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BASIQ 2023 Conference Keynote Speakers



Adriana Grigorescu, after 10 years as Sales Director and Commercial Manager in various companies, starts the activity of teaching commerce and marketing. The passion and multidisciplinary education was transferred to the research and teaching of Public Marketing and Project Management at National University of Political Studies and Public Administration, Bucharest. She is now full professor in Management and Associate Senior Researcher at Romanian Academy - National Institute of Economic Research "Costin C. Kiritescu". Associate Researcher at Intellectual Capital Research Group, Universidad de Castilla-La Mancha, Spain (2012-present), Member of Chinese Education & Human Resources Management Network Association, Taichung, Taiwan (2013-present) and Visiting Professor at several universities from the European Union, China, Taiwan, etc. Is leading (2015-p) the Global Economy & Governance - Interdisciplinary Research Platform, where she has promoted and organized international conferences and research partnerships with European Union countries, USA, Israel, China, Taiwan, Philippines, Korea, Indonesia, etc. She is the President of the European Business Ethics Network Association - Romania (EBEN-Romania) - 2020 and of the Holistic Research Academic Association (HoRA) - 2016 and member of multiple professional organizations; member of CNATDCU (2012-2016 and 2016-2020), evaluator ARACIS (2017-present), evaluator ANC, MEC. Director or expert in about 50 national and international research projects, encouraged innovative interdisciplinary, cross sector studies and the links between education, business environment and public sector. Globalization, knowledge production & transfer and skills development for a better sustainable world are the current topics of her research.

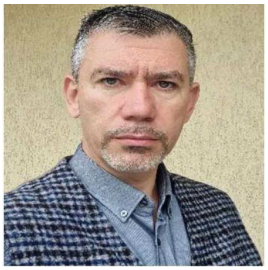


József Popp is Professor at John Neumann University, Hungary and the founding member of its Doctoral School of Management and Business. He is Professor at WSB University, Dąbrowa Górnicza, Poland and visiting professor at the University of Johannesburg, College of Business and Economics, South Africa. He is also an active member and chairman of several academic and professional organizations. Professor József Popp obtained his PhD of economics at the Hungarian Academy of Sciences and his Dr. Sc. oec. degree at the Humbold University, Berlin, Germany. He is a corresponding member of the Hungarian Academy of Sciences, where he is the chairman of the Bolyai János Research Scholarship Committee and the chairman of the Scientific Committee of Circular Economy. He also serves as a member on a number of Editorial Boards of international journals worldwide and is a member of several national councils related to science and education.

Among the honors he has received are: Doctorem Honoris Causa Pannon University, Hungary, 2010, "Honoris Causa Professorship", Delhi School of Professional Studies and Research, India, 2010, Award of the Hungarian Academy of Sciences in Recognition of Research Contributions, 2011. He has a long list of publications and has advised dozens of PhD students and postdoctors holding research and teaching positions in Hungary and abroad. Stanford University has recently released a list that represents the top 2 per cent of the most-cited scientists of the world in various disciplines including the name of József Popp as well. His research in the social sciences cover topics such as economics, circular economy, bioeconomy, food, energy and environmental security, rural development and ecosystem services.



Judit Oláh has both studied and lectured abroad in her career. Nowadays, she is a Professor at John von Neumann University and University of Debrecen in Hungary, and a visiting Professor at WSB University, Poland, and University of Johannesburg, South Africa. She is the head of the Doctoral School of Management and Business at the John von Neumann University, Budapest, Hungary.
She is a Doctor of the Hungarian Academy of Sciences (DSc) and is an active member and chairman of several academic and professional organizations. Her research activity is related to renewable energy, bieconomy, circular economy, food industry, digitalization in the supply chain, logistics and Industrie 4.0.
Stanford University has recently released a list that represents the top 2 per cent of the most-cited scientists of the world in various disciplines including the name of Judit Oláh as well.
In 2023 she was awarded the Top 1 external researcher and Top 20 researcher at the University of Johannesburg, South-Africa.
During her studies at different universities, she has developed a strong environmental awareness. One way to achieve sustainability is to help businesses adopt sustainable environmental practice because it is one of the key drivers behind innovation.



Adrian Istrate-Scrădeanu is leading a group of companies dedicated to the transport industry, with activities covering everything from freight forwarding to port operations. Being involved in several projects for the maritime industry and relying on his experience of over 20 years, he also works as a consultant for different shipping lines in his area of expertise, the Black Sea.
Although his activity is mainly concentrated on the vibrant port of Constanta, as the largest Black Sea port, its interests and activities are spread on neighboring countries like Bulgaria, Moldova, North Macedonia, Hungary, Georgia, and Azerbaijan. Mr. Istrate is co-founder of Romanian Port Developments, an organization aiming both to be a dialogue partner between ports operators and relative authorities but also to encourage education and port spirit for new workers.
Born in Constanta, he is a sea lover who is passionate about the development and future of sea transportation, particularly in terms of transport and fuel efficiency, sustainability, and long-term vision plans. Currently, in a world fully immersed in globalization and with supply chains spanning over continents, he is conducting scientific research to study the relationship between maritime container traffic, connection of subject volumes with the degree of economic development and its influence on GDP per capita.

Authors Index

A

Albăstroiu Năstase Irina

Almășan – Anghel Cristiana Maria

Andrei Tudorel

B

Barbu Corina Aurora

Barbul Maria

Bălu Evelina Petronela

Bâra Adela

Belciuganu Oltea

Belu Mihaela Gabriela

Benabed Anis

Bichel Andreea

Birchi Florin-Aurelian

Bîgu (Potcovaru) Ana Mădălina

Bobe Magdalena

Boboc Cristina-Rodica

Bodislav Dumitru Alexandru

Bojescu Irina

Boruzescu Patricia Cristiana

Boshnakov Petyo

Bran Florina

Breaban Lucian

Breazu Andreea

Bucur Mihaela

Budz Sonia

Bujor Dragoș

Bumbac Robert

Burlacu Sorin

Butnaru Gina Ionela

Buzoianu Ovidiu Andrei Cristian

C

Cazacu Marian

Călin Ana Maria

Chersan Ionela Corina Chersan

Chiotan Radu Alexandru

Chița Sandra Diana

Ciobanu Ghenadie

Ciobotea Mihai

Ciofu Ioana

Cohen-Tzedec Betty

Cojoacă (Alniți) Denisa-Maria

Condrea Elena

Cosma Aurora

Cozma Oana-Maria

Crețu Romeo Cătalin

Cumpăt Maria Ana

D

Dabija Dan-Cristian

Darie Flavius Cosmin

Diaconu Amelia

Dieaconescu Ramona Iulia

Dijmărescu Eleonora

Dima Cristina

Dimitrova Vesselina

Dina Răzvan

Dinu Mihai

Dinu Vasile

Dobre Florin

Dobrea Răzvan Cătălin

Dodoc (Ghițun) Mădălina-Maria

Dragomir Diana

Dragomir Mihai

Drăcea Lăcrămioara

Drăgoi Mihaela-Cristina

Dumitriu Simona

Dumitru Mădălina

Dumitru Ștefan-Marian

Dumitru Valentin Florentin

E

Enache Calcedonia

Ene (Constantin) Andreea Bianca

F

Felea Mihai

Firican Diana Andreea

Frățiloiu Bogdan Alexandru

G

Gallucci Teodoro

Ganea Otilia

Georgescu Cristina Elena

Georgescu Iulian

Ghencea Alexandru

Ghiță Oana-Maria

Ghiță Simona Ioana

Giungato Paquale

Gombos Carol Cristina

Gorgan Cătălina

Gorgan Vasile

Grigorescu Adriana

Grosu Raluca Mariana

H

Heide Michael P.

Holotă Anamaria

Hornoiu Remus Ion

I

Iacob (Pârgaru) Oana Camelia

Ichim Alexandru – Mihăiță

Ionașcu Alina Elena

J

Jansen Adela

Jinga Gabriel

K

Kalashnikova Kseniia

Kondort Giulia

Košíková Katarína

L

Lincaru Cristina

Liptac Adrian Petre

M

Maiorescu Irina Gabriela

Malichová Eva

Manolache Simona Beatrice

Mansour Lăcrămioara

Mariniuc Anamaria

MarinovGeorgi

Mănescu Cătălin Octavian

Melinte Cristiana

Mihai Laurențiu Stelian

Mihalcea Carmen Maria

Militaru Ionuț Andrei

Mirică Andreea

Moise Daniel

Moncea Mădălina Ioana

N

Naumann Michael Matthias

Neacșu Marius

Negrea Teodor Mihai

Nicolae Ștefan Liliana

Niculae Andreea-Mihaela

Niță Valentin

O

Oancea-Negescu Mihaela Diana

Olariu Ana Alexandra

Olaru Stelian

Onete Cristian Bogdan

Oprea Simona-Vasilica

Orieščík Tomáš

P

Pamfilie Rodica

Panait-Ioncică Diana-Eugenia

Panduru Andrei Dorian

Pantea Maria Carmen

Paraschiv Dorel Mihai

Păcuraru Marcela

Pegulescu Irina Andreea

Pelău Corina

Petcu Ionela-Roxana

Petre Adrian

Petrescu Eva-Cristina

Petrescu Irina Elena

Pila Mihaela

Pitz Fabian

Pîrciog Speranța

Platagea Gombos Svetlana

Pleșea Doru Alexandru

Ploscaru Andra Nicoleta

Pop Ștefana

Popa Alexandra

Popa Cătălina Florentina

Popa Ioan

Popa Ștefan Cătălin

Popescu (Groaznicu) Luminița Nicoleta

Popescu (Iacobescu) Ioana Maria

Popescu Claudia Rodica

Popescu Daniela Victoria

Popescu Delia

Popescu Dorin Vicențiu

Popescu Maria Loredana

Predilă Ana-Maria

Procopie Roxana

R

Rana Roberto Leonardo

Răducanu Dragoș

Rădulescu Carmen-Valentina

Robu Raluca

Romanescu Sofia Mihaela

Rotea Claudia Cristina

Rotescu Daniela Corina

S

Sava Ștefan

Săracu Alina Florentina

Săseanu Andreea Simona

Sârbu Alexandra Maria

Sârbu Roxana

Sitnikov Cătălina

Spătariu Elena Cerasela

Spînu Cristinel Sorin

Stan Marian

Stanca Ionela Petruța

Stanciu Anca Cristina

Stanciu Silvius

Stănescu Marius Sandy

Stănescu Robert-Daniel

Ș

Șișu Julia-Anamaria

Șulă Denisa Mihaela

T

Tăchiciu Laurenţiu
Tiriteu Ștefan
Tiutiu Miriam
Tîrnovanu Andrei
Tofană Silvia
Tokarčíková Emese
Toma Sorin George
Tricase Caterina
Troacă Victor Adrian
Tudose (Pop) Iuliana

V

Vasile Valentina
Vasiliu Cristinel
Vâlcu Elena Crizantema
Vochin Oana Alexandra
Voinea Lelia

W

Wu Tong

Z

Zamfir Andreea
Zavatin (Chilea) Iuliana
Zgură Ion Daniel
Zouri Nicoleta

Contents

Constructing modern knowledge: competency-based education and new ways of capacity building

Front matter..... **21**

The Balanced Scorecard: A Bibliometric Approach
Ștefan Cătălin Popa, Cătălina Florentina Popa, Ana Alexandra Olariu, Andreea Breazu..... **22**

The Impact of Using Enhanced Teaching Materials on Core Skills When Teaching English as a Foreign Language
Maria Ana Cumpăt, Nicoleta Zouri..... **31**

Capacity Building and Development in the Health Sector: Implications for Romania
Cristiana Maria Almășan – Anghel..... **38**

The Question of the Week Teaching Approach for Online Learning
Mădălina Dumitru, Vasile Gorgan, Gabriel Jinga..... **44**

Assessment of Factors that Motivate Young People to Volunteer
Mădălina-Maria Dodoc (Ghițun), Denisa-Maria Cojoacă (Alniți), Marius Sandy Stănescu..... **51**

Theoretical Approaches of Project Management
Denisa-Maria Cojoacă (Alniți), Mădălina-Maria Dodoc (Ghițun), Marius Sandy Stănescu..... **60**

Evaluating the Effects of HRM Practices on Employee Engagement and Organizational Culture
Andra Nicoleta Ploscaru, Claudia Cristina Rotea, Simona Dumitriu, Iulian Georgescu..... **68**

Exploring the Direct Influence of the Organizational Change Process on Organizational Performance
Andra Nicoleta Ploscaru, Claudia Cristina Rotea, Marian Cazacu, Daniela Victoria Popescu..... **74**

E-learning Platforms and European Digital Society
Marian Stan, Alina Florentina Săracu, Mihai Ciobotea..... **80**

Ethical Communication in Healthcare Organizations
Ana-Maria Predilă..... **89**

How Does the Supply of Tertiary Graduates Correlate with the Labour Market? Evidence from European Countries
Simona Ioana Ghiță, Cristina-Rodica Boboc, Andreea Simona Săseanu, Valentina Vasile…… **96**

Perspectives of Human Capital Core Specialization for Digital Transformation in Romania
Adriana Grigorescu, Cristina Lincaru, Speranța Pîrciog…… **104**

The Importance of Managerial Skills Transfer Management for Organizational Success
Cătălina Sitnikov, Daniela Corina Rotescu, Cristinel Sorin Spînu, Sofia Mihaela Romanescu…… **113**

Change Management in a Dynamic Economic Environment
Ionela Stanca Petruta, Denisa Mihaela Șulă, Liliana Nicolae Ștefan, Carmen Maria Mihalcea, Irina Andreea Pegulescu…… **121**

Energy transitioning to sustainability

Front matter…….... **130**

Electricity Price Evolution and the Disruptive Economic and Geopolitical Context on the Spot Market. A Romanian Case Study
Adela Bâra, Simona-Vasilica Oprea, Andreea-Mihaela Niculae…….... **131**

The Effect of Renewable Energy Consumption in Romania
Flavius Cosmin Darie…… **139**

The Deregulation Trap in Today's Energy Markets
Florina Bran, Dumitru Alexandru Bodislav, Romeo Cătalin Crețu, Otilia Ganea……. **145**

Corporate Carbon Performance Study Across Nations: The Point of View of Global Investors
Dragoș Bujor, Bogdan Alexandru Frățiloiu, Iuliana Zavatin, Adela Jansen…… **151**

Green Energy and Societal Marketing in the Context of Climate Change
Eva-Cristina Petrescu, Diana-Eugenia Panait-Ioncică…… **159**

AI Trends: Salient Aspects for the Manufacturing Sector and Its Global Supply Chain
Eleonora Dijmărescu…… **168**

The Role of Human Resources Function in Promoting Sustainability on Oil & Gas Industry
Oana Alexandra Vochin, Alexandra Maria Sârbu, Rodica Pamfilie, Roxana Sârbu…… **176**

Artificial Intelligence's Relevance for Energy Optimization, Companies and Business Internationalization
Anis Benabed…….. **183**

Regional innovation for sustainable development

Front matter……..... **192**

Outsourcing in Today's Economic Environment
Dumitru-Alexandru Bodislav, Răzvan Cătălin Dobrea, Florina Bran, Mădălina Ioana Moncea…… **193**

Sustainable Financing in the Context of Global Crisis and Digital Transformations
Ghenadie Ciobanu, Luminița Nicoleta Popescu (Groaznicu), Dragoș Răducanu, Carol Cristina Gombos…… **201**

The Current State of Industrial Production in the European Union and New Recovery Solutions
Oana Camelia Iacob (Pârgaru), Radu Alexandru Chiotan, Ana Mădălina Bîgu (Potcovaru), Ghenadie Ciobanu…… **209**

Population Growth and Global Nutrition: Implications for Universal Health Coverage and Sustainable Development Goals
Carmen-Valentina Rădulescu, Cătălin Octavian Mănescu, Maria Loredana Popescu, Mihaela Diana Oancea-Negescu…… **218**

Challenges Regarding the Performance of Public Investment Projects
Cristina Dima, Carmen Valentina Rădulescu, Irina Elena Petrescu, Amelia Diaconu…. **226**

The Role of Public Administration in Promoting Sustainable Development: A Case Study of Population Growth and Global Nutrition Interventions
Sorin Burlacu, Ana Maria Călin, Elena Crizantema Vâlcu, Evelina Petronela Bălu…… **234**

Analysis of Fiscality and Economic Growth at EU Level
Mihai Dinu, Sorin Burlacu, Elena Crizantema Vâlcu, Ovidiu Andrei Cristian Buzoianu. **245**

Globalization and its Impact on Environmental Policies
Ovidiu Andrei Cristian Buzoianu, Oana Camelia Iacob (Pârgaru), Dragoș Răducanu, Victor Adrian Troacă…… **252**

Innovative Enterprises in Europe – a Country Cluster Analysis using R Shiny
Tudorel Andrei, Andreea Mirică, Ionela-Roxana Petcu…… **260**

Sustainability in Higher Education
Anca Cristina Stanciu, Elena Condrea…….. **267**

Clustering of Customer Attitudes Towards Eco-Innovations - Evidence from Bulgaria
Georgi Marinov, Teodoro Gallucci, Vesselina Dimitrova, Petyo Boshnakov…… **274**

Sustainable Leadership in European Business Environment
Andreea Bianca Ene (Constantin)…….. **280**

Regional Innovation for Sustainable Development: The Case of Romania and China
Tong Wu…… **288**

Linking National Competitiveness to Innovation at a Global Level in the Period 2019-2022
Sorin-George Toma, Andreea Simona Săseanu…… **295**

Socio-demographic trends. Imagine and anticipate the societal future

Front matter……..... **302**

Who Is More Rational During a Crisis Situation: Men Who Do Not Spend Their Money or Women Who Think About the Future?
Alexandru – Mihăiță Ichim, Andrei Dorian Panduru…….. **303**

The Nexus Between the Travel Trends of the Young Generation and Ecotourism Development in the North East Region of Romania
Cristiana Melinte, Gina Ionela Butnaru, Valentin Niță…….. **311**

The Correlation Between Motivation and Employee Satisfaction in the Service Industry
Laurențiu Stelian Mihai, Florin-Aurelian Birchi…… **319**

The Paradoxes of the SGDs from the Sustainable Development Report
Florin-Aurelian Birchi, Laurențiu Stelian Mihai, Patricia Cristiana Boruzescu …….. **327**

The Parents Perception of Martial Arts Practiced by their Children
Daniel Moise, Amelia Diaconu, Florin Dobre, Svetlana Platagea Gombos…… **334**

The Importance of Institutional Efficiency and Skill Development in the Context of Globalization and Economic Growth: Case Study – Romania
Robert-Daniel Stănescu …… **342**

The Impact of COVID-19 on Online Consumer Behavior for Sports Equipment: A Trend Analysis
Cristian Bogdan Onete, Ștefan Sava, Sonia Budz, Sandra Diana Chița…… **351**

The New Paradigm of Online Marketing: A Study of Generation Z Consumers' Behaviour and Their Attitude Towards Brands
Alexandra Popa, Corina Aurora Barbu, Alina Elena Ionașcu…… **359**

The Implementation of Telemedicine Increases the Quality of Medical Services
Marcela Păcuraru, Aurora Cosma, Ștefan Tiriteu, Andreea Zamfir..... **369**

Are Young People Keen to Adopt More Sustainable Behaviour by Using Shared Services?
Eva Malichová, Emese Tokarčíková, Katarína Košíková, Tomáš Orieščík..... **377**

Regulating Artificial Intelligence – Balancing Between Protecting Citizens Privacy and Fostering the Industry's Growth in Europe
Ștefan-Marian Dumitru..... **385**

Is Digitalization Gender-Neutral? Gender Digital Divide Status in EU
Anamaria Holotă, Mihaela-Cristina Drăgoi..... **392**

Financial Stability of Romanian Households in Light of the COVID-19 Pandemic Shocks
Calcedonia Enache..... **400**

Senior Entrepreneurship Literature: A Systematic Review
Raluca Mariana Grosu, Irina Albăstroiu Năstase, Marius Neacșu, Ion Daniel Zgură..... **407**

The Main Pillars of Supporting the Acceptance of Cultured Meat as a Possible Alternative Source for Sustainable Food Consumption
Lelia Voinea, Dorin Vicențiu Popescu, Teodor Mihai Negrea, Răzvan Dina..... **416**

Technological and social innovation for sustainable business

Front matter..... **424**

Early Disclosure of the Double Materiality Concept in a European Oil and Gas Company
Valentin Florentin Dumitru, Ionela Corina Chersan, Cătălina Gorgan..... **425**

The Circular Economy as a Driver for Sustainable Business Development and the Role of ICT
Adrian Petre, Doru Alexandru Pleșea, Michael Matthias Naumann, Fabian Pitz..... **433**

Mapping the Supply Chain Digitalization: An Exploratory Bibliometric Analysis
Ramona Iulia Dieaconescu, Mihaela Gabriela Belu, Ioan Popa, Dorel Mihai Paraschiv **441**

XBRL Standards – Mean of Improving Capital Market Information Process
Lăcrămioara Mansour, Elena Cerasela Spătariu, Cristina Elena Georgescu..... **448**

Innovative Trends Through Robotic Process Automation. A Case Study
Andreea Bichel, Julia-Anamaria Șișu, Andrei Tîrnovanu..... **456**

Impact Assessment of Pomegranate Cultivation Using Reclaimed Wastewater
Paquale Giungato, Roberto Leonardo Rana, Caterina Tricase…… **464**

Change Management in the Context of Digital Transformation: A Comparison Between a Theoretical Model and Successful Approaches in Organizations
Diana Andreea Firican…… **472**

Factors Impacting SMES' Business Sustainability Post-COVID-19 in Bucharest, Romania, from the Perspective of Resilience
Betty Cohen-Tzedec, Mihaela Bucur, Irina Gabriela Maiorescu, Robert Bumbac…… **480**

Liberalisation of Competition and Stimulation of the Economy by Granting State Aid in the Republic of Moldova
Alexandru Ghencea, Simona Beatrice Manolache, Mihaela Pila, Adrian Petre Liptac, Silvius Stanciu…… **487**

Travel and tourism resilience and sustainability challenges

Front matter…….... **494**

Supply and Demand in Tourism Destinations in Romania. Pre and Post Pandemic Comparative Analysis
Claudia Rodica Popescu, Delia Popescu, Iuliana Tudose (Pop), Ionuț Andrei Militaru... **495**

Understanding Customer Loyalty in Romanian Wellness Spa Tourism: Insights from TRA Research
Lucian Breaban, Remus Ion Hornoiu…… **503**

Overview on the Impact of Consumer Behavior Decisions on the Tourism Industry in Romania
Mădălina Moncea, Lăcrămioara Drăcea, Răzvan-Cătălin Dobrea…… **511**

Value creation for businesses and consumers through innovative business models. New forms of market interaction, open innovation and collaborative networks

Front matter…….... **519**

From Developing to Under Developing Economies - The Storyline of Slavery and Nowadays Consumption
Oana-Maria Cozma…… **520**

The Nation Branding in Romania, Approach to Strategy and Leadership
Oltea Belciuganu, Anamaria Mariniuc…… **528**

Developing a Circularity Cost Approach for the Wood Products Industry
Diana Dragomir, Silvia Tofană, Mihai Dragomir…… **534**

Generations' Perception Towards the Interaction with AI
Maria Barbul, Irina Bojescu..... **539**

Artificial Intelligence Implications in Retail in the New Normal: A Qualitative Approach
Miriam Tiutiu, Dan-Cristian Dabija, Maria Carmen Pantea, Mihai Felea..... **547**

Unfolding Authenticity within Retail Transformation in Novosibirsk, Russia
Kseniia Kalashnikova..... **555**

Design of Sustainable Business Models Using the Example of the Medical Supply Store
Michael P. Heide..... **563**

Bank Non-Performing Loans – a Panel Data-Based Analysis in European Context. Study Case: Germany
Simona Ioana Ghiță, Cristina-Rodica Boboc, Oana-Maria Ghiță, Sorin George Toma..... **569**

Knowledge Transfer and Service Embedding for Upgrading in Global Value Chains
Raluca Robu..... **577**

The Main Retail Companies in Romania: Evidence from 2021
Cristinel Vasiliu, Vasile Dinu, Laurenţiu Tăchiciu..... **585**

Factors Predicting Consumer-AI Interactions
Ștefana Pop, Corina Pelău, Ioana Ciofu, Giulia Kondort..... **592**

How Relevant Are Nutrition and Health Claims in Healthier Food Choices of Romanian Consumers?
Magdalena Bobe, Roxana Procopie..... **598**

A SWOT Analysis of the Romanian Food Industry's Approach to Innovation
Ioana Maria Popescu (Iacobescu), Iuliana Zavatin (Chilea), Rodica Pamfilie, Stelian Olaru..... **606**

Business Resilience and Concerns of Companies and SMEs for Internationalization in Times of Globalization and Risks
Anis Benabed..... **614**

Constructing modern knowledge: competency-based education and new ways of capacity building

The Balanced Scorecard: A Bibliometric Approach

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Abstract

The Balanced Scorecard is a strategic analytical model that helps organizations align their strategy with their performance measures and objectives and provides a comprehensive view of an organization's performance by looking at four key perspectives: financial, customer, internal process, and learning and growth. This paper focuses on a bibliometric analysis that was performed using the VOSviewer program and the Biblioshiny program. Thus, three sets of documents from the Web of Science database in the fields of Management and Economy were considered, over three time periods and, respectively: 2000-2010, 2010-2020, and 2000-September 2022. Moreover, the research focused on the evolution over time of the "balanced scorecard" concept, the analysis of keywords, and the number of citations of the selected documents. The conclusions indicate that there is great interest in the research of this concept, but also for other concepts related to the concept of the 'balanced scorecard', the evolution being considerable from one period to another, up to the year 2019. This research also presents an original point of view, regarding the concept of the 'balanced scorecard', considering the limited existence of bibliometric works on this subject. Moreover, this study can contribute to the development of the existing literature from this field.

Keywords: Balanced scorecard, bibliometric, management, performance, strategic performance.

DOI: 10.24818/BASIQ/2023/09/002

Introduction and research background

Performance refers to the ability of an individual or organization to achieve its goals and objectives. Performance measurement and evaluation is also important because it helps organizations identify areas for improvement and track progress over time, allocate resources effectively, and make the right decisions. It can be measured through various means, such as performance evaluations, self-evaluations, and quantitative metrics, such as productivity and efficiency.

The "Balanced Scorecard" represents an analytical model of strategic information developed by Kaplan and Norton (1992). Since then and until now, this model has been the subject of many research studies on its utility as a strategic management (Bigliardi and Ivo Dormio, 2010). The basic premise of this model is quite simple. Unlike traditional performance measurement systems, which have financial controls at their core, the balanced scorecard starts with the vision and strategy of an organization. To translate vision and strategy into performance measures, it is necessary to determine objectives in each of the four perspectives of the Balanced Scorecard (Niven, 2005): (1) financial, (2) customer, (3) internal processes, and (4) learning and development of employees.

Our searches show that there have been numerous studies that examine the integration of the balanced scorecard concept with other fields, such as artificial intelligence (Żółtowski, 2022) and supply chains (de Sousa et al., 2020). Bibliometric studies carried out exclusively on the concept of "balanced scorecard" are limited, most studies (Mishra, et al., 2018; Garengo and Sardi, 2021) focus more on the analysis of multiple concepts related to performance measurement (or performance in general), and not just on the concept of "balanced scorecard". Also, a single bibliometric analysis was carried out by Ribeiro et al. (2020) on the scientific production of the "balanced scorecard" concept in the public sector, and the results of the study can be analysed with the results of our study.

Given the limited number of studies that have evaluated the balanced scorecard concept using bibliometric analyses, it is crucial to highlight the importance of this field in current management research. To address this gap, we propose two research questions that will provide relevant insights into the current state of research on the balanced scorecard and its impact on performance measurement and evaluation. By answering these questions, we hope to emphasize the significance of this field and its potential for future research. Therefore, the two research questions are formulated as:

Q1: What is the current state of research on the balanced scorecard and how has it evolved over time in the field of management?

Q2: What are the key findings and trends in research on performance measurement and evaluation?

Thus, considering the mentioned aspects, the purpose of this study is to observe the evolution over time of the "balanced scorecard" concept, and to observe which were the most cited works in the field of management and economics. Last but not least, to analyze the connections of the concept with other concepts in the targeted field.

Following this, we suggest outlining the methodology that will guide this study, followed by the data analysis phase. Specifically, we will describe the data collection method that will be used for the bibliometric analysis and the analytical approach that will be employed to study the data. This will enable us to use appropriate tools to analyze the dataset in the subsequent stage.

1. Materials and methods

To observe the evolution over time of the concept of "balanced scorecard", also to analyze the keywords for documents related to this concept, and to be able to identify the documents with the highest number of citations (considering a specific set of documents), we used the VOSviewer (Van Eck and Waltman, 2010) and Biblioshiny programs (Aria and Cuccurullo, 2017). Generally, bibliometric analysis focuses on the characteristics of publications, the impact of citations, the analysis of the countries of origin of the authors, and the analysis of the subjects of scientific documents (Büyükkidik, 2022).

Even Google Scholar is the largest database including scientific production, Web of Science (owned by Clarivate) was selected since it implies more strict inclusion criteria, thus allowing the research to be conducted on a higher quality set of documents (Popa et al., 2023).

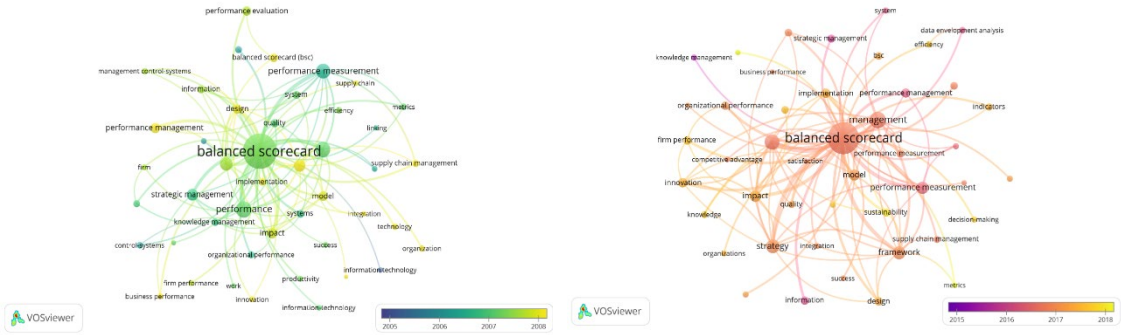
For this analysis, three sets of documents from the Web of Science database (selecting the fields of Management and Economics) were taken into consideration, namely: (1) set (a) of documents, composed of publications specific to the period 2000-2010; (2) set (b) of documents, composed of publications specific to the period 2010-2020; and (3) set (c) of documents composed of publications specific to the period 2000-September 2022. The documents were downloaded from the Web of Science platform and imported into the two bibliometric analysis programs. The evolution over time of the concept of "balanced scorecard" was analyzed using all three sets of documents, and the specific keywords related to the concept of "balanced scorecard", as well as the documents with the highest number of citations, were identified using set (c) of documents. To analyze the evolution over time of the concept of "balanced scorecard" and to analyze the keywords for documents related to this concept, both the keywords provided by the authors and the PLUS keywords were taken into consideration. Unlike the keywords provided by the authors, the PLUS keywords refer to the concepts that frequently appear in the titles of cited articles.

2. Data Analysis and Discussion

2. 1 Evolution over time of the "balanced scorecard" concept

To analyze the evolution of the concept of "balanced scorecard," two sets of documents were selected. The fields selected from the Web of Science database were Management and Economics, and the two maps (Figure no. 1 (a) and Figure no. 1 (b)) reflect the connections between the most relevant keywords in the selected scientific documents. The size of each nods indicates the number of appearances of the concepts, and the length of the lines reflects the strength of the connection between two concepts. The maps include both the keywords provided by the authors and the PLUS keywords (words that frequently appear in the titles of cited articles). Although the periods targeted for the analysis of the evolution of the concept of „balanced scorecard" were 2000-2010 (set (a) of documents) and 2010-2020 (set (b) of documents), the VOSviewer program automatically selected the periods with the strongest connections between the concept of "balanced scorecard" and other concepts or phrases (2005-2008 and 2015-2018).

Figure no. 1(a) reflects the specific map of the 2005-2008 period of the connections between the keywords of the first set of documents (651 scientific articles). The map shows the emphasis of 2007 on the keyword "balanced scorecard", the keyword "performance", and the connection between the two concepts. Also, a strong emphasis of 2006 and 2007 on the following connections is noted: "balanced scorecard" - "performance measurement"; "balanced scorecard" - "strategic management"; "balanced scorecard" - "management"; "balanced scorecard" - "strategy". In 2008, the authors' concerns were oriented (to a lesser extent) towards the connections between the concept of "balanced scorecard" and concepts/phrases such as "performance management", "business performance", or "innovation". Furthermore, Figure no. 1(b) deals with the period 2015-2018 and represents the map of connections between the keywords of the second set of documents (1681 scientific articles). For this period, the number of documents is significantly higher than in the previous period. The concept of „balanced scorecard" was used most frequently between 2016 and 2017, and the most important connections are those that existed between the concepts that were emphasized in the previous period. The focus of 2015 on the connections between the concept of "balanced scorecard" and concepts such as "knowledge management" and "strategic management" is notable, and the emphasis of 2018 on the connections between the concept of "balanced scorecard" and concepts such as "decision-making" and "sustainability" is notable.



Set (a) of documents **Set (b) of documents**

Figure no. 1. Link map between keywords over time
Source: authors with VOSviewer

The two network-type graph maps largely capture similar connections between the concept of „balanced scorecard" and other concepts. However, during the 2015-2018 period, the authors' interest in this concept has increased considerably as we can see in in Figure no. 2. Furthermore, during this period, there was strong interest among the authors in the connection between the concept of balanced scorecard and concepts such as "strategy", "innovation", "strategic management", and "competitive advantage".

In order to be able to observe the evolution of scientific production related to the concept of "balanced scorecard", an analysis of all scientific documents (set (c) of documents) that were published between 2000 and September 2022 (2447 papers) was carried out in the Web of Science database, considering the fields of Management and Economics.

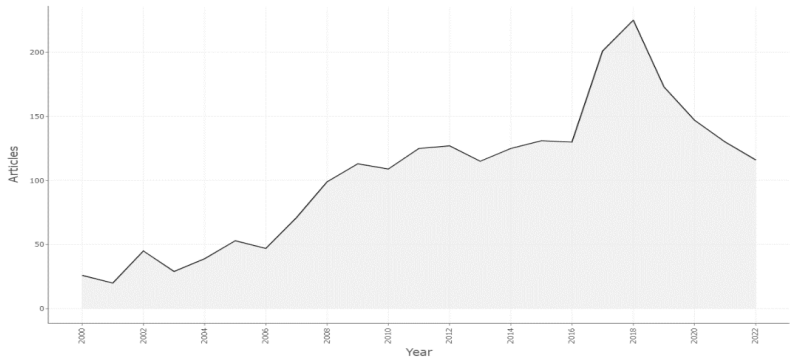


Figure no. 2. Evolution of annual scientific production related to the concept of a "balanced scorecard" (set (c) of documents)
Source: authors with Biblioshiny

The starting period, the period 2000-2003, coincides with the emergence of the first research on the concept of "balanced scorecard", and therefore, as can be observed in Figure no. 2, scientific production was quite

low during this period. From 2004 on, research on the concept of "balanced scorecard" intensified, the number of scientific documents that analyzed this concept reached 125 in 2014, 130 in 2016 and 225 in 2018. Most of the research was conducted in the period 2017-2018, when there were also the most connections between the concept of „balanced scorecard" and other concepts (as can be observed in Figure no. 1). Although there has been a decrease in the number of documents that have analyzed the concept of "balanced scorecard" starting in 2019, there are still research directions that researchers can focus on in the future.

In Figure no. 3, it can be observed how scientific production related to the concept of "balanced scorecard" has evolved in the period 2000-September 2022, this time considering the country of reference of the authors (the program automatically selected the top 6 countries with the highest volume of scientific documents related to the concept of „balanced scorecard"). Most of the documents that analyzed this concept came from China (577 scientific documents) and the United States (405 scientific documents). Compared to the other 4 countries (United Kingdom, Spain, Brazil, and Australia), in China and the USA, there has been a rapid increase in research on the concept of "balanced scorecard", especially after 2010. Among the countries analyzed, the least scientific documents that referred to the concept of "balanced scorecard" were recorded in Australia (183 documents) and Brazil (184 documents).

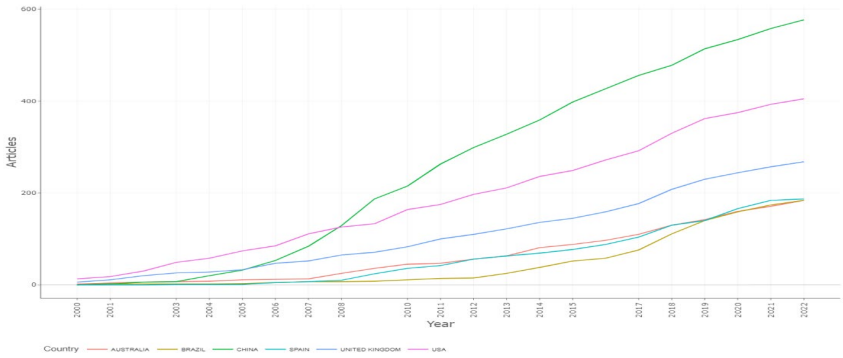


Figure no. 3. Country productivity over time of balanced scorecard documents (set (c) of documents)
Source: authors with Biblioshiny

2.2 Analysis of keywords for documents related to the concept of "balanced scorecard"

The specific keywords of the documents related to the balanced scorecard concept can be seen in Figures no. 4 and 5. Furthermore, Figure no. 4 represents a tree of the 50 most frequent keywords provided by the authors. The concept of "balanced scorecard" represented one of the keywords of the authors in 816 papers out of the 2447 analyzed, having a weight of 28%. The next three most frequent authors' keywords were "performance measurement" (weight 9%), "performance management" (weight 5%), and "performance" (weight 3%). Instead of the concept of "balanced scorecard", the authors also used concepts such as "bsc" (weight 2%), "balanced scorecard (BSC)" (weight 2%), and "balance scorecard" (weight 1%).

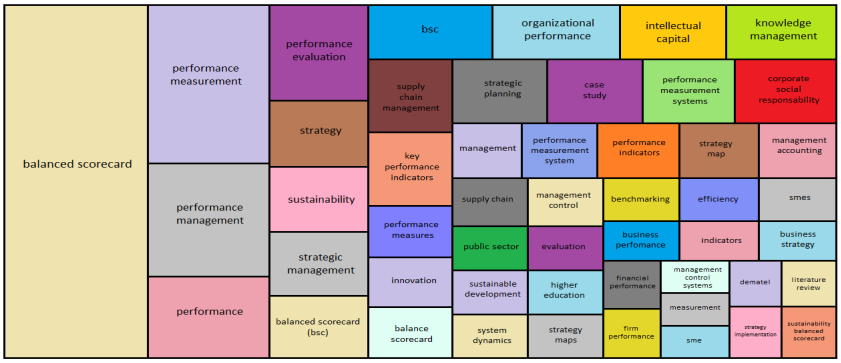


Figure no. 4. Keyword tree of authors (set (c) of documents)
Source: authors with Biblioshiny

Figure no. 5 represents a tree of PLUS keywords. For this analysis, the set (c) consisted of 2447 documents (selected from the Web of Science database), considering the period 2000–September 2022. According to Figure no. 5, the concept of "balanced scorecard" was mentioned 973 times in the titles of the cited articles, having a weight of 20%. The next three most frequent PLUS keywords were "management" (weight 8%),

"performance" (weight 6%), and "framework" (weight 5%). The authors focus on some concepts related to performance, such as: "performance evaluation", "organizational performance", "performance measurement system", "performance indicators", and "key performance indicators", but also on some concepts related to strategy, such as: "strategic management", "strategic planning", "strategy map", "business strategy", and "strategy maps".

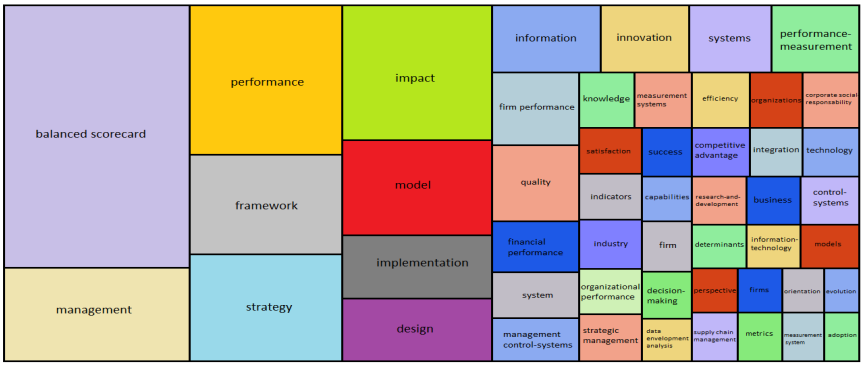


Figure no. 5. Tree of keywords PLUS (set (c) of documents)
Source: authors with Biblioshiny

Further we realized Figure no. 6 which represents a map of the keywords (both those provided by the authors and those from PLUS), grouped into clusters of different colours, and also of the links between them. The strongest links are those between the concept of "balanced scorecard" and the following concepts: "management", "performance", "performance measurement", and "strategy". The first cluster (red) contains 23 items. The main element of this cluster is represented by the concept "performance" (number of occurrences: 355), and most of the other elements ("organizational performance", "firm performance", "business performance", "financial performance") are closely related to this concept. Thus, from the links created between the terms, we observe the fact that research has focused on all aspects of performance in an organizational context. The second cluster (green) contains 14 terms, the most frequently used being the concept of "balanced scorecard" (number of occurrences: 1553). The strong connection between the concept of "balanced scorecard" and the concept of "performance measurement" (another item of this cluster) is noted.

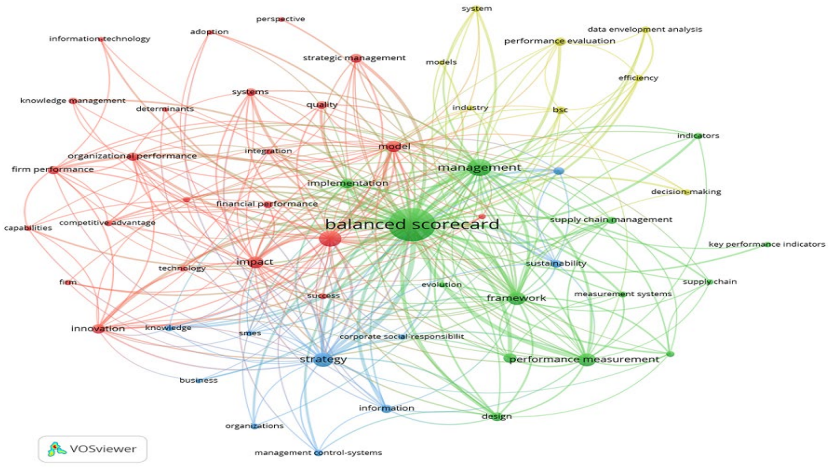


Figure no. 6. Link map between keywords (set (c) of documents)
Source: authors with VOSviewer

Moreover, we also observe links with other terms from the cluster such as "management", "evolution", "sustainability" and others, which confirms the fact that performance measurement is important in an organizational environment because it helps it to achieve its goals and objectives. The third cluster (blue) contains 10 items, its main element being the concept "strategy" (number of occurrences: 280). There are also links with the terms "knowledge", "information", "business" and others, indicating that performance measurement is important to organizational strategy and the direction in which it is heading to achieve its goals. The fourth cluster (yellow) contains the fewest items (8), and the main element of this cluster is represented by the concept "performance evaluation" (number of occurrences: 99) and links to "modes", "efficiency", "BSC" and others. Thus, we accept the idea according to which performance measurement

and evaluation is important because it helps organizations to assess the effectiveness and efficiency of their operations, processes, and strategies.

2.3. Documents with the highest number of citations

In Table no. 1, the titles of the 10 most cited works can be observed. Jensen's work, published in 2002, in the journal Business Ethics Quarterly, has the highest number of citations (961). This work is followed by the work belonging to the authors Malmi and Brown (663 citations), published in 2008 in the journal Management Accounting Research, and the work belonging to the author Saedi et al. (603 citations), published in 2015 in the Journal of Business Research and, also the last work having the lowest number of citations (393). The most cited works are those that were published during the period when the scientific production related to the "balanced scorecard" concept was quite low (1999-2005).

Table no. 1. The 10 most cited articles (set (c) of documents)

No.	Source	Purpose	Methods	Findings
1	(Jensen, 2002)	This article presents a proposal, referred to as "enlightened value maximization," aimed at clarifying the relationship between value maximization and stakeholder theory.	This study takes a qualitative approach to address two research questions: whether a company should have a single goal, specifically value maximization, and whether that goal should be value maximization or value maintenance.	A single-objective function is insufficient to guarantee the success of an organization. The author argued that firms that adhere to conventional stakeholder theory will perform worse in the competition for survival compared to those that follow a clearly defined single objective, such as value creation.
2	(Malmi and Brown, 2008)	The purpose of the study is to examine different definitions of MCS and the challenges they have posed as well as a new classification of MCS.	This study adopts a qualitative approach and examines various definitions of MCS and the challenges they have posed. The paper presents a new categorization of MCS, structured around five groups: planning, cyber, reward, and compensation, administrative, and cultural controls.	The findings suggest that as research advances in this field, there is a need for refinement and improvement of both the conceptual typologies and the constructs within them.
3	(Saeidi, Sofian, Saeidi, Saeidi, and Saaeidi, 2015)	This study aims to test and establish a more intricate relationship between CSR and firm performance by including three mediators, customer satisfaction, reputation, and sustainable competitive advantage.	The approach used is quantitative and involved conducting a survey of opinions. The study targeted 1250 manufacturing and consumer product companies, specifically their managers. Ultimately, only 205 companies participated in the research.	The conclusion shows that only reputation and competitive advantage act as intermediaries between CSR and firm performance. These results indicate that CSR can indirectly enhance firm performance by boosting reputation and competitive advantage, while also increasing customer satisfaction.
4	(Otley, 1999)	This paper presents a framework for analyzing the functioning of management control systems, structured around five key components: objectives, strategies, and plans for attainment, target-setting, incentive, and reward structures, and information feedback loops.	The study employs a qualitative approach and centres on an examination of the dominant theories on the functioning of the proposed framework.	The findings suggest that the utilization of management accounting and control systems can be effectively analysed through the lens of performance measurement and management.
5	(Ittner, Larcker, and Randall, 2003)	This study explores the connection between measurement system satisfaction, economic performance, and two general methods of strategic performance measurement: increased measurement diversity and improved alignment with the firm's strategy and value drivers.	The research used an observation and questionnaire approach, using data from 140 US financial services firms.	The findings indicate that a higher level of measurement diversity in comparison to firms with similar value drivers has a stronger correlation with stock market performance than a higher level of measurement on an absolute scale.

6	(Kaplan and Norton, 2000)	The aim of the paper is to demonstrate the utilization of the map's strategy, which outlines the organization's plan for converting its various assets into desired outcomes.	A literature review with examples of the strategy employed by Mobil North American Marketing and Refining.	Strategy maps help determine when scoreboards aren't really strategic and how to use them.
7	(Chenhall, 2005)	The aim of this study is to expand upon the existing accounting literature by exploring the relationship between the informational dimensions of SPMS and desired organizational outcomes.	Data was gathered through a survey questionnaire given to senior managers from Australia's top 200 industrial organizations.	The findings suggest, three interrelated dimensions of integrative SPMS have been identified that assist managers in developing competitive strategies.
8	(Ittner, Larcker, and Meyer, 2003)	The objective of this study is to investigate how various performance measures were given importance in a subjective balanced scorecard bonus scheme implemented by a major financial services company.	The study employs a quantitative methodology and tests three hypotheses with data from Global Financial Services' North American retail banking operations.	The researchers discovered that the subjectivity in the scorecard plan gave superiors the ability to tilt the balance of bonus awards towards financial measures, at the expense of other measures.
9	(Neely, 2005)	This work provides an update of the literature review by Neely et al. (1995)	The study uses a citation/co-citation analysis of literature in the area of performance measurement to investigate advancements in the field globally.	The paper contends that scholars within the performance measurement field share a consensus on the crucial research questions despite their varying disciplinary backgrounds.
10	(Neely, et al., 2000)	The aim of the research is to determine if a comprehensive process for designing the performance measurement system can be established, and if so, what this process would entail.	A pilot process was applied for the performance measurement system, consisting of 12 stages.	Many managers are currently revising the measurement systems in their organizations, however, few have a systematic approach. Even fewer appear to be actively addressing the issues related to implementing, using, and maintaining the measurement systems they are designing.

Source: authors

Conclusions

The term "balanced scorecard" is a relatively new concept that has received significant attention from researchers, especially in the period 2017-2019. Observing the evolution of this concept over time, it can be concluded that interest in researching this concept, but also in analyzing the links between the concept of "balanced scorecard" and other concepts, has grown considerably from one period to another, until the year 2019. From 2019 to now, the evolution of research on this concept has been downward. This aspect may suggest that the authors' interest has also migrated to other concepts, and there are still multiple future possibilities to research the concept of the "balanced scorecard". At the same time, the network graphs suggest the existence of strong links between the concept of "balanced scorecard" and the following concepts: "management", "performance", "performance measurement", and "strategy". Analyzing the documents with the highest number of citations, the reference work of Jensen (2002) in which the balanced scorecard model is approached as the managerial equivalent of the stakeholder theory, is a reference work.

Although numerous studies have examined this concept, the approaches vary across different sectors, but we believe that the traditional approach of Kaplan and Norton (1992) still holds significant value in the field of management. Other studies have made an impact in the field, however, it is hoped that this research will also contribute to its advancement, as there are limited bibliometric analyses on this concept.

Future research may include studies in other more niche fields, such as health management, or others. Moreover, we believe that comparative bibliometric analyses between databases can also be carried out. The limits of the study being specific to the bibliometric limitations, the quality analysis of these works can be considered.

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The Impact of Using Enhanced Teaching Materials on Core Skills When Teaching English as a Foreign Language

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Abstract

Our study evaluated the effectiveness of several types of study materials used in addition to the textbook in teaching English as a second language to middle school-level students in Iasi, Romania. The additional classroom materials used were a combination of workbooks used for the students to practice their writing and reading skills and online video materials to practice their listening and comprehension skills. The same materials contributed to the English vocabulary enrichment of the students. The study participants were students from grades 5, 6, and 7 at Dimitrie A. Sturzda School from Iasi, Romania. The study showed that the additional study materials were effective at improving the reading, writing, and listening skills of students in grades 6 and 7 while decreasing the skill levels of students in grades 5. The study did not take into consideration other factors that may contribute to a decrease in skill levels for students in grade 5.

Keywords

Teaching effectiveness, English as a second language education, enhanced classroom material effectiveness, middle school English skills.

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Introduction

In his work,Tomlinson says classroom materials are anything that is used to facilitate the acquisition of a language. They may vary from „textbooks, cassettes, videos, CD-ROMs, dictionaries, grammar books, readers, workbooks or photocopied exercises" (Tomlinson, 2011). Merriam-Webster defines the „textbook" as „a book used in the study of a subject such as one containing a presentation of the principles of a subject or as a literary work relevant to the study of a subject" (Webster, 2023).

In Romanian schools, the primary source for students in learning and developing their knowledge is the textbook. Nunan says that „a textbook is the main component of any instructional program and it is difficult to imagine a class without it" while Cunningsworth adds that textbooks are an effective resource for both teachers and students for self-directed learning with various activities (Cunningsworth, 1995; Nunan, 1999). Sheldon claims that textbooks "represent the visible heart of any ELT program" (Sheldon, 1988).

In the last few years, an effort has been made by the authors of the English textbooks to create additional teaching material to enhance the learning experience of students and improve their English core skills.

In this study, we have compared the use of textbooks only with the use of textbooks combined with supplementary language-enhancing material in teaching English as a foreign language to middle school students in grades 5, 6, and 7.

1. Literature Review

Listening Skills

In Brown's opinion listening is at the center of the learning process, being at the same time the least understood and researched skill in language learning and it is often ignored by most language instructors. (Brown, 2008). At the same time, Floyed defines this skill as a process involving hearing, attending to, comprehending, analyzing, and reacting to spoken messages (Floyed, 1985). Regarding the nature of the communication, this changes as the context vary. Wolvin and Coakley talk about five different types of listening: discriminative listening, comprehensive listening, critical listening, therapeutic listening, and appreciative listening. This diversity of listening demonstrates that this skill is an active process and not a passive product (Wolvin, 1988).

To emphasize the importance of listening and its impact on the other core skills, Rost talks about the need to expose the learner to different types of oral interaction because the spoken language,within the context of normal conversations, could represent a challenge. He also points to how the learners' grammar improves through listening (Rost, 1994). This idea of the importance of listening appears in Harmer's book too which says that listening plays an important role in understanding a language, which it can be done with the help of the teacher, textbooks, and supplementary materials so that the learner can hear differences between varieties and accents of English (Harmer, 1998).

A language is learnedby observing its pronunciation, intonation, usage, or structures or the spoken language. Exposure to appropriatelistening can also teach how the emotions of the speaker can be reflected by the vocal aspects (Rangaraju, 2020). In learning a language Grant insists on hearing particular sounds, (Grant, 1987) while Ur talks about real-life situations, such as interviews, radio news, lecture, story-telling, and others (Ur, 1991).Moreover, when choosing a type of listening task or material, different kinds of activities such as comprehension questions or extracting specific information in a meaningful context should be taken into consideration (Cunningsworth, 1995).

Speaking Skills

Speaking is considered a critical skill in learning a language by learners and its success is measured in terms of accomplishment in oral communication (Nunan, 1999).

In their book, Carter and Nunan, agree that speaking skill is the most difficult skill because the participants in a conversation cannot always be prepared, and the communication has a less predictable specificity.The ability to speak a language means functioning in that language. When we talk about knowing a language, we merely talk about speaking it (Nunan, 1999).

Textbooks can provide several real-life contexts suitable forconversation practice.Paired work; group work and even monologues or presentations can be used as a way to work on this skill.(Rangaraju, 2020). But as Grant appreciates, textbooks do not contain enough activities for speaking, and most of it is done by the teacher and not by the learner. This might be a reason why some learners find it difficult to express themselves orally (Grant, 1987). The fluency, accuracy, appropriateness, grammar, relevant length, responding or initiating or discourse markers are an integral part of the development of this skill as Lackman states in his book (Lackman, 2010).

Reading Skills

Reading skills are the most accessible for practice with textbooks. Different themes, most of them adapted to the current interests of the learner and according to their level through short stories, comics, picture reading, or news articles (Rangaraju, 2020). Reading texts from thetextbooks 'main purpose isto improve this skill, presenting grammar structures, developing vocabulary, and discovering a new topic or a model for writing (Cunningsworth, 1995).

In developing cultural awareness and sensitivity, according to Tomlinson, materials should help the learner (Tomlinson,2003).The extracts provided in textbooks, which are carriers of cultural information, are usually based on specific cultures which create interest to the learner. The combination of both local and global culture suggests a balance in introducing and developing the learner's cultural awareness (Starkey, 1991; Cortazzi, 1999).

Writing Skills

Level, age, or interests are among the main factors for choosing the appropriate type of writing. By writing a simple poem, postcards, or more complex types, the learner can produce a written piece at the level of their language knowledge (Harmer, 1998).

Writing tasks are meant to give adequate practice to the learner. Starting from small parts of sentences to various writing compositions, the approach should be more on the teaching of this skill rather on its result, the text itself (Rangaraju, 2020). The variety of tasks followed by the given emphasis on accuracy, style, punctuation, spelling, layout, and the review of the written work should be present in this section (Cunningsworth, 1995).

Because of this, practice is required to perfect in the creation of a letter, a message, an invitation, a short paragraph, an application, or descriptive or narrative writing (Rangaraju, 2020).

Grammar

As Ur (1991) states, "Grammar is sometimes defined as the way words are put together to make correct sentences." making it one of the most important parts of a language, essential in understanding and producing words and phrases.

In his work, Cunningsworth affirms that grammar can be thought of without its meaning (Cunningsworth, 1995). At the same time, Ur mentions that "it is not good knowing how to perceive or construct new tense of a verb if you do not know exactly what difference it makes to meaning when it is used" (Ur, 1991), an idea that reinforces that learning a language it is more than studying its grammar rules.

As Tomlinson adds, learning materials have to help the learner to connect the learning experience to their own life, and the textbooks should include clear instructions alongside some tips and tricks for learning and teaching grammar(Tomlinson, 2003). However, some additional materials, such as songs, games, handouts, or quizzes can be very effective in learning grammar rules (Rangaraju, 2020).

Vocabulary

Strongly related to grammar, spelling, and pronunciation is vocabulary which deals with learning and teaching single words idioms, phrases, and others (Ur, 1991). Cunningsworthsays that in the process of learning a new language, we should expect to learn about 1000 new words for every 120 to 140 hours that we spend learning that language. Learning outside the classroom can be facilitated by a variety of vocabulary–learning tasks provided by the students' workbooks. However, it is difficult to include the whole English language vocabulary in a single course book, because of its dimension (Cunningsworth, 1995).

On the other hand, presenting and teaching new vocabulary can be made by a clear description of the concept, the description of its characteristics through examples and images, uses, synonyms, or antonyms (Ur, 1991).

Another approach can be the association of the lexis with some particular situations such as clothing, food, animals, greetings, and so on (Cunningsworth, 1995) that can be found under the same section "working with language" of each unit, where are various vocabulary tasks (Rangaraju, 2020). Maděřičová claims the importance of the lexis presentation through its distinction between passive, active, or classroom vocabulary Maděřičová, 2013).But, the limited number of vocabulary exercises is not enough for the learner's development who is forced to use auxiliary materials to expand their knowledge (Rangaraju, 2020).

2. Research Methodology

The research is focused on comparing the core English skills levels of students before the introduction of the enhanced teaching materials with the skills levels after 6 weeks of using enhanced teaching materials during the class instructional time. The core English skills are reading, writing, and listening.

The research focuses on using the following textbooks as main teaching resources:

- For grade 5: Kennedy, Clare, et al., Limba modernă 1 Engleză, Clasa a V-a. Art Klett Bucureşti, 2022.
- For grade 6: Cowan, Audrey, et al., Limba modernă 1 Engleză, Clasa a VI-a, Art Klett, București, 2019.
- For grade 7: Puchta, Herbert, et al., Limba modernă 1 Engleză, Clasa a VII-a, Art Klett, București, 2019.

The following enhanced supplementary teaching resources were used:

● Kennedy, Clare, et al., Limba modernă 1 Limba engleză Caietul elevului, Clasa a V-a Workbook, Art Klett, București, 2022. Accompanied by CD with recorded voice lessons.

● Cowan, Audrey, et al., Limba modernă 1 Limba engleză Caietul elevului, Clasa a VI-a Workbook, Art Klett, București, 2020. Accompanied by CD with recorded voice lessons.

● Puchta, Herbert, et al. Limba modernă 1 Limba engleză Caietul elevului, Clasa a VII-a Workbook, Art Klett, București, 2020. Accompanied by CD with recorded voice lessons.

● Perju, Iulia, Writing Skills for young learners Workbook, Booklet, București, 2006.

● British Council Teen, learning English language British Council websiteworksheets, videos, recordings for the productive skills (writing and speaking) and the receptive skills (reading and listening)

● Twinkle, an online platform with worksheets for multiple school subjects adapted to the national and international curriculum, from which we used grammar and vocabulary worksheetsfor English language.

The enhanced supplementary teaching resources were used to allow the students to practice their reading, writing, listening, and speaking skills through various exercises complementary to the lessons in the textbook.

The lessons were conducted with two 50 minutes sessions per week for each grade. Each session was structured as follows: 15 minutes of listening, 15 minutes of reading, and 20 minutes of writing.

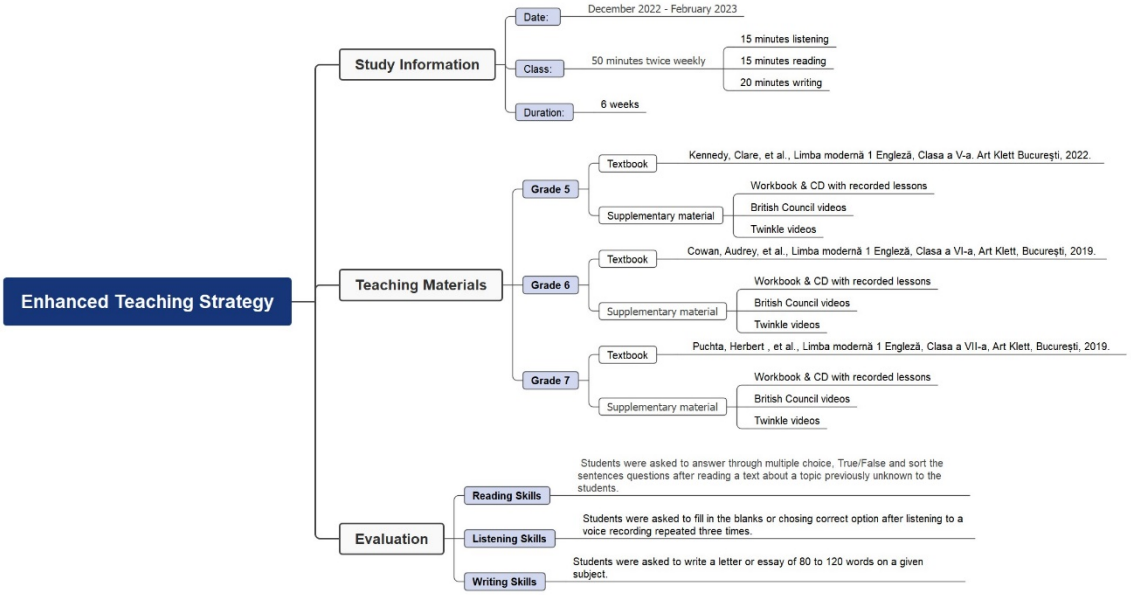


Figure no. 1. Teaching strategy with supplementary materials

The students were evaluated 6 weeks after the introduction of the supplementary material, not including vacation time.

The 50 minutes test had the following structure:

● Reading section: learners were asked to read a text related to the specific subject they were taught which was previously unknown to them. Then, they were asked to answer multiple-choice, True or False, match the two columns, and sort the sentences type of question. The section evaluated the student's comprehension.

● Listening section: learners were asked to listen to a short recording from their books or from the online platforms used for training. The recording was repeated three times. Then they were asked to fill in the blanks or choose the correct option from the list.

● Writing section: learners were asked to write a letter or an essay of around 80 to 120 words, on a given subject. For the letter, students had to write a response to a letter from the textbook. For the essay, the students had to write their opinion on a specific subject that was previously presented in the Reading section.

The grades were on a scale of 0 to 10 with zero being the least prepared and 10 for the best prepared.

The participants of this study were 76 students from „Dimitrie A. Sturdza" School from Iasi, Romania, from grades 5, 6, and 7. Of those 76 students, 39 were females, and 37 were males.

There were 28 students from grade 5, 16 females, and 12 males, 27 students from grade 6, 13 females and 14 males, and 21 students from grade 7, 10 females and 11 males.

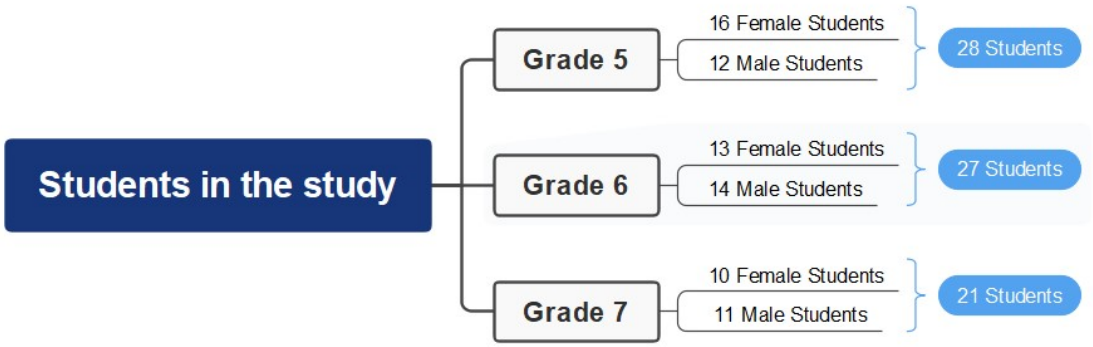


Figure no. 2. Study participants

3. Research Results

The results for grade 5 students show a significant decline in performance for writing and listening skills by 36.58% and respectively by 44.79% for female students and 30.65% and respectively 8.21% for male students. A smaller decline has been observed in reading skills with 4.77% for female students. Male students' reading skills have improved by 5.36%.The rate of change for reading, writing, and listening skills for grade 5 students is shown in Figure no. 3.

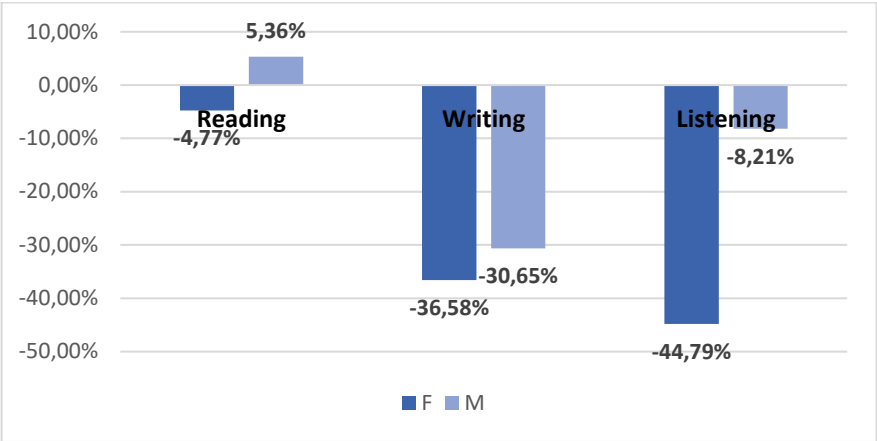


Figure no. 3. Grade 5 students' skills rate of change

For grade 6 the rate of grade change was positive for males for reading, writing, and listening. The reading skills have improved by 24.74% for females and by 5.01% for males. Females' writing skills have declined by 4.37% while males' improved by 10.87%. Listening had the most significant improvement for all students, with 37.01% and 18.58%. The rate of change for reading, writing, and listening skills for grade 6 students is shown in Figure no. 4.

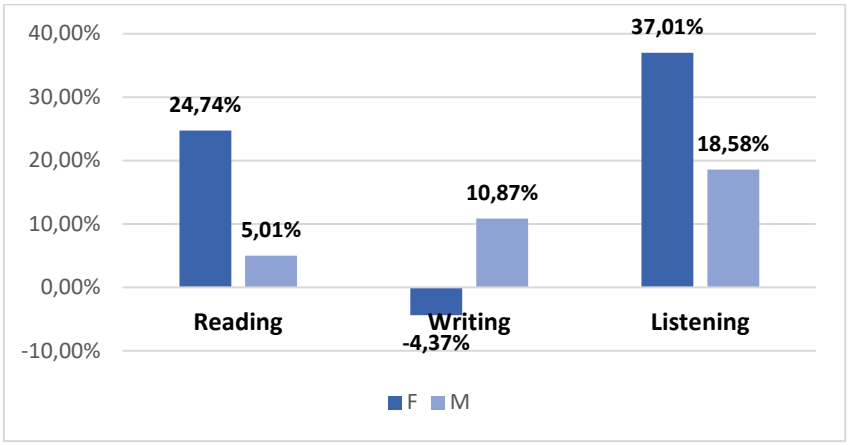


Figure no. 4. Grade 6 students' skills rate of change

For grade 7 student results show an improvement both in reading and listening, 14.85% and 11.42% for females and 20.17 and 24.06% for males. A small decline can be seen in writing, 2.83% for males and 0.13% for females.The rate of change for reading, writing, and listening skills for grade 7 students is shown in Figure no. 5.

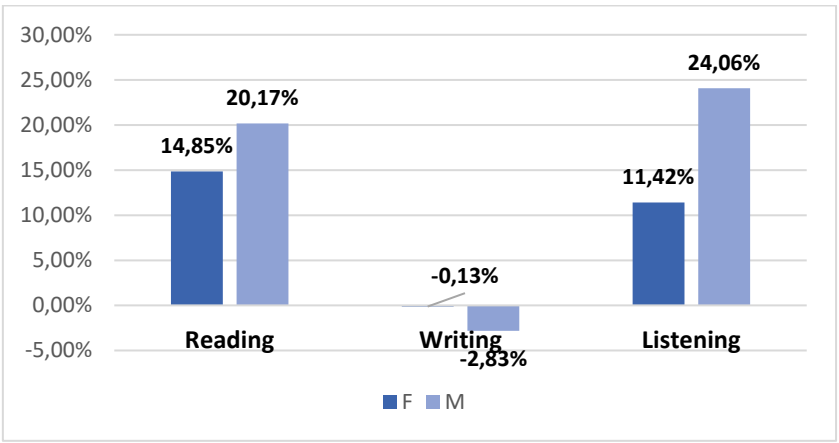


Figure no. 5. Grade 7 student's skills rate of change

Overall, the rate of grade change was positive for both male and female students for reading and listening and was negative for writing skills. Female students have improved their reading by 11.61% and listening by 1.21%, while their writing skills have declined by 13.69%. Male students have improved their reading by 10.18% and listening by 11.48% while their writing skills have declined by 7.54%.

Table no. 1. Overall grade change rates per sex

Sex	Reading	Writing	Listening
F	11.61%	-13.69%	1.21%
M	10.18%	-7.54%	11.48%

Per class, students in grade 5 results have declined by 17.71% for reading, 33.61% for writing, and 26.50% for listening, students in grade 6 results have improved by 14.88% for reading, 3.25% for writing, and 27.79% for listening, and students in grade 7 results have improved by 17.51% for reading and 17.74% for listening, and have declined by 1.48% for writing.

Table no. 2. Overall grade change rates per class

Class	Reading	Writing	Listening
5	-17.71%	-33.61%	-26.50%
6	14.88%	3.25%	27.79%
7	17.51%	-1.48%	17.74%

Conclusions

The enhanced supplementary material use has contributed to a significant improvement in reading and listening skills for male and female students in grades 6 and 7, while for students in grade 5, the same skills level has declined with exception of boys' reading skills which have improved slightly.

Writing skills have declined significantly for both sexes for grade 5 students, while for grade 6 female students and grade 7 both male and female students, performance has declined slightly. The only group whose writing skills improved were boys from grade 6.

Future work will include the student's perspective on the learning materials and a greater emphasis will be placed on using the specific type of learning materials the students enjoy using more. Also, a potential collaboration with a trained child psychologist will be considered to identify factors that could have contributed to the considerable decline in skills for grade 5 students.

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Capacity Building and Development in the Health Sector: Implications for Romania

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Abstract

Capacity development is a key component in the overall improvement process of any branch of the public sector within a country. The role of capacity building is defined by the ability of a system to maximize its productivity and human resource availability and regeneration over time, through the enacting of positive policies which are beneficial to itself and to the people that comprise it. Due to recent events, it became essential to re-evaluate the development of the workforce capacity processes with respect to the of the swiftly changing global healthcare system requirements. In the case of the public health sector, capacity building and development are fully influenced by the number of human resources and financial investments that are poured into the apparatus, since one cannot ensure productivity without the other; these two factors are highly dependent on each other. From a political point of view, the ramifications of a failed development programme have been proved to be dire for the health sector within Romania as it can be observed, over the last two decades, what a subpar financial backing can do to such an institution. It is imperative for a country to invest into the infrastructure of its public health system just as much as it should invest in the workers within it, otherwise it is destined to fail to meet the popular requirement of medical care, which are of a paramount importance. Considering the mentioned objectives and motifs, this study`s main target is to explore how capacity building is to be improved to meet the newly formed demands of the public health system, due to the recent critical changes it has suffered.

Keywords

Capacity building, development, public health, human resource, infrastructure.

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Introduction

Clearly, health is a socioecological construction that begins with a biological foundation and individual physical and emotional characteristics that are shaped by the social and environmental aspects of our lives (Mc. Murray, 2007) The need to view health as a Social Capital, from the perspective of the community, leads us to consider the potential in the concept of building health in the population, from a network that includes different aspects of human resources based on the sanitary conditions of a given population. Community health capacity increases when there are health-promoting organizational structures, such as schools, workplaces, and community planning mechanisms (Bowen and Harris, 2001) This empowerment should be interpreted as participation in collective actions for the community's benefit (Fawcett et al., 1995). Capacity building refers to the well-known ideas of community and worker growth. Capacity development is the process of enhancing the current abilities of people, groups, organizations, or processes to improve participation, decision-making, and control of problems.

The concept of capacity development in health promotion comes from the realization that tactics can be more successful and durable if they stretch beyond conventional health sector limits. The advantages are obvious. Working across sectors can enhance community action, develop individual skills, and enable organizations to encourage lasting health behaviors and support healthy surroundings. Capacity building in the health sector should be an ongoing, dynamic process that is never inert; consequently, it requires ongoing investment and renovation. Capacity development is a means of achieving objectives. For decades, the concept of capacity building in development cooperation remained unchanged: it was

equated with individual training and organization restructuring (Milen, 2001). The current definition of capacity building implies a complex process that aims to alter the mentality and behavior of individuals through the introduction of more efficient technologies and resources.

Across the globe, the medical education and health systems were subjected to an unparalleled interruption due to the pandemic. The life-threatening symptomatology resulting from COVID-19 infections created challenges for medical education since the integrity and steadiness of the medical education process became restricted, along with the safe delivery of lectures by the faculty members. Another objective of this study is to reveal the critical aspects of medical education that need to be strengthened post-COVID-19, concentrating on creating an effective healthcare workforce, clinical training through clinical rotations which has been postponed due to the fact that medical students could become infected, thus spreading the virus further to the community (Zern et al., 2022). Such challenges caused restricted patient care resulting from the focus placed on treating COVID-19 cases, limiting the accessibility of bedside education for medical students.

1. Paper Body

Education and professional training have a particularly important role for the development of the capacity of the public health sector, as the personnel employed in this field, in general, are subject to a long training process, which can last up to 10 years, in the case of specialist doctors who work in hospitals. So, we can say that the professionalism and productivity of these employees are directly influenced by the level of knowledge and development accumulated throughout the period of schooling during the university internship, as they acquire more knowledge and experience in the field in which they work, they become more and more productive, this being the objective of capacity development.

In other words, the development of the capacity of this sector does not only depend on the investment made in hospital equipment and infrastructure, but also on the investment in the educational system, more precisely, in those who are going to use the aforementioned to maximize work efficiency, as much as it is difficult for a skilled employee to carry out his activity in an environment underdeveloped for his professional needs, the latest generation equipment becomes useless for an employee who lacks the necessary knowledge to use it correctly and efficiently.

To holistically manage health on several variables, including sanitation, economic, and social factors, integrated health services will be created at the neighborhood level. Children, the aged, people with impairments, and, where applicable, the Roma community will all receive extra care because they are fragile and at-risk groups. Local governments will create these services with federal help in terms of funding, logistics, and information. In the medium and long term, these combined community medical facilities are expected to serve as a viable and template for a standardized practice in Romanian cities. Integrating health services into local communities in a sustainable manner while building the administrative ability of key local players to deliver them. of comprehensive healthcare services delivered at the local community level by interdisciplinary teams. Expanding and professionalizing the school medicine network, as well as improving its contribution to prevention, acceptance of healthy behavior and health instruction.

Health-related human resources are demotivated, elderly, and primarily located in big metropolitan areas, particularly in areas with medical universities. In the areas of public health, primary healthcare, other basic (essential) health services, related services, and niche / hyperspecialized / high-performance medical services, the distribution of health professionals by specialties and skills does not meet the needs of the health system or the needs of the population. In state hospitals, the administration of human resources and organizational structure are strict and out of step with the actual requirements for healthcare in the regions they serve, as well as with the funding sources. Furthermore, there is a lack of equality in the regulations governing staff compensation between different employee classifications, and in the case of physicians, there is no clear connection between pay and the quality of the job done (Akers, Blough and Iyer, 2020). Finally, the health system is concerned about the lack of a suitable and affordable method for medium- and long-term planning of human resources that is based on detailed statistical data. Through the insufficiency of human resources and technical skills to meet its service requirements, this absence has significant detrimental impacts on the population's health (Crisp, Swerissen and Duckett, 2000).

The condition of medical staff has become a recurrent topic in public discourse because of the COVID-19 epidemic. Beginning in early 2020, discussions of the need for medical care, the risk of hospital staff contracting disease, and their excessive workload suddenly became commonplace issues. These discussions persisted through 2021, when the story ceased to be news and the pandemic situation

appeared to be gradually getting better. Since then, regular news about the dire state of hospitals has been replaced by sporadic reports about the severe shortage of personnel that some public hospitals are experiencing (Guga, 2022).

