the nutritional quality of food, according to studies. The combination of a color-coded format with a scaled indicator seems to improve consumers' objective understanding of what they are eating (Egnell et al., 2018; Storcksdieck Genannt Bonsmann, 2020).

The graded indicator labeling scheme has sparked controversy among EU experts (European Parliament, 2017) because it penalizes the traditional system of labeling geographical indications and disadvantages higher quality food products, such as those from the Mediterranean diet. Other criticism relates to the provision of misleading and incomplete information preventing consumers from making informed choices about the nutritional content of foods or the authenticity of foods. However, we believe that such an indicator is an easy, effective, but not sufficient solution for adequate nutrition education.

Among the innovative solutions to increase the usefulness of FOP nutrition labeling systems:

- the increase of the visibility of the label on small packages (attaching an accordion-type label with a closure system allowing the consumer to access the nutritional information of the food, as an extension of the nutritional labeling);

- the inclusion on the nutrition label of additional information on substances harmful to health, for example on the content of trans-fatty acids, although European legislation limits their content in food to 2 grams per 100 g of fat (EC, 2019), to increase consumer awareness of the negative effects of these substances;

- the use of a QR code on product packaging as an additional information tool, but also as a marketing tool that can enrich the shopping experience. Thus, an intervention function could be attached to the communication function (Radu, 2019) because the manufacturer/retailer can add nutritional information

related to different categories of consumers according to age, gender and physical activity, origin of ingredients or healthy food pairing.

- development of mobile applications: the possibility of determining its nutritional value by means of easy-to-use applications that can draw up a nutritional profile in a short space of time requires the creation of a database containing nutritional declarations for as many products as possible. Such applications, by merging functions, could thus provide a link between food guides, supply, nutrition labels and healthy foods, but attention must be paid to improving the automation and integration of applications, to allow diversification of recipes, calculation of the energy value and nutrient content of the product, and reporting to individual needs.

Thus, nutrition labeling can be a means of personalizing the offer and educating consumers.

Conclusions

In recent decades, food labeling has undergone a major development in terms of production methods and the graphic qualities of the label, as well as a permanent enrichment of its information content. The visual appeal and nutritional informativeness of nutrition labels play a decisive role in consumers' purchase intentions (Brewer and Sebby, 2021), and consumers love visuals.

The research highlights the implications of nutrition label innovation in improving consumer perceptions of the usefulness of FOP labeling schemes. The theoretical and practical operational aspects of innovation in this area require consideration of contextual factors and a normative, cognitive and pragmatic approach to nutrition labeling schemes. The results obtained align with the findings of other studies reviewed in the literature and demonstrate that FOPs are familiar, useful and improve the perception of the nutritional profile of food.

The usefulness of FOP nutrition labeling schemes lies in their adaptation to consumer needs, consumer values and stakeholder acceptability, given the determinants of the social-cultural environment. Social marketing is successfully used to promote better nutrition, based on the premise that people consider the perceived benefits of alternative eating behaviors against the costs determined in economic terms: monetary expenditure, psychological costs, time, energy. Voluntary FOP nutrition labeling schemes feasibly adapted to nutrition interventions, even tailored to individual needs, can facilitate healthy food choices through their informative, educational and promotional role.

In the future, the aim is to create a sustainable labeling framework that harmonizes the nutritional aspects of food products in synergy with other relevant initiatives: climate, environmental, social, ways to harmonize voluntary environmental claims (EC, 2020b). EU countries adopt different approaches as part of their health promotion strategies, which take the form of action on healthy lifestyles and healthy eating.

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The Impact of E-banking Services on Banking Risks

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Abstract

This paper aims to present the issues related to the risks involved in providing banking services through an unconventional channel, namely the Internet (e-banking), which along with traditional banking, have become traditional. The material and methods used for the purpose of these works, consist of research, forays into literature; evaluation through the research and design triangle, analysis and interpretation of data from the literature, as well as statistical calculations. Documentation remains a key element in the area of high environmental issues and the implications of the report on banking management. The research methods in the research studies in the paper articles are the following: especially the documentary documentation through literature, in this sense being studied many books, especially documents and international ones; statistical methods, such as classification, synthesis, graphical representation of investigated events and phenomena. An important finding of the paper revealed that, globally, banks' management believes that the adoption of e-banking services generates potential benefits for them. Reducing overall costs is the main benefit. This can be done in two ways: by minimizing the cost of making transactions and by reducing the number of affiliates that are needed to serve an equivalent number of customers. E-banking offers other benefits to banks: e-banking transactions are much cheaper than those made at branches or even by phone and electronic banking is much easier to set up. For this reason, countless new operators may appear, which will offer users more choice, although they will be less inclined to remain loyal, thus eroding customer loyalty. Bank management should understand the risks associated with e-banking and, before providing such services, assess the costs of managing risk in relation to the return on investment. Innovators of e-banking anticipate the needs of their customers, but bear higher costs and face increased complexity of their operations. The article adds value in the banking field, one of notoriety in the context of globalization by analyzing the problems related to management and banking risks in an innovative system, both in general and in Romania. At the same time, the aspects related to the quantitative and qualitative situation of the banking system are analyzed, as well as the identification of the main problems related to them together with the finding of the solutions regarding their correct management. The practical implications of the topic can result from good management of banking risks and innovations in this system. In the context of globalization, e-banking seems to be the optimal solution now and in the future, but it is certainly necessary to implement it more deeply on the global economic market.