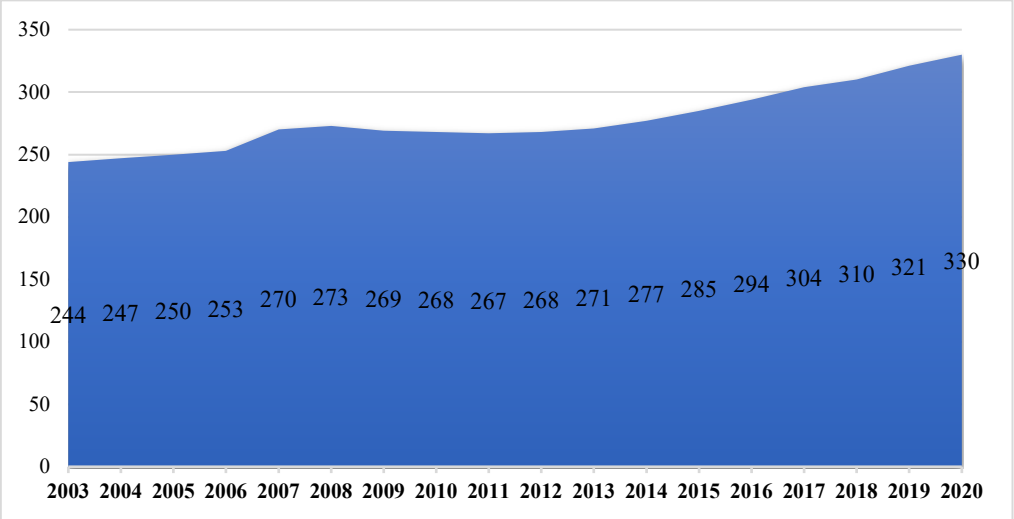


Figure no. 1. The Evolution of Personnel from the Public Health System
Source: INS ROMANIA

A straight-forward shift of action from one way to another is not at all how the private sector develops, nor is it how it interacts with the public sector. Between the state and the commercial health systems, there are significant variations in organizational personnel. First, auxiliary health personnel (7.5% compared to 31% in 2020) has a very low proportion in the private sector compared to the public sector (nurse, gurney carriers, firemen, etc.). This is mainly because there are no commercial emergency services, and the public system continues to handle most cases that are severe enough to require long-term confinement and special care. Together, they constitute about 37% of the health personnel in the private system, compared to less than 3% in the public system. In the second row, dentists, pharmacies, but also family physicians (after 2015) have a virtually insignificant representation in the system public. In the third paragraph, we note that there are fewer physicians in the commercial setting (10% compared to 20% in the public system), but that the share of typical healthcare personnel (primarily nurses) is roughly the same (46-47%). This disparity is primarily attributable to the fact that, in the private sector, physicians typically do not have a written job contract and instead operate under the "collaborators" norm.

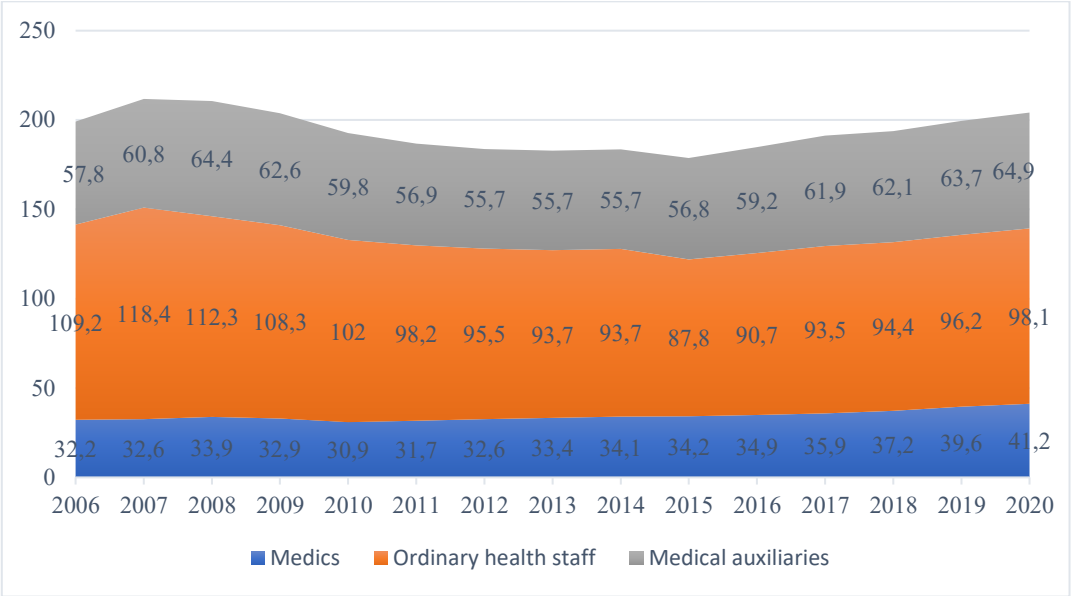


Figure no. 2. The Evolution of Personnel from Public Health Sector
Source: INS ROMANIA

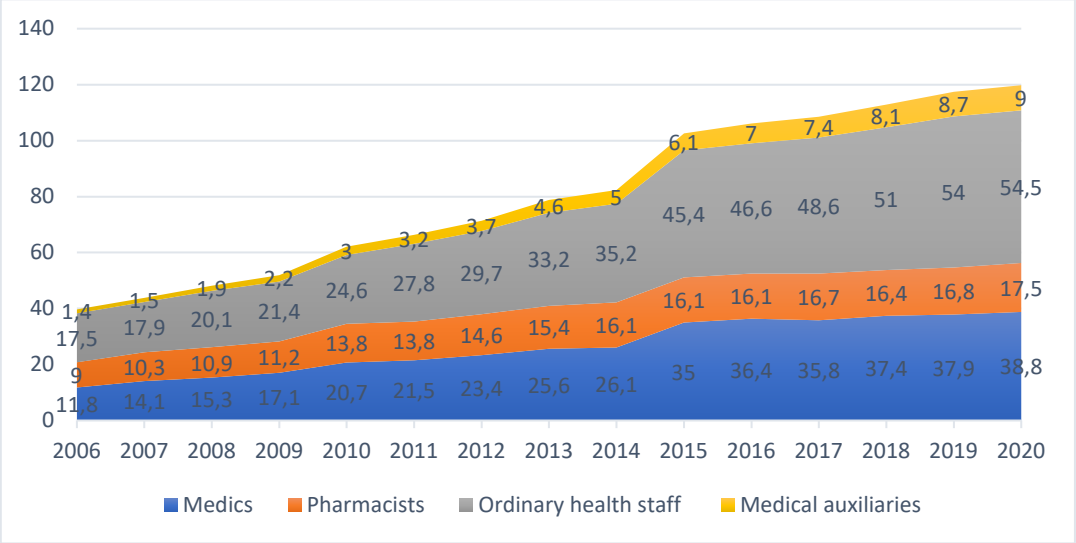


Figure no. 2. The Evolution of Personnel from Private Health Sector
Source: INS ROMANIA

Particularly after 2017, we observe a greater growth in the number of physicians in the public system, while the typical staff size has increased quantitatively much more strongly in the private sector. Regarding the public system, it should be mentioned that there are presently a high number of physicians (over 40 thousand, up from 34 thousand in 2008) and that the number of ordinary health staff is still quite low (under 100 thousand, compared to 120 thousand in 2007). The question that needs to be asked for the private system is whether the expansion of private health services aligns with the public objective of guaranteeing available health services for all citizens or not. Again, hypothetically speaking, this is not feasible because any private activity emphasizes development and revenue over service accessibility. We might anticipate, for instance, that private medical practice would be concentrated in towns and regions with comparatively high earnings rather than in impoverished ones. The most pertinent way to assess the situation would be to look at the spread of ordinary health personnel, as highly skilled personnel in the private system tend not to be directly hired and many public system physicians collaborate in the private system. The average net pay and the county spread of health workers are clearly correlated and as a result, private medical activity is more likely to focus on counties with better salaries, since, naturally, fewer people can afford private health care in impoverished counties. But as we'll see, regional disparities are also more evident in the public system, where the spread of medical staff is very comparable to that of the private system.

A vital component for the health and well-being of people is a national public health system that is viable, robust, and effective. The challenge of the COVID-19 epidemic and the prolonged shift characterized by its numerous incomplete changes emphasized the subpar ability of the public health system to meet the requirements and expectations of both residents and health workers.

The public health system has withstood numerous tests of change over the past 30 years, but its viability has been compromised by inadequate financing, population decline, and widespread professional movement. The public health system currently employs an insufficient number of experts who are also highly demotivated, burnout, and unsatisfied with their jobs. Additionally, the administrative bureaucracy, the inadequate information system for data collection, validation, and reporting, the erratic use of a variety of funding sources, and the priority focus on the financial component of national public health programs at the expense of monitoring health outcomes have all contributed to significant dysfunctions in the best implementation of crucial public health interventions. The health of the community, particularly during times of crisis, is not properly addressed, and the provision of preventive services is not understood as an essential component of well-being and is essentially non-existent due to the absence of an adequate regulatory framework, variable but rather low interest, and inappropriate use of available human resources (such as community nurses).

A public health system that has been rebuilt on solid principles can respond quickly, flexibly, and adequately to current and future public health challenges. It also has increased resilience of surveillance and monitoring systems for the major public health issues, continuously invests in multidisciplinary human resources, values teamwork, and makes adequate use of digital and health information systems to connect, respond quickly, and coordinate to threats (DeCorby-Watson et al., 2018). A population health management system that prioritizes the proactive participation of local communities with public health

institutions and professionals to improve the quality of life, the workplace and social interactions for its residents while also addressing the social determinants of health status, inequities in health status, both individually and collectively. A public health system that adequately and continuously monitors and addresses health risks through the proactive participation of citizens in decisions about their own health and that of the community in which they live through adequate health information and education throughout their life, and that comprehensively addresses the main preventive interventions for prior communicable diseases and chronic diseases with a major impact on disability and preventable morbidity.

To coordinate health in all area policies with the other organizations or agencies concerned, the Ministry of Health takes the position of a proactive interministerial collaborator.

- An integrated method for tracking health programs that produces frequent reports.
- Increasing the number of people working in public health by more than 50% and broadening their skills sets.
- A fifth of local public bodies have joint ventures with DSPs to improve the health of the member population and public health.

Geographically speaking, the health sector's labor deficit is dispersed more and more widely. One of the most effective public policy initiatives in recent memory focused on the condition of health workers: Law 153/207, which mandated historically high wage increases in the public health system, raises whose stated goal was to decrease departure and solve the staff scarcity issue. On a larger scale, Law 153/2017 was incredibly successful in reducing the departure of trained health workers to very low levels in a brief period and even causing an excess of workers in the cities of wealthy counties. Salary rises, however, did not address the issue of a dearth of people outside of established metropolitan areas, and to some degree even served to exacerbate spatial inequality. The issue of staff gaps in the public health system proved to be difficult to address despite the need for salary increases. Meanwhile, the officials' primary goal has changed to investing in healthcare facilities while also taking advantage of the cash chance provided by the PNRR. Like salary rises, infrastructure investment is unquestionably necessary, but may fall short due to the possibility that some of the new facilities will not have enough employees to function. Although they are crucial and represent significant departures from the public policy of previous decades, the already realized case of wage increases and the potential future investments in infrastructure also highlight the shortcomings of piecemeal solutions to a very complex problem, whose effects go far beyond the issue with the sanitary system. They should be supplemented by additional steps involving medical staff and the healthcare system, as well as a larger plan to lessen social disparities between and within regions. Commuting subsidies, military housing, and wage increases are just a few of the subsidies that have been debated frequently over the years and are tacitly recommended in the most recent public policy papers. Although such actions would be required, there is little probability that they will solve the issue. Reassessing the training program would be another crucial move. Residency programs are currently only offered in university settings, and the fact that new physicians begin their careers by spending several years in these settings undoubtedly lessens the appeal of other regions of the nation. However, without a more comprehensive plan to address rising social disparities, an efficient and long-lasting answer is not feasible. There is a point beyond which any additional funding for health professionals in the area will ultimately prove insufficient, as health professionals already lament the lack of opportunities for a professional and personal life that are comparable to those provided by developed urban areas, rather than a lack of funding. From this vantage point, the predicament of health professionals in underdeveloped areas is just one small aspect of a much broader picture in which most of the country's territory and people continue to trail behind a few wealthy cities. The clearest proof that such a plan did not exist over the past few decades is the constant escalation of these disparities despite shifts in administration and the overall economic direction.

Conclusions

Compared to 2022, the health system is experiencing a totally different kind of staffing deficit. During this time, the number of health professionals has greatly grown; even though the Romanian health system has undergone several fundamental changes, the public sector's employee numbers are still fewer than they were at the end of the 2000s, despite the private health system's rapid growth and the public sector's financial success. The increasing separation of duties between the public and private sectors is especially evident in the almost complete outsourcing of some health-related activities. Family medicine, which is now primarily a private practice, fell far behind other medical services in terms of numbers. Geographically, the lack of family physicians is not widespread but is more pronounced in some regions of the country. To provide personnel (particularly physicians) and handle complex situations, the private

system continues to be reliant on the functioning of the public system. The rapid increase in the percentage of physicians under 35 years of age demonstrates the revitalization of the staff. The reality that Romania has many graduates from specialist institutions supports this encouraging trend, expanding spatial disparities between wealthy and impoverished areas, as well as between major cities and the surrounding area. Rich areas have benefited most from the recent rise in health workforce, whereas impoverished areas are experiencing stasis or even decline.

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The Question of the Week Approach for Online Teaching

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Abstract

The objective of the paper is to introduce a teaching strategy designed to improve students' engagement in management accounting classes. During the pandemics, the authors of this paper introduced a new requirement for the students, the question of the week. Instead of a normal homework, the teachers designed new questions, involving aspects from several chapters, with a higher degree of difficulty, or designed questions which required each student to introduce his or her own figures. The method describes the context and an example of application with solution. The results indicate that the questions improved the student engagement and their understanding of the concepts. The approach is original, as it helps the teacher to create example for each student. It can be used in both online and face-to-face teaching.

Keywords

Online teaching; student engagement; online platform; management accounting.

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Introduction

The beginning of the COVID-19 pandemic determined the universities to completely switch from exclusive face-to-face to exclusive online learning. The objective of the paper is to introduce a teaching strategy designed to improve students' engagement in management accounting (MA) classes.

In an online environment this is important because the teacher has limited access to the students and limited tools to interact with them (Tartavulea et al., 2020; Januszewski and Buchalska-Sugajska, 2022; Blondeel, Everaert and Opdecam, 2023). Also, the solution introduced in this paper is represented by a homework, a form of formative assessment. By sending the students varied applications as homework, the teacher overcomes the obstacle imposed by the pandemic and represented by proctoring for the evaluation.

The study answers the objective by introducing a new teaching approach: the question of the week, which is a homework received by the students, designed for that particular cohort and sent to them as part of their homework. The questions are also special because they include rules regarding the variables instead of numbers and each student has to adapt the text to his or her particular context.

The paper is organised as follows. First, we discuss the challenges brought by the pandemic in terms of lectures design and assessment. Next, we present the context under which the applications were created. The paper continues with an example of an application. We finish with our conclusions.

1. Literature review

Formative assessment is represented by assessing the learning process during the semester. They may include homework (Tartavulea et al, 2020). Yet, the homework is in general the same for the entire cohort and even from one cohort to another. At an undergraduate level, the critical thinking skills and interpretation of the results are less frequent than the technical skills required, meaning that it is easier for the students to be inspired by their peers in solving their homework. To a greater extent than summative assessment,

formative assessment is thought to have a positive impact on students' performance (Brookhart, 1997). Formative assessment helps students feel less stressed as they are able to review learning material, can self-reflect and discuss with other students which helps them to better understand the course content (Cheng and Ding, 2021).

Online assessment has been widely used in both summative and formative assessment for many years. Literature suggest that online assessment promotes active engagement, stimulates interaction with content, encourages students to become responsible for the learning process which is the key of future success. The online activity of students tends to peak in the week of the assessment and in the week before the assessment and this may be a sign that weekly online assessment may encourage class participation and active learning (Cheng and Ding, 2021).

Learning accounting implies reviewing the learning material multiple times during the semester. Accounting in general and management accounting in special is a technical course that involves acquiring of concepts, techniques and technical competences. This is the reason many students perceive accounting as a difficult course which leads to failure and poor course perception. Moreover, studies show that procrastination is a frequent practice among students (Steel, 2007; De Paola, Gioia and Scoppa, 2023) and this is a major problem in the case of technical courses such as accounting. Formative assessment is thought to have a positive influence on procrastination behaviour and therefore on students performance, increasing self-efficacy and decreasing test anxiety (Blondeel, Everaert and Opdecam, 2023).

A study on online learning conducted in Poland in the field of managerial accounting shows that students have highly appreciated the e-learning method used during the COVID-19 pandemic. Despite some drawbacks that were caused by social distancing (a sense of isolation, the lack of immediate contact with the tutor) the students results are evidence of the fact that this form of learning achieved the expected educational outcomes and, even more important, it was very well appreciated by students (Januszewski and Buchalska-Sugajska, 2022).

Flipped or inverted classrooms is an approach in which students are encouraged to become responsible for the learning process while the classroom time is not used to deliver information but to solve problems, discussions, hands-on activities and guidance. The literature indicates that flipped classrooms have many positives outcomes but also some limitations are associated with this approach. As positive educational outcomes of flipped classroom most authors cite students learning achievements and satisfaction, learning performance, better retention, improved attendance, more efficient class time, more time for practice, improvement of critical thinking skills (Akçayır and Akçayır, 2018). Among the drawbacks of this approach, the authors highlight the need of quality instructional videos and also the need of more interactive tools required to provide feedback to students immediately as they see the content for the first time or when they are doing homework outside the class. Also, literature shows that it is not clear how much of the benefits of flipped classrooms are actually due to active learning methods and future research should address the differences between flipped model and non-flipped active learning models (Jensen and Kummer, 2015; Akçayır and Akçayır, 2018).

2. The method

The context in which the applications were developed

The COVID-19 pandemic determined in March 2020 the complete switch from face-to-face to online learning in Romania after three weeks of study in the case university (out of a total of fourteen weeks included normally in a semester). The cohort described in this paper was in the second year of studies, second semester, and one of the compulsory disciplines included in the syllabus was MA. MA is usually considered more difficult by the students than financial accounting because they study it in a lower number of classes, the rules are not as strict as in the case of financial accounting, the applications require interpretation, logic, basic math knowledge, and, sometimes, the creativity of the students.

In March 2020, for MA the teacher who had the lecture at this cohort started to use immediately the online platform provided by the university and zoom for synchronous classes. The platform, which is adapted from Moodle, allowed the teacher to post files, homework, quizzes, short questions during the lectures or tutorials in order to test if the students were paying attention to the classes. As the semester was already started and the students had the didactic materials before the switch to online learning, it was difficult to change the applications significantly.

However, the online teaching continues during the next academic year, which starts in Romania in October. The authors of this paper were teaching the cohort a discipline which continued the aspects introduced in MA. The new lecture was Performance measurement and control (PMC). The chapters covered were costing, decision making, transfer prices, budgeting, performance reporting. The discipline is more difficult than the MA, it introduces many new concepts but also builds on existing knowledge. The teachers decided to apply a different approach. Thus, noticing during the first semester of pandemic that the students' engagement with the lecture decreased (e.g. some of them didn't focus during the lectures, they didn't turn on their cameras on zoom), they decided to ask the students to solve during each week an application for which they needed good knowledge of the aspects discussed in MA and PMC. This was named by them "question of the week" and it was designed to raise the students' interest in PMC, to offer them more attention and also satisfaction when understanding the problems. Eight such questions were distributed to the students. Each week, the teacher graded them and offered feedback during the classes, which is an advantage for the students (Cheng and Ding, 2021).

Some of the questions of the week were represented by a template in which the students had to include the missing variables. The variables were represented by numbers specific to each person, such as the birth date, the birth month, the birth year, mother's birthday, the number of the student in the group or series of students. They were created for contexts with which the students were familiar, such as an accounting firm, a firm producing chocolate, ice cream, or bicycles. They were all new, this cohort being the first to see them. Before distributing the applications, the students solved them with two sets of numbers: one was January 1st, 2001, a small number, and another one was October 25th, 1978, a larger number. All the issues were addressed, so that the solutions to be obtained were realistic (e.g. comparable figures for revenues and expenses). The teachers created excel templates in which they solved the application for each student who sent it. Next, we present the application created for full costing.

Example of application

VSD manufactures two types of puffs: plain puffs and flavored puffs. The information obtained from the financial accounting is presented in Table 1.

Table no. 1. Information obtained from financial accounting

No.	Items	Text received by the students		Data for birthday: October 25, 1978	
		Plain puffs	**Flavored puffs**	**Plain puffs**	**Flavored puffs**
1	Selling price	Min(3; month of birth)	Min(4; month of birth)	3	4
2	Raw materials (sorghum) needed for a bag of puffs (grams)	Max(10; birthday)	Max(8; birthday*5)	25	125
3	Unit price for one kilogram of sorghum	Min(3; month of birth)		3	
4	Direct labor hours for 100 bags of fluff (hours)	Min(0.5; month of birth/10)	Min(0.6; month of birth/10)	0.5	0.6
5	Cost of one hour of direct labor	Max(month of birth*10; 100)		100	
6	Quantity obtained	Min(birthday*birth month*birthyear; 50,000)	Min(birthday*birth month*3,000; 5,000)	50,000	5,000
7	Manufacturing overheads	Max(100,000; month of birth*year of birth)		100,000	
8	Administration and selling expenses	Min(500,000; day of birth*month of birth*50)		12,500	

Source: authors' compilation 2023

Calculate:

a) The manufacturing cost using the traditional method, knowing that for the apportionment of manufacturing overheads the number of direct labor hours is used as the absorption basis;

b) The full cost knowing that the manufacturing cost is used as the basis of absorption for the apportionment of administration and selling expenses;

c) The result of the enterprise knowing that the entity did not have initial and final inventories.

Solution for the date October 25, 1978

The full cost is computed in table 2.

Table no. 2. Full cost

No.	Items	Plain puffs	Flavored puffs
1	Raw materials (kg)	0.025	0.125
2	Unit price (monetary units – mu/kg)	3	3
3	Raw materials expenses per bag of puffs (rows 1*2)	0.075	0.375
4	Labor hours per piece (bag of puffs)	0.005	0.006
5	Cost per labor hour	100	100
6	Labor cost per bag of puffs (rows 4*5)	0.5	0.6
7	Quantity obtained	50,000	5000
8	Total number of labor hours (rows 4*7)	250	30
9	Prime cost (rows 3 + 6)*(row 7)	28,750	4875
10	Manufacturing overheads (see below)	89,285.71	10,714.29
11	Manufacturing cost (rows 9 + 10)	118,035.7	15,589.29
12	Administrative and selling expenses (see below)	11,041.69	1458.305
13	Full cost (rows 11 + 12)	129,077.4	17,047.59
14	Selling price per bag	3	4
15	Turnover (rows 7*14)	150,000	20,000
16	Result (rows 15 – 13)	20,922.59	2952.409

Source: authors' compilation 2023

We compute the overhead absorption rate (OAR) for the manufacturing overheads:

OAR = ΣManufacturing overheads/ΣAbsorption base (1)

The absorption base is represented by the total number of labor hours (row eight in the table 2). With the data presented here, the OAR will be:

OAR = 100,000/(250 + 30)

OAR = 357.1429.

Thus, the manufacturing overheads for each type of product are:

Manufacturing overheads for Plain puffs = 357.1429*250 = MU 89,285.71

Manufacturing overheads for Flavored puffs = 100,000 – 89,285.71 = MU 10,714.29.

We compute the OAR for administrative and selling expenses. The absorption base is represented by the manufacturing cost (row 11 in the table).

OAR = 12,500/(118,035.7 + 15,589.29) = 0.093545.

The administrative and selling expenses apportioned to each product are:

Administrative and selling expenses for Plain puffs = 118,035.7*0.093545 = MU 11,041.69

Administrative and selling expenses for Flavored puffs = 12,500 – 11,041.69 = MU 1458,31.

3. Results and discussion

Grading of applications

The grading was conducted according to table 3.

Table no. 3. Grading the applications

No.	Item	Maximum marks
1	Text with variables for each student	2
2	Prime cost	2
3	Apportionment of manufacturing overheads	1
4	Manufacturing cost	1
5	Apportionment of administration and selling expenses	1
6	Full cost	1
7	Result	1
8	Default point	1
9	Total	10

Source: authors' compilation 2023

The results obtained by the cohort

Eight such "questions of the week were distributed to the cohort during the first semester of the academic year 2020-2021. The number of respondents is included in figure no. 1.

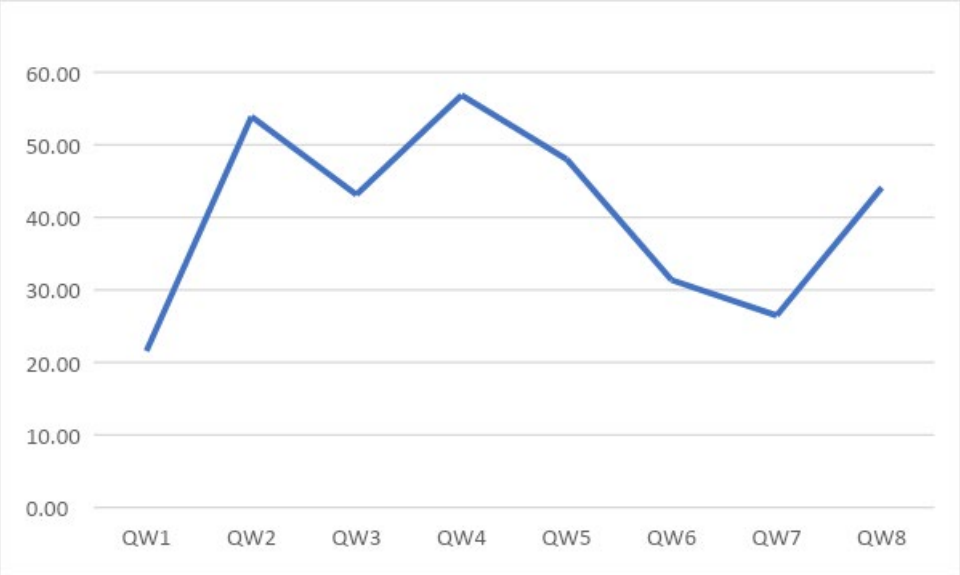


Figure no. 1. The number of respondents

Source: authors' compilation 2023

We notice that the number of respondents varied from one week to another. The lowest number was registered for the first question of the week (22 out of 102 students), because the students were not used, yet, to this type of homework. The biggest number of respondents was registered for the fourth question of the week (55 responses).

The average of the marks registered for the homework is presented in figure 2.

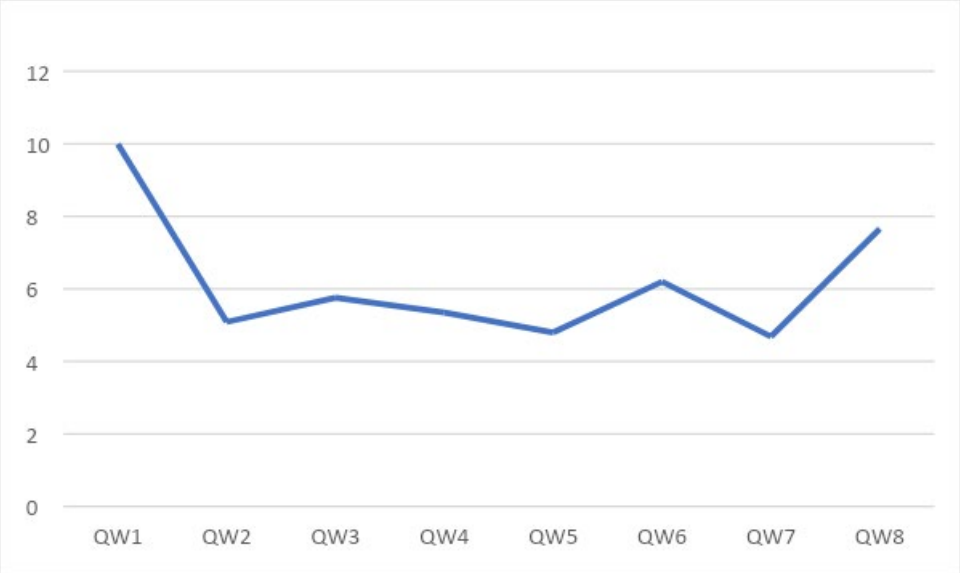


Figure no. *2*. The average of the marks for "the question of the week"

Source: authors' compilation 2023

The average was 10 (out of ten) for the first question of the week. The lowest average was 4.69 (out of ten) for the seventh question of the week. Thus, the marks obtained are, in general, average, meaning that the concern of the educators related with too high marks in online environment can be mitigated when developing new applications.

Conclusions

The COVID-19 pandemic determined the universities worldwide to switch within days from exclusive face-to-face to online education. Online assessment raised many questions for the teachers and determined them to innovate and change the traditional assessment. The study contributes to the literature by introducing a new approach regarding a part of the formative assessment, the homework. Thus, a type of question in which the students adapt the text based on their own data is introduced. The novelty raised their curiosity and they were more willing to do their homework. The type of application described here was used both in online and face-to-face environment. Psychologically, by seeing that their teachers were determined and tried to continue their education process, showing that they cared about the cohort, the students were determined to show their engagement, too.

Future research can address teaching strategies which can help students who fall behind their peers to recover. Another avenue to explore is the use of the information technologies in teaching accounting in general and management accounting in particular. The development of simple applications by the teachers and their impact on the learning process should be studies.

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Assessment of Factors that Motivate Young People to Volunteer

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Abstract

The volunteering activities in which young people participate play a significant role in individual development, but it also affects society. The diverse challenges in the field of volunteering highlight the factors that motivate young people to carry out volunteering activities. The decision of young people stems from the desire to make contributions to an important cause. The paper aims to identify the practices underlying young people's decisions, identify the peculiarities of volunteering, the types of volunteering, and the typology of volunteers, and evaluate how young people rank the factors that determine them to carry out volunteering activities. Setting up new voluntary initiatives is essential, but particular importance should be attached to methods of integration and retention of young people. Therefore, between January and March 2023, a quantitative study on young people involved in volunteering activities was carried out. Our research objective consists of evaluating the factors that motivate young people to carry out volunteering activities and analyzing the behavior of young people in carrying out volunteering activities. The results prove that young people actively participate in volunteering activities, and gender, age, and level of education are factors influencing the involvement of young people. Furthermore, the young people's lifestyle and the family environment influence their motivation to volunteer and contribute to the community's sustainable development.

Keywords

Volunteering activities, young people motivation, typology of volunteers, behavioral commitment, influencing factors.

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Introduction

Currently, young people in Romania want to get more and more involved in volunteering activities, which substantially impact them and the community. A challenge for voluntary organizations is identifying the mechanism behind motivating young people to volunteer and associating them with their lifestyle. As a result, the responsibilities of young people converge, sometimes with organizational responsibilities (Burlea-Schiopoiu et al., 2017).

Active young people show creativity, which leads to the development of skills and the reduction of specific weaknesses of volunteers since, in some cases, even various disabilities (such as deafness, blindness, paralysis) can be overcome together with other volunteers through joint efforts (Farmer and Van Dyne, 2005).

Salamon (2010, p.202) defined *volunteering work* as "the great renewable resource for social and environmental problem-solving".

Studies in the field of volunteering should focus on young people involved in volunteering activities, volunteer managers, representatives of Non-Governmental Organizations (NGOs), and ways to promote volunteering (Wilson, 2012).

Navracsics (2016), as the European Commissioner responsible for Education, Culture, Youth, and Sport, following dialogues with young Europeans, initiated efforts to attract them to engage in activities within local communities, especially volunteering activities. Moreover, it is considered that a volunteering scenario is composed of three elements: the availability of volunteers, the strengths or skills that the volunteers have, and the tasks that the volunteer will carry out (Meijs and Brudney, 2007).

Our research objective consists of evaluating the factors that motivate young people to carry out volunteering activities and analyzing the behavior of young people in carrying out volunteering activities. That is why facilitating young people's access to existing volunteering opportunities is essential.

The research results will contribute to the drawing of defining elements of young people's behavior in terms of volunteering activities and a better understanding of the factors that influence their motivation to become volunteers. The paper presents an analysis of volunteering activities, followed by a case study, and is completed with conclusions and future research.

1. Literature review

- ***Motivation of young people to get involved in volunteering activities***

Meijs et al. (2006, p. 40) sought answers to the question: *What drives a person to volunteer?* Based on the answer to this question, they identified the following three scenarios:

- The micro (individual) level of volunteering involves everyone with their skills, abilities, and experience.
- The meso (organizational) level of volunteering refers to volunteers who prefer to participate in volunteering activities within the organization and choose to be an integral part of it.
- The macro level (community or societal) of volunteering is characterized by society's civic spirit, including people willing to participate in volunteering activities to support the community.

The dynamism of each volunteer, from recruitment to management practices, is influenced by motivation (Meijs et al., 2006). The main elements that influence the motivation of young people to take part in volunteering activities are the person's desire to take part in volunteering activities, personal capabilities, and availability in terms of time spent.

Managers have a vital role in the ethics of volunteering activities, which helps define the behaviors and skills of the young people involved in Eisenbeis's activities (2012).

The European Youth Portal has identified factors that discourage young people from engaging in volunteering in their communities: the costs of participation, summary information on the opportunities available, lack of motivation, lack of recognition, lack of interest of employers in the skills acquired by young people involved in volunteering and lack of inspirational models.

Awareness of these factors makes the difference between the success and failure of an activity.

One of the European Union's (EU) priorities is young Europeans and their volunteering activities. Thus, the European Youth Portal (https://europa.eu/youth/home_en), dedicated to informing young people about learning opportunities, career development, and volunteering for young people, aims to contribute to shaping European citizens at the level of social standards.

The EU Youth Strategy resulting from Member States' cooperation contributes to improving volunteering policies (e.g., through projects and sharing good practices).

The international voluntary initiatives of the European Voluntary Service (EVS), part of the Erasmus+ program, and the EU Aid Volunteers are carried out by the European Commission and contribute to promoting youth volunteering by funding the Erasmus+ program.

- ***The role of motivation in the typology of volunteers***

The typology of volunteering has changed because of lifestyles and young people involved in various volunteering activities (Hustinx and Lammertyn, 2003). The classification of volunteering activities can be

done based on several volunteering scenarios due to the energy and motivation of volunteers to benefit from volunteering opportunities.

Goudge (2003) stressed the importance of training young people in volunteering, his research on young people in Central America, and locals' acceptance of Western volunteers. Numerous visitors to developing countries in the south and from developed countries in the west induce the locals to a state of inferiority, creating some inconsistencies. Thus, if westerners were called brigadistas in the past, this appellation has disappeared, replaced by notions such as tourist volunteers and students adapting to cultural trends and social norms.

As a result of the motivation of young people to get involved in volunteering activities, two types of volunteering have been identified: *classical collective organizational volunteering and episodic volunteering focused on personal development* in terms of the volunteer's biographical reference framework, motivational structure, level of involvement and intensity of the personal commitment, organizational environment, the field in which volunteering activities take place, as well as rewarding the effort made.

Classical collective organizational volunteering is carried out in a well-organized setting, the motivation of the volunteers is considered a duty to the organization to which the volunteers belong, and volunteering activities lead to the promotion of the common good.

Episodic volunteering is focused on personal development, volunteering is a consequence of individual planning, and the volunteers' priorities dictate participation in volunteering activities. (Hustinx and Lammertyn, 2003).

Studies on voluntary typologies have highlighted those contemporary styles of volunteering refer to specific characteristics of volunteers, such as (Hustinx et al., 2010, p. 6):

- High interest in episodic volunteering does not imply a long-term commitment.
- Individual decisions on carrying out certain types of voluntary activities.
- The use of personal skills and the discovery of autonomy.
- Determining the factors that generate benefits as a result of the participation of volunteers in volunteering activities and the factors that influence altruistic motivation.
- Focusing on the cause that generated the volunteering project or other significant activities for the volunteers and less on loyalty to a particular organization.

Formal volunteering corresponds to an organization that carries out practical volunteering activities carried out by people with specially designed training for volunteering activities, where volunteers' motivation is guided by society's current needs (Perpék, 2012).

The idea of *occasional volunteering* may seem to indicate instability, but due to volunteers' motivation and spontaneous nature, it is associated with a high quality of volunteering activities (Wang and Yu, 2015).

Meijs et al. (2021, p. 22) highlighted the importance of episodic, virtual, and team volunteering. *Episodic volunteering* does not involve costs from the organization; most of the time, spontaneous volunteers are people who do not identify with a particular volunteer organization but are people who are voluntarily involved in helping their fellow human beings as a result of force majeure situations such as in the context of the recent pandemic generated by the COVID-19 virus and during periods of natural disasters (i.e., Earthquakes, fires). In the framework of organizations, *episodic volunteering* takes place on a project basis (involving activities different from those usually carried out within the organization) to generate volunteer energy within specific groups.

Virtual volunteering is a different approach to episodic volunteering, and it is carried out by social media volunteers, who use the Internet to take part in volunteering activities, a complement to existing volunteering within organizations, a change in the scenario that involves low costs and new benefits because the activities become more flexible being independent of place, time, or both.

Team volunteering refers to groups of people (for example, company employees, students of a class, or volunteers within an organization) who participate in team activities aimed at common well-being because of decisions within the company, organization, or curriculum. This type of volunteering involves additional costs depending on the activities carried out.

Young people have the right to choose which organization to be part of, according to their skills and personal motivation, and the managers of volunteering activities must ensure that the volunteer is placed first in the organization (Balan and Burlea-Schiopoiu, 2017).

2. Research methodology

The research was conducted based on a questionnaire distributed online on the Google Forms platform between January and March 2023. The questionnaire is structured in two sections: in the first section, we included the demographic data of the respondents (gender, age, and categories of studies), and in the second section, we included the elements for identifying the factors that motivate young people to carry out volunteering activities that we evaluated using a Likert measurement scale (of 1 to 5, where 1 = Total disagreement and 5 = Total agreement).

We received a reply to 127 questionnaires, and after the removal of incomplete questionnaires, 103 valid questionnaires resulted. The results of the collected questionnaires were processed by SPSS 23.0.

The respondents are young people between the ages of 18 and 35 from Romania. The structure of respondents by gender is as follows: 47 women (45,6%), 48 men (46,6%), and eight respondents preferred not to respond (7,8%). Regarding the age structure: 51 respondents (49.5%) are under 25 years old, 36 respondents (35%) are between 25 and 29 years old, and 16 respondents (15.5%) are between 30 and 35 years old.

The level of education is a significant factor, and it seems that with the acquisition of new knowledge, the desire for representation also increases, which determines a greater involvement on the part of young people in Romania. For example, if at high school, 24.3% of young people volunteered during the bachelor's degree cycle, the number of young people who carry out such activities almost doubled (37.9%).

After completing the master's cycle, the youth rate registers a decrease (27.2%) because of entering the labor market and setting up their own family. However, young people who choose to enroll in doctoral study programs (8.7%) and post-doctoral studies (1.9%) intend to continue to participate in volunteering activities because they already know the benefits of getting involved in such activities and can put into practice their own identified solutions for some existing problems in the community.

3. Results and discussions

The analysis of the results shows that young people were involved in volunteering very often (75.7%), which demonstrates the civic spirit, interest, and intention of respondents to act, either on their own as independent, spontaneous volunteers (63.1%) or within student associations (76.7%) youth associations (57.3%) or non-governmental organizations (54.4%).

Only (4.9%) of the respondents were involved in volunteering activities only once, which demonstrates the receptivity of young people to this type of activities and the desire to try to take part, either out of curiosity or because of the volunteering opportunities they identified with the help of information sources.

In the top of the primary sources of information of the respondents on volunteering opportunities were found the group of friends and family (72,8%), social networks (73,8%), and educational institutions (51,5%), which suggests the impact of education on the motivation and the need for young people to belong to the community, which determines them to offer their support. 33% of the respondents chose the church as a source of information, which proves the inner character of the factors underlying young people's intention to get involved in volunteering activities without expecting material rewards but to achieve inner peace.

In the first stage, the mean and the standard deviation for the variable related to measuring the impact of factors on the Level of involvement of young people in volunteering activities and for control variables were calculated.

The most significant standard deviation observed in Table No. 1 is that of the variable: *Respondent's sources of information*. Another control variable that records a notable standard deviation is *the Level of education*. The lowest Dispersion (.099) is the Voluntary *status*. We can deduce that almost all respondents hold the status of volunteers. The other control variables (*respondent's gender*, *age*, *respondent's involvement in volunteering activities*, *and the place where the respondent worked as a volunteer*) register a lower standard deviation, reflecting the homogeneity of the sample concerning these four criteria.

Table no. 1. Descriptive statistics of the variable on the level of involvement of young people in volunteering activities and of the control variables

Stage	Mean	Standard deviation
Voluntary status	1.01	.099
Respondent's gender	1.62	.628
Age	1.66	.735
Level of education	2.22	1.019
Respondent's involvement in volunteering activities	3.58	.835
The place where the respondent worked as a volunteer	1.68	.831
Respondent's sources of information	1.93	1.096

Source: Author's own research.

The analysis of descriptive statistics for *measuring the impact of factors on the level of involvement of young people in volunteering activities* reveals that behavioral commitment, passion, effort, perseverance, and determination in volunteering activities have the most significant influence on the involvement of young people (4.50). Furthermore, the highest standard deviation (1.160) is recorded by the Time allotted to the volunteering factor. Therefore, the Time allotted was not a priority for respondents.

Table no. 2 analysis shows that the evaluated items obtain averages above 4, the lowest recorded average (4.20), and a reduced relative standard deviation (.943) for Constant focus on volunteering tasks and objectives. Therefore, we infer those respondents attach little importance to this factor regarding engagement. For them, aspects such as *Enthusiasm, attitude, and interest in the volunteering mission*, *Positive body language (smile, laughter, openness, and eye contact) during volunteering activities*, *Mutual trust of volunteers and interpersonal networking*, *Behavioral commitment*, *passion, effort, perseverance, and determination within volunteering activities, Verbal communication with staff and/or other volunteers*, where the standard deviation is relatively low, are the factors that determine them to be actively involved in the development of volunteering activities.

Table no. 2. Descriptive statistics for measuring the impact of factors on the level of involvement of young people in volunteering activities

Stage	Mean	Standard deviation
Time allotted to volunteering	4.29	1.160
Positive body language (smile, laughter, openness and eye contact) during volunteering activities	4.44	.788
Constant focus on volunteering tasks and objectives	4.20	.943
Verbal communication with staff and/or other volunteers	4.24	.955
Mutual trust of volunteers and interpersonal networking	4.43	.836
Enthusiasm, attitude, and interest in the volunteering mission	4.42	.835
Behavioral commitment, passion, effort, perseverance, and determination within volunteering activities	4.50	.839

Source: Author's own research.

The next step was to identify the factors that influence the level of involvement of young people in volunteering activities according to the importance they give to them. One of the study's results materialized in the realization of a ranking based on the answers received from the respondents. In Table no. 3, we can see the main factors that influence young people in Romania.

Table no. 3. The factors that influence the level of involvement of young people in volunteering activities

Number	
1.	Time allocated to volunteering activities (65%)
2.	Behavioral commitment, passion, effort, perseverance, and determination within volunteering activities (64%)
3.	Mutual trust of volunteers and interpersonal networking (60%)
4.	Positive body language (smile, laughter, openness, eye contact, etc.) during volunteering activities (57%)
5.	Enthusiasm, attitude and interest in volunteering (56%)
6.	Verbal communication with staff and/or other volunteers (50%)
7.	Constant focus on volunteering tasks and objectives (48%)

Source: Author's own research.

Many respondents (65%) considered time one of the most important factors that conditioned their involvement in volunteer activities. This is because young people provide the most important resource, the young people plan so that they feel fulfilled and can carry out the activities that attract them. However, several 5% of respondents indicated a disagreement about the positioning of time among the factors of influence, and these young people consider other factors such as passion, trust and networking, positive body language, enthusiasm, or communication more relevant to the motivation to take part in volunteering activities (Figure no. 1).

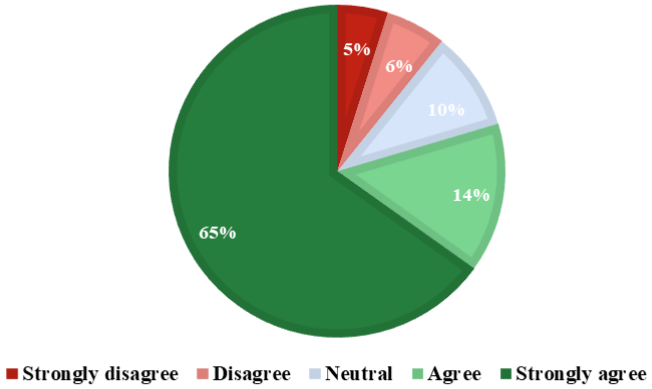


Figure no. 1. Time allocated to volunteering activities.
Source: Authors own research.

Positive body language, a sincere smile always on the lips because of the joy felt, openness to other people, and keeping eye contact during volunteering activities was indicated as a relevant factor for respondents. This highlights young people's desire to be greeted with a sincere smile and to be able, by their mere presence, to do so much good in their turn by engaging in volunteering activities.

The mutual trust of volunteers and interpersonal relationships have also been analyzed, and many respondents (60%) fully agree, and 26% agree that mutual trust is the basis for establishing a lasting relationship between volunteers and contributes to the involvement in long-term volunteering activities, thus creating an environment where personal and professional development pleasantly takes place. The results are shown in Figure no. 2. Other respondents (11%) chose to be impartial, while 2% disagreed or disagreed (1%) with the idea that other volunteers influence personal participation. The concern of young people to continue to participate in volunteering activities should be done for reasons related to each individual volunteer; it is not the kind of activity to participate in because others do it too. To be lasting, the desire for involvement to contribute to a particular cause, in volunteering activities, as in the case of the independent, spontaneous volunteer, and as it should be in the case of those in voluntary organizations, must come from within.

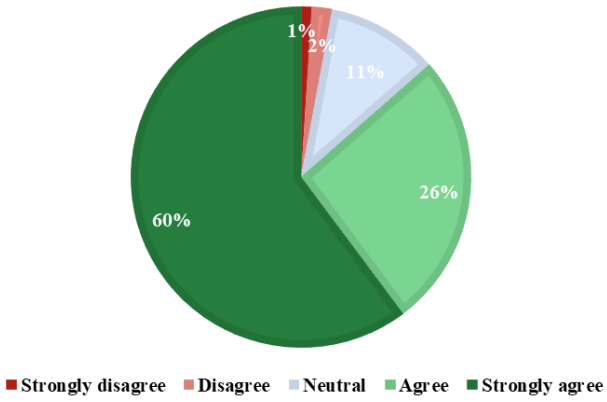


Figure no. 2. Mutual trust of volunteers and interpersonal relationship
Source: Authors own research.

An essential factor that leads to the continuation of volunteering activities by young people is the enthusiasm generated by the chance to make their contribution, the optimistic attitude, and the interest in the volunteering mission. The distribution of answers, according to Figure no. 3 shows that 56% of respondents support that enthusiasm, mood, and interest are the basis of the decision to participate in volunteering activities. The uniqueness of each activity, spontaneity, and reasoning is a mix that makes young people choose to continue to experience volunteering activities.

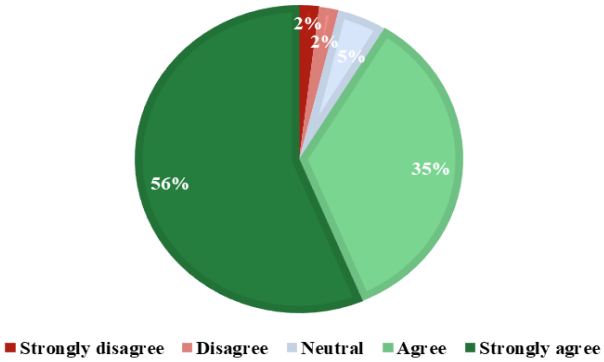


Figure no. 3. Enthusiasm, attitude, and interest in volunteering missions
Source: Authors own research.

Behavioral commitment, passion dedicated to volunteering activities, the effort that young people make, perseverance, and determination are among the factors that guide the decision to continue to get involved body and soul in volunteering activities. Most of the respondents (64%) are in complete agreement, and 27% agree with the positioning of these factors in the first place; when it comes to volunteering, although many moments involve considerable effort, young people know their goals and put passion into completing the volunteering mission (Figure no. 4). The power of young people to follow their calling is the basis of all the activities they undertake; success, in this case, lies in the permanent desire to act for the causes that matter to them: reducing pollution, supporting children from disadvantaged backgrounds, promoting the rights of people with disabilities, or promoting equal opportunities between women and men on the labor market.

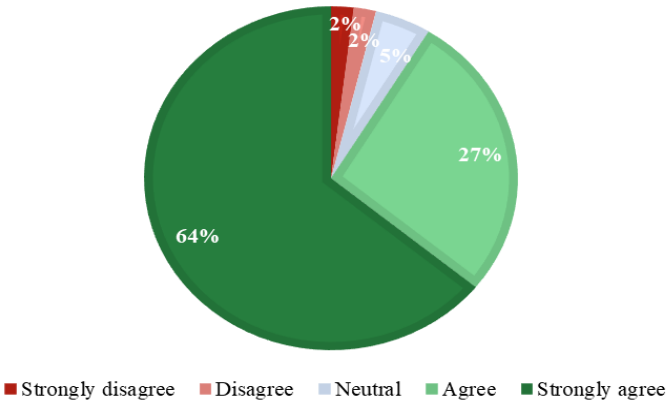


Figure no. 4. Behavioral commitment, passion, effort, perseverance, and determination within volunteering activities
Source: Authors own research.

Conclusions

In conclusion, young people's volunteering activities contribute to the community's sustainable development. Therefore, promoting and supporting volunteering activities should be an objective of government policy. Young people in Romania appreciate volunteering opportunities and provide active support, which is in the same line with Burlea-Schiopoiu et al. (2016), which analyzed accounting students'

behavior as leaders and volunteers. The level of knowledge is also a factor that influences young people's commitment to volunteer activities (Burlea, 2007).

In the following research, we aim to analyze the causes that prevent young people from getting involved in volunteering activities and the influence of management practices within voluntary organizations on the motivation of young people.

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Theoretical Approaches of Project Management

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Abstract

Our paper aims to critically analyze the scientific literature regarding the competencies of project managers and their role in creating and coordinating an efficient team. To carry out our research, we employed a qualitative research approach based on the study of secondary sources. As a result of the literature review, we have classified and analyzed the competencies of managers that lead to successful project outcomes. Furthermore, based on the particularities and competencies of managers, we have analyzed how the relationship between the manager and the team influences project outcomes. Furthermore, based on the particularities and competencies of managers, we have analyzed how the relationship between the manager and the team influences project outcomes. This research should be considered a starting point for future research by providing insights into the skills and competencies required for effective project management. The project managers and teams can use our findings to develop and implement a strategic vision to achieve project objectives. Moreover, creative skills and the ability to motivate the entire team represent relevant elements to conduct successful projects and strengthening team cohesion. This study is of great relevance to academics and practitioners in project management, as it offers the opportunity to identify areas for improvement and implement corrective measures to enhance project success. Therefore, future research should focus on developing and transforming the manager's skills into a true leader.

Keywords

Manager, project management, team, motivation.

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Introduction

Project management has grown in importance over the years as organizations have recognized the need for efficient and effective management of resources to achieve their objectives (Kloppenborg et al., 2017).

However, the success of a project depends not only on technical skills and knowledge but also on the competencies of the project manager and the ability to lead and coordinate a team toward the project's objectives. Therefore, the selection and development of competent project managers and leaders have become a priority for organizations seeking to succeed in their projects (Abyad, 2019; Alsagoff and Alqarni, 2019, Henkel et al., 2019; Imam and Zaheer, 2021).

Despite the growing literature on project management, the literature on the competencies of project managers and their role in creating and coordinating an efficient team still needs to be developed (Cuellar and Paradice, 2017; Karlsen and Andersen, 2019). Moreover, the literature focuses on technical skills and knowledge rather than the competencies that relate to the manager's ability to lead and coordinate the team. Therefore, there is a need to critically analyze the literature on the competencies of project managers and their role in creating and coordinating an efficient team.

Our research objective is to analyze project managers' competencies and role in creating efficient teams, identify the competencies that lead to successful project outcomes, and provide insights for future research and development of project management skills.

1. Review of the scientific literature

The competencies of the project manager have been extensively discussed in the specialized literature, analyzing the relationship between leadership and project performance (Ogunnaike and Jegede, 2017; Akindayomi and Akinsanmi, 2018; Dotsey-Brown and Effah, 2018; Burlea-Schiopoiu and Ferhati, 2021), communication skills and conflict management (Cuellar and Paradice, 2017; Davis and Neider, 2017; Potocan and Karmen Pažek, 2017), situational leadership (Mihai et al., 2016; Youker, 2016; Kuhnert and Lewis, 2017; Zhang and Gao, 2017), and the role of the leader in team development (Russell and Galli, 2015; Jugdev and Cooke-Davies, 2016; Hammad and Keil, 2018). Based on studies on the impact of the project manager's competencies on the team's success, researchers have concluded that the manager and their leadership style influence performance (Harned, 2017; Kloppenborg et al., 2017; Dwyer et al., 2019).

Project management is a process independent of factors such as the size and type of project, the type of coordinating organization, and the market sector because, due to the complexity of the objectives, the management style must be adapted accordingly. Therefore, studies on project managers and their relationship with team members will continue to generate interest from an academic, economic, and industrial standpoint. Project management carried out through the manager, is more than just a need for improvement and represents a field that aims to improve itself through its impact on project success (Radujkovic and Sjekavica, 2017, p. 613). A good leader can also be a good manager without the mirror necessarily being valid: a good manager may not possess any leadership qualities. The manager must monitor the project's economic, legislative, and operational aspects and sample the team by reducing tensions, ensuring communication in both directions and providing constructive feedback towards achieving success through proposed parameters and maximum efficiency. Pells (2018) argues that project managers must possess both leadership skills and management competencies, which are complementary and essential for successfully managing projects. Moreover, researchers in the field generally accept that the ideal leadership model for a project team is the manager-leader (Grynchenko et al., 2018; Broadly, 2020).

A manager needs to be a leader in strategic vision and advanced creative abilities, from the team formation stage to completing project tasks (Grynchenko et al., 2018). The Project Management Institute in the PMBOK Guide (PMI, 2021, p. 70) argues that the manager keeps team members focused on carrying out activities according to plan through teamwork within the project and joint effort. A successful manager aims to coordinate project activities in such a way as to effectively manage the team's motivation level and maintain the concentration of team members at high levels when challenges, delays, or cost changes arise in the project.

2. Research methodology

Our research methodology consists of comparative and descriptive analysis. Information was collected and critically analyzed from the scientific literature using various databases and public sources. We started by identifying and analyzing studies on the manager's competencies required for efficient project management and a successful outcome. The data utilized in this study is a comprehensive review of existing research, which allows us to identify managers' particularities and their relationships with the team.

3. Results and discussion

Project management is defined by the visions attributed to the project (Abyad, 2019, p. 8), and the project manager becomes the tool for achieving these visions. Opran (2013, p. 82) develops the idea that the manager's goal is to achieve project performance objectives and plans by using the capacity to adapt to available human, material, and intellectual resources. Since activities do not always follow the initial plan, a manager must apply risk management and thus pay close attention to the project's specifications, limitations, and specific characteristics (Lock, 2010, p. 99). Therefore, to minimize or eliminate the impact of an unforeseen event, the project manager must be able to redirect and replan activities and processes and estimate in detail all possible influencing factors (PMI, 2019, p. 16).

We can affirm that the project manager carries out complex and continuous work from the idea stage of the project until its completion. Therefore, the project manager ensures an exemplary implementation of the project, from the activity plan, budget, and initial specifications to achieving the objectives and reaching the proposed goal.

Shirley (2020, p. 153) argues that the differences between leadership and management have always been a topic of debate. For this study, an effort of literary research on the characteristics and leadership competencies of a project manager will be presented below. Recently, there has been an increasing differentiation between a manager and a leader, as highlighted in Figure no. 1 (Broadly, 2020, p. 11; Grynchenko et al., 2018, p. 16).

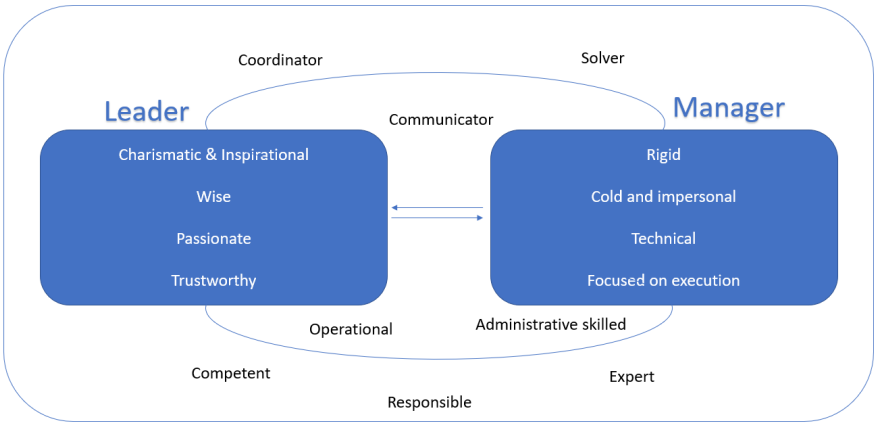


Figure no. 1. Manager and Leader
Source: Grynchenko et al., 2018, p.16 & Broadly, 2020, p.1

The project manager should be a charismatic, wise, trustworthy, and passionate person who attracts other participants .in achieve common goals (Broadly, 2020, p.1). Furthermore, the manager evaluates and balances the team's concentration level and the progress of established objectives quantitatively balances workloads and evaluates the motivation of team members in order to optimize project value and maintain their concentration. According to Kloppenborg et al. (2017, p.5), in recent years, society has concluded that communication and leadership play a vital role in project success. The competencies of managers represent a subject actively researched in terms of general competencies of different types of projects as well as the specific ones related to the exact typology of the projects (Moradi, et al., 2020).

The project manager must possess cross-functional and practical skills, often having more responsibilities than authority, and the managerial skills trio is composed of technical, behavioral, and strategic business management skills (Kloppenborg et al., 2017, pp. 6-7). To demonstrate efficiency, a manager holds the minimum competencies necessary to achieve the project. These refer to skills such as communication, team building, and organization, sensitivity to multicultural preferences, and the ability to understand the meaning of emotions and how they influence personality types or are influenced by leadership styles, negotiations, and goal-setting (Watt, 2014, p. 75).

The skills of a manager must be congruent with their personality so that the effectiveness of project leadership can be generated. In this sense, Dwyer et al. (2019, p. 15) found that among the critical factors that determine project success are the manager's competencies. Likewise, Dulewicz and Higgs (2003, pp.8-9) have identified three dimensions of leadership and 15 general competencies that are relevant to project management, as follows:

- *Managerial (MQ):*

- Resource management – plans ahead, efficiently organizes and coordinates resources, monitors and provides feedback to the team, so that project objectives become action plans;

- Development – believes in the potential of others and invests in coaching sessions and constructive feedback for their development, identifies new tasks, and encourages team members to develop their skills;

- Empowerment – encourages the team to become autonomous and creates the right environment for thinking in perspective, critical thinking, and problem-solving;

- Engaging communication – involves and encourages stakeholders in the communication process enthusiastically, communicates objectives and visions clearly, adapting the communication style depending on the audience (public or project personnel);

- High achievement – determined to achieve objectives, willing to make calculated but high-risk decisions that bring significantly more significant benefits.

● *Intellectual (IQ):*

- Critical analysis and judgment – present critical thinking, analyzing facts, and making correct judgments and decisions based on analysis hypotheses of advantages and disadvantages of proposed situations;

- Vision and imagination – have a clear vision of the priorities and future direction of the organization, is innovative and imaginative in their own and the team's work;

- Strategic perspective – sensitive to the broader implications of emerging issues, needs, relationships with stakeholders, and the implications of decisions taken, thereby predicting threats and opportunities.

● *Emotional (EQ):*

- Self-awareness – aware of their feelings, capable of recognizing and controlling emotions experienced so that the professional impact is kept under control;

- Sensitivity – aware of the expectations and perceptions of others, adapts decisions and solutions according to these, is open to proposals, and actively listens, thus achieving the commitment of others in activities;

- Motivation - achieves precise results through dynamism, energy, and the ability to balance and pursue short- and long-term objectives regardless of challenges and rejections;

- Emotional resilience - maintains focus under pressure and in the face of personal challenges, adapting behaviorally to new situations and individuals involved;

- Influence - convinces those involved to change their opinions based on recognition of their position and the need to listen to a new perspective;

- Intuitiveness - uses rational and intuitive perceptions to adopt and implement clear decisions even when information received is incomplete;

- Conscience - demonstrates a commitment to adopting ethical decisions, facing challenges, and implementing what is decided verbally in practice.

These competencies are frequently used in research in the field. For example, Podgórska and Pichlak (2019, pp. 869-887) used these competencies (Dulewicz and Higgs, 2003) to study the leadership competencies of project managers, as well as the impact of these competencies on project success and arrived at the following conclusions:

● Leadership competencies, such as communication skills, team management, and technical skills, are essential for project success;

● Project managers with more experience and higher levels of education tend to have stronger leadership competencies, and those who have good communication skills and can effectively manage risks tend to have more success in project implementation;

● Developing leadership competencies can be beneficial for project success and career development in project management.

The management style is reflected in the team's work and project activities. Therefore, the project manager's soft competencies, communication skills, and self-education skills are considered very important for the final result by Podgórska and Pichlak (2019). Turner (2019) also argues that in project management, in addition to having an overall vision, a successful project manager must also exercise leadership skills such as communicating, inspiring, and motivating team members.

Müller and Turner (2010) use Dulewicz and Higgs' (2003) set of competencies to analyze the leadership competencies of successful managers, depending on the particularities of the project type. This list of competencies was supplemented with specific domain and technology knowledge, as well as practical experience in project management. According to their study (Müller and Turner, 2010, p. 446), leadership skills are one of the essential points of a project manager. Thus, developing leadership skills and technical and managerial competencies must be a vital component of the training and development of project managers. Additionally, Burlea-Schiopoiu and Lefter (2011) have concluded that in Romania, the most common leadership practices are paternalistic and charismatic leadership. They recommend developing emotional intelligence, encouraging innovation and creativity, and promoting a more participative leadership style to improve the leadership process. The practiced leadership style may vary and prove to be

more effective depending on external and internal elements of influence on a project, such as culture, geographic area, or the preferred style of the project team leader.

The different approaches to leadership (i.e., task-oriented or relationship-oriented) can influence the project's success and the team members' satisfaction. However, a situational leadership approach instead of a one-size-fits-all leadership style presents increased chances of completing projects (Henkel et al., 2019, p.9). Although all skills are essential, a good project manager must combine leadership and management skills to successfully lead the team and achieve the proposed objectives (Müller et al., 2014). Therefore, it cannot be claimed that there is a unique management style or one that works regardless of the situation. Instead, efficient project management is reflected in the leader's ability to realistically assess the situation and cope with challenges that may arise during the project's implementation.

Project teams are a group of stakeholders involving other stakeholders to understand, consider, communicate, and respond to the interests, needs, and responses of projects (PMI, 2021, p. 33). Within projects, the team acts as a complex social system in which individuals with high professional competence usually need to fulfill a specific set of interrelated functions. Although more challenging, a successful project team requires close cooperation. This cooperative action requires allocating time to express ideas, debate them, and arrive at decisions and strong leadership to coordinate the group (Harned, 2017, p. 121). Project managers who adopt a leadership approach can be advantageous in creating a balance between the needs of the team and those of the project (Alsagoff and Alqarni, 2019; Burlea-Schiopoiu, 2009).

Effective project management requires a set of personal and professional competencies designed to manage both the team and its interpersonal dynamics, as well as the internal and external challenges of the project. Creating a project team, as well as coordinating the objectives and interests of its members, are much hindered by the psychological traits (i.e., distinct interests, ambitions, aspirations, values, and ideals) of each member of the team (Grynchenko et al., 2018, p. 14). Since project performance can be influenced by the characteristics of the team (Figure no. 2), it is essential to monitor them both in the selection stage and throughout the implementation stages (Kloppenborg et al., 2017, pp. 145-146).

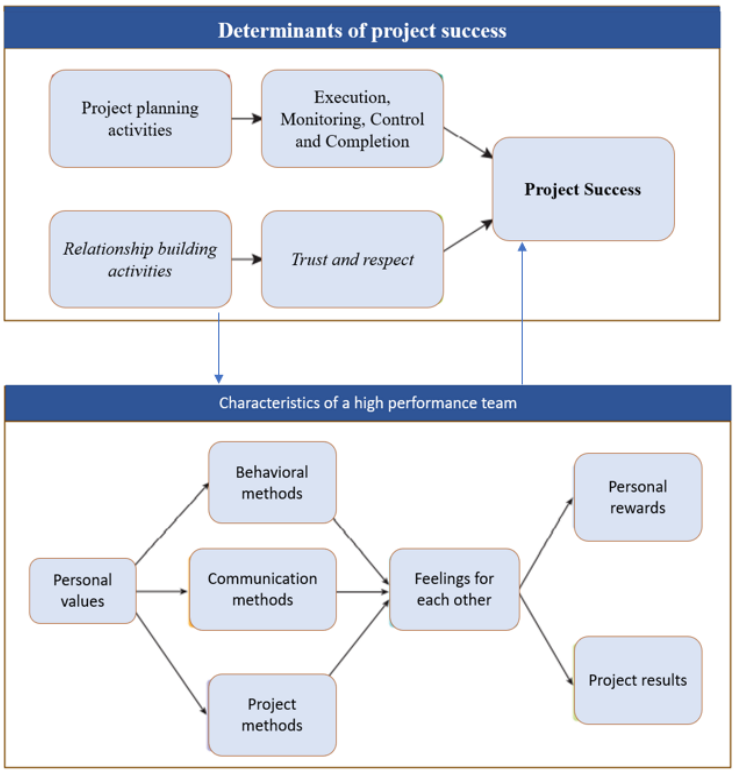


Figure no. 2. Determinants of success-team characteristics
Source: Kloppenborg et al. (2017, p.102; p.145)

Since project performance can be influenced by the characteristics of the team (Figure no. 2), it is essential to monitor them both in the selection stage and throughout the implementation stages (Kloppenborg et al., 2017, pp. 145-146).

Kloppenborg (2017, p.107) introduces norms of human management that influence project success, including collaboration, intercommunication, and team relationship. Imam and Zaheer (2021, pp.2-3) suggest that knowledge exchange, cohesion, and trust within the team are critical factors that must be addressed in project management.

Rarely does a project unfold as anticipated, and new opportunities to generate value arise when unforeseen elements arise (PMI, 2021, pp.55-56). As a result, the ability to motivate others is a skill that the project manager must possess or acquire. The project manager manages communication, motivates the team, identifies and evaluates warning signals to ensure they do not become real problems, and encourages a supportive environment (Harned, 2017, p.23, Podgórska and Pichlak, 2019, p.882).

Managers, in a positive sense, are considered to be master manipulators because it is vital for a manager to accurately establish the position in Maslow's hierarchy that a team member falls under in order to manipulate motivational factors based on the particularities of each team member (Shirley, 2020, pp. 141-149). The management style has a strong influence on the team and the project. For example, transformational and transactional management styles help create and maintain project team cohesion, encourage collaboration and innovation, and evaluate and improve individual performance. Transformational managers encourage team members to exceed their limits and become innovators, while transactional managers focus on managing and developing individual performance. Both approaches can increase team cohesion and project performance by increasing employee engagement and encouraging collaboration. However, the interaction between the manager and team members can negatively affect team cohesion, such as the autocratic leadership style, which is more significant for virtual teams than traditional teams (Burlea-Schiopoiu, 2007; Wang et al., 2018).

Developing team cohesion is essential for the performance of team members and the overall project performance. Podgórska and Pichlak (2019, p.882) emphasize the importance of personnel in achieving a successful project, considering that a strong and well-managed team is essential for achieving goals, and managers should focus on the effective development and management of their team. Thus, the manager facilitates the team's accommodation with the tasks at hand and the other members, thereby increasing team cohesion and the chances of project success.

Conclusions

Lately, researchers are directing their efforts toward studying the relationships between human resources because they are a factor that influences the project's outcome.

There are situations where project results cannot be successfully achieved, but the project manager is the one who can change this outcome. Therefore, this paper emphasizes the importance of considering technical competencies, efficiency, professional expertise, and soft skills in choosing a project manager. Although there are various management styles in the literature, none of them is defined as the ideal style that works regardless of the type of project. Our research has found that while a leader's ability to assess the situation and apply relevant skills is crucial, leadership is situational. The roles of manager and leader have become laborious processes composed of different qualitative actions and activities, two different skills or personalities with intermittent applicability.

Our work concludes that although both managerial and leadership skills are crucial for project management, a qualified project leader should be able to combine both skill sets with leading the project team and achieving the project objective effectively (Müller et al., 2014).

Our conclusion shows that when the project manager has leadership skills, the chances of completing a project are greatly improved. Moreover, it is known that both the technical skills and the expertise in the field of the leader should be addressed. However, the skills of the project team, leadership, cohesion, and the interaction between these elements lead the project to a successful conclusion under normal and abnormal conditions. Therefore, it is essential to invest in skills training at both the project management level and the team level.

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Evaluating the Effects of HRM Practices on Employee Engagement and Organizational Culture

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Abstract

Human resource management (HRM) is a critical field in business and organizations, and practices in this field can significantly influence employee engagement and organizational culture. The paper proposes a model for evaluating the effects of HRM practices on employee commitment and organizational culture. The empirical study in which the model is tested was carried out among 294 employees from Romanian organizations who answered the questionnaire questions. Structural equation modeling was used to process the data and obtain the results. HRM practices can directly influence employee engagement and organizational culture. Involving employees in the decision-making process, offering opportunities for career development, properly managing labor relations, and promoting diversity and inclusion are HRM practices that can increase employee engagement and develop a positive organizational culture. The study has important managerial implications by highlighting HRM practices that substantially affect employee engagement and organizational culture. Employees more involved and loyal to the organization are more likely to respect its values and goals, so the organizational culture becomes more substantial and better defined. Therefore, organizations must implement HRM practices that help increase employee engagement and develop a more robust and better-defined organizational culture.

Keywords

Human resource management, HRM practices, employee commitment; organizational culture; employee perceptions.

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Introduction

In recent decades, human resource management has become a significant concern for most organizations, regardless of size or industry. Since employees are one of the most critical assets of any company, improving employee engagement and organizational culture has become a priority for most managers and organizational leaders.

Employee engagement represents the degree to which an employee feels attached and involved in the organization's activities and goals (Shimazu et al., 2015; Mercurio, 2015). Organizational culture refers to the values, attitudes, behaviors, and practices shared by organizational members that influence how the organization achieves its goals and fulfills its mission (Hall et al., 2010; Iqbal, 2017). HRM practices can have a significant impact on employee engagement and organizational culture. A well-structured approach to HRM can contribute to developing a robust organizational culture based on respect, trust, and collaboration. At the same time, a solid organizational culture can increase employee commitment and improve organizational performance (Delaney and Huselid, 1996; Khoreva and Wechtler, 2018; Tortia et al., 2022).

This paper aims to evaluate the effects of HRM practices on employee commitment and organizational culture in the perception of employees of Romanian organizations. The structure of the paper has five

sections. The first section presents the introduction, the second provides a literature review, and the third describes the research design. Finally, the last two sections present the results, discussion, and conclusions.

1. Literature review

HRM is essential in any organization, and its practices can significantly impact employee engagement and organizational culture (Giancaspro et al., 2021). In recent years, research has encouraged organizations to focus more on developing HRM practices that help increase employee engagement and develop a positive organizational culture, which can lead to better employee performance in the long term (Khoreva and Wechtler, 2018; Tortia et al., 2022).

HRM practices can significantly impact employee engagement and organizational culture (Delaney and Huselid, 1996; Otoo, 2019). Delaney and Huselid's (1996) study showed that HRM practices promoting professional development, employee recognition and appreciation, and open and transparent communication could increase employee commitment and a more robust organizational culture.

Studies have also shown that HRM practices perceived as unfair and discriminatory can negatively impact employee engagement and organizational culture (Delaney and Huselid, 1996; Khoreva and Wechtler, 2018; Tortia et al., 2022). For example, Mercurio (2015) showed that the absence of justice in pay and benefits could lead to low employee engagement and a fragile organizational culture.

In addition, studies have shown that HRM practices can vary by culture and organizational context. For example, a study by Iqbal (2017) showed that HRM practices that work in one cultural context might be ineffective in another. Therefore, managers and leaders must consider the organizational and cultural context when implementing HRM practices. Assessing the effects of HRM practices on employee commitment and organizational culture can provide valuable information for managers and organizational leaders (Ha-que et al., 2017). Various studies have shown that HRM practices can have a significant impact on employee engagement and organizational culture, but it is essential to consider the organizational and cultural context (Vărzaru and Vărzaru, 2013; Vărzaru and Vărzaru, 2016; Hall et al. al., 2010; Iqbal, 2017; Moreira et al., 2022). HRM practices that promote professional development, employee recognition and appreciation, and open and transparent communication can lead to increased employee commitment to the organization and a more robust organizational culture (Moreira et al., 2022).

In particular, recruitment and selection, training and development, performance appraisal, and reward practices have been found to have a significant influence on employee engagement and organizational culture (Delaney and Huselid, 1996; Hall et al., 2010; Iqbal, 2017; Mercurio, 2015; Moreira et al., 2022). In terms of recruitment and selection practices, they have been found to influence organizational culture significantly (Iqbal, 2017). Employees perceive organizations that emphasize recruiting and selecting the best candidates have a more robust and better-defined organizational culture. As a result, they are more engaged and loyal to the organization. Training and development practices significantly influence employee engagement (Mercurio, 2015). Employees perceive that organizations that invest in their training and development have greater trust in the organization and are more engaged in their work. Performance appraisal practices also significantly influence employee engagement and organizational culture (Moreira et al., 2022). Employees perceive that organizations with a well-defined and fair performance evaluation process have a more robust organizational culture and are more engaged in their work. Regarding reward practices, employees perceive that organizations that offer fair and transparent rewards have a more significant commitment from employees and are more motivated to achieve their goals (Giancaspro et al., 2021). At the same time, unfair and discriminatory practices can harm employee engagement and organizational culture. Thus, managers and organizational leaders must consider equity in implementing HRM practices (Bocean, 2015).

In general, evaluating the effects of HRM practices on employee commitment and organizational culture can help develop and improve HRM policies and practices in organizations (Bocean, 2007, 2008). Managers and organizational leaders need to consider the specific context of their organization and focus on practices that promote employee engagement and strong organizational culture, and avoid practices that may negatively impact them (Moreira et al., 2022).

Based on the literature review, we proposed two research hypotheses:

H1. In the perception of the organization's staff, HRM practices exert a direct influence on employee engagement.

H2. In the perception of the organization's staff, HRM practices exert a direct influence on employee engagement.

2. Research Methodology

The research design involved conducting an empirical study among 294 employees from Romanian organizations who answered the questionnaire questions regarding HRM practices, employee commitment, and organizational culture. The method used to construct the sample was stratified random sampling, depending on three socio-demographic variables: gender, age, and education. The paper uses structural equation modeling to evaluate the relationships between HRM practices, employee commitment, and organizational culture, which other researchers also use to evaluate the relationships between latent variables (Vărzaru et al., 2022; Iancu et al., 2022; Puiu et al., 2022). Structural equation modeling allows the analysis of relationships between latent variables, built based on observable variables (questionnaire items), exogenous to the model (Vărzaru, 2022).

Results and discussion

The empirical model involves testing relationships between latent variables. Figure 1 shows the theoretical model applied to the selected sample, obtained with the help of SmartPLS v 4.0.

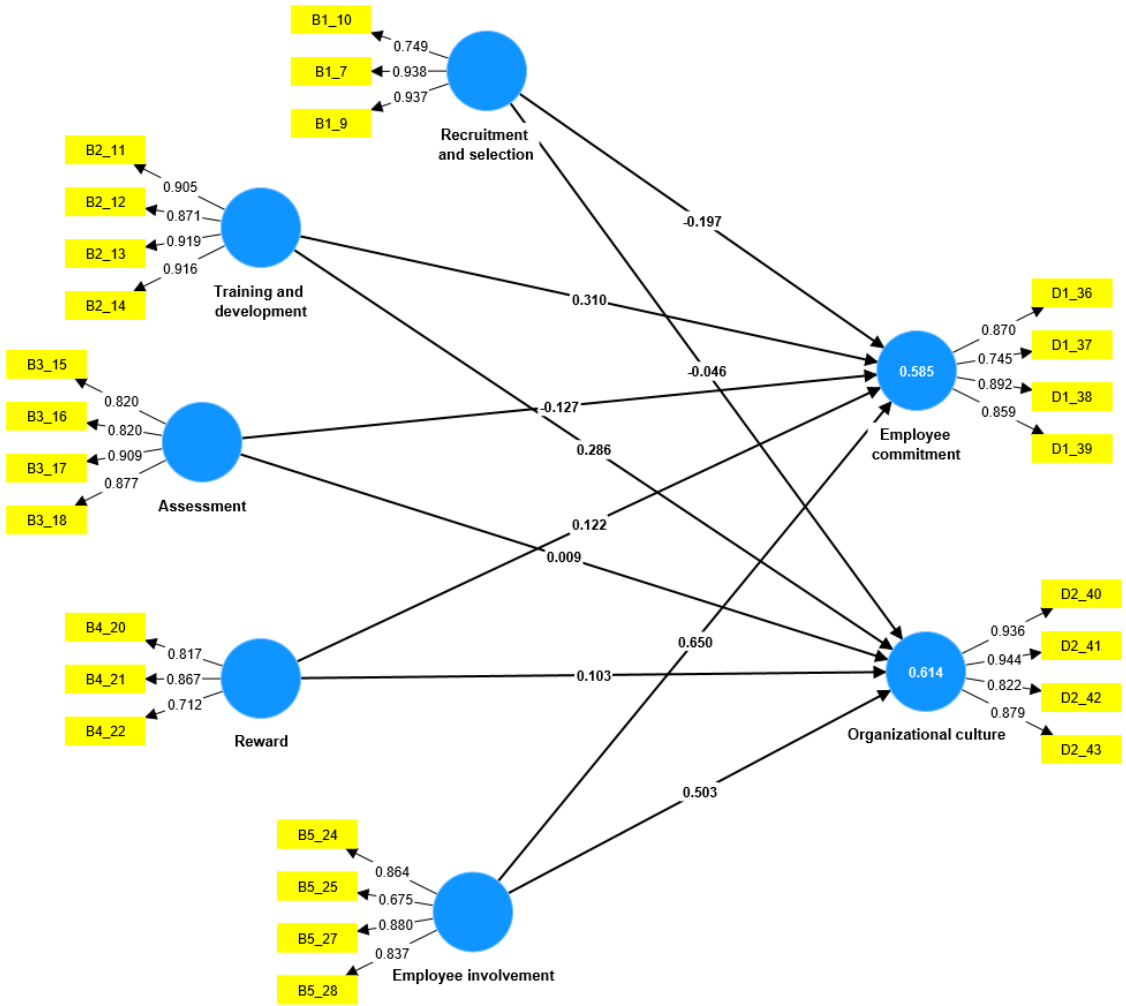


Figure 1. Modified PLS model

Source: Developed by the authors based on data using SmartPLS v4.0

The resulting model is relevant and reliable. SRMR has a value of 0.079 (<0.08), and NFI has a value of 0.914 (>0.9). Other reliability indicators are shown in Table 1.

Table no. 1. Model reliability indicators

	Cronbach's alpha	Composite reliability	Average variance extracted
Employee commitment	0.864	0.877	0.908
Organizational culture	0.918	0.928	0.942
Assessment	0.879	0.882	0.917
Training and development	0.925	0.931	0.946
rewarding	0.717	0.723	0.842
Recruitment and selection	0.855	0.922	0.91
Employee involvement	0.837	0.875	0.889

Source: Developed by the authors based on data using SmartPLS v4.0

Path coefficients indicating the total effects of HRM practices on employee engagement and organizational culture are presented in Table 2.

Table no. 2. Path coefficients

	Original sample	Standard deviation	T statistics	P values
Assessment -> Employee engagement	-0.127	0.074	1.714	0.087
Assessment -> Organizational culture	0.009	0.068	0.138	0.891
Training and development -> Employee engagement	0.31	0.076	4.088	0.000
Training and development -> Organizational culture	0.286	0.082	3.474	0.001
Reward -> Employee engagement	0.122	0.07	1.736	0.083
Reward -> Organizational culture	0.103	0.067	1.534	0.125
Recruitment and selection -> Employee engagement	-0.197	0.079	2.505	0.012
Recruitment and selection -> Organizational culture	-0.046	0.089	0.513	0.608
Employee involvement -> Employee engagement	0.65	0.057	11.408	0.000
Employee involvement -> Organizational culture	0.503	0.057	8.855	0.000

Source: Developed by the authors based on data using SmartPLS v4.0

Following the analysis of the path coefficients and significance levels (p values), it can be concluded that the HRM practices influencing employee commitment are professional training, personal development, and employee involvement. Such practices increase employee engagement in their organizations. As far as organizational culture is concerned, it is influenced by professional training and personal development, labor relations, and employee involvement. Following the analysis of the research model, it was stated that hypotheses H1 and H2 were partially validated. In the perception of the organization's staff, some HRM practices directly influence employee commitment and organizational culture.

Research results based on correlation analysis and structural equation modeling show that HRM practices can directly influence employee engagement. One of these practices is the employees' involvement in the organization's decision-making process. According to Giancaspro et al. (2021), the involvement of employees in the decision-making process can increase their level of satisfaction and commitment to the organization. This can be achieved through tools such as brainstorming sessions or organizing regular employee meetings. Research also shows a strong link between career development and employee engagement (Otoo, 2019). Thus, offering opportunities for career development can contribute to increasing employee engagement.

Moreover, according to other research that was not confirmed by our research findings, several HRM practices are related to employee rewards and benefits. For example, according to research, offering

additional benefits to employees, such as flexible working hours or customized benefits packages, can help increase employee engagement (Tortia et al., 2022). Also, offering a fair salary package can increase employee engagement (Khoreva and Wechtler, 2018).

In addition to influencing employee engagement, HRM practices can also influence organizational culture. According to Giancaspro et al. (2019), there is a strong link between HRM practices and positive organizational culture. This can be achieved by developing a shared set of values and principles, promoting open communication, and encouraging team collaboration. In addition, research shows that HRM practices that encourage diversity and inclusion can contribute to developing a positive organizational culture (Otoo, 2019).

Research also shows a strong link between HRM practices and creative and innovative organizational culture. According to Tortia et al. (2021), HRM practices that encourage innovation, such as providing professional training and incentives for innovative ideas, can contribute to developing a positive organizational culture and increasing organizational innovation.

Conclusions

Our research results demonstrate that HRM practices can significantly impact employee engagement and organizational culture. Some specific factors of HRM practices that can positively impact employee commitment and organizational culture include professional development opportunities, employee involvement in organizational decisions, open and transparent communication, and equity and justice regarding the granting of wages and benefits. On the other hand, HRM practices that can negatively impact employee commitment and organizational culture include the absence of professional development opportunities, excessive supervision, absence of feedback, abuse of power, and discrimination. HRM practices that employees perceive as fair, transparent, and equitable can lead to increased employee commitment and a more robust organizational culture.

Assessing HRM practices and their effects on employee engagement and organizational culture can provide valuable information for managers and organizational leaders. For example, HRM practices that promote professional development and employee involvement can lead to increased employee commitment and a more robust organizational culture. On the other hand, HRM practices that are perceived as unfair, unjust, and discriminatory can lead to low employee engagement and a fragile organizational culture. Therefore, managers and organizational leaders should regularly review and revise HRM practices to ensure increased employee engagement and a healthy and robust organizational culture.

The paper presents a limitation derived from the transversal approach, which does not consider the time factor. However, through a longitudinal approach, the evolution of employees' perceptions can be followed. Also, the study carried out among Romanian employees may have geographical and cultural limitations. Therefore, expanding the research for employees from other countries can increase the representativeness.

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Exploring the Direct Influence of the Organizational Change Process on Organizational Performance

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Abstract

Organizational change can significantly impact organizational performance, but this impact can be different depending on the nature and purpose of the change and how it is managed. The paper proposes a model for evaluating the effects of the organizational change process on organizational performance, staff retention, and organizational abandonment. The empirical study in which the model is tested was carried out among 294 employees from Romanian organizations who answered the questionnaire questions. Structural equation modeling was used to process the data and obtain the results. Effective change management and employee involvement in the change process can contribute to the success of organizational change and the development of a positive organizational culture, leading to increased organizational performance, high employee retention, and the organizational dropout rate minimization. In addition, organizations should also consider open and transparent communication with employees, as well as providing support in developing the skills and competencies of employees so that they can adapt to organizational changes and contribute to the organization's success.

Keywords

Organizational change; organizational performance; employee retention; organizational abandonment.

DOI: 10.24818/BASIQ/2023/09/036

Introduction

Change is inevitable in the business world and can be one of the most difficult challenges for any organization. However, while change may be necessary to remain competitive and achieve goals, it can also negatively affect organizational performance (Heckmann et al., 2016). In recent years, research has encouraged organizations to focus more on effectively managing change and engaging employees in the change process to improve long-term organizational performance. Organizational change can be an essential part of an organization's development and growth, but it can also negatively affect organizational performance, staff retention, and abandonment (Bamford and Forrester, 2003; Kotter, 2007; Amis and Janz, 2020).

Therefore, it is essential to understand better the direct influence of the organizational change process on organizational performance, staff retention, and organizational abandonment. The paper aims to evaluate the effects of organizational change on organizational performance, employee retention, and organizational abandonment by evaluating the perceptions of employees of some Romanian organizations. The work is structured in five sections. The first section presents the research topic, and the second reviews the literature. The third section outlines the methodology, while the following sections present the results, discussion, and conclusions.

1. Literature review

Organizational performance refers to the organization's ability to achieve its goals and to efficiently and effectively accomplish specific tasks. Many studies have investigated the effects of organizational change on organizational performance. For example, a study by Klarner et al. (2008) investigated the impact of the organizational change process on organizational performance in public health services. The results indicated that implementing change can improve the organizational performance of healthcare organizations, but only if the process is well planned and executed.

Employee retention is essential for organizational success, as losing talented and experienced employees can negatively impact organizational performance. Stevens (2013) examined the influence of organizational change on staff retention. The results indicated that organizational change could negatively affect staff retention, but these effects can be mitigated by clear communication and employee involvement in the change process. Wang et al. (2020) found that organizational changes had a negative impact on employee retention in the educational system. However, the same study showed that good communication between the organization and employees and a strong student orientation could reduce the negative impact of organizational changes on employee retention.

Organizational abandonment refers to the decision of employees to leave the organization following organizational changes. This can have a negative impact on organizational performance, as the loss of talented and experienced employees can lead to the loss of knowledge and experience in the organization (Dempsey et al., 2022). Lausier et al. (2020), examining the influence of organizational change on organizational abandonment, indicated that organizational change could increase organizational abandonment, but this can be mitigated by involving employees in the change process and providing appropriate benefits and rewards. In turn, Amis and Janz (2020) found that organizational changes significantly negatively impacted organizational abandonment. In addition, research has shown that employees' perceptions of organizational justice and support can moderate the negative impact of organizational change on organizational abandonment.

Organizational change is necessary for organizations to remain competitive in a dynamic business environment and adapt to market changes. Organizational change can be driven by various factors, such as technology, organizational culture, business strategies, and changes in market demand (Dempsey et al., 2022). In addition, according to Dunphy (1996), organizational changes can increase productivity, improve employee satisfaction, and increase the organization's financial performance.

In addition to impacting employee retention and organizational abandonment, organizational change can significantly impact other crucial organizational performance variables, such as employee satisfaction, productivity, and profitability (Dempsey et al., 2020).

Based on the literature review, we proposed two research hypotheses:

H1. There is a direct, significant, positive relationship between organizational change and performance.

H2. There is a direct, significant, positive relationship between organizational change and employee retention.

H3. There is a direct, significant, negative relationship between organizational change and abandonment.

2. Research methodology

The research strategy involved conducting an empirical study among 294 employees from Romanian organizations based on a questionnaire regarding the influence of organizational change on organizational performance. The method used to construct the sample was stratified random sampling, with layers formed based on gender, age, and education. The paper uses structural equation modeling to evaluate organizational change's influence on organizational performance, employee retention, and abandonment, similar to other authors (Vărzaru et al., 2022; Iancu et al., 2022; Puiu et al., 2022; Vărzaru, 2022).

3. Results and discussion

To test the hypotheses, we chose structural equation modeling as a method. Figure 1 shows the theoretical model applied to employees of Romanian organizations, obtained with the help of SmartPLS v 4.0.

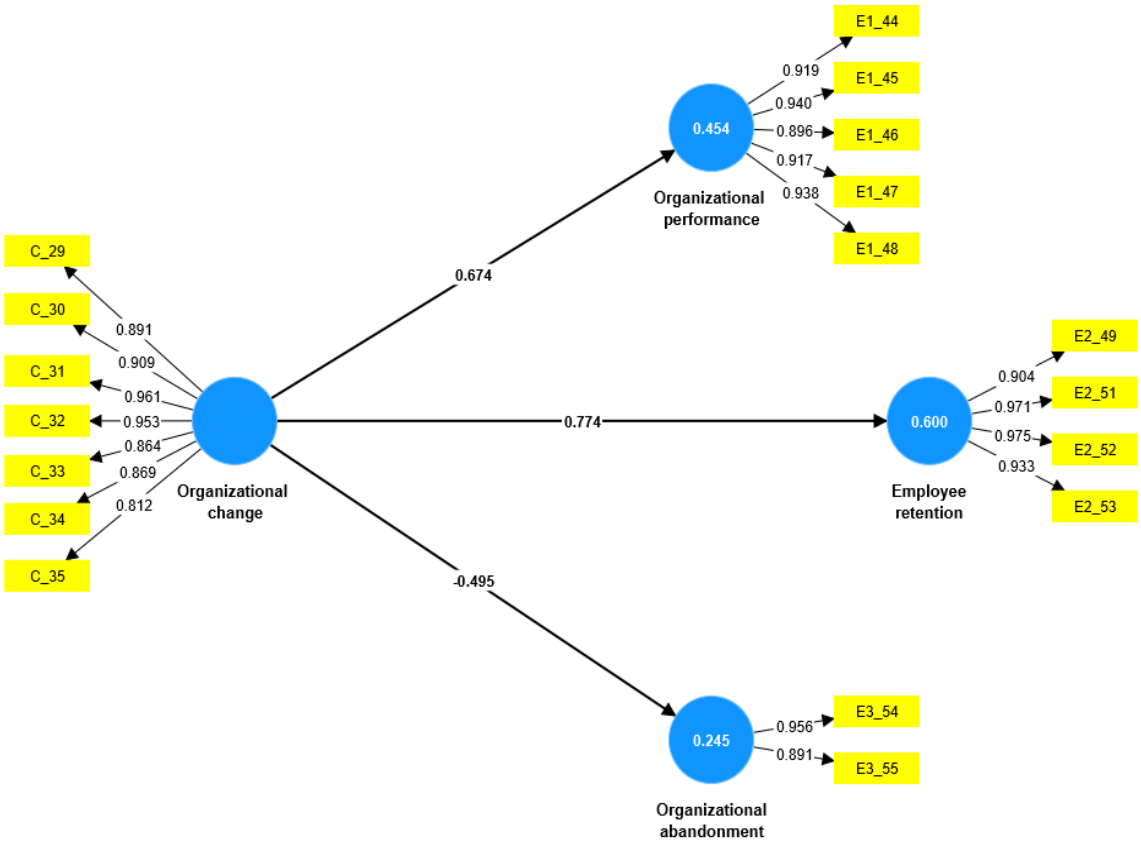


Figure 1. PLS model of direct relationships between organizational change and organizational performance

Source: Developed by the authors based on data using SmartPLS v4.0

For the model to be significant, it is necessary that the loading of each exogenous variable represented by the questionnaire items be more significant than 0.7. To increase the degree of relevance of the model, we eliminated the exogenous variables with loadings lower than 0.7, resulting in a modified model with a higher degree of relevance.

The resulting model is relevant and reliable. For example, SRMR has a value of 0.062 (<0.08), and NFI has a value of 0.934 (>0.9). Other reliability indicators (Cronbach's alpha, Composite reliability, and Average variance extracted) are shown in Table 1.

Table no. 1. Model reliability indicators regarding the direct relationships between organizational change and organizational performance

	Cronbach's alpha	Composite reliability	Average variance extracted
Organizational abandonment	0.835	0.949	0.853
Organizational performance	0.956	0.956	0.85
Employee retention	0.961	0.965	0.895
Organizational change	0.958	0.959	0.802

Source: Developed by the authors based on data using SmartPLS v4.0

The discriminant validity obtained in matrix form according to Fornell and Larcker's (1981) criterion is presented in Table 2. The model has excellent validity, with the values on the main diagonal being the highest on the row and column.

Table no. 2. Validitatea discriminantă a modelului privind relațiile directe între schimbarea organizațională și variabilele de rezultat

	Organizational abandonment	Organizational performance	Employee retention	Employee retention
Organizational abandonment	0.924			
Organizational performance	-0.418	0.922		
Employee retention	-0.551	0.811	0.946	
Organizational change	-0.495	0.674	0.774	0.895

Source: Developed by the authors based on data using SmartPLS v4.0

Path coefficients indicating direct relationships between organizational change and the outcome variables are presented in Table 3.

Table no. 3. Path coefficients in the model regarding direct relationships between organizational change and outcome variables

	Original sample	Standard deviation	T statistics	P values
Organizational change -> Organizational abandonment	-0.495	0.041	11.932	0
Organizational change -> Organizational performance	0.674	0.033	20.341	0
Organizational change -> Employee retention	0.774	0.024	31.843	0

Source: Developed by the authors based on data using SmartPLS v4.0

Following the analysis of path coefficients and significance levels (p values), it can be concluded that the organizational change process influences all three categories of outcome variables. First, the organizational change process significantly positively influences organizational performance (path coefficient 0.674) and employee retention (path coefficient 0.774). On the latent variable of organizational abandonment, the organizational change process exerts a strong negative influence, and adequate management of the change reduces the intention to abandon. The results of these analyzes demonstrate the validity of the research hypotheses.

Following the investigation of hypotheses H1, H2, and H3, we found a direct relationship between organizational change and performance. Successfully managed changes have been associated with improved organizational performance, while unsuccessful changes have resulted in decreased organizational performance. This relationship can be explained by the fact that organizational change can improve organizational processes and practices to increase productivity and efficiency. For example, a change that improves communication and collaboration between departments can increase organizational performance by reducing errors and processing time (Varzaru and Varzaru, 2016).

Change can positively and negatively affect organizational performance (Mladenova, 2022). First, well-planned and implemented change can increase productivity and efficiency by eliminating redundant tasks, improving work processes, and encouraging creativity and innovation (Bocean, 2015). Also, a well-managed change can increase employee satisfaction by improving working conditions, workspaces, and remuneration (Bocean, 2007). In addition, a well-planned change can improve the quality of the products or services provided by the organization.

On the other hand, change can also negatively affect organizational performance. For example, not well-planned or implemented changes can lead to decreased productivity and efficiency by increasing redundant tasks, confusion, and frustration among employees (Judge and Blocker, 2008). Also, adverse changes, such as downsizing or restructuring, can decrease employee satisfaction and cause organizational abandonment

(Varzaru and Varzaru, 2013). In addition, negative changes can also affect the quality of products or services provided by the organization.

Conclusions

Organizational change can also have a significant impact on employee retention. In general, changes that are successfully managed and involve employees in the change process can have a positive effect on employee retention. However, changes imposed on employees without adequate explanation or employee involvement can lead to increased organizational abandonment and decreased employee retention. For example, a change involving a reduction in working hours may be perceived negatively by employees, who may feel that their efforts are not respected and may be tempted to leave the organization.

Organizational abandonment is a significant problem for organizations around the world. Organizational change can be essential in preventing organizational abandonment by improving employee engagement and satisfaction and creating a positive and motivating work environment. In addition, organizational change should be implemented effectively and coordinated to increase employee engagement and satisfaction so that they are less likely to leave the organization. Organizations can achieve long-term success and stability in the increasingly competitive market by improving these aspects.

Therefore, organizations should consider these aspects and invest in organizational change development and change management programs. They should also consider developing strategies to improve employee retention and reduce organizational abandonment, such as improving career development programs, improving the work environment, and increasing employee satisfaction. By implementing these strategies, organizations can achieve significant benefits such as better performance, higher employee retention, and reduced costs associated with organizational abandonment.

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E-learning Platforms and European Digital Society

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Abstract
The current paper emphasizes the role that e-learning platforms play in upskilling and reskilling of the European workforce, thus improving the competitiveness and contributing to a stronger digital landscape. By using a mixed-method approach, combining literature review, document and trend analysis with descriptive statistical analysis, the auhors have examined the relationship between e-learning platforms and the European digital society.
The research revealed substantial disparities in digital skill proficiency and online learning adoption among European citizens, emphasizing the need for targeted strategies to boost digital literacy and fully harness the potential of e-learning platforms in improving digital skills. European countries should capitalize on the progress made in the last two years and work towards creating digital educational tools and methods that are of higher quality, more readily available and more inclusive. Although a number of programs and target objectives are in place to support the digitalization of education in Europe, the e-learning platforms still represent an underutilized tool that can help to increase digital skills among European citizens. The potential to improve the digital skills is still high and an extra focus should be granted to the programs that improve these on a national or cross border level.
The originality of the article consists of a review of relevant statistics regarding the most recent evolution of online learning and digital skills, along with an examination of the existing frameworks at the European level that have an aim to improve digital education and skills.

This research contributes to a better understanding of the complex and expansive nature of e-learning platforms and the European Digital Society and can offer valuable insights to policymakers and other stakeholders such as decision-makers from various organizations, educators and technologists.

Keywords

E-learning, Digital Skills, European Digital Society, MOOC.

DOI: 10.24818/BASIQ/2023/09/037

Introduction

With the expansion of the internet, e-learning platforms in general and Massive Open Online Courses (MOOC) platforms in particular are regarded as a promising solution for democratizing the access to education, workforce upskilling and for improving the European digital ecosystem.

Despite a growing corpus of research on the evolution and impact of e-learning, such as the exhaustive bibliometric analysis conducted by Djeki et al. (2022), there is a lack of knowledge regarding the broader implications of e-learning within the European digital society context. This research seeks to address this gap.

This study seeks to highlight the significant role that e-learning platforms can play in the process of upskilling and reskilling the European workforce, thus contributing to a more robust digital landscape across the European Union.

The specific objectives of this research are to: 1) Examine the relationship between e-learning platforms and the European digital society in order to determine the current status and potential of e-learning in improving the digital skills of European citizens. 2) Examine the disparities in digital skills proficiency and adoption of e-learning across European regions, emphasizing the need for targeted strategies to improve digital literacy and leverage the potential of e-learning platforms.

We have used a mixed-method approach, widely utilized in e-learning research. Our research methodology includes a comprehensive literature review, document analysis, keyword trend analysis, and descriptive statistical analysis.

The benefits of digitalization are correlated with innovations in the digital sphere, with a direct impact on the field of education. In OECD countries, educational strategies are established by designing and implementing specific technologies (van der Vlies, R., 2020). Through e-learning platforms, clear benefits in the academic environment are observed as a result of improved communication relationships between students and teachers, the development of harmonious group relationships, and quick access to materials posted by interested parties (Benta, D., Bologa, G., & Dzitac, I, 2014). This research is of interest because the context in which MOOC strategies are implemented must be coherently and objectively evaluated. As a result of studies conducted by specialists in the field, significant disparities specific to different geographic areas are observed (Jansen et al., 2015). Using digital technology in education can significantly streamline time-consuming tasks for teachers, such as monitoring attendance and student performance. Also, educational technologies offer students a virtual realm, allowing them to access digital information tailored to their learning styles (Haleem et.al, 2022).

Our findings indicate that e-learning platforms are still an underutilized mechanism that can assist in enhancing the digital skills of EU citizens. The potential to improve the digital skills is still high and an extra focus should be granted to the programs that improve these on a national or cross border level.

This paper is organized as follows. The next section includes a literature review of the existing research on e-learning and digital society. This is succeeded by the research methodology section. Next, we present our results and discuss their implications. The study continues with the conclusions section and it concludes with the study limitations and further research.

1. Literature review

The digitalization and the digital society are abstract concepts, sometimes difficult to understand by the general public. Digital technologies have already transformed our lives. Such technologies seem to redefine the times, the spaces and the ways of our daily living. Some authors proposed the concept of *digi-grasping*, a theoretical construct to analyze the awareness and the involvement in a digital society (Duvfa & Duvfa, 2019).

Djeki et al. (2022) have conducted a bibliometric analysis of 12,272 publications between 2015 and 2020 from the Web of Science database on the e-learning topic as a search term, by using the VosViewer tool. The authors of the above study have found that Spain, the USA, England, China and Romania have produced the highest number of papers. Also, in e-learning domain, among the most influential European countries are Spain, England (UK), Germany, Italy, Portugal, Belgium and Romania (ranked by citations).

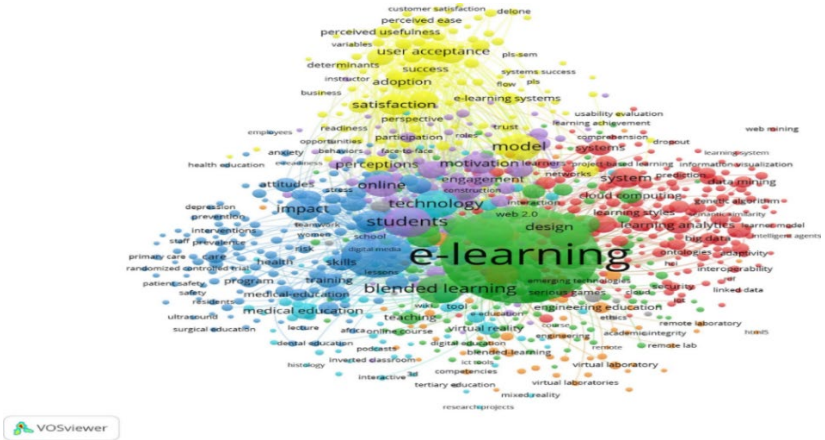


Figure no. 1. Network visualisation map of e-learning keywords' co-occurrence.
Source: Djeki et al., 2022

As illustrated in Figure 1 above, Djeki et al. (2022) identified several clusters of keywords, with the red cluster being the largest (208 keywords), the green cluster (166 keywords) , blue (163 keywords) and yellow (118 keyword) ones also had significant keywords related to e-learning. The findings of the previously referenced study, illustrated above, suggest the major role that e-learning plays in the education context and the necessity to integrate the collaboration tools and technology with an aim to enhance the digital learning experience. Digital technologies provide the educational institutions with the potential to disseminate knowledge to more people than ever before. During COVID-19 pandemic, the use of technologies for e-learning have gained in popularity in a compressed period. The impact of digitalization on education started long before the COVID-19 pandemic. The digital world has given massive advantages, but the rate at which digital technology progresses is far faster than the ability of individuals to adapt in terms of education, regulations and culture (Jackman et. al. 2021). However, the discussions regarding adopting e-learning to develop institutional collaborations are not new. For quite some time, e-learning has represented a significant topic on the discussions regarding education in the European Union (Hodgson, 2002). The literature on this topic (Salajan and Roumell, 2016) has highlighted a steady unification of e-learning policies at EU level, which points to the need for a more consistent and structured way to member state level.

A research study on institutional MOOC strategies in Europe (Jansen and Schuwer, 2015) has revealed a growing implication in the MOOC movement by European higher education institutions however, from a business perspective the MOOC movement seems to be dominated by the United States players. Furthermore, in a comparative study of institutional MOOC strategies in Europe and U.S has been conducted by Jansen et. al. (2015) and concluded that “MOOC provision is set to become a mainstream trend in Europe in the next years”. In fact, the role of digital education is recognized by an important number of OECD countries, as revealed by van der Vlies, R. (2020). In an earlier research study, some authors have concluded that the influence of digital technologies in the Czech Republic will result in a significant transformation of the environment in which future generations of students are educated. (Jelinek, 2015). A quantitative study on the utilization of digital learning technologies among educators from Malta, exploring the costs and benefits of using digital learning resources in schools, has revealed that educators were committed to using digital technologies and younger teachers were increasingly engaging in digital learning resources (Camilleri and Camilleri, 2017). Other authors have highlighted the differences that e-learning providers should consider on how Z generation students gather and gain information and knowledge from the web compared with earlier generations, who used mostly professional literature and libraries (Tick, 2018). According to van Dijck (2020), integrating core societal values into the development and operation of digital societies has emerged as a critical European challenge that should not be the sole responsibility of companies. Ensuring that the internet continues to be a democratic and accessible platform calls for the collaborative efforts of (supra-) national and local authorities, businesses, civil society groups and individuals.

2. Research Methodology

The objective of this research is to examine the effectiveness of e-learning platforms in improving the digital skills across EU member states. The authors have adopted a mixed-method approach, combining the literature review, document analysis, keyword trend analysis and descriptive statistical analysis. According to Creswell & Creswell (2018), mixed methods research is “an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study”. Using a mixed-method research is a commonly used practice in e-learning studies (Lan and Hew, 2020; Gentile et al., 2020). Our research aligns with these approaches, combining a review of scientific literature, document analysis, and trend analysis with descriptive statistical analysis. Also, quantitative analysis of existing datasets is frequently utilized in researches related to e-learning (Pejić Bach et al., 2023).

Literature review: We have conducted an analysis of scientific literature published in journal entries indexed in Web of Science, Scopus and Google Scholar, reviewing academic studies, relevant journal articles and research reports published in the last 15 years. We have used relevant keywords and phrases such as "e-learning", "e-learning platforms", "digital society” and "European Union" to identify relevant works addressing these topics in an international context.

Document analysis: We reviewed Organization for Economic Co-operation and Development (OECD) and EU official publications related to digital education and digital society, such as Digital Education Action Plan 2021-2027, Declaration on Digital Rights and Principles, Recovery and Resilience Facility (RRF)

and The Digital Europe Programme, Digital Economy and Society Index, Digital Skills Indicator, European Investment Bank's Investment Report; and The Digital Europe Programme.

Keyword trend analysis: The Google Ngram Viewer, a digital tool used in the literature for trend analysis, has been used for tracking the prevalence of key terms related to e-learning and digital skills over time, providing a historical perspective on the evolution of these fields.

Descriptive statistical analysis: We have used the EU official datasets isoc_sk_dskl_i21 and isoc_ci_ac_i (data code: TIN00103), graphically illustrating the top five, the EU average, and the bottom five values.

Data Analysis Procedures: The Eurostat datasets were primarily used for data extraction. These datasets already provide population-level figures for various indicators across EU countries, reducing the need for inferential statistics. Instead, we focused on descriptive statistics to illustrate the top five, EU average, and bottom five values for various indicators.

3. Results and Discussions

According to a recent EIB's Investment Report 2021/2022 edition, the success of e-learning effectiveness is likely to have been impacted by variables such as parents' educational backgrounds, family affluence and immigrant status. These variables have an impact on the standard of working circumstances, the learning environment at home and the level of digitalization in the schools the student attends (European Investment Bank, 2022).

The e-learning and digitalization have been interesting topics for the global research community and the frequency of these terms within the recent literature has increased. We have analyzed the terms "e-learning", "MOOC", "digital skills", "digital society" and "digital education" with Google Books Ngram Viewer based on the following search criteria: Years range: 1990 – 2019; Corpus: English(2019); Mode: Case insensitive; Smoothing = 3, in order to get historical perspective on the usage of these terms over time.

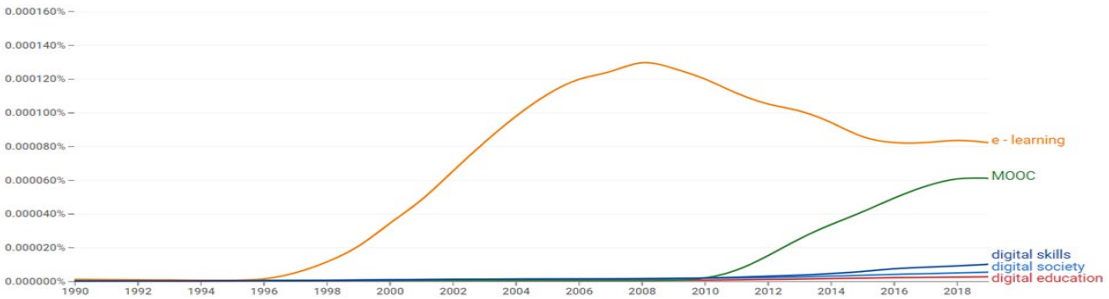


Figure no. 2. The frequency of the e-learning, MOOC, digital skills, digital society, digital education concepts in Google Books from 1990 to 2019
Source: Google Books Ngram Viewer, 2023

Based on the output displayed, it seems that the e-learning and the MOOC concepts have the highest popularity while digital society, digital skills, digital society and digital education concepts are less popular. Per Ngram viewer data, e-learning has gained momentum starting with 1996, reaching a peak in 2008, while MOOC has gained in popularity starting with 2010 until 2018 and has leveled off since then, as illustrated in Figure 2.

Advantages of using e-learning platforms:

E-learning platforms seem be adaptable and accessible, allowing students to access educational content whenever and wherever they choose. The option to replay lectures, quizzes and mini-games enables the students to better comprehend the topic. Also, content can be quickly changed to reflect evolving technological and commercial developments. Another significant advantage is that online education is more cost-effective than traditional classroom instruction. E-learning systems offer uniformity in terms of quality and content, guaranteeing that all students have the same learning experience. The course information and materials can be updated in real-time. E-learning has less of an effect on the environment if electronic resources are used more often comparing with printed textbooks because it reduces the need to print textbooks on paper and there is less waste of resources.

Based on the centralization provided by ClassCentral.org, an independent aggregator of online courses, the highest number of the online courses are provided by US based e-learning platforms. These US based

platforms are leading as well when it comes to the number of learners recorded on their platforms. For example, Coursera has 17.4 million learners in Europe, with an average age of 33. A percentage of 40% of learners are using their mobile devices to access their courses (Coursera Global Skills Report, 2022). Although no European country is among the top five countries with the highest number of registered learners, the UK and Spain have the highest number of Coursera learners in Europe (Coursera, 2023).

Table no. 1. Comparison of e-learning platforms from US and Europe

E-learning platforms from United States	Number of courses	E-learning platforms from Europe	Number of courses
Udemy	22223	Alison	4000*
Coursera	13952	FutureLearn	3463
Linkedin Learning	11802	OpenLearn	822
EdX	5597	MiriadaX	687
Pluralsight	5506	FUN	675
Domestika	2349	OpenSAP	220
Udacity	352	iversity	119

Source: ClassCentral.com, 2023;
Note: Alison.com, nd*

Besides the above-mentioned platforms, in Europe there are multiple initiatives to develop e-learning platforms such as:

Unow (https://www.unow.fr/): Unow is a French e-learning platform that offers online courses in management, personal development, marketing and technology. Unow contributes to the development of digital skills and increasing accessibility to high-quality education in Europe.

Leuphana Digital School (https://www.leuphana.de/digital-school.html): This German platform offers free online courses and learning programs in collaboration with universities and higher education institutions in Europe. The courses offered include topics such as management, science and technology.

OpenClassrooms (https://openclassrooms.com/): OpenClassrooms is a French e-learning platform that offers courses and learning in areas such as web development, design, marketing and project management. The platform contributes to developing digital skills and increasing accessibility to education in Europe.

European Schoolnet Academy (http://www.europeanschoolnetacademy.eu/): This platform, supported by European Schoolnet (a network based in Brussels of over 30 ministries of education), offers free online courses for teachers and education professionals.

OpenupEd (https://www.openuped.eu/): OpenupEd is a European initiative, a service of European Association of Distance Teaching Universities (EADTU) bringing together universities and higher education organizations to provide accessible and free MOOC (Massive Open Online Courses) courses.

The Lifelong Learning Platform (https://lllplatform.eu/) is a community of 42 European organizations that operate in the fields of education, training and youth and are based in various parts of Europe and beyond. These networks currently comprise over 50,000 educational institutions and associations that offer formal, non-formal and informal learning opportunities across all sectors.

In 2022, the European Commission (EC) launched an updated version of Digital Skills Indicator (DSI 2.0) that was based on its Digital Competence Framework 2.0. The DSI 2.0 measures the internet activities of European citizens in the last three months for the following areas: communication and collaboration; digital content creation; information and data literacy; safety and problem solving. These activities over the internet may be able to indicate the level of digital skills of the individuals (EC, 2022a).

According to recent data from Eurostat (dataset isoc_sk_dskl_i21), the average share of individuals aged 16 to 74 with at least basic overall digital skills across the EU was 53.92%. The digital skills with the levels "basic" and "above basic" have been defined based on Digital Competence Framework for Citizens (DigComp) and measure the internet activities of European citizens in regard to the following dimensions: a) digital content creation; b) safety; c) information and data literacy; d) communication and collaboration and e) problem solving (EC, 2022b).

The EU countries with the highest percentage of individuals with basic and above basic digital skills were Finland (79.18%) and the Netherlands (78.94%), followed by Ireland at 70.49%. In contrast, Romania had the lowest percentage of individuals with basic and above basic digital skills at 27.82%, followed by Bulgaria (31.18%) and Poland (42.93%). This has been illustrated in Figure no. 3 below that shows top five and bottom five countries.

These findings highlight the varying degrees of digital skill proficiency across different EU Member States and the need for targeted efforts to improve digital literacy. As digital technology continues to play an increasingly significant role in various aspects of daily life, including digital education and training, it is essential for the individuals to possess at least basic digital skills to maximize their participation and benefits in the European digital society.

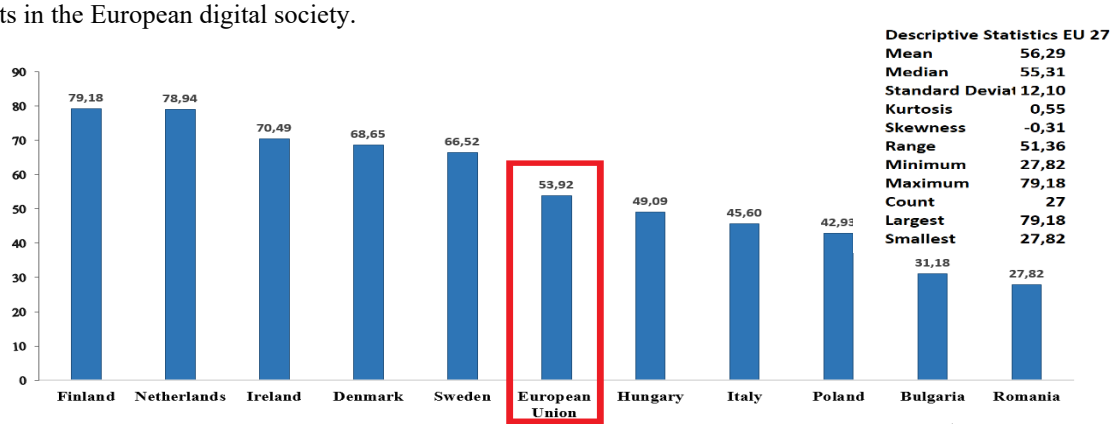


Figure no. 3. The percentage of individuals with at least basic digital skills in 2021 in EU
Source: Adapted by authors, based on dataset: isoc_sk_dskl_i21 (Eurostat, 2023a)

The EU Digital Compass is a strategic plan designed to direct the European Union (EU) toward realizing its digital transformation objectives by 2030. One of the key goals of this plan is to ensure that a minimum of 80% of all adults possess basic digital skills (EC, nd). This goal is very important if EU citizens are going to be able to fully participate in the digital economy. It will also help promote digital inclusion and decrease the risk of digital divide.

Digital infrastructure and fast connectivity, together with consistent cross-country institutional support, create the conditions for the significant development of e-learning platforms and open educational resources (OER). Also, by offering courses that are made for both current and future needs, these platforms can help European citizens improve their digital skills.

The Organization for Economic Co-operation and Development (OECD) conducted research on online learning in 2020, which suggests that unless there is a sense of community support and improvements in literacy and socio-economic equality, online educational opportunities are only completed successfully by privileged individuals (OECD, 2020).

Furthermore, the official European statistics (Eurostat, nd- available at https://ec.europa.eu/eurostat/databrowser/view/TIN00103/default/table?lang=en&category=isoc.isoc_i.isoc_iiu) reveal significant discrepancies among EU Member states regarding the percentages of individuals that have been used the internet to do an online course (Figure no.4).

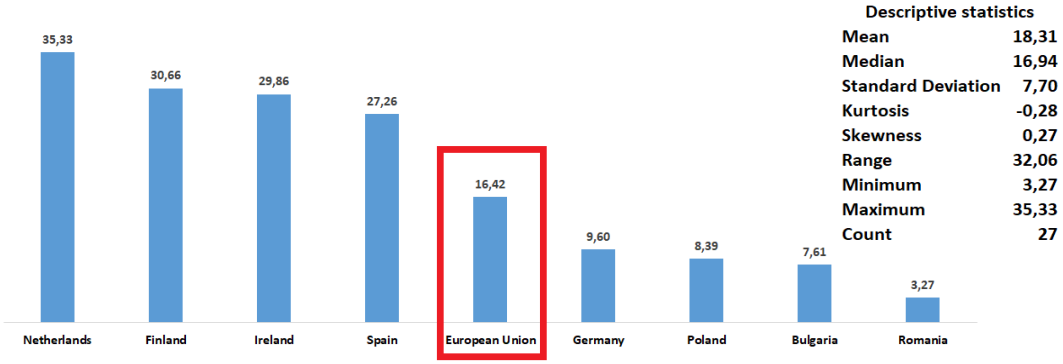


Figure no. 4. The percentage of individuals in EU, in 2022, using internet for doing an online course
Source: Adapted by authors, based on dataset isoc_ci_ac_i (Eurostat, 2023b)

Among EU Member States, Netherlands (35.33%), Finland (30.66%), Ireland (29.86%) and Spain (27.26%) are the countries with the highest percentages of individuals doing an online course while Germany (9.60%), Poland (8.39%), Bulgaria (7.61%) and Romania (3.27%) have the lowest percentages. These reveals significant disparities related to the prevalence of the online learning among European citizens. With an average of 16.42% of individuals at EU level doing an online course in the last three months from the applied survey in 2022, the potential to increase the online education in EU seems very high.

As part of the RRF, each EU member state is expected to allocate 20% of the funds towards the digital transition (EC, nd). Large-scale initiatives, often known as multi-country projects, are essential to fulfilling Europe's digital transformation objectives by 2030, as no one Member State is able to achieve such tasks alone. These initiatives allow Member States to collaborate and combine resources in order to create digital capabilities in important sectors that are crucial for enhancing Europe's digital independence and supporting its economic recovery. The European Commission has identified an initial list of multi-country projects. This list includes areas for investment, such as data infrastructure, digital innovation hubs and digital skills (EC, nd).

Conclusions

A stronger EU engagement in digital education and upskilling is crucial not only for the European Union's labor market but also for its overall competitiveness.

Digital competencies contribute decisively to states' economic development, as they generate an increase in labor productivity, operational efficiency in diverse and complex actions, increased access to international markets and global competitiveness, as well as the identification of new business ideas. As highlighted in this work, countries where intensive online courses are conducted are countries with a high level of economic development. Through improved and continuously updated digital competencies, a series of areas can be revolutionized, namely: research and development, e-commerce, financial-banking services, tourism services, as well as the productive sector.

Digital infrastructure and fast connectivity, together with consistent cross-country institutional support, create the conditions for the significant development of e-learning platforms and OERs. Also, by offering courses that are made for both current and future needs, these platforms can help European citizens improve their digital skills.

EU countries should capitalize on the progress made in the last two years and work towards creating digital educational tools and methods that are of higher quality, more readily available and more inclusive.

Although a number of programs and target objectives are in place to support the digitalization of education in Europe, the e-learning platforms still represent an underutilized tool that can help to increase digital skills among EU citizens. The potential to improve the digital skills is still high and an extra focus should be granted to the programs that improve these on a national or cross border level.

Limitations of the study and future research

Due to the extensive scope of e-learning platforms and the European Digital Society, as well as the page limitation, this paper could only provide a high-level overview as opposed to a thorough investigation. Consequently, some topics may not be investigated as exhaustively as they may merit, indicating the need for more in-depth studies in future researches.

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Ethical Communication in Healthcare Organizations

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Abstract

Today, sustainability is an economic concept increasingly applied in the global economy, and communication is an inevitable part of every strategy. The events of recent years, marked by the COVID-19 pandemic, have led to the transformation of the business model in the medical sector by including ethical communication as a main component. The article aims to analyze the ethical communication with patients in organizations in the medical sector to eliminate the high risks related to a sustainable medical act and only in this way will the conditions for realizing a relevant and viable medical act be created for the individual and society. The research was carried out by means of a questionnaire applied to patients from hospitals in Romania. The results prove that progress in the health sector has increased remarkably, and health management is better due to new knowledge about managing diseases and life-threatening problems for patients. Therefore, it is necessary to incorporate ethical principles in all communication activities in the medical sector globally. Ethical communication will determine an elimination of the risks related to the loss of the image of medical institutions, the occurrence of medical errors, and their related financial consequences.

Keywords

Medical communication, ethics of communication, ethical principles, patient, sustainability.

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Introduction

Communication is a significant problem in modern society, directly or indirectly affecting people, communities, and entire societies worldwide. Communication can be seen as a bond between people in a community. Communication offers the possibility of psychosocial homogenization and assures a normal functioning of a community (Moreau, 2021).

Communication is a complex phenomenon that transmits information, opinions, and ideas from one community to another and/or from individual to individual (Sethumadhavan and Sasangohar, 2020). Hence, the communication process is found today as an integral part of the activity of an individual or a community and of a company's business process.

The events of recent years that the COVID-19 pandemic has marked have determined that communication in the medical sector has become essential for the individual and the community leading to the creation of better management in the medical sector (World Health Organization, 2021). Progress has been made in the health sector, but medical professionals need effective communication to provide effective and quality care. Today, unfortunately, we still encounter medical organizations that suffer from a series of communication deficiencies (Burlea-Schiopoiu and Ferhati, 2021). These constitute a vulnerability of the medical system that, for patient safety, it must be removed. The risk of medical errors as well as the risk of communication failures, must be removed. Recent expert studies show that communication failures in medical organizations lead to inefficiencies in health systems. They waste precious resources for the healthcare system, and for a sustainable medical act, it is necessary to eliminate these risks (Pablo, 2015).

The paper aims to analyze ethical communication in the medical sector to eliminate the risks related to a sustainable medical act and create the premises for carrying out a viable medical act for the individual.

1. Review of the scientific literature

An essential component of communication in the medical sector is managerial communication. Managerial communication presents particularities determined by communication's complexity, purpose, objectives, and implications. In organizations in the medical sector, these particularities usually follow norms imposed by the organization's policy and/or managerial culture.

New relevant characteristics have been identified in the literature related to the issue of managerial communication (Jankelová and Joniaková , 2021). Management communication is based on feedback, a process that uses permanent or scheduled informational activities. Therefore, the characteristics of managerial communication depend very much on the performance of communication functions (Burlea-Schiopoiu, 2007b).

Managerial communication must be carried out permanently and on time. Therefore, it can be done vertically upwards, downwards, and horizontally on the same hierarchical level and through formal, pre-established communication channels. Formal internal communication is based on the operation of the communication system under the communication rules and procedures established in policies and procedures at the organizational level (Voinea, 2015). In addition to formal communication, communication can be done through informal channels that transmit information without immediate and/or direct utility (Burlea-Schiopoiu, 2010). Informal communication channels are spontaneous. These are constantly changing. It works at all organizational levels (European Commission, 2022).

In every organization, internal managerial communication is based on the organizational climate (defensive or closed). Therefore, internal managerial communication depends on the organizational structure, formal communication rules, the impact of informal communication, communication barriers, communication climate, and subordinate relationships in the organization (Burlea-Schiopoiu, 2007a; Pablo, 2015).

In the organization in the medical sector, both internal and external communication is carried out. Internal communication is vital in the conduct of the medical act. External communication is critical to patient satisfaction and it is vital for maintaining the image of the organization in the medical sector. Internal and external communication significantly contribute to the fulfillment of the purpose of the medical act (Pablo, 2015).

Institutions in the medical sector possess ethical values and they must be respected by all its members. At the management level, each manager knows how to communicate both internally and externally for the protection of the image of the organization in the medical sector as well as his own image. Medical personnel are obliged to constantly reconsider their attitude related to ethical principles. It must apply these principles both inside and outside the organization in the medical sector (Vermeir at al., 2015).

Hospitals are the most important category of organizations in the medical sector because often face ethical issues. There are still problems in hospitals related to established doctor-patient relationships, especially during medical research activities and these relationships must be regulated and controlled very well. In hospitals there are still problems related to internal relations. The problems related to external relations are usually regulated by specific internal procedures.

The main actors in a medical institution involved in ethical communication are presented in Figure no. 1.

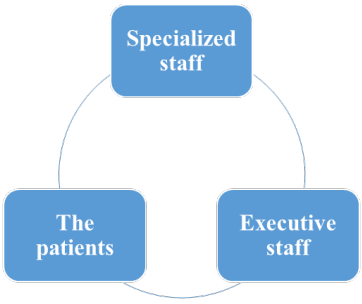


Figure no. 1. The main actors in communication in organizations in the medical sector
Source: World Health Organization, 2010

Communication must be based on ethical principles only because only in this way can the final goal be achieved under good conditions: the performance of the medical act. Medical personnel generally consider all the values generated by applying medical ethics primordial. Moreover, emphasis is placed on the legally stipulated right of patients to be informed and to decide and agree with the proposed therapy. Finally, the executive staff is always guided by the marketing principles, which mainly aim at the best optimal development of their organization (World Health Organization, 2010).

A lack of communication between medical and administrative staff can generate conflicts. As a result, ethical and effective communication is necessary to remove this vulnerability and offer patients a relevant medical record and a better quality of life.

Another essential category of built relationships is external communication with society (Burlea-Schiopoiu and Balan, 2018). How resources are used in the short term and in the long term to ensure the necessary medical services are critical because they can have ethical implications for the local and global community (World Health Organization, 2010).

In order to carry out the medical act, the regulation of a correct and honest method of communication between institutions in the medical sector must be ensured, and the risk of false competition must be eliminated (World Health Organization, 2021).

At the management level, a leader in the medical sector is responsible for ensuring optimal conditions for real collaboration between all the employees, and only in this way will ethical values be utilized in medical practice. Depending on the specifics of each institution in the medical sector, relevant analysis of the application of these ethical principles of communication must be carried out, as well as the need to develop new regulations.

2. Research Methodology

How can ethical communication be analyzed in the medical sector? By analyzing the communication carried out by the main communication actors in the organizations in the medical sector. The communication of doctors and medical staff with patients is an essential part of the analysis of ethical communication in organizations in the medical sector. For this analysis, a questionnaire applied to patients from several hospitals in Romania was created and used.

The research was carried out between January 15, 2023 and March 15, 2023. Compliance with the legal provisions on the protection of personal data was ensured.

The questionnaire was created in Google Forms from the Google Docs ePlatform. The resulting data were collected for further processing using MS Office Excel and MS SPSS version 26.

3. Results and Discussion

From the data collected regarding the answers of the patients to the questionnaire, it follows that 242 patients participated in the study, of which 130 women (53.7%) and 112 men (46.3%) (Table 1). The relatively equal number of women and men leads to greater accuracy of the results obtained.

The 242 patients included in the study are between 18 and 30 years old, accounting for 37.2% of the total number of patients, being the most representative age group. Among the patients, 19% have high school education and 3.3% post-high school education. The largest number of patients included in the study is represented by patients with higher education (76.9%).

82.6% represent patients from the urban environment.

Table no. 1. Descriptive statistics of the collected data

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Female	130	53.7	53.7	53.7
	Male	112	46.3	46.3	100
	Total	242	100	100	
Age	18 - 30 years	90	37.2	37.2	37.2
	31 - 40 years	62	25.6	25.6	62.8
	41 - 50 years	60	24.8	24.8	87.6
	51 - 65 years	26	10.7	10.7	98.3
	over 65 years	4	1.7	1.7	100
	Total	242	100	100	
Education Level	Secondary	46	19	19	19
	Post-secondary School	8	3.3	3.3	22.3
	Higher education	186	76.9	76.9	99.2
	PHD	2	0.8	0.8	100
	Total	242	100	100	
The environment of origin	Urban	200	82.6	82.6	82.6
	Rural	42	17.4	17.4	100
	Total	242	100	100	

Source: Author's own research results.

Communication between medical staff and patients in organizations in the medical sector

Doctors and medical personnel listen to the patient (50.41%) (Figure 2). Doctors and medical personnel provide clear explanations to the patient regarding the treatment and appropriate medication (52.07%) and provide information that the patient understands regarding the treatment/medication in recovery (54.55%). Doctors and medical personnel always provide clear explanations to the patient regarding his health condition (48.35%). They are open in communication with the patient (45.97%). Doctors and medical personnel use in communication a language understood by the patient (42.15%).

Vulnerabilities that can lead to high risks and that still persist in the medical system are related to the attention with which doctors and medical personnel communicate very carefully with the patient (37.60%) with a high percentage of undecideds (33.99%). Vulnerabilities are also related to the fact that doctors and medical personnel do not offer any explanation or little explanation to the patient (33.47%) with a fairly high percentage of undecideds (23.14%).

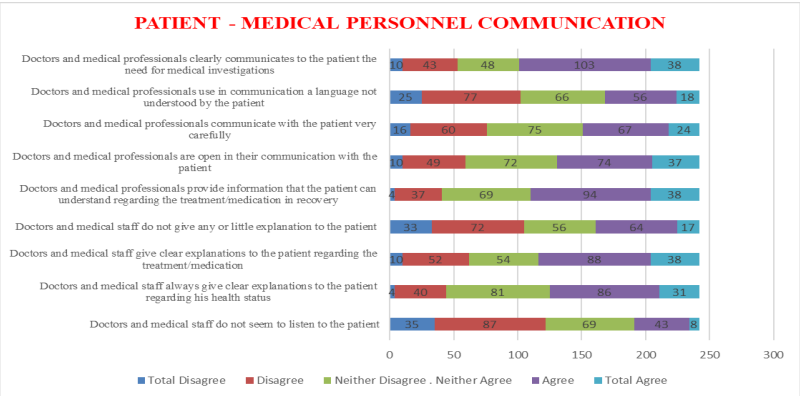


Figure no. 2. Communication between medical staff and patients in organizations in the medical sector

Source: Author's own research results.

The level of patient safety, satisfaction and trust in the medical system

The patient is satisfied with the interaction with the current doctor (54.96%) (Figure 3).

Vulnerabilities that can lead to high risks and that still persist in the medical system are related to the patient's communication with the medical personnel, who present a state of dissatisfaction (58.26%). This communication needs to be improved to increase patient safety, satisfaction and trust in the medical system.

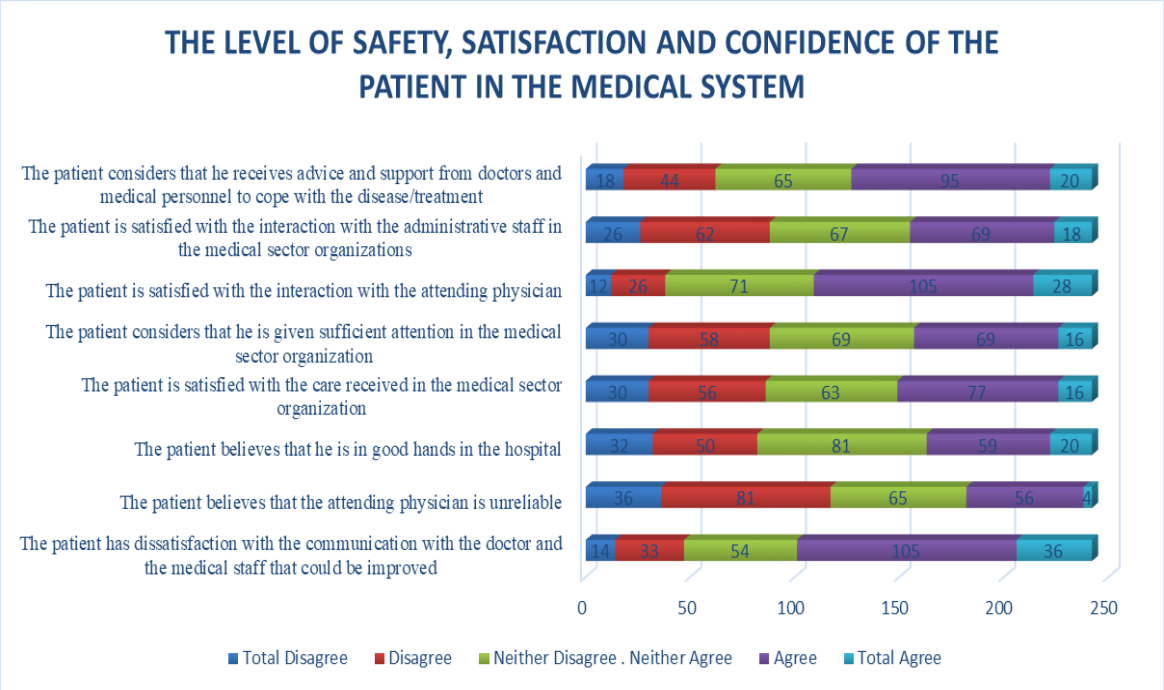


Figure no. 3. The level of patient safety, satisfaction and trust in the medical system
Source: Author's own research results.

Communication of the medical staff with the patient's relatives

The patient believes that he receives advice and support from doctors and medical staff to cope with the disease/treatment (47.52%) (Figure 4).

Vulnerabilities that can lead to high risks and that still persist in the medical system are related to the way in which medical professionals are interested in the patient's family and/or relatives (50%). If the percentage of those who are undecided (26.86%) is added to this percentage, the result is that patients are not satisfied.

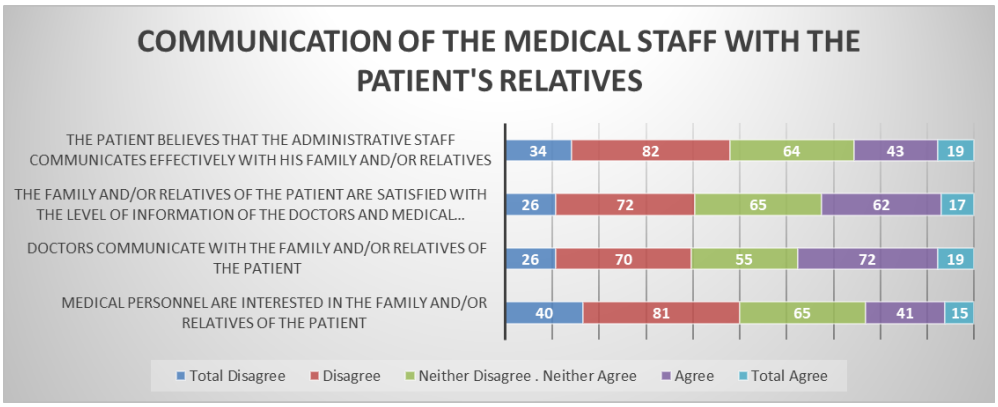


Figure no. 4. Communication of the medical staff with the patient's relatives
Source: Author's own research results.

The obtained results demonstrate that doctors and medical personnel listen to the patient. It gives him clear and clear explanations regarding the appropriate treatment and medication. Doctors and medical staff are open in their communication with the patient. The patient is generally satisfied with the interaction with the attending physician.
It is found that there are still vulnerabilities related to the way doctors and medical staff communicate with the patient and his relatives. More attention should be paid to the patient regarding his uncertainties. Careful attention should be paid to all the details of the patient's treatment to eliminate all uncertainties related to the patient's treatment. All this can only be achieved through ethical communication.

Conclusions

Communication is a basic component of a sustainable business, in all fields. Ethics must be at the center of communication, implicitly also in the field of health. Thus, ethical principles must be incorporated into all health communication activities. Ethical communication will eliminate the risks related to medical errors as well as the risks related to the loss of the image of the medical institution. It will eliminate the financial consequences.

Only ethical medical communication will influence people's behaviors related to the medical system. It will influence people's choice in adopting a healthy lifestyle. It will influence the choice of healthy behaviors to maintain a quality of life at the highest qualitative level.

In case of deficient and/or unethical communication, there is the risk of huge financial losses not allowed in the current economic conditions but what constitutes a major risk in this case is the risk of losing the image of the medical institution. This entails another risk, namely the loss of patients' trust in the medical act. In the current economic and social context, the role of the entire medical staff becomes essential in approaching and applying ethical principles in communication.

Health communication activities unfortunately raise a multitude of ethical concerns and these are particularly directed at personal preferences and deep-rooted social values. The results of the study show that although there are regulations to prevent communication in medical institutions, the degree of patient satisfaction is still not optimal. Ethical communication in the field of health involves addressing essential issues not only for the individual but also for society, namely responsibility, risks as well as social and cultural values.

Ethical communication is necessary for the performance of a medical act to the quality standards imposed by the current socio-economic conditions correlated with the regulations in the field. Only ethical communication can lead to an increase in the trust of individuals and communities in the image and in medical institutions, globally. Many vulnerabilities and risks of medical institutions can thus be eliminated by approaching ethical communication.

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How Does the Supply of Tertiary Graduates Correlate with the Labour Market? Evidence from European Countries

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Abstract

It is well-known that the education level has significant impact on employment prospects on the labor market. Despite a slight decrease in the number of tertiary graduates in 2018-2019, the year 2020, when the COVID-19 pandemic began, was marked by an increase in the indicator-level. In the long term, the supply of tertiary graduates registered an upward trend. The paper performs - in a note of originality - a cluster analysis of the European countries by the correlation between the evolution of the graduates with higher education and that of the employment rate of the highly qualified, in order to identify the main behavioral patterns. As a novelty element, the paper tests the hypothesis of the existence of statistically significant changes from the perspective of the share of tertiary graduates and that of the employment rate of highly educated, during the current pandemic crisis compared to the previous global financial crisis. The results indicated an important improvement only of the second indicator, which shows the need to develop policies to stimulate the youth to raise their education level, and thus improve the situation on the labor market, even in crisis times.

Keywords

Education level, tertiary graduates, employment, cluster analysis, non-parametric test.

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Introduction

A widely recognized fact is that the education level of people who are involved or want to be involved on the labor market is one of the key factors of work performance, bringing a benefit to the society as a whole. That is why the way in which the transition from school to the labor market is made, but also the involvement in the education and training process throughout adulthood is of significant importance, especially in the conditions of the expansion of digitalization in all areas of life (Central Statistics Office, 2021). Currently, at EU level, the employment rate for tertiary educated is 85% (ISCED 5-8), compared to 72.8% for upper secondary, post-secondary non-tertiary education (ISCED 3-4), or to 54.9% for less than primary, primary and lower secondary education (ISCED 0-2) (Eurostat database, 2021). Given that the number of higher education graduates followed an increasing trend, accentuated in 2020 by the onset of the COVID-19 pandemic, the question arises whether this changes the employment conditions on the labor market, whether it puts increasing pressure on the demand for qualified workforce, with effects on salary incomes. Some studies have pointed out the increasing gaps between the skills and knowledge required at the workplace and those of their occupants, something seen as a potential threat to the long-term economic prosperity of the countries in question (SHRM, 2019; Bouchrika, 2022). The quality of higher education institutions has a significant influence on the results obtained on the labor market (Baciu, 2022; Epuran et

al, 2016; Deaconu et al, 2014; Chebeň et al, 2020), but more extensive data are needed regarding the situation in several countries of the world, especially in countries with a centralized university education system.

In this context, the general objective of this paper is to analyze the situation of graduates with higher education in European countries, as well as their transition to the European labor market in the last 10 years. Also, the analysis considered the following specific objectives: to analyse the higher education graduates, both in total and by fields of study, by time and space coordinates; to analye the labor market situation of employees with tertiary education - evolution over time and variation in territorial profile; toanalyse the correlation between the evolution of graduates with tertiary education and that of the employment of the highly qualified population on the labor market; to identify the behavioral patterns of European countries with respect to the correlation between these two statistical indicators.

The paper has three parts: the first part reviews the main results of the scientific literature referring to the relation between the education level and the employment level; the second part presents the methodology applied and the data set; the third part shows the main results of the analysis performed, subordinated to the main and the specific objectives. The paper ends with a sum of the main conclusions of this research.

Review of the scientific literature

In a survey conducted by the Society for Human Resource Management (SHRM) in 2019 on HR specialists in the US, it was found that more than half of the respondents believe that the contribution of the education system to reducing the skills shortage is low, while 83% of them had difficulties in finding the right employees in the last 12 months. Among the latter, 75% recognized the existence of a skills shortage among applicants for certain jobs, which led to a decrease in the quality of candidates, especially since the phenomenon has significantly worsened in the last two years (SHRM, 2019). Other authors reduce this problem of skills mismatch to an overqualification of candidates for a job, at least in some countries, appreciating the ability of workers who have acquired knowledge and skills through the education system to respond to economic shocks (Machin and McNally, 2007). The transversal skills acquired by recent graduates from the higher education system are essential in their integration into the labor market, especially in a market affected by numerous social, economic or technological changes (Belchior-Rocha, Casquilho-Martins and Simões, 2022). Some other studies focused on the analysis of trends in higher education, especially in the conditions of the manifestation of the COVID-19 pandemic. Thus, one of the major changes that took place in higher education was the transition from classic, traditional education to online education, the openness shown by many universities for this flexible, innovative form of learning. But some authors are of the opinion that these changes are only formal, giving the impression of a reform of the education system, but they do not address the real problems that this system is facing. The problem of accessibility to the higher education system of the less privileged social categories, but also of the quality of knowledge and applied methods, still remains to be solved (World Economic Forum, 2022). The problem of inequalities in terms of access to tertiary education, especially depending on income, was also pointed out by Nascimento, Mutize and Chinchilla (2020), noting, however, that, despite these problems, globally, access to tertiary education has increased in the last two decades, the gross enrollment ratio in tertiary education practically doubled (from 19% to 38%). Numerous studies and analyzes have focused on studying the link between the outcome of the higher education system and the labor market, on the influence of the education level of the participants in the labor market on the employment situation on this market. Thus, Machin and McNally (2007) analyzed whether the increasing supply of graduates with tertiary education led to a change in conditions on the labor market. The main conclusions reached by the authors were: the increase in the supply of graduates with higher education was not excessive, which would put real pressure on the labor market, the average salary difference between tertiary education graduates and other graduates is significant. Also, employers have shown the desire to employ more and more highly qualified workers in their companies. Although the supply of graduates with tertiary education has increased, the salaries of highly qualified employees have continued to increase or have remained constant in most countries. At the same time, this increase in the supply of graduates with tertiary education has led to an increase in the demand for highly qualified employees, as there are more and more positions that require technological, innovative skills (Machin and Manning, 1997; Katz and Autor, 1999; Acemoglu, 2002; Machin and Van Reenen, 2006; Machin and McNally, 2007). The studies show that there is limited evidence regarding the value of graduation diplomas, the returns of the qualification degree, depending on the field of study of the graduates, suggesting a wide heterogeneity of these gains by field of study. Due to the fast pace of demand growth for science and technology jobs, there is a shortage of graduates who have trained in these fields, the demand being covered to some extent by the mobility of graduates from other countries. An OECD study analyzed the benefits of education on employment prospects on the labor

market. Thus, there is a direct correlation between the education level of those looking for a job and employment prospects, with more pronounced differences between those with upper secondary education and those without this education level. Also, there is evidence in all OECD countries that employment opportunities are significantly higher for tertiary education graduates than for other types of graduates, and higher for men than for women. In the year the report was drawn up, 83% of the population with tertiary education was in employment, a significantly higher percentage than in the case of the population with upper secondary education. The employment gender gap decreases with the increase in the education level, which can be partially explained by the over- or under-representation of women in some fields of education, compared to men (for example, women are under-represented in high-technology domains, in engineering, manufacturing and construction and are overrepresented in education, health and welfare) (OECD, 2012). Wolbers (2000) analyzed the correlation between the level of education and unemployment, based on panel data for the Netherlands. The author came to the conclusion that employees with the lowest level of education face the greatest risk of becoming unemployed, compared to employees with the highest level of education. At the same time, the effect of education on unemployment differs according to gender. A second conclusion of the authors is that the unemployed with a higher level of qualification have higher chances to re-engage in work compared to the unemployed without qualification, and this effect differs according to the aggregate unemployment rate, gender and unemployment duration. In the same idea, Epuran et al (2016) showed that in many European countries there is evidence of a strong correlation between the level of education completed and the chances of employment, tertiary education leading to a significant increase in these chances, compared to other lower education levels.

Data and methodology

The selection of statistical indicators used in the analysis was aimed at capturing the importance of the education level on the employees' situation on the labor market under two aspects: on the one hand, the results/outcomes of the education system (considering the graduates with higher education - as a number and as a share in the population aged 20-34); on the other hand, as the employment level on the labor market of the highly educated population (through the prism of the employment rate of the population with tertiary education). A detailed description of the statistical indicators included in the analysis can be found in table no. 1.

Table no. 1. Description of statistical indicators included in the analysis

Indicator name	Measurement unit	Space/time coordinates	Source
Population on 1 January by age group	Number (persons)	31 European countries 2013-2022	Eurostat Online code: DEMO_PJAN
Graduates by education level, field of education	Number (persons)	31 European countries 2013-2020	Eurostat Online code: EDUC_UOE_GRAD02
The share of graduates with tertiary education (ISCED 5-8) in the total population aged 20-34	%	31 European countries 2013-2021	Calculated by the authors, based on Eurostat data
Employment by educational attainment level	Thousand persons	31 European countries 2013-2020	Eurostat Online code: LFSI_EDUC_A
Employment rates by educational attainment level	%	31 European countries 2013-2021	Eurostat Online code: LFSA_ERGAED

Source: authors' selection.

The data were provided by Eurostat database for 31 European countries (EU and non-EU members), for the time period 2013-2020. 2020 was the last year for which data on graduates (total number and by field of study) were available, therefore, in the analysis, the level of indicators regarding graduates and employment of the population with tertiary education in 2020 compared to 2013 was compared.

In the first part of the analysis, a descriptive statistical analysis of the selected indicators was applied, characterizing the central tendency and the variability of their level in territorial profile, at the level of the European countries, as well as the distribution shape of the European countries included in the analysis from the point of view of graduates with higher education, by field of education and training. At the same time, a temporal analysis was carried out, of the evolution of the number and share of graduates with higher

education, as well as the employment rate of the population with tertiary education, in the period 2013-2020, based on specific time series statistical indicators. In order to verify some working hypotheses on the existence of significant changes in the level of the selected indicators, at the end of the time period analyzed compared to the beginning, non-parametric statistical tests for paired samples (Wilcoxon signed ranks test and Sign test) were used. The correlation method enhanced the analysis of the existence of a significant correlation between the share of graduates with higher education and the employment rate of the highly qualified population, as evolutions over time. The results of the correlation method were used as input data in the cluster analysis, in order to identify country- groups with different behaviors in terms of how the share of graduates with higher education and the employment rate of the highly qualified population evolved in the period 2013-2020 (Hierarchical and Non-hierarchical Cluster Analysis).

Results and discussions

At the level of the European Union, in the period 2013-2019, the number of graduates with ISCED 5-8 education level (tertiary education) recorded some fluctuations around an approximately constant level, with a peak in 2017 (of 3991 thousand people) and a decrease quite pronounced in 2018 and 2019 (almost 3%). However, there is a strong return of the number of graduates with higher education in 2020, very likely against the background of the onset of the COVID-19 pandemic, of the transition from the classical traditional school to the online school (4240 thousand graduates). As a share of higher education graduates in the 20-34-year-old population, a similar evolution was recorded, in 2020 the percentage increased to 5.37% (from 4.92% in 2019) (Figure no. 1).

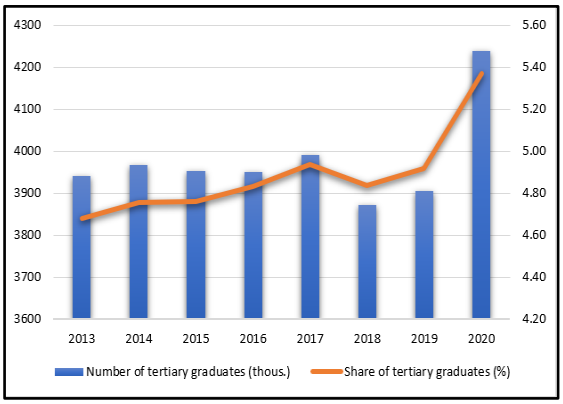


Figure no. 1. The number of graduates with tertiary education (thousand persons) and the share of tertiary graduates in population aged 20-34 (%), EU level, 2013-2020

Source: authors' contribution, based on Eurostat data.

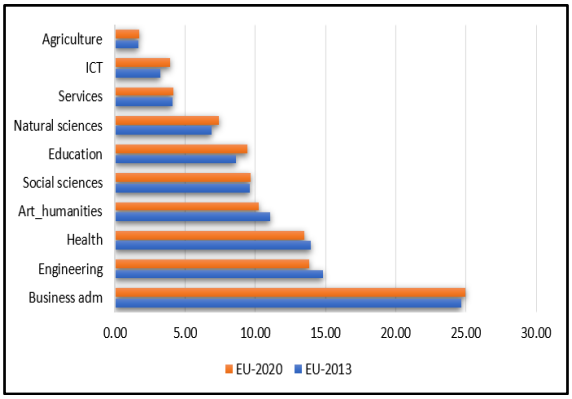


Figure no. 2. The share of tertiary graduates in population aged 20-34 (%) by field of education, EU level, in 2013 and 2020

Source: authors' contribution, based on Eurostat data.

There were, however, some important territorial variations in the level of the two indicators. Thus, in 2020, Hungary recorded an almost 10% share of graduates with higher education (9.93% of the population aged 20-34), while in Luxembourg only 1.38% of the young population graduated from an educational institution superior in the same year. Other countries with high shares of graduates with tertiary education - over 7% - were Ireland (9.78%), France (7.31%) and Denmark (7.13%). At the opposite pole – with less than 4% - were Slovakia (3.60%), Malta (3.68%), Estonia (3.71%), Czechia (3.78%), Romania (3.80%), Bulgaria and Germany (3.97%).

Next, we analyzed the distribution of graduates with tertiary education on fields of education and training. The following areas were considered (according to the *International Standard Classification of Education – Fields of education and training ISCED-F 2013*) (UNESCO Institute for Statistics, 2015): Education; Arts and humanities; Social sciences, journalism and information; Business, administration and law; Natural sciences, mathematics and statistics; Information and Communication Technologies; Engineering, manufacturing and construction; Agriculture, forestry, fisheries and veterinary; Health and welfare. In the year 2020, at the EU level, it is noticeable that the graduates are especially directed towards Business, administration and law (25.14%, in a slight decrease compared to 2013), Engineering, manufacturing and construction (14.83% - with an approximately 1% decrease compared to 2013) and towards Health and welfare (13.46%, slightly lower than in 2013). The fields with the lowest share of tertiary graduates are Agriculture, forestry, fisheries and veterinary (1.87%) and - surprisingly - Information and Communication Technologies (with only 3.92%), although it is a field with explosive growth and an ever-increasing demand. The fields that registered increases in the share of graduates with higher education in total

graduates in 2020 compared to 2013 are Education (by 1.4%), Information and Communication Technologies (by almost 0.8%) and Natural sciences, mathematics and statistics (by almost 0.5%) (Figure 2).

Considering the distribution of European countries by the share of tertiary graduates, for each field of education and training, in 2020, we can characterize these distributions as follows: in terms of central tendency, Business, administration and law has the highest mean, almost twice higher than the two next fields (Engineering, manufacturing and construction and respectively Health and welfare). In terms of variability, Agriculture, forestry, fisheries and veterinary, on the one hand, and Services, on the other hand – experienced the highest relative variability (with a coefficient of variation that exceeds 50%). At the opposite pole two domains: Arts and humanities and respectively Social sciences, journalism and information recorded the lowest relative variability (with a coefficient of variation lower than 35%). In terms of the distribution shape, fields like: Business, administration and law, Natural sciences, mathematics and statistics and Engineering, manufacturing and construction have positive skewness, these fields being characterized by a predominance of the countries with large shares of tertiary graduates (larger than the mean). Other domains, like Social sciences, journalism and information – are negatively skewed, with a predominance of countries with a lower than average share of graduates with tertiary education. Also, country-distribution by the share of tertiary graduates in Business, administration and law, in Arts and humanities and in Natural sciences, mathematics and statistics have positive kurtosis, revealing that these distributions present a higher risk of the occurrence of outliers than the normal distribution (Figure no. 3).

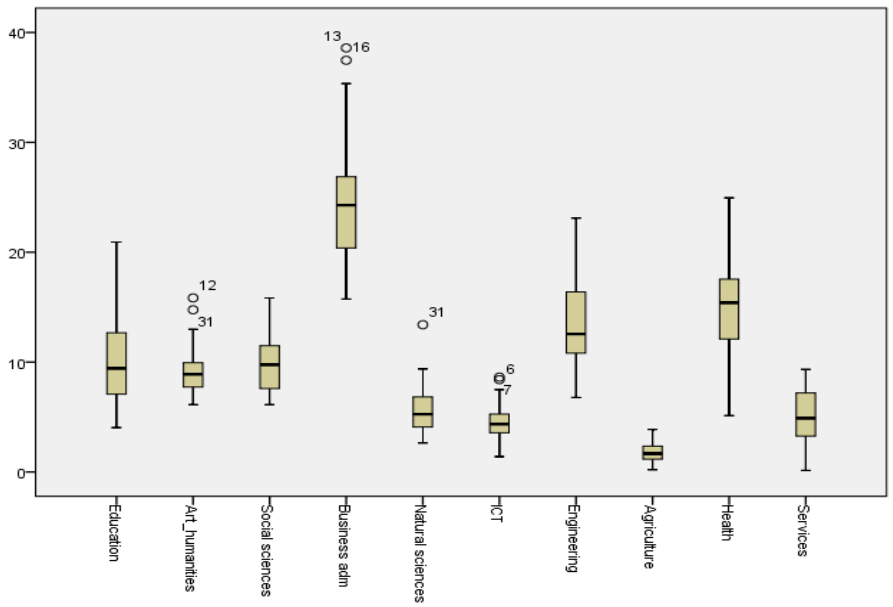


Figure no. 3. Box-and-Whisker Plot - European countries by the share of tertiary graduates by field of education (%) in 2020

Source: authors' contribution, based on Eurostat data.

In order to characterize the situation on the labor market of the population with higher education, the Employment rate by educational attainment level – tertiary education (ISCED 5-8) was analyzed, for 31 European countries, between 2013 and 2021. For the entire period, at EU-level, the indicator-level exceeded the overall employment rate, following an upward trend, but with an average annual growth rate equal to half of that of the overall employment rate. (Figure no.4). The 2021 top 3 countries with the highest employment rate of the tertiary educated population include: Malta (90.2%), Poland and Hungary (89.9%). The last countries ranked from this point of view are three Southern European countries: Greece (75.1%), Italy (79.2%) and Spain (79.7%). In order to analyze the changes over time regarding the share of tertiary graduates in the population aged 20-34 and the employment rate of highly educated, the following working hypotheses were formulated:

- WH1: In 2020 the share of tertiary graduates significantly changed compared to 2013.
- WH2: In 2020 the employment rate of highly educated significantly changed compared to 2013.

Since the two continuous quantitative variables are not normally distributed, non-parametric tests for paired samples were applied (Wilcoxon signed ranks test and Sign test). In the case of the first hypothesis tested, both tests indicated the acceptance of the null hypothesis, according to which there was no statistically

significant change in the share of graduates with tertiary education in 2020 compared to 2013, and therefore WH1 hypothesis is not validated (for 5% significance level).