Keywords: development, e-banking, Internet, management, risk

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Introduction

Although not yet among the definitions in DEX, the concept of e-banking is already universally known and accepted as designating the processes by which a customer of a bank can conduct banking transactions without visiting the physical institution. The implementations of this concept in Romania have been defined and regulated by the Ministry of Communication and Information Technology as:

- e-banking - a payment instrument with remote access based on the issuer's Internet technology and computer systems (Ayo et al., 2016).

- home banking - a remote access payment instrument that is based on a software application of the issuer installed at the owner's premises, on an individual workstation or in a network (Amin, 2016).

- phone banking - that payment instrument with remote access that involves the use of mobile equipment (telephone, PDA - Personal Digital Assistant, etc.) and services offered by telecommunications operators (Burlacu, Profiroiu and Vasilache, 2019).

Banks need to use more sophisticated credit risk management tools and promote a stronger understanding of borrowers, their collateral, business prospects and the ability to repay loans (Chaimaa, Najib and Rachid, 2021).

Banks need to manage customers and relationships with business partners by applying appropriate, risk-sensitive strategies (Dragomir, 2004). Risk management has long since ceased to be a concept, having become a science in itself for more than half a century (Profiroiu et al., 2020), risk management in a certain field becoming an interdisciplinary activity due to the complexity of the aspects to be analyzed (Riek, Bohme and Moore, 2015).

Therefore, at least three distinct disciplines have been addressed in this paper: that of risk management, that of banking financial services and that of information transmission, processing and storage technology in order to define processes, implications, in order to minimize the risk involved in e-banking (Bodislav et al., 2020).

In the context of a market economy that involves remodeling and replacing the old economic system with a new one (Burlacu et al., 2021), based on an institutional framework of financial, banking, monetary and foreign exchange systems specific to the market economy (Chmielarz & Zborowski, 2020) the process of remodeling the banking system aimed, on the one hand , the creation of a banking system specific to the market economy (Jianu et al., 2019), and on the other hand, the harmonization of the Romanian legislation with that of the countries from the European Union (Bodislav et al., 2021). The remodeling of the Romanian banking system mainly focused on the restructuring of the banking system and the regulation, authorization and supervision of the banking activity (Rădulescu et al., 2020).

1. The impact of technology evolution on banking services

The Romanian banking system, even if it cannot be considered as operating at the normal parameters of a banking system in a solid market economy, could not remain insensitive to the extraordinary opportunities offered by technological innovations in the field of telecommunications, microtechnology and transmission. and electronic storage of information (Orzan et al., 2020).

In order to quantify the appetite of bankers in terms of information technology and their willingness to allocate budgets for modernization and implementation in this area, the National Bank of Romania conducted a survey with respondents as chief executives of banking, financial and investment companies and authorities, within the NBR (NBR, 2021).

The results of this survey clearly highlight the growing role of information technology in determining the competitiveness and profitability of a banking enterprise both in terms of the risks involved in the use of information technology and in the awareness of the competitive advantage that a bank can have as a result of using high-performance technologies. Of the 50 responses to this questionnaire, technology as a competitive advantage is increasingly important in the view of respondents, as can be seen in Figure no. 1.

Both now and in the medium term, the most important competitive advantages are considered to be management and qualified personnel. In addition, survey participants believe that over the next five years, technology will play an even more important role in banking competition (Nguyen, Rosoff and John, 2017).

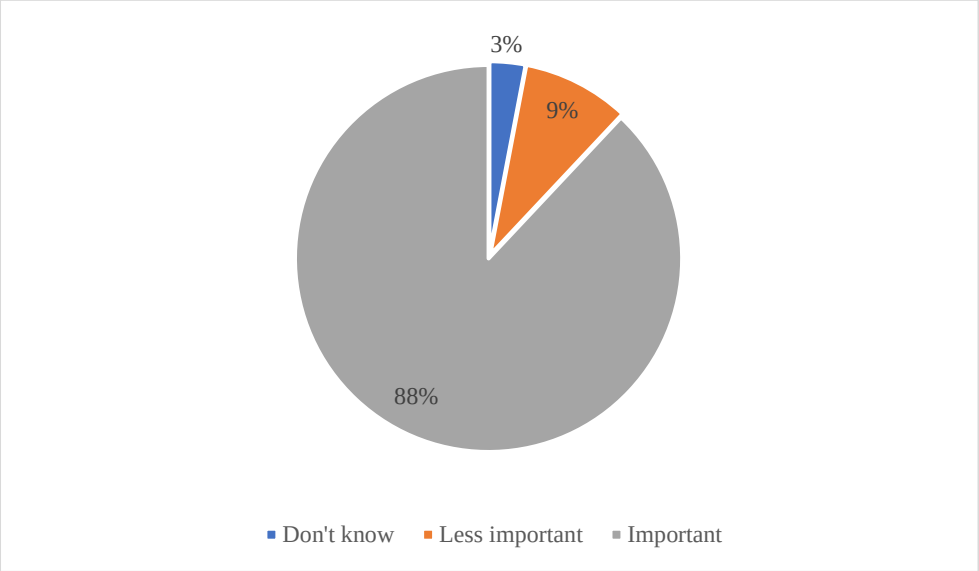


Figure no. 1. The importance of technology as a competitive advantage of a bank in the future
Source: National Bank of Romania, 2021

As can be seen from Figure no. 1, 88% were of the opinion that in the future technology will play an even more important role among the competitive advantages of a bank.