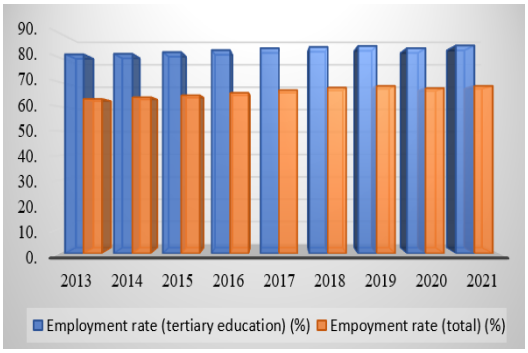


Figure no. 4. Overall employment rate (%) and Employment rate – tertiary education (%), EU-level, 2013-2021

Source: authors' contribution, based on Eurostat data.

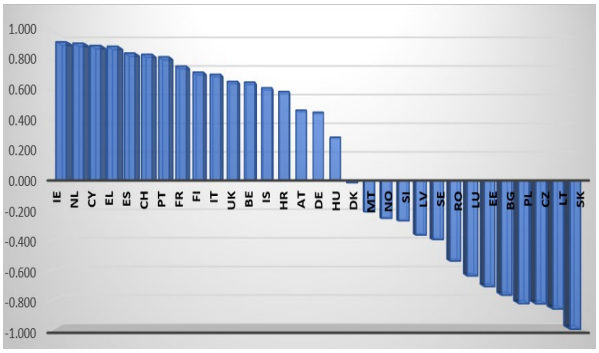


Figure no. 5. Correlation Coefficient between the share of tertiary graduates (%) and the employment rate of tertiary educated (%), European countries, 2013-2020

Source: authors' contribution, based on Eurostat data

Regarding the second working hypothesis, both the Wilcoxon signed ranks test and the Sign test indicated that there are not enough reasons to accept the null hypothesis, so the conclusion formulated is that the employment rate of tertiary educated significantly changed (increased) in 2020 compared to 2013 – and therefore WH2 hypothesis is validated (for 5% significance level) (Tables no. 2 and 3).

Table no. 2. Wilcoxon Signed Ranks Test results

Test Statistics[a]

	Z	Asymp. Sig. (2-tailed)
Share_tertiary_graduated_2013 - Share_tertiary_graduated_2020	-1.548[b]	.122
Empl_rate_tertiary_educ_2013 - Empl_rate_tertiary_educ_2020	-4.489[b]	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Table no. 3. Sign Test results

Test Statistics[a]

	Z	Asymp. Sig. (2-tailed)
Share_tertiary_graduated_2013 - Share_tertiary_graduated_2020	-1.078	.281
Empl_rate_tertiary_educ_2013 - Empl_rate_tertiary_educ_2020	-3.951	.000

a. Sign Test

Source: authors' contribution, based on Eurostat data.

In the next stage of the analysis, we wanted to see if the evolution over time of the share of graduates with tertiary education is correlated with that of the employment rate of tertiary educated, for the analyzed European countries. The correlation matrix indicated values from -0.995 (in the case of Slovakia) to 0.928 (Ireland), with a predominance of high values, close to 1, in absolute value (Figure no. 5).

Using the Hierarchical and Non-hierarchical Cluster Analysis, the European countries were clustered into 4 groups, by the correlation coefficient between the share of tertiary graduates and the employment rate of tertiary educated (Figure no. 6).

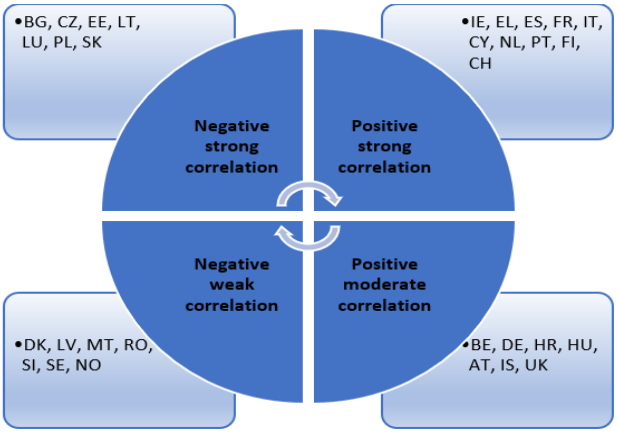


Figure no. 6. Country-clusters by the correlation between the share of tertiary graduates (%) and the employment rate of tertiary educated (%), 2013-2020

Source: authors' contribution, based on Eurostat data

The clusters are characterized as follows:

Cluster 1: BG, CZ, EE, LT, LU, PL, SK - Negative strong correlation - the share of tertiary graduates have decreased, with an average annual rate between 0.47% (Luxembourg) and almost 6% (Slovakia); meanwhile, the employment rate of those tertiary educated have increased with an average annual rate between 0.05% (Luxembourg) and 1.18% (Bulgaria). Correlation ratio have negative values, revealing an inverse relation between the evolution of the two statistical indicators - ranges between -0.71 and -0.995. The decreasing rate in the share of tertiary education graduates was higher, in absolute value, than the increasing rate in the employment rate of highly educated population.

Cluster 2: DK, LV, MT, RO, SI, SE, NO – Negative weak correlation – the two indicators had, in general, similar evolutions to those in the first cluster, but their average annual rate of evolution - although in opposite directions - were closer in absolute terms. The exception was Norway, where % of tertiary graduates in pop. aged 20-34 increased by 2.25% on average per year, while the employment rate of tertiary educated decreased very slightly. For the countries in this group, the correlation coefficients varied between -0.015 and -0.395.

Cluster 3: IE, EL, ES, FR, IT, CY, NL, PT, FI, CH – Positive strong correlation – both indicators followed an upward trend of evolution in the period 2013-2020, but the share of graduates with higher education grew at an average annual rate faster than the employment rate of the highly qualified. Thus, the first indicator increased by 0.8% - 7.55% on average per year (Switzerland, respectively Cyprus), and the second indicator increased with an average annual rate between 0.11% (Switzerland) and 1.34% (Portugal). The correlation coefficients among the countries in this cluster varied between 0.711 (Italy) and 0.928 (Ireland).

Custer 4: BE, DE, HR, HU, AT, IS, UK – Positive moderate correlation - the two indicators had, in general, similar evolutions to those in the third cluster, both the share of tertiary graduates and the employment rate of highly educated people experiencing an upward trend. There was an exception, Iceland, where both indicators followed a downward trend. The correlation coefficient has positive values, showing a direct correlation between the indicators, its values ranging between 0.289 (Hungary) and 0.663 (UK).

Conclusions

In the long term, at EU-level, the supply of tertiary graduates registered an upward trend. Despite the fact that the number of graduates with tertiary education decreased in 2018 and 2019, 2020 was marked by a significant increase in the indicator-level. In 2020, the share of tertiary graduates in the population aged 20-34 ranges between 1.38% (Luxembourg) and 9.93% (Hungary). In the same year, the graduates are predominantly directed towards Business, administration and law (25.14%), Engineering, manufacturing and construction (14.83%) and Health and welfare (13.46%). Agriculture, forestry, fisheries and veterinary and Information and Communication Technologies are the fields with the lowest share of tertiary graduates (1.87%, respectively 3.92%). Referring to the employment rate of tertiary educated, for the entire period (2013-2020), at EU-level, the indicator-level was higher than the overall employment rate, following an upward trend, but with an average annual growth rate much lower than that of the overall employment rate. In order to analyze the changes over time regarding the share of tertiary graduates in the population aged 20-34 and the employment rate of highly educated, two working hypotheses were formulated. Following the application of non-parametric statistical tests, the working hypothesis claiming that *the share of tertiary graduates significantly changed in 2020 compared to 2013* was not validated. But the working hypothesis which states that *the employment rate of highly educated significantly changed in 2020 compared to 2013* was validated. In the next stage of the analysis, the correlation between the evolution over time of the share of tertiary graduates and the evolution of the employment rate of tertiary educated was analyzed. For almost all European countries, the values of the correlation coefficient range between -0.995 (in the case of Slovakia) to 0.928 (Ireland), with a predominance of high values, close to 1 or -1. The European countries were clustered into 4 groups, by the correlation coefficient, as follows: cluster 1 (BG, CZ, EE, LT, LU, PL, SK) is characterized by a strong negative correlation; Cluster 2 (DK, LV, MT, RO, SI, SE, NO) – by a negative weak correlation; Cluster 3 (IE, EL, ES, FR, IT, CY, NL, PT, FI, CH) – by a positive strong correlation and Cluster 4 (BE, DE, HR, HU, AT, IS, UK) – by a positive moderate correlation.

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Perspectives of Human Capital Core Specialization for Digital Transformation in Romania

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Abstract

The actual challenge is the digital transformation and the higher education holds the leading role to digital adoption and new skills providing. Based on the challenges highlighted by COVID19 pandemic, the new business models are shaped considering the digital transformation and the future jobs creation. They are requiring human resources with specific new skills and knowledge, educated in new teaching programs. The purpose of the study was to explore the Romanian higher education system capacity to create human capital core specialization for digital transformation in view to design a sustainable occupational mobility. It used the theory based analysis as a logic model, particularly in terms of the causal linkages between outputs and the different levels of outcome. Higher education spatial and temporal analysis were conducted with focus on study programs with relevant content for digital transformation creation in the framework the unified matriculation register. The specialized study programs are the intervention that should make the difference in digital transformation. Interdisciplinarity is the core of the new digital occupations formalization which request to develop and update an appropriate taxonomy based on a common scientific framework. The study offers practical inputs to design new tools for interdisciplinary management in creation of new occupational standards, to design study programs adequate for the new digitalized economy. A second finding refers to the domains that are faster moving forward to the new dimensions of digital adoption and futures jobs, the labor mobility, flexibility and hybrid or remote opportunities being part of the new business paradigm.

Keywords:

Human capital, Study Programs, Digital transformation, Interdisciplinary, New Occupations

DOI: 10.24818/BASIQ/2023/09/067

Introduction

The digital transformation is a global concern nowadays, accelerated by the effects of the COVID-19 pandemic and it is stated as a strategic objective by the European Union. Human capital need to adapt rapidly to the irreversible radical economies changes driven by digital transformation. This process generates creation for new economic sectors as well as destruction of old ones. New digitally transformed sectors request long term investment in human capital (Ulas, 2019). This has to be able to generate new occupations in the same time with labour force reallocation from the old sectors (Berman, 2012). Even if these new sectors profiles have not very clear profiles, there are some characteristics already emphasized for new occupations:

- the need to adopt new radical disruptive digital technologies for a knowledge economy, an economy based on science;

• the novelty character is generated especially by its interdisciplinary interaction of fundamental scientific fields of knowledge.

All these processes demand for creation of labor mobility mechanisms that are able to create new jobs in new sectors and to reallocate labour force from old sectors to this new sectors in a sustainable manner (Solberg et al., 2020.).

The mobility mechanism has to fully exploit the new digital opportunities and need to develop new digital tools that allow interconnectivity of Educational Systems (Levels of Education and Certification) and labour Market System (Occupation and Qualifications) especially by specialization domains in a scientific common framework. Among these new tools we mention the RMU. It is also important to formalize the new occupations generated by digital transformation using a scientific common framework. Here we point towards the comprehensive, holistic and strategically understanding of occupational content to be in studies programs using appropriated and updated taxonomies.

The nowadays transformations generated by the challenges that started with the COVID-19 pandemic are being reflected in digital transformation, remote working, hybrid working, trade and transport restructuring etc., the energy crisis with impact on economic growth, transport and energy consume, military conflicts with multiple and unexpected effects and other turbulations, clearly demonstrated that the education will be hit by the need of new specialization required on the labour market (Beylis et al., 2020). The present study is a preview of the education system development and needs to change (Kopp et al., 2019).

1. Literature review

Digital transformation in Higher Education Institutions (HEIs) is not only a priority for the decision makers but it also represents a research area explored by a lot of specialists in the last years (Benavides, 2020). That is because the importance of the academics in developing new programs aimed to offer the skilled personnel needed on the labour market and in accordance to the social changes. The content of the education, in line with the innovation and digital adoption and the managing aspects, has to be considered to faster the transition (Jackson, 2019). Aditya et al (2021) analyzed the barriers to the digital transformation in HEIs. Usually the transformation should be driven by the education, but from time to time the economic life pushes the education reshape (Pirciog et al., 2023).

The strategies of the digital transformation must be revised upon the actual need and the disruptions that are taking place on socio-economic life since the beginning of 2020 (Wilms et al., 2017; Xiao, 2019; Seres et al., 2018; Kopp et al., 2019). One of the most important issues is the content of the programs, it should fit with the skills evolution and the expectations of the employers (Alenezi, 2021; Marks & Al-Ali, 2022; Kupta et al., 2022; Neborsky, 2020; Grigorescu et al., 2022). This briefly screening of the literature, but not only if we have understood how the new educational programs are generated to be efficient and effective.

Research Hypothesis we will explore in current study is: The creation of a new sector is consistent when there is mass specialization for those economic activities. We understand through mass specialization the existence of at least a bunch of study programs with specific and dedicated content at first educational level of university programs, bachelor degree, respectively ISCED 6. The question that has to be posted is: Is the actual Educational system able to provide the Human Capital Core Specialization for Digital Transformation in Romania in content, volume and dynamics? The figure no.1 is presenting the research framework proposed for the study.

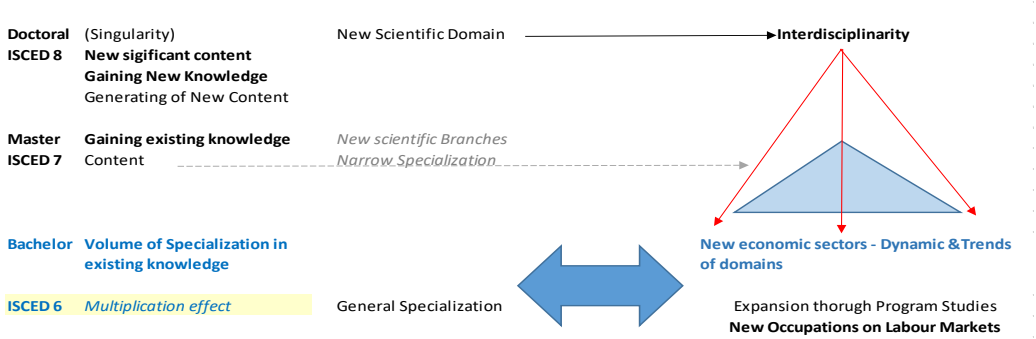


Figure no.1 Research framework

Source: authors' concept

The proposed framework is reflecting the process of a new specialization appearing at bachelor degree level as a reflection of the new scientific domain created as a result of the society evolutions and challenges.

2. Digital transformation educational context in Romania

The bachelor education programs expanded during 1990-2007 with negative effects on quality. In 1990, the number of students enrolled in the undergraduate program was 192.8 thousand and reached a level of more than 4 times higher in 2007. Figure no. 1 indicates that Romania's access into the EU, there is a rapid decrease of the students enrolled in the undergraduate university program from 907.3 thousand in 2007 to 411.2 thousand by 2014, due to the new regulation. Once the regulations about the accreditation and the quality control on the higher education programs, were implemented , in accordance with the European regulations, the number of students has stabilized, with small variations. The phenomenon of programs creation and academic unit without quality standards, made the education process questionable from a quality perspective (Romania Court of Accounts, 2015, p 6).

The experts from the Romania Court of Accounts (2015) stated in their reports that from the perspective of content and quality of the educational process there is no correlation with the labor market needs. Their comments showed that less performing universities, improper programs content are driving to a large number of graduation diplomas, but less skilled professionals and finally to a low competitiveness on the European market. We can note that there is a decoupling of the educational system from the labor market, a fact illustrated by a low performance in various sectors. The quality assurance of the higher education programs and units covers two components (Iordan, 2021, p18): provisional authorization and respectively accreditation and the ranking of study programs and the classification of universities.

The paradigm shift is found in the new approach to education public policies highlighted in QAFIN project (Improving public policies in higher education and enhancing the quality of regulations by updating quality standards) funded by European Social Fund (ESF).

From the perspective of the digital transformation there are levels of digital tools implementation. There are six digital platforms active at educational management level (Iordan, 2021, p26). The Integrated Educational Register (Registrul Educațional Integrat - REI), actually hosting and managing the Unique Matriculation Register **(**Registrul Matricol Unic –RMU) aims to integrate all the platforms with data about education units, students, programs, teaching staff, research activity, etc. One of the most important platforms that creates the link between programs and qualifications is the National Register of Higher Education Qualifications (Registrul Național al Calificărilor din Învățământul Superior - RNCIS).The fact that it links the Students, Graduates and the Labour Market Platform (Studenți, Absolvenți si Piata Muncii - SAPM) will give a complete picture of the compatibility between the skills needed on the labor market and the skills provided by the HEIs.

Decision no. 42/2021, within the Government Program 2021-2024, also reveals the strategic importance of using the inter-connectable digital tools by assuming the implementation of the integrated computer system of education in Romania (SIIIR) and the creation of the Unique National Reporting Platform in Higher Education in July 2022. The link with the National Institute of Statistics is set up within this unique platform.

3. Research methodology

The digital transformation is a highly complex process that could be evaluated under the theory of Change. It is important for social funds design (Carvalho and White, 2004). The method we apply for this study is the Theory-based approaches to evaluation starting from the change theory. The intervention is very complex and represents comprehensive cross-sector community-based interventions designed to improve the programs offers considering Weiss (2011).

Theory-based approaches to evaluation represent a logical enquiry based on the observed fact and results through the theories. It can be combined with evaluation methods. This theory is mainly an evaluation of the research object, a theory supporting the structuring analysis in an evaluation process. The theory of change gives the possibility to evaluate the expected results produced by an intervention. The most commune mechanism is the logic model that starts with the inventory of the existing facts, acts and results (Shadish et al., 1995; Alkin, 2013). The **s**ix principles to a successful application of the approach of change were identified by White (2009)**.** Another way of evaluating the change is question-based approach to evaluation practice by Vedung (1997, 2020) applied by Mickwits et al (2021) to evaluate the

transition to sustainability. The theory of change can be analyzed as a logic model using the causal linkages between inputs and outputs, considering intermediate outcomes.

For this study we will consider the data from the RMU about the HEIs for 2020-2021 academic year and select the domains we are considering vital for digital transformation, for a brief analysis (Rodrigues, 2017). The administrative database provides an exhaustive picture regarding the description of the state of higher education in the year 2020-2021. The data set is publicly offered in Open Source format on the data.gov.ro platform in the Invatamant-Superior-2020.xlsx file.

4. Results and Discussions

Nomenclature for the classification of the Specialization Programs by the official statistics is done upon the INCED codes, in our case ISCED 6 education level is allocated to bachelor's degree. The evolution of the bachelor students enrolled in Romania between 1990 and 2021 is presented in figure no. 2 and reconfirm the abnormal growth up to 2007, the decrease and the level of constancy from 2014 up to now.

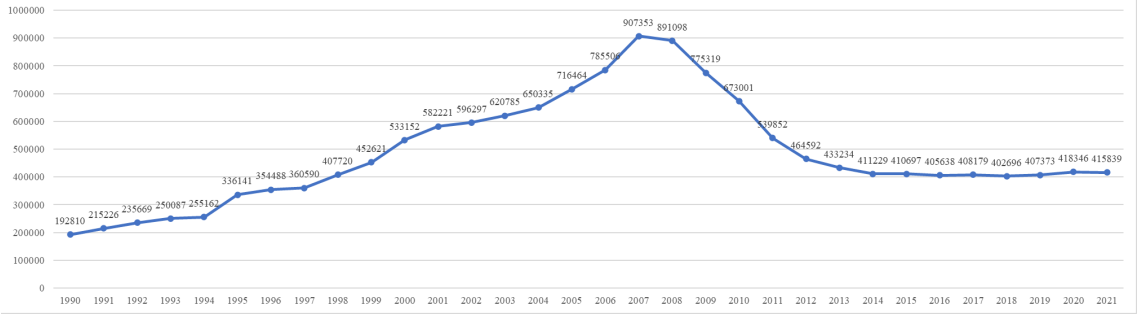


Figure no. 2 Students enrolled in bachelor programs during 1990-2021 (Number of persons)
Source: Authors representation based on data from INS TEMPO TEMPO_SCL103L_10_4_2023

To evaluate the digital transformation we will explore the evolution of the programs that are generating proper shills. At first sight, we are presenting the evolution of the total programs and on levels INCED 6,7 and 8, for 2014-2021 and particularly for the programs specialized in information and computer technology (ICT).

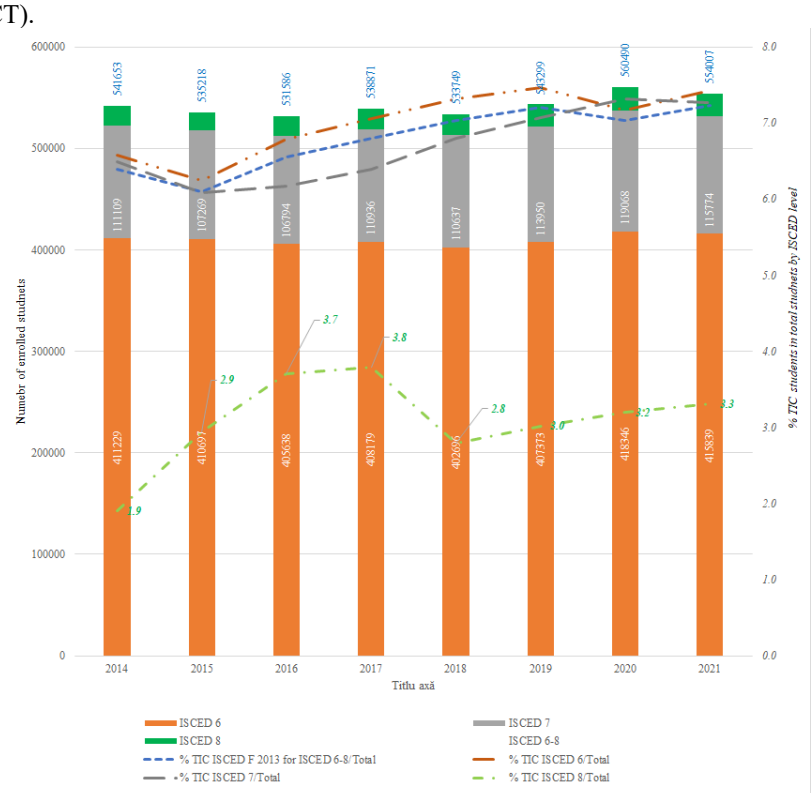


Figure no. 3 Students enrolled in tertiary education and ITC specialization during 2014-2021 (Number of persons, %)
Source: Authors representation based on data from INS TEMPO TEMPO_SCL103L_10_4_2023

In figure no.3 it can be seen that the number of total students enrolled in academic programs is roughly constant, with slightly changes between changes. The percentage of the students in ICT programs knows an increase of 0.84 ppt, but the level is placed at 7.2% for 2021. The higher increase was done for INCED 8 (1.40 ppt) that demonstrates a tendency of new scientific domains appearance. The number of students enrolled in ITC doctoral and post-doctoral programs is doubled in 2021 compared to 2014. Overall, in our opinion, the number of students generally studying ITC is very small to signal a consistent digital transformation and new specialization.

The science branches with more than 1% share in students number is presented in Figure no. 4 and it can be seen that the Economics & Business administration is the first (16.13%) followed by Medicine (10.30). The digital transformation branches: Electrical, Electronics and Telecommunication Engineering and Systems Engineering, Computers and Information Technology are having only 4.65% respectively 4.51%.

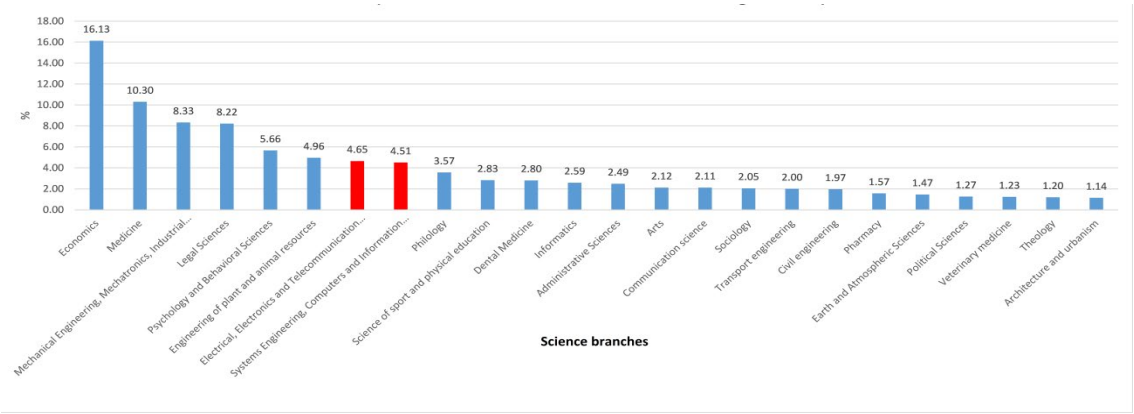


Figure no. 4 Science branches ranking for 2020/2021, INCED 6

Source: Authors representation based on data from https://data.gov.ro/dataset/reteaua-unitatilor-de-invatamant-universitar-2020-2021

For figure no.4 we used data from the RMU platform and we found a rate of data recording of 96%, compared to the national statistics. This is relevant for the data accuracy and the integrated platform REI.

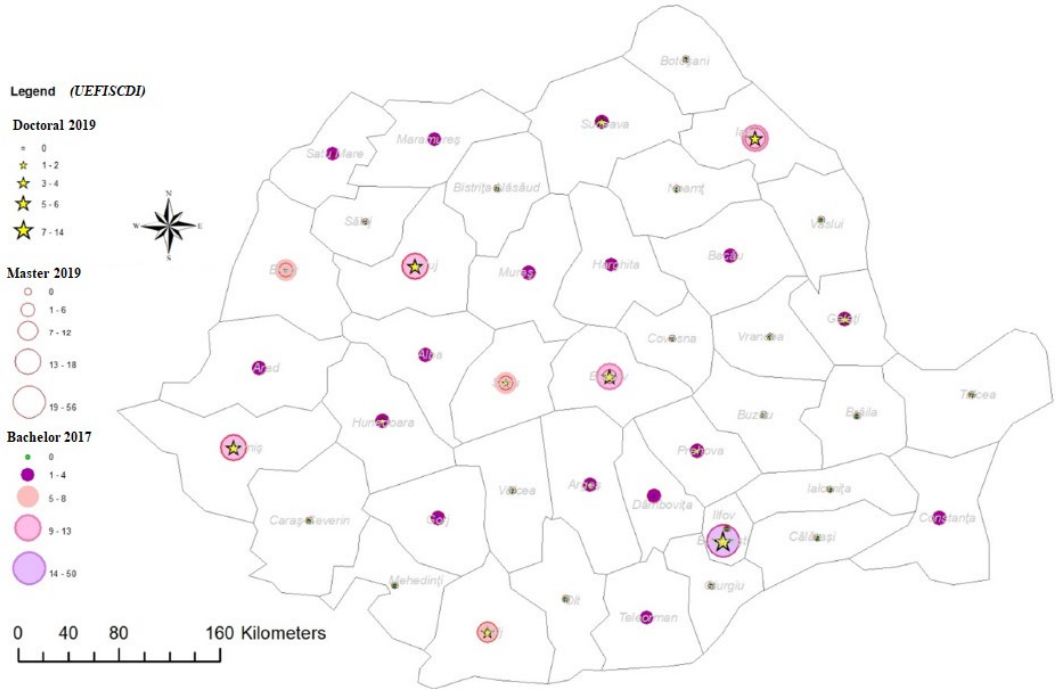


Figure no. 5. Spatial distribution of study program specializations by level of education in 2020

Source: Authors representation; RMU data.gov.ro

Figure no. 5 presents the geographic distribution of the educational programs for bachelor, master and doctoral levels. It is obvious that there is a concentration in few centers: Bucharest, Brasov, Cluj, Iasi, Timisoara, Craiova. The concern is the East and South areas have the most uncovered counties.

A selection of study programs with potential in digital transformation in Romania were done with their correspondence to the fundamental domain and science branch. The data reveals the fact that the highest consistent growth for digital transformation is in engineering, followed by military science and economics. At first sight, the conclusion is that the technical domains are acting on the program renew for digital transformation and new specializations. The ranking of the specializations in 2020 places the Modern languages on top with 14.89%, compared to Economic informatics (place 34, 0.57%), Applied Electronics (place 36, 0.54%), Computers (place 38, 0.51%) and Technologies and Telecommunication Systems (place 59, 0.40%). This volume of core program studies specialization for digital transformation in Romania at bachelor degree level reveal the relatively low amplification power of the process.

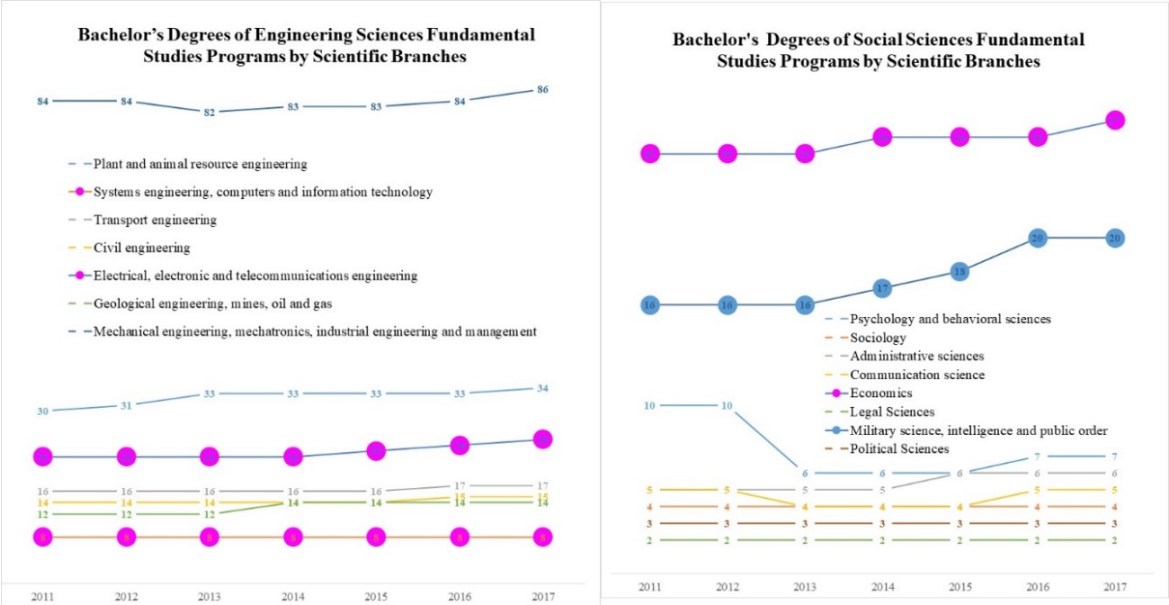


Figure no. 6. Bachelor's degrees studies programs evolution and comparison

Source: Authors representation; RMU data.gov.ro

If we are comparing the evolution of the study programs in Engineering Sciences and Social Sciences, there is an increase of programs for Electrical, Electronics and Telecommunication Engineering and a stagnation for Systems Engineering, Computers and Information Technology. For military sciences and Economics there is a more consistent growth.

In figure no.7 is presented a synthesis of the study programs distribution and consistency for Engineering and Social Science, as an example of structural integrated analysis framework. The theory based change analyze offers a brief image of the past seven years evolution of the higher education system and the germs of the digital transformations. The lack of data about the content of the study programs is a barrier in having a transversal content analysis. We can appreciate that not significant changes took place in the structure of domains, branches and field of specialization in view of the digital transformation. A deep analysis will be needed for new education areas or for the content reshaping of the existing.

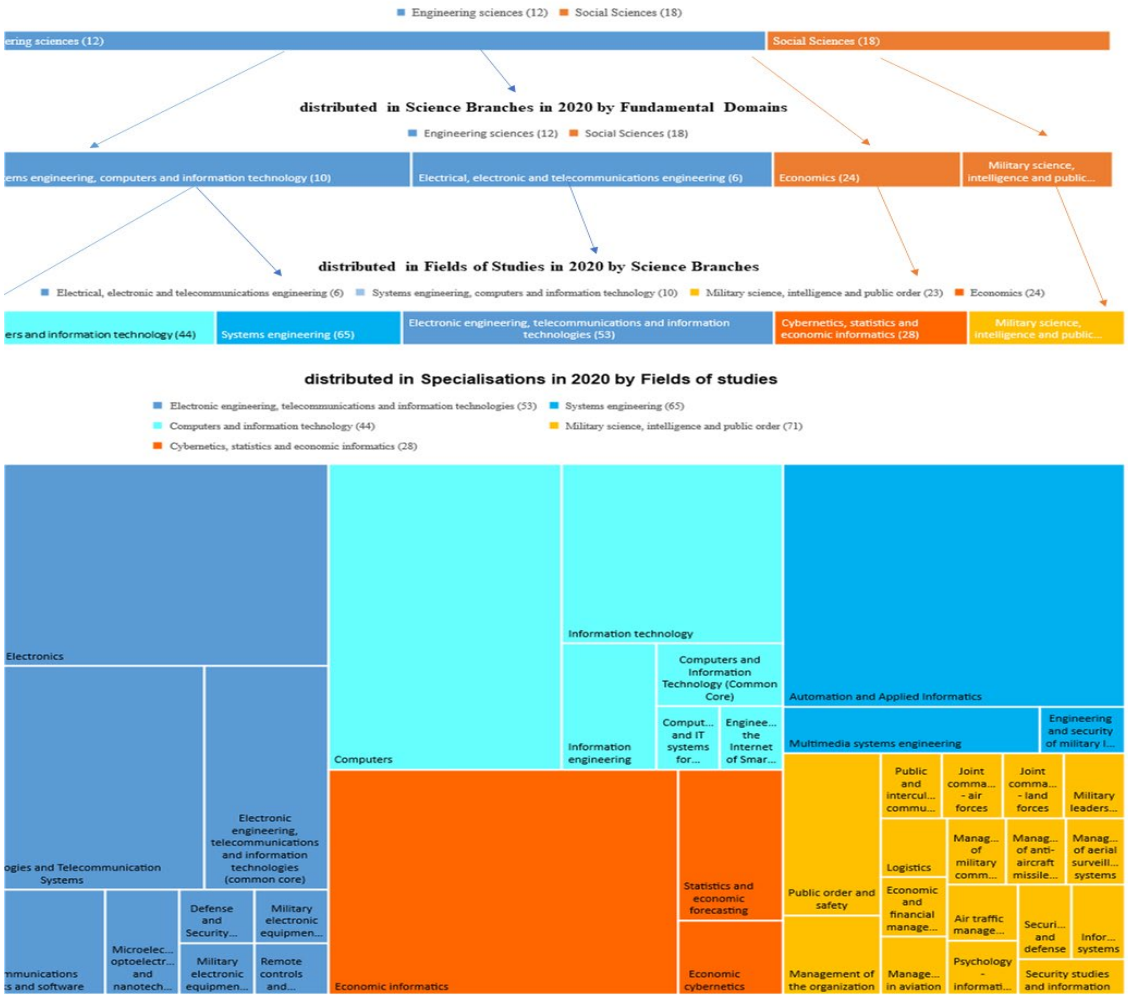


Figure no. 7. Bachelor study programs distribution in Romania for 2020
Source: Authors representation

Conclusions

Our main contribution is statistical analysis of the perspectives of human capital core specialization for digital transformation in Romania. The present educational system is not able to provide the human capital core specialization for digital transformation in Romania in volume, dynamic and tendency. Even if the content is present, it is spatially isolated and does not provide mechanisms for interdisciplinary programs.

In our opinion, the science fundamental domains and science branches need an interdisciplinary management tool development. On this purpose, there is a request to develop and update an appropriate taxonomy based on a common scientific framework as a tool for managing interdisciplinarity as the source for the new digital occupations. RMU is a digital tool that could be improved to better reflect the link between the study programs and the adoption of digital transformation. Based on a clear taxonomy, the evolution of the students flow, specialization, qualification (skills), professions and jobs will reflect the shift to the new occupations needed on the labour market. The identification of the qualitative and quantitative items of study programs evaluation in accordance with the content and appropriateness for the business environment are amongst other measures to be implemented. From the perspectives of data - it needs a better, relevant and consistent of the records collection, real time and access, all integrated in a framework easy to be linked with other data bases at national, European or international level (Iordan, 2021) and this will increase the visibility of the digital transformation process and that is not the only plus side.

This work is of a tremendous importance to properly evaluate the education system capacity to support digital transition in a sustainable manner in Romania. The detailed image of the network of HEIs includes the data of public and private units operating in the 2020-2021.

The results do not 100% reflect the changes to the digital transformation because the most important limit of the study consists in having little information about the content of the study programs,

Among the possible applications of this research, we mention the new occupation generation based on new occupational standards to be linked to the new educational programs and to assure fully connection with labour market demand.

Further extend of the study are: exploration of the studies programs matching with the labour market specialization demand across economic sectors in the digital transformation framework; interoperability of educational systems with labour market systems; forecasting for digital transformation implementing in Romania based on regional smart specialization strategies.

Acknowledgement(s):



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The Importance of Managerial Skills Transfer Management for Organizational Success

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Abstract

The main objective of the research is to improve the management of the transfer of managerial skills, with a projection on the Romanian economy. The main own contribution in this direction is the development of a methodology to approach the *management of the transfer of managerial skills* (MTMS) to assist decision-makers by structuring decision-making problems, identifying the correspondences between the types of problems and the modeling methods and algorithms for solving them. The realization of this methodology requires several own contributions aimed at theoretical and practical aspects of the studied theme. At the microeconomic level, both theoretical research and empirical studies have highlighted certain objectives specific to each class of people involved in MTMS. The main objectives of the shareholders are to change the value of the shares and dividends as a result of the *transfer of managerial skills* (TMS). From the point of view of managers, their objectives consist in increasing the competitiveness of the organization, developing their own career and personal development, goals materialized from a quantitative point of view in changing the company's profit and personal net income. The objectives of the employees related to MTMS mainly refer to the improvement of the working environment and personal advancement possibilities. For organizations, TMS has the following main objectives: winning new markets, developing and perfecting products and services, attracting funding sources, increasing revenues, securing specialized human resources, diversifying activity, successfully implementing the organization's strategy, and increasing flexibility. This research study supports organizations and managers who wish to engage in a process of improving managerial skills through the transfer of specialist knowledge from organizational, personal or academic sources. The main contributions of the article consist in improving the management of the transfer of managerial skills by developing a methodology for approaching and solving decision-making problems according to their typology.

Keywords: managerial skills, transfer, management, organizations

DOI: 10.24818/BASIQ/2023/09/077

Introduction

Ensuring a high level of managerial skills is a determining factor of macroeconomic development. The direct objectives of management skills transfer management (MTMS) are to improve the quality of administration, public policies and development strategies adopted. The indirect objectives of MTMS refer to increasing the productivity of companies, the level of innovation and therefore stimulating economic development.

At the microeconomic level, both theoretical research and empirical studies have highlighted certain objectives specific to each class of people involved in MTMS. Carriger and Quirk (2018) concluded that the main objectives of shareholders are changes in share value and dividends as a result of achieving TMS. From the point of view of managers, their objectives consist in increasing the competitiveness of the organization, developing their own career and personal development, goals materialized from a quantitative

point of view in changing the company's profit and personal net income. The objectives of the employees related to MTMS mainly refer to the improvement of the working environment and personal advancement possibilities. For organizations, the transfer of managerial skills (TMS) has the following main objectives: winning new markets, developing and perfecting products and services, attracting funding sources, increasing revenues, securing specialized human resources, diversifying the activity, successfully implementing organization strategy and increased flexibility (Andriessen, 2004). The development of specialized knowledge and skills, including managerial skills (MS), is stimulated by the international exchange of information, which gives rise to a process of combining knowledge obtained from the international environment with local experiences. Starting from the theoretical models for the analysis of international alliances, an econometric model was created that tests the relationship between the regional research-development activity, which includes the development of managerial skills and the effects of the international flow of knowledge through foreign direct investments, the mobility of researchers from academia and access to global information.

Frank (2022) is of the opinion that the management of the transfer of managerial skills (MTMS) represents a sequence of decisions, which correspond to a sequence of problems. Starting from the MTMS stages, a typology of TMS managerial problems was elaborated. After formulating managerial problems generated by forecasting, planning, organizing and evaluating action strategies, correspondences were created between managerial problems and their modeling methods and solving algorithms were identified, realizing interferences between problems, modeling methods and methods of solving. These methods were also experimented and applied on case studies from Romania, demonstrating possibilities for improving MTMS in economic practice. Hays and Erford (2022) believe that the transfer of managerial skills (TMS) is a particularly complex process, both through the influence of the human factor and through the important effects it has on the development of organizations. Within MTMS there is a need for methods to simplify this complexity so that the best solutions can be identified for the problems that arise at each stage of MTMS. The most modern and effective method of reducing complexity is mathematical modeling. Thus, modeling methods were identified corresponding to each main class of problems that appear within MTMS. Among these modeling methods, those methods that proved necessary for the analysis of representative case studies from empirical research were detailed and applied: methods for planning products destined for TMS, methods for planning the transfer of knowledge trained in this process, planning human resources, the allocation of resources on multiple objectives aiming at a degree of simultaneous or total satisfaction of the objectives, problems of flexible optimization of TMS and problems of developing the expansion strategy of organizations.

1. Review of the scientific literature

Managerial skills are a strategic asset, both at the macroeconomic level and at the microeconomic or individual level (Gilbert, 2007). The development of specialized knowledge and skills, including managerial skills (MS), is stimulated by the international exchange of information, which gives rise to a process of combining knowledge obtained from the international environment with local experiences (Addicot et al., 2006). Starting from the theoretical models for the analysis of international alliances, an econometric model was created that tests the relationship between regional research-development activity, which includes the development of managerial skills and the effects of the international flow of knowledge through foreign direct investment, mobility of academic researchers and access to global information (Donahue, 2022). At the microeconomic level, managerial skills are considered the most important strategic advantage of a company (Benbasat and Zmud, 2013). Moreover, organizational theory defines a strategic good as one that simultaneously satisfies the following characteristics: it is rare, valuable and impossible to imitate or substitute for competitors (Morey et al., 2002). Starting from this definition, intellectual capital is considered the only strategic asset, being the only resource that cannot be perfectly imitated by other organizations due to the dependence on the environment in which it is created.

TMS is a process that involves the assimilation and exploitation of specialized information, which can be analyzed through communication theory. The main components of this process are: the source of the transfer (the company, organization or person from whom the skills are taken), the content of the transferred knowledge (by decoding the skills and transforming them into transmissible information), the method of communication, the beneficiary of the transfer (the stage of assimilation and transformation knowledge transferred into managerial skills), as well as the organization that provides the framework for the exploitation of new skills (Booker et al., 2018). The relationship between these components of TMS is often marked by conflicts of interest and multiple influencing factors (Elliot, 2018). Depending on the different components of the transfer process, the typology of TMS involves several classification criteria, among

which we mention the delimitation of TMS according to the source of information in the transfer in: inter-organizational, intra-organizational and extra-organizational TMS (Armstrong and Murlis, 2018). The transfer of managerial skills is a human process, in which the degree of assimilation and fruition of managerial skills depends to the greatest extent on the degree of internalization and combination of knowledge by the beneficiary persons. At this level, the process of transfer of managerial skills resembles a biological process (Pfeffer, 1994). From this perspective, an analysis model based on neural networks has been proposed, which evaluates and predicts MTMS results in conditions where the internal process of knowledge processing is not known in detail (Andreica, 2011). This model can be applied to the problems of classifying and evaluating human resources, forecasting managerial performances, identifying those managerial knowledge that can provide competitive advantages, perfecting a data path within MTMS (Barney, 2016).

The management of the TMS process involves the exercise of the managerial activities of forecasting, planning, organization, control and evaluation. Within each activity, the main objectives, the elements of the decision-making matrix, as well as the most frequent problems that managers may face were identified (Sadler-Smith et al., 2003). The exploitation strategies of the new MSs and their transformation into competitive advantages were also identified.

2. Research methodology

This case study supports CFR staff trainers by identifying the main factors influencing promotion and the level of skills assimilated in foreign language courses for staff in management positions, as well as staff involved in European transport coordination. This study answers the question: what is the general profile of people who successfully pass the language refresher courses organized by the National Center for Railway Qualification and Training?

The National Railway Qualification and Training Center (CENAFER) is established by taking over the activity of the Romanian Railways Staff Training and Qualification Centers (CFR) in Bucharest, Craiova, Timișoara, Cluj, Brașov, Iași, Galați and Constanța, which provided staff training CFR since the beginning of the 20th century. The legislative framework that governs the operation of the Center is given by the Ordinance of the Government of Romania no. 58/2004, approved by Law no. 408/2004, with subsequent amendments and additions brought by Law no. 329/2009. The center has the status of a public institution with legal personality and is subordinate to the Ministry of Transport. CENAFER is designated as the specialized national body of the Ministry of Transport that ensures the training, qualification, improvement, verification and professional authorization of Romanian Railways staff, as well as the improvement of the administrative staff of the Ministry of Transport, having several decades of experience in this activity.

Part of the training and specialization courses offered to CFR staff are foreign language courses: technical and specific notions of English, French, German and Spanish. We mention the fact that these knowledge are components of managerial skills, the courses being attended by personnel who carry out activities specific to the development of rail transport and who wish to promote to management positions serving international transport routes (Paris, Vienna, Thessaloniki and Venice), to work at border points, in stations with international traffic or in national means of transport with information communicated in foreign languages. Another category of beneficiaries is represented by the executive staff of the Ministry of Transport who wish to promote and/or participate in European-level working meetings (ERA and UIC) or international conferences. Most of the beneficiaries of the four courses come from the CNCF SA, SNCF-CF SA and SNCF-MS structures.

Considering that these courses are for improvement, only students who can prove specialized knowledge and who have been recommended by their superiors after at least three years of experience in the CFR are admitted. The content of the courses is technical and includes specialized language for the railway, economic, legal, technical and administrative fields. Learners are divided according to the level of training they declare at registration into pre-intermediate, intermediate and advanced level groups. The courses are fully funded by the Ministry of Transport and are of great importance both for job stability, for professional promotion and for increasing the salary level. Course promotion brings a 10% increase in salary for staff in central positions, while operational service staff gain senior positions that bring an average increase in income of 30%.

The duration of each course is 40 hours for executive staff and 80 hours for staff with central functions (lawyers, economists, technicians and administrative staff). The courses run for four hours a day from Monday to Friday, and the trainees benefit from being taken out of production for the duration of the course. Beneficiaries can have the following categories of functions, specific to CFR:

1. of execution (40-hour courses), whose managerial skills are perfected in order to occupy higher hierarchical positions: conductors (who check tickets on the train and provide personalized information); cashiers (who sell tickets in stations and train stations and carry out related activities); warehouse workers (work at CFR Marfa border points); informers (they work in large stations, in hubs and stations with international traffic; they are responsible for transmitting announcements through the station to the public).

2. driving (80-hour courses): economists; lawyers; technicians; administrative staff.

The dependent variable of the model is the probability of language improvement courses, both in pass/fail form and on the grade scale. Following the semi-structured interviews conducted with the Head of Department of the CFR staff trainers, several factors emerged that could have an influence on the outcome of these courses, factors that were included in the model as independent variables as follows:

1. Form of the course: French, English, German or specialized Spanish;

2. Course duration: 40 or 80 hours;

3. Gender of beneficiaries: male or female;

4. Age category: 20-24 years, 25-30 years, 31-40 years and 40+;

5. Ethnicity: Romanian, Roma, Szechuan/Saxon, Hungarian;

6. Geographical area of the workplace: urban or rural;

7. Function: conductors, storekeepers, cashiers, informants, economists, lawyers, technicians, administrative functions;

8. General level of training: high school, bachelor's degree, master's/doctorate;

9. Level of initial language skills: pre-intermediate, intermediate, advanced.

3.Research results

In building the model, we split the data set (100 individual observations, with no missing data, from October 2022 ÷ February 2023) into a training group and a test group, using random numbers to assign observations to groups and letting the model use as many observations as it needs to train. The training modality selected was online, as it is most appropriate if the independent variables could be correlated (general level of education and level of language skills). Considering the specifics of managerial skills transfer processes, in which the absorption of information is achieved gradually, the transmission function was approximated with the hyperbolic tangent function (Figure 1), represented as follows:

$$f(u) = \frac{e^{u} - e^{-u}}{e^{u} + e^{-u}} \quad (1)$$

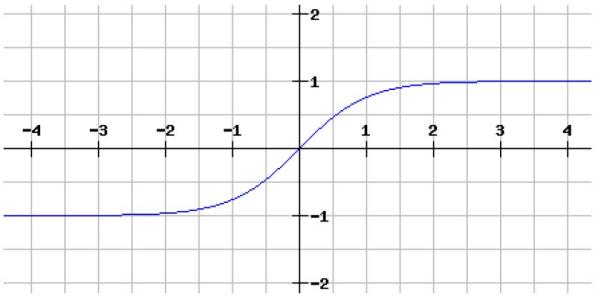


Figure 1. Transfer function approximation (hyperbolic tangent)

Source: graph made with the Matlab application

The model was tested in two variants, using different forms of the dependent variable. In the first phase, the importance of the independent variables for obtaining a certain grade was tested. These results correspond to the evaluation stage of transferred Managerial Competences. The marks in the end-of-course exams were calculated on a scale from 0 to 10, with 10 being the maximum mark. The model reached a 1-hidden-layer, 2-unit equilibrium using 72% of the observations for learning and 28% for testing. After two

consecutive steps without the model error (calculated as the sum of the squares of the deviation of the results) decreasing, the learning process was completed with the following result (Table no. 1):

Table no. 1. Summary of the TMS evaluation model

Training	Sum of Squares Error	1.257
	Relative Error	.185
	Stopping Rule Used	1 consecutive step(s) with no decrease în error[a]
	Training Time	0:00:00.02
Testing	Sum of Squares Error	1.167
	Relative Error	.377
Dependent Variable: Note a. Error computations are based on the testing sample.		

Source: data processed with the SPSS application

As can be seen, the model error is relatively small. The importance of the analyzed factors on obtaining a certain grade on the exam is shown in Table no. 2:

Table 2. Factors of influence in the evaluation of transferred managerial skills

Independent Variable Importance		
	Importance	Normalized Importance
Course duration (hours)	.016	7.3%
The gender	.045	20.8%
Age	.185	85.3%
Area of origin	.032	14.8%
Function	.178	82.1%
The level of general training	.217	100.0%
Initial language level	.199	91.9%
Course	.051	23.4%

Source: data processed with the SPSS application

Of all the influencing factors analyzed, the level of general schooling is essential for obtaining a certain level in the final examination of the skills acquired in the management training courses (100% importance). This result corresponds to expectations, due to the fact that these courses are of a theoretical nature and therefore correspond to the passability level in general education. The initial level of language knowledge, age and position held also have a decisive influence. At the opposite pole is the length of the course, a surprising result that we attribute to the fact that the requirements for shorter courses are lower than those for 80-hour courses. Also, the area of origin and the gender of the beneficiaries have very little importance in predicting the final passing grade.

The second method of analyzing this form of skills transfer is to test the link between the independent variables mentioned above and the pass rate in the exam. In this variant of the model, which analyzes the success of TMS, the dependent variable is of binary form, which allows us to highlight the percentage of correct predictions made by the model. The model is similar to the one above, with the only difference that only 68% of the variables were needed for learning and only one hidden layer for information processing (Table no. 3 and Table no. 4).

Table no. 3. TMS analysis model

Model Summary		
Training	Sum of Squares Error	5.701
	Percent Incorrect Predictions	8.8%
	Stopping Rule Used	1 consecutive step(s) with no decrease în error[a]
	Training Time	0:00:00.01
Testing	Sum of Squares Error	2.169
	Percent Incorrect Predictions	6.3%
Dependent Variable: Rezultat a. Error computations are based on the testing sample.		

Source: data processed with the SPSS application

Table no. 4. Analysis model of TMS results

Classification				
		Predicted		
Sample	Observed	.0	1.0	Percent Correct
Training	.0	11	4	73.3%
	1.0	2	51	96.2%
	Overall Percent	19.1 %		
Testing	.0	2	1	66.7%
	1.0	1	28	96.6%
	Overall Percent	9.4%	90.6%	93.8%

Source: data processed with the SPSS application

It can be seen that the model error is much smaller, with only 6.3% of the values predicted incorrectly. From the details of the predicted values, we note that the error is larger for the category of learners who did not pass the course, which is related to the fact that there were relatively few observations in this category (18%). At this assumed level of error, the influencing factors on the exam pass rate that are of particular importance are: age and initial skill level, which provides a slightly different perspective from the first model (Table no. 5):

Table no. 5. Factors influencing the success of TMS

Independent Variable Importance		
	Importance	Normalized Importance
Course	117	46.5%
Course duration (hours)	.082	32.5%
The gender	.105	41,6%
Age	.251	100%
Area of origin	.058	23%
Function	.080	31.8%
The level of general training	.131	52%
Initial language level	.199	91.9%

Source: data processed with the SPSS application

4.Discussions

By comparing the two models, the following conclusion can be drawn: if the general level of theoretical training has a decisive influence on the level of absorption of new MSs, age is the most important factor that explains the success or failure of the TMS process. In general, it is observed that personal factors such as the individual's gender, ethnicity or age have a much greater importance in promoting the TMS process, but do not influence the results obtained in the assessment of MS as much. By means of the model based on neural networks with hyperbolic tangent function and online training method, the main personal factors that ensure a high level of performance in TMS were analyzed. The results of the model show that the results of the evaluation of the transferred managerial skills (MS) are mainly determined by professional factors: the general level of schooling, the level of language skills, the age and the function of the beneficiaries. The success of the TMS (pass rate in the final test) is, however, influenced more by personal factors: age, type of course, gender of the beneficiaries (male or female) and ethnicity.
The improvement of managerial skills that drive the economic development of companies and regions in Romania largely depends on research carried out on the economic and human generative mechanisms of MTMS.

Thus, among the identified future research directions, we highlight the following:

- ✓ such as the application of the macroeconomic model elaborated in this paper to other regions of the global economy and to other sectors of activity, these conclusions being of interest to all geographic regions or fields of activity that have a development model based predominantly on low costs and less on specialized skills;

- ✓ applying TMS modeling methods to other types of problems encountered in practice;
- ✓ creating a compendium of recommendations and a comparative study of the best MTMS strategies.

Regardless of the activity carried out, managerial skills determine the direction and pace of development of an organization. At the macroeconomic level, the development of managerial skills in the public and private environment has a decisive influence on sustainable economic growth. At the microeconomic level, improving managerial skills represents an important competitive advantage, determines the economic results of organizations, the profitability of investments and the quality of the work environment. From an individual point of view, the transfer of managerial skills ensures the professional and personal development and prestige of people with management positions.

Conclusions

The transfer of managerial skills is a process in which the human factor plays an essential role. This human component, which includes psychological, subjective, relational, circumstantial aspects cannot be ignored, but it is also very difficult to model through a classic economic model, which are based on stable relationships between the included variables. The use of neural network-based models is one approach that can successfully deal with such aspects of MTMS, in order to draw the contours of the analyzed situation based on data obtained from multiple previous iterations of the process.

The major disadvantage of this method is that the model on which the interaction of the variables is based is not known, but this is also the main advantage: if we knew the relationships between the variables, we could use classical, more explicit mathematical models. However, in the author's opinion, the results obtained from estimates whose foundation is not clear at first glance are still much more frequent and generally accepted in reality with the same ease with which we would withdraw our hand from a needle without calculating them a priori diameter and without knowing for sure how one gets from tactile impulse to discomfort. That is why we believe that models with a strong empirical, experimental character, such as those based on neural networks, should not be marginalized, but on the contrary, we can hope that economic science will progress more and more in explaining and including the complexity of the human factor in the models that elaborate.

In this sense, collecting as much statistical data as possible is essential for determining the level of correctness of the models. This information – which can take the form of macro-data – thus takes on much greater importance as economic theory is entrained in the evolution of mainstream technology. Organizations able to systematize and harness this raw individual information can better anticipate changing societal preferences and thus base their decisions on more secure premises. The presentation of the analysis model in this chapter, located at the border between the biological and social sciences, aims to improve managerial skills to give organizations the opportunity to turn into competitive advantages the opportunities offered by detailed information about potential consumers - information that is increasingly accessible with the development of social media and data storage capacity.

In conclusion, managerial skills are often analyzed only through the lens of a qualitative approach. This perspective creates uncertainty and difficulties in securing the resources needed to implement such a process. TMS is a process that requires significant financial, human and organizational costs, but it is difficult to make a calculation of the return on investment in PTMS if research in the field only provides qualitative and strategic factors for evaluating TMS. The modern management of the transfer of managerial skills also needs quantitative models to substantiate decisions during each stage of this process. The present research emphasizes the continuous need for improvement of managerial skills and wants to stimulate TMS through a systemic, transparent analysis of the decision-making process, as well as through the development of quantitative methods of analysis aimed at providing decision-makers with comparable indicators for the required investment and the results obtained through TMS.

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Change Management in a Dynamic Economic Environment

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Abstract

The general purpose of the article is the development of scientific knowledge through the analysis of the changes produced at the level of institutions in the banking sector, with the main objective being the identification of ways to improve the management of change, especially that specific to banking institutions. The research methodology has both a fundamental component, which regroups the set of theoretical and empirical activities that aim to produce new knowledge about phenomena and processes, as well as the formulation of conceptual models and theories, as well as an application component, in order to use scientific knowledge for improving the activities of banking institutions and increasing their capacity to adapt to change. The article has both a fundamental component, which regroups the set of theoretical and empirical activities that aim to produce new knowledge about phenomena and processes, as well as conceptual models and theories, as well as an applied component, in order to use scientific knowledge to improve the activities of banking institutions and increasing their capacity to adapt to change. The general purpose of the article is the development of scientific knowledge through the analysis of the changes produced at the level of institutions in the banking sector, with the main objective being the identification of ways to improve the management of change, especially that specific to banking institutions. The article shows particular importance to the fact that through production it could produce a positive change in the attitude towards change at the individual level as well as at the group or organization level and a better understanding of the need to improve change management.

Keywords: change, management, organization, change capacity

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Introduction

The evolution of the concept of change was under the influence of the transformations that took place over time. Thus, social, economic or technological revolutions led to the emergence of new concepts and approaches regarding organizational change.

The study of change represents a problematic section, with a wide audience in the history of knowledge. The change is found in the texture of most areas of interest in the social sciences: economics, sociology, political science, anthropology, psychology, etc.

The pace of change has increased in recent decades, the pressures of the external environment, corroborated with the influences of internal factors, produce rapid transformations and their effects are found in all aspects of political, social and economic life (Burnes, 2017).

The ability to cope with change is one of the most useful traits of employees or organizations. This is a sine-qua-non condition for an organization to demonstrate its competitiveness and achieve high and sustainable performances. Transformations regarding the dynamics of global markets, technological progress, customer preferences for differentiated products and services, increasingly strong competition, etc. directly and inevitably affects the organizational environment (Nicholls, 2022).

The managers of the moment must prepare for the future and for this they must know that they can count on the best strategic weapon of the information age: the organization specialized in change. It anticipates, creates and reacts effectively to change (Brisson-Banks, 2017).

Managers who can embed change capability into daily operations and who empower their staff to act as change agents are less likely to be taken by surprise or encounter resistance from their employees. To some extent, they won't need to incite revolutions in order to accomplish their objectives. They will have the option of choosing a path between the two equally risky extremes of rejection (too little change) and radical transformation (too much change). The change capacity of an organization rests on the three fundamental pillars of change: *the cooperative behavior of employees, the flexible organizational structure and the managerial system that promotes change* (Holt et al, 2017).

In our opinion, no organization can develop if it does not want and does not manage to adapt to market conditions. That is why a careful analysis of the organization's capacity to change and the identification of tools for its construction and development must be carried out. We believe that this fact will also lead to an increase in the efficiency of change management.

A certain degree of resistance to change is inevitable and, we believe, even welcome in some cases, but measures must be taken to reduce it. At the top management level, this fact can be achieved by: increasing the level of acceptance of the fact that change is necessary, developing the plan for its implementation and analyzing the possible results both in the short term and in the medium or long term.

1. Review of the scientific literature

The specialized literature presents certain models that try to evaluate how ready an organization is for change, however, as stated by Bennebroek et al. (2013) *unlike the readiness of individuals for change, that of organizations has not yet been the subject of in-depth theoretical research or empirical studies*.

The viewpoints of theorists and practitioners regarding the concept of organizational change may also differ depending on the experiences that specialists have had in managing change. According to Jarrett (2011) change can mean different things, depending on the position towards it of the one who defines it. For some it may mean keeping or losing their job, while for an executive it may mean increasing profits, reducing costs or saving the business (Smith, 2014).

Cameron and Green (2019) consider that *it is important to differentiate the concept of "readiness for chang*e, which represents the ability to implement a specific change, from that of *change capacity*, which means the ability of an organization to change not just once, but as a normal course of events, in response to anticipating internal and external transformations.

The capacity to adapt to future changes must be developed and encouraged by using all the opportunities that arise from past and present changes (Kotter, 2021). Although the expression *adaptation to change*" is frequently used, most of the time organizations and their members are not fully aware of what it means and the implications it has (Jones et al., 2015).

The most important challenge for managers is to actually produce change and not to realize the need for it. In order to have positive results following the implementation of change management, sufficient attention must be paid to the question *how could change management be effective if the organization is not ready for change?* (Ashmarina and Khasaev, 2015).

Why do some companies manage to successfully implement an impressive number of change initiatives, while others fail in such projects ? What is the difference between organizations that succeed in implementing change and those that do not ? (Hayes, 2021).The ability of the company to react to changes in the external environment, which reflects the attitude and fundamental internal capabilities, as well as their dynamics, makes a difference (Babalâc, 2013).

Middle-level management should place particular emphasis on how the change affects the organization's members, on open and honest communication with those affected by the change, and on employee participation in the change process (Karen, 2021). The implementation of the change itself is simply one aspect of change management; efforts taken to accommodate the change are also necessary. An organization's ability to adapt is something that is established and developed over time with the participation of all of its members. The respective actions consider the following (Holt et al., 2017):

- ✓ adapting the structure of the organization to the new elements introduced;

- ✓ rethinking the strategy from the new perspective of change;
- ✓ readjustment of the management systems of the organization, respectively the informational, decision-making system, etc.;
- ✓ promoting a management style that not only favors change, but also attracts the members of the organization towards change and towards the manifestation of their creative potential.

In the current economic context, managers are increasingly faced with the problem of learning, of preparing for change, this implies (Brisson-Banks, 2017):

- ✓ clarity of objectives at all organizational levels;
- ✓ action planning and the participation of managers and specialists to solve the problems in mind;
- ✓ empowering employees to support change initiatives;
- ✓ evaluating performances and providing answers;
- ✓ capitalizing on the ideas of the entire staff of the organization;
- ✓ awareness of the fact that change is a learning process.

Obtaining positive or negative results of the change initiatives is determined by the attention given to the human resources involved in the change process (Lena, 2015). According to Jones et al. (2015), an organizational culture that values learning, innovation, and taking calculated risks helps organizations be adaptable to change. The significance of adaptable organizational policies, the contribution of organizational atmosphere to change, and prior positive experiences that can spur availability to support organizational transformations are also underlined.

2. Research methodology

The objective of the research is to contribute to the advancement of scientific knowledge by analyzing the changes occurring in banking institutions and identifying effective strategies for managing change. The focus is on exploring ways to enhance change management practices within the banking sector and drive improvements in organizational processes and outcomes.

The specific objectives of the research were:

- ➢ analysis of organizational changes from a procedural and typological aspect;
- ➢ determining the kinds of changes that the members of the analyzed organizations believe are imperatively necessary for the organizations in which they work;
- ➢ determining the coordinates required for the creation of a successful strategy for the change's implementation;

The sampling method chosen is stratified sampling, namely stratified proportional sampling. In this way, representativeness in terms of sample structure was fully ensured. Sampling was based on subject availability. The target group for the realization of my research approach is the members of banking institutions in Romania.

As part of the research, we used the questionnaire to collect information about the experience and perception of employees in the banking sector:

- ➢ the need to produce changes in the respective institutions;
- ➢ the factors that influence the appearance and management of these processes;
- ➢ the causes that determine the resistance to change and the methods of reducing it;
- ➢ the importance of the direct involvement of employees in making changes in banking institutions;
- ➢ the strengths and weaknesses of change management.

Thus, the questions of the questionnaire were formulated in accordance with the mentioned objectives. The questionnaire was structured in such a way as to lead to the obtaining of relevant, correct and complete information in order to identify methods for improving change management. In developing the questionnaire,in developing the questionnaire, we paid special attention both to the general rules recommended by the theory for creating questionnaires, as well as to those aimed at the form of presentation: the formulation of questions, their sequence, the balance between closed and open questions.

Thus, for the preparation of the questionnaire we considered the following aspects:

- the complete content of the questions, the presentation of all the information necessary to describe the investigated subject;
- clarity of questions, avoiding possible confusion;
- the intelligibility of the questions, the explanation of the terms used, which we thought could create confusion, right from the beginning of the questionnaire;
- the simplicity and timeliness of the questions to facilitate obtaining answers faster and reducing the non-response rate (for formulating the answers it is not necessary for the respondents to check previous data and information);
- the logical sequence of questions and their grouping according to the objectives pursued.

The questions included in the questionnaire were of two types: closed questions, with pre-coded answer options, dichotomous (yes/no type) or multiple (with Likert-type ordinal scale, in 5 steps with the following meanings: 1 = total disagreement, 2 = partial disagreement, 3 = undecided, 4 = partial agreement, 5 = total agreement) and open questions.

In order to apply the questionnaire, we contacted the directors of 10 banks in Romania to whom we presented the objectives of the research and the questionnaire. In the case of 3 of these banks, it was not possible to apply the questionnaire because the necessary approval was not obtained. In the other 7 banks, the questionnaire was administered to 150 people, managers and non-managers. Among the respondents, 62% were women and 38% men, 98.3% have higher education (of which 58.3% postgraduate studies and 40% university studies) and 1.7% have high school education, 24% are managers and 76 % do not hold management positions. Most of the respondents, namely 65%, have more than 5 years of experience in the organization where they currently work, while the percentage of those who have experience between 1 and 5 years is 25%. The number of those who have been working for a short time in the analyzed institutions is relatively small, they represent 10% of the total number of respondents.

128 questionnaires were completed and returned, of which 120 were valid, coming as follows: Investment bank – 50%, Savings Bank – 4%, Business bank – 2%, Commercial bank – 15%, Retail bank – 2%, Leasing bank – 6%2, Mortgage credit bank – 21%.

3.Research results

We acknowledge that a significant number of people working for financial institutions have done so for a considerable amount of time, assuring relevance in terms of the level of comprehension of the critical changes and their implementation by the pertinent institutions.

The questionnaire's initial questions were designed to examine how Romanian financial institution employees perceived organizational changes and their capacity to adapt to them. The majority of respondents (55%) agree with the statement "I think I adapt quite easily to major changes" completely, and 33% agree with it partially, indicating that they believe they have a high capacity for change adaptation.

We believe that it should be mentioned that none of the respondents expressed their total disagreement, and 7% expressed their partial disagreement. 5% of the respondents were undecided on this aspect (Figure no. 1).

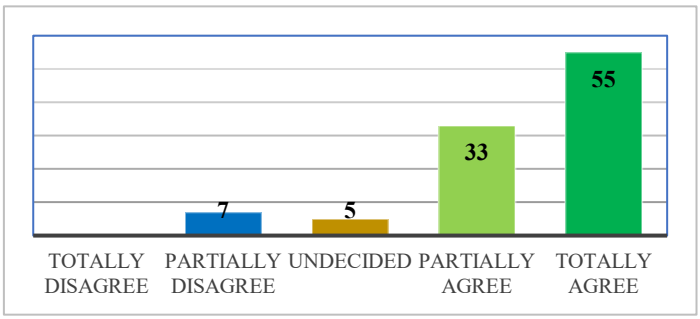


Figure no. 1. Employees easily adapt to major changes
Source: made by the authors

We can consider that the study participants want changes in the institutions where they work because more than 75% appreciate that any change is welcome in the current economic context (Figure no. 2).

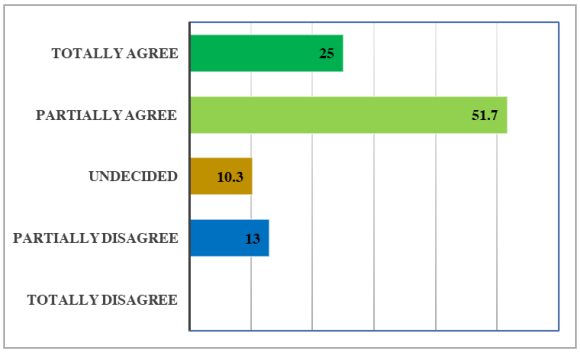


Figure no. 2. Any change is welcome
Source: made by the authors

The statement "If the management of the organization proposes a change plan, I will mobilize to put it into practice" received a substantial majority of yes votes (Figure 3). This demonstrates that staff members are ready to support the suggestions made for change by the organization's administration.

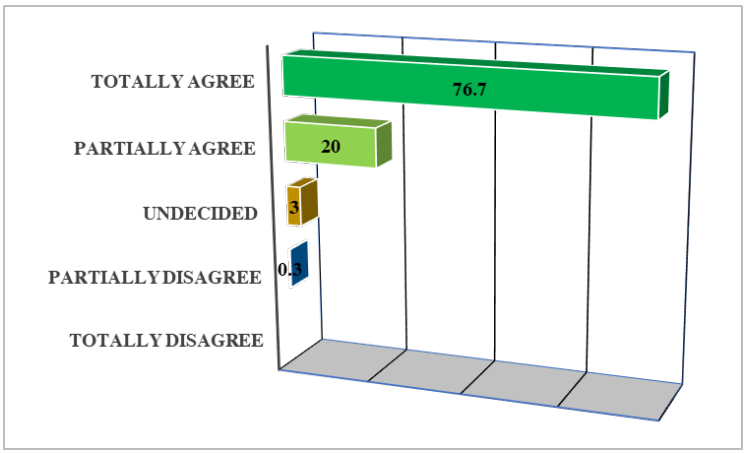


Figure no. 3. Employees will mobilize for the implementation of the change plans proposed by the management of the organization
Source: made by the authors

Following the answers given by the participants in the survey, we have identified a number of factors that can contribute to the acceptance and effective implementation of organizational changes. These include:

- improvement of working conditions;
- salary increase;
- promotion to a higher hierarchical step;
- increasing the professional qualification.

Another way to ensure the success of the implementation of the organizational change can be represented by the participation of employees in courses regarding the modification of the way in which they relate to the transformations within the organization.

From Figure 4 we observe that an overwhelming majority of employees (91.7%) consider that a major priority in the development of an effective change strategy is the stimulation of innovative employees. None of the respondents rejects the idea that there is a direct link between innovation and organizational change and that effective changes can occur much more easily if the institution motivates its employees to be creative and have new development ideas.

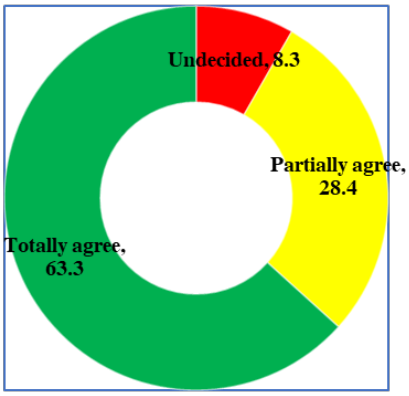


Figure no. 4. Stimulating employees who come up with new ideas or who try to change something for the better is a way to achieve real change

Source: made by the authors

As part of the research, we also sought to identify the obstacles encountered by the change within banking institutions, in the opinion of their members. Contrary to expectations, the number of those who do not know the most significant obstacles in making changes in banking institutions was relatively high. Among the answers given by the respondents, we considered those presented in Table 1 as the most important.

Table no. 1. Obstacles to change in banking institutions

the mentality of the new management that does not know the reality on the ground	the average age of the employees in one of the analyzed banks is high (55 years) in the conditions where the profile market is dominated by electronic communications and rapid legislative changes
ineffective communication	the lack of suitable products for the market
inadequate legislation	poor organization of the institution
the leadership style of top managers	approvals to be obtained from the parent bank
there is no real vision of the client-bank partnership	the resistance to evolution of some employees
human resource, employee mentality	low level of risk taking
the dynamic competition of the profile market	the relationship between the branch and some agencies

Source: made by the authors

4.Discussions

Employees in banking institutions need to adapt easily to major changes, as it is crucial to stay up-to-date and provide high-quality services. These changes may involve restructuring departments, changes in policies and procedures, and adapting to a new organizational culture. To succeed in the new structure and maintain their level of performance, employees must be flexible and open to change. The adaptability of employees to major changes plays a crucial role in the success of banking institutions. Employees must be open and receptive to new technologies and work methods. Changes brought about by the introduction of new technologies in the banking sector, such as online and mobile banking, process automation and artificial intelligence, can lead to increased efficiency and better and more personalized customer service.

Also, legislative changes and financial regulations may require banking institutions to adjust their policies and procedures to comply with the new requirements. Employees must be aware of these changes and apply them appropriately in their daily activities. In addition, the need to meet customer expectations is another important factor driving changes in banking institutions. Today, banking customers expect personalised, fast and affordable services. Employees must be prepared to respond to these needs and provide innovative solutions that improve the customer experience and build strong relationships with them.

The answers given by the study participants allowed us to identify some conditions considered to be necessary for the successful implementation of the organizational change process:

- ✓ the clear formulation of new objectives;

- ✓ reallocation of responsibilities in accordance with the attributions of the employment position and the salary;
- ✓ accurately establishing the tasks for each employee affected by the change;
- ✓ closer collaboration between managers and subordinates.

According to the results presented, employees know that, in the institutions where they work, changes aimed at:

- ✓ improving the management style of managers;
- ✓ promoting a better economic strategy;
- ✓ developing a more effective marketing strategy for the sale of products and services from the banks' portfolios.

We believe that it is not possible to ensure the implementation of change without encountering increased resistance to it if the employees involved do not know the necessity of producing the change, the stages of the transformation process but, above all, the proposed and expected objectives. Employees who come up with new ideas and voice their opinion about potential improvements bring an element of innovation and creativity to the banking institution. These fresh ideas can help identify better solutions, develop innovative products and services, and find effective ways to address existing challenges. Stimulating and appreciating employees who try to change things for the better helps to increase their motivation and engagement at work. When employees feel that their ideas and efforts are valued and supported, they will feel more motivated to continue to contribute ideas and actively engage in the change process.

Conclusions

The banking system in Romania, under the influence of the economic-financial crisis and the changes in the strategies and objectives of the parent banks in the countries of origin, has registered a series of restructuring processes that are still taking place today and whose effects will be manifested in the long term, especially in terms of its competitiveness and ability to satisfy the requirements of banking institutions' clients. In the current context of economic pressure and the evolution of the social and political environment, organizational change is becoming an increasingly important priority. Organizations are experiencing greater and more frequent changes in today's economic climate. The ever-changing marketplace, increasingly dynamic workforce, and technological advances have created an environment where change is becoming *business as usual* for organizations.

Change is a continuous process, and many changes occur without organizations being able to intervene. Changes can sometimes generate only a slight adjustment from a functional and structural point of view or, on the contrary, they can lead to a major redesign and reorganization of the organization.

In an organization, regardless of its field of activity, change can concern strategy, vision, structure, policies, budget, products and services, suppliers and customers, costs and prices, resources, technologies, etc. All these elements determine competitiveness and organizational performance, being influenced by both the external and internal environment of the organization.

Change is a complex process that can have negative outcomes as well as positive outcomes, and as a result we need to consider the available evidence so that the process is as efficient as possible. In this environment, organizations are beginning to recognize the importance of building competence for rapid and successful change.

The changes produced in recent years within the banking institutions in Romania have materialized in the following forms:

- ✓ changes of mid-level and even top managers;
- ✓ changes in business strategies;
- ✓ acquisition of the bank by another bank;
- ✓ change of shareholders;
- ✓ modification of the organizational structure;
- ✓ changing the targeted customer segment;
- ✓ changing the tasks specific to the positions;
- ✓ personnel restructuring;
- ✓ resizing the network of banking units.

Most of the employees of the analyzed banks (70%) declared that they are familiar with the term "change management", but only 48.3% appreciate that methods and tools specific to this concept are applied in the institutions where they work. At the same time, however, 83.4% of respondents declare that change management has an important and very important role in the institutions they belong to and that it is carried out "on the basis of change strategies and coherent action plans" (50%).

Contrary to the expectations at the beginning of the scientific approach, the strengths of the management are known to very few of the employees of the analyzed banking institutions. Specifically, 70% of the respondents stated that they do not know them or that they prefer not to comment and 7% of them said that there are no strong points of change management in the institutions where they work.

In order for an organization to be prepared for changes, its employees must show flexibility towards new elements that appear. Adaptability to change in organizations as a whole is built over time and with difficulty, but managers can use different methods of facilitation. The way in which a bank's employees are trained and motivated contributes to the creation of their commitment to the transformation processes undergone by the institution.

The research carried out also has some limitations, but we appreciate that they do not significantly influence the fulfillment of the established objectives, nor the conclusions obtained:

- ✓ the relatively small number of analyzed banking units due to the refusal of the management of some banks to allow the application of questionnaires among their employees;
- ✓ the condition imposed by the analyzed banking institutions that their names should not be made public;
- ✓ the subjectivity of the respondents directly affected by the changes that took place in the analyzed banking institutions;
- ✓ the reluctance to complete the open questions, which determined a lower rate of response to those questions;

Acknowledgment

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Energy transitioning to sustainability

Electricity Price Evolution and the Disruptive Economic and Geopolitical Context on the Spot Market. A Romanian Case Study

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Abstract

The current context of the electricity markets is marked by the lingering effects of COVID-19 and the conflict in Ukraine that have a significant influence on the European wholesale electricity markets. Both Day-Ahead Market (DAM) and balancing market have been heavily impacted by fluctuating prices. This trend started in October 2021 when the lockdowns were removed and the high request for commodities led to a higher inflation. Then in 2022, the conflict in Ukraine accentuated this evolution and even higher prices were recorded for electricity, gas, oil and other resources. In this paper, we analyze a set of fundamental variables and provide an electricity price forecast on DAM using a multiple regression model. The exogenous variables considered in this paper are the following: power system data (total consumption, total generation and its breakdown: renewables (RES) and Non-RES), economic data (inflation, interest rate), certificate price for CO2 emissions (EU-ETS), level of Danube River and other resources prices (oil, gas). Interesting insights can be extracted from a data set that consists of merged time series collected from January 2019 until August 2022. The results are measured using Mean Absolute Percentage Error (MAPE).

Keywords

Electricity price forecast, day-ahead market, multiple regression, emission price.

DOI: 10.24818/BASIQ/2023/09/003

Introduction

The electricity price evolution and forecast were extensively studied in the past as the electricity prices have a significant impact on the economies.

The motivation behind this study is related to the high price volatility that emerged by the end of 2021. For example, we show in Figure 1 two snapshots with the average prices on DAM in some European countries. The first snapshot is taken on 3rd on January 2022 and the second one is taken by the end of August (on 30th of August 2022).

One can notice that the prices increased from 100 Euro/MWh to 738 Euro/MWh, even seven times as is the case in Romania. Furthermore, impressive variations were recorded in France, Germany and in the neighbouring countries (Bulgaria, Serbia, Hungary). This evolution was the result of numerous factors, such as: rapid recovery after lockdowns and business dynamics that were left behind, European dependence on the Russian gas and oil resources, severe drought in some European countries, speculation on the market as market participant knew the economic and geopolitical context as well as the planned generation units outages.

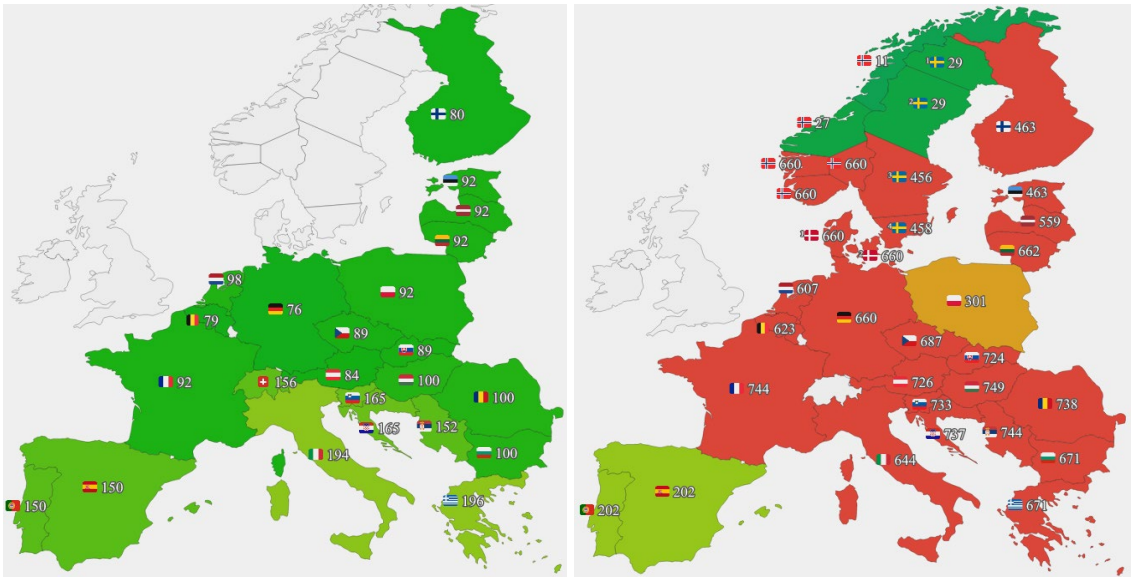


Figure no. 1. DAM prices in Europe 03 Jan. 2022 - 30 Aug. 2022

Source: https://euenergy.live

In the next section, we will investigate the input data set created to predict the electricity prices on DAM.

Literature review

The integration of the electricity price prediction was envisioned to estimate the electricity costs for commercial activities on mid-term (Busse and Rieck, 2022). Probably the most difficult aspect is to predict the electricity price spikes or sudden increase/decrease of the prices (Lu et al., 2005; Voronin and Partanen, 2013).

The financial impact of prediction low accuracy on the generation units (Kath and Ziel, 2018; Ugurlu et al., 2018), load schedule (Mathaba, Xia and Zhang, 2014) and storage facilities (Finnah, Gönsch and Ziel, 2022) was also studied. The impact of a higher volume of Renewable Energy Sources (RES), especially solar and wind, on the electricity prices on DAM was investigated by Alsaedi, Tularam and Wong (2020).

Numerous methods and models have been developed to cope with electricity price forecast, including naïve and regressive models (Nowotarski and Weron, 2015; Marcjasz, Uniejewski and Weron, 2020; Liu et al., 2022), neural networks (Abedinia et al., 2015; Keles et al., 2016; Lehna, Scheller and Herwartz, 2022), deep learning using Long Short-Term Memory (Li and Becker, 2021), Machine Learning (ML) – SVM (Razak et al., 2019) and hybrid models (Dong et al., 2011; Shikhin, Shikhina and Kouzalis, 2022).

Most of the studies related to the electricity price forecast on DAM focused on West-European countries (Spain - (Beltrán et al., 2022)), Australia (Yang et al., 2019), U.S.A. (Ontario - (Razak et al., 2019)) and Nordic countries (Danish market - Schütz Roungkvist, Enevoldsen and Xydis, 2020)), probably because the data sets are easily available.

Methodology

A similar analysis of the Romanian electricity prices and its prediction have not been performed yet. Therefore, for Romania, a data set was built merging open data sources such as from Transelectrica (https://www.transelectrica.ro/ro/web/tel/home) for Romanian power system data, INS (http://statistici.insse.ro/shop/?page=ipc1) for inflation or index price, OPCOM (https://www.opcom.ro/pp/grafice_ip/raportPIPsiVolumTranzactionat.php?lang=ro) for prices and traded quantities on DAM, Macrotrends for oil price, cursbnr (https://www.cursbnr.ro/robor) for interest rate (ROBOR3M), Romanian Commodities Exchange (https://www.brm.ro/piata-spot-gn/) for gas price on DAM). The various time series were merged based on date and hour, including level of Danube (https://www.cotele-dunarii.ro/Braila) at three locations (Turnu Măgurele, Brăila and Tulcea). We focused on the interval before COVID-19 and after the first waves of shock caused by the conflict in Ukraine. Thus, the data was extracted from 1st of January 2019 until end of August 2022. From the Romanian Transmission

System Operator - Transelectrica, we extracted several input variables, such as: the total consumption, generation and its breakdown (coal, oil and gas, hydro, nuclear, wind, PV, biomass generation), exchange with neighbouring power systems or sold. The prices for emissions EU-ETS (https://www.investing.com/commodities/carbon-emissions-historical-data) were also extracted as well as inflation in Europe that is actually highly correlated with inflation in Romania.

The electricity prices in Romania started to increase in October 2021 and kept an increasing pace until August 2022. The electricity price evolution on DAM is graphically depicted in Figure 2.

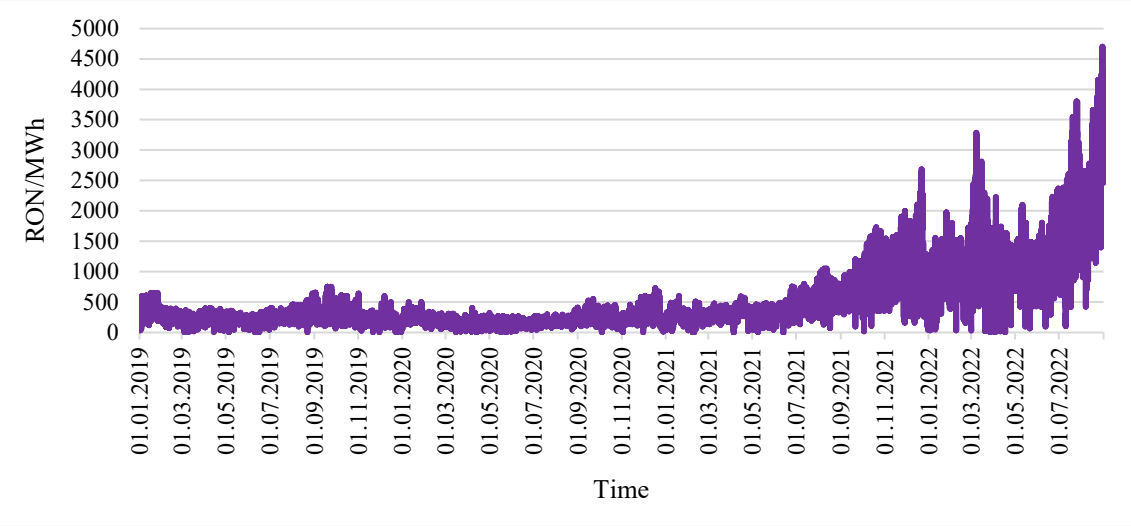


Figure no. 2. Price evolution in the analysed interval (Jan. 2019 - Aug. 2022)

For the analysed interval, Jan. 2019 - Aug. 2022, the correlation between electricity prices on DAM and the other variables is shown in Table 1. It is strongly correlated with gas price on DAM, inflation in Romania and Europe, interest rate (ROBOR3M), oil price and CO2 emissions certificate price (Price EUETS). A lower inverse correlation is registered between the electricity price on DAM and the level of Danube (-0.3 on average). Therefore, the droughts influence the electricity price on DAM: the lower the levels, the higher the prices.

Table no. 1. Correlations between target variable – electricity price on DAM (El_price_DAM) and other exogenous variables

Variable	2019-2022 El_price_DAM	2019 El_price_DAM	2020 El_price_DAM	2021 El_price_DAM	2022 El_price_DAM
El_price_DAM	1	1	1	1	1
El_quantity	0.196241	0.599123	0.312068	-0.13812	0.168683
Gas_price_DAM	0.89076	0.122353	0.443976	0.82858	0.757485
Gas_quantity_DAM	-0.14605	-0.03055	-0.1695	0.486406	0.334951
Inflation_RO	0.795821	-0.33964	-0.05012	0.789006	0.329347
Inflation_EU	0.814193	-0.16378	-0.07226	0.786641	0.454506
ROBOR 3M	0.664544	-0.31346	-0.07331	0.704966	0.586826
Oil_price	0.685848	-0.32092	0.423426	0.593899	0.042344
Level_Turnu Magurele	-0.28379	-0.31655	-0.11877	-0.55886	-0.44648
Level_BR	-0.32029	-0.27305	-0.0728	-0.57319	-0.55958
Level_TL	-0.26181	-0.26507	-0.09993	-0.5755	-0.54291
Consumption	0.131593	0.641255	0.765344	0.322032	0.193566
Generation	-0.04685	0.23874	0.536873	-0.03781	-0.1943
Coal_gen	-0.00101	0.405274	0.571223	0.132546	0.228913
Oil&Gas_gen	0.167736	0.366169	0.56547	0.414415	0.048759
Hydro_gen	-0.09151	0.024599	0.398181	-0.33788	-0.0179
Nuclear_gen	-0.0473	0.045853	0.07763	0.196464	-0.01421
Wind_gen	-0.07253	-0.15929	-0.17239	-0.00498	-0.3163
PV_gen	0.008701	0.074729	-0.11724	-0.09232	-0.00558
Biomass_gen	0.24985	0.242901	0.353651	-0.07165	-0.21031
Exchange	0.175975	0.293093	0.357552	0.306741	0.242605
Price_EUETS	0.763298	0.083855	0.442297	0.707506	0.004049

The variation in time of the correlations is shown in Figure 3:

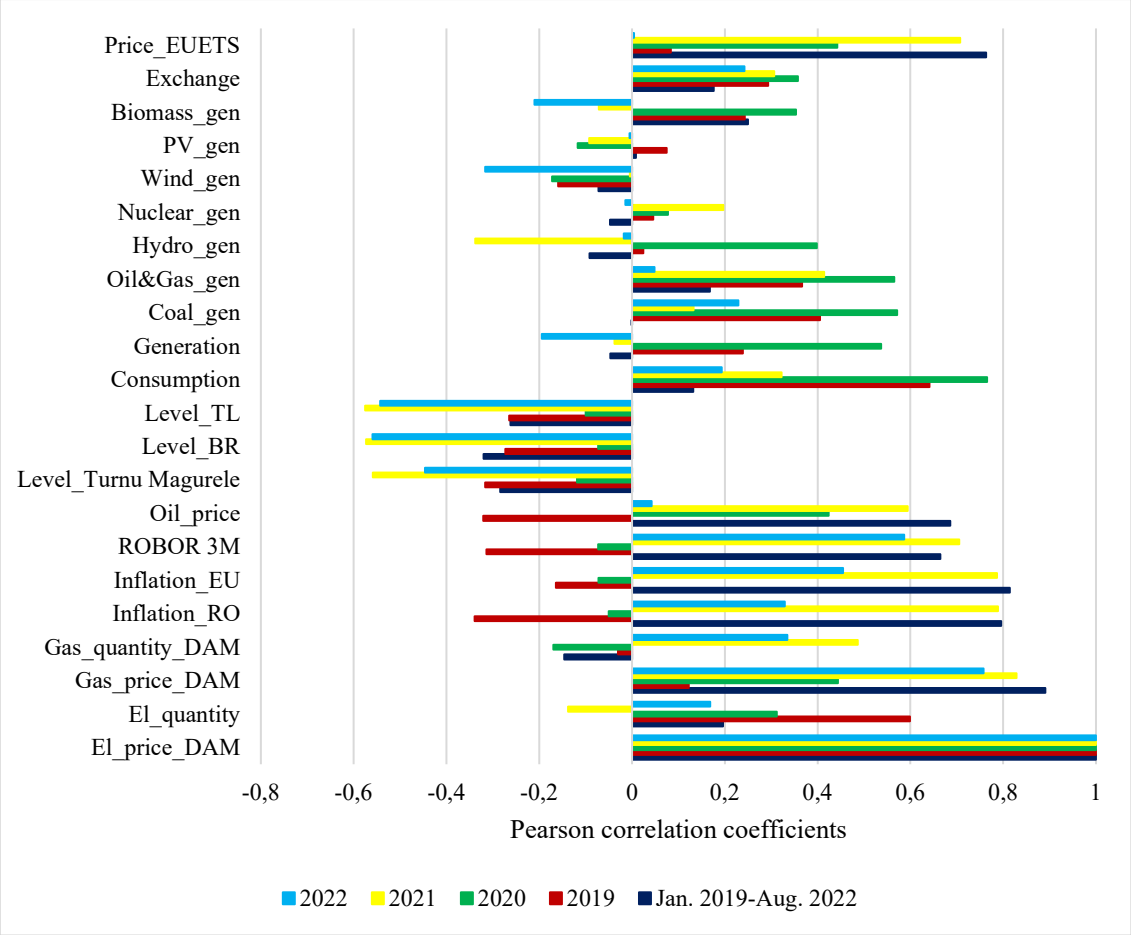


Figure no. 3. Pearson correlation coefficients

It is interesting to notice how some variables lost their importance (for instance, traded quantity on DAM, total consumption) and other gained more importance (gas price). The electricity price is more correlated with the prices of other resources (oil, gas) and less dependent on the consumption level. Inflation and interest rate have no significant influence in 2019 and 2020, but in 2021 they increased substantially.

For calculations, we considered several combinations of exogenous variables, and the best results are obtained using the variables shown in Table 2. The variation of electricity price is explained in proportion of 81% by the exogenous variables (as in Table 2): electricity traded quantity or volume on DAM (El_quantity), certificate price for CO2 emissions (Price_EUETS), gas price on DAM (Gas_price_DAM), inflation in Romania (inflation_RO), interest rate calculated at three months (ROBOR 3M) and brent crude oil price (Oil_price). The number of observations is 32,060 reflecting the hourly data in 3 years and half. All *p-values* are smaller than 0.05 threshold (as in Table 3). Therefore, the regression is statistically significant.

Table no. 2. Regression statistics

Regression Statistics	
Multiple R	0.899121
R Square	0.808419
Adjusted R Square	0.808383
Standard Error	241.1842
Observations	32060

Table no. 3. Regression coefficients and significance

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-197.787	8.935	-22.133	0.000	-215.301	-180.272	-215.301	-180.272

El_quantity	0.056	0.002	23.902	0.000	0.051	0.061	0.051	0.061
Price_EUETS	0.958	0.201	4.748	0.000	0.562	1.353	0.562	1.353
Gas_price_DAM	2.173	0.015	137.191	0.000	2.141	2.204	2.141	2.204
Inflation_RO	-43.997	1.797	-24.471	0.000	-47.521	-40.473	-47.521	-40.473
ROBOR 3M	85.749	2.404	35.659	0.000	81.036	90.463	81.036	90.463
Oil_price	1.566	0.133	11.699	0.000	1.303	1.828	1.303	1.828

The line fit plots associated to the exogenous variables are depicted in Figure 4.

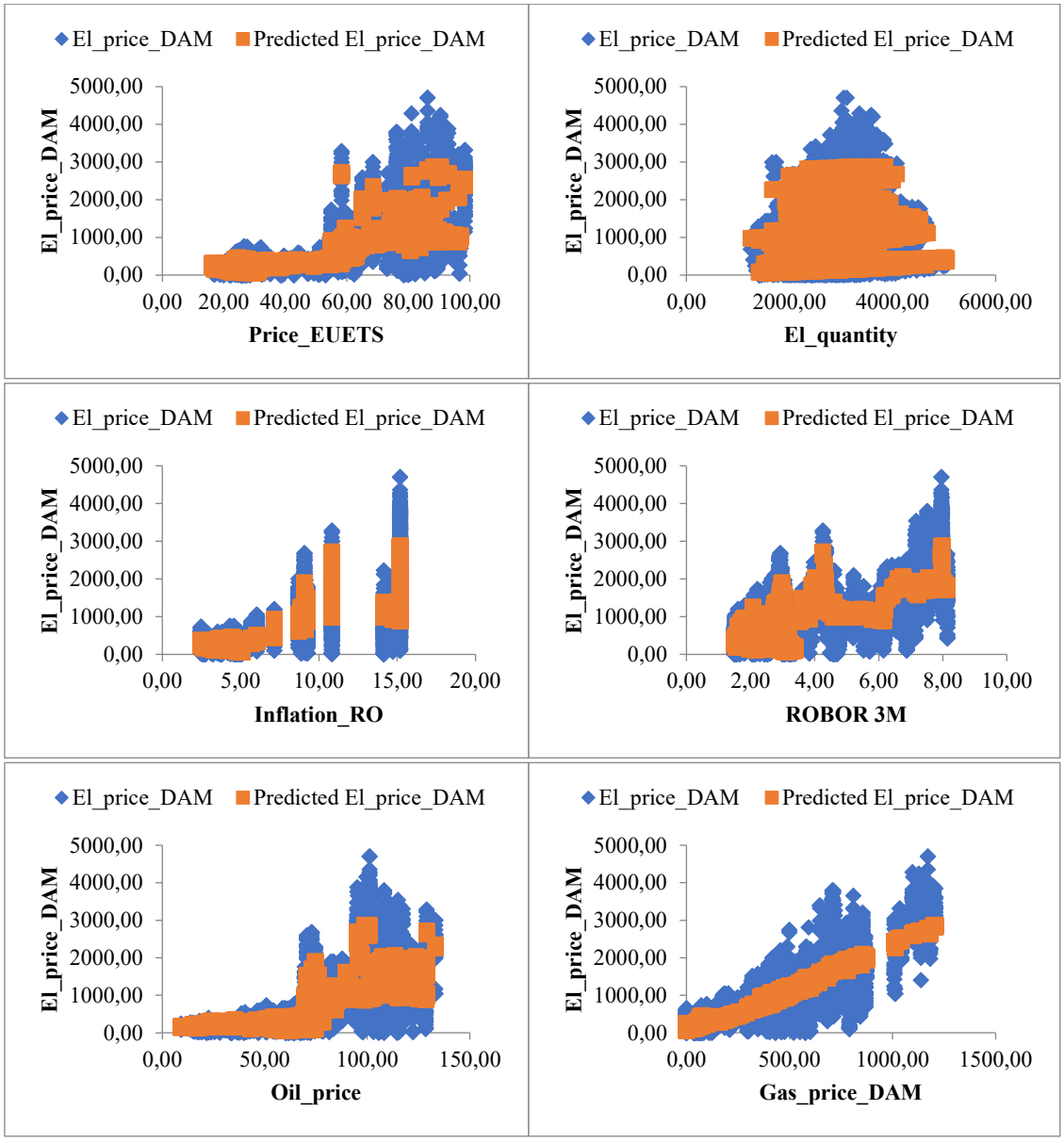


Figure no. 4. Line fit plots associated to the exogenous variables

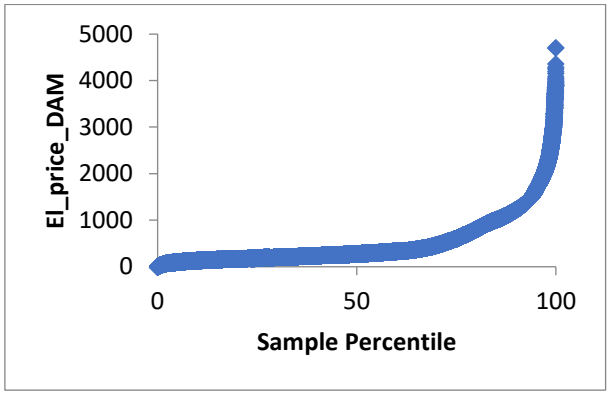


Figure no. 5. Normal probability plot

The residual plots are depicted in Figure 6. Residual is the difference between observed and predicted values.

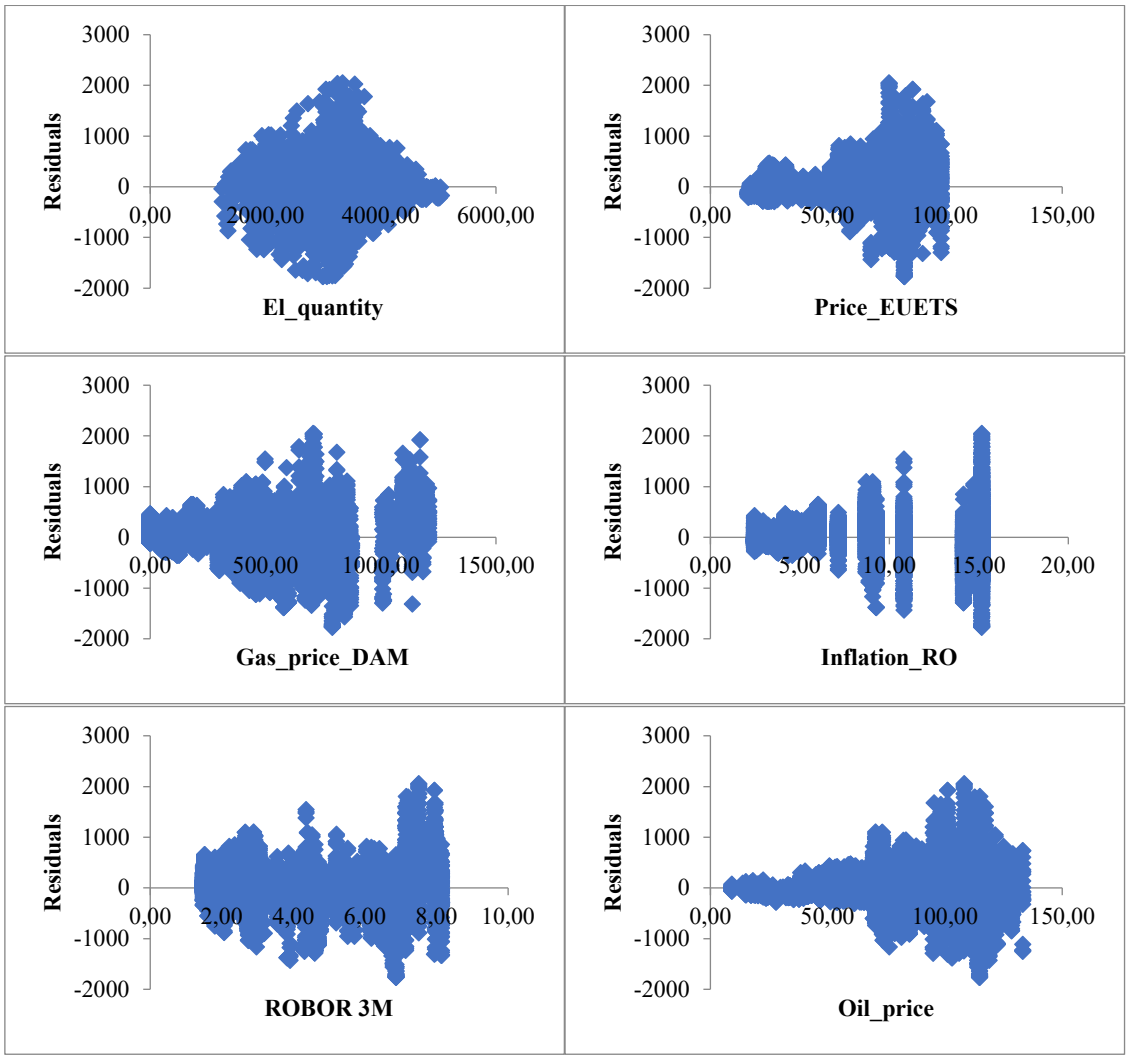


Figure no. 6. Residual plots

According to the results obtained in Table 3, one can predict the electricity price using the following equation:

$$\mathrm{El}_{\mathrm{price}_{\mathrm{DAM}}} = -197.787 + 0.056 \times \mathrm{El}_{\mathrm{quantity}} + 0.958 \times \mathrm{Price}_{\mathrm{EUETS}} + 2.173 \times \mathrm{Gas}_{\mathrm{price}_{\mathrm{DAM}}} - 43.997 \times \mathrm{Inflation}_{\mathrm{RO}} + 85.749 \times \mathrm{ROBOR}_{3\mathrm{M}} + 1.566 \times \mathrm{Oil}_{\mathrm{price}} \quad (1)$$

The results were measured using MAPE that is 6.17%, therefore the accuracy of the regression model is over 93%. The performance indicators except MAPE were calculated using FORECAST.ETS.STAT function from Excel. The values are presented in Table 4. MAPE was calculated using the following eq.:

$$MAPE = \frac{1}{T}\sum_{h=1}^{T}\frac{\left|y^h - \widehat{y^h}\right|}{|y^h|} \times 100\% \quad (2)$$

Where y^h is the observed value, $\widehat{y^h}$ is the predicted value and T is the interval.

Table no. 4. Performance indicators for predicting the electricity price on DAM using multiple regression

Metric	Value
MAPE	6.17099261
MASE	18.19563873
SMAPE	0.000263966
MAE	0.568033239
RMSE	4.070766716

MASE returns the mean absolute scaled error metric that is a measure of the accuracy of forecasts. SMAPE returns the symmetric mean absolute percentage error metric that is an accuracy measure based on percentage errors. MAE returns the symmetric mean absolute error metric an accuracy measure based on errors or a measure of the differences between predicted and observed values, whereas RMSE returns the root mean squared error metric.

Conclusion

In this paper, we aimed to analyse the electricity prices on the European spot markets (with a special focus on one of the East-European countries – Romania) and to predict them using a multiple regression model. Th contribution of this paper consists in identifying the variables that provide the best result as several regression models were run with different sets of six variable out of the total – 21 variables.

Therefore, we found out that electricity traded quantity or volume on DAM (El_quantity), certificate price for CO2 emissions (Price_EUETS), gas price on DAM (Gas_price_DAM), inflation in Romania (Inflation_RO), interest rate calculated at three months (ROBOR 3M) and brent crude oil price (Oil_price) represent the variables that allow us to predict the electricity price on DAM with an accuracy of 93%.

Compared with other approaches, such as ML, neural, networks, LSTM, our approach is simpler and assists us to understand the trend and potential evolution of the electricity prices on spot markets as well as factors that can influence these prices.

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The Effect of Renewable Energy Consumption in Romania

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Abstract

The development of a national economy generally takes into account its capability to generate and maintain access to energy resources constantly. Thus, powerful nations are usually associated with considerable energy consumptions. However, this correlation can slowly disappear as soon as nations focus their attention towards renewable energy and intensify its contribution to sustainable growth. Sustainable development can be achieved through conservation of natural resources, sustainable agriculture, education of the labour force and adaptation to modern technologies. The education system must be tailored in accordance with the changing requirements as the perspectives of the society are currently oriented towards a green economy supported by green technologies. The aims of this research paper are to examine the current situation of renewable energy in Romania and to question the ability of household to transition to green energy. In order to reach the objectives of this research paper, the author used secondary quantitative research methodology. Therefore, the author identified and obtained the necessary information through desk research from mainly top scientific journals related to this topic and Eurostat. Significant increase in the energy prices directly impacts both the economic operators and household consumption as the disposable income for households will be reduced drastically due to the inflation being present in many other sectors. From 2018 to 2020, the gross final energy consumption as well as the renewable energy production have increased year by year. However, in 2021, the gross final energy consumption as well as the renewable energy production have slightly decreased due to the inflation affecting energy input and raw materials prices. The originality of this research paper consists in the fact that it provides an up-to-date overview of the Romanian economy and its energy sector, including a viable solution to the energy problem.

Keywords

Renewable resources, green energy, green growth, energy efficiency, fossil energy, inflation, photovoltaics.

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Introduction

The development of a national economy generally takes into account its capability to generate and maintain access to energy resources constantly. Thus, powerful nations are usually associated with considerable energy consumptions. However, this correlation can slowly disappear as soon as nations focus their attention towards renewable energy and intensify its contribution to sustainable growth. Additionally, it is very important to boost the energy sector and its security in order to achieve green growth. According to Reilly (2012), a reduction in the dependency of energy imports can be accomplished by increasing the production of renewable energy that contributes to a faster transition to an independent and greener economy. The current challenge for the European and world economies must consider a substantial rise in the share of renewable energy especially nowadays with energy high prices and environmental concerns.

The renewable energy sector significantly developed in the past few years. It creates major opportunities for new industries in both new technological production and exploration, influencing the economic growth and job creation. The aim of this sector is to efficiently improve the low or unused resource such as inappropriately exploit of biomass, low production of the labour force and most importantly, solar and wind energy production that represents one of the key methodologies used to generate green energy for households. However, it is expensive to produce this form of energy for each household due to its significant investment cost. The topic of energy efficiency became the main challenge of the European Union. According to results of Balitskiy et al. (2016), the consumption of natural gas positively influences the economic growth although the correlation between the consumption of natural gas and economic

development appears to be negative. Their findings suggest that policy makers should consider targeting and increasing energy efficiency and intensity.

The scarcity of the necessary resources can be reduced by enforcing economic policies regarding their protection (recommending the use of green energy technologies) and interventions in the markets (labour market, resources market, etc). Nowadays, economic growth is strongly connected with sustainability. Therefore, the economic system works very well within an ecological structure as both of them complement each other. More specifically, applied economic policies in an ecological system support each other and evolve together. Incomplete or manipulated information negatively impacts the performance evaluation of alternative investments compared to the classical ones (Liou et al. 2016).

On the other hand, the labour force is not yet experienced enough for the renewable technologies as much of Romanian population is aged, especially in the rural areas. Thus, the need to train the younger generation arises. It is very important for the labour force to adapt to new technologies and recognize the need for sustainability development. Creating and using renewable energy stimulates the jobs creation for this sector. The net effect on employment varies according to loss of jobs in other sectors. However, specialists in this field indicate that all non-fossil fuel technologies such as energy efficiency and renewable energy create more jobs per unit energy compared to the natural gas and coal (Wei, Patadia and Kammen, 2010).

Sustainable development can be achieved through conservation of natural resources, sustainable agriculture, education of the labour force and adaptation to the modern technology. The education system must be tailored in accordance with the changing requirements as the perspectives of the society are currently oriented towards a green economy supported by green technologies. Education plays a fundamental role in understanding the value of sustainable objectives and their future benefits (Biswas, 2012). To reach this goal, education must be supported by both governmental agencies and non-governmental organizations. Working together on different policies and projects significantly improves the education system compared to only schools and universities (Kolleck, 2016).

The aims of this research paper are to examine the current situation of renewable energy in Romania and to question the ability of household to transition to green energy. The research methodology was based on quantitative data.

This research paper is organized as follows: the review of the scientific literature is presented in the second section while the research methodology together with results and discussion are presented in the third and fourth section respectively. Finally, this research paper ends with the conclusion section.

1. Review of the scientific literature

Energy is perceived as a strategic commodity and even the slightest doubt related to its supply can affect the performance of the economy especially in emerging economies. At some point, every society depends on certain levels of energy. Therefore, it is essential to secure energy supplies at reasonable prices and develop a sustainable socioeconomic environment with reduced greenhouse gas (GHG) emissions and low environmental impact. According to Sen and Ganguly (2017), conventional fossil fuel consumption signifies 85% of the energy demand which is responsible for 56.6% of anthropogenic greenhouse gas emissions. In the current state, renewable energy technologies heavily support the idea of using renewable energy as much as possible in order to replace the fossil fuel consumption. Favorable promoting policies provided by governments increase the confidence in alternative sources of energy production.

Renewable technologies generate clean energy as they optimally use the necessary resources to reduce the environmental impact while producing minimum secondary wastes. These renewable technologies are sustainable for the current as well as future economics. Sun represents the main source used to produce all energies. The fundamental forms of solar energy are light and heat. Both are beneficial for the environment in various ways. Transformation of the sunlight and heat result in flows of renewable energy such as wind energy and biomass. Renewable energy technology brings forth a significant opportunity to reduce global warming by switching to alternative green energy sources and lowering the greenhouse gas emissions (Panwar, Kaushik and Kothari, 2011). Furthermore, Reikard (2015) argues that in the coastal region the energy produced by waves is becoming extremely popular and might soon replace the leading sources (solar and wind) renewable energy production. Compared to the solar and wind, waves are found to be more predictable and indicate lower reserve costs. Thus, waves could also be an alternative energy producer for Romania in the near future.

Bhattacharya et al. (2016) confirmed the evident of long-term relationship between energy-related contributions and economic growth using panel estimation. The findings of the authors on long-term output

elasticities show a significant positive impact on the economic productivity when consuming renewable energy for 57% of the selected countries. Furthermore, the authors also conducted long-term time-series analysis to confirm their initial results. As a result, they suggest that government, international cooperation agencies, associated bodies and energy planners must act together in a coordinated effort to increase renewable energy investment for low carbon growth.

The consumption of renewable energy provided by the solar and wind sources in the electricity sector is rapidly growing, making it the highest proportion in the European economy. The volatility of photovoltaics and wind power have significantly declined due to the absence of fuel cost and thus, their attractiveness has increased. From 2005 to 2015, the installed wind turbines producing green energy has increased three and a half times to 142 GW while the solar photovoltaics producing green energy has increased 50-fold to reach 95 GW in Europe. Since the Paris Agreement went into force as of 4th November 2016, the pressure of replacing the traditional energy with green energy has considerably intensified. According to Arantegui and Jäger-Waldau (2018), the European Union began deploying wind turbines and photovoltaics together with the policy drivers. Hence, in 2016, approximately 12% of the demand for electricity in the European Union was covered by wind and solar renewable technologies. However, to reach the 2030 goal, a tripling green energy contribution is necessary.

2. Research methodology

In order to reach the objectives of this research paper, the author used secondary quantitative research methodology. Therefore, the author identified and obtained the necessary information through desk research from mainly top scientific journals related to this topic and Eurostat. Afterwards, the author organized and examined the dataset using a comprehensive literature review. Lastly, the author incorporated the results within this research paper.

3. Results and discussion

After reviewing the literature of top scientific journals related to this topic, the author has examined the dataset and recognized the impact of this research paper on the Romanian economy. The production of energy is crucial for accomplishing daily objectives regardless of the beneficiary (households and economic operators). In recent times, growth of its prices in the European Union is likely to reflect eventually the general rise in inflation rates and the dynamics of consumer prices. Furthermore, concerns regarding the sudden price increases in energy supply could have significant medium and long-term effects on the economy. As a result, the uncertainty concerning inflation prospects of economic operators has increased and the economic recovery period will be longer.

The significant increase in energy prices along with the rise of all raw materials prices will be reflected in the GDP of the following years. Among the important transmission channels signaling these shocks are the available real income of households together with the resources available for investment of economic operators considering that energy inputs are very challenging to substitute with other factors of production over short-term and medium-term time spans. The aggregate effects of rising energy costs have a negative impact on the GDP. Hence, their consequences are expected to reveal both the dynamics of potential GDP and the cyclical component (GDP gap) mainly as a result of reduced aggregate domestic demand. Significant increase in the energy prices directly impacts both the economic operators and household consumption as the disposable income for households will be reduced drastically due to the inflation being present in many other sectors. Furthermore, the ability to generate new jobs will also be reduced. (Radulescu et al. 2022).

The severe impact of inflation in most of the key sectors of the economy such as industrial production recorded increasing production costs due to the prices of the energy inputs. In addition, the exports of goods and services continue to be affected by the complications associated with the supply chain. The dynamics of goods and services imports are considered to be influenced by the domestic demand and, respectively, those on exports of goods and services. Nonetheless, imports might still remain the solution due to the domestic increase in the price of energy and better energy-efficient technologies, especially within certain segments of the market.

Table no. 1. Renewable energy Romania

Energy	Type	2018	2019	2020	2021
Electricity	Hydro	1,432.8	1,416.1	1,377.4	1,390.9
	Wind	570.9	580.3	582.6	647.3
	Solar	152.3	152.8	149.0	146.5
	Solid biofuels	31.6	38.7	42.4	49.9
	All other renewables	6.0	4.6	4.6	6.3
	Total numerator	**2,193.5**	**2,192.7**	**2,156.0**	**2,240.9**
	Electricity generated from other sources	5,248.5	5,145.2	4,970.8	5,273.9
	Total denominator	**5,248.5**	**5,145.2**	**4,970.8**	**5,273.9**
	Total (%)	**41.79%**	**42.62%**	**43.37%**	**42.49%**
Transport	Ren. Electricity in road transport	1.4	1.4	1.5	6.9
	Ren. Electricity in rail transport	36.7	36.2	36.0	42.2
	Ren. Electricity in all other transport modes	0.7	0.7	1.5	1.8
	Compliant biofuels	297.1	412.4	483.3	495.8
	Total numerator	**396.6**	**510.5**	**549.2**	**518.9**
	Fuel used in transport	6,253.7	6,506.5	6,430.5	6,766.3
	Total denumeraator	**6,253.7**	**6,506.5**	**6,430.5**	**6,766.3**
	Total (%)	**6.34%**	**7.85%**	**8.54%**	**7.67%**
Heating and cooling	Final energy consumption	3,403.0	3,419.2	3,363.2	3,565.7
	Derived heat	66.5	76.6	91.5	95.7
	Total numerator	**3,469.5**	**3,495.9**	**3,454.6**	**3,661.5**
	All fuel consumed	13,641.5	13,581.9	13,640.4	14,955.4
	Total denumerator	**13,641.5**	**13,581.9**	**13,640.4**	**14,955.4**
	Total (%)	**25.43%**	**25.74%**	**25.33%**	**24.48%**
Gross final consumption	Electricity	2,154.7	2,154.4	2,117.0	2,190.0
Note: electricity used in transport is included in transport and not in electricity	Heating and cooling	3,469.5	3,495.9	3,454.6	3,661.5
	Transport	335.9	450.6	522.3	477.1
	Total numerator	**5,960.1**	**6,100.9**	**6,060.8**	**6,328.6**
	Aviation adjustment	24,964.1	25,117.0	24,760.7	26,820.3
	Total denumerator	**24,964.1**	**25,117.0**	**24,760.7**	**26,820.3**
	Total (%)	**23.87%**	**24.29%**	**24.48%**	**23.60%**

Source: Eurostat shares 2021.

As presented in Table no. 1, the ratio between the total amount of renewable energy (total numerator) divided by the total amount of all energy (total denominator) represents the gross final energy consumption. Thus, from 2018 to 2020, it can be seen that the gross final energy consumption as well as the renewable energy production have increased year by year. However, in 2021, the gross final energy consumption as well as the renewable energy production have slightly decreased due to the inflation affecting energy input and raw materials prices. As a result, key sectors of the economy such as industrial production has also been impacted.

A viable solution to protect households and economic operators is the installation of photovoltaic panels. According to Romanian Energy Regulatory Authority (ANRE), approximately 14.000 prosumers were recorded at the end of 2021. A prosumer is an entity that consumes and also produces energy. It is a massive increase in the number of prosumers compared with the year 2020, where nearly 1700 prosumers were recorded (Economica.net, 2022). Unfortunately, the official statistics for 2022 are yet to be determined. However, the trend is likely to go up as energy prices continue to climb.

Conclusions

The results of this research paper are in line with those of Wei, Patadia and Kammen (2010), Panwar, Kaushik and Kothari (2011), Reilly (2012), Biswas (2012), Reikard (2015), Balitskiy et al. (2016), Bhattacharya et al. (2016), Liou et al. (2016), Kolleck (2016), Sen and Ganguly (2017), Arantegui and Jäger-Waldau (2018), Radulescu et al. (2022).

The development of a national economy generally takes into account its capability to generate and maintain access to energy resources constantly. Thus, powerful nations are usually associated with considerable energy consumptions. However, this correlation can slowly disappear as soon as nations focus their attention towards renewable energy and intensify its contribution to sustainable growth. Additionally, it is very important to boost the energy sector and its security in order to achieve green growth. Sustainable development can be achieved through conservation of natural resources, sustainable agriculture, education of the labour force and adaptation to modern technologies. The education system must be tailored in accordance with the changing requirements as the perspectives of the society are currently oriented towards a green economy supported by green technologies. Education plays a fundamental role in understanding the value of sustainable objectives and their future benefits.

However, a major drawback of photovoltaic panels is represented by their close relationship with the sun. In great weather conditions, the photovoltaic panels increase their production while in worse weather conditions, the photovoltaic panels lower their production. Similar problems extend to other renewable energy sources such as wind and waves. As a results, for the time being, the fossil fuels cannot be completely eliminated.

This research paper will enrich the literature associated with green energy development, improvement of the educational system and the adaptation of labour force to renewable technologies even though the complete substitution of the fossil fuels with renewable energy has not yet been achieved.

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The Deregulation Trap in Today's Energy Markets

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Abstract

The deregulation of the energy industry has long been a contentious issue. Opponents claim that it can lead to higher pricing, poorer dependability, and market manipulation, while supporters claim that it results in increased competition, cheaper prices, and improved efficiency. Overall, energy market deregulation can have both positive and negative effects, depending on the specific circumstances of each market. While deregulation can lead to greater competition, efficiency, and choice, it can also create greater volatility and risk if not properly managed. Therefore, policymakers and regulators need to carefully consider the potential benefits and drawbacks of deregulation before implementing any changes to the market structure. This research essay looks at the historical background and justification for the deregulation of the energy market, the effects it has on consumers, and the opportunity for regulatory control to lessen any unfavorable effects.

Keywords

Energy markets, deregulation, development, sustainability

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Introduction

From the beginning of the 20th century, the regulation of energy markets has played a significant role in the American economy (Stigler, Friedland, 1962). To guarantee that customers have access to reasonably priced and dependable energy supply, governments have historically controlled the energy markets. Nonetheless, there has been an increasing tendency toward deregulation in recent years, and several states have adopted regulations that for greater competition in the energy sector (Zajicek, 1999). Deregulation proponents assert that it can result in cheaper costs, higher effectiveness, and more innovation, while deregulation opponents caution about the possibility of market manipulation and less reliability.

Energy market deregulation refers to the process of removing government regulations and controls on the energy market, allowing for more competition and greater flexibility in pricing and supply (Bodislav, 2013). The impact of energy market deregulation can vary depending on the specific circumstances of each market, but in general, there are several potential results that may occur:

- Increased competition: Energy market deregulation can lead to increased competition among suppliers, resulting in lower prices for consumers. With more suppliers competing for customers, companies may be forced to offer more attractive pricing and incentives to win business.

- Improved efficiency: Deregulation can also lead to greater efficiency in the energy market. Suppliers may be more motivated to invest in new technologies and infrastructure to improve their competitiveness, and this can lead to more efficient use of energy resources.

- Greater choice: Deregulation can provide consumers with greater choice in terms of their energy supplier, the types of energy sources available, and the pricing plans offered. This can help to create a more dynamic and responsive market that is better suited to the needs of individual customers.

- Market volatility: Energy market deregulation can lead to greater market volatility and price fluctuations. This can occur if there are sudden changes in supply or demand, or if suppliers are subject to unexpected external factors such as changes in government policy or fluctuations in commodity prices.

- Risk of market manipulation: With increased competition and greater market complexity, there is also a risk of market manipulation by unscrupulous suppliers or other market actors. Regulators may need to be vigilant in monitoring the market to prevent anti-competitive behavior or other forms of market abuse.

Literature Review on Energy Market Deregulation

Energy market deregulation has its roots in the 1970s, when the US saw a jump in energy costs and shortages as a result of the OPEC oil embargo. In response, the government put in place a series of measures designed to cut energy use and boost local output. The Public Utilities Regulatory Policy Act of 1978 was one of the most important of these laws, requiring utilities to buy electricity from independent power producers at prices determined by regulators.

Although PURPA was designed to promote competition in the energy industry, it eventually resulted in the growth of small-scale power producers that were able to sell their electricity at exorbitant costs. As a result, in the 1990s, several states started to experiment with dereglementing their energy markets. A handful of jurisdictions have fully deregulated their energy markets by the early 2000s, allowing customers to select their own energy suppliers and fostering more competition.

Deregulation of the energy market refers to the process of reducing governmental oversight and restrictions on the industry. In this process, the pricing of energy commodities like electricity, natural gas, and oil are determined by market forces. The goal of deregulating the energy market is to boost competition in the industry, boost productivity, and ultimately bring down consumer costs (Rădulescu, Angheluta et al., 2022). Deregulation of the energy market has its roots in the early 1900s, when the government started to regulate monopolies to stop them from taking advantage of customers.

The production, delivery, and cost of energy commodities were all subject to government regulation prior to the energy market's deregulation. The utilities, which were in charge of providing energy to customers, were likewise under the jurisdiction of the government (Profiroiu et al., 2020). The utilities were governed to prevent them from abusing their monopolistic position and to guarantee that they delivered electricity at fair and acceptable pricing (Radulescu et al., 2020).

Due to the energy crisis in the 1970s, the government implemented regulations to encourage energy conservation and efficiency. The government started looking at the notion of deregulating the energy industry as a method to enhance competition and bring down energy prices, but these measures had only modest results.

The government started putting deregulation measures into place for the energy industry in the 1980s. Natural gas was the first industry to be deregulated, followed by oil and electricity. The goal of deregulating the energy sector was to encourage competition, which would result in lower consumer costs, more efficiency, and innovative thinking (Jianu et al., 2019). The government thought that deregulation would spur further competition by encouraging new market entrants.

The idea that government regulation was producing inefficiencies in the energy industry was one of the main drivers for the deregulation of the energy market (Angheluta et al., 2019).. The government argued that because regulated monopolies were guaranteed a fixed amount of profit, they had no motivation to innovate or cut expenses. The government hoped that by liberalizing the energy sector, it would level the playing field for all businesses, fostering more efficiency and innovation (Bodislav et al., 2020).

Deregulation, according to the administration, would boost energy sector investment. Energy distribution was monopolized by utilities before to deregulation, which meant that they were in charge of all sector investments. Yet, the introduction of competition allowed for the entry of new businesses, increasing investment in the industry (Bodislav et al., 2020).

Deregulation of the energy sector was also justified on the grounds that customers would pay less for their energy (Anderson, 1994). The government assumed that since businesses would have to compete on price to draw customers, competition would result in reduced pricing (Profiroiu, Radulescu & Burlacu, 2020). Deregulation, according to the government, would increase efficiency, which would reduce expenses and, ultimately, cut prices for customers.

Notwithstanding the potential advantages of deregulating the energy sector, there have also been worries about its effects. Deregulation might result in market failures, especially in the case of natural monopolies,

which is one of the key worries. In sectors with natural monopolies, one business can offer the service more effectively than others. Without regulation, there is concern that natural monopolies can take advantage of their market dominance to harm consumers (Bodislav et al., 2021).

Concerns have also been raised regarding how deregulation may affect the environment. While businesses would no longer be subject to government limits on emissions, critics claim that deregulation might increase pollution and greenhouse gas emissions (Bran et al., 2020).

Because it aids in achieving distribution efficiency, a higher employment rate, and the growth of the entire economy, the public sector—or state-owned enterprises—is viewed as an effective tool in European nations, particularly in emerging ones. To this, one can add the development of corporate behavior, which includes promoting exports and imitating state governance through corporate governance. The Japanese and American visions, which emphasize little engagement in national execution in the public sector, are in opposition to the European perspective (Brackman et al, 2009). Globally, the biggest number of privatizations occurred in the 1990s, which was highlighted by reduced government confidence in state-owned enterprises and increased budgetary costs. Large-scale privatization took place in Europe in the 1990s; it began with France and the United Kingdom in 1986, then moved on to Italy, Spain, and Germany in 1993. Europe's economic outlook between 1979 and 1999 was altered by privatization since it created a strong private sector and simplified the residual state-owned enterprises. These shifts in perspective were also in line with political and ideological trends of the day, such as "Thatcherism" and "Reaganism," but the crises of 1987 and 2007 were delayed by unresolved problems the private sector had with the public sector, which were further compounded by technological advancements that eliminated some monopoly positions from the market.

The development of telecommunications and the production and distribution of energy might be added to the list of technical advancements (Burlacu, Negescu et al., 2021). By improving allocation efficiency, information technology aids in neutralizing natural monopoly or even streamlining some oligopolistic positions. One example of a current monopoly case study is the nationalization of a business, comparable to TARP in 2009. (US). In the instance of oligopoly, we have the evolution of a market by new entrants reproducing existing oligopolies of businesses due to technical advancement. A monopoly that was broken up into smaller companies in 1984 to cut expenses and improve the economy is AT&T. In both situations (monopoly and oligopoly), we have a state-owned corporation that shouldn't have profits as its major goal since it may also experience losses (High, 1991). These losses shouldn't be seen negatively because they are related to the public company's primary goal. The business should operate on the assumption that prices are equal to marginal costs and that fixed expenses are marked losses that are compensated by the public budget, improving the efficiency of resource allocation.

Regulation versus Market Deregulation – Methodological Research

Adam Smith, the father of modern economics, introduced the concept of regulation in "Wealth of Nations," based on the premise that a seller has some benefits, but at a cost that is passed on to the broader audience.

In the 1970s, Stigler came to understand that regulations had two main effects: they redistribute income and increase economic waste costs. Interest groups ask the government for laws and work to achieve a goal on behalf of the general welfare, but they also strive to get the government to regulate the market in order to benefit themselves (Stigler, 1971). According to Stigler, when an industry is given governmental authority, its benefits would decline and its losses will increase for the entire branch. Instead of reducing market flaws brought on by natural monopolies or reducing social inequality, politicians adopt legislation in response to requests from interest groups that might provide them with supplementary advantages, such as boosting their chances of being reelected (financial support, moral support, etc.). The rationale and objectives behind action regulation reveal the motivations of those in a position to sway political decision-makers. Regulation was depicted by Stigler as an organization that seeks profits by controlling its influences for the benefit of the interest group it represents.

Since they all began as man-made monopolies, the rise of electric energy and telecommunications at the beginning of the 20th century was comparable to the emergence of real monopolies towards the end of the 20th and the beginning of the 21st centuries. Since they wanted to eventually securitize their market share, companies like Chicago Commonwealth Edison and AT&T requested the US government to monitor and control their sectors (Bodislav, 2013). These businesses helped industries, markets, and geographic penetration establish regulatory bodies. Stigler emphasized how mercantilism, another kind of modern economic regulation, shares the same poor faith attitude toward the public interest.

The concept that politicians "sell" regulations to the highest bidder on a market where bids are equivalent with bribes, votes, or other quantitative sources valid for decisional administrative and legislative organizations is another intriguing addition made to regulatory research by Sam Peltzman in 1976. The best regulation serves both the producers and the consumers. Niche regulation does not assist all producers or consumers, but it does make certain little subgroups more competitive. By maximizing the marginal utility of laws, regulators distribute advantages to the producer and the consumer (Schwarz, 2001). All of the political parties concerned behave in a rent-seeking manner toward the decisions made by the particular regulator.

Government regulation and economic efficiency are put under increased strain due to the competitive impact between interest groups. Becker emphasized how interest groups exert pressure on governments to get certain advantages and how barriers formed by regulations lead to economic inefficiencies. All of the recently formed competition places further pressure on public policies for long-term production growth. Both Becker and Peltzman noted that by consistently spending money on campaigning for regulatory development against deregulation, the regulatory flow may be simplified.

Here, we may see how the economy is affected by deregulation. The economic theory on sector segmenting against regulatory relaxing for getting marginal advantages and redistributing pressure on original interest groups was expanded by Becker and Peltzman. In the past, deregulatory instances could have resulted in rising marginal costs for consumers and lowered marginal benefits by regulating manufacturers. In this approach, re-regulating behavior even shifts the political balance.

The Chicago school of thought emphasized the notion of a regulative economy, built on methodological individualism and expanded on market behavior perceived as a hole, impacting the debate over the question of governments' and economic agents' incentives acting rationally. This strategy is likewise founded on Austrian economics, but the key distinction is that between the two schools, unrestricted competition exists and generates larger marginal benefits than controlled competition (Zajicek, 2001).

Limits and Discussion regarding the Inefficiency of Deregulation

The case study of the state of California's deregulation of the electricity system and energy market serves as the finest adverse illustration for comprehensive deregulation. In California, the deregulation of the energy sector resulted in unrestricted commerce between supply and demand, a phenomenon only observed in ideal markets. Because long-term agreements between producers and customers were outlawed, everyone was forced to conduct business on the spot market through the ISO, a monopoly operator (Independent System Operator). Because the deal was only carried out when a certain threshold was met, a secondary market developed within the primary market, allowing manufacturers and suppliers to manipulate pricing to their benefit. Enron and Dynegy benefited financially from the market reform, which moved the imbalance away from the energy dealers and toward the broader economy (Bodislav, 2013, 2014).

Electrical energy costs excessively increased as a result of the deregulation law. The traditional regulatory framework for the energy industry was used to establish these expenses. The law led to the formation of local monopolies and raised hurdles to entry for new energy producers, including those producing green energy. Throughout the years 1985 to 2005, this statute caused a setback for the development of electric facilities in the state of California and boosted imports from Canada to meet the state's demands. The "black swan" theory's reaffirmation in 2001 rendered this law null and void, as the year's unfavorable combination of factors—including an exceptionally hot summer, a bitterly cold winter, rising natural gas costs, and Enron's greed—led to an accelerated financial disaster (Bodislav, Constantinescu, 2014). When providers reached the consumer's maximum regulated price, they ceased providing electric energy. The law that was designed to abolish monopoly and open the energy market was a failure in this regard (Gordon, 2001). The "deregulation bill" failed due to execution issues and the way in which the regulation was seen, turning it into the most egregious example of the inefficiency produced by deregulating rather than regulating a market.

Conclusions

The charm of deregulatory reform has entranced certain nations in Central and Eastern Europe. Most politicians, businesspeople, academics, and members of the media from emerging nations support deregulation and actively engage in international lobbying because they believe that genuine regulatory actions occasionally need the development of new rules. The situation of the CEE countries is unique

because they are members of the European Union, which is a supranational organization with the most tightly regulated economy among all existing economic unions. As a result, interest groups must make significant financial investments in a potent lobbying apparatus. As the majority of these nations experienced communism, they have a vibrant economic and political elite that is aware of how to go beyond some of the EU's objectives in order to further their own interests. On this basis, a cartel is established to reorganize the laws meant to prevent the creation of monopolies (banned in the EU). Where the interest group has its headquarters and with implications for the political class that governs the European Union, independent regulators or the dominant political class determine the cartel's organizational structure.

It is necessary to reduce political influence inside public utility corporations in order to create an effective economic hybrid. The long-term answer to creating a regulated market, particularly for the energy sector and state-owned utility businesses, is to abolish government control rather than seek better regulation.

Politics has a significant impact on the type and effectiveness of regulations as well as the pace and process of regulations and deregulatory actions. Legislators' actions will determine if genuine regulatory unhappiness will result in the deregulation or re-regulation of a market and whether these changes are simply a response to certain inequalities that were seen in a prior circumstance.

We could draw the conclusion that, with a few minor exceptions, deregulation might result in lower costs, higher service quality, and the entry of new players into certain industries. However, those few minor exceptions might turn into actual black swan events if politicians and interest groups act irresponsibly or some unregulated innovations from the financial sector become systemic risks.

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Corporate Carbon Performance Study Across Nations: The Point of View of Global Investors

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Abstract

The paper aims to examine the global carbon performance of companies from the perspective of national diffusion. According to the Paris Agreement, listed companies from non-OECD countries produce average carbon dioxide cheaper than listed companies from OECD countries. However, the spread of corporate carbon dioxide emissions is lower in OECD countries compared to non-OECD countries, due to the increase in average national carbon dioxide emissions. Also, the spread of corporate carbon dioxide emissions at the country level in the post-Paris Agreement period is inversely correlated with foreign stock ownership. This result confirms our hypothesis that advanced foreign investors from rich countries have a significant positive effect on the efficiency of indigenous firms in developing countries in managing carbon emissions.While the sources checked for this paper may focus on different dependent variables at times, they all address the subject of whether a stricter and more enforceable regulatory framework on carbon emission may lead to a healthier and sustainable environment. We used the quantitative and qualitative analysis to see in what extent large sets of data regarding various indicators of corporate carbon performance are confirmed by a rate of success in the yearly sustainability reports released by the large international companies and international organizations. Further research may also focus on different strategies which aim to produce effects in the long run, not necessarily linked with corporate targets. For this, the topic should be addressed on the level of the entire society and the mission of the governments, and the international community is to find the best way for cooperation.

Keywords

Carbon performance; Paris Agreement; emissions management; carbon emissions.

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Introduction

Economic studies have long been interested in problems relating to carbon. By connecting carbon and climate challenges with company financial performance, climate finance research, which has just recently emerged, brings a new dimension to environmental study.

Also, the availability of a variety of commercial ESG data for academic research has speed up the development of climate research that employs firm-level ESG metrics designed for asset managers and buy-side analysts to seek alphas. Our study makes use of the recent growth in global commercial data on the carbon performance of firms to examine how foreign investments affect carbon performance at the national level.

Our work expands on the examination of carbon emissions by connecting corporate carbon management performance to global stock investments in listed companies, which is in line with the path that financial research has recently taken.

Grossman and Krueger (1991, 1995), are only a few examples of the numerous works that provide evidence of the economic and financial implications of carbon emissions. Listed companies are significant

contributors to the production of carbon, according to stakeholders. Corporate management and governance are predicted to have a substantial impact on a company's carbon performance. As a result, various research investigate how different board governance models and traits may influence climate disclosure and carbon performance (e.g., Peters and Romi, 2014).

In the same time, several studies concentrate on specific environmental initiatives at the board level and their beneficial effects on carbon performance.

On the other hand, earlier research has shown that more knowledgeable foreign investors from industrialized nations have a considerable impact on local businesses in emerging nations. For instance, listed companies in emerging stock markets benefit from an improved information environment and have stronger growth, increased investment, profitability, and efficiency while using less leverage (Bae et al., 2006). (Mitton, 2006). International investors can also help local businesses in developing countries lower the cost of equity capital by stabilizing and monitoring the market (Li et al., 2011).

In this paper, we adopt the stance that the sophistication of corporate management and control of carbon risk can have an impact on the carbon performance of listed enterprises. Listed companies in rich nations should, therefore, have a better awareness of and commitment to carbon risk mitigation than listed companies in poor ones. International equity investments have the potential to be a powerful catalyst for increasing business understanding of this climate risk. With equity ownership, foreign investors from industrialized nations contribute managerial expertise and higher expectations for carbon performance to their investees in order to achieve corporate sustainability.

Thus, we contend that national company carbon performance is positively influenced by global equity ownership.

The most important selection criterion should enable establishing a single corporate carbon management measure that considers both the exposure to carbon-related climate risk and the associated management approaches of listed companies throughout the world. When evaluating the effectiveness of carbon management, the measure must also account for firm-, industry-, and country/region-specific carbon risk contexts. The reason for this management strategy and actions should correspond to the degree of exposure. For instance, a company with a significant exposure to carbon risk should also have very strong carbon management, whereas a company with a low exposure to carbon risk may handle the exposure in a very understated manner.

In accordance with the literature, the mean logarithm of deviations and the Theil index are used as two metrics of inequality to determine the dispersion (e.g., Abiad et al., 2008; Acemoglu and Dell, 2010; Chancel and Piketty, 2015). The dispersion variables can assess the overall effectiveness of enhancing corporate carbon management in a country if the variety in corporate carbon performance within a country reduces while average businesses attain a high carbon performance (Cho, 1988; Abiad et al., 2008). Then, the carbon performance at the national level is compared between OECD (or developed) and non-OECD (or developing) nations, as well as between the Paris Agreement's ex-post and ex-ante implementation.

1. Key points according to literature review

CO2 emissions at the national level and economic expansion

Several scholars have been examining how economic activity affects greenhouse gas pollution of the environment (hereafter GHG). Grossman and Krueger (1991, 1995) show that while governments will eventually pay more attention as economies expand, economic activities have detrimental effects on the environment in the early stages. As a result, the Environmental Kuznets Curve (hereafter EKC) hypothesis, which was proposed by Grossman and Krueger in 1991 and 1995, is the first to uncover evidence of an inverted U-shaped link between economic development and air pollution.

Yet, there is some disagreement in the studies on the relationship between income growth and carbon emissions. Whereas Khan et al. (2019) indicates a positive influence of economic development on CO2 emissions in a worldwide sample of 193 economies, Omri et al. (2014) demonstrate bi-directional connection in the sample of MENA[1] nations.

[1] **MENA Nations:** Western Asia (18): Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen. Northern Africa (7): Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, Western Sahara.

Cheikh et al. (2021) found in a study of 12 Middle Eastern and North African countries that energy consumption has a positive and larger (smaller) impact on carbon emissions for low- and high-income countries, but that the significantly negative environmental impact of GDP growth is dependent on high energy consumption growth. On the other hand, studies by Acheampong (2018) and Shoaib et al. (2020), for instance, show that economic growth and carbon emissions are negatively correlated in both emerging and developed nations. While developing nations frequently fall behind in institutional quality, developed economies typically have robust institutional frameworks. Several studies show that institutional quality considerably reduces carbon emissions (Danish and Ulucak, 2020), for example, by implementing strict and enforceable environmental rules. Yet, inadequate institutional foundations foster a climate that is hospitable to corruption, incompetent administration, and disrespect for environmental problems (e.g., Danish et al., 2019a).

Firm-level carbon dioxide emissions between developed and developing countries

Another part of the literature deals with greenhouse gases from the perspective of firms. According to stakeholder and resource), companies that deal with environmental issues should experience different benefits, such as improved reputation, increased efficiency and access to new green markets. However, empirical evidence on the benefits of increased CO emissions is inconclusive.

According to Elmawazin et al. (2022), US listed companies with greater environmental technology innovation tend to have less expensive equity capital. According to their findings, businesses with fewer CO2 emissions experience lower returns (better outcomes) in the short and long terms compared to those with greater emissions.

Muttakkin et al. (2022) recently came to the conclusion that businesses in nations with robust democratic systems have a negative relationship with carbon intensity. There is a ton of proof that firms in developed nations with stringent environmental regulations (like national carbon trading schemes in the EU) have bought carbon emissions from upstream and downstream firms in developing nations despite the strict (and frequently poorly enforced) regulation in the global supply chain. As a result, carbon dioxide emissions shift from developed countries (such those in the EU) to emerging nations (e.g. China).

Several research look at the sorts of management techniques and governmental traits that might influence climate data and business success. The reporting of carbon dioxide emissions and proactive environmental government activities are positively correlated, according to Peters and Romi (201 4). Additional research shows that gender diversity and board qualities have a favorable impact on carbon emissions. Moreover, some materials are focused on different environmental government efforts and their impacts on carbon dioxide emissions. For instance, Ntim (2022) contend that emission reduction programs, environmental innovations, and resource efficiency show a positive association with carbon emissions, whereas assert that a stronger environmental orientation of cardboard can enhance carbon emissions.

Corporate carbon emissions and profitability of investments

More than 4000 institutional investors from 60 countries and more than 120 trillion US dollars in assets under management signed up for the Principles for Responsible Investing starting in April 2021 and pledge to include ESG factors into their investment choices (UNPRI, 2021). The empirical research on institutional investors' motivations, tactics, and impacts on company carbon performance and initiatives (post-Paris Agreement) is expanding quickly.

Institutional long-term investors who care about the environment had the biggest beneficial influence on business disclosures of climate change risk. This resulted in a favorable reaction from the U.S. equity market. According to Bolton and Kacperczyk's findings in 2021 and 2022, institutional investors use unique screening techniques for sectors with the greatest direct carbon emission intensity. This may indicate that their efforts to compel pledges were successful. In a review research, Kruger et al. (2020) discovered that 29% of 39 institutional investors are attempting to lower the carbon footprint of their portfolios, with risk management and active engagement (divestment) being the (most) common technique without sacrificing returns.

Standardized assessments of the environment impact

Beyond reporting of measured emissions, the ultimate challenge is to assess the effective environment impact. In order to have comparable results and credible conclusions based on such results, a uniform method of measuring the emissions and a commonly agreed methodology of assessment is absolutely necessary. One must take account not only quantitate elements, but also the actual effect, impact or risks to the environment. Indeed, few emissions have only an immediate global effect. Unlike carbon, most

emissions will have a different local, regional or global impact depending not only on the amount discharged but also on its environmental disruption nature. Thus, it is recommended to tackle the actual risks the emissions may pose to the environment rather than pure accounting approach in collecting and reporting data on carbon emission. Otherwise, the information disclosed to the markets and to the investors could not be optimal.

Several standardization initiatives in this context have emerged at regional but also international level. A good example is the European standard EN 17463:202 Valuation of Energy Related Investments (VALERI), a standard developed by CEN and CENELEC which focuses mainly on the valuation and documentation of the economic impact of energy related investments, also reflecting the method to gather, calculate, evaluate and document information. Assessment of green financial projects is foreseen in ISO 14100 standard. It outlines a process to identify criteria for environmental impacts and performance to consider when is related with projects, assets and activities seeking finance. Another relevant international standard is ISO 14067 specifying principles, requirements and guidelines for the quantification and reporting of the carbon footprint of a product. Several draft standards are under development for setting a universally recognized methodology to calculate carbon emissions. Businesses in developed countries are actively involved in standards-setting activities. As such they are more aware and knowledgeable of efficient instruments to increase their carbon performance and to make environmentally calculated investments than companies in emerging economies.

2. Research Methodology

The authors started the article with a critical analysis of the existing worldwide relevant literature in the field. Having in mind the empirical data, together with the descriptive character of the paper, the authors focus on checking in what extent the large data sets based on a variety of indicators regarding the corporate carbon performance are confirmed also by the reports released by OECD which aims to picture the global environment. The keywords used were “carbon performance”; “Paris Agreement”; “emissions management”; “carbon emissions” and the selected papers for this research were directly showing the impact of the involvement of foreign investors on the carbon strategy when the decisions for starting new business are made. For this reason, we corelated the MSCI Index which shows in what extent the carbon emissions are part of the strategy of the new investors with the average corporate carbon emissions score and dispersion in OECD versus non-OECD group of countries before and after the Paris agreement. This hypothesis, along with the others highlighted, points to the need to look at other important and evolving links between foreign investors and carbon performance. Finally, the authors will present their own observations and conclusions regarding the contextualization of the carbon emissions performance and show that only the corporate efforts are not enough to reach the proposed targets.

3. Research and Discussion

The number of businesses having MSCI carbon emissions[2] ratings for each year of the study period is shown in Table 1. (2010–2020). We can see that there are more businesses now than there were in 2010 (1855 vs. 14,346 in 2020). Also, the bulk of the observations in each of the examined years are from OECD nations. In particular, the sample is most and least imbalanced (in terms of the ratio of OECD to non-OECD enterprises), respectively, in 2010 and 2020, i.e., the coverage of firms in non-OECD nations gets considerably better over time more quickly. By 2020, 90.33% of listed companies in the OECD countries will have a carbon performance rating thanks to MSCI, which gradually covers the majority of listed companies in these nations.

[2] The MSCI Climate Action Indexes are designed to help institutional investors seeking to invest for the transition and finance companies’ emissions reduction to drive change in the real economy.

Table no. 1. The number of firms in each year (2010-2020).

	No. of firms				% of listed firms		
Year	All	OECD	Non-OECD		All	OECD	Non-OECD
2010	1855	1702	153		6.05%	8.34%	1.64%
2011	1845	1710	135		5.88%	8.15%	1.50%
2012	2924	2590	334		8.21%	10.84%	3.76%
2013	6880	5909	971		28.99%	47.47%	9.15%
2014	1090	6212	878		28.08%	47.99%	8.17%
2015	6956	5904	1052		31.23%	53.07%	10.95%
2016	10.725	9047	1678		42.72%	73.33%	16.49%
2017	11.605	9700	1905		45.69%	79.75%	17.51%
2018	13.453	10.067	3386		53.95%	88.86%	24.02%
2019	14.208	10.419	3789		49.25%	81.50%	27.02%
2020	14.343	10.659	3684		45.54%	79.13%	22.75%

Source: UNFCCC. (2022). The Paris Agreement (https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement)

Within the MSCI ESG ratings for public firms' environmental pillar, carbon emissions play a significant role. To analyze corporate carbon risk and its performance, MSCI specifically utilizes corporate carbon risk and raw data from sources such annual reports, sustainability disclosures, government and academic databases, and media. So, in order to earn the same total materiality score, "greater levels of risk demand larger degrees of demonstrated managerial competence" (MSCI, 2022). MSCI CO2 emissions ratings therefore vary from 0 to 10, with a score of 0 (respectively, 10) denoting extremely low (respectively, exceptionally good) performance.

The table that follows was taken straight from the MSCI ESG Rating Methodology Overview page. A total of 35 substantial ESG concerns are included in the table, which are divided into 10 themes and 3 pillars. The environment pillar is where the most crucial subjects are listed for clarity's sake. This pillar includes individual themes as well as 13 big topics, as illustrated below. One of the main challenges in this pillar is CO2 emissions.

Table no. 2. MSCI ESG Rating

Pillar	Themes	ESG Key Issues	
Environment	Climate Change	Carbon Emissions	Financing Environmental Impact
		Product Carbon Footprint	Climate Change Vulnerability
	Natural Capital	Water Stress	Raw Material Sourcing
		Biodiversity & Land Use	
	Pollution & Waste	Toxic Emissions & Waste	Electronic Waste
		Packaging Material & Waste	
	Environmental Opportunities	Opportunities in Clean Tech	Opportunities in Renewable Energy
		Opportunities in Green Building	

Source: UNFCCC. (2022). The Paris Agreement (https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement)

Evaluation of a material issue: The MSCI ESG grading approach assesses both risk exposure and risk control. A 0–10 scale is used to assess risk exposure. This score indicates if a business has a proven track record of thinking and dealing with particular risks and opportunities. Major challenges are first quantified across all industries, however the vulnerability of each organization to each issue differs.

As a result, the MSCI ESG Ratings use precise breakdowns such operational sectors, locations of operations, outsourced manufacturing, or reliance on government contracts to determine company-level exposure to important ESG risks. Management needs to address the degree of exposure if they want to rank higher on important problems. In other words, it is expected that highly engaged businesses would have extremely capable management groups. As a result, a company with poor management and high ESG risk

will perform worse than a company with similar management practices but lower ESG risk. On the other hand, businesses with less exposure could choose a more cautious strategy to get the same grade.

Before and after the Paris Agreement, Table 3 displays the average CO2 performance values (CARBON) and the variation of values (THEIL and MLD) in OECD and non-OECD nations. We can observe that following the Paris Agreement, the CO2 levels for both samples rose or became better. Also, as predicted, the CO2 levels for businesses with headquarters in OECD nations were much higher than those of businesses in non-OECD nations for both subsample times.

Moreover, following the Paris Agreement, the CO2 value for firms in OECD nations reached 7.9 2, while the CO2 value for companies in non-OECD countries was 7.636 during the same period, showing that both OECD and non-OECD country enterprises have reasonably decent carbon footprints. Once nations agreed to limit their carbon emissions in accordance with the Paris Agreement, you may see that you have attained management capability. Overall, the Performance gap between the two samples shrunk substantially, with non-OECD companies overtaking their OECD competitors.

At the time after the Paris Agreement, the gap in carbon performance values between OECD and non-OECD enterprises decreased to 0.395 (0.307). Also, non-OECD enterprises experienced a somewhat higher average increase in carbon performance value (1.32) than post-Paris OECD companies (1.3) compared to the prior Paris Agreement. The differences mentioned above are all statistically significant at the 1% or 5% level, which is important to note from Table no. 3.

Table no. 3. Average corporate carbon emissions scores and the dispersion in OECD versus non-OECD groups of countries before and after the Paris Agreement

Period	OECD	Non-OECD	Diff. (OECD - Non-OECD)	t-stat
Average carbon performance score:				
Before Paris Agreement (2010–2015)	6.598	6.203	0.395	(1.97)* *
After Paris Agreement (2016–2020)	7.942	7.636	0.307	(3.34)* **
Diff. (After - Before)	1.344	1.432		
t-stat	(10.09)* **	(8.00)* **		
Theil index:				
Before Paris Agreement (2010–2015)	0.065	0.053	0.012	(1.84)*
After Paris Agreement (2016–2020)	0.050	0.050	-0.000	(−0.04)
Diff. (After - Before)	-0.015	-0.003		
t-stat	(−2.74)* **	(−0.53)		
MLD index:				
Before Paris Agreement (2010–2015)	0.063	0.052	0.010	(1.61)
After Paris Agreement (2016–2020)	0.042	0.040	0.002	(0.68)
Diff. (After - Before)	-0.020	-0.013		
t-stat	(−4.23)* **	(−2.48)* *		

***1%, **5%, *10%

Source: UNFCCC. (2022). The Paris Agreement (https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement)

Conclusions

According to Generation Investment Management (2021), publicly listed corporations on international markets were responsible for 40% of greenhouse gas emissions. Because of this, publicly listed corporations are crucial to achieving the Paris Agreement's primary goal of reducing global temperature rise. The effectiveness of bettering carbon management across listed firms in six countries is investigated in the study from 2010 to 2020. Firm carbon performance (i.e. firm exposure to carbon risk and capacity to manage carbon risk), as opposed to other research that concentrated on the carbon emissions of individual enterprises, is utilized to generate country-level carbon emissions. Corporate carbon management based on yearly observations from 91,88 enterprises and a sample of 20,712 listed companies.

Our empirical study demonstrates that, following the Paris Agreement, the average carbon footprint of listed businesses in non-OECD nations expanded more quickly than in OECD countries, and that, in recent years, carbon emissions from developing to developed countries have been dropping. Additionally, we discovered that OECD countries had a greater decline in corporate carbon emissions variability following the Paris Agreement than non-OECD nations. We may draw the conclusion that the reduced variability in corporate carbon performance across OECD nations implies increased carbon management efficiency by combining the results of improved average country-level carbon performance and smaller spreads.

Also, the ownership of foreign investors is unfavorably correlated with the performance of business carbon emissions after the Paris Agreement. According to other research (Aggarwal et al., 2011, Bena et al., 2017) foreign investors have a considerable impact on local enterprises' corporate governance, ESG performance, and carbon performance.

Finally, compared to OECD nations, non-OECD countries have seen a greater drop in the dispersion of corporate carbon performance since the Paris Agreement. In conclusion, this study demonstrates that more experienced foreign investors from industrialized nations significantly influence domestic businesses in developing countries to increase their effectiveness in managing carbon emissions. Consequently, by using a special mix of carbon management data and the dispersion (Theil index) technique to assess corporate carbon management effectiveness within a nation from a global perspective, our work adds new knowledge to the literature on carbon.

According to earlier studies, the variation of the MSCI firm's carbon management score serves as a proxy for carbon management effectiveness (i.e. Abiad et al., 2008; Acemoglu and Dell, 2010; Chancel and Piketty, 2015). Having as milestone the Paris Agreement, many research compared the levels before and after this signature' moment, the carbon management performance of listed firms in OECD (considered developed countries) and non-OECD (considered as developing nations), and analyzed how foreign investment influences the effectiveness of carbon management at the national level.

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Green Energy and Societal Marketing in the Context of Climate Change

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Abstract

In the context of climate change, the objectives of this paper concern the perception of green energy and programs and plans that encourage it, the perception regarding the measures necessary to be taken in terms of green energy and the perception regarding societal marketing actions in the field of energy. The study was carried out by exploiting the primary sources of information, using direct qualitative research, the investigation being realized using semi-directed interviews, and the studied population consisted of potential consumers of green energy. The analysis of the results of the research indicates that most of the interviewed subjects perceived climate change as a danger and also that the majority are familiarised with the forms of green energy and have a formed opinion about the necessary measures. In the study, the measures were divided according to their ex-post (reduction of negative effects) or ex-ante (prevention) character and also function on the decision level at which the mentioned measures are taken: measures at the individual level, measures at the level of energy producers, measures at the level of energy-consuming companies and measures involving government programs and legislative power. In the paper, the perceived societal marketing role in the field of energy is also studied and the specific mix of marketing is presented, which can have important practical implications.