The most important alternative channel for the distribution of banking services is undoubtedly the Internet (Ionescu, 2003). Its importance is generated by the ease of access- almost all companies have realized the importance of connecting to the public information transmission network. The use of computers and the Internet by individuals is and will be more and more massive in Romania as evidenced by studies conducted by various survey institutions (Nica, 2006), the results of which are listed in this chapter. Technological advances in hardware and telecommunications have led to a successful evolution of software systems and revolutionized all data transmission, storage and processing systems.

Most banks in Romania have so far adopted only the first type of presence, mainly due to the fact that it involves low investment and operating costs, although these costs increase only marginally in the case of the second type of web presence.

Table no. 1. Penetration of Internet use worldwide in 2020

Geographical regions	Percentage of world population	Penetration % of the population	Worldwide users %
Africa	14.0 %	1.5 %	1.5 %
Asia	56.3 %	8.4 %	35.0 %
Europa	11.4 %	35.5 %	30.2 %
Middle East	4.0 %	7.5 %	2.2 %
North-America	5.1 %	67.4 %	23.9 %
South America and Caraibe	8.5 %	10.3 %	5.3 %
Oceania / Australia	0.5 %	48.6 %	1.8 %
Total	**100.0 %**	**-**	**100.0 %**

Source: Internet World Stats

For a clearer picture of the level of Internet penetration at European level, Table no. 2 shows in detail the evolution of the number of users in Europe, noting the extraordinary growth rate in countries not yet part of the European Community.

Table no. 2. Penetration of Internet use in Europe in 2021

Europa	Percentage of world population	Number of Internet users in 2021	Rhythm of increase the use of the Internet 2000-2021	Penetration % of the population	Users worldwide%
Countries from Union	8.1 %	216.765.036	131.6 %	46.9 %	24.3 %
Countries from outside	5.3 %	44.888.108	341.9 %	16.2 %	5.9 %
Total Europa	**13.4 %**	**261.653.144**	**472.5%**	**63.1%**	**30.2 %**

Source: Internet World Stats

Romania is present in these statistics with a growth rate of Internet use compared to previous years of 500%, with a total of 6 million users, representing a percentage of 20.7% of the total population of Romania and 1.8% of the total population of the continent European.

France, Italy and Spain are expected to see the largest increases in Western Europe in terms of Internet access in the next five years, when the number of Internet users in the region will exceed 300 million, according to a study taken by Reuters (Kumar and Gupta, 2020).

By the end of 2020, France had 61 million Internet users, ahead of Germany and the United Kingdom in Europe alone in terms of the number of Internet connections.

Corporate clients execute and manage thousands of financial transactions a day (Tureac, 2007). Under these conditions, it is necessary to operate several updates in a single day. Also, due to the existence in different locations of individuals who want to access their account information, it becomes appropriate to perform transactions quickly and at low cost, via the Internet and, therefore, institutions will opt for these services.

As a natural consequence of the steps taken in the evolution of banking services, addressed to the population, the banks that serve the corporations are building a global presence on the Internet (Rusu, 2000). This will facilitate the global expansion of banks, but will also dramatically increase the level of competition.