Keywords

Climate change, green energy, societal marketing, direct qualitative research

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Introduction

The aim of this study is to provide, in the context of climate change, the perception of green energy and of the role of societal marketing in the field. In the first part of the study, climate change, green energy and societal marketing challenges are presented using a review of the scientific literature. Then, the study continued using primary sources of information. A direct qualitative research was realized using semi-directed interviews, the studied population being potential consumers of green energy.

There are many studies regarding the climate change theme and green energy, but there are very few studies that relate the subjects with the societal marketing approach and, in the current context of the economy, this perspective could be an improvement of the activity in the energy sector and also can be the basis for a better perception of the energy sector at society level.

The green economy represents a serious effort to "green" the existing economy by using different instruments and ecological economics argue that it is necessary to make changes at the systemic level, if it is necessary to understand and solve serious problems such as climate change (Jakobsen and Storsletten, 2019) and new technologies, systems, societal organization and policies for energy saving are urgently needed in the context of accelerated climate change (Farghali et al., 2023). Renewable energy is perceived as a key tool in addressing the dual issue of increasing energy demand and climate change mitigation (Maxim, Jijie and Roman, 2022).

There are studies on renewable energy sources: wind power, hydro power and energy from crops and wood, which reveals that higher income, male gender, young age, and pro-environmental attitude increase

the probability to choose renewable energy instead of the current energy mix (Kosenius and Ollikainen, 2013).

In this paper, there is a qualitative research studying how green energy is perceived by potential consumers, the opinions regarding RepowerEU Plan and Green House Program and the perception regarding societal marketing actions in the field of energy. The principal findings of the research indicate that the population is aware of the danger of climate change and of the necessity of green energy, being familiarized with the forms of green energy. Most of the studied population has a formed opinion about the measures necessary to be taken. The measures are presented in the study according to their ex-post or ex-ante character and also function on the decision level at which the mentioned measures are taken: measures at the individual level, measures at the level of energy producers, measures at the level of energy-consuming companies and measures involving government programs and legislative power.

The value and the importance of the research are related to the fact that the study depicts the perception regarding climate changes and identifies the measures necessary to be taken in the context of climate change in terms of energy and gives an objective perspective regarding green energy and societal marketing.

The paper is structured as follows: in the first part the challenges of climate change, green energy and societal marketing are presented, in the second part the objectives and the methodology of the qualitative research are described, in the third part the results of the research are analyzed, pointing out the extent to which the population is familiar with green energy, with Green House Program, with RepowerEU Plan, with the prosumer concept and different types of green energy, the perception regarding climate changes and the measures considered necessary to be taken in the context of climate change in terms of energy and the measures considered inappropriate, the perception regarding green energy and the price of green energy, the views about the legislation on green energy consumption and the RepowerEU Plan, the opinions about prosumer and the perception regarding societal marketing actions in the field of energy.

1. Challenges of climate change, green energy and societal marketing

Climate change is by far the strongest driver and both high and low-income countries may benefit greatly from investing in adaptation measures to climate change (Winsemius et al., 2016).

An important challenge is related to the increasing demand for sustainable energy and it exists within the context of an increasingly interconnected world and climate change (Ward et al., 2016). Satisfying the growing energy demand, while reducing greenhouse gas emissions and mitigating climate change are some of the most challenging and ardent issues for the policymakers around the world (Maxim, Jijie and Roman, 2022) and the answer to the challenges are related to the green energy sector. Green energy alternatives include biomass boilers and stoves, hybrid heat pumps, geothermal heating, solar thermal systems, solar photovoltaics systems into electric boilers, compressed natural gas and hydrogen (Farghali et al., 2023).

Another important challenge is the social acceptance of green energy and, for example, for bioenergy it can be influenced by the awareness of climate change and its impacts, the knowledge of technologies and the perceived fairness of the preparatory and decision-making processes (Fytili and Zabaniotou, 2017).

At the level of the European Union, there are different plans related to the environment, such as The Green Deal which aims to make Europe carbon-neutral by 2050 (Popescu, Coroș, Pop and Bolog, 2022) and RePowerEU Plan (from 2022) aiming at making Europe independent from external fossil fuels, in light of the current geopolitical crisis.

In the context of tight interdependence between development and the environment, there are increasing societal exigencies regarding the environment protection and there are more and more severe regulations (Pamfilie, Procopie and Bobe, 2011). Government regulations are the most widely used policy instruments for environment protection (Ioncică, Petrescu and Ioncică, 2012), but there are also programs like Green House (Casa Verde) meant to stimulate the use of green energy, for installing photovoltaic panels on houses.

The societal marketing orientation appeared in the context of the deterioration of the environment, depletion of natural resources, population growth and social problems and the organizations that have a societal marketing orientation must serve the needs of consumers in the best conditions, while respecting the needs of society, even if the interests of society do not always coincide with the needs of the organization (Petrescu, 2008). In order to have a sustainable development, the societal marketing orientation is necessary in the sector of energy and the marketing policy must take into account

simultaneously three objectives: maximizing the profits, satisfying the needs of consumers in the best conditions and respecting the public interest.

2. Objectives and research methodology

In this context, the objectives of the research are:

1. Determining the extent to which the studied population is familiar with green energy, with Green House (Casa Verde) Program, with RepowerEU Plan, with the prosumer concept and the identification of known types of green energy,
2. Determining the perception regarding climate changes and identifying the measures considered necessary to be taken in the context of climate change in terms of energy and the measures considered inappropriate to the current context in terms of energy
3. Identifying the perception regarding green energy and the price of green energy
4. Identifying opinions about the legislation on green energy consumption and the RepowerEU Plan
5. Identifying opinions about the idea of being a prosumer and about the necessary conditions
6. Identifying the perception regarding societal marketing actions in the field of energy.

In this case, primary sources of information and qualitative research were used to analyze how green energy is perceived by potential consumers. The information from primary sources was obtained using semi-directed interviews. The main advantage of the information from primary sources is that they strictly respond to the objectives of the research. Direct research is the main method used to obtain actual information and depending on the type of information, the research can be classified into quantitative research: which aims to quantify data and generalize the results at the level of the entire studied population and qualitative research: which aims to understand and explain a variety of phenomena (Cătoiu et al., 2009, Petrescu, 2012). Through qualitative research the aim is to generate ideas and solutions, which will be quantified later with the help of quantitative research. Qualitative research uses specific methods and techniques that originally appeared in psychology (Petrescu, 2008).

This study was carried out by exploiting the primary sources of information and the studied population consisted of potential consumers of green energy. The observation unit in this case coincided with the survey unit, being the person over 18 years old, potential consumer of green energy from Romania. In the case of qualitative research, it is not necessary for the sample to be representative, given that its dimensions are small. The interviews were conducted in March 2023 on 45 subjects selected with the help of a selection questionnaire.

The research carried out is a qualitative research, and the technique used was that of the semi-directed interview, with the conversation guide as a tool. The conversation guide used comprises 10 discussion topics: it starts with general questions to identify the extent to which they are familiar with green energy, the Green House Program, the RepowerEU Plan and the prosumer concept, questions on the extent to which climate change is perceived as a danger, questions about the measures considered necessary to be taken in the context of climate change in terms of energy and measures considered inappropriate to the current context in terms of energy, questions about the types of green energy known, questions about opinions about green energy, about the price green energy, about the legislation regarding the consumption of green energy, about the RepowerEU Plan, about the idea of being a prosumer and about the necessary conditions and questions about the perception of societal marketing actions in the field of energy. The conversation guide is not an actual questionnaire, but contains the main axes of the discussion. In the conversation guide, the themes and sub-themes of the discussion are mentioned and it includes the main points of the discussion.

The stage that follows the collection of information is the content analysis, which involves: the study of each file, highlighting the themes addressed and the importance attributed to them by the interviewed subject, obtaining a list of themes summarized by keywords, then bringing together all the lists in a table with the subjects interviewed and the themes addressed, thus obtaining various typologies and finally formulating conclusions taking into account the overall structure, but also the particular characteristics. Content analysis includes several types of analysis: thematic analysis, in which the content is analyzed function of the frequency of ideas that appear and the frequency of associations, analysis of the syntax, in which the structure of the speech and the way the phrases are constructed are analyzed and lexical analysis, in which the vocabulary used is analyzed (Petrescu, 2012).

Content analysis requires a psychological approach, but also a statistical approach (on which this study is mainly based), in the analysis taking into account the frequency of occurrence of keywords, phrases,

expressions and ideas. The information was analyzed in this case, using content analysis by studying each file, highlighting the themes addressed and the importance attributed to them by the interviewed subject. The conclusions were formulated taking into account the overall structure.

There were 45 respondents selected to participate in the qualitative research regarding green energy. The profile of the respondents is diverse, so that all social categories of potential consumers can be studied, but focusing on the young and well-educated, mainly from the urban environment. Based on the answers to the recruitment questionnaire: function of age 42,2% are in the category 18-24 years old, 31,1% in 25-34 years old and 26,7% are in 35-65 years old, function of gender: 55.6% female and 44.4% male, function of the education: last school completed by 46.67% is high school and 48.89% have university studies, function of marital status 60% are bachelor and 36% married and function of the living environment: 80% were from the urban environment. The profile of the respondents' function of the type of energy used indicates that 95.56% used energy from traditional sources and 15.56% used green energy (a multiple choice question was used in the recruitment questionnaire).

The results obtained from the analysis cannot be extrapolated to the entire population, but they can be used as hypotheses for further research, for quantitative studies or they can be an important source of new ideas.

3. Analysis of the results of the research

3.1. The extent to which the studied population is familiar with green energy, with Green House Program, with RepowerEU Plan, with the prosumer concept and the known types of green energy

The extent to which they are familiar with green energy is average, even if most of them know the concept of green energy. The degree to which they are familiar with the Green House (Casa Verde) Program is also average, one third of respondents not being familiar with it, the degree to which they are familiar with the RepowerEU plan is lower, as well as regarding the concept of prosumer.

The majority of subjects know green energy forms, mentioning solar energy, photovoltaic panels, a large part mention hydroelectric power and wind power, and a small part mention geothermal energy and biomass as sources of green energy. The main sources of green energy discussed are solar energy (solar panels for water heating, photovoltaic panels for electricity production), hydroelectric energy (produces electricity), biomass (substitutes fossil fuels and comes from waste), wind energy (produces electricity), geothermal energy (hot water from boreholes is used, so that fossil fuels are no longer used for heating, this energy started to be used including in households through heat pumps).

3.2. The perception regarding climate changes and the measures considered necessary to be taken in the context of climate change in terms of energy and the measures considered inappropriate.

The extent to which climate change is perceived as a danger is high, over three quarters of the interviewees considering climate change a danger, only a very small part not considering it as such.

The necessary measures to be taken in the context of climate change related to energy mentioned in the interviews can be divided according to their ex-post (reduction of negative effects) or ex-ante (prevention) character in measures to reduce negative effects (for example, measures related to waste recycling and selective collection) and preventive measures related to reducing resource consumption, reducing energy consumption and reducing pollution.

Depending on the decision level at which the mentioned measures are taken, they can be divided into measures that can be taken at the individual level, measures at the level of energy producers, measures at the level of energy-consuming companies and measures involving government programs and legislative power (see Figure no. 1):

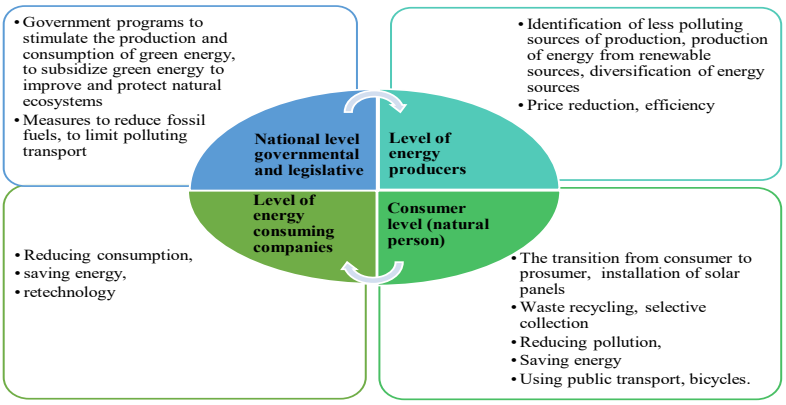


Figure no. 1. Necessary measures to be taken in the context of climate change in terms of energy function of the decision level

At **the individual level,** the main measures mentioned are related to waste recycling, selective collection, reducing resource consumption, saving energy, reducing pollution, gas emissions, switching from consumer to prosumer, installing solar panels, switching to more efficient modes of transport low polluting, for example: "public transport should be used instead of personal transport vehicles and electric vehicles", "use of bicycles as means of transport". Another change related to consumer behaviour is the proposal to "use electronics that charge in natural light".

The measures mentioned at **the level of energy producers** aim at the production of energy from renewable sources, such as hydroelectric energy, solar energy and wind energy, the production of energy from green sources such as biomass, the identification of less polluting sources for traditional energy production, diversification of energy sources, reduction of pollution from gas emissions in the case of traditional sources, but also economic measures are mentioned, such as: price reduction, efficiency.

The measures mentioned at **the level of energy-consuming companies** are: more prudent consumption of energy and reduction of pollution, gas emissions, reduction of industrial production, re-engineering.

The mentioned measures that involve **government programs** are proactive measures for prevention, programs for subsidizing green investments, respectively green energy production, increasing global access to green energy, subsidizing the planting of high biomass density plants and the production of briquettes and pellets, improving and protecting natural ecosystems that capture greenhouse gases, such as forests, laws to support eco-friendly energy use options, allocating funds to end consumers for the purpose of implementing mechanisms in homes that provide green energy, increasing energy independence through the development of green energy capacity, measures related to the restructuring of the National Energy System through the introduction of energy storage stations, simultaneously with the continuation of the transition towards the production of energy from renewable sources, but also coercive measures that provide obligations, such as the obligation to switch from the use of fossil to green energy, the reduction of fossil fuels, the limitation of energy consumption for existing and new buildings. Some of the respondents mention transport-related measures: the development of public transport, the encouragement of electric-powered public transport and the ban on polluting vehicles "Stop using Euro 2 and 3 cars on the streets".

Most of the interviewed subjects referred to measures that should be taken at the national level, either at the legislative level, for example, laws to encourage the use of green energy sources, or at the governmental level, for example, the allocation of funds for the implementation in homes of mechanisms to supply green energy. Most of the mentioned measures are aimed to stimulate and develop, but also there are taxation measures, limitation of fossil fuels, and limitation of transport that uses polluting energy. Most of the subjects interviewed mentioned measures that are taken at an individual level, more than half of them being related to the reduction of pollution, greenhouse gas emissions, some of the interviewees referred to the installation of panels solar or the use of alternative sources of green energy. A part referred to the necessary and positive character of the measures: “necessary”, “good”.

A very small part of the subjects interviewed stated that they do not know the necessary measures to be taken in the context of climate change in terms of energy.

As far as the **measures considered inappropriate to the current context in terms of energy a** small part believes that there are no inappropriate measures or actions with the current context regarding energy or states that they do not know, but the majority believes that there are inappropriate measures, among which are: increasing the price of energy, waste and excessive consumption "electricity consumption exaggerated", above-average pollution, unclear regulations, the transition to green means of transport, in conditions where the necessary technology and infrastructure do not exist.

3.3. The perception regarding green energy and the price of green energy

The vast majority of subjects have a favorable opinion about green energy, considering it “necessary”, “useful”, “vital”, “the most viable option”, “the energy of the future”. The vast majority of words used to describe green energy have a positive character. One part mentions disadvantages of green energy related to costs and equipment: "requires substantial initial investments", "panels are expensive", "requires large investments", "too expensive", "the only reserve is related to the source of the equipment", "and access to green energy sources is easy in developed countries".

Regarding the perception of the price of green energy a small part of the subjects state that they do not have information or do not have a formed opinion about the price of green energy, the rest fall into three categories: a large part considers the price high, a significant number have a favorable opinion about the price considering it: “accessible”, “fair”, “the price of green energy is relatively low”, “acceptable, compared to that of traditional electricity”, “it is a good, honest one”, “Given that green energy comes from natural sources, such as sunlight, wind, water and many others, its price is fair and considerably cheaper than for traditional forms of energy”. A rather small part of the respondents present both the favorable and the unfavorable aspects, such as: “The price of green energy is low, but the investments to obtain it are expensive and long to amortize”, “It drops, at the moment the price of solar energy being lower than that of fossil fuel”, “Of course, there is also a higher initial cost for the implementation of this energy source, a cost that, in my opinion, is effectively amortized over time”, “The price starts to decrease, especially since we have a local producer, which is the most competitive”, “From what I found out and heard, I concluded that in the long term it is beneficial, moving the bills quite decently”.

3.4. Opinions about the legislation on green energy consumption and the RepowerEU Plan

A large part of the subjects state that they do not know the legislation regarding green energy, and there is also an answer that tries to explain why it is not known: "I think that it should be spread through other channels, not only through the Internet, because a lot of the population, especially those from the rural area don't have access, in addition some of them are quite old and don't know how to use the internet".

Among those who have a formed opinion, the opinions are divided, those who have an unfavorable opinion mention that: "it is incomplete", "it needs improvements and the authorities are aware, because it is continuously updated, in the last 3 years it has been modified", "It is complex even though they are trying to standardize", "It is far too convoluted", "every distributor interprets it as he wants - it depends on how lucky you are", "they want to implement taxes for green energy ... this will destroy people's motivation to invest in green energy", "Creates blockages for investors", "it is not clarifying".

Those who have a favorable opinion consider that "it is in accordance with European legislation" and "the legislation has evolved positively in recent years, as the countries will become neutral from a climate point of view in the coming years".

There are some respondents that considers that "it is suitable, but it is really a little more difficult to implement due to some infrastructure deficiencies" and "Romanian legislation is in good agreement with the European one. Fortunately, the legislation is quite good; unfortunately, its application is difficult."

A large part of the respondents do not know the RepowerEU Plan, the rest have a favorable opinion about it: “it is important for an independent Europe”, “The RepowerEU Plan is absolutely necessary, aiming both to reduce Russia's dependence on fossil fuels and to reduce pollution”.

3.5. Opinions about the idea of being a prosumer and about the necessary conditions

A part of the respondents have heard of the prosumer concept and most of them have a favorable opinion: "A very good opinion, considering the context in which you can reduce your utility bill", "I think it is an advantageous plan, the fact that you can it produces renewable energy for its own consumption, and the surplus energy can be delivered to the public network for compensation, individually it helps us with substantial economies, and the conditions for obtaining it are quite accessible", "I think it's a very good idea, both from the point of view from a climate point of view as well as costs, considering that you produce most of the energy you need yourself and you can make money from the energy surplus. Another advantage is that if you can't produce enough energy yourself, you are connected to the grid anyway so

you don't run out of energy, which anyway has a positive impact on the environment", "In my opinion, as society evolves, we will all become prosumers. I consider that it is an advantageous alternative also from the point of view of the conditions to produce partially the energy consumed".

There are many respondents who believe that it is not easy to become a prosumer: "I have a very good opinion about the idea of being a prosumer regardless of the necessary conditions, but in order to become a normality, the conditions must be as accessible as possible, I do not say that there would be a lot of bureaucracy, because the process is simplified a lot, leaving the financial part as an impediment, which is discouraging for many potential beneficiaries. In the current economic context and considering the energy crisis, I think it is opportune to have friendly legislation with potential prosumers and it would be opportune to motivate the population to make long-term investments to produce green energy, accessing the related subsidies.", "It is a wonderful idea, but difficult to put into practice", "I believe that although the idea of becoming a prosumer would appeal to the majority of the population, the necessary conditions to be able to fit into this category are not within the reach of the majority", "The idea is good, the conditions are quite difficult to fulfil. From the difficulty of obtaining an approval for installations with higher power, to the reluctance of distributors to implement technical solutions", "It takes extremely long from 6 weeks to 1 year to process distributor / supplier documents", "Favorable opinion, but there are obstacles, however, from the State and energy suppliers".

There are also opinions that show that in the urban environment, for those who live in flats, it is not a solution: "Practically impossible if you live in flats", "Good idea, but it is not valid for those who live in flats."

3.6. The perception regarding societal marketing actions in the field of energy

There are formed opinions among potential consumers about the societal marketing actions that should be found in the policy of energy companies to meet the needs of consumers, while protecting society. The answers of a large part of the respondents show that the role of marketing actions is to inform about the green energy, to present consumers with the benefits of using green energy, to present the advantages of using green energy: "It should be highlighted that in addition to producing the energy you need yourself, you can also make money from surplus energy", to help consumers be aware of the need to reduce energy consumption, to educate: "Educating customers to better understand the phenomenon", "Companies can educate consumers so that they change their unhealthy habits for the environment, but also for their own pocket", “many energy supply companies have started various campaigns offering electrical objects with good energy efficiency in order to replace the old ones that consume a lot", to promote social responsibility: "afforestation campaigns, function of the degree of pollution produced", to involve and motivate clients in complying with environmental protection regulations (see Figure no. 2).



Figure no. 2. Perceived roles of societal marketing regarding green energy

The respondents consider that responsible activities towards the environment and society suppose that the energy companies will invest in obtaining renewable energy sources, allocate more funds for the regeneration of forests and finance awareness raising campaigns regarding energy efficiency.

The tools used can be found at the level of all four elements of the marketing mix: at the level of the product policy (to offer packages for the installation of production and/or energy saving equipment, to offer products with lower consumption of energy, to provide a customer service more adapted to the customer's profile), the price policy (price reduction, personalized price offers), the distribution policy (personalized distribution) and the communication policy (see Figure no. 3).



Figure no. 3. Societal marketing mix in green energy field

Most of the measures are mentioned at the level of the communication policy: "to help consumers to become aware using promotional campaigns with tips & tricks for reducing energy consumption", "promoting renewable energy and efficient use of energy", "Green energy should be marketed as a necessity", "promotion through social media", "Promoting the various sources of obtaining green energy", "Promoting in mass media financial advantageous offers for the consumer". An aspect mentioned is related to the diversity of communication channels, so as to provide access to information to the widest possible audience.

There are very few respondents who believe that there are no marketing actions with real impact or that marketing activity is not necessary and a small part of the respondents do not have an opinion about the societal marketing actions of energy companies.

Conclusions

There are numerous studies regarding the risk perceptions of climate change and there are different results, for example the 1992 Gallup Health of the Planet (HOP) Survey indicated that more than half of the respondents in 13 out of 24 countries worldwide felt that climate change was a serious problem (Lorenzoni & Pidgeon, 2006), but Leiserowitz in a study (2005) states that Americans perceived climate change as a moderate risk that will predominantly impact geographically and temporally distant people and places, and Kahan et al. (2012) shows that members of the public with the highest degrees of science literacy and technical reasoning capacity were not the most concerned about climate change. Surveys of the public in Canada, Mexico, and the United States regarding the levels of concern over climate change threats, perceived risk, knowledge of climate change policies, … and other perception factors to help understand the relationships between public perceptions and policy preferences for renewable energy show national differences between the countries in nearly all climate change perceptions, with Mexico reflecting the highest levels of concern and the United States the lowest and Mexico showing the greatest support for renewable energy sources (Hagen and Pijawka, 2015).

In this research, the analysis of the results indicates that climate change is perceived as a danger and green energy is perceived as necessary in the current context. The potentials consumers are familiarized with the forms of green energy and have a formed opinion about the necessary measures which can be structured according to their ex-post (reduction of negative effects) or ex-ante (prevention) character and also function on the decision level at which the mentioned measures are taken: measures at the individual level, measures at the level of energy producers, measures at the level of energy-consuming companies and measures involving government programs and legislative power.

The originality and value of the research are related to the fact that the study provides an image of how the green energy is perceived and the societal marketing role in the field of energy is presented together with the specific characteristics of the marketing mix, which can have important practical implications for the energy sector. The purpose of societal marketing is to satisfy the needs and requirements of customers, to make profit respecting at the same time the conditions of long-term social responsibility.

The main limits of the research are related to the fact that the results obtained from qualitative research cannot be extrapolated to the level of the entire researched population, but they are useful because they provide an insight of green energy perception and of the marketing activity in the field and the results of this study can constitute the premises for quantitative research.

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AI Trends: Salient Aspects for the Manufacturing Sector and Its Global Supply Chain

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Abstract

There has been a lot of buzz around latest AI chatbots. No doubt generative AI comes with the potential to significantly increase productivity for specific tasks in the corporate world. However, we must keep in mind that AI trend is currently in a hyped context and it is important to demystify what are just inflated expectations. The manufacturing sector and its global supply chain are areas where the chatbots implementation can help to achieve sustainability goals and identifying ways for improvement. In summary AI algorithms are transforming the manufacturing sector and its global supply chain by enabling predictive maintenance, improving quality control, optimizing the supply chain and manufacturing processes, enabling mass customization, facilitating autonomous operations and promoting sustainability. To answer the question what the AI strategies for the manufacturing sector and its global supply chain are, it was conducted a review of the recent scientific literatures to detect the salient aspects. With these identified directions it was cross-checked the news press articles of seven large global consulting companies to pinpoint the highlights and lowlights. For better understanding of the AI expectations, a cross table survey had been considered with strengthen, opportunities and limitations. However, the roadmap to implement those directions is up to each corporate company.

Keywords

AI, manufacturing sector, global supply chain, AI algorithms, AI chatbots, consulting

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Introduction

There are several trends that are to emerge in post-pandemic times: increased adoption of automated robotic processes. Acronym AI refers to Artificial intelligence which is the simulation of human intelligence processes by machines, especially computer systems. Even before the pandemic it was used various AI applications including advanced web search engines, recommendation systems, chatbots understanding human speech, self-driving cars, translation between natural languages, automated decision-making and competing in chess or other strategic games. However, for large and complex problems, AI algorithms consume considerable resources and computational time due to exceeding large, big data searching approaches (Zhang et al, 2014). The pandemic has brought new aspects and needs in the immediate attention: the growth of remote work and increased focus on cybersecurity (Jaber et al, 2021) The pandemic has forced many companies to embrace remote work. AI applications such as chatbots and virtual assistants helped to facilitate communication and collaboration between remote workers. With more people working from home into the cloud systems or data had been transmitted online, there is a trigger and great need for cybersecurity. Here also AI-powered solutions can help to detect and prevent cyber threats in real-time (Pritom et al, 2020). It is important to mention that pandemic had more emphasis on the AI-driven healthcare strategies. AI can be used for diagnosis and even predicting outbreaks or diseases (Devaraj et al, 2021; Jaber et al, 2021). Last not least the pandemic has highlighted the importance of ethical AI practices. Specific AI applications become more transparent and traceable, with fair accountability in the development and deployment of AI systems (Cave et al, 2021). Overall, post-pandemic times are likely to see greater adoption and development of AI and chatbots technologies across a range of industries, as businesses and

organizations seek to adapt to new challenges and opportunities. AI is likely to play an increasingly important role in the industry and specific in the manufacturing industry sector (Velu et al, 2020). The use of the AI in industrial sector and its global supply chain dates back to the 1990s (Kar et al. 2019; Kaushik et al, 2023). That time early application for planning and some decision support systems were used to optimize various aspects of the global supply chain. However, only until the mid-2000s the use of the AI has gain significant attention, due to increased data memory of the largest computers (Molas et al, 2021). Another area where AI has been used in global supply chain have been the planning optimization. AI-based algorithms have been used to optimize transportation, logistics and transit planning (Agarval, 2016; Kar et al, 2019; McKinsey, 2022). An AI chatbot is a computer program that can simulate human interactions using natural language processing and machine learning (Adamopoulou et al. 2020; Gupta et al., 2020). AI chatbots can learn from machine learning algorithms, scripts and stored big data. Also, they understand the context and are able to associate questions with answers, learn from each interaction and enlarge human decision with additional context. In the recent post-pandemic years, the AI algorithms have also been used to mitigate supply chain resilience, with accurate traceability and to improve supplier selection and negotiation (Atwani et al, 2022). This aspect had enabled organizations to ensure products on-time-delivery, quality requirements and competitive price level. To ensure supply chain resilience the main query was formulated as follows:

RQ1: What are the salient aspects from the AI perspective for the manufacturing sector and its global supply chain?

Overall, the use of AI chatbots in global supply chain has evolved significantly over the years. Today it is a critical tool for organizations looking to optimize their supply chain operations, enhance customer service and improve sustainability.

1. Review of the scientific literature

This paper research is looking to identify the important directions of applicable AI trends by reviewing the scientific literatures for the chosen key words. The recent post-pandemic researchers bring a multitude of various scenarios including lesson learnt. Focus of this paper research is to acknowledge potential study cases which might be further developed by the manufacturing organizations. It is not the focus to ensure a safe way to validate use cases scenarios, but only to setup general directions for the salient aspects.

EU Commission experts from research and technology organizations have discussed the Industry 5.0 concept in July 2020 (https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en). AI algorithms have the potential to transform the manufacturing sector in several ways. For further analysis, with no specific prioritization it was identified and considered following six areas and directions of applicability with potential benefits: predictive maintenance, quality control, supply chain optimization, manufacturing process optimization, product customization.

1.Predictive Maintenance: AI enables predictive maintenance by analyzing data from sensors embedded in machines. This helps manufacturers identify potential problems before they occur and proactively schedule maintenance, thereby reducing downtime and costs. AI-powered sensors and analytics can help manufacturers identify potential equipment failures before they happen, allowing for proactive maintenance and reducing downtime. Artificial Intelligence for predictive maintenance refers to the use of advanced machine learning algorithms and data analysis techniques to predict when maintenance is required for machinery or equipment. This approach enables organizations to detect potential equipment failures before they occur and take corrective action to prevent unplanned downtime, increase reliability, and reduce maintenance costs (Stewart et al, 2022). AI for predictive maintenance typically involves collecting and analyzing large amounts of sensor data from machinery and equipment, such as temperature, vibration, and other performance metrics. Machine learning algorithms are then used to identify patterns and anomalies in this data, and to generate predictions about when maintenance is likely to be required. These predictions can be used to schedule maintenance proactively, minimize downtime, and optimize maintenance resources. Overall, AI for predictive maintenance can help organizations to improve the efficiency and effectiveness of their maintenance operations, extend the lifespan of their equipment and reduce overall maintenance costs (Wang et al, 2018).

2. Quality Control: AI-powered vision systems can detect defects in real-time, enabling manufacturers to identify and rectify quality issues quickly. This results in fewer defective products and higher customer satisfaction. AI can be used to monitor production lines and detect defects or anomalies in real-time, improving product quality and reducing waste. Artificial Intelligence for Quality Control refers to the use of advanced machine learning algorithms and computer vision techniques to automate the process of

detecting defects or anomalies in manufacturing or production processes (Adamopoulou et al. 2020). With AI for quality control, cameras and sensors are installed along the production line to capture images of products as they move through the production process. The images are then analyzed using machine learning algorithms to identify any defects or anomalies in the product, such as scratches, dents, or misalignments. This approach can be used to identify defects that might be difficult or impossible for human inspectors to detect and it can operate 24/7, enabling continuous monitoring of quality. In addition to detecting defects, automation for quality control can also be used to identify patterns and trends in the manufacturing process that may be contributing to quality issues and provide insights into ways to improve processes or adjust production parameters. Generally, AI strategies for quality control can help organizations to improve the consistency and quality of their products, reduce waste and rework, and increase efficiency in manufacturing or production processes.

3. Supply Chain Optimization: AI can be used to optimize the global supply chain by predicting demand, reducing inventory and identifying the best suppliers. This enables manufacturers to streamline their supply chain, reduce costs and improve lead times. AI data control can help manufacturers optimize their supply chains by predicting demand, identifying bottlenecks, and optimizing inventory levels. Artificial Intelligence refers to the use of advanced computer algorithms and machine learning techniques to enable computer systems to perform tasks that typically require human-like intelligence, such as decision-making, problem-solving, and natural language understanding. When applied to supply chain optimization, AI algorithms can help organizations to better manage their inventory, production, and distribution processes, by providing real-time insights and recommendations based on data analysis and predictive modeling (Agarval, 2016). AI can also be used to automate repetitive tasks, office routines, improve efficiency and enhance collaboration across the entire supply chain ecosystem. Ultimately, AI can help organizations to achieve their supply chain goals, such as reducing costs, improving quality, and increasing customer satisfaction (Velu et al, 2020; Atwani et al, 2022; Deloitte, 2022). Furthermore, AI algorithms can be used to analyze data from various sources, including suppliers, customers, and regulatory agencies, to identify opportunities for sustainable practices and develop strategies to achieve sustainability goals. This can include using predictive analytics to forecast demand and optimize inventory levels, as well as using machine learning algorithms to identify patterns and predict potential risks before they occur. Overall, AI can be a powerful tool for promoting sustainability in the supply chain, enabling organizations to reduce their environmental impact, promote social responsibility, and enhance economic sustainability by optimizing operations and reducing waste.

AI for supply chain risk mitigation refers to the use of advanced technologies and machine learning algorithms to identify potential risks in the supply chain and develop strategies to mitigate those risks (Deloitte – OmniaAI; The AI opportunity in sourcing and procurement, 2023)AI algorithms can help supply chain managers to identify potential risks, such as disruptions in the supply chain due to natural disasters, geopolitical conflicts, or other unforeseen events, and develop proactive strategies to mitigate those risks. This can include identifying alternative suppliers, optimizing inventory levels, and developing contingency plans for various scenarios. Furthermore, AI chatbots can be used to analyze data from various sources to identify patterns and predict potential risks before they occur. This can help supply chain managers to take preemptive action to avoid disruptions and ensure continuity of operations (Modgil et al, 2020). AI can help manufacturers optimize their supply chains by predicting demand, identifying bottlenecks, and optimizing inventory levels. When applied to supply chain optimization, AI can help organizations to better manage their inventory, production and distribution processes, by providing real-time insights and recommendations based on data analysis and predictive modeling. AI can also be used to automate repetitive tasks, reduce waste, improve efficiency, and enhance collaboration across the entire supply chain ecosystem. Ultimately, AI strategies can help organizations to achieve their supply chain goals, such as reducing costs, improving quality, and increasing customer satisfaction.

4. Process Optimization: AI can optimize manufacturing processes by analyzing data from sensors, predicting and preventing equipment failures, and identifying process inefficiencies. This leads to improved productivity, reduced waste, and cost savings. Artificial Intelligence for production optimization refers to the use of advanced machine learning algorithms and data analysis techniques to optimize various aspects of manufacturing or production processes, such as scheduling, inventory management, and equipment utilization. AI algorithms for production optimization typically involves collecting and analyzing large amounts of data from various sources, such as sensors, production logs, and supply chain data. Machine learning algorithms are then used to identify patterns and insights in the data, and to generate recommendations or predictions for optimizing production processes (Atwani et al, 2022; Kutz et al, 2022). For example, AI can be used to optimize production scheduling by predicting the availability of raw materials and the capacity of production lines, and generating optimal production plans that minimize downtime and maximize efficiency. AI can also be used to optimize inventory management by predicting

demand for products and generating optimal inventory levels that minimize costs while ensuring sufficient supply. AI for production optimization can also be used to improve equipment utilization by predicting equipment failures before they occur and scheduling preventive maintenance to avoid unplanned downtime. In addition, AI can provide real-time insights into production processes, enabling operators to make informed decisions and adjust processes as needed to optimize performance. Overall, AI strategies for production optimization can help organizations to improve the efficiency and productivity of their manufacturing or production processes, reduce waste and costs, and enhance the overall quality of their products (Capgemini, 2022)

5. Personalization: AI can enable mass customization by analyzing customer data and tailoring products to meet their specific needs. This enables manufacturers to differentiate themselves in a crowded market and increase customer loyalty. AI algorithms can help manufacturers offer more personalized and customized products by analyzing customer data and preferences and enabling flexible production processes. Artificial Intelligence for product customization refers to the use of advanced machine learning algorithms and data analysis techniques to enable personalized and customized products or services that meet the specific needs and preferences of individual customers (Wang et al, 2022). With AI for product customization, customer data such as purchase history, preferences, and behavior are analyzed using machine learning algorithms to identify patterns and insights. This analysis is used to generate recommendations and customized products or services that are tailored to the individual needs of each customer. For example, AI can be used to generate personalized product recommendations based on a customer's purchase history and preferences. AI can also be used to enable mass customization of products, allowing customers to select specific features or options that meet their needs. AI for product customization can also be used to improve the design and development of products, using techniques such as generative design and predictive modeling to create products that are optimized for individual customers. Overall, AI for product customization can help organizations to improve customer satisfaction and loyalty, increase sales and revenue, and differentiate themselves from competitors by offering unique and personalized products and services. AI strategies has the potential to revolutionize the manufacturing sector by improving efficiency, reducing costs, and increasing quality and customization. However, its successful implementation requires careful planning, investment in infrastructure and talent, and a focus on ethical and responsible AI practices (OECD, 2021)

6. Autonomous Operations: AI can enable fully autonomous operations by automating repetitive tasks, such as assembly line operations, inventory management, and quality control. This reduces the need for human intervention, increases productivity, and reduces costs. AI-powered robotics and automation can help manufacturers automate repetitive tasks, increase efficiency, and reduce labor costs. Artificial Intelligence for robotics and automation refers to machine learning techniques to enable robots and automated systems to perform tasks that typically require human-like intelligence and decision-making. AI for robotics and automation can be used in a wide range of industries, including manufacturing, logistics, healthcare, and agriculture. It can be used to improve the accuracy and efficiency of robotic systems, reduce the need for human intervention, and enhance the overall performance and reliability of automated processes. For example, AI can be used to enable robots to learn and adapt to new tasks and environments, using techniques such as reinforcement learning and deep learning. AI can also be used to enable robots to perceive and interpret their surroundings, using computer vision techniques such as object recognition and image segmentation. This can enable robots to perform tasks such as picking and packing items in a warehouse or performing surgical procedures in a hospital. AI for robotics and automation can also be used to optimize the performance of automated systems by predicting equipment failures before they occur, scheduling preventive maintenance to avoid unplanned downtime, and adjusting production processes in real-time to optimize efficiency and reduce waste. Overall, AI strategies for robotics and automation can help organizations to improve the efficiency and effectiveness of their operations, reduce costs, and enhance the safety and quality of their products and services (Kutz et al, 2022).

2. Research methodology

The research was carried out in the form of a case study that covered nine global major consulting companies with focus on the global supply chain and the manufacturing industrial sector. The selection of the consultant studies have been based on the six areas detected by the analyses of the literature reviews (Predictive maintenance, Quality control, Supply chain optimization, Personalization, Process Optimization, Autonomous Operations). The research consists in structuring the consultant opinion as high- or lowlights with main statements for these specific areas. The main aspects have been considered from a broaden range of articles and topics. The presentation and interpretation of the results with pros and cons had the focus on „global supply chain" for „manufacturing sector" as key words. Opinions as high-/low-

lights had been organise within a structured table in order to highlight specific conclusions and also with the limitation of the references.

3. Results and Discussions

AI algorithms and chatbots have been the central theme of the post-pandemic time and continue to further develop. The study focuses on the detailed analysis of these companies and may be treated as a case study.

Table 1: AI statements from major international consulting groups – Surveys summary for global supply chains – Highlights/Lowlights Overview

No.	Source of research	Authors opinion as Highlights	Authors opinion as Lowlights
1.	**Alvarez&Marsal** https://www.alvarezandmarsal.com/insights/artificial-intelligence-goes-mainstream	■ Most powerful technology available through low code in history and will fundamentally transform every element of a modern organization including marketing, sales, product development human resources and supply chain..■ AI is the next transformative force in business. It will fundamentally change customer expectations, bring about new and innovative business models	■ increased reliance on suppliers means an increase in the risks associated with suppliers. Service interruptions, data breaches and compliance and quality issues represent just a few of the challenges topping news stories, and as new risks are identified, regulations associated with the use of suppliers grow more numerous and complex. Use of AI in supply chain risk mitigation is a complex challenge.
2.	**Ernst&Young Global** https://www.ey.com/en_gl/ai	■ The application of artificial intelligence goes beyond "better" or "faster" processes. It inspires new ways of operating and growing a business. ■ AI is maturing and being embedded in enterprise systems or becoming more accessible for nontechnical users.	■ "Pervasive intelligence" will emerge through a massively distributed, digital connectivity and cloud fabric, transforming our economy.
3.	**Boston Consulting Group** https://www.bcg.com/publications/2022/benefits-of-ai-driven-supply-chain	■ A recent study by BCG and Aera Technology sought to pinpoint the source of companies' struggles to maximize value from AI in supply chains. The root cause lies how and where companies are applying it. Most still focus on using AI for analytics and prediction	■ Companies have not pursued the more valuable application of using AI to make recurring decisions by recognizing patterns in big data that humans cannot see.■ To unlock the full potential, companies need to deploy an AI-powered learning system that is integrated across functions ■ identify the efforts required and potential impacts likely to have on supply chains
4.	**McKinzey& Company**	■ Enabling end-to-end transparency and faster decision making ■Areas to benefit from AI implementation: Marketing	■ Companies must take organizational steps to capture the full value from AI.■ Supplementary effort to have stretched supply-chain functions.

	https://www.mckinsey.com/industries/metals-and-mining/our-insights/succeeding-in-the-ai-supply-chain-revolution	and Sales/ Procurement/ Planning/ Logistic and Distribution/ Production■Ai-driven Supply chain transformation	Concentrate on dynamically optimizing the company's global value rather than simply improving the performance of local functions. ■ AI will be able to provide teams with deeper insights. However, this visibility alone will not be enough to capture more value from AI-based supply-chain solutions.
5.	**Deloitte.** https://www2.deloitte.com/xe/en/insights/topics/emerging-technologies/ai-adoption-challenges.html	■ Research continues to improve the AI technology. We even saw a bump in investment during the first couple of years of the pandemic■ Technology comes in packages, as any practical solution relies on a range of complementary technologies as well as the key innovation	■ Why hasn't AI delivered on its promise? We just haven't supported it with the right enablers—both technological and human.■ complementary technologies that transformed the solutions from technically possible to economically viable.■New solutions for old problems based on Augment/ Streamline/ Optimize/ Renegotiate■ The real opportunity, the path to unlocking the full value of AI, requires us to think about work differently (RPA, various AI techniques, even non-AI techniques)
6.	**KPMG** https://kpmg.com/xx/en/home/services/advisory/management-consulting/optimize-your-sector-operations/future-supply-chain.html	■ Ethical supply chains. Businesses need to act to operationalize their sustainability strategy. ■ Data-driven decisions. Approach decision-making as a business discipline enabled with analytics technology■ New workforce for the future. Rapid workforce hiring and reskilling are critical organizational success factors.	■ Business as usual is not an option. The biggest limitation for supply chains is no longer technology but the imagination of the people who put it to work. As enterprises around the world face a perfect storm of change, today's supply chain leaders must transform business models, organizational structures and operations.
7.	**pwc** https://www.pwc.com/id/en/services/consulting/digital-supply-chain.html	■ The challenge is how to make it work effectively and affordably in a constantly evolving world.■Digital procurement. The procurement function plays a pivotal role in managing risk and cost across supplier management, strategic sourcing, contract management, purchase to pay and spend analytics.	■ more efforts to monitor continuously■ higher financial effort to invest in material stocks ■ more efforts and higher costs■ Customer behaviors and expectations are changing dramatically, challenging the established supply chain and operations setups of leading industrial companies. Supply chains are increasingly facing major disruptions, with the impact of COVID-19 at the top of the list.
8.	**Roland Berger**	■ Companies need to realize that customer centricity in supply chain management is a	■Global supply chains have often become 'monsters' that rob companies of a competitive advantage through

	https://www.rolandberger.com/en/Insights/Publications/Supply-chain-platform-from-customer-to-core.html	key competitive differentiator■ Turning legacy supply chain configurations into a company-wide platform that offers suitable supply chain configurations for all products in all markets	their opacity and complexity. ■Reduce complexity, increase value – But where to start? The first step is to analyze the different operating models in use in the company and assess them in terms of standardization and harmonization.
9.	**ACCENTURE** https://www.accenture.com/us-en/insights/artificial-intelligence/supply-chain-analytics-ai	■The keys to simultaneously addressing relevance, resilience and responsibility are advanced analytics and AI.■ There are three use cases make the most sense as starting points—all of which can play a significant role in helping companies maximize relevance, resilience and responsibility: 1. Advanced scenario modeling 2. Unified demand planning 3. Supplier risk monitoring and resolutions.	■ Companies so far have only scratched the surface of what analytics and AI make possible. To rise to the occasion today, companies need a full-scale reconstruction of the supply chain and manufacturing network.■ New demands are stressing the supply chain. Challenges to leveraging data and supply chain AI at scale. Despite recognizing the power and value of data and AI, companies will likely continue to find it difficult to leverage their investments more broadly.

The same consulting groups are showing reluctancy for the AI trends due to extra costs, limitations or potential failures (Deloitte, 2023; Accenture, 2023). In this age of digitization, technology resilience is essential for businesses. It prepares organizations to overcome challenges in the event of a failure, force majeure, cyberattack, data corruption, and other catastrophic system failures, 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).

Conclusions

AI systems can assist companies in analyzing large amounts of data, identifying patterns, and generating insights, but they cannot replace the strategic thinking and interpersonal skills of the human. Generally, the AI trends are described in very exciting aspects by all the consulting agencies. It is like these agencies are very keen to support the AI developments within the large corporate organization. Aligned conclusions is that companies must implement specific strategies which means struggle and costs. All the six main areas of applications for supply chain in manufacturing industry have to be developed in parallel. In summary, AI can be a valuable tool in improving supply chain resilience by providing real-time visibility, predicting potential disruptions, and optimizing purchasing processes for the manufacturing sector. However, it is important to note that AI has limitations and cannot replace human expertise and decision-making in all the situations. A holistic approach that combines AI with human expertise and risk management strategies is essential for building a resilient supply chain. The conclusions of this study align for the companies the AI benefits on the long term against various challenges within a very large and complex global supply chain for an manufacturing industrial sector.

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The Role of Human Resources Function in Promoting Sustainability on Oil & Gas Industry

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Abstract

This article presents the level of awareness among Human Resources managers and professionals of an Austrian oil & gas company with regards to Green Human Resource Management (GHRM). This is an approach with focus on integrating environmental sustainability practices into various HR functions within an organization. In addition, it recognizes that HR plays a crucial role in promoting and supporting sustainability by aligning the related policies and practices when it comes to talent attraction and retention, diversity, equity and non-discrimination or training and organizational effectiveness.

To collect the data, a qualitative research methodology was used. We aimed to deep dive on how the Human Resources function integrates the environmental, social and economic sustainability principles into the practices, policies and strategies of the organization. Thus, such actions involve long-term impact HR decisions and actions on the environment, society and on the overall well-being of employees and stakeholders.
The theoretical framework of the article is based on how corporate sustainability is integrated as a component of the overall business and Human Resources strategy. Interviews in the area of Talent attraction & Retention (Recruitment), Diversity, equity and non-discrimination and Training & Organizational Effectiveness were conducted in order to deep dive on the synergies between sustainability and HR strategy approach.
The finding of the study confirms that there is a relationship between the presence of GHRM and corporate sustainability in the Austrian oil & gas company where the interviews were conducted. The HR managers and professionals are aware of Green Human Resources Management, however there is space for improvement in building the right business capabilities for a sustainable environment. In this respect, organizations should implement strategic human resources management policies based on Green Human Resources Management concept, with more focus on selecting, developing and retaining green employees. By integrating sustainability principles into HR principles, organizations can contribute to a more sustainable and responsible future while fostering a positive workplace culture that attracts, develops and maintains top talents.

Keywords

Green Human Resources Management, Corporate sustainability, Recruitment, Diversity, equity and non-discrimination, Training & Organizational Effectiveness

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Introduction

As environmental concerns continue to expand worldwide, accompanied by the implementation of international environmental standards, businesses are now required to adopt formal environmental strategies and programs (Daily & Huang, 2011). By using a staggered approach, organizations are becoming more aware of the significance of adopting environmentally friendly practices and implementing environmental management techniques. In an environment where the corporate world shifts towards globalization and a

modern capacity-based economy, there is a growing need to embrace sustainable business practices, including exploring the green economic aspects of the business.

Green human resource management (GHRM) has therefore been noted as a key business driver for growing organizations where the Human Resource division plays a vigorous role in implementation of green initiatives (Ahmad, 2015). According to Ahmad (2015), Green Human Resource Management involves the implementation of HRM policies and best practices aimed to promote better use of resources within the organization. By fostering environmentalism, this approach also enhances employee morale and satisfaction. As per Jabbour (2013), it is crucial for organizations to align their human resource practices with their green management priorities. Muster and Schrader (2011) define Green Human Resource Management (GHRM) as the process of utilizing employees to boost sustainable practices and enhance their awareness and commitment towards sustainability issues. GHRM incorporates specific policies and practices that align human resources with the economic, social, and environmental pillars of sustainability worldwide.

Shore et al. (2006) argued that Green Human Resource Management plays a critical role in enabling organizations worldwide to address environmental issues by acknowledging them. From a management perspective, they suggested that organizations should adopt policies, practices, and rules linked to environmental protection. According to Jabbour (2010), Green Human Resource Management involves two critical elements: environmentally friendly human resource practices and the preservation of knowledge capital. In addition, Green HR includes reducing the carbon footprint by minimizing paper printing and adopting video conferencing and online interviews.

The objective of HRM practices is to enhance the environmentally friendly human capital and culture of an organization by recruiting pro-environment employees, providing training on technology and innovation, and offering rewards and incentives to promote the success of environmental management.

1. Context

During the time there was a lack of attention dedicated to the optimization of human resource management practices and their effectiveness in environmental management (Dalaney & Huselid, 2006). The clustering of GHRM practices for environmental management, including recruitment and selection, performance management and appraisal, training and development, employment relations, and pay and reward, was not introduced until 2008 (Renwick et al., 2008). HR professionals are now assisting oil and gas companies in their efforts to adopt strategies for sustainable business practices.

2. Objective of the study

The study aims to investigate GHRM and corporate sustainability among oil and gas companies within an Austrian oil & gas company. Moreover, the study is set out to achieve the following specific objectives:

- Determine the level of awareness on sustainability within the Human Resources department of an Austrian oil & gas company
- Collect qualitative data by conducting interviews with the Human Resources Director, but also functional department managers, such as Recruitment, Training & Organizational Effectiveness and Diversity, Equity & Inclusion.

The data was obtained from 4 HR managers within the company and 10 HR professionals in the chosen study. The theory of green economy was baseline for the study. As part of the interview questionnaire, both managers and professionals were asked about specific HR measures and projects, dedicated to support business in corporate sustainability. The focus was put on how they measure success when it comes to sustainability, how they act (in terms of actions & programs) and which is their plan and outlook for the coming period. The qualitative research aims to conduct a deep dive on the human resources strategy of one of the biggest oil & gas companies of Europe and one of the biggest investors and contributors within Romania.

3. Theory of Green Economy

In 1989, the UK government introduced the term "green economy" to describe a society that integrates with the ecosystem and considers markets and economies as social systems that should adapt to social and environmental objectives. The concept encompasses various subjects, such as the complex relationship between humans and the environment. The term "green economy" describes a society that harmonizes with

the ecosystem and considers markets and economies as social systems that must align with social and environmental goals. This theory covers a broad range of topics, including the intricate interplay between humans and the environment.

Oil and gas companies are utilizing GHRM practices to achieve their goal of corporate sustainability. A green economy aims to mitigate environmental risks and ecological shortages, while also pursuing sustainable development that avoids causing harm to the environment.

4. Concept of Corporate Sustainability

According to Landrum and Edwards (2009), corporate sustainability refers to a company's ability to operate in a way that safeguards the long-term health and survival of the business and its economic, social, and environmental systems while serving the interests of all current and future stakeholders.

Roberts and Tribe (2008) explain that while green HRM practices support the foundation and identify actions, processes, and practices that can lead to corporate sustainability. In other words, sustainability is the result of behavior driven by the adoption of green HRM practices and actions.

Although green HRM practices establish a basis and identify actions, processes, and practices that can contribute to corporate sustainability, there is a distinction between the two. Corporate sustainability is a consequence of behavior that is motivated by the adoption of green HRM practices and actions.

Hitchcock and Willard (2009) and Elkington (2004) argue that businesses that solely focus on reducing their environmental impact are referred to as "green businesses," while sustainable businesses should focus on all three dimensions of sustainability, also known as the "triple bottom line." The interdependence of these realms must be understood. However, several authors have criticized the private industry's attempt, particularly in the manufacturing industry, to become "sustainable" while limiting their efforts to the environmental dimension only (Swarbrooke, 1999; Font & Harris, 2004; Roberts & Tribe, 2008).

Kernel (2005) proposes a four-step model for sustainable development in firms, where taking environmental initiatives can be the first step towards sustainability. The initial step is creating cleaner processes and improving environmental management practices. Subsequent steps challenge organizations to consider social and ethical aspects as well as integration into the community. Similarly, Dunphy, Griffiths, and Benn (2007) provide a sustainability phase model that outlines distinct steps organizations can take to achieve sustainability.

The last stage, referred to as the "sustaining corporation," involves the integration of sustainability principles into the core values of the organization. This includes a deep commitment to ensuring the ecological viability of the planet, promoting equitable social practices, and supporting human fulfillment. However, according to Dunphy et al. (2007), no organization has currently achieved this stage. Most businesses seem to be in the early phase and must continue to work towards incorporating the ecological, environmental, and socio-cultural aspects of sustainability.

The Human Resources department of the group where we conducted our study, launched the new strategy 2030 in 2022, which is in line with the global business strategy. It aims to facilitate the implementation of our Business Strategy and enable transformation within the organization. It established a basis for the creation and maintenance of a robust talent pool that will empower us to attain our objectives, comprising four key strategic pillars: "New Ways of Working," "Organizational Evolution," "Growing Talent," and "Employee Experience."

The organization initiated a collaborative and all-encompassing approach to revamp the values, guided by the philosophy of "fingerprints of the many," at the group level to promote inclusivity. All employees were integral to this endeavor, contributing in achieving the goal of "Re-inventing Essentials for Sustainable Living" while shaping a new working approach. A Change Agent Network comprising over 70 members globally, was formed, and human resources department conducted workshops on Values & Behaviors and AI (Artificial Intelligence) to facilitate a collective development of our novel values that will steer the future modes of operation.

5. Human Resource Management

A green company is one that provides environmentally sustainable products and services, employs renewable energy sources, utilizes resources efficiently, and reduces negative impacts on the environment through green practices. Green activities refer to actions taken by an organization to decrease its detrimental effects

on the environment and preserve natural resources. Meanwhile, the workforce plays a pivotal role in attaining organizational objectives through the development and implementation of business strategies.

To achieve green policies, an organization must ensure that it has skilled and talented individuals, as stated by Phillips (2011). Gerhart et al. (2010) suggest that the successful implementation of green strategies is contingent upon the extent to which employees within the organization are environmentally conscious.

Phillips (2011) states that for an organization to realize its green objectives, it must have a competent and proficient workforce. Additionally, Gerhart et al. (2010) propose that the effectiveness of green initiatives is reliant on the degree to which employees are environmentally aware.

Green management, which seeks to maintain a healthy environmental balance, includes green human resource management (GHRM). The objective of GHRM is to preserve the environment and promote sustainability, as outlined by Javed and Cheema (2017). Renwick et al. (2008) define GHRM as the development and in the implementation of a system that fosters environmental consciousness among employees and supports the attainment of environmental sustainability goals. GHRM involves the use of HRM practices to endorse environmentalism and sustainable utilization of organizational resources. Owino and Kwasira (2016) suggest that GHRM practices encompass job descriptions, recruitment and selection processes, training, performance management, and evaluation.

Abbaspour, Karbassi, and Khadivi (2006) define green HRM as a dynamic and continuous system of activities and processes that aims to foster alignment between the environmental values of staff and those of the organization. Molina-Azorin, Claver-Cortés, López-Gamero, and Tari (2009) note that organizations often consider green HRM as an ethical concern and a potential source of competitive advantage due to its ability to provide economic and strategic benefits, rather than just as a reactive strategy.

With the growing importance of environmental management worldwide, academics have increasingly focused on exploring the link between financial and social performance (Margolis, Elfenbein & Walsh, 2009). Researchers have argued that adopting environmental practices can have a positive impact on a company's competitive position (Giménez Leal, Casadesús Fa & Pasola, 2003), reduce negative environmental impact and encourage stakeholders to adopt environmentally friendly behaviors.

The approach adopted by the Austrian oil & gas company analyzed within this study, about People & Communities supports the following UN Sustainable Development Goals:

- Addressing communicable diseases such as COVID-19;
- Ensuring equal opportunities for both genders by enhancing skills and preventing discrimination;
- Implementing policies to eradicate discrimination against women;
- Encouraging diversification, technological advancement, and innovation while providing decent work and equal treatment to all employees;
- Eliminating any discriminatory policies or practices.
-

6. Diversity, equity and non-discrimination & Corporate sustainability

When it comes to diversity, equity and nondiscrimination, the company places a strong emphasis on utilizing diversity as a means of generating business value, recognizing that diversity in terms of age, nationality, and gender can greatly enhance our problem-solving capabilities. The organization recognizes that Diversity, Equity, and Inclusion (DE&I) can have a positive impact on individuals and teams, leading to increased engagement, job satisfaction, and contributing to the long-term sustainability of the business.

An important objective of DE&I strategy is to enhance gender diversity at the management level, nurturing the development of future talent, and concurrently improving employee engagement and overall employee experience.

Hearing that Austrian oil & gas organizations, launched a DE&I vision with three pillars: diversity of thought and experience, equitable opportunity reflects an improvement when it comes to ensuring an inclusive and safe space.

The first pillar, diversity of experience, is essential to foster a culture of innovation and creativity. By embracing and leveraging differences in perspectives, backgrounds, and experiences, the organization can tap into a wealth of ideas and insights that might not otherwise be possible.

The second pillar, equitable opportunity, is critical to ensure that everyone within organization has an equal chance to succeed and contribute to its success. This means actively removing barriers to entry, promotion, and advancement that might prevent certain individuals or groups from reaching their full potential.

The third pillar, ensuring an inclusive and safe space, is crucial to building a culture of trust and respect within your organization. This means creating an environment where everyone feels comfortable bringing their full selves to work, without fear of discrimination or harassment.

Overall, by focusing on these three pillars, the organization can work towards creating a more diverse, equitable, and inclusive workplace, where everyone can thrive and contribute to its success. As part of its sustainability success measurements, the organization tracks the diversity of its employees in terms of age, nationality, gender, and management positions. Additionally, the organization also monitors parental leave for both men and women on an annual basis.

7. Talent Attraction and Retention & Corporate Sustainability

In order to attract environmentally conscious candidates, job advertisements should include environmental values, such as being part of a green team. Renwick et al. (2008) and Jackson et al. (2011) suggest that proactively branding the organization as a high-quality "green employer of choice" can facilitate the recruitment of environmentally aware talent. Many companies are recognizing that building a reputation as a green employer is an effective strategy for attracting and retaining talent (Phillips, 2011; Stringer, 2009). Research by Owino and Kwasira (2016) on the influence of green human resource management practices on environmental sustainability has concluded that hiring eco-conscious employees is a key factor in achieving an organization's sustainability goals.

In order to achieve their environmental goals, environmentally responsible employers can attract the talent necessary to implement corporate environmental management initiatives.

The Austrian oil & gas company which participated to our study is continuously devising strategies and programs with the objective of attracting and retaining talented professionals who are enthusiastic about contributing to the growth of the organization. By maintaining a high retention rate, they enhance employee morale, foster a positive work culture, increase productivity, and position the company as an employer of choice.

As part of the sustainability reported KPIs, they keep track of the number of newly hired employees and the employee turnover rate, categorized by age group and gender. Additionally, they monitor parental leave statistics and gauge the level of engagement among their team. Their emphasis lies on constructing long-term talent acquisition programs and drawing in fresh graduates to cultivate the upcoming generation of skilled professionals.

8. Training and Organizational Effectiveness & Corporate Sustainability

Renwick et al. (2008) proposed several green training and development practices, including teaching employees to perform environmental assessments of their workspace, utilizing job rotation to train future green managers, providing specific training on aspects of environmental management such as safety, energy efficiency, waste management, and recycling, developing personal green skills, and retraining staff who are losing their jobs in polluting industries (Jackson et al., 2011). These skills encompass reducing waste (North, 1997) and possessing expertise in environmental protection and environmental literacy. Environmental education, training, and development are crucial components of green HRM within an organization. Achieving the targeted environmental performance of a firm is challenging without proper education, training, and development.

A study conducted by Prasad (2013) found that a strong connection between training and development and environmental sustainability. The study concluded that when employees are well-educated about the company's green policies and procedures, including its vision and mission statements, it enhances sustainability-oriented benefits and facilitates company-wide initiatives such as reducing greenhouse gases and creating eco-friendly products.

Similarly, Daily et al. (2011) conducted studies on the integration of environmental sustainability skills in human capital training and development. This indicates that some organizations have recognized the significance of providing green education, training, and development in their workplace.

The Austrian oil & gas company promotes a culture of continuous learning, where employees are encouraged to enhance their knowledge, skills, and performance to meet the business objectives. The nature of our activities demands highly qualified employees who can adapt to the evolving technologies and changing market demands. The organization is committed to maintaining a skilled, highly qualified, and high-performing workforce.

As part of the training and organizational effectiveness KPIs, the organization tracks the number of training hours per employee, categorized by employee type and gender. Additionally, the organization monitors the number of employees who receive regular performance and career development reviews.

The organization adjusts its training curricula based on a needs assessment, which involves a combination of internal and external training programs. With the COVID-19 pandemic, traditional classroom training has been transformed, and there is now a greater emphasis on e-learning and digital content platforms. The organization encourages employees to select subjects that are better suited to their needs on these platforms.

The quality of all training programs is evaluated based on various criteria, such as content quality, instructor performance, ability to adapt to the audience, and achieved outcomes. After conducting an internal analysis and gathering feedback, improvements are considered and implemented to enhance the quality of the content and select the most appropriate topics for the upcoming training period.

Implementing innovative learning programs and supporting teams increase their technical competencies, develop their soft skills and enabling them to be a part of the organizational transformation and growth is key for developing a sustainable HR strategy.

Conclusions

Based on the findings of this research, there is a trend among HR managers in oil & gas industry to be aware of the importance of Green Human Resources Management. The HR strategy mirrors the business strategy for "reinventing essentials fir a sustainable living" and develops tools which support business focus on corporate sustainability. However, during the interviews managers mentioned that their journey in green HR is still at the beginning. As a development and continuous improvement measure, HR department should aim to further built on implementing the new business strategy by supporting business to attract, retain and develop human resources in a sustainable way.

In addition, dedicated engagement surveys and pulse check surveys shall be conducted as an integrator for wellbeing, people development and leadership development. The main focus areas in terms of diversity shall focus on employee's wellbeing, generations, disabilities and women. Dedicated events having as main theme corporate sustainability are a good enablement tool to increase employee's commitment and interest on the topics and create a strong volunteer network.

In terms of training and organizational effectiveness, we recommend the integration of the corporate sustainability element within the company's values, as part of living the new purpose – "Reinventing essentials for sustainable living". A training catalogue, presented and marketed as a "Sustainability academy" would be a good enablement tool for upskilling the team and developing leadership.

Furthermore, organizations shall implement strategic human resources management policies based on Green Human Resources Management concept, with more focus on selecting, developing and retaining green employees.

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Artificial Intelligence's Relevance for Energy Optimization, Companies and Business Internationalization

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Abstract

This paper presents and analyses the relevance of artificial intelligence for energy optimization companies and business internationalization, the mega-trended combination between digitalization and globalization impacts directly business internationalization. The methodology of research relied on a literature review and data analysis in quantitative qualitative way by focusing on a case study as well using bibliographic data from Scopus and operating the steps using VOSviewer to go further with research. The research question is" How relevant and connected or useful artificial intelligence for business internationalization, companies and energy optimization?". The results show that embracing artificial intelligence could speed so far business operations and processes. Moreover, since the world is moving towards industry 5 and the economy of the future, artificial intelligence has become an important instrument for all the economic sector including energy that is related to business opportunities and companies' internationalization and operations, energy is a business as well since it is about supply and demand and it always needs optimization and AI has been useful for that taking the example of smart grids, smart cities and houses, AI for renewable energy (solar and wind), industry and electrical vehicles. In conclusion, business internationalization relies on the use of digitalization that connects business operations and relationships. AI is important for business internationalization, companies and energy optimization.

Keywords Business, company, artificial intelligence (AI), energy optimization, implications, internationalization

DOI: 10.24818/BASIQ/2023/09/075

Introduction

The world of energy and global energy map have been undergoing major changes and challenges from time to time since energy sources and commodities are considered world engines. All the changes and challenges are directly associated with business opportunities and economic processes which many companies use and consider to advance and consolidate their internationalization process. AI is a vast and expanding area that is penetrating all scientific fields. It is currently being used in many areas, including marketing, banking, agriculture, healthcare, security, robots, speech recognition, chatbots, manufacturing, and many other areas (Faisal *et al*, 2021). Digitalization and internationalization of business helps the firms promote and sell their products at affordable cost. This mechanism is not working if they are operating in an export market without a non-digital oriented and infrastructure readiness (Gregory, Karavdic, & Zou, 2007).The changes appear mainly in the perspectives of supply and demand. On the supply side, there important factor to consider such as the resurgence of oil and gas production in the energy market. The decision to reduce nuclear energy in many counties and the speed up to renewables have been challenging facts globally. Since energy has moved the world to more consumption and production, global energy and demand has been controversial and significant to fight against energy poverty as a main goal economically and energetically. Although artificial intelligence is a great invention in technology, it could provoke some difficulties in the same sectors where it is relevant and more. The fact that Artificial Intelligence implements and makes decisions as well bases on big data by defining the goal for that, it has become more relevant and important in the energy sector and industry. Its potential for the energy system and its future design have become very compatible and big. Especially, in some fields such as smart grids, electricity, trade, transport and heating.

It has made the energy industry more efficient by processing and analysing big data. Artificial intelligence has become able to process and evaluate power trading to help improve forecasts for weather data, historical data and electricity trading. Supply security needs better forecasts that increase and rely on grid stability. Therefore, it helps speed up the integration of renewables and enhance forecasts in the energy industry.

1. Literature review

The first use of "Artificial intelligence" (AI) was by computer scientist McCarthy in 1954 (Cukier, 2019). In the conference organized by him and his colleagues, he stated that every aspect of learning and intelligence could be described in a way that a computer can simulate. AI is the ability to mimic the cognitive functions of humans, such as learning and problem-solving which are distinct features of the human mind (Schalkoff, 1990). AI is a vast and expanding area that is penetrating all scientific fields. It is currently being used in many areas, including marketing, banking, agriculture, healthcare, security, robots, speech recognition, chatbots, manufacturing, and many other areas (Faisal *et al*, 2021). In recent years AI applications in energy systems have gained more focus (Forootan *et al*., 2022). (Ang and Lee, 1994) proposed that the optimal restructuring of industrial structure transformed heavy industries into light industries, which greatly reduced energy intensity. (Feng *et al*. 2009) studied the long-term relationships among energy intensity, economic structure, and energy consumption structure and suggested that the energy structure dominated by coal consumption largely constrains the improvement of energy efficiency, and the government should fully consider the effects of energy consumption structure and economic structure on energy intensity. Economic development and raising welfare are always entangled with the rising consumption of energy resources. Increasing energy generation as the default answer to how to cope with this additive energy consumption may not be the best answer. From an energy justice perspective, it's not acceptable to deplete energy reservoirs that belong to the next generations (Sari *et al*., 2017). One area in Artificial intelligence and machine learning usage is buildings energy consumption modelling (Amasyali and El-Gohary 2018). Building energy consumption is a challenging task since many factors such as physical properties of the building, weather conditions, equipment inside the building and energy-use behaving of the occupants are hard to predict (Platon, 2015). Controlling and modelling the combustion processes (Kalogirou, 2003) optimizing the distillation tower (Ramchandran and Russell Rhinehart,1995) or even more specific processes such as "shell" heavy oil fractionator are examples of usage of Artificial intelligence in this industry. AI and ML can be implemented in renewable energies that has recently gained a lot of focus (Zahedi, 2022). AI may be implemented in energy storage ML is very able in data classification and other related tasks. Mainly, AI and ML can efficiently may use energy storage in the energy grid to shave peaks or use the stored energy when these sources are not available. ML methods have recently been used to describe the performance, properties and architecture of Li-ion batteries. (Kauwe *et al*., 2019). Digitalization and internationalization of business helps the firms promote and sell their products at affordable cost. This mechanism is not working if they are operating in an export market without a non-digital oriented and infrastructure readiness (Gregory, Karavdic, & Zou, 2007). Similar to the impact of technology turbulence (Kaleka, 2012). Digitalization facilitates and boosts knowledge acquisition and enhances business networking. It creates a business environment in which young exporters can learn fast and makes early and rapid internationalization possible (Johanson and Vahlne, 2009).

2. Research method and research questions

The methodology of research relied on a literature review and data analysis in a quantitative qualitative way by focusing on a case study, the steps for the case study are mentioned below using bibliographic data from Scopus and operating the steps using VOSviewer to go further with the research, (See figure no. 1) VOSviewer is a software for creating and visualizing maps of network data, it was suitable in this study, analysis and research to run a bibliometric analysis so the maps of common items and their co-occurrences could be successfully visualized using the relevant data. The research question is" How relevant and connected or useful artificial intelligence for business internationalization, companies and energy optimization?"

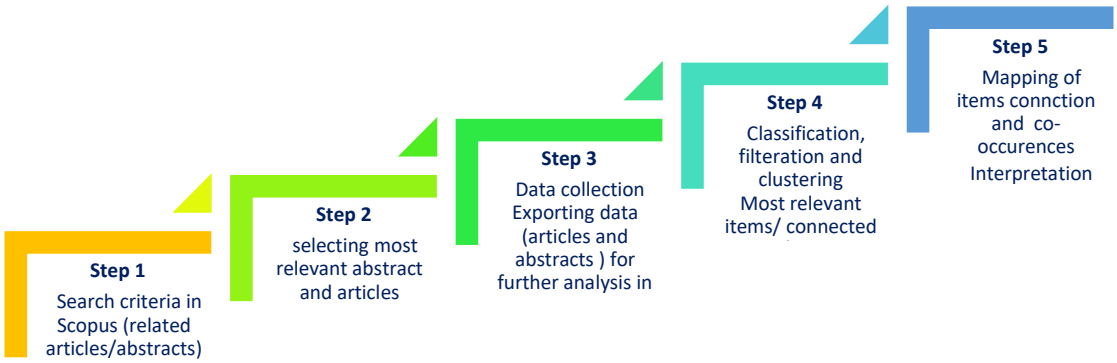


Figure no. 1. Research criteria and steps of case study
Source: Author's design and research, 2023

3. Results and discussion

The use of artificial intelligence promises great benefits for global society. One of the current topics of this time concerns global warming, which can be attributed to the energy consumption of fossil fuels. On the one hand, artificial intelligence helps understand the effects of emissions on climate change, on the other hand, company processes and consumption in households can be optimized through its use.

The use of AI on Energy Demand and Markets

The use of artificial intelligence has a fundamental relationship to the energy sector, especially in the extraction of hydrocarbons, the search for water for the construction of wells and the identification of new ways of generating energy, ways are always being sought to make the use of natural resources more sustainable without sacrificing productivity. Artificial intelligence helps in the efficient, fast and safe extraction of resources and deals with the distribution and regulation process. The two main goals are therefore lower costs with the associated more competitive prices and a more sustainable use of resources. An example of an artificial intelligence technology is known as a "smart grid" artificial intelligence network. This network makes it possible to analyse the level of supply and demand analysis and troubleshoots the supply chain and detects consumption peaks. AI may help generate insights in energy and market by going through the following steps: (See figure no. 2)

- **Decentralization:** Transition from customer to prosumer, each being an active element of the ecosystem
- **Decarburization:** Integrating more sustainable energy sources through Distributed Energy Resources (DER).
- **Digitalization:** Generating real-time insights from connected assets from automated remote operations.

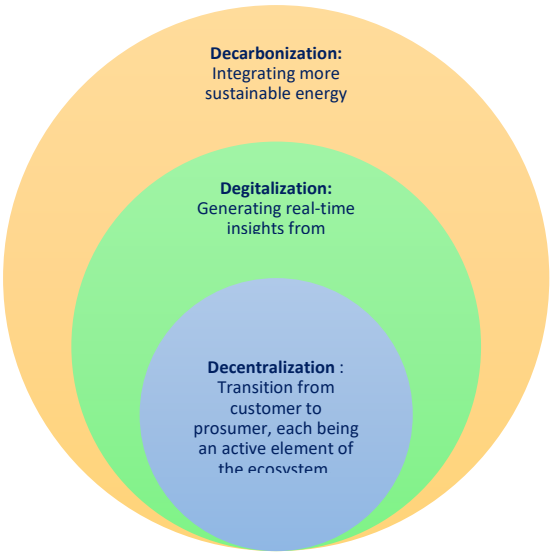


Figure no. 2. Smart Grids and Transformation for Energy Advantage
Source: Author's contribution 2023, Thales 2021

Artificial intelligence is seen as the technology that could dominate the world in the future. Higher or lower carbon deliveries may be something that artificial intelligence may or may not embrace, as the systems can analyze the vast amounts of data at hand and suggest optimization actions. Efficiency can reduce energy demand and emissions, for example by reminding and raising awareness among customers of the need to reduce energy consumption during peak periods by changing and controlling the setting of thermostats. In this way, the energy adjustment will be easier. A hyper-intelligent energy system powered by artificial intelligence could reduce costs and generate further savings. Energy consumption also changes over time in the energy market. With all the advantages, however, the disadvantages of using artificial intelligence should also be considered. The collection and use of consumer data can lead to unequal competition and, in the worst case, disadvantage consumers. The collected data can also fall victim to hacker attacks and be used for fraudulent purposes if not secured properly. In this respect, too, there are a number of things to consider in order to contain the disadvantages as much as possible.

Application and prospects of artificial intelligence in the energy sector

Artificial intelligence generally refers to adaptive intelligence exhibited by a machine on its own. The behaviour is not necessarily predetermined but adapts to the data entered. Most machine methods lend themselves to two main problems and classification problems. Problems of predicting if or when the equipment will fail, while problems of classification involve the difference between customers based on the artificial intelligence data from them. In the energy sector there are several interesting examples in both the retail and commercial sectors. One of the cleanest uses of AI, failure prediction and dynamic maintenance allows operators to predict device failures using sensor data from different devices, significantly reducing downtime and maintenance costs. In the area of energy efficiency, DeepMind, part of Google, has championed the use of reinforcement learning to reduce energy consumption in its data centers by a whopping 15%. The model learned by looking at operational data and then dictated changes to individual units. In trading, Origami Energy uses machine learning to predict asset availability and market prices in near real-time, enabling the company to bet successfully in the retail frequency response markets. Retailers use machine learning to understand patterns in customer behaviour to attract and retain customers, and even predict bill payment or non-payment. Artificial intelligence solutions are on the rise for consumers, and many retailers are offering these systems as part of an integrated package. Devices like "Alexa" allow customers to seamlessly interact with their thermostats and control systems, so increasing customer interaction with the device leads to the development of more personalized usage profiles that lower customer bills and help the utility to accurately predict operations .Indeed, AI aims to make the energy system more connected, intelligent, efficient, reliable and sustainable, and science is the ingenuity of making intelligent machines, especially intelligent computing.

Smart grids and the digitization process for the energy of the future

By analysing the challenges of the energy transition and the importance of digitization in it, artificial intelligence can be considered as a very important and fundamental role in the transition and transformation of the energy model. In fact, artificial intelligence allows and can do something and things that human beings are not capable of doing. Energetically, in the energy field, the truth is that there is a lot of data on the behaviour of people related to the system and meteorology, for example. Tailored insights from the energy sector can be obtained as well-analysed data, energy is consumed and generated with a controlled distribution process. Actually, to know the information that is available, three-tier analytics is applied to simply anticipate production or demand and prescriptive. Technical and non-technical incidents such as energy fraud or, in other words, energy irregularity are detected to optimize energy and the advanced energy model for smart networks, data is worked on in prediction of production and demand with use and implementation of smart meters.

Energy fraud or energy irregularities

The detection of energy fraud is done for different categories such as gas and electricity, to identify energy irregularities in the facilities, analysis of the information or data is carried out by the companies that have them about the user, which means the location of the meters. , rate types and consumption…etc. According to the needs of the distribution company and based on the data or information obtained, the system systematically compiles information on customers with a score for each one, for example, and the data is interpreted graphically to facilitate its compunction in a ranking firm, as well With this, a group of clients that could potentially be committing fraud against the company or the company is detected and shown. So the company can physically inspect the facilities to train predictive models again, so investing to limit energy fraud is very important.

Case study: AI relevance in energy and business

The method and research criteria AI, energy and business connection and items' co-occurrences started from number of relevant bibliographic data from the supported file database "Scopus", there were filtered much data to reach 5 most relevant "AI and energy" and 16 most relevant "AI and business). Using VOSviewer the minimum number of occurrences of an item (chosen) was 1 and the total reached items for AI and energy reached 86 whereas for AI and business the total items co-occurrences were 125 with a full counting method and a relevance score 60 % the final reached items by relevance score for AI and energy were 86 but the final filtered were 56 clustered in 5 clustered but for AI and business the final filtered items by relevance could reach 95 clustered in 10 clustered. (See tables no. 1 and no. 2)

Table no. 1. Method and research criteria AI, energy and business

Research criteria	AI and energy	AI and Business
Number of relevant bibliographic data (documents)	5	16
Supported file types	Scopus	Scopus
Fields from which terms where extracted	Abstracts/papers	Abstracts/papers
Minimum number of occurrences of an item (chosen)	1	1
Total reached items	86	125
Counting method	Full counting	Full counting
Relevance score (%)	60%	60%
Final reached items by relevance score	86	125
Final filtered items by relevance	56	95
Number of clusters	5	10

Source: Author's elaboration and research, 2023

The clusters are mentioned and visualized in various colours on the map of co-occurrences and they represent that prove the common connection between artificial intelligence and energy and business (See figures no 3 and 4).

Table no. 2. Clustering, research criteria and items' co-occurrences

Clusters/ Research criteria	AI and energy (items' co-occurrences)	AI and Business (items' co-occurrences)
Cluster 1	13	20
Cluster 2	13	13
Cluster 3	11	13
Cluster 4	10	12
Cluster 5	09	9
Cluster 6	-	8
Cluster 7	-	6
Cluster 8	-	5
Cluster 9	-	5
Cluster 10	-	4
Total	56	95

Source: Author's elaboration and research, 2023

A co-occurrence items' map was visualized between artificial intelligence and energy, so we observe the co-occurrence of items and links between AI and energy are potentially confirmed for the use and relevance of AI for energy in energy efficiency, energy policy, energy sources and industry, smart grids, energy utilization and management. Smart grids are connected through big data and neural network for alternative energy as well. AI is relevant for energy law and justice as observed with a focus on big data. (See figure no. 3). The visualized map of artificial intelligence connection, relevance and relationship with business shows that the clusters are connected directed with AI. Artificial intelligence is relevant for business process, intelligent robots, it has links with business models and management. Ai is related well to business values, benefits and challenges, business process and intelligence by focusing well on adaptive algorithms. (See figure no. 5)

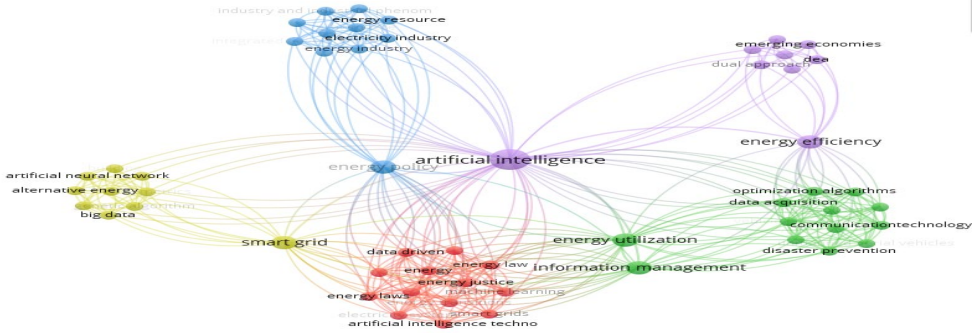


Figure no. 3. Artificial intelligence connection with energy
Source: Author's elaboration and research, 2023

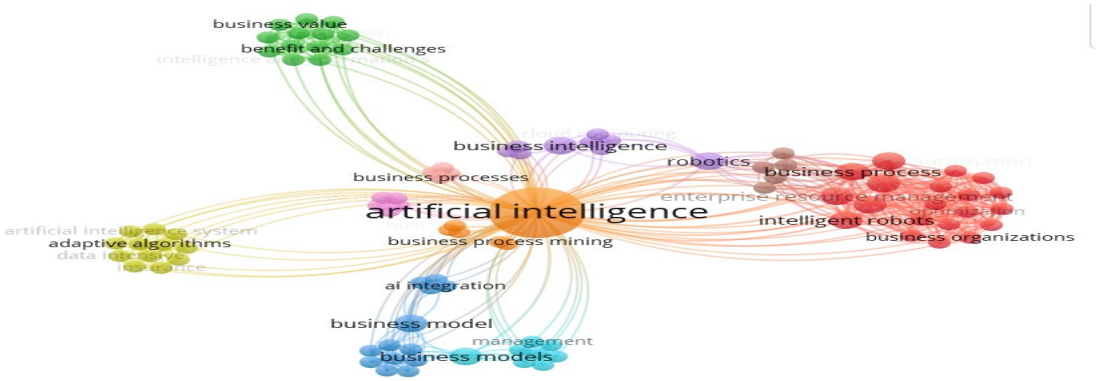


Figure no. 4. Artificial intelligence integration and connection with business
Source: Author's elaboration and research, 2023

In fact, the smart grid technology market size world changed from 49.7 billion US $ (2022) to 58.38 US billion $the first quarter of 2023 and according to Statista forcast by 2028 it will have reached 130.2 billion US dollars.(See figure no.5).

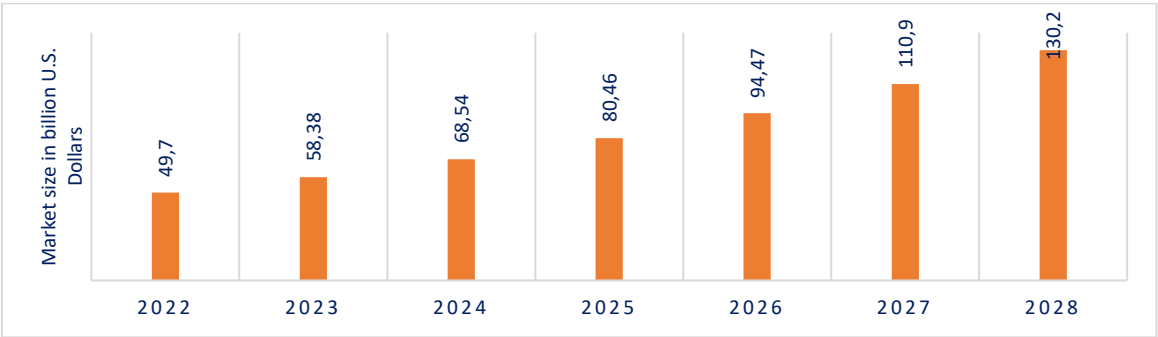


Figure 5 Smart grid technology market size worldwide from 2022 to 2028 (in billion U.S. dollars)
Source: Author's contribution 2023, Statista data 2022

By analysing the artificial intelligence Startup company funding at the global level by quarter, since 2020 it has been going through various ups and downs it the first quarter of 2020, the funding value was 6.4 billion US dollars and increased to reached the top with 18 billion US dollars in the third and fourth quarters of 2021 then it decreased to reach 8.3 billion US dollars in the third quarter of 2022. (See figure no. 6).

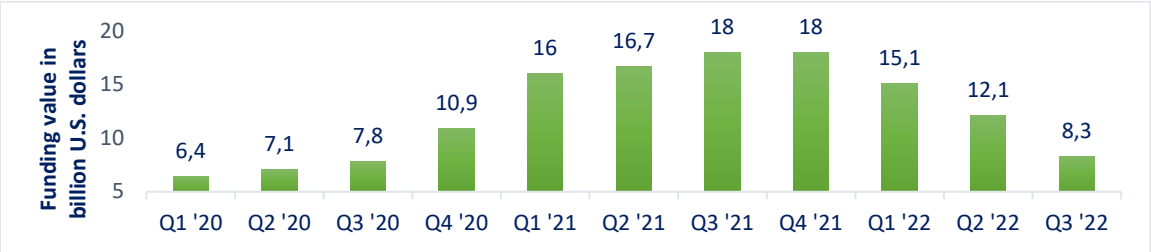


Figure no. 6. AI startup company funding worldwide 2020-2022, by quarter
Source: Author's contribution 2023, Statista 2022

Energy is a business as well since it is about supply and demand and it always needs optimization and AI has been useful for that taking the example of smart grids, smart cities and houses, AI for renewable energy (solar and wind), industry and electrical vehicles. In conclusion, business internationalization relies on the use of digitalization that connects business operations and relationships. Artificial intelligence is important for business and companies since the use of social media, applications, machines and digital operation has become very useful. (See figure no. 7).

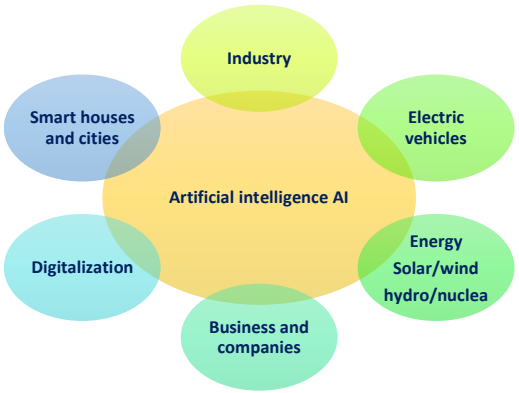


Figure no. 7. Artificial intelligence use and integration
Source: Author's elaboration, 2023

Conclusions

Embracing artificial intelligence could speed so far business operations and processes. Moreover, since the world is moving towards industry 5 and the economy of the future, artificial intelligence has become an important instrument for all the economic sector including energy that is related to business opportunities and companies' internationalization and operations, energy is a business as well since it is about supply and demand and it always needs optimization and AI has been useful for that taking the example of smart grids, smart cities and houses, AI for renewable energy (solar and wind), industry and electrical vehicles. In conclusion, business internationalization relies on the use of digitalization that connects business operations and relationships. AI is important for business internationalization, companies and energy optimization. Although the use of artificial intelligence itself is energy-intensive and, as a result, emissions are caused (the more data is processed, the greater the computing effort and associated energy use), the benefits of this technology far outweigh this. The big advantages lie in the processing of huge amounts of data and the detection of patterns, which would probably remain hidden without the use. With regard to global warming, AI can help to better understand the causal relationships and effects of emissions on the climate and to use energy more efficiently within the company or household. The technology should therefore be used to lower the cost of one's own energy needs and reduce emissions.

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Regional innovation for sustainable development

Outsourcing in Today's Economic Environment

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Abstract

An economic phenomenon that is defined by the movement of industrial activity from developed to emerging nations has occurred during the past two decades. This technique may be seen as the huge firms' solution to the issue of production costs that were steadily growing along with rising living standards and compensation. This paper seeks to study outsourcing from the standpoint of its evolution as well as the benefits and drawbacks that come with it. On the other hand, this research essay aims to define the concept's foundations and explore its applicability to the public sector. Overall, research on outsourcing has shown that outsourcing can provide significant benefits in terms of cost savings, flexibility, and quality, but it also presents challenges in terms of managing relationships, maintaining control, and managing the human resources aspects of outsourcing. Companies need to carefully consider the potential benefits and risks of outsourcing before deciding whether to outsource specific functions or processes.

Keywords

Outsourcing, evolution, development, sustainability

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Introduction

Outsourcing originated from the American word "outside resourcing," which refers to obtaining resources from the outside. Later, the phrase was employed in economic jargon to denote the use of outside resources to advance a company rather than its usual internal resources.

Outsourcing is a long-standing issue that has been felt ever since the Second World War, with a notable tendency notably since 1990. Some estimates claim that just 20% of the value contributed to American goods and services came from outside sources in 1946, but that percentage has since quadrupled to reach 60%.

Aalders (2001) reiterates this, supporting the idea that outsourcing is not a recent issue and that businesses have been outsourcing maintenance, manufacturing, legal services, advertising, and other services for at least 50 years.

According to Duhamel and Quélin, outsourcing frequently involves transferring material and human resources to the selected supplier. Its responsibility is to replace domestic services in partnerships that are medium or long-term (on average, five to six years) with the client company (Quelin and Duhamel, 2003).

Although outsourcing is often regarded as a future trend with several advantages for the parties involved, others have questioned the ramifications of this phenomena. One of them is Henry Kissinger, who made some ironic remarks on outsourcing during a talk in Davos and questioned if America will still be a great power, or at least a dominant one, in light of the expanding significance of outsourcing (WEF, 2022). Gary Hamel, who is aware of the changes taking place in the world and their rate of progression, is with him. The world is aware that we have entered a new period that is characterized by significant changes, but the question is whether we like these changes, he claims in the book "Leading the Revolution" (Hamel, 2003).

While addressing the issue chosen design variation, outsourcing approach has come to dominate the specialized literature in recent years. The strategy for creating a system is discovered, along with the possibility of outsourcing, and how this approach may be applied throughout any project to put the system into place (Perry and Devinney, 1997). Numerous issues arise when choosing to outsource routine tasks in accounting, human resources, and marketing even when one can draw on prior experiences from the systems development due to the demanding requirements of clients and lack of experience, which makes it difficult to choose the approach that will best achieve business objectives (Outsourcing Institute, 2002).

Using the various categorization criteria and our analysis of the authors' opinions, we were able to pinpoint the following outsourcing choices (Wilcocks and Fitzgerald, 1993):

- The level of outsourcing: whole, selective, or partial.
- Human resources, project development management, and service management are three areas where outsourcing might be used.
- The outsourcing agreement may be generic, temporary, or related to a business operation.
- One provider - one customer, one supplier more customers, some vendors - a client, or many vendors - more customers are some examples of the types of outsourcing relationships.
- Long- or short-term outsourcing periods are also possible.

The provider can be found locally, internationally (offshore), or regionally (near shore), all of which are closer to the client.

Outsourcing is a term used to describe when a company purchases goods and services from a third party. Both domestic and foreign outsourcing are possible in this situation.

Internal outsourcing refers to a company's procurement of goods or services from a source situated in another company inside the same nation.

The acquisition of services or material inputs from a supplier situated abroad is referred to as international outsourcing (Gillespie, Matthews, 2022). This phrase refers to both intra-firm international outsourcing (in which the company still owns the foreign input source) and remote international outsourcing (by which foreign supplier of inputs is independent of the company that uses inputs). Foreign outsourcing is a component of the nation's imports of products and services. Offshoring is a different phrase frequently used to refer to global outsourcing.

Most businesses in industrialized economies outsource their work internationally, which helps businesses, particularly those in poorer nations, save expenses (Profiroiu et al., 2020).

The uniqueness of outsourcing at the present is that it has become more popular in the services sector (Negescu et al., 2020). The service industry was long thought to be immune to foreign competition. Services may now be provided across national boundaries using enhanced communications technology, such as the internet, and at the same time get access to well-trained, inexpensive labor (Ladaru et al., 2022).

Even while outsourcing may be anticipated to have long-term advantages, there may be adjustment costs in the form of job losses (Burlacu et al., 2021). This process is notably evident at the microeconomic level since outsourcing services are initiated even in more complex processes (Belostecinic et al., 2022).

Literature review on outsourcing

The practice of outsourcing has its beginnings in the 18th century, when British businesses began sending their industrial processes to places like China, India, and other emerging nations. The necessity to lower expenses and boost earnings served as the main motivator in this. As technology developed in the 20th century, it became simpler for businesses to interact with other businesses across the world, which led to an increase in outsourcing (Bodislav et al., 2020).

Outsourcing can take many different forms, including IT outsourcing, business process outsourcing, and knowledge process outsourcing. BPO entails contracting out back-office duties including customer support, accounting, and human resources. KPO entails the outsourcing of knowledge-based tasks including engineering, data analytics, and research and development (Bodislav et al., 2020). IT outsourcing is contracting out information technology duties including network administration, infrastructure management, and software development (Popescu et al. 2021).

Advantages of Outsourcing: There are several advantages for businesses to outsource, including flexibility, access to specialist knowledge, cost savings, and increased emphasis on core company operations. Employing workers in nations with cheaper pay through outsourcing enables businesses to cut their labor expenditures. This makes it possible for businesses to refocus their resources on other aspects of their operations, such research and development (Bran et al., 2020).

Difficulties of Outsourcing: Notwithstanding the advantages of outsourcing, there are also difficulties involved. The loss of control, concerns with quality, challenges based on language and culture, and legal hazards are a few of them. Communication difficulties brought on by linguistic and cultural differences might cause misconceptions and delays. The loss of control can also be difficult since businesses can not have direct control over the services that are outsourced.

Effect of Outsourcing: Organizations, economies, and society have all been significantly impacted by outsourcing. While outsourcing has caused job losses in some industries in rich nations, it has increased employment prospects and boosted economic growth in emerging nations. The globalization of the economy and the diffusion of information and technology have both been aided by outsourcing.

For businesses aiming to save expenses, boost productivity, and raise the caliber of their services, outsourcing has grown to be a popular business approach (Ionita, Burlacu and Gaidargi, 2009). Notwithstanding the advantages of outsourcing, there are drawbacks as well, such as linguistic and cultural difficulties, a loss of control, problems with quality, and legal dangers. Yet, outsourcing has had a huge influence, aiding in the globalization of the economy and the dissemination of information and technology (Burlacu, et al., 2022). As a result, outsourcing will continue to be a crucial option for businesses wishing to compete in a global market (Bodislav et al., 2021).

Outsourcing accelerators

There are various things that may be noticed that affect how the globe changes while also attracting businesspeople from all over the world to outsourcing.

Companies must discover better ways to create and employ information technology in order to get a competitive edge and improve performance as a result of globalization and competition. The cost of creating information systems has risen, necessitating a growing need for highly skilled and qualified human resources. Companies need to be effective in order to get items to market on time and on a tight budget in order to survive the intense competition (Balu et al., 2021). However, preferences and requirements are always changing. Companies are attempting to delegate the responsibility of having specialists, facilities, and equipment to a third party, localized primarily in developing nations where there is a high potential for human resources and a variety of opportunities, favoring the development projects in a swift and affordable manner (Jianu et al., 2019).

In one of his works, "Competitive Strategy," Michael Porter claims that the effects of globalization might result in cost reductions (or cost savings associated with energy production) and a reduction in distribution routes. "Aggressive multinational corporations spreading their methods all over the world may contribute to some of this drop. Considering this, Porter claims that "globalization contributes to lessening barriers to global competitiveness" (Porter, 1980).

Although outsourcing has been discussed for a few decades, Porter and Handy, who both questioned how a company should establish strategies and how crucial it is for the company to focus on the skills they already have while outsourcing the rest to save money, are responsible for introducing this phenomenon to the field of strategic management in the 1980s. Nonetheless, greater flexibility and distinctiveness from other market providers as well as more varied product and service offerings.

Short-term outsourcing, in the opinion of Prahalad and Hamel (1994), can occasionally result in advantages by offering a shortcut to a more competitive product. However, they note that this does not permit the development of the skills required to preserve a competitive advantage achieved.

The findings of research dedicated to outsourcing may vary depending on the specific focus of the study and the methodology used. However, some of the main findings that have been reported in outsourcing research include:

- Cost savings: Outsourcing is often seen as a way to reduce costs, and many studies have found evidence to support this claim. By outsourcing non-core functions to specialized vendors, companies can often achieve cost savings through economies of scale, access to cheaper labor markets, and reduced overhead costs.

• Increased flexibility: Outsourcing can also provide companies with greater flexibility in responding to changing market conditions or shifting business priorities. By outsourcing non-core functions, companies can focus on their core competencies and respond more quickly to changes in the market.

• Improved quality: Outsourcing can also lead to improved quality of services, particularly in areas where the vendor has specialized expertise or access to better technology. By leveraging the expertise of vendors, companies can often achieve higher quality services than they would be able to provide in-house.

• Cultural and communication challenges: One of the main challenges of outsourcing is managing cultural and communication differences between the company and its vendors. Studies have shown that effective communication and collaboration are key factors in the success of outsourcing relationships.

• Loss of control: Outsourcing can also lead to a loss of control over certain business functions, which can create risks and challenges for companies. Studies have shown that companies need to carefully manage outsourcing relationships to ensure that they maintain control over critical business processes and data.

• Impact on employees: Outsourcing can have significant impacts on employees, particularly in cases where outsourcing leads to layoffs or changes in job responsibilities. Studies have shown that companies need to carefully manage the human resources aspects of outsourcing to minimize negative impacts on employees and maintain morale.

Benefits and drawbacks of the outsourcing concept

The staff of the provider who are given ongoing training in their expertise come to mind right away when discussing the pluses (Radulescu et al., 2020). Outsourcing is a strategic technique used by firms to gain a competitive edge.

The major corporations are forced by the harsh economic environment to outsource business operations in the core business, giving up some of their control over resources and information in the process. Because of economies of scale, outsourcing organizations can achieve savings of up to 15% on the whole cost.

In addition to cost factors, outsourcing has several benefits, such as enhanced emphasis on key operations, access to resources not readily available internally, and process standardization. Yet, there are certain worries about outsourcing, organizational strength, a loss of control, and uncertainty about the performance and quality (Plant, 2000).

Once a favored choice for small businesses and without the collateral needed to support the operations of their specialty, outsourcing has recently evolved into a solution for medium-sized and big organizations.

According to a research by the Economist Intelligence Unit (EIU), North African and Central and Eastern European nations are becoming popular outsourcing locations, especially for businesses with European headquarters. India is getting more costly, and European businesses prefer nations with closer cultural ties, according to EIU. As the international IT company began outsourcing services to regional subsidiaries in 2005, the market in Romania started to expand.

When they require more personnel, businesses engage subcontractors and assign them to short-term tasks (Curie, 1998). Due to the company's lack of resources and competence, tasks are outsourced.

Benefits of outsourcing:

• Outsourcing is a relatively recent phenomena in Romania and Eastern Europe that is viewed with mistrust and is seen to be risky by many. In highly developed nations, things are more clearly defined, and outsourcing is occasionally seen as a natural and essential step in a company's improvement.

• The Outsourcing Institute, a prominent voice in the outsourcing industry, has created a list of the top 10 reasons why a business would need to use such services:

• Cost reduction and operational control; an improved company focus; access to new opportunities; the release of internal resources for other uses; the lack of resources within the company; the acceleration of benefits reengineering; the cost of driving for a while; the availability of employment equity; the sharing of risks; and the injection of capital.

• Further advantages include integrated applications that are powerful, adaptable, and secure, easy installation and configuration, increased accuracy, productivity, and efficiency, and decreased or even eliminated storage requirements.

• Moreover, outsourcing has positive macroeconomic effects, rerouting money into emerging markets. These capital flows, which manifest in the construction of production facilities and the creation of jobs, contribute to raising living standards and ensuring the viability of these economies largely through lowering unemployment rates and raising GDP.

Drawbacks of outsourcing:

• Naturally, there are drawbacks as there are in every connection where a compromise is one of the fundamental requirements.

• One drawback is a lack of understanding of the client's external and internal outsourcing environment. Of course, this obstacle is readily overcome with effective cooperation, communication, and patience.

• After careful consideration of the outsourcing option, a second drawback would be a misdefinition of the activity's goal. Benefits and other factors must both be taken into account while making a decision.

• We may recall the misalignment of objectives, the response time and quality issues, the pre-supplier control by different means, and the mindset gap between "the firm workers" and "outsource colleagues' degree of personal pride to remuneration packages" from these concerns.

• Results from outsourcing take time to manifest. In the first year of an outsourcing contract, the labor productivity of the majority of firms decreased by 20%, mostly as a result of the time required for knowledge transfer to the outsourcing provider. They may collaborate more successfully and result in cost reductions after bringing their expertise of the customer and supplier along with their aims.

• At the macroeconomic level, the disadvantages are more obvious for advanced economies since the outsourced activity and jobs are relocated to another country, lowering living standards and temporarily raising the unemployment rate.

Outsourcing's boundaries

While there are many advantages to outsourcing for businesses, it's vital to remember that there are also certain restrictions. Outsourcing has certain limitations, including:

1. Quality Control: Ensuring quality control is one of the major issues of outsourcing. An enterprise may not have the same amount of control over the caliber of the job being done when it outsources its operations to another business. Quality problems might come from this, which could harm the company's standing and financial performance.

2. Communication Barriers: Due to linguistic, cultural, and time zone issues, communication problems may occur when outsourcing to other nations. Communication difficulties brought on by these disparities might result in errors and delays.

3. Security Risks: An company may be subject to security risks as a result of outsourcing, such as the loss or abuse of sensitive data. A company that outsources its operations could have to provide sensitive data to the outsourcing partner. If the outsourcing partner is unable to maintain sufficient security controls, this might lead to significant security problems.

4. Intellectual Property Loss: Outsourcing may also make it more likely that intellectual property may be lost. When a firm outsources its research and development tasks, this is especially true. The outsourcing partner can have access to confidential data and procedures that could be used against the company in the future.

5. Legal and Regulatory Issues: Outsourcing, especially when done to other nations, can lead to legal and regulatory problems. Organizations that must adhere to several legal and regulatory frameworks may face difficulties since various nations have different laws and regulations.

6. Cost: Outsourcing might save costs, but it can also end up being expensive in the long term. Outsourcing cannot always be the most economical choice in the long run due to hidden costs including travel expenditures, administrative charges, and additional training.

Although while outsourcing can provide businesses several advantages, it's vital to think about the possible downsides as well (Mears, 2005). To guarantee successful outsourcing, careful partner selection, open communication, security precautions, and legal and regulatory compliance are required.

Conclusions

According to the study done for this research paper, major firms from rich nations have discovered a way to save costs by shifting a portion of their manufacturing to partners or subsidiaries in developing countries. With the help of outsourcing, these large corporations' approach reduced their manufacturing costs by 20% or more, enabling them to focus the growing globalization.

As a result, by linking emerging economies to those in wealthy nations, these methods have significantly accelerated the pace of globalization (USA, UK, Germany, Japan, etc.).

When we weigh the benefits and drawbacks of outsourcing, we can say that the macroeconomic balance between the losses experienced by advanced nations and the gains experienced by emerging economies is favorable to the micro-level benefits of applying this approach (Troacă and Bodislav, 2012). We may discuss a worldwide transfer of income in this situation, from affluent economies to emerging economies.

Regarding the feasibility of adopting the idea of outsourcing in the public service, given the macroeconomic expenses incurred, we feel it is important to further explore these concerns, even if there are some successful examples of outsourcing public services throughout the world (health system in the United States and part of the education system in the same country).

For businesses wishing to save expenses, boost productivity, and get access to specialist knowledge, outsourcing has become a popular business approach (Wilcock, Fitzgerald, 1993). Although outsourcing offers advantages, it might not be the best choice for every business or circumstance (Hirschheim and Lacity, 2000). These are a few substitutes for outsourcing:

1. Insourcing: The reverse of outsourcing is insourcing, in which a company brings its outsourced functions back in-house. Organizations may benefit from having better control over quality, communication, and security as a result. Moreover, insourcing enables businesses to develop their own internal experience and knowledge.

2. Automation: Automation refers to the use of technology to carry out formerly manual operations. Costs may be decreased and efficiency and accuracy can be increased with automation. Automation is sometimes a good substitute for outsourcing, especially for routine jobs or procedures that don't require human involvement.

3. Collaboration: Cooperation is collaborating with other businesses or partners to accomplish a shared objective. Organizations can obtain specialized expertise, split expenses, and gain economies of scale by collaborating with other companies. For non-core functions, collaboration can be an effective substitute for outsourcing.

4. Co-sourcing: This hybrid strategy mixes internal and external activities. Co-sourcing is bringing in outside experts to collaborate with inside workers on a particular project or aim. This enables businesses to access specialist knowledge while keeping quality and communication under tight control.

5. Offshoring: An alternative to outsourcing to another firm, offshoring is establishing operations in another nation. Offshoring enables businesses to access cheaper labor while keeping quality and communication under control.

In conclusion, even while outsourcing offers advantages, it is not always the ideal choice for every business or circumstance. Alternatives like insourcing, automation, collaboration, co-sourcing, and offshore may all assist firms in achieving their goals and objectives while keeping control over communication and quality. Each choice should be thoroughly analyzed by organizations to ascertain which one best suits their requirements.

The finest outsourcing strategy in 2023 will vary depending on the requirements and objectives of each firm. Here are some basic recommended practices to take into account while outsourcing, though:

1. Establish clear objectives and expectations: Before to outsourcing, it's critical to establish the project's goals and expectations. The project's scope, intended results, and any particular requirements or standards that must be satisfied are all included in this.

2. Choose the best outsourcing partner: The success of the outsourcing project depends on picking the best outsourced partner. It's critical to thoroughly assess prospective partners in light of their knowledge, experience, reputation, and performance history.

3. Create efficient communication channels: The success of an outsourcing project depends on the creation of efficient communication channels. This entails establishing regular communication channels, defining the communication standards, and identifying the important stakeholders.

4. Establish precise performance measurements: To monitor and assess the outsourced project's progress, precise performance measures are crucial. This involves building a system for monitoring and reporting progress as well as determining the key performance indicators (KPIs).

5. Ensuring legal and regulatory standards are followed: Adhering to legal and regulatory regulations is crucial to staying out of trouble with the law and paying fines. It is crucial to confirm that the outsourcing partner is capable of adhering to all relevant rules and regulations.

6. Handle the outsourcing project successfully: A successful outsourcing project requires successful project management. This include developing a project schedule, outlining the roles and duties of each team member, and managing risks and problems that develop throughout the project.

In conclusion, firms aiming to save costs, boost efficiency, and access specialized expertise may find outsourcing to be a useful business approach. But it's crucial to adhere to best practices, which include articulating clear objectives and expectations, selecting the ideal outsourcing partner, setting up efficient communication channels, defining precise performance metrics, making sure that legal and regulatory requirements are met, and managing the outsourcing project skillfully. Organizations may maximize the advantages of outsourcing while lowering the risks and difficulties by adhering to these best practices.

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Sustainable Financing in the Context of Global Crisis and Digital Transformations

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Abstract

In the current conditions, we are facing multiple crises both at the global level and at the level of countries, development regions and local level. At the same time, we are also facing economic and technological changes and digital transformations. At all levels of development, sustainability processes need to be supported financially, with investments, with technologies. In this sense, the financing and investment mechanisms are diverse and very complex. In this article, we have proposed to review the sustainability financing approach at the international level with a review of the sustainability approach at the level of the banking system and bank management. We approached the experience of banks' involvement in sustainable activity, the involvement of banks in sustainable development activity considering the priorities of sustainable development at the European level, the existing objectives, financing and investment needs. We proposed to approach the development of sustainable financing with methodological support in order to build the entropic model realized through the entropic logic of the managerial system.

Keywords

Global economic development, sustainable development, finance international projects, banking activity, digitization.

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Introduction

Brookings' Program on Global Economics and Development conducted a survey on multilateralism in spring 2021 as part of a project on the future of global governance. Those results therefore come as the new Biden administration has re-committed the United States to cooperative multilateralism and various initiatives — notably on international taxation, the issuance of $650 billion in new Special Drawing Rights (SDRs) and intensified efforts to reduce emissions to combat climate change (Mogos et al., 2021).

The crisis of the Covid-19 pandemic has brought many countries of the world into a situation of health crisis, economic crisis, delayed vaccination rates and uneven recoveries from the economic recession induced by the pandemic (Belostecinic et al., 2022).

Multilateralism, and the systemic crisis, existed long before the pandemic (Ladaru et al., 2022). Increasingly, dissatisfaction with globalization, associated with the failure of the multilateral system to stop the growing wave of inequality, social fragmentation, and job insecurity, intensified by technological changes, has increased (Negescu et al, 2021). Global governance reform is therefore called for, reflecting the changing economic, demographic and political weight of development in largely neglected countries . Multilateral organizations such as the IMF, World Bank, UN, WTO are faced with various issues related to the need to develop new methodologies and their applicability in the efficient functioning of financial

and monetary systems , of transparency, of strategies, policies and strategic and operational management effectively applied by national financial institutions, economic agents and the integration of these institutions in the global financial-monetary system adapted to radical digital transformations, to climate changes, to new eco-innovative and innovation processes social, to ensure the vulnerable global problems that the world map is going through today (Popescu et al. 2021). Therefore, in the paper we proposed to come up with a new methodological approach from the theory of entropy value, to develop an entropic model that can be built based on the entropic logic of the managerial system, to study and observe the evolution of qualitative degradation, losses of integrity systemic, s.a. complex aspects.

1. Review of the scientific literature

We aim to strengthen the activity of the national financial systems in correlation with ensuring the general financial balance between the national systems and the international financial-monetary system. In the current conditions of activity Banks, act as financial intermediaries, ensure the growth of the economy. The authors (Kirikkaleli and Kayar, 2023), argue that, given the opportunities within the monetary policies and mechanisms, they are good tools to ensure sustainable macroeconomic design. Banks, as financial institutions, are most exposed to some high financial risks (Burlacu et al., 2019). Kirikkaleli and Kayar explore the long-term effects of economic, financial, social-political stability on the banking system. The analyzed research covers a period of over two decades, 21 years, from 1996 to 2017. We must mention that the impact of globalization has contributed to the diversification of nature, with a wide range of risks, arising due to economic uncertainties and changes in various factors. The results of economic, financial activity, social and political developments in different countries are reflected in the country risks of the respective countries (Profiroiu et al., 2020). Country risk is a very important indicator for the investment future of each country . For these reasons, careful monitoring by the responsible institutions is necessary, because it can affect both the banking system and companies and different branches of activity (Jianu et al., 2019).

The authors of the respective study are of the opinion that the high-risk information (economic, financial, political) from the diversified portfolio of country risks, from six Balkan countries selected during the years 1996-2017, were analyzed with the application of panel data analysis techniques. When evaluating the results obtained, following the respective analysis, it was found that the calculated values, for all the examined variables, for the respective countries, were lower than the critical values calculated for the applied test, this moment demonstrated that the examined variables have unit roots (Bodislav et al., 2019).

The impact of the global financial crisis (GFC), will also have an impact on the pharmaceutical market, the stagnation of market liquidity, leads to a deep recession of the pharmaceutical field. (Dong, Zheng and Li, 2023). After the COVID-19 pandemic, the pharmaceutical economic downturn, the financial crisis in the pharmaceutical industry have been on the rise, caused by the containment and control of the COVID-19 pandemic in China, have served as important reasons in the emergence and accumulation of systemic financial risks in China.

To support the pharmaceutical field, financial stability, the authors of the study analyzed the mechanism of the weakening of stabilization effects, in the scenarios of systemic risks (Balu et al., 2021). The ways in which the evolution of systemic risks, under the shock of COVID-19, affected the effects of monetary policy stabilization were analyzed (Radulescu et al., 2021). Sustainable development for the international financial-monetary system is the foundation of the healthy and stable development of the global economy (Burlacu et al., 2021).

Shen (2022) claims that: "the importance of the digital currency mechanism in China as a research object uses and applies a regime-switching transition autoregressive model (STAR), a non-linear autoregressive model that varies in " time-stochastic-parameter-volatility-vector"," to empirically analyze the relationship between digital RMB, the internationalization of RMB (legal currency of China, RMB renminbi) the development of the international monetary system. The results reflect the relationship between DC/EP internationalization and RMB. In conclusion, the authors pose the question: Can (DC/EP) Digital Currency / Electronic Payment promote RMB internationalization?

That question will affect the sustainable development of the Chinese financial system and the international monetary system. To accurately describe the impact of DC/EP on RMB internationalization, we will need to analyze China's digital currency, focus on the relationship between digital currency and RMB internationalization.

RMB, in particular, the auto-regressive, regime-switching transition (STAR) model and a non-linear variation parameter in "time – stochastic volatility – vector auto-regression model" will be applied for the

empirical analysis of the relationship between RMB digital, RMB internationalization and international development.

Therefore, the results tell us about the time-varying relationship between DC/EP internationalization and RMB. The above relationship is significantly different in different economic situations, which reflected that the effect of digital RMB on RMB internationalization is asymmetric.

Applying different monetary values for emissions as a weighting of environmental indicators and as a 'counterweight' to economic outcomes affects the total cost (environmental and financial life cycle cost).

Alves, Santos and Penha-Lopes (2022) are of the opinion that the respective transformation has both social, economic and political impact, which is inevitable and must be prioritized from the point of view of globalization, if we consider it appropriate to prevent financial crises in the future. It is necessary to contribute to the reduction of economic inequalities, to adhere to climate agreements, to the priority objectives of sustainable development (Bran et al., 2020). To achieve the respective objectives, we need a new paradigm of economic development. social, financial-monetary, which will be able to address the causes, and will solve the cases of current unsustainability . A new monetary ontology and design will be provided, and the orientation of the monetary regime towards social, economic and ecological regeneration (Radulescu et al., 2020). It is also necessary to understand the ecological importance of currency (money), based on ecological economics and the ecological theory of value that lays the foundations for the democratization, decentralization and conscious diversification of money. In this way, we contribute to the development of the Ecological Monetary Economy by systematizing the transition trajectory of the currency, towards sustainable development, by offering the set of principles extracted from the regenerative economy literature, to design the monetary ecosystems, which contribute to solving the challenges of the third millennium society. In conclusion, transforming the concept of currency (money), understanding and designing monetary ecosystems, is an important part of economic processes. It is an economic, sustainable, social and regenerative realignment (Bodislav et al., 2020). The promotion of a new economic and monetary Paradigm is a complex process of transition, in which we need new values, new thinkers, for a viable and functional development (Bodislav et al., 2021). An ecological theory of money, such as Ament's EMT, anchored and supported by ecological value theory, the monetary theory of the sustainable transition, has the best chance of replacing neoclassical monetary theory and providing an overall view suitable for develop monetary mechanisms, and design our monetary ecosystems to regenerate social, economic and ecological mechanisms (Negescu et al., 2020).

A diversified classification of the approach of "green finance" and "green monetary policies". In the last decade, green financing emerged as a Strategy and as the economic and managerial activity involved in environmental problem solving activities (Dziwok and Jäger, 2021). However, it remains to be seen whether green finance effectively addresses current global environmental issues (Sarbu et al., 2021). Lately, there have been proposals regarding the greening of monetary policy.

The purpose of this study is to provide a new conceptual framework that distinguishes between different forms of green finance and monetary policy. It is welcome to systematically analyze forms, instruments, mechanisms and measures in the field of green finance and green-sustainable monetary policy from different theoretical backgrounds.

If we manage to do this, some problems of both research and practical activity will be solved, at the same time providing an appropriate professional classification, which aims to facilitate future research.

Therefore, a set of different categories is offered, from which we distinguish between neoliberal, reformist and progressive forms of "green finance". Monetary policy, systemic risk that is based on the analysis of large-scale computer networks is analyzed by the authors (Su, Huang and Drakeford, 2019), who used the large-scale financial network to investigate risk contagion systemically across different industries in China to explore the impact of monetary policy and heterogeneous factors. The empirical results suggest that the general level of systemic risk increased a lot during the global crisis of 2008 and the stock market crash in 2015-2016. The energy, materials, industrial and financial sectors actively contribute to systemic risk. Another important point concerns the determinants of banks' net interest margin: evidence from the Eurozone, during the crisis, after the crisis, was analyzed by Angori, Aristei and Gallo (2019) who have studied the determinants of the net interest margin in the years 2008–2014 in the euro area. The starting point of the analysis is the premise that this variable is an indicator of the stability and health of financial institutions. Since the beginning of the global financial crisis, difficulties in achieving sustainable levels of profitability, primarily due to vulnerable margins in the traditional activity of banks, have increased the fragility of the European banking system. From our point of view, we considered it appropriate, that the main bank-level factors affecting net interest margin (market power, capitalization, interest rate risk, level of efficiency) to consider the effects of regulatory and institutional settings. The results reflect a certain

degree of vulnerability of the banks' sustainable profitability, although that negative trend was partially mitigated by the recent monetary policies of the European Central Bank.

Angori, Aristei and Gallo (2019) analyze the determinants of the net interest margin, for the period of 2008-2014, in the euro area. The starting point in the analysis is the premise that the variable is an indicator of the health and stability of financial institutions (Burlacu et al., 2022). We want to highlight the moment, that since the beginning of the global financial crisis, the difficulties of reaching a level of sustainable development, of profitability, mainly due to the vulnerable margins, from the banks' activity, have increased the fragility of the European banking system. In addition to the fact that the main factors, at the banking level, affecting the net interest margin considered, the effects of regulatory and institutional settings.

The authors contributed various proposals. First, of all, the investigation highlights the relationship between low-level banking margins, financial vulnerability - characterizes the period after the beginning of the crisis. Second, the Lerner index used to measure the effect of competition on net interest margin. It found that the increase in market power in the period 2008–2010 partially countered the direct negative effect of financial turbulence by contracting credit growth rates. Financial Stability and Sustainability under the Coordination of Monetary Policy and Macroprudential Policy: New Evidence from China. After the financial crisis, financial stability and sustainability analyzed by the authors (Jiang, et al., 2019) became a priority, for global economic and social development, for the coordination of monetary policies and macroprudential, have a crucial role in maintaining financial stability and sustainability. The authors provide a theoretical analysis and empirical evidence from China, regarding the impact of monetary policy, of coordinating the mix of macroprudential policies, in financial stability and sustainability. The authors collected data for the period 2003-2017; at the micro level, they used the System Generalized Method of Moments (System GMM) method, to be able to analyze the coordination effect of monetary policy and macroprudential policy. The Chinese experts used the automatic regression method of the structural vector in the analysis of the coordination effect of two policies on housing prices and stock price bubbles.

2. Research methodology

Sustainable financing follows the decision-making process regarding sustainable development, circular economy, ecological (environmental) and social issues. When financing investment decisions are taken, evaluation of various projects or crediting opportunities in the financial-banking sector. Projects in the ecological and sustainable field may include climate change adaptation and mitigation, the eco-innovation process, biodiversity conservation, pollution prevention and prevention, and the issue of the circular economy, or green economy. The Europe 2020 strategy, provisions that can also be found in the strategic documents for the new Strategic cycle (SNCISI, 2022-2027), it focuses on three priorities: smart growth – the development of an economy based on knowledge and innovation; sustainable growth – promoting a more efficient economy from the point of view of the use of resources, more ecological and more competitive; inclusive growth – promoting an economy with a high employment rate, able to ensure economic, social and territorial cohesion. These three priorities support each other and provide an overview of Europe's social market economy for the 21st century.

The "green economy" is a model that would allow the conservation of natural resources and the cessation of greenhouse gas emissions and, at the same time, the reduction of poverty, ensures the report of the United Nations Environment Program (UNEP). The report, which covers the period 2011-2050, compares a scenario based on the current economic model with a "green" scenario, in which approximately 2% of global GDP ($1.3 trillion) invested annually in ten key sectors. The "green" scenario would immediately guarantee more jobs in several sectors (agriculture, transport, construction, etc.), although in other sectors (e.g. fishing) the transition would mean a reduction in the time needed to rebuild natural stocks. Although the causes of these crises differ, they all have, in principle, a common characteristic: the defective distribution of capital. "Green" economic activities are ahead of polluting industries in terms of the number of employees. This is the general conclusion of a study initiated by WWF, entitled "Low carbon jobs for Europe". The study shows that approximately 3.4 million jobs directly related to the renewable energy sector, to that of sustainable transport and goods and services based on low energy consumption. Polluting industries such as mining, gas, electricity, cement or metalworking account for 2.8 million jobs across Europe.

The promotion of the concept of green economy in the activity of financial institutions, and in the activity of economic agents, denotes a particularly complex reality, a set of activities that can be found in all economic sectors and that have as a common feature the direct reporting to the environment in the effort to protect the quality and to stop its degradation, to preserve or restore natural balances, to save non-renewable resources, including by identifying and promoting alternative solutions.

The objectives of building the green economy for developing countries

The transition to the "green economy" - represents the most important condition for reducing chronic poverty - the most visible manifestation of social injustice caused by unequal access to education and health services, the expansion of credits and unequal incomes and respect for the protection of property rights. General context implementation of the ecological model of development - oriented. The transition from the Development Model, in which environmental protection is considered a pressure on the economy, to a model, in which environmental protection is a generator of the development of the national and world economy, is identified with the emergence of the notion of - "Green" Growth. Green growth is the response to society's calls for reorientation to ensure qualitative growth and abandoning the practice of evaluating results with the help of traditional economic indicators (eg GDP). The problem is in generating the paradigm of economic and social policies both at the global level and at the national, regional and local level.(Ciobanu et al., 2015)

Rethinking value management in banking activity first of all, the management of the value, of the economic potential at the level of society must take into account both the valorization of the processes providing potential in the near or distant future, and the increase of the productivity of all the processes engaged in obtaining the value. (Natural processes, Processes in society, Economic processes of production and consumption).

Secondly, the mechanism for attracting low entropy from the environment, for processing and conservation must be equipped with new technologies that will increase the transformation yield, together with the reduction of the specific consumption of substance S and energy E.

We must use part of the economic potential at our disposal to reduce pollution, to repair what we have damaged in the years of theft of potential and ecological crime. The conservation of economic potential in the wounds of Nature is an investment with multiplier effects. Only by integrating the natural environment, and therefore also the green economy, with the information society and the knowledge society will the economic activity fit well into the new society and will ensure the economic potential necessary to maintain these systems in a fluctuation that will arrange things in an order. The model will explain the changes in the environment and in the structure of the economic activity system of companies, institutions and the economy as a whole.

3. Research method

Theory of Entropy-Based Value (TVE**)** The entropy value theory model is comprehensive enough to make room for the mechanism of obtaining value for activities that give an attractive form to use values, raise the level of quality and reliability attributes or drive economic activity efficiently and effectively. (Bran, P.,p. 2003)

The development of the management of the social-economic and financial-monetary system based on the entropic model, achieved through the entropic logic of the managerial system of all ment, as a result of which the system degrades qualitatively, becomes quantitatively poor, loses systemic integrity.

It is necessary to develop fundamentally theoretical and methodological, in ensuring the transition to the new model of development, in the innovative, digital context, with a fundamental based on information networks, with synergistic development based on new knowledge, synergy-innovation methods and management technologies.

An entropic social system can be characterized by the negative dominance of development, the decrease in the measure of opportunity and organization, the increase in disorganization, the decrease in the level of order, the increase in disorder, the deterioration of the quality of the structural and functional organization, negative effects of entropy, the decrease in informational capacity, the potential energy of this system as a whole of all its elements. Management entropy subjects are carriers of the system-fragmentation entropy logic of managerial decision-making.

The development of economic and financial management based on low entropy, on the economy of entropy, made by managers in the field of entropy through the fragmentary logic of entropy of managerial decision-making, as a result of which this system degrades qualitatively and becomes quantitatively poorer, becoming more and more more. unsystematic and fragmented (the isolation of elements increases), it increasingly loses its systemic integrity and does not achieve its main functional purpose - progressive development, less and less corresponds to the timely, genetically predetermined nature.

The concepts of "entropic economy" and "synergistic economy" introduced by us are becoming new research objects in economics and other related scientific disciplines.

The radical digital transformations in society, the digital economy (Ciobanu et al., 2015) digital finance (Burlacu et al., 2021) in the financial-monetary field, the creation of digital currencies, both private and official, are revolutionizing domestic and international finances. Consider international payments. They involve many currencies, payment systems operating under different protocols, and organizations governed by various regulations. As a result, cross-border payments tend to be slow, expensive and difficult to track in real time. Now, new technologies spawned by the cryptocurrency revolution enable cheaper and near-instant payments and transaction settlements (Burlacu et al., 2021).

Conclusions

Sustainable financing has become a priority in today's world, especially in the context of the global crisis and digital transformations.

Sustainable financing will support the challenges generated by the global crisis, with both public and private funding provided by banking and non-banking institutions for initiatives that address environmental, social and governance issues. in the field of renewable energy, energy efficiency, sustainable transport and other fields.

Digital transformations have created new opportunities for sustainable finance.

The complex spectrum of banking activity, oriented towards bank profitability, is a permanent activity for financial stability in the euro area and which will be able to support sustainable financing projects in various fields of activity in the field of sustainable economy. Although the banks still have a low but still acceptable profitability, especially in terms of net interest income.

From the analyzed studies, we note that some analyzes focused on the main factors of banks' net interest margins, whose greater vulnerability was in the center of attention during the crisis.

Among the critical parameters of the entropy of the state of the economic system, the following should be highlighted: the degradation of the social, economic, financial-monetary, industrial, agricultural potential; brain migration; the strong dependence of the economy, the financial market, budget revenues on the prices of fuels and energy resources;

A macro-management of administrative entropy at different levels is the result of managerial entropy manipulation technologies. One of the main critical parameters (risks) of entropy is the significant increase in foreign loans of banks and the non-financial sector.

The modern world crisis is a systemic crisis of the genetic foundations of an industrial market civilization, it is a programmable and controlled crisis, which has its own entropy-type management subjects ("manager entropies"), personalized carriers of entropy, way of thinking (entropy economic thinking), asystem- logic of fragmented entropy (entropy methods) of managerial decision-making. In the economic literature, in our opinion, it is legitimate to raise the question today of the need to analyze a whole class of new concepts: "entropy manager", "entropy management", "entropy economic thinking".

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The Current State of Industrial Production in the European Union and New Recovery Solutions

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Abstract

Industrial activity is of great importance in the economic development of all countries, but in the last decades the results of this branch of the economies of many countries have faced various problems due to the systemic crises that economies in transition, but also the economies of developed countries, are going through. In this article, we propose to review some aspects of the situation regarding industrial production in EU countries, with a stronger focus on industrial production in Romania. It is more necessary to study these topics considering the crisis of the Covid-19 Pandemic, the geopolitical crisis in the region that has stopped multiple logistic processes related to the industry. In other words, it is important to connect the industrial strategies and policies of the European Union countries for the development of Industry 4.0/5.0, to digitize production systems, digital technological processes and robotization, efficient management of the production and distribution chain. We propose to outline the main objectives that must be taken into account for the development of new industrial policies focused on new directions of development for the Romanian economy.

Keywords

Industrial production, industrial policy, industry 4.0, decarbonization of the economy, digitalization

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Introduction

In this article he aimed to make a statistical analysis of the evolution of industrial production in the countries of the European Union and especially in Romania in the current conditions of multiple crises that Europe is facing today. We propose to do the bibliographic study of the specialized literature in the field, through which we can identify the experience of researchers from different countries who have studied the respective problem regarding the situation of industrial production, of industrial policy both in the EU member countries and in other states, such as be the experience of China for example. These studies will allow us to identify policies and strategies that will help us know how we can develop industrial policies both in Romania and in other EU member countries. We want to mention the authors (Criscuolo, Lalanne and Díaz, 2022), who studied the problem of quantifying industrial strategies and measuring industrial policy expenses. Authors (Coyle and Muhtar, 2021), studied UK industrial policy, oriented towards learning from the past, Author (Zurstrassen, 2022). EU industrial policy in the steel industry, author (Timmers, 2022), the digital industrial policy for Europe. Not least, it is of interest The OECD report on industrial policy was based on a new industrial policy framework analysis developed by (Criscuolo et al., 2022), the paper reviews the study bibliography on the effectiveness of industrial policy, the tools applied He argues that well-designed economic incentives for companies and good framework conditions that shape

the business environment are effective. In this article, we proposed an analysis of the evolution of industrial production in the European Union, a review of the scientific literature in the industrial field and the new industrial development priorities and development by promoting viable and functional industrial policies.

1. Analysis of the evolution of industrial production in the European Union

Although recently we are facing multiple crises both in Europe and globally, in 2021, the value of production sold in the EU amounted to 5,209 billion Euros, an increase of almost 14% compared to 4,581 billion Euros in year 2020, in current prices. In the period 2011-2014, the value generated by the production of EU member countries was stable. Between 2014 and 2018, there was a steady annual increase from the previous year. In 2019, production growth was consolidated, with a value of production sold in the EU reaching 4,945 billion euros. In the countries of the European Union, decreases were recorded in the production of clothing. In 2021, EU countries produced more than EUR 3.5 billion of articles, which constituted EUR 27.8 billion. This product decreased by 5% in 2021, compared to 23% since the pandemic break in 2019. Italians produced more than 50% of the value sold at the level of EU countries (around EUR 14 billion). In second place is Spain, Portugal in third place, which constituted 5.5 billion Euros. Germany, Romania and Bulgaria were in the top 6 producers in the EU, 85% of the total production in the EU. Industrial production in Romania, in May 2022, registered a decrease of 0.1% compared to the previous month, as a result of the decreases recorded by the manufacturing industry (-2.3%), the extractive industry (-1.7%). but with an increase of 1.1% compared to May of the previous year (2021) (INSSE, 2022). In the first five months of 2022, industrial production was down by 2.4% compared to the corresponding period of 2021, as a result of the decreases in the three industrial sectors: the production and supply of electricity and thermal energy, gas, hot water and air conditioning (-5.8%), extractive industry (-4.3%), manufacturing industry (-1.2%). The production and supply of electricity and thermal energy, gas, hot water and air conditioning increased by 4.3% compared to April.

Table no. 1. Evolution of the annual growth of industrial production in the member countries of the European Union (%)

	2018	**2019**	**2020**	**2021**	**2022**
EU - 27 from 2020	106.4	106.2	98.5	107.5	110.8
Euro area - 20 (from 2023	105.3	104.6	96.6	105.2	107.6
Euro area - 19 (2015- 2022)	105.3	104.6	96.6	105.2	107.5
Belgium	108.7	114. 0	109.7	128.1	127.2
Bulgaria	107. 0	107.6	100.9	111.1	125.3
Czechia	113.6	113.2	105.1	112. 0	114.8
Denmark	108.7	111.6	105. 0	113.7	130.8
Germany,until 1990	104.7	101.3	91.6	95.9	95.4
Estonia	112.5	120.5	117.1	132.1	129.1
Ireland	97.3	104.1	119.2	153. 0	181.9
Greece	108.8	108. 0	105.7	116.6	119.5
Spain	105.4	106. 0	95.6	102.8	105.9
France	103.5	104.1	92.8	98.2	98.1
Croatia	105.9	106.5	102.9	109.4	111.2
Italy	106.5	105.3	93.3	104.7	105.1
Cyprus	127.2	132.9	123.2	131.1	132.8
Latvia	116.1	117 .0	115. 0	122.4	123.4
Lithuania	116.3	119.7	117.4	141.2	154.4
Luxeembourg	102.2	99. 0	88.3	95.7	94.5
Hungary	110.1	116.3	100.1	118.8	125.6
Malta	102.4	103.5	103.2	103. 0	106. 0

Netherlands	103.3	102.4	98.4	103.3	105.9
Austria	113.5	113.4	106.8	118.9	127.8
Poland	116.6	121.6	119. 0	136.7	151.8
Portugal	106.2	103.9	96.3	99.6	99.6
Romania	118.1	114.3	103.7	110.6	108.7
Slovenia	120.7	124.5	117.9	130. 0	132. 0
Slovakia	111.7	112.5	103.4	114.1	109.9
Finland	111.2	113. 0	109.4	114. 0	118.4
Sweden	109.3	111.9	106.4	113. 0	115.8

Source: Eurostat, 2022

According to the information of the National Institute of Statistics in Romania, industrial production in Romania decreased by 6.1% compared to last year, in January 2023, after a decrease of 6.3% in the previous month. It was the third consecutive period of contraction due to declines in manufacturing output (-4.6% from -3.6% in December) and electricity, gas, steam and air conditioning production (-13.8% from -16.6%). Meanwhile, mining and quarrying output rebounded (0.8% vs. -1.1). On a monthly basis, industrial production rose 2.0 percent in January, the first monthly increase in five months, rebounding from a 1.6 percent decline in December.

Table no. 2. Evolution of monthly industrial production growth in 2022-2023

(in % of monthly data, 2022-2023)

	2022-04	2022-05	2022-06	2022-07	2022-08	2022-09	2022-10	2022-11	2022-12	2023-01
EU - 27, from 2020	109	110.7	112.6	109.8	111.8	112.3	110.2	111.6	110.9	111.2
Euro area - 20 countries, (from 2023)	105	107.6	109.7	106.2	108.7	109.1	107.1	108.6	107.2	107.9
Euro area - 19 countries, from 2015-2022	105	107.6	109.7	106.1	108.7	109.1	107.1	108.6	107.2	107.9
Romania	111	110.6	108	108.5	108.5	108.6	108.1	104.2	107	102.4

Source: Eurostat, 2022

The beginning of 2022 was very difficult and worrying at the global level, due to the consequences of the pandemic, but especially the geopolitical and military context in region, which caused imbalances, being also felt on the main commodity markets, stock exchanges and financial markets, consumption and services. We see the results in the significant increase in the prices of consumer goods, the revision of economic growth forecasts, in the shaping of the basis for the increase in monetary policy interest rates. Supply chains were affected for industry and commerce.

2. Review of the scientific literature

Complementarities between economic incentives and interventions such as skills policies, framework conditions, competition and trade policies are highlighted (Androniceanu et al., 2017). The authors reflected the opportunities for the adoption of robotic applications, through the perspective of the marketing mix, by describing the current state of the integration of industrial robots in Romanian enterprises and on the labor market, in contrast to other economies of the European Union. The respective research highlights the impact of industrial robots within enterprises, taking into account the standard of living of the population, perceived by GDP per capita. Exploratory research was carried out based on secondary data on the evolution of the robotics sector in Romania, in relation to the dynamics of the global robotics market and the European Union. The authors performed a principal components analysis, which revealed the main factors that contributed to the dynamics of the enterprise statistics at the national level. That analysis reflected the fact that greater integration of industrial robots contributed to lower employment rates in the six EU countries considered, while having positive correlations with GDP per capita and productivity appearance of work. We can highlight that the impact of industrial robots contributes to the increase in remuneration, suggesting the potential adverse effects that automation can have on incomes.

Extensive studies on CE in the construction industry have focused on resource use and waste management. Research on CE in the construction industry clearly concludes that research focuses on the impact of CE in the areas of supply chain integration, building design, policy, energy efficiency, land use, off-site production, cost reduction and cost management, cost and risk whole life. , health and safety are limited. The focus of the empirical analysis was directed to sectors related to the so-called New Industrial Revolution (Industry 4.0) (Ďurcova, 2022). However, agriculture will always be among the most important sectors in every national economy. It is a sector that has undergone many structural changes in the last two decades. The purpose of the authors is - the detailed analysis of different indicators of this sector, especially its current position, its economic links with other internal/or external industries (from abroad) or the effects generated on employment, and the added value. The analysis is based on the input-output methodology. The results confirm the global weakening of internal links, especially on the demand side, the strengthening of import flows. From the supply side, the importance of agriculture as a supplier to other sectors is declining. The agricultural sector has lost its power and job creation potential. Regarding the indicators of added value and the value of the gross product, the authors' results confirm the important role of agriculture in the Slovak economy (Pangratie et al, 2022). In order to have results in industrial production in Romania, an important moment belongs to the development of rural areas, and the development of the eight development regions, different in evolution and development. Rural areas are particularly important both throughout Europe and in Romania, being characterized by social, economic and environmental diversity (Burlacu et al., 2022). Some rural areas enjoy good socio-economic results, in some cases better than the neighboring urban areas, with a prosperous population, with well-paid jobs . Other areas face depopulation, demographic aging, high levels of poverty, abandonment of agricultural land, dependence on small-scale agricultural production, limited/or non-existent basic services, major infrastructure problems (Radulescu et al., 2018). Authors (Tutak and Brodny, 2022) present the results of the study that reflects the assessment of the level of digital maturity of businesses in Europe, they analyze the similarities between companies in terms of the technologies implemented in Industry 4.0. It is mentioned that the digital transformation of production and service enterprises has become a common direction of development for all economic sectors (Burlacu et al., 2022). The idea of Industry 4.0 has become synonymous with innovation, it is the basis of business development (Burlacu, 2021). The role and importance of these transformations is recognized by the EU, in promoting and supporting the development of the innovative digital economy (Radulescu et al., 2018; Burlacu, et al., 2022; Hernández, Nieto, and Rodríguez, 2022) it is based on the institutional theory, and on the resource view to analyze the relationship between the governance imperfections in the country of origin, the intensity of exports of companies from economies in transition, including the examination of the moderating role of innovation. The authors' findings allow us to support the authors' conclusions, although companies from transition economies face export difficulties, due to regulatory constraints in the countries of origin, and the innovation strategy represents a viable way to overcome these limits. The study is focused on the systematic review of CE literature published between 1990 and 2019 (Osobajo et al., 2022). The study adopts the five-step procedure as the methodology for the review: formulating research questions, locating and identifying relevant studies, selecting and evaluating studies, synthesizing and reporting results. Authors (Apurbo Sarkar et al., 2022) argue the global trends in sustainable agriculture (SA) have expanded into many practical and academic studies. Many studies and analyzes have focused on various aspects of sustainable agriculture (SA): the effectiveness of pesticide management, the impact on cultivation and improvement, quantification with soil, water and air, agro-ecological activities, ecological aspects, etc. areas of interest (Bran et al., 2020; Radulescu et al., 2020; Burlacu et al., 2022). An in-depth background and data analysis is described that will support academia, science and governments to understand how SA-focused studies create environmental impacts and potential long-term impacts on the world's biodiversity. Authors (Lu, 2017), claims that in Germany, Industry 4.0, the fourth industrial revolution, has attracted a lot of attention in studying the respective problem. It is closely related to Internet of Things (IoT), Cyber Physical System (CPS), Information and Communication Technology (ICT), Enterprise Architecture (EA) and Enterprise Integration (EI). However, Industry 4.0 required a systematic and extensive review of research about it was not available. The authors perform a comprehensive analysis on Industry 4.0, present an overview of the content, scope and findings of Industry 4.0, examining the existing bibliography in all Web of Science databases.

Analysis of the concept of construction models (Grabowska and Saniuk, 2022) it is the essential aspect of the theoretical treatment of business modeling, which is part of strategic management. The interest of researchers in business models, Industry 4.0 is constantly growing. The study contributes to identifying the current state of knowledge about the concept of business models in the era of the fourth industrial revolution by analyzing the evolution of the state of knowledge and trends. Due to the broad agreement that the world community must actively combat climate change and promote green and low-carbon development, the authors (Siy et al., 2023) argue, that in order to address the problem of the relocation of carbon emissions, which is caused by the increase in the cost of industrial production, as a result of policies to reduce

greenhouse gas emissions, the EU intends to implement a Mechanism to adjust the carbon border in its entirety, starting in 2026. The pilot phase will start in 2023. This reflects the emergence of the new international trade system, coordinated by "climate change actions", "carbon peak", "carbon neutrality", which will be broad and broad in character, achieving impact on China's foreign trade industry. The authors of the paper presented policy proposals actively address the problems and effects of the EU "carbon tariff", analyzing the operation process of the EU, through the development of models, and determining the influence of the mechanism on social welfare, carbon emissions and exports.

Authors Dembicka-Niemiec et al., (2023), pursue the main objective of the research, to identify the scope of application of EU funds for the formation of the economy with low carbon emissions, by companies providing energy services in Poland in the period 2014-2020. The presented findings are new and will contribute to a better understanding in the use and management of EU funds. The author's conclusions directed towards: (1) studies of the use of EU funds by Polish energy companies indicate that the funds were an important tool in the transition to a low-carbon economy in the period 2014-2020. (2) EU funds are important in financing investments for the decarbonization of the economy. (3) The level of co-financing of investments made by energy companies was high, often exceeding half of the investment value. (3) The companies that entered the sociological research, surveyed with the support of EU funds, aimed to achieve the objectives of Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, of bringing to reality the economy with low emissions of carbon. (4) Most of the EU support funds, allocated to infrastructure investments, are insufficient to accelerate the energy transition. (5) The projects implemented by some companies were aligned with the objectives of Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency and aimed at supporting the transition to a low-carbon economy. Therefore, half of the projects involved investments related to renewable energy sources (Angheluta et al., 2019).

Author Detsios, et al. (2023) emphasize that the Paris Agreement's Climate Change Goals are putting aviation under great pressure and environmental inspection. In particular, the aviation industry is committed to achieving a 50% reduction in CO2 emissions by 2050 compared to 2005 levels. A shift to alternative aviation fuels appears imperative. The International Air Transport Association has identified the production of sustainable liquid fuels as the most promising strategy for reducing environmental impactAcritical summary of current alternative aviation fuels presented, and a comparative analysis of dominant technologies performed, considering techno-economic assessment, environmental assessment and future projections.

Authors Szymańska and Mroczek (2023) are of the opinion: "the aim of this study was to assess the energy consumption of production in selected branches of the Polish food industry and to identify its changes after Poland's accession to the EU". This issue is particularly important in the period of energy transformation and rising energy prices. The novelty of this article is the determination of changes in the energy efficiency of different branches of the food industry. The main data source was the main statistical data and unpublished data from the Central Statistics Office for the period 2004–2020. Descriptive statistics, comparative analysis and strategic group mapping used in data analysis. Indeed, food production is one of the most energy-intensive processing sectors (Rădulescu et al., 2022). Authors Berglund et al. (2022) familiarize us with EU Directive 92/57/EEC, which focuses on ensuring that health and safety aspects are considered at every stage of construction work and have been introduced into the regulations of member countries. In addition, we argue that there is a need to broaden the analysis of the implementation of EU directive 92/57/EEC also include specific national changes to health and safety management and policy. Authors Sechi, et al. (2022) claim that the share of industry in the final global energy consumption was over 30% in 2020, of which hard-to-reduce sectors represented almost 60% of consumption total end in the industry. In Europe, industry accounts for approximately 25% of final energy consumption. In order to reduce the industry's impact on energy consumption and greenhouse gas emissions, Europe has established many policies to support and regulate the sector, including pricing carbon emissions in a cap-and-trade scheme called the European Trading Scheme of emissions (EU ETS). According to the EU ETS, in 2021 the verified emissions of all stationary installations were approximately 1.3 billion tonnes of carbon dioxide equivalent emissions. In 2021, the total allocated allowances amounted to about 1 billion tonnes of carbon dioxide equivalent emissions, half of which freely allocated.

3. Methodological approaches for the development of industrial policy in Romania

In order to be able to build a new industrial policy for Romania, it is welcome to see what are the objectives of the European Union in the field of industrial policy: (1) accelerating the adaptation of industry to structural changes; (2) encouraging the environment favorable to the initiative and development of EU

enterprises, in particular, of small and medium-sized enterprises; (3) encouraging the environment conducive to cooperation between enterprises; and (4) favoring the efficient exploitation of the industrial potential of innovation, research and technological development policies (Article 173 of the TFEU). During several years, the European Commission paid due attention to industrial development. We propose to go through a short x-ray of the actions of the European Commission in terms of industrial development (1) From the Europe 2020 Strategy to the new Industrial Strategy. (2) European Commission Communication from 2012, "A stronger European industry for economic growth and recovery - Update on the Communication on Industrial Policy", to support investment in innovation, focusing on six priority areas with high potential. (3) in 2014 "For a European industrial renaissance", focused on the reversal of industrial decline, of reaching the objective of 20% of GDP for manufacturing activities by 2020. In 2016, that policy was developed with the work "Digitalization of Industry European - The full exploitation of the digital single market", oriented towards the digital transformation, towards issues related to financing, ICT standardization, BIG data and skills. (4) In 2019 the "European Green Pact", aimed at mobilizing industry for a clean and circular economy (which included the ICT, steel, cement, textiles and chemicals sectors). (5) in March 2020, "A New Industrial Strategy for Europe", aimed at helping European industry to lead the dual transition to climate neutrality and digital leadership, and to strengthen the competitiveness and strategic autonomy of Europe. (6) in May 2021, the Industrial Strategy for Europe was updated, focusing on the resilience of the EU single market, EU dependencies in key strategic areas, supporting small and medium-sized enterprises (SMEs), new start-ups, accelerating green transition and prioritizing digital transformations. (7) In September 2020, it adopted the action plan on critical raw materials with the prospective study for critical raw materials for technologies and strategic sectors until 2030 and 2050.

For the development of a viable and functional industrial policy, it is necessary to consider some priority aspects. Considering the real situation, we are facing and the results that confirm the global weakening of internal ties, especially on the demand side, the strengthening of import flows. On the supply side, the importance of agriculture as a supplier to other sectors is declining. The agricultural sector has lost its strength and job creation potential. Rural areas are particularly important both throughout Europe and in Romania, being characterized by social, economic and environmental diversity (Burlacu, Stoica et al., 2022). Some rural areas enjoy good socio-economic outcomes, in some cases better than neighboring urban areas, with a prosperous population and well-paid jobs. Other areas face depopulation, demographic aging, high levels of poverty, abandonment of agricultural land, dependence on small-scale agricultural production, limited/or non-existent basic services, major infrastructure problems (Rădulescu et al., 2018).

Authors Nisula et al. (2022) argue that while the field of work is moving towards digital environments, the antecedents of knowledge workers' digital creativity remain scarce understood well. The study investigated the digital work environment as a sociotechnical environment and contextual amplifier of the digital creativity of knowledge workers. Briggs (2012) examines the apparent flourishing of community-centred digital practices in the subsequent 'post-conflict' decade, galvanized by Northern Ireland and EU policy initiatives armed with the strengthening of the peace process. The article highlights two projects - "digital memory boxes" and "interactive galleon" - developed in 2007-2008. The article continues and critically examines the processes involved in the practical realization and creative and theoretical reconciliation of digital production, engaged by the community in a certain socio-political context of academic-community collaboration. Authors Authors (Tseng et al., 2021) provide contributions to the existing literature, a state-of-the-art bibliometric analysis of sustainable industrial and operational engineering as the field moves towards Industry 4.0, and directions for future studies and practical achievements. Although industrial and operational engineering is promoted towards sustainability, the systematization of knowledge that forms the production and operations of companies, which includes their broad concepts, abundant complementary elements, industrial engineering is still absent. Bibliometric analysis and the fuzzy Delphi method are proposed. It results in a total of 30 indicators - critiqued and grouped into eight study groups, including lean manufacturing in industry 4.0, cyber-physical production system, intelligent and big data-driven communications, safety and security, artificial intelligence for sustainability, circular economy, in a digital environment, business intelligence and virtual reality and environmental sustainability. Machado et al (2020), conducted the systematic review, and to identify how sustainable manufacturing research contributes to the development of the industry 4.0 agenda, for a broader understanding of the links between Industry 4.0 and sustainable manufacturing, by mapping and summarizing existing research efforts, identifying research agendas, gaps and opportunities for research development.

Conclusions

For the development of an effective industrial policy, it is necessary through sustainable industrial policies to support and promote the involvement of enterprises, in the design and implementation of project activities, aimed at - the creation and use of innovative solutions, in the training of human competence, in various industrialization activities with the reduction of intensity carbon of the economy.

It is necessary to financially support the low-carbon economy modeling projects of the key players in the energy sector.

Organizational support from industry in supporting creativity, innovation, digital transformations applied in industries will contribute to the modernization of industries and facilitate the use of technology in virtual and digital industrial activity.

Especially in rural areas that require sustainable economic development, especially rural areas that face depopulation, demographic aging, high levels of poverty, abandonment of agricultural land, dependence on small-scale agricultural production, limited basic services, problems of infrastructure.

Continuing deep structural reforms and developing new policies to increase economic and industrial competitiveness, ensuring sustainable growth in the medium and long term.

Creating business conditions that allow entrepreneurs and businesses to take initiatives and capitalize on existing ideas and opportunities. Developing models that suggest that the relationship between organizational support and digital creativity is moderated by the sense of virtual community that is facilitated by the ease of use of technology.

In the field of digitalization and robotization apart from IoT, CPS, ICT, big data and cloud computing, there are a variety of industrial information integration methods and techniques that we can use in enterprise architecture and enterprise integration for Industry 4.0, such as be business process management, workflow management, enterprise applications, integration, service-oriented architecture, network computing, enterprise resource planning and supply chain management.

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Population Growth and Global Nutrition: Implications for Universal Health Coverage and Sustainable Development Goals

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Abstract

The purpose of this article is to examine the implications of population growth for global nutrition, and how nutrition interventions can support universal health coverage (UHC) and the sustainable development goals (SDGs). The article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The findings show that population growth poses significant challenges for food systems, health systems and environmental sustainability, and that malnutrition in all its forms undermines human development and well-being. The article also highlights the opportunities and benefits of integrating nutrition into UHC and the SDGs and proposes a set of policy and programmatic actions to achieve nutrition equity. The article contributes to the existing knowledge on population-nutrition linkages and provides valuable insights for policymakers and practitioners working on health and development issues. The article also suggests some practical implications for improving nutrition service delivery, financing, governance and accountability within health systems and beyond.

Keywords

Population growth; nutrition; universal health coverage; sustainable development goals; health systems.

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Introduction

Population growth is one of the most significant demographic trends of the 21st century, with profound implications for human development and well-being (Radulescu et al., 2018). According to the United Nations, the world population is projected to increase from 7.8 billion in 2020 to 9.7 billion in 2050, and to 10.9 billion in 2100. This rapid population increase is largely driven by the demographic transition from high to low levels of mortality and fertility, which is occurring at different rates and stages across regions and countries1. Population growth poses major challenges for social and economic development, especially in low- and middle-income countries (LMICs) where most of the future population growth will take place1. Among these challenges, ensuring adequate food security and nutrition for all people is a critical priority, as malnutrition in all its forms – undernutrition, micronutrient deficiencies, overweight and obesity – affects more than one third of the global population (Burlacu et al., 2022). Malnutrition has serious consequences for health, education, productivity, gender equality and human rights, and is estimated to cost the global economy up to US$3.5 trillion per year (Balu et al., 2021). Moreover, malnutrition is closely linked to environmental sustainability, as current food systems are responsible for more than a third of greenhouse gas emissions and contribute to biodiversity loss, land degradation, water scarcity and pollution (Radulescu et al., 2018).

Achieving universal health coverage (UHC) and the sustainable development goals (SDGs) requires addressing the complex linkages between population dynamics and nutrition outcomes. UHC means that all people have access to quality health services that meet their needs without exposing them to financial hardship. UHC is a key component of SDG 3 on ensuring healthy lives and well-being for all at all ages, but it also contributes to other SDGs related to poverty reduction, education, gender equality, economic growth and environmental protection (Alpopi et al., 2022). Nutrition is an essential element of UHC and the SDGs, as it influences both the demand for and supply of health services, as well as the social determinants of health2. Nutrition interventions can prevent and treat various forms of malnutrition, reduce the burden of communicable and non-communicable diseases (NCDs), improve maternal and child health outcomes, enhance cognitive development and learning abilities, empower women and girls, increase productivity and income, and support climate change mitigation and adaptation (Mogos et al., 2021).

However, despite the importance of nutrition for UHC and the SDGs, there are significant gaps in the integration of nutrition into health systems and policies. Globally, only about half of the countries have a national nutrition plan or policy aligned with global nutrition targets, and only about a quarter have a nutrition budget line within their health sector budget (Profiroiu et al., 2020). Moreover, many countries face challenges in delivering quality nutrition services at scale, especially at the primary health care level where most people access health care (Radulescu et al., 2020). These challenges include inadequate financing, human resources, infrastructure, equipment, supplies, information systems, governance, and accountability mechanisms for nutrition (Carra et al., 2022). As a result, the coverage and quality of essential nutrition actions remain low across regions and populations, leaving millions of people behind (Sarbu et al., 2021).

This article aims to examine the implications of population growth for global nutrition, and how nutrition interventions can support UHC and the SDGs. The article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The article also highlights the opportunities and benefits of integrating nutrition into UHC and the SDGs and proposes a set of policy and programmatic actions to achieve nutrition equity. The article contributes to the existing knowledge on population-nutrition linkages and provides valuable insights for policymakers and practitioners working on health and development issues. The article also suggests some practical implications for improving nutrition service delivery, financing, governance, and accountability within health systems and beyond.

1. Methodology

This article uses a systematic review of literature to analyze the relationships between population dynamics and nutrition outcomes across different regions and contexts. The methodology of this article consists of four main steps: (1) defining the research question and scope; (2) searching and selecting relevant sources; (3) extracting and synthesizing data; and (4) reporting and discussing the findings.

The research question of this article is: How does population growth affect global nutrition outcomes, and how can nutrition interventions support UHC and the SDGs? The scope of this article covers both the challenges and opportunities of population growth for global nutrition, as well as the policy and programmatic actions to integrate nutrition into UHC and the SDGs. The article focuses on malnutrition in all its forms – undernutrition, micronutrient deficiencies, overweight and obesity – as well as their consequences for health, development and sustainability. The article also considers various dimensions of population dynamics, such as population size, growth rate, structure, distribution, movement and composition.

The search strategy of this article involves identifying relevant sources from different databases, websites and reference lists. The main databases used are Web of Science, PubMed, Scopus and Google Scholar. The main websites used are those of international organizations such as the United Nations, the World Health Organization, the Food and Agriculture Organization, the World Bank and others. The main keywords used are: population growth; population dynamics; nutrition; malnutrition; food security; food systems; health systems; health services; universal health coverage; sustainable development goals. The search is limited to sources published in English between 2010 and 2020. The selection criteria of this article include: relevance to the research question and scope; quality of methods and evidence; diversity of perspectives and contexts.

The data extraction and synthesis of this article involves summarizing and comparing the main findings and arguments of the selected sources, using a conceptual framework to organize and analyze the data. The conceptual framework of this article is based on a modified version of the UNICEF conceptual framework

for malnutrition, which illustrates the immediate, underlying and basic causes of malnutrition, as well as their consequences for health, development and sustainability. The framework also incorporates the elements of UHC and the SDGs, as well as the pathways and factors that link population dynamics and nutrition outcomes. The framework helps to identify and explain the complex relationships between population growth and global nutrition, as well as to highlight the gaps and challenges in integrating nutrition into UHC and the SDGs.

The reporting and discussing of this article involves presenting and interpreting the results of the data extraction and synthesis, using tables, figures, diagrams and text. The reporting follows a logical structure that corresponds to the research question and scope. The discussion evaluates the strengths and limitations of the literature review, compares the findings with other studies, draws implications for policy and practice, identifies knowledge gaps and research priorities, and concludes with key messages.

2. Literature review

The growing global population has raised concerns regarding sustainable development and nutrition (Radulescu, Bran et al., 2020). Cohen (2019) argues that population growth is one of the primary drivers of climate change and suggests that addressing population growth is a critical component of sustainable development. The Food and Agriculture Organization of the United Nations (FAO) (2017) similarly highlights the impact of population growth on food security and nutrition.

Achieving sustainable development goals, including universal health coverage and nutrition, requires a focus on global food systems (Bran et al., 2020). Haddad, Hawkes, and Waage (2016) emphasize the importance of sustainable food systems and highlight the need to address food system challenges such as food waste, loss, and unhealthy diets. To achieve this, the Institute of Medicine and National Research Council (1991) suggest implementing nutrition education and training programs to promote healthy dietary practices.

Agriculture plays a significant role in global food systems and ensuring that it is nutrition-sensitive is crucial for achieving nutrition goals. Nisbett and Gillespie (2014) provide an overview of nutrition-sensitive agriculture, while Popkin (2014) explores the relationship between nutrition, agriculture, and the global food system. Lal (2017) emphasizes the importance of soil health and carbon management in sustainable agriculture.