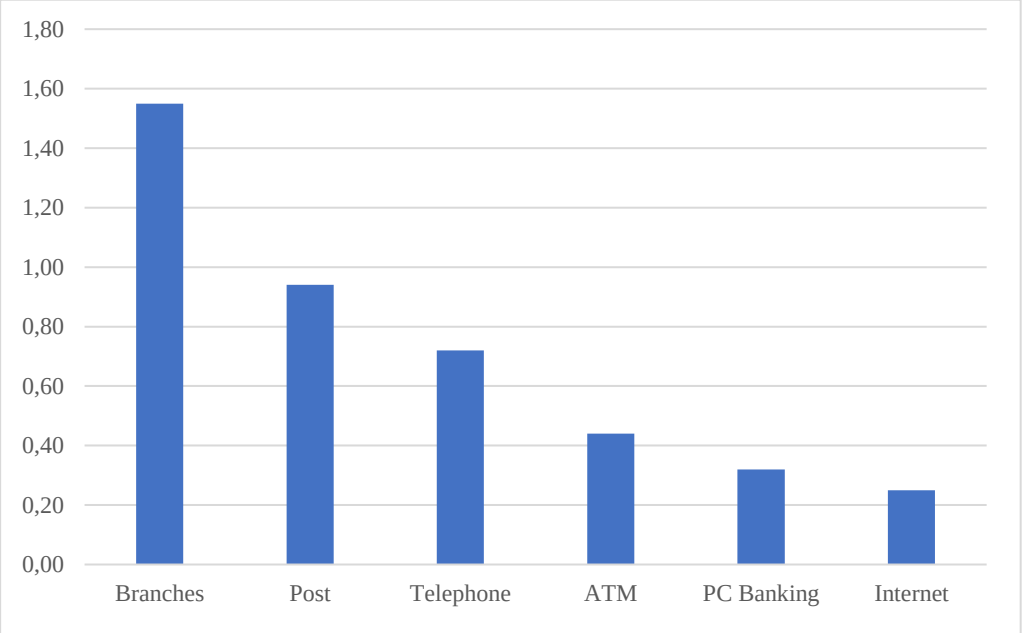


Figure no. 2. Internet banking costs
Source: Forrester Research

In recent years, there has been an increase in the number of websites owned by banks. There are more than 2,500 sites owned by banks worldwide, most of them in the United States. In Europe, most banking sites

are in England, followed by Germany, Spain, Italy and France.

Many web banking sites are evolving from simple web presence to Internet transactions (Thaichon et al., 2014). Application costs increase as the value of the business increases, as can be seen in Figure no. 2. Transactional sites allow banks to sell additional products to existing customers, which increases the banks' partial portfolio per customer and makes individual customers more profitable for the bank.

Transactional sites are not limited to promoting or providing information about banking services, but allow customers to conduct a variety of transactions, thereby giving even more visibility to banks (Pripoaie, 2004). Internet banking thus becomes very attractive to all banking institutions, allowing them to build a different type of customer relationship in any category (Mansur et al., 2022).

M-banking applications will range from simple banking operations on the move to the ability to perform financial transactions for any e-commerce transaction made via a portable device. Basic retail banking services are followed by sophisticated mobile financial services applications as well as stock exchange operations and financial trading and trading facilities.

The share of WAP compatible phones in total sales has increased exponentially with WAP services allowing the use of interactive m-banking services, such as initiating transactions, along with services already available through the SMS protocol: checking the balance and obtaining account statements (Shankar and Jebarajakirthy, 2019).

Although, in Romania, the Internet penetration rate is only 18.7%, the growth rate is one of the highest in Central and Eastern Europe. In addition, the large number of mobile phone users- over 3.6 million, and the technological developments in the field, also appeared on the Romanian market, the fact that a large part of those who have access to the Internet is represented by people with above average incomes, who are holders of bank accounts or payment cards, generate exciting potential for the implementation of direct banking services as a component of the multi-channel distribution strategy.

Conclusion

The evolution of information technology could not fail to affect the banking services both to optimize the existing information system and to expand it. It is important that each risky banking operation is associated with the policies and procedures for assessing, managing and mitigating the risk involved in that operation.

The concept of e-banking is already universally known and accepted as designating the processes by which a customer of a bank can conduct banking transactions without visiting the physical institution. e-banking being a new way of providing banking services brought with it new risks in the system and therefore the need to create tools for their management.

The Romanian banking system has made sustained efforts to be able to create a European banking system, viable and robust as we find in all developed countries among which Romania aspires to integrate. We can say that Romania has a healthy banking system composed of banks capable of carrying out its activity without interventions from the state and with small interventions for regulating the exchange rate, from the National Bank.

The global and European concerns for the study of the risk involved in banking are remarkable. E-banking, as a new potential in terms of risk, is still at an early stage in terms of developing standards, policies and procedures for study and management, even at the international level.

The provision of financial services using the Internet as a delivery channel can change the bank's risk profile and lead to the creation of new aspects in the control and management of banking risk. The implications that the e-banking activity may have on the general risk profile of the bank are manifested in relation to the strategic, operational, reputational, legal, credit, liquidity, market and exchange rate risk.

Risk analysis has become a concern in itself, which in this case requires cooperation between two types of skills that have in common the risk: risk-related banking, financial skills and risk-related IT skills. Closer knowledge of banking and financial leverage is no longer enough as in traditional risk management, but there is a need to create a mixed team of financial analysts and information technology personnel to ensure the security, integrity, confidentiality and non-repudiation of transactions. on the new channels for providing banking services.

Risk management is a complex activity, directly proportional to the scale of the operations of the company that manages it. Hundreds of specialists who have analyzed banking risks and created complex systems for monitoring and controlling bank risks together with the extensive bibliography generated by their studies

indicate a high complexity of the risk phenomenon and a continuous concern to limit it. In this landscape of banking risk analysis, e-banking risk analysis is a new chapter that goes beyond the financial sphere, entering the sphere of cutting-edge technologies, telecommunications and automated electronic processors.

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Traditional Foods Market. Evolution, Concentration, and Growth Potential in Romania

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Abstract
Traditional products represent an opportunity for the Romanian producer and a market niche which can be accessible at European and national level. This paper puts forth an analysis of the Romanian potential in the development of the traditional products, an evaluation of the degree of concentration and of the factors of market influence. The study used information provided by governmental organizations, national and European statistical database. The collected data was processed, graphically represented and analyzed. Herfindahl-Hirschman and Gini-Struck indexes were used to analyze the market concentration. The research results showed an uneven distribution of the traditional products on regions and counties in Romania. The national market is characterized by a high concentration level, most registered products coming from Central and North West regions. The South Est region is modestly represented at national level, but covers roughly 40% of the European traditional registered products in the eAmbrosia database. The local investors' entrepreneurial spirit is a more important factor than the tradition in the development of the traditional foods. In Romania there is an insufficiently capitalized potential for the development of the traditional foods. The analyses performed is useful to the business environment and the

Keywords
traditional, food market, market niche, Gini-Struck, HH Index, Romania

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Introduction

The quality and diversity of food production represents one of the strengths of the national cultural and gastronomic patrimony. The development and the promotion properly accomplished can represent a competitive advantage for the Romanian producers and leads to substantial revenues for small companies (Stanciu, 2014). The traditional products entered a fierce competition on a national food market dominated by supermarkets and industrial products contested for high levels of additives, lack of quality or originality (Stanciu et al., 2019a, Stanciu at al., 2019b). The majority are not known to the Romanian consumer who prefers imported foods, more easily to procure from big marketplaces, better promoted and, more often, cheaper (Stanciu, 2015).

1. Materials and Methods

Articles from Clarivate Analytics database, SCOPUS, Google Scholar and Research Gate were used for the bibliographical references, accessed based on institutional accounts. The legislation in the food field and the traditional products was selected from EUR-Lex, European Commission's press releases, the European Parliament, the Romanian Government, the Ministry of Agriculture and Rural Development, the Ministry of Health and National Consumer Protection Authority and other institutions, European or national. For the recording of the local producers and the registered traditional products the registrations of the National

Register of Traditional Products published by the Ministry of Agriculture and Rural Development and information given by the National Institute of Statistics were used. The collected data was organized and statistically processed using tables and market concentration index, adapted for traditional products. The results obtained were compared to others from specialized literature for validation.

2. Results

2.1. Traditional food production in Romania

To differentiate industrial products from traditional ones, strict rules were imposed, rules which the traditional producers must obey for attestation (Gheorghe et al, 2013). Starting with 2014, traditional products must meet the requirements imposed by the joint order of the Ministry of Agriculture and Rural Development, the Ministry of Health and National Consumer Protection Authority regarding the attestation of the traditional products (2013). If until 2014 there was a permissive legislation which allowed easy registration for more than 4000 products, a lot of which accomplished by industrial producers, after the changes to legislation, the rules became stricter, the control procedures more severe, and after October 2014 almost 90% of the products declared as traditional did not receive the necessary certification (MADR, 2015). According to Guidelines on registration of traditional products, issued for the appliance of Order no 72/2013 the traditional product is defined as being manufactured on national territory from local raw material, without food additives in their composition, using a traditional recipe; a method of production and/or processing and a traditional technological procedure and different from other similar products belonging to the same category (MARD, 2014). After regulations, the specific conceptual terms of traditional production and industrial production were very clearly determined, thus the number of artificial products registered at national level being reduced. For recognition the description of the methods of specific production place, authentic and invariable, as well as the description of the traditional technological process, with all its phases of production, including the ones manually realized, were asked for. Being about higher quality products, stating the organoleptic and physic-chemical elements and the production or manufacturing process which would reflect a traditional technique, through which the product can be differentiated from another product from the same category, was imposed (Petrescu et al, 2018). The task book must include a story and a historic of the product, and many other aspects for the product validation.

The certification of the traditional products represents the recognition of the traditional nature, in accordance with the applied legislation. The certified products are included in the National Registry of Traditional Products NRTP published by MARD (MARD, 2021). Starting with April 1st 2020 the provisions of the Regulation (EU) 2018/775 to establish the implementing rules of the article 26 paragraph (3) from Regulation (EU) no. 1169/2011 of the European Parliament and Council with regard to the information supplied to the consumer concerning the country of origin of the primary ingredient of a food, is applied in Romania, too. The producers/ manufacturers/ importers of food products have the obligation to provide complete information by specifying the country of origin or the place of origin of the primary ingredient, alongside the other mandatory information regarding the labelling of the food product. The consumers can be assured of the product authenticity and quality and so can choose local products (Kapelari et al., 2020). Purchasing traditional Romanian products, they can contribute to the preservation of the national cultural heritage values and to the development of the local economy (MARD, 2020a). Traditional products can be registered upon voluntary quality schemes which target certain technical specifications of the food products.

The benefits of the certification/ registration/ recognition based on these quality schemes are given by the promotion opportunities and European market entering, accessing European funds, facilitating the participation in “Enjoy, it’s from Europe” program; making European consumers aware of the quality of the traditional Romanian food products; participation in global value chains and adding component services to the product; conservation and protection of the environment etc. (Stanciu, 2014; EC, 2018).

The Ministry of Agriculture and Rural Development reaccredited in 2014 the certification of 309 traditional products according to the Order 724/2014 (MARD, 2020c). In 2015 there were 474 products registered, which grew to 750 in 2020.

The players involved in the image consolidation of the traditional product on the Romanian market are The National Federation of Producers of Traditional Products and the profile Associations from the country; MARD, through specialized authorities); County Agricultural Authorities through specialized authorities; NACP with its county offices for consumer protection; HM. At the certification of the product, the producer receives a certificate “Certified Traditional Product”, but this does not exonerate the economic operator from the responsibility regarding the manufacturing and the merchandising of the traditional product. The certificate keeps its validity as long as the economic operator fulfils the criteria and requirements for which

the certificate was released. The evolution of traditional products registered annually at MARD in NRTP is presented in figure no. 1.

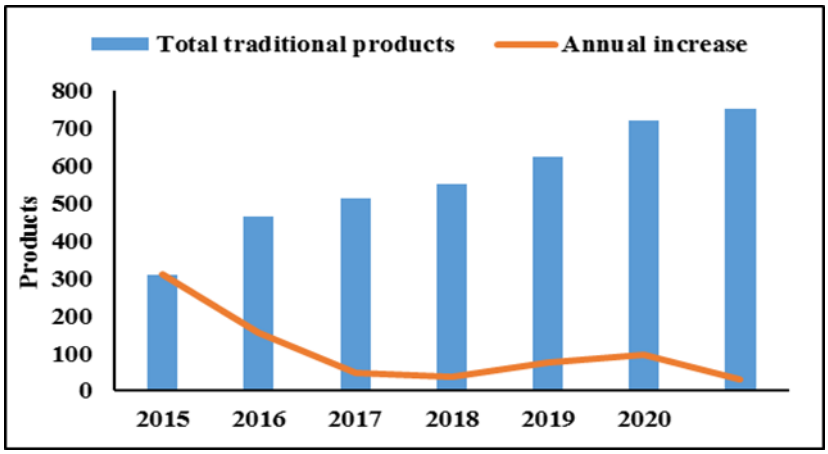


Figure no. 1. Traditional products registered in NRTP
Source: Author, by using MARD, 2020d

During the period evaluated, the annual median rate of registration of traditional products at national level was about 70 products/year, being relatively moderate in the last few years. In 2020 there were registered only 29 certificates for traditional products, more than 60% being attributed to producers from Alba and Gorj Counties (figure no. 2).

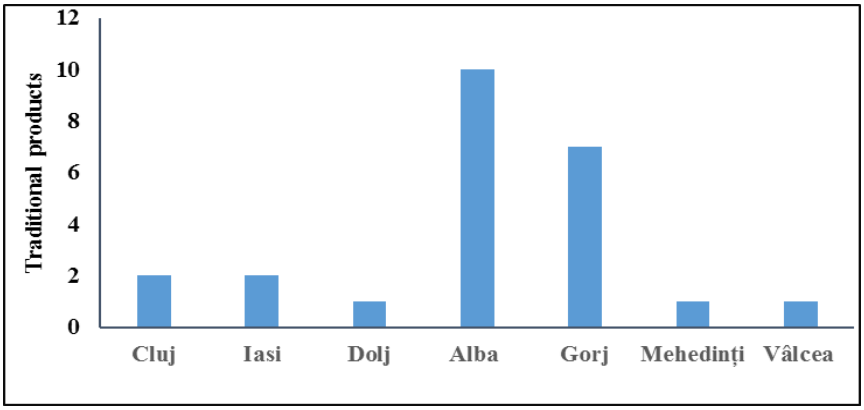


Figure no. 2. County distribution of products registered in NRTP
Source: Author, by using MARD, 2020d

Until this research there has not been registered any traditional products originated from the South-East Regional Development Counties. The distribution of the registrations of traditional products between 2014-2020 in NRTP, on development regions of Romania, is presented in figure no. 3.

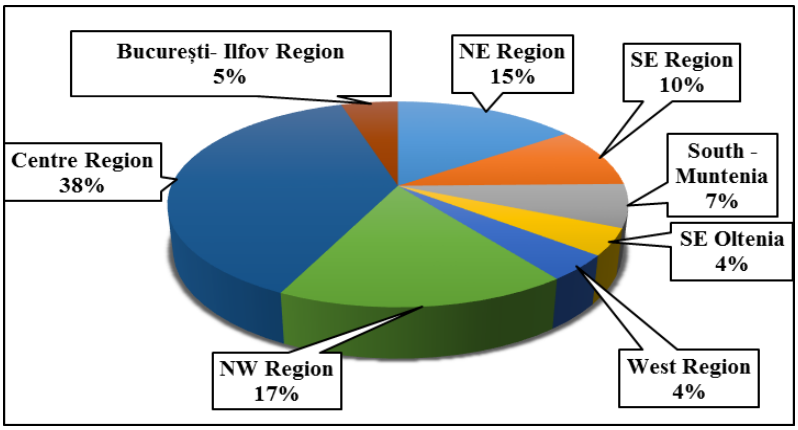


Figure no. 3. Products registered in NRTP by regions (2014-2020)
Source: Author, by using MARD, 2020d

The total number of traditional products in absolute values and the regional distribution is presented in Table 1. To measure the market concentration, Roberts (2014) recommends to apply Herfindahl-Hirschman analysis, based on concentration index HHI. HHI is calculated by the square sum of market shares of all sector factors. In this case, HHI represents a value of the way in which a small number of regions can represent a big share of the traditional products market.

The higher the HHI market value, the more the production is concentrated in a small number of factors. In general, when the HHI value is below 1,000, the market concentration is considered low; when the index is between 1,000 and 1,800, the market concentration is considered median, and when the HHI value is over 1,800, this is considered high (Competition Council, 2020). The HHI is calculated using formula 1, recommended by Săvoiu, Crăciuneanu și Țaicu (2010) and applied by Stanciu et al. (2015), to evaluate the concentration value of meat products market in Romania.

$$IHH=\sum Gi2 \qquad (1)$$

where Ni - number of products i,
N - number of products, and
Gi - the weight of the product i, calculated according to Table no.1.

According to the data presented in Table 1, HHI takes the value 2179.34, which proves a high value of concentration of the traditional products market at national level. Over 55% of the traditional products registered in NRTP come from just two Romanian regions, respectively NW and Centre Region.

Table no. 1. Distribution and share of traditional products by Romanian Regions

Region	Registered Products (Ni)	Gi (%)	Gi2
NE Region	112	15.20	230.941014
SE Region	70	9.498	90.2113338
South - Muntenia	50	6.78	46.0261907
SE Oltenia	31	4.21	17.6924677
West Region	30	4.07	16.5694286
NW Region	128	17.37	301.637243
Centre Region	281	38.13	1453.70961
Bucharest - Ilfov Region	35	4.75	22.5528334
Total	737	100.00	2179.340132

Surce: Authors, by using MADR (2020d)

A verification of the concentration value of the market of traditional products can be carried out by means of the Gini-Struck Index (GSI). GSI is calculated by using the formula recommended by Săvoiu, Crăciuneanu și Țaicu (2010), showed in formula 2.

$$GSI = SQRT\ ((N\sum Gi2-1)/(N-1)) \qquad (2)$$

If the GSI value tends to 1, this indicates a high value of market concentration and if the value of the coefficient tends to 0, it indicates a low concentration value of the structure of the analyzed market. The application of formula 2 leads to a value of GSI = 0.33, respectively a high value of market concentration.

2.2. Traditional products in the South-East Region of Development of Romania

The distribution of traditional products registered on South-East Regional Development County, between 2014-2020 is shown in Table 2. Buzau and Tulcea, with 39, respectively 20 traditional products certified between 2014-2020 take the first places at regional level, and concentrate over 84% of the total traditional products from this part of Romania. In 2020 there were no traditional products registered in the NRTP coming from this region, the maximum number being registered in 2014 when 22 products were approved through the regularization of the profile market.

Through the registered traditional products perspective, with only one traditional product registered, Braila county with ”Bors de putina” (Other products category, 2015), respectively Constanta with ”Ghiudem taranesc Mos Iosif” Meat products category (2018), take the last place in the regional classification. In Vrancea County there were registered three traditional products from “Bread, bakery products and pastries” category, belonging to the Bogart Design LLC company (2017), respectively Motareschi Eugenia Individual Enterprise (2018) and Rustic Pani Grig LLC (2018). Galati County is represented by 7 traditional products in “Meat and Meat products” category, registered by two local producers: DRU AGRO LLC (3 certified products in 2014), respectively Verdesi &CO LLC (4 products in 2019).

Table no. 2. Traditional products on SE Region by County (2014-2020)

County	2014	2015	2016	2017	2018	2019	2020	Total
Brăila	0	1	0	0	0	0	0	1
Buzău	11	2	0	3	8	15	0	39
Constanța	0	0	0	0	1	0	0	1
Galați	3	0	0	0	0	4	0	7
Tulcea	8	0	0	6	6	0	0	20
Vrancea	0	0	0	1	2	0	0	3
Total	22	3	0	10	17	19	0	71

Source: Authors, by using MADR, 2020d

In Buzau 39 traditional products were certified, all in "Meat and meat products" category, registered by 8 producers: "Gabioti traditional products from Plescoi" – 11 traditional products (2014); "Ghizdeanu Victoras Authorized Natural Person" – 2 traditional products (2015), Traditional Popa Carm LLC – 3 products (2017), 8 in 2018 Roxana Com LLC (3), David Prodcom Panif LLC (1), La Bunica Gina LLC (3), Macelaria Veche LLC (The Old Butchery) (1), and in 2019 there were certified 15 products Macelaria Veche LLC (The Old Butchery) (6), respectively Global Pro Carm LLC (9).

The main categories of registered products in Tulcea County were registered by three producers, respectively for "Fish", Miadmar HDP LLC registered 8 products in 2014; at "Fruit-Vegetable" category there were 7 products registered by SC PICCOLO ANGELO SRL (5 products in 2017 and 2 products in 2018), which also has 4 traditional products from "Bread, bakery products and confectionery" category (1 product registered in 2017 and 3 products registered in 2018), respectively "Milk and dairy products" category, with goat feta cheese registered in 2018 by Migit H. Nicolae ANP.

In the SE Region the agents show a small interest in registering traditional products, just 18 companies and natural people being authorized as traditional producers. Mainly requests for products from "Meat and meat products" category was addressed for certification, which represents more than 66% of the total at regional level (figure no 4). "Fish", "Fruit and vegetable" and "Bakery – confectionery products" are domains in which the region is better represented.

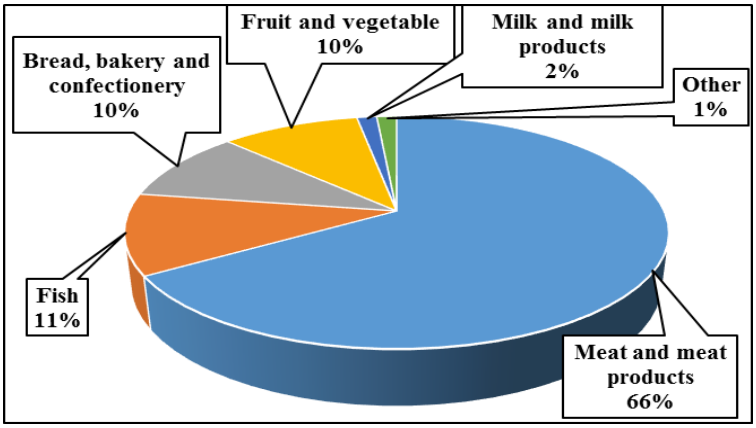


Figure no. 4. Traditional products in SE Region, by categories
Source: Author, by using MADR, 2020d

2.3. Romanian traditional products registered at European level

In Romania there could be registered a number of food products which have potential, taking into account the fact that there is a vast heritage and interesting traditions of production and consumption, which could be the basis of some successful promotional campaigns (Voinea et al., 2020). Unfortunately, the local producers have lacked the inspiration and the experience necessary to make the most of the existing potential at national level (Butu et al., 2020). In the database eAmbrosia, the European Register of products with geographical specifications, developed by the European Commission EC (EC, 2021), the traditional producers from Romania have registered so far only 69 products, representing less than 8% from a total of 3,330 products certified on the basis of quality facultative schemes, registered at the European States level. (Figure 5). The best represented Romanian products in eAmbrosia are spirits (wine and distilled spirit), representing 87% of the total certified/in the process of being certified.

Table no. 3. Certified traditional products, on SE Region Counties (2014-2020)

No.	Product	Category	Product code	Type
1.	Salam de Sibiu (Sibiu salami)	1.2 Meat products (cooked, salted, smoked, etc.)	PGI-RO-01280	PGI
2.	Cârnați de Pleșcoi (Plescoi sausages)	1.2 Meat products (cooked, salted, smoked, etc.)	PGI-RO-02174	PGI
3.	Telemea de Ibănești (Ibanesti Feta)	1.3 Cheeses	PDO-RO-01182	PDO
4.	Telemea de Sibiu (Sibiu Feta)	1.3 Cheeses	PGI-RO-02473	PGI
5.	Caşcaval de Săveni (Saveni cheese)	1.3 Cheeses	PGI-RO-02361	PGI
6.	Magiun de prune Topoloveni (Topoloveni plum jam)	1.6 Fruit, vegetables and cereals fresh or processed	PGI-RO-0763	PGI
7.	Novac afumat din Țara Bârsei (Smoked Bighead carp from Barsa Country)	1.7 Fresh fish, molluscs, and crustaceans and products derived therefrom	PGI-RO-01183	PGI
8.	Scrumbie de Dunăre afumată (Smoked Danube mackerel)	1.7 Fresh fish, molluscs, and crustaceans and products derived therefrom	PGI-RO-02234	PGI
9.	Salată tradițională cu icre de crap (Traditional carp roe salad)	1.7 Fresh fish, molluscs, and crustaceans and products derived therefrom	TSG-RO-2457	TSG
10.	Salată cu icre de știucă de Tulcea (Tulcea Pickerel roe salad)	1.7 Fresh fish, molluscs, and crustaceans and products derived therefrom	PGI-RO-02476	PGI
11.	Plăcintă dobrogeană (Cheese pie Dobrogeana style)	2.3 Bread, pastry, cakes, confectionery, biscuits and other baker's wares	PGI-RO-02510	PGI

Source: Authors, by using EC, 2021

From the 11 traditional foods registered at European level, 4 belong to the producers from the South Est Region, all of them from Tulcea County. Even if the South-East Regional Development County of Romania does not take the first places in the national classification, the European certification was more attractive to local producers.

Conclusions

The paper carried out an analysis of the local traditional products market evolution in a European context. After 1990-2014, a period of time in which the national regulations concerning the traditionality of food products were unclear, with many industrial products declared as traditional, the correlation between the national legislation and the European legislation reduced the number of certified traditional products. At the responsible Ministry level there was created a national registry of traditional products, recommendations and specialized institutions in the accreditation of the producers. Compared to other European states, Romania has a low number of traditional foods registered in eAmrosia database. The national certification as traditional means a preliminary stage before European level recognition. In Centre, NW and NE regions there are registered the most of the traditional products, on a national market characterized by a high concentration value, proved by the high levels on HHI and GSI indexes. In the South-Est region of development of Romania, although there is a major development potential of the traditional products, given by tradition and cultural diversity, there is a low number of registered products. Great differences were noticed between the counties of the region, even though they are geographically close to each other, probably due to a greater number of local entrepreneurs interested in developing these products.
The traditional products may represent business opportunities for the local producers, but there is a need for financial support and legal advice from specialized government agencies. For preliminary identification and promotion there is a need for viable strategies, for a real and well-rounded plan for each region at national level.

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