Despite the progress made in addressing food security and nutrition, significant gaps remain. Mason-D'Croz et al. (2018) highlight the need for better data to achieve food security and nutrition targets. Additionally, reducing child undernutrition remains a priority for the post-MDG era (Smith & Haddad, 2015).

Overall, achieving universal health coverage and sustainable development goals requires addressing the challenges posed by population growth, promoting sustainable food systems, and ensuring that agriculture is nutrition sensitive (Profiroiu et al., 2020). The United Nations Development Programme (2015) and United Nations Population Fund (2014) recognize these challenges and provide guidance on achieving sustainable development and addressing global population concerns.

3. Findings

The literature reviewed highlights the significant impact of population growth on global food systems, nutrition, and sustainable development. Addressing population growth is crucial for achieving sustainable development goals, including universal health coverage and nutrition.

Sustainable food systems and nutrition-sensitive agriculture are essential components of achieving nutrition goals. Nutrition education and training programs can promote healthy dietary practices and support the adoption of sustainable food systems. However, significant gaps remain in achieving food security and nutrition targets, requiring better data and increased attention to reducing child undernutrition.

The United Nations Development Programme and United Nations Population Fund recognize the importance of addressing population growth and promoting sustainable development. Achieving sustainable development goals will require concerted efforts to address the challenges posed by population growth, promote sustainable food systems, and ensure that agriculture is nutrition-sensitive.

Population growth poses significant challenges for food systems, health systems and environmental sustainability, which affect global nutrition outcomes in various ways. Table 1 summarizes some of the

main challenges of population growth for global nutrition, according to different dimensions of population dynamics and nutrition outcomes.

Table no. 1. Main challenges of population growth for global nutrition

Dimension	Challenge	Example
Population size	Increasing food demand and pressure on natural resources	- Global food demand is projected to increase by 50% by 2050 due to population growth - Population growth contributes to land use change, deforestation, biodiversity loss, water scarcity and pollution.
Population growth rate	Changing dietary patterns and preferences	- Rapid population growth is associated with dietary transitions from traditional diets rich in cereals, legumes, fruits and vegetables to modern diets high in animal products, fats, sugars and processed foods - Dietary transitions increase the risk of overweight, obesity and NCDs such as diabetes, cardiovascular diseases and some cancers.
Population structure	Altering disease patterns and health risks	- Population aging is a result of declining fertility and mortality rates due to population growth. - Population aging increases the burden of NCDs and multimorbidity, as well as the demand for health care services.
Population distribution	Influencing health service utilization and access	- Urbanization is a consequence of population growth driven by rural-urban migration. - Urbanization creates challenges for health service delivery such as overcrowding, pollution, poor sanitation, infectious diseases outbreaks, social inequalities and violence.
Population movement	Affecting women's reproductive health and empowerment	- Migration is a form of population movement influenced by population growth. - Migration affects women's reproductive health and empowerment through factors such as exposure to violence.

Source: Authors

4. Discutions

The literature reviewed highlights the critical role of population growth in global nutrition and sustainable development. Addressing population growth is necessary to achieve sustainable development goals, including universal health coverage and nutrition. Sustainable food systems and nutrition-sensitive agriculture are essential components of achieving nutrition goals, and promoting healthy dietary practices through education and training programs can support the adoption of sustainable food systems.

However, the literature also reveals significant gaps in achieving food security and nutrition targets, which requires better data and increased attention to reducing child undernutrition. Achieving sustainable development goals will require concerted efforts to address the challenges posed by population growth, promote sustainable food systems, and ensure that agriculture is nutrition-sensitive.

Population Growth and Food Security:

Population growth can have a significant impact on food security, particularly in developing countries. As the population increases, so does the demand for food, which can strain the agricultural and food systems. This strain can lead to increased food prices and reduced access to nutritious foods, particularly for the most vulnerable populations. Additionally, population growth can lead to the expansion of agricultural land, which can have detrimental impacts on the environment, including deforestation and biodiversity loss.

Global Nutrition and Health:

Nutrition is a critical component of global health, with malnutrition contributing to a significant proportion of the global burden of disease. Malnutrition can lead to stunted growth, impaired cognitive development, and increased susceptibility to infectious diseases. Addressing malnutrition is essential for achieving SDG 2, which aims to end hunger, achieve food security, and improve nutrition.

Implications for Universal Health Coverage:

Universal health coverage (UHC) is a critical component of the SDGs and aims to ensure that all individuals have access to essential health services without facing financial hardship. Malnutrition can have a significant impact on health outcomes, and addressing malnutrition is an essential component of achieving UHC. Investing in nutrition programs can lead to significant improvements in health outcomes and contribute to the achievement of UHC.

Implications for Sustainable Development Goals:

The SDGs are a comprehensive framework for achieving sustainable development, and nutrition is a crucial component of several goals. Population growth can have significant implications for achieving SDG 2, which aims to end hunger, achieve food security, and improve nutrition. Additionally, population growth can impact SDG 3, which aims to ensure healthy lives and promote well-being for all ages. Addressing the impacts of population growth on nutrition is essential for achieving these goals.

One potential solution for addressing the challenges posed by population growth and achieving sustainable development goals is to adopt a more holistic approach to food systems. This could include integrating nutrition, health, and environmental considerations into food systems, with a focus on reducing waste, promoting sustainable agriculture practices, and improving the availability and accessibility of nutritious food.

Another potential solution is to focus on reducing inequalities in access to food and nutrition. The literature highlights the disproportionate impact of food insecurity and malnutrition on vulnerable populations, including women and children. Addressing these disparities will require a multifaceted approach that addresses not only access to food but also factors such as poverty, gender inequality, and social exclusion.

The relationship between population growth and global nutrition has been a topic of significant interest in recent years. With the global population expected to reach 9.7 billion by 2050, it is crucial to understand how this growth impacts food security and nutrition. This research article aims to explore the implications of population growth for universal health coverage and sustainable development goals (SDGs) related to nutrition.

5. Results

Population growth and global nutrition are important topics that have significant implications for universal health coverage and the sustainable development goals. Here are some key findings and implications from research on this topic:

Population growth is a major driver of global food demand, which puts pressure on natural resources and can contribute to food insecurity and malnutrition.

Malnutrition remains a significant global health challenge, with an estimated 149 million children under five years of age suffering from stunted growth and 50 million children experiencing wasting.

Poor nutrition is a major risk factor for a range of health conditions, including infectious diseases, non-communicable diseases, and maternal and child health problems.

Achieving universal health coverage and the sustainable development goals will require addressing the underlying determinants of poor nutrition, including poverty, inequality, and lack of access to healthy food and healthcare.

Interventions that promote good nutrition, such as breastfeeding, micronutrient supplementation, and food fortification, can have significant health and economic benefits, both at the individual and population level.

Addressing population growth and its implications for food security and nutrition will require a range of policy interventions, including investments in sustainable agriculture, family planning, and nutrition education.

Key Findings	Implications for Universal Health Coverage and Sustainable Development Goals
Population growth is a major driver of global food demand, contributing to food insecurity and malnutrition.	Addressing population growth and its implications for food security and nutrition will require a range of policy interventions, including investments in sustainable agriculture, family planning, and nutrition education.
Malnutrition is a significant global health challenge, with an estimated 149 million children under five years of age suffering from stunted growth and 50 million children experiencing wasting.	Poor nutrition is a major risk factor for a range of health conditions, including infectious diseases, non-communicable diseases, and maternal and child health problems. Achieving universal health coverage and the sustainable development goals will require addressing the underlying determinants of poor nutrition, including poverty, inequality, and lack of access to healthy food and healthcare.
Interventions that promote good nutrition, such as breastfeeding, micronutrient supplementation, and food fortification, can have significant health and economic benefits, both at the individual and population level.	Promoting interventions that improve food security and nutrition can contribute to achieving universal health coverage and the sustainable development goals.

Overall, population growth and global nutrition are critical issues that require urgent attention from policymakers, researchers, and the public health community. By addressing the underlying determinants of poor nutrition and promoting interventions that improve food security and nutrition, we can make significant progress towards achieving universal health coverage and the sustainable development goals.

Conclusion

This article has examined the implications of population growth for global nutrition, and how nutrition interventions can support UHC and the SDGs. The article has shown that population growth poses significant challenges for food systems, health systems and environmental sustainability, and that malnutrition in all its forms undermines human development and well-being. The article has also highlighted the opportunities and benefits of integrating nutrition into UHC and the SDGs, and proposed a set of policy and programmatic actions to achieve nutrition equity. The article has contributed to the existing knowledge on population-nutrition linkages, and provided valuable insights for policymakers and practitioners working on health and development issues.

In conclusion, the implications of population growth for global nutrition are significant, and addressing these implications is essential for achieving UHC and the SDGs related to nutrition. Investing in nutrition programs and sustainable food systems can lead to significant improvements in health outcomes and contribute to achieving the SDGs. As the global population continues to grow, it is crucial to prioritize nutrition and food security to ensure that all individuals can live healthy and sustainable lives.

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Challenges Regarding the Performance of Public Investment Projects

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Abstract

Investments, approached as a factor influencing the future, have an essential role in economic growth and development by stimulating the production process and by creating new, high-performing structures that are correlated with the specific needs of individuals and society.

From the point of view of access to resources, but also of economic-social competition, economic development generates a higher level of performance, certified on the basis of qualitative and quantitative evaluation processes. In this context, the analysis system of investment projects must be based on operational principles and instruments with medium and long-term impact, capable of aligning with strategic visions. In this paper, based on the research carried out in the specialized literature and the analyzed studies regarding public investments, we identify the current challenges regarding the performance of public investment projects and propose a series of criteria for evaluating the performance of public investments and a sequence of stages to ensure the elimination of non-performing projects at the local, regional and national level.

The results of the present research reveal the inadequate prioritization of public investments to ensure adequate sustainability and offer us the opportunity to develop new research directions in the following works in which we will analyze the impact that inadequate prioritization has on the sustainability of local, regional and national communities.

Keywords

Investments, public investments, economic growth, project management, performance.

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Introduction

Public social investments are the main tool through which public authorities can ensure the provision of quality public services, ensure connection at the community level (people, organization, association, etc.) and capitalize on opportunities in the context of economic and social growth (Profiroiu et al., 2020).

The economic development of communities is influenced by the way local and central public authorities design and implement the public investment strategy (Radulescu et al., 2020). The performance of a public investment strategy can be evaluated through the lens of how it integrates economic, social, and environmental priorities at the local and regional level with the interests and needs of community members (Sarbu et al., 2021). The methodological framework through which this integration can be achieved has highlighted multiple dysfunctions, in different periods of time, an aspect that has led to a disproportionate development of the communities in relation to the existing potential and resources (Ladaru et al., 2022). Concerns in terms of scientific research have intensified in the direction of identifying the most appropriate integration models of all influencing factors to define portfolios of optimal public investment projects (Bodislav et al., 2021).

In the current context, of permanent changes, investments of the main support of economic development can ensure progress and increase the quality of life, both at the level of individuals and at the level of organizations and communities (Bran et al., 2020). Recent economic history has highlighted multiple concerns, both at the theoretical and applied levels, for identifying and implementing the best investment options, which simultaneously respond to all the requirements of those involved (Burlacu et al., 2022). Approached from a historical point of view, public investments represented the response of the authorities to the needs of the communities regarding certain goods, infrastructure works or services, considered to be of vital national interest.

The challenges assimilated to the performance of public investment projects to which this research tries to answer have in mind the formulation of pertinent recommendations for at least the following questions: Who should evaluate and decide on the performance of the projects? What are the performance criteria used and when are they applied depending on the stage of development of a project? How can transparency be ensured in the management of public investment projects?

The motivation of the research is related to the analysis of the situation observed both from a practical and theoretical point of view as being insufficiently debated and researched, namely the management of public investment projects in the substantiation phase and respectively in the post-implementation phase (ex-ante and ex-post), in the context of approaching the concept of intelligent and integrated development. All these challenges follow a sustainable economic development based on modern tools that respect the principles of integrated territorial intelligence and use information technology to increase the level of territorial connectivity between people, organizations and communities. The present paper is structured as follows: Introduction, Review of the scientific literature, Research methodology - Challenges in assessing the performance of public investments, Methodologies for optimizing the level of performance in the case of public investment projects at different stages of implementation, Results and discussion and Conclusions.

1. Review of the scientific literature

Optimizing markets by increasing the level of openness and the degree of flexibility, ensuring the efficiency of resource allocation, encouraging innovation and investments in intangible assets and to help organizations overcome their own barriers, represent objectives of general interest, both for the sphere of public institutions and the private ones. Digital, transport and green energy infrastructures represent potential solutions, but without an appropriate level of complementarity they remain just initiatives without an assumed impact. Access to finance is no longer a fundamental concern of most organizations, but there are more and more constraints geographically located, politically influenced, and conditioned by the attitude of public entities (Negescu et al., 2020). The general approach to the concept of investment refers to the volume of resources allocated and consumed to obtain results, which added up and compared with the associated efforts determine positive effects at the level of the organization or community (Profiroiu et al., 2020). The new global context, in which market requirements, dominated by a dynamic competitive environment, are in permanent change, identifies investment processes as the priority tools for the development of organizations, in which the performance of all processes carried out both inside and outside the systems economic becomes possible only through a responsible integrated approach (Bodislav et al., 2019). Obviously, the definition of an optimal investment model, and we are referring to those financed from public sources, is a complex approach, which must ensure the coexistence of at least four important categories, respectively: the system of needs, the set of available resources, the implementation capacity but also the estimated results (Bodislav et al., 2020). Conceptually, public investments represent the essential tool in ensuring quality public services to the community, create the connection between citizens, organizations and public authorities and capitalize on opportunities favorable to economic growth (Conencov, 2016). In Romania, the concept of public investment is legally regulated by HG 907/2016. According to this document, the notion of public investment represents all the expenses, initial or subsequent, from public funds, intended both for the realization of fixed assets and for the replacement of used assets, which are partially or totally financed from public funds (Government of Romania, 2016).

Through the communication of the European Commission regarding sustainable public investments, the degree of improvement and stimulation in terms of economic recovery through innovation, productivity improvement, cost optimization, quality and sustainability of the public and private sector is highlighted (European Commission, 2021). In the view of the World Bank Group, public investments are represented by the expenses incurred for the purchase of fixed assets and which contribute to the formation of fixed capital in the public sector (World Bank, 2015). Thus, sustainable public procurement is currently taking shape and shows increased interest from both researchers, communities, societies, and public institutions (Manta et al., 2022). Considering the impact of economic growth through investments, their achievement

represents the catalyst of sustainable economic growth (Cojocaru, Ulian and Davidov, 2017). Public investment can be evaluated quantitatively, as a percentage of GDP (gross domestic product) reported over a period. These can be grouped into physical or material infrastructure investments (e.g.: transport, telecommunications, and buildings); human or immaterial investments in education, skills and knowledge and current investments in the consumption of goods and services (eg: social benefits and pensions) (Simon, 2017).

The evaluation of the performance of public investments is a complex process in which the owners and administrators are involved on the one hand, but especially the beneficiaries and users of the newly created infrastructures. In order to increase the performance of public investments, the collaboration of the public sector with the private sector facilitates the exchange of knowledge and is timely for the research and development of these sectors (Buyse, Heylen and Schoonackers, 2020). If from a legislative point of view, the implementation part of investment projects is the best regulated (HG 907/2016, HG 28/2008, HG 225/2014, GEO 88/2013, Law 500/2002, etc.), the issue of substantiation (ex-ante) and that of ensuring sustainability (ex-post) remain within the scope of individual and sometimes subjective decisions, subject to temporal constraints and needs, without being correlated at a strategic level in terms of performance and real contribution to development economic-social.

The pre-investment stage, considered decisive for the performance of a project, involves connecting the three essential elements, namely the project idea, its necessity, and the actions necessary for implementation. Based on an identified, analyzed, and quantified need, the project concept is developed within which, based on specific documentation, the feasibility and viability of the investment project is substantiated. The performance of the pre-investment analysis is influenced, to a large extent, by the quantity and quality of the information available to substantiate the investment decision, the favorable case being the one in which the support and development of the project idea considers the elements and information related to the external environment. The methods and tools used based on cost-benefit analysis (economic and financial analyzes strictly based on the recovery period, the internal rate of return and the discounted net income) evaluate the economic efficiency of the investment thus limiting the foundation on the one hand but also ensuring sustainability on the other part. The priority role of public investments in ensuring institutional financial sustainability is dependent on aspects such as: the country's ability to carry out the technical, solid, and non-political evaluation and selection of projects, the existence of appropriate mechanisms for implementation, supervision and monitoring of projects and evaluation ex -post.

2. Research methodology - Challenges in assessing the performance of public investments.

The developed countries of the world but also those in the process of development have tried, over time, different performance evaluation models, but most of them have a limited character, due to the different context, lack of information or criteria and the indicators used. Also, although there is many projects in financial difficulty, in delay or operated under limited performance conditions, little research or empirical studies are available on the determinants of the performance of public investments and especially on the solutions available to solve non-compliant situations. Some of the most relevant results in the evaluation of the performance of public investments were published in the June 2015 report published by the International Monetary Fund (IMF), according to which project performance is approached two-dimensionally from the perspective of the efficiency and productivity of public investments (Mark and Shakira, 2016). The model proposed by the IMF is restricted from the perspective of application only to public investments made in technical-economic infrastructure (highways, airports, roads, railways, water and sewage systems, telecommunications) and social infrastructure (schools, hospitals). The efficiency of public investments can be evaluated based on the relationship between the value of the public financial resources involved and the degree of coverage, respectively the quality of the infrastructure achieved. In order to meet the new challenges in terms of performance assurance, public investment projects require proper management and an adequate level of transparency in terms of attracting, allocating and using all resources.

According to the report of Allain-Dupré (2011), we identified and analyzed the three main challenges for the coordination of public investments and the impact generated by them, on several levels, as follows:

1. Coordination challenges: cross-sectoral, jurisdictional, and inter-institutional coordination is necessary, but difficult to materialize on the operational component. Additionally, the number and connections of actors involved in public investments is very large, and for this reason it is possible that their interests are not always convergent.

2. Challenges regarding institutional capacity: if the capacity to develop and implement strategies is limited, investment policies fail to achieve their objectives. The experience of previous financial programming periods has proven that the volume of public investments and the expected results are

dependent on the quality and training of human resources as well as the management methodologies used, at the local or regional level.

3. Challenges of the legislative framework: good practices in terms of budgeting, procurement and regulatory quality are an integral part of successful investments, but not always implemented and used at all levels of the administrative system.

Regardless of the institutional nature, the vast majority of countries face these challenges, motivated by the high degree of mutual dependence between the levels of administration for public investments, in the perspective of higher and higher performance objectives. The concerns of the entities involved and the needs regarding investment performance must be integrated into a set of criteria, which we propose as follows in figure no. 1.

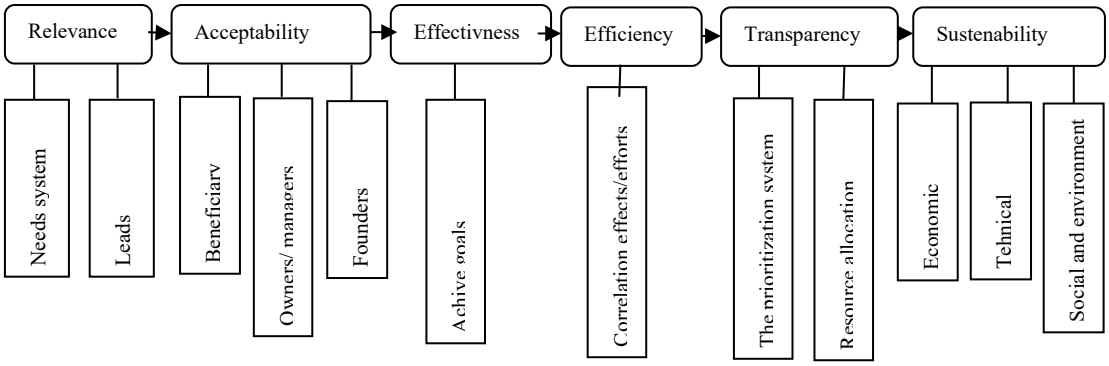


Figure no. 1. Synthesis of criteria proposed for evaluating the performance of public investments.

Source: own contribution

The system of criteria proposed for the performance analysis of investment projects can be supplemented with other specific elements depending on the nature of the assumed objective. The development and implementation of the set of proposals requires further additions from the perspective of assimilating some indicators for each criterion, some systems for measuring and quantifying the associated values and implicitly some reference values for the indicators.

The proposed criteria associated with some specific processes such as the transparency of the budget execution and the way of prioritizing needs, managing the implementation of projects under conditions of efficiency, effectiveness, and sustainability, are the subject of theoretical and research concerns on an international level, as the states become aware of their importance for the performance of public investments. Thus, in order to bring added value to a public institution, performance measurement systems are needed that can be useful in monitoring activities, comparing them with the objectives initially established, facilitating decision-making regarding the timing of actions and control and remedying any malfunctions. From the specialized literature, it emerges that the selection of the performance measurement system at the level of public institutions is made based on an economic context and environmental factors, also integrating both financial and non-financial indicators. Evaluating the performance of an investment project involves several types of analyzes carried out at different points in time, some with a predominantly quantitative component, but which must be correlated and monitored over relevant time periods. The importance of these impact analyses, the correctness of their realization and the coherence of the results at least in two important stages, respectively ex-ante and ex-post, is justified primarily by the irreversible character of the investment processes, the limited size of the necessary resources and implicitly the time, all in the context of the significant increase in the system of needs. From the point of view of efficiency and performance, investment projects connected and substantiated collectively, by all actors of a community, will ensure sustainability but also the generated impact. In such a situation, the focus will also be on the social elements, not just the economic one, integrated at the level of a territorial community to ensure sustainable development.

Methodologies for optimizing the level of performance in the case of public investment projects at different stages of implementation

Regarding the level of performance of public investment projects, we consider it appropriate to develop a sequence of stages to ensure the elimination of non-performing projects and the guarantee that all projects included in the local / regional / national investment strategy will benefit from funding for implementation

and will be completed within the assumed time frame. In fact, the need to improve the efficiency and effectiveness in the management of public investments, in the context of the allocated time frame, constitutes a generating problem of the research approach.

According to the methodology proposed by the World Bank, such a complex process must integrate a sequence of 5 stages, shown in figure 2, as follows: (The World Bank, 2015)

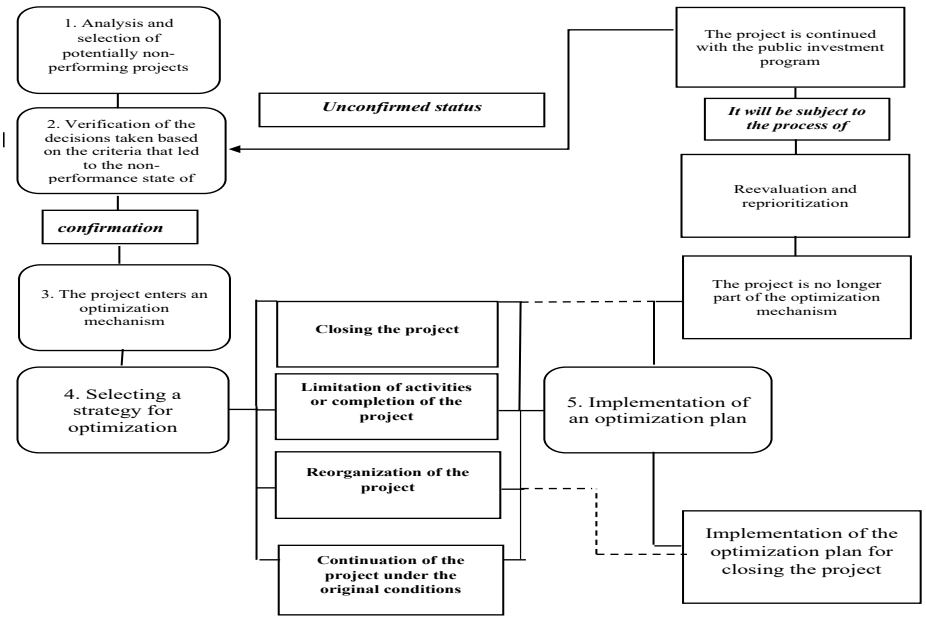


Figure no. 2. The sequence of stages proposed for the optimization of investment projects, which are in different stages of implementation.

Source: adapted from The World Bank, 2015, pg. 55

The sequence of the five proposed stages, from figure no. 2, is completed with specific actions and the way in which projects are differentiated according to the decision-making package adopted in each stage.

In the first stage, called "Analysis and selection of potentially non-performing projects to be included in the optimization program", the processes for framing and selecting non-performing projects must be defined, based on a system of criteria established by the responsible entity.These criteria can be supported by the concrete use of data and information from the database of the funding body, accordingly the Ministry of Public Finance, the Ministry of European Funds, the Regional Development Agencies or even the County Councils and town halls in the geographical reference area. Following the application of the established criteria, a list of potential projects assessed as non-performing is drawn up for each main credit authorizer.

In figure 3 we present the synthesis of the potential criteria on the basis of which the state of non-performance of public investment projects can be identified.

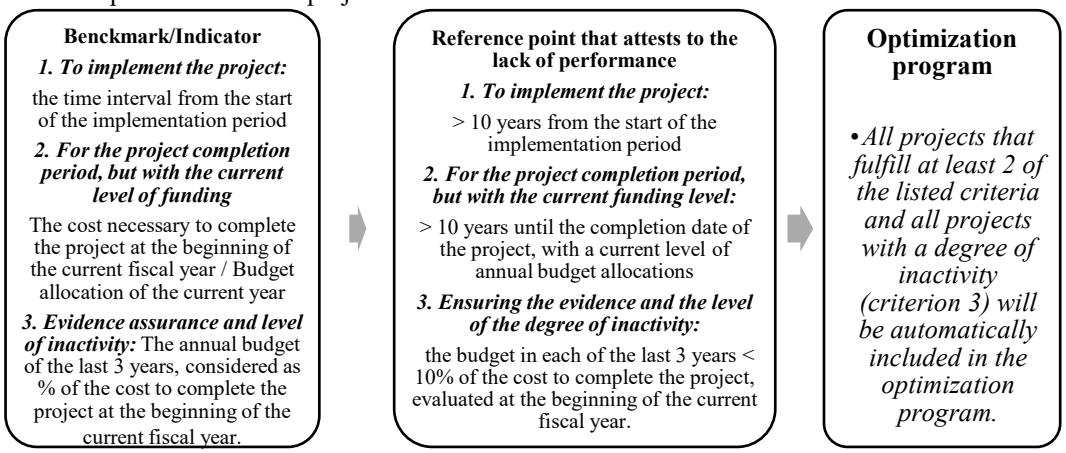


Figure no. 3. Criteria for identifying non-performing projects

Source: own representation adapted from The World Bank, 2015, pg.56

These criteria can form the basis of the process of identification and selection of non-performing projects. They can be supplemented with others depending on the strategic objectives assumed at the level of the financier and public authorities. This process of identifying non-performing projects must be carried out in the first quarter of the fiscal year, after updating the databases related to the investment strategy carried out in accordance with the finalization of the allocated budget.

In the second stage, it is proposed to check and validate the decisions taken based on the criteria that determined the non-performance status of the projects. The list of non-performing projects must be validated by the representatives of the central authorities (Ministry of Public Finances) in collaboration with the main credit officers at regional and local level.

This sub-stage represents the second stage of project filtering, motivated by the fact that errors may occur in the initial classification of a project as non-performing. The non-fulfillment of some criteria can induce a state of non-performance of the projects, but this can be caused by other aspects of a temporal nature. For example, the non-performance of a project can be caused by the delay in solving some temporary technical conditions, before implementation, but which, if solved later, can ensure the running of the project in optimal conditions.

This sub-stage proves its usefulness if, following the application of the criteria, the state of non-performance was induced, but, the causes related to this state have been resolved in the meantime or have been eliminated. If, following the verification, it is found that some projects do not meet the non-performance criteria, they must be re-included in the public investment strategy and plan with the obligation to fulfill, at least, the following conditions: the main authorizing officer of credits will justify the need to continue the project, demonstrating that: the project will be a priority in its investment program and that it fulfills its main role and functions; the feasibility study, the result of the project approval, is still valid; the main authorizing officer of credits will have to demonstrate to the central authority (Ministry of Public Finance) both the availability of the necessary funding for the project according to the budgeted framework, and the fact that the implementation of the project will not create deficiencies at the level of the budget for the other projects in the investment program. After the completion of the verification process, the list of projects validated in the optimization program must be integrated into the fiscal-budgetary strategy for the next financial year. In the third stage, it is proposed to remove the projects declared non-performing from the public investment strategy and introduce them into the optimization mechanism.

The budget allocated to the settlement mechanism is established in the national fiscal budget strategy and must not exceed a maximum of 5% of the total sums allocated to public investments. The solution of the project from budget reallocations is ensured within the limits of the financial and temporal space, in the short term, of a maximum of 1 year, but not guaranteed. Funding of projects from the optimization mechanism budget can be applied for cases such as: the existence of costs related to the work performed and unpaid; the existence of absolutely necessary maintenance costs, limited in time until the plan is resolved; the existence of expenses necessary for the early completion of a project, if this option is the best; the existence of costs related to the decision to close the project. If a project is subject to re-evaluation and review in detail, to be reintroduced into the public investment strategy, it will not receive funding from the settlement mechanism. The fourth stage involves the formulation of a solution strategy for the individual projects in the optimization program. The projects transferred to the settlement mechanism will benefit from a settlement strategy, carried out by the central authority (Ministry of Public Finance). The deadlines for drawing up solution strategies are established after the final validation of the list of projects included in the optimization program.

The solution strategy will be built based on an initial assessment of both benefits and costs for the different options related to a project. In principle, 4 solutions can be considered:

1. closing the project.
2. curtailment of activities or completion of the project before the originally set deadline.
3. the reorganization of the project from the perspective of the purpose and the proposed objectives in order to increase the level of affordability.
4. continuation of the project under the initial conditions.

The last proposed stage envisages the implementation of a solution plan for individual projects.

Following the integration of the optimization strategy of a project, the main authorizing officer of credits will develop for each project a resolution plan, depending on the stage in which the respective project is as follows: projects that require reorganization or full completion will have to be re-evaluated for inclusion in the reprioritization process, referring to other investment options. The whole process will respect the documentation and evaluation procedures generally valid and applicable for all types of projects included in

the investment strategy, including the update of the feasibility study; for those projects proposed for closure or for a curtailment of activities and early completion, a resolution plan will be drawn up by stages and costs. This plan will include the most viable option at the time, but also an additional option with the lowest costs. In the resolution plan, the completion and closure of a project will fall within a time frame of 24 months, except in special circumstances. The financing of these projects included in this stage will be done from the budget of the settlement mechanism.

3. Results and discussion

The application of the present methodology for prioritizing projects in difficulty can contribute to the improvement of the management of public investment projects, carried out both locally and centrally. The advantages of the implementation can be determined by the fact that the number of delayed projects can be limited, at different stages, through aspects related to opportunity, strategic integration, economic and social justification, acceptability, and affordability. Another advantage of the methodology is to increase the level of confidence in making budget forecasts, through detailed knowledge of all the financial commitments related to the projects.

In the overall limits of the present methodological proposal, we consider that the following are relevant: the lack of information or restricted access to information related to previous investment projects, a fact that can create difficulties in the objective application of the methodology, as well as the limited potential interest of the credit officers in solving the projects in a state of non-performance.

We also mention the fact that the application of the optimization methodology of public investment projects requires a considerable time horizon, namely 2-5 years, to allow the analysis of all projects and stopping them or continuing their financing until their end.

The results obtained following the optimization process must also be analyzed from the perspective of convergence at the territorial level (locality, county, region) but also at the level of strategic orientation regarding the focus on those projects, generators of considerable added value and capable of generating multiplier effects. Also, in the project optimization process, achieving a balance in meeting the present, historical and future needs of people must be considered. The excessive focus on solving historical and present problems can affect in the medium term the administrative and financial capacity of public authorities in collecting and understanding future needs through the lens of commitments already assumed.

Conclusions

The obtained results highlighted the insufficiency of the assessment of investment projects on the whole e levels, the current system of indicators being centered only on the economic side of investment projects. Also, the efficiency of the investments and the current level of performance are centered on the strictly economic forecast and evaluation, thus excluding a qualitative and intelligently integrated evaluation at the level of the entire territory. The connection of all actors, the collective integration of knowledge and partnerships and the communication based on the technological infrastructure are insufficiently treated by the current methodology, deficient from the point of view of the integrated approach.

The diversity of needs and implicitly the solutions that can be adopted to solve existing problems, must be permanently correlated with the financial and institutional possibilities of the responsible entities, to consolidate a stable management framework, based on efficiency, effectiveness, and performance.

The prioritization of investment projects in the context of multiannual budget planning must represent a major concern of the decision-makers, to ensure the optimal framework for an intelligent, sustainable, and integrated development of communities. The quality of the prioritization tools and ensuring an appropriate level of objectivity in their application is a conditionality for the overall performance of the process.

The prioritization of public investments and the identification criteria of non-performing projects should be mandatory in every public institution to ensure the sustainability of public projects. As future directions of research, we proposed to analyze the impact of inadequate prioritization of public investment projects in public institutions.

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The Role of Public Administration in Promoting Sustainable Development: A Case Study of Population Growth and Global Nutrition Interventions

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Abstract

This research paper aims to investigate the role of public administration in promoting sustainable development through a case study of global nutrition interventions and population growth. The study employs a case study approach to gain a comprehensive understanding of the challenges and opportunities presented by these issues, and to explore how public administration can effectively address them. The purpose of the research is to generate new insights and hypotheses that can inform theory and practice, as well as to provide practical recommendations for policymakers and practitioners.

The methodology of the study involves an in-depth investigation of four different countries, each selected based on their distinct characteristics and challenges related to global nutrition interventions and population growth. Secondary sources of data are used to develop the case study, including reports, policy documents, and academic literature. The research objectives are to identify the key drivers and barriers to promoting sustainable development in each country, to evaluate the effectiveness of current public administration strategies, and to propose practical recommendations for enhancing policy and practice.

The main findings of the study demonstrate the critical importance of effective public administration in promoting sustainable development, particularly in the context of global nutrition interventions and population growth. The case study highlights the need for coordinated and integrated policy approaches that engage a range of stakeholders, including government, civil society, and private sector actors. The study also highlights the importance of context-specific approaches that consider the unique characteristics and challenges of each country.

The degree of novelty and originality of this research lies in its holistic and contextualized approach to exploring the role of public administration in promoting sustainable development. By using a case study approach, this research generates new insights and recommendations that can inform policy and practice in a practical and actionable way. The practical implications of this research are significant, as it provides a roadmap for policymakers and practitioners to effectively address the complex and multifaceted challenges posed by global nutrition interventions and population growth.

Keywords

Public administration, sustainable development, population growth, nutrition interventions, case study, policy coherence, performance evaluation.

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Introduction

Sustainable development is a broad idea that includes the environment, the economy, and the social well-being of people. Its goal is to meet today's needs without making it harder for future generations to do the same. World leaders adopted the 2030 Agenda for Sustainable Development in 2015. It has 17 goals and 169 targets that cover a wide range of issues, such as poverty, hunger, health, education, gender equality, climate change, peace, and justice. (UN, 2015)

Public administration is a key part of putting policies and actions that aim for sustainable development into action and making sure they work together. Public administration is the way that public officials and institutions at different levels of government organize and run public business. (UNDP, 1997). Planning, making decisions, delivering services, regulating, monitoring, and evaluating public policies and programs that affect people's lives and the environment are all part of public administration.

One of the most difficult parts of promoting sustainable development for public administration is figuring out how population growth and food systems interact with each other. Population dynamics include things like population growth, urbanization, changing age distributions, changes in health and mortality, rural-to-urban migration, and international migration. These changes in population have big effects on food systems, which include all the parts and activities related to making, processing, distributing, eating, and getting rid of food. (HLPE, 2014) Food systems affect people's and groups' food security and nutrition, as well as the health of the environment and social justice.

Food security means that all people always have physical and financial access to enough, safe, nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, IFAD, UNICEF, WFP & WHO 2020). Nutrition is a bigger idea than just eating. It also includes how the body uses nutrients for growth, development, health, and well-being. Malnutrition is any condition that is caused by not getting enough or the right kinds of nutrients. It includes undernutrition (not getting enough food or not getting good food), overweight and obesity (getting too much food or food with a lot of calories), micronutrient deficiencies (not getting enough important vitamins or minerals), and diet-related non-communicable diseases like diabetes or heart disease (WHO, 2020).

For sustainable development to happen, everyone must be able to eat and get enough nutrition, and the natural resources and ecosystems that support food production and human health must be kept safe. But, given how things are now, this is a scary challenge. According to the most recent estimates, more than 2 billion people were moderately or severely food insecure in 2019, and almost 690 million were undernourished. At the same time, more than 3 billion people had poor diets that made them malnourished in different ways. Also, up to 37% of the world's greenhouse gas emissions, 70% of freshwater use, and 80% of deforestation and biodiversity loss are caused by food systems. (FAO, et al. 2020)

The COVID-19 pandemic has made these problems even worse by messing up food supply chains, lowering incomes and ways of making a living, making poverty and inequality worse, and affecting health systems and services. The pandemic also showed how human health and the health of the planet are connected and how we need more resilient and sustainable food systems that can handle shocks and stresses (UNEP, FAO, IFAD & UNDP, 2020)

The goal of this research is to find out how public administration can help promote sustainable development by addressing the challenges of population growth and global nutrition interventions. Global nutrition interventions are policies and programs that aim to improve nutrition on a large scale, especially for children, women, older people, refugees, and other people who are especially vulnerable. (WHO 2019). Some of these actions are encouraging breastfeeding, adding nutrients to staple foods, giving extra micronutrients, treating acute malnutrition, preventing obesity and diet-related diseases, and improving the variety and quality of people's diets.

The study uses a case study method to look at the experiences of different countries and regions that have used public governance strategies to reach population and nutrition-related sustainable development goals (SDGs). The paper lists the main things, like institutional arrangements and policy coherence, that help or hurt the effectiveness of public administration in this situation.

1. Literature review

The field of public administration encompasses various theories, models, and practices that address how public officials and institutions at different levels of government organize and manage public affairs. Public administration is considered both a science and an art, as it involves applying scientific knowledge to real-world problems while also using creativity and leadership to develop and implement effective policies and programs. Sustainable development emerged as a normative idea in response to concerns about environmental degradation, social injustice, and economic instability caused by unlimited growth and exploitation of natural resources. Sustainable development aims to balance environmental, economic, and social well-being, taking into account the needs of both current and future generations.

Public administration is crucial to promoting sustainable development by transforming the vision, principles, and goals of sustainable development into tangible policies and actions that affect citizens and the environment. Public administration affects how state actors, civil society, the private sector, and other stakeholders work together to achieve common goals. Public administration can facilitate sustainable development by planning, deciding, providing services, regulating, and monitoring and evaluating. However, public administration faces several challenges when it comes to promoting sustainable development, such as dealing with complexity, coordinating policies across different levels and sectors, building capacity, involving citizens and stakeholders in policy design and implementation, and ensuring accountability.

Profiroiu et al. (2020) discusses the changes and trends in the global economy and highlights the need for public administration to adapt to the changing economic landscape and develop policies that promote sustainable development. The research on the role of public administration in promoting sustainable development, specifically in the context of population growth and global nutrition interventions, may be linked to Radulescu et al.'s (2020) article on the role of entrepreneurial education in promoting sustainable business practices. Public administration can play a critical role in promoting sustainable business practices by encouraging businesses to adopt sustainable practices and providing incentives for entrepreneurs to develop sustainable business models.

Radulescu et al. (2020) argue that entrepreneurial education can play a critical role in fostering the development of sustainable businesses. To achieve sustainable development, businesses need to adopt sustainable practices that consider environmental, social, and economic factors. This aligns with the concept of promoting sustainable development, which involves finding ways to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Public administration is a broad and multidisciplinary field that includes many different theories, ideas, models, approaches, and practices about how public officials and institutions at different levels of government organize and run public affairs (Calin et al., 2022). Public administration can be seen as both a science and an art because it involves using scientific knowledge and methods to analyze and solve real-world problems, as well as using creativity, judgment, and leadership to create and implement effective policies and programs (Denhardt et al. 2013).

Sustainable development is a normative idea that came about in the late 20th century in response to growing concerns about environmental degradation, social injustice, and economic instability caused by the dominant development paradigm based on unlimited growth, consumption, and exploitation of natural resources (WCED, 1997). Sustainable development tries to find a balance between the environment, the economy, and social well-being (Alpopi et al., 2022). It also requires a long-term view that considers the needs and rights of both current and future generations, as well as an integrated approach that considers how different issues, sectors, and actors are linked and depend on each other (UN 2015).

Public administration is a key part of promoting sustainable development because it is their job to turn the vision, principles, and goals of sustainable development into concrete policies and actions that affect the lives of citizens and the environment (Burlacu et al., 2022). Public administration also affects the ways in which state actors, civil society, the private sector, and other stakeholders work together to reach common goals (OECD, 2016).

Public administration can help with sustainable development by doing things like: Planning: setting goals, strategies, priorities, indicators, and targets for sustainable development at different levels (national, regional, local) and in different sectors (e.g., health, education, agriculture) (UNDP, 2017).

Deciding means choosing between different ways to act based on things like efficiency, effectiveness, fairness, accountability, transparency, participation, and long-term viability (Leuenberger, 2006).

Service delivery means providing public goods and services that meet the needs and preferences of citizens and improve their well-being, such as health care, education, water, sanitation, transportation, energy, etc. (UNDP, 2017).

Regulation is the process of making rules and standards that tell people, organizations, and markets how to act when it comes to things like protecting the environment, protecting consumers' rights, ensuring workers' rights, protecting human rights, etc. (UNDP, 2017).

Monitoring and evaluating: Using indicators, benchmarks, audits, reviews, surveys, etc., to gather and analyze data and information about how policies and programs related to sustainable development are working and what effects they are having (UNDP, 2017).

But there are also many problems for public administration when it comes to promoting sustainable development (Negescu et al, 2021). Some of these problems are:

Complexity: dealing with multiple dimensions, interactions, uncertainties, and trade-offs in sustainable development issues, which requires systemic thinking, holistic analysis, and adaptive management. (OECD 2016).

Coordination implies making sure that policies are consistent, aligned, and integrated across different levels of government (vertical coordination), different sectors (horizontal coordination), and different actors (multi-stakeholder coordination) (Burlacu et al., 2021).

Capacity means having enough people, skills, knowledge, technology, and money to put policies and programs for sustainable development into action in an effective and efficient way. (UNDP 2017).

Participation: Including citizens and other stakeholders in the design, implementation, and evaluation of policies and programs for sustainable development by using tools like consultation, deliberation, collaboration, and co-production (Sarbu et al., 2021).

Accountability means meeting the needs and expectations of citizens, being open about decisions, actions, and results, being subject to oversight by independent bodies, being responsible for mistakes or wrongdoing, being open to feedback, and learning from past mistakes (OECD 2016).

2. Methodology

The methodology for this research involves a case study approach to investigate the role of public administration in promoting sustainable development through addressing challenges posed by global nutrition interventions and the growing global population.

The purpose of this research is to explore how public administration can contribute to sustainable development by examining specific cases of population growth and global nutrition interventions. The objectives of this study are to identify the challenges faced by public administration in addressing these issues, to assess the effectiveness of different approaches taken by public administration, and to generate insights and recommendations for improving policy and practice.

The case study will focus on four countries: China, Ethiopia, Sweden, and Romania, selected based on their different levels of development, population growth rates, and experiences with global nutrition interventions. Secondary sources such as government reports, academic articles, and other relevant documents will be used to develop the case study.

Data analysis will involve a qualitative method, including content analysis, and comparative analysis. The primary data sources will be the selected secondary sources used to develop the case study.

The degree of novelty and originality of this research lies in its exploration of the role of public administration in promoting sustainable development through a case study approach that examines the challenges posed by global nutrition interventions and population growth. The findings of this research will have important practical implications for policymakers and practitioners working in the fields of public administration, sustainable development, and global health.

3. Results and discussions

This research adopts a case study approach to investigate how public administration can contribute to the promotion of sustainable development by addressing the challenges posed by global nutrition interventions

and the growing global population. A case study is a method of conducting research that entails an in-depth investigation of a modern phenomenon within the context of its actual occurrence, making use of a variety of different sources of evidence (Yin 2014). Case studies are suitable for exploring complex and multifaceted issues that require a holistic and contextualized understanding, as well as for generating new insights and hypotheses that can inform theory and practice (Flyvbjerg 2006).

The research is centered on four cases that illustrate different geographical locations, degrees of development, patterns of population growth, and types of food systems. These are the cases:

China is a large and populous country with a fast-growing economy, growing cities, and a changing population, as well as big changes in food production, consumption, and nutrition (Zhang et al. 2020).

Ethiopia is a low-income country with high levels of poverty, food insecurity, and malnutrition. Its mostly rural and agricultural population is also affected by environmental damage and climate change (FAO, IFAD, and WFP, 2019)

Sweden is a high-income country with a long history of public administration for sustainable development. Its citizens also have a high level of social welfare, environmental awareness, and good eating habits. (Larsson et al. 2019).

Romania faces challenges in implementing a digital public administration system that promotes sustainable development. Digitization of public administration can contribute to increasing efficiency and transparency, improving access to public services, and reducing administrative costs. However, it is important to ensure data security and pay special attention to the digital inclusion of vulnerable groups (Burlacu et al., 2022).

The case study analysis reveals that public administration performance in relation to population growth and global nutrition interventions varies significantly across the four cases, depending on the institutional arrangements, policy coherence, stakeholder participation, capacity building and performance evaluation dimensions. The following table summarizes the main strengths and weaknesses of each case along these dimensions.

Table no. 1. Summary of China's public administration performance in relation to population growth and global nutrition interventions

Items	**Institutional arrangements**	**Policy coherence**	**Stakeholder participation**	**Capacity building**	**Performance evaluation**
Strengths:	Strong central leadership and coordination; clear roles and responsibilities; comprehensive legal frameworks; innovative pilot programs	High-level commitment to sustainable development; alignment with national development plans and international agendas; integration of population and nutrition issues across sectors.	Involvement of various actors in policy implementation; collaboration with international organizations and donors; mobilization of social organizations and volunteers	Availability of financial resources; development of human resources; advancement of technology and innovation; improvement of infrastructure	Collection and analysis of data and information; use of indicators and targets; regular monitoring and reporting; learning from experience.
Weaknesses:	Lack of transparency and accountability; limited public participation; top-down decision-making; bureaucratic fragmentation	Trade-offs between economic growth and environmental protection; inconsistency between national policies and local realities; insufficient attention to social equity and human rights	Limited voice and influence of citizens and civil society; restricted access to information and feedback mechanisms; lack of trust and dialogue among stakeholders	Unequal distribution of resources; gaps in skills and knowledge; dependency on external assistance; vulnerability to shocks and stresses	Lack of disaggregated and timely data; limited use of evaluation results; low quality and reliability of data sources; insufficient feedback and learning mechanisms

Source: Authors

According to the documentation made and summarized in table 1, the Public Administration in China has a strong central leadership and coordination, with clear roles and responsibilities and comprehensive legal frameworks. However, there is limited public participation, top-down decision-making and bureaucratic fragmentation. China shows a high-level commitment to sustainable development and the integration of population and nutrition issues across sectors. Stakeholder participation is limited, but collaboration with international organizations and donors is evident. There is an emphasis on advancing technology and innovation, but the distribution of resources is uneven. Regular monitoring and reporting take place, but there is a lack of timely and reliable data and limited use of evaluation results.

Table no. 2. Summary of Ethiopia's public administration performance in relation to population growth and global nutrition interventions

Items	**Institutional arrangements**	**Policy coherence**	**Stakeholder participation**	**Capacity building**	**Performance evaluation**
Strengths:	Federal system that allows for decentralization and local autonomy; legal frameworks that support sustainable development; participatory planning processes	Strengths: alignment with national vision and international commitments; integration of population and nutrition issues into sectoral policies; policy dialogue and harmonization among actors.	Strengths: engagement of various actors in policy formulation and implementation; empowerment of communities and local governments; partnership with international organizations and donors.	Mobilization of domestic resources; development of human resources; transfer of technology and innovation; enhancement of infrastructure Weaknesses:	Collection and analysis of data and information; use of indicators, targets, benchmarks, etc.; regular monitoring, review, audit, etc.; learning from experience.
Weaknesses:	Weak institutional capacity and coordination; overlapping roles and responsibilities; political instability and insecurity; corruption and mismanagement.	Lack of policy coherence and consistency; inadequate implementation and enforcement mechanisms; conflicting interests and agendas among actors	Low level of public awareness and participation; limited representation and empowerment of women, youth, minorities, etc.; challenges in coordination and communication among stakeholders.	Insufficient financial resources; shortage of skills and knowledge; dependency on external assistance; vulnerability to shocks and stresses	Lack of disaggregated, timely, reliable data sources; limited use, dissemination, feedback, of evaluation results; insufficient evaluation capacity, methods, tools.

Source: Authors

As shown in table 2 which summarizes the research carried out, the public administration in Ethiopia has a federal system that allows for decentralization and local autonomy, but weak institutional capacity and coordination, overlapping roles and responsibilities, political instability and insecurity, corruption and mismanagement are challenges. Alignment with national vision and international commitments is evident, and population and nutrition issues are integrated into sectoral policies. The involvement of different actors in policy formulation and implementation is observed, and communities and local governments are empowered. However, public participation and representation of women, youth, minorities, etc. are limited. Internal resources are mobilized, but there is insufficient financial support, skills, and knowledge. Regular monitoring and learning from experience take place, but there are limitations in data sources, evaluation results and evaluation capacity.

Table no. 3. Summary of Sweden's public administration performance in relation to population growth and global nutrition interventions

Items	Institutional arrangements	Policy coherence	Stakeholder participation	Capacity building	Performance evaluation
Strengths:	Democratic system that allows for transparency, accountability, participation, checks-and-balances, etc.; legal frameworks that support sustainable development; decentralized planning processes	High-level commitment to sustainable development; alignment with national vision and international agendas; integration of population and nutrition issues across sectors Weaknesses:	Engagement of various actors in policy formulation and implementation; empowerment of communities and local governments; partnership with international organizations and donors	Availability of financial resources; development of human resources; advancement of technology and innovation; improvement of infrastructure	Collection and analysis of data and information; use of indicators, targets, benchmarks, etc.; regular monitoring, review, audit, etc.; learning from experience.
Weaknesses:	Complex institutional structures and coordination mechanisms; bureaucratic inertia and resistance to change; political uncertainty and fragmentation; lack of diversity and inclusion	Trade-offs between economic growth and environmental protection; inconsistency between national policies and local realities; insufficient attention to social equity and human rights	Limited voice and influence of citizens and civil society; restricted access to information and feedback mechanisms; lack of trust and dialogue among stakeholders	Unequal distribution of resources; gaps in skills and knowledge; dependency on external assistance; vulnerability to shocks and stresses	Lack of disaggregated, timely, reliable data sources; limited use, dissemination, feedback, of evaluation results; insufficient evaluation capacity, methods, tools

Source: Authors

According to Table 3, Sweden has a democratic system that allows for transparency, accountability, participation, and checks, as well as legal frameworks that support sustainable development and decentralized planning processes. However, there are complex institutional structures and coordination mechanisms, bureaucratic inertia and resistance to change, political uncertainty and fragmentation, and a lack of diversity and inclusion. There is a high commitment to sustainable development and the integration of population and nutrition issues in relevant sectors, but there are trade-offs between economic growth and environmental protection, inconsistencies between national policies and local realities, and insufficient attention to social equity and human rights. There is involvement of various actors in policy formulation and implementation, empowerment of communities and local governments, and partnership with international organizations and donors, but there is limited voice and influence of citizens and civil society, restricted access to information and feedback mechanisms, and a lack of trust and dialogue between stakeholders. There is an availability of financial resources and human resource development, technology transfer and innovation, infrastructure improvement, but there is an uneven distribution of resources, skills and knowledge gaps, dependence on external assistance and vulnerability to shocks and stress. There is collection and analysis of data and information, use of indicators and targets, regular monitoring and reporting, learning from experience, but there is a lack of disaggregated and timely data, limited use of evaluation results, low quality and reliability of data sources and insufficient feedback and learning mechanisms.

In Romania, the performance of public administration in relation to population growth and global nutrition interventions can be evaluated based on the following institutional arrangements, policy coherence, stakeholder participation, capacity building, and performance evaluation:

Table no. 4. Summary of Romanian public administration performance in relation to population growth and global nutrition interventions

Items	Institutional arrangements	Policy coherence	Stakeholder participation	Capacity building	Performance evaluation
Strengths:	Romania has a centralized system of governance, with clear roles and responsibilities of various government institutions. The Ministry of Health is responsible for developing and implementing policies related to nutrition, while the National Institute of Statistics collects data on population growth and health indicators.	Romania has a National Strategy for Sustainable Development that includes objectives related to health and nutrition. The government has also developed policies aimed at improving access to healthy food, such as the National Program for School Milk.	There are opportunities for stakeholder participation in Romania, including through civil society organizations and public consultations. The Ministry of Health also collaborates with international organizations to implement nutrition programs.	Romania has made progress in developing its healthcare system, with improved infrastructure and technology in recent years. The government has also invested in education and training for healthcare professionals.	The National Institute of Statistics collects data on population growth and health indicators, and the Ministry of Health regularly monitors and evaluates nutrition programs.
Weaknesses:	There are concerns about corruption and inefficiency in the Romanian public administration system, which may hinder effective implementation of policies and programs related to population growth and nutrition interventions.	There may be inconsistencies between national policies and local realities, which may result in uneven implementation of nutrition programs. In addition, there may be trade-offs between economic growth and environmental protection, which may impact the availability and affordability of healthy food options.	There may be limited public awareness and participation in nutrition interventions, and some groups, such as women and minorities, may not have adequate representation and empowerment.	There may be gaps in skills and knowledge related to nutrition interventions, particularly in rural areas. Romania may also be vulnerable to external shocks and stresses, such as economic downturns or changes in international funding for health programs.	There may be a lack of disaggregated and timely data on nutrition interventions, which may hinder effective evaluation and learning from experience. In addition, there may be limited use and dissemination of evaluation results, which may limit opportunities for feedback and improvement.

Source: Authors

Through comparison, we see that a wide range of institutional, policy, stakeholder, capacity, and evaluation factors influence the success of public administration in responding to population growth and global nutrition interventions. It is possible to spot a few overarching trends and patterns:

Thanks to its strong central leadership and coordination, comprehensive legal frameworks, innovative pilot programs, and availability of resources, China has made remarkable progress in improving food security and nutrition outcomes for its large and rapidly growing population. However, China also faces substantial challenges in maintaining a healthy balance between economic development and environmental protection, protecting social justice and human rights, increasing public participation and accountability, and dealing with the growing epidemic of overweight and obesity.

Ethiopia's primarily rural and agricultural population is threatened by extreme poverty, food insecurity, and malnutrition due to environmental degradation and the effects of climate change. Ethiopia has worked to involve multiple stakeholders in policy implementation and to better align its population and nutrition programs with the Sustainable Development Goals (SDGs). Ethiopia, however, is plagued by issues such as inadequate financial resources and reliance on foreign aid, as well as weak institutional capacity and coordination, political instability and insecurity, corruption, and mismanagement.

Sweden has a high standard of living, environmental consciousness, and wholesome diets because of its long history of public administration for sustainable development. Incorporating population and nutrition issues across sectors, Sweden has shown a strong dedication to sustainable development that is in line with national vision and international agendas. Nonetheless, the country must also deal with such challenges as inconsistency between national policies and local realities, and insufficient focus on social equity and human rights.

Romania has made progress in improving food security and nutritional outcomes, but still faces significant challenges. The country has implemented policies and programs to address issues such as malnutrition, stunting and obesity, and has improved access to clean water and sanitation. However, Romania also faces challenges such as income inequality and inadequate access to healthcare, especially in rural areas. Overall, progress has been made to ensure that all Romanian citizens have access to healthy and nutritious food and that the government is effectively addressing the root causes of food insecurity and malnutrition.

Table no. 5. Comparative analysis of key points about China, Ethiopia, Sweden and Romania

Country	Key strengths	Key challenges
China	Strong central leadership and coordination, comprehensive legal frameworks, innovative pilot programs, and availability of resources have led to remarkable progress in improving food security and nutrition outcomes for its large and rapidly growing population.	Maintaining a healthy balance between economic development and environmental protection, protecting social justice and human rights, increasing public participation and accountability, and dealing with the growing epidemic of overweight and obesity.
Ethiopia	Involvement of multiple stakeholders in policy implementation and better alignment with the Sustainable Development Goals (SDGs).	Extreme poverty, food insecurity, and malnutrition due to environmental degradation and the effects of climate change, inadequate financial resources and reliance on foreign aid, weak institutional capacity and coordination, political instability and insecurity, corruption, and mismanagement.
Sweden	High standard of living, environmental consciousness, and wholesome diets due to its long history of public administration for sustainable development. Incorporation of population and nutrition issues across sectors and strong dedication to sustainable development that is in line with national vision and international agendas.	Inconsistency between national policies and local realities, insufficient focus on social equity and human rights.
Romania	Diverse agricultural resources, a rich culinary heritage, and recent efforts to implement nutrition policies and programs.	High rates of overweight and obesity, low levels of physical activity, inadequate public financing for nutrition programs, limited availability of healthy foods in some areas, and lack of coordination and implementation of nutrition policies and programs.

Source: Authors

Comparative Table 5 highlights the various challenges and opportunities for improving food security and nutrition outcomes in different countries. While China and Sweden have made significant progress through innovative policies and strong coordination, Ethiopia and Romania face unique challenges such as environmental degradation, poverty and weak institutional capacity. Overall, sustained efforts and multi-stakeholder partnerships are needed to ensure sustainable progress towards global nutrition goals.

Sustainable development, which balances economic, social, and environmental factors, has grown in popularity. Given its role in implementing social and environmental policies, public administration is

crucial to sustainable development. This literature review examines how public administration promotes sustainable development, focusing on population growth and global nutrition interventions.

Population growth is a major cause of environmental degradation and resource depletion. Public administration can help solve this problem by promoting sustainable population growth. Family planning reduces family size. In China and Thailand, family planning programs have reduced population growth. To succeed, culturally sensitive programs must involve local communities.

By encouraging rural-to-urban migration, public administration can sustain population growth. Urbanization reduces fertility because it improves healthcare, education, and job opportunities. Urbanization increases pollution and waste. Public administration must balance urbanization's benefits with environmental sustainability.

Global Nutrition Interventions: Malnutrition affects over 800 million people worldwide. Implementing nutrition security policies and programs can help public administration address this issue. Food fortification adds micronutrients to flour and salt. Food fortification is a cost-effective way to address micronutrient deficiencies, especially in low-income countries.

Sustainable agriculture policies can help public administration improve nutrition security. Sustainable agriculture balances economic, social, and environmental factors to improve food security and reduce environmental damage. Agroecology designs and manages agricultural systems using ecological principles. Agroecology improves food security, environmental quality, and rural livelihoods.

Conclusions

In conclusion, public administration plays a crucial role in promoting sustainable development by translating the principles and goals of sustainable development into concrete policies and actions. This study focused on investigating the challenges of global nutrition interventions and population growth and how public administration can address them. Institutional arrangements, policy coherence, stakeholder participation, capacity building, and performance evaluation are some of the factors that affect the efficiency of public administration in this setting. The study suggests that improving public administration practices and outcomes in relation to sustainable development can be achieved by addressing contextual factors, improving institutional arrangements, policy coherence, stakeholder participation, capacity building, and performance evaluation.

Each of the mentioned countries (China, Ethiopia, Sweden, and Romania) has its own challenges and successes in terms of public administration and population nutrition. However, all these countries can learn from each other and work together to make progress in nutrition globally. It is important that these countries dedicate their resources and efforts to address the nutritional and health problems of their populations so that they can achieve the Sustainable Development Goals set by the United Nations.

The study's findings and recommendations can help public officials, policymakers, practitioners, and researchers improve population health and nutrition to promote long-term sustainable development.

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Analysis of Fiscality and Economic Growth at EU Level

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Abstract

Purpose/objectives: What this article proposes is to make a presentation as clear and current as possible of the member states' taxation, direct and indirect taxation being the main categories to which we refer. The choice of the theme was motivated by our interest in discovering the effects of some decisions taken at the European level. It is desired to discover the way and the impact in which taxation influences economic growth in the European community.

Design/methodology: Mix research technique has been used. While qualitative research entails in-depth literature readings and reports, quantitative analysis entails presenting data via graphs and tables.

Findings: Taxation was and will remain a main component in the general economy that influences the good functioning of a system. Its effectiveness is conditioned by the legal regulations that each state designs individually, but not without the influence of the communities of which it is a part. For example, Romania was conditioned upon its entry into the European Union to modify its laws in order to be at the same level as the states in the Union. It is a laborious process that takes a long time and is constantly changing and improving. The process of designing and implementing these programs is tried to be carried out as easily as possible for each individual state, being individualized by economy, regional power, global impact, etc. The progress of each country entered in this sense is very important and is constantly monitored, and periodic reporting is very useful.

Originality/value: The work is an original research work conducted by the researchers. The findings will add to the body of knowledge on the area of research funding in Romania.

Possible practical implications: The completed project is addressed to those people who are interested in the fiscal side of an economy, especially understanding the process of economic growth, how difficult it is to reach a favorable situation at such a high level.. It can also represent a starting point for bachelor's, master's level studies, in order to broaden general knowledge, or even in-depth study for a final paper.

Keywords

Development, economy, fiscality, taxes.

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Introduction

The future of any modern state is inconceivable without a tax system that performs well in terms of yield and affordability on the part of taxpayers. The present state of prosperity of a contemporary state is dependent, to a large extent, on the history of its own fiscal system, on the way it was conceived and functioned. What distinguishes a country in progress from one in decline is, to a large extent, the preference shown to building the future. This preference is measured by taxes, loans and the interest rate (Oprea, 2022).

A state's finances are closely related to its social and political situation, there being a strong interdependence between the political regime and finances.

Taxes are a "bad" for those who bear them and a "necessary" for feeding the public budget, being the most important source in this regard. The honest taxpayer agrees to pay the tax and voluntarily submits to this burden, but at a given moment, when the taxes exceed certain limits of affordability, phenomena occur that seriously undermine the state's ability to collect these revenues.

The behavior of the taxpayer becomes abnormal, he tries in every way to evade the tax, hoping for a decrease in the fiscal pressure that sometimes becomes suffocating. The literature proved that competition can have divergent echos on the economic behaviours (Istudor et al., 2022) and this has direct impact on tax collection.

The increase or decrease of fiscal pressure over a certain period is definitely linked to the economic and social role of the state, to its intervention in order to ensure the source of public expenditure coverage.

The fiscal policy within the European Union consists of two components: direct taxation, which remains the exclusive competence of the member states, and indirect taxation, which influences the free movement of goods and the free provision of services (Stefan, 2022). As regards direct taxation, member states have taken measures to prevent tax evasion and double taxation (Acemoglu et al., 2019).

Fiscal policy is intended to avoid distortion of competition between Member States on the internal market due to differences between the levels and regimes of indirect taxation (Burlacu, Lădaru et al., 2022). Also, measures were taken to prevent the negative effects of fiscal competition in situations where companies make cash transfers between the member states of the European Union (Bayar, 2016). Competition-related policy measures require all the atention of decision-makers (Constantin et al., 2023).

Governments have always juggled indirect tax rates, managing to reach international agreements as well. The changes that have occurred at the European level are numerous and are determined by economic, political, social movements and, especially in the last period, they have determined the emergence of some situations that we are currently facing (Mathieu &Sterdyniak, 2019).

1. Review of the scientific literature

European organizations must be alert and responsive to all the movements occurring on the economic level to direct their help and interest to countries that have potential, abilities to prosper and to implement the European concepts that are the basis of the Union of which Romania is also a part (Rădulescu, Angheluta et al., 2022. Indirect taxes have the largest share in total revenues for each country separately and at the European level, so it can be said that the evolution of these taxes directly affects us even if they are indirect, having the illusion that we taxpayers do not bear them, they hide in every good/service purchased (Burlacu, Ciobanu et al., 2021).

Governments can mask their intentions to increase revenues through these indirect taxes because they are not as contested as the direct ones paid by each taxpayer separately at the end of the year or semester (Rădulescu, Bran et al., 2022). Each state manages its own quotas, the methods of implementing these taxes, each state wants to impose its own vision and make a well-argued opinion regarding the common European regulations, the EU-27 member countries must consider minimum and maximum taxes throughout the European territory. Harmonizing all the needs required time and understanding, each country following a well-established protocol, and the individual route planned for each state.

The fiscal field is a vast one, but the main thought of any person when he hears about taxation is the tax (Burlacu, Georgescu et al., 2022). This immortal source of the state (Calin et al., 2022), which manages to collect revenues year after year for the state budget, covers any activity of taxpayers who are forced to obey the law and pay the necessary taxes.

The functions of taxation are based on the correct approach to the fundamental functions performed by public finances:

- Distribution function - Mobilization- through which financial resources are formed through differentiated withdrawals from the income or wealth of natural and/or legal persons, with a definitive, non-refundable title, and without an equivalent consideration from the state;
- Distribution- through which public funds are directed to their beneficiaries.
- The control function- as an important function, justified by the fact that public funds belong to the

entire society and are administered by the state in charge of the nation. That is why the institutions specialized in fiscal control monitor the legality, necessity, opportunity and efficiency with which public money is constituted and spent.

The issue of fiscal pressure is also a very vital component of the system, which emphasizes the importance of quantifying the fiscal burden both at the macroeconomic and microeconomic (Al-Naser et al., 2019).

In the completion of this issue, the analysis of the causes of the increasing trends in mandatory withdrawals is presented with an accuracy worthy of being reported to the specialists in the field. Taxation falls within the competence of the member states and not of the European Union.

2. Research methodology

What is desired through this work is the achievement of a clear and current presentation of the taxation of the member states, direct and indirect taxation being the main categories to which we refer. The methodology used was limited to the search for viable sources of information and research, the collection of necessary data from Eurostat, but the presentation focused more on theoretical aspects that I extracted from numerous books and articles as well as specialized websites. The theoretical part for this study is given in general by the use of official websites made available to the interested public. Our research also covers financial dailies and local newspapers.

3. Results and discussion

The fiscal pressure, also known as the Taxation Rate, can be calculated at the individual level (per person), in this way each taxpayer can determine the degree to which they bear taxation; for the economic agent, modern enterprises perform periodic calculations to determine fiscal costs, their evolution and proportions; or globally (Álvarez et al., 2019).

It is known that any compulsory levy obtained from taxpayers returns to the economic circuit through public spending, therefore this indicator should not be considered as a pressure of the state on the economy. The rate of taxation pressure expresses relatively the public burdens that press on the economy, reflecting the part of the GDP that is taken over to the public budget in order to cover public expenses. In a developed economy, the tax pressure can increase without affecting the tax base, which makes the level of absolute withdrawals increase (Bojanic, 2021). Above a certain threshold of the fiscal pressure - which correspund to the maximum amount possible to be collected from compulsory levies, as the level of tax rates increase, the level of tax receipts decreases. The high fiscal pressure causes a direct or indirect slowdown of economic activity in general, which previously leads to a decrease in the tax base.

For the period 2010-2021, the fiscal pressure was analyzed at the level of the European Union, the 27 countries, following the evolution of this indicator, we observe the increase of the fiscal pressure in 2021 compared to 2011 and 2012 when together with the decrease in the revenues collected to the budget, the GDP also decreased, which meant a lower fiscal pressure.

Table no. 1. The situation of total EU27 revenues and EU-27 GDP, in millions of euros, for the period 2010-2021

Year/Millions of EUROS	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
EU-27	4.268.433,9	4.277.928,5	4.375.532,6	4.450.175,9	4.655.286,9	4.901.793,8
GDP	9.258.000	9.691.769	9.982.139	10.153.898	10.804.970	11.264.975
Year/Millions of EUROS	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
EU-27	5.235.386,8	5.543.387,8	5.671.679,6	5.594.720,4	5.6413.080,5	5.680.840,9
GDP	11.811.604	12.501.315	12.664.608	11.952.761	12.674.559	12.841.711

Source: Eurostat data

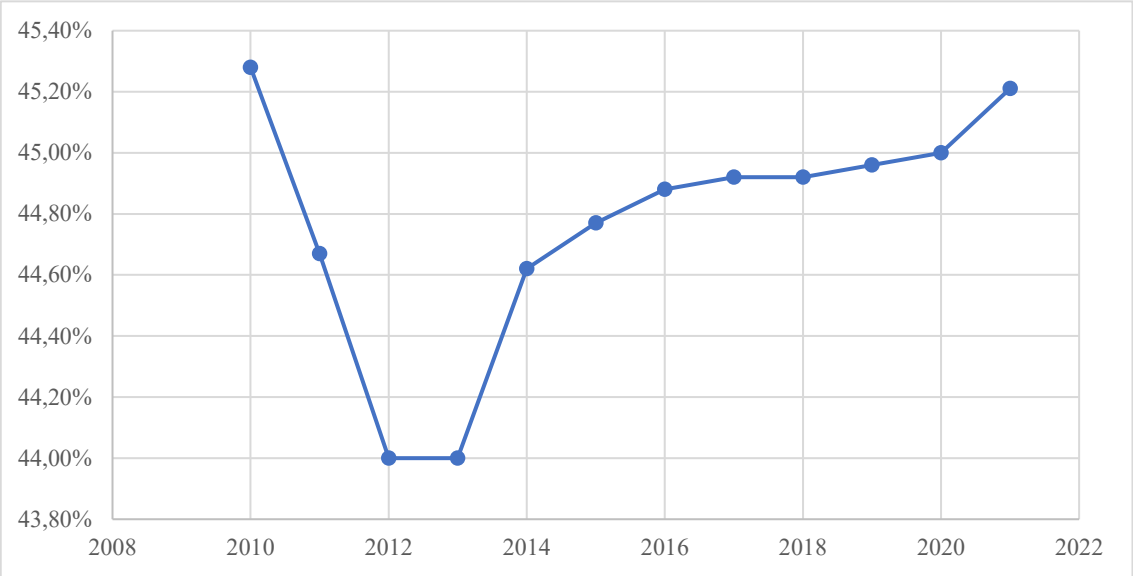


Figure no. 1. Tax rate (%) EU-27 for 2010-2021
Source: Eurostat data

- *Fiscal policy trends in the EU states*

For this chapter, the main material studied was the European Commission's 2022 Eurostat report on Taxation in Europe. Fiscal policy differs from country to country, but the European Union tries to provide a favorable framework for the simultaneous development of all member countries.

It is desired to apply a single monetary policy at the European level, but this step is very difficult to take, as there are numerous impediments of a fiscal and above all political nature.

Fiscal policy and taxation practices in Europe have an impact on the global economy, being closely monitored by the World Bank, the IMF, etc. (Balu et al., 2021).

Some time after the beginning of the pandemic, which for Europe meant a strong economic decline, the European authorities are trying to find customized solutions for each country within the European space in order to obtain a harmonization in terms of overcoming the financial difficulties caused by the economic crisis. The reduction in economic growth was due to the change in most components of the Gross Domestic Product (Mladenovska and Tashevska, 2019).

The report highlighted the various anti-crisis packages, the wide range of policies, fiscal measures adopted by EU governments in response to the crisis. Taken as a whole, the EU is a high-tax area, so the measures considered must coincide with the situation economy of each member country. For 2021, the General Fiscal Report prepared by Eurostat indicated that the sum of taxes and social security contributions for the 27 member states (EU-27) amounted to 39.5% of the weighted average GDP, more than a third above the levels recorded in the United States and Japan.

Regarding future trends, the European Commission forecasts for the coming years EU-27, the overall fiscal ratio will remain well below the pre-crisis level, but governments are generally sleepy to maintain favorable conditions for recovery, to restart economies. However, in the long term, the accumulation of debts by the member states will lead to the solution of the governments to gradually strengthen their own budgets so that tax reductions will be limited (Wahrig, 2012).

Governments must face challenges to ensure recovery, fiscal consolidation, productivity growth and job creation. In this sense, they continue to balance supporting the recovery of the economy based on the timely implementation of anti-crisis economic policies (Blanchard et al., 2021; Popescu et al., 2022).

- *Fiscal coordination*

In the EU, 27 tax systems belonging to the 27 member states co-exist, with important differences between them in terms of fiscal regimes. That is why the different fiscal regimes determine a fiscal competition

through different tax rates with the most diverse consequences on investments and the workforce (Martin et al., 2021).

Fiscal competition can, however, exceed certain limits, a situation that can become harmful by distorting free competition within the single market. Therefore, the objective of the EU is to reduce the level of taxation in order to create a fair and transparent fiscal competition. Fiscal policy must contribute to the achievement of the EU's general objective of making the EU economy the most competitive and dynamic in the world (Carniti et al., 2019). Economic growth is in the center of attention, entire nations continue to see it as an extremely important economic and political objective, the only factor that ensures the economic success of a nation in the long term.

At first sight, we are tempted to limit the definition of economic growth to the growth of the gross national product per inhabitant; but, it is better to characterize economic growth by increasing the standard of living (Bodislav et al., 2021).

In general, there is a consensus on the need for economic growth. Growth theories and models highlight different ways in which the present activity influences the future one and identify the sources that can lead to continuous growth (Jianu et al., 2019). These theories have evolved over time, depending on the dynamics of economic reality and the evolution of economic analysis tools (Bodislav et al., 2020).

Economic growth is a complex process, which targets the economic system as a whole and in its dynamics (Bran et al., 2020) In the issue of the content of economic growth, different opinions have emerged. Economic growth takes place in a certain spatial and temporal framework. By its content, economic growth means a positive, upward evolution of the national economy, but which does not exclude concurrence fluctuations, even temporary economic regressions. The appreciation that a national economy registers an economic growth is based on the existence of the real positive growth trend (Negescu Oancea, et al., 2020).

Conclusions

Sustainable economic growth is supported by an efficient fiscal system that helps the state in continuous levies with a constant improvement in the level of tax efficiency. All the state's income sources must be designed with a safe and correct basis, thus new thresholds of taxation efficiency will be reached which further determine a real economic growth.

Tax cuts can have significant effects on production, investment and employment. However, if it is not followed by spending cuts, especially those on social protection, tax cuts may not be sustainable in the long term. The need to frame tax cuts in overall economic reforms is also important to increase the beneficial effects of shifting the tax burden from labor taxes to other tax bases.

The fiscal system plays an important role in achieving the economic and social objectives of the state. In this sense, the main objectives to be aimed at are: obtaining a high fiscal yield for the taxes collected; carrying out a process of distribution of the collected resources in such a way as to obtain a maximum effect in use; recording a high level of collected revenues (a negative aspect that has accompanied the Romanian economy in the last decades is the reduced capacity to collect owed revenues); compliance with the fundamental principles of any coherent and efficient fiscal system; stabilization of the economy affected by the action of disruptive factors; regulation of production in relation to the existing economic situation, including its modernization and restructuring and the sustainable development of society; combating the phenomenon of tax evasion; thorough substantiation of fiscal measures to avoid negative effects generated by legislative changes not anchored in the realities of the Romanian economy; the formulation of long-term financial policies, which ensure a stability of the business environment; ensuring the neutrality of fiscal measures.

Direct taxation remains an important instrument at the disposal of the state that can stimulate the economic environment through tax quotas, the facilities granted for the purpose of making investments in important fields or stimulating production.

The budget revenues decreased, and the Governments reacted differently by adopting solutions to the existing problems, the austerity measures imposed in each country have as their final goal the savings, the reduction of the total expenses of the state budget. The measures include the reduction of unemployment allowances and other social programs, layoffs in the public sector, reduction of wages, increase of income tax, introduction of new taxes, increase of the VAT rate.

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Globalization and its Impact on Environmental Policies

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Abstract

Purpose/objectives: The present work proposes to present the most important theoretical and practical aspects of globalization, a process that has gained momentum in all areas of socio-economic life. At the same time, between the phenomenon of globalization and ecological policies there is an impact relationship, with mutual requirements and with permanent changes.

Design/methodology: Mix research technique has been used. While qualitative research entails in-depth literature readings and reports, quantitative analysis entails presenting data via graphs and tables.

Findings: As a result of the present research, the link between globalization and sustainable development was found, a concept that leans towards both the ecological dimension and the economic and social one. At the same time, it stands out through various patterns or broad principles existing both nationally and globally.

Originality/value: The article brings added value through the analysis carried out at the European, global and Romanian level and through the interpretation of statistical data related to ecological policy in the context of globalization.

Possible practical implications: The implications can be either practical or theoretical. The first is the direct impact of your findings on related practices, while the second is the impact on the theories we have chosen in the present study. In this sense, this article could represent a first step in the statistical dimension or the development of future ecological policies, taking into account all the listed principles.

Keywords

Ecology, environment, globalization, sustainable development.

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Introduction

In the view of international economic bodies, economic growth will have to start from the principle of localization, through which the development and economic ascent of provinces, cities, rural communes is pursued (Huang et al., 2022). Thus, in the process of accelerated globalization of the world economy, emphasis will be placed on the improvement of communications, transport and the dismantling of trade barriers that make the world smaller (Burlacu, Crețu et al., 2022). This phenomenon has two sides:

- A wider participation of local populations in the field of politics and economic decisions;
- A wider process of decentralization and increase of local autonomy through which a certain socio-economic, cultural identity is recognized.

Globalization offers both risks and benefits:

- Expanding the markets, developing the technique;
- Increasing productivity, improving the standard of living;
- It also creates the fear of job cuts, through the import of products;
- Financial instability determined by the penetration of inconstant flows of foreign capital;
- Threats related to environmental pollution problems.

The phenomenon of globalization has its own forms of manifestation that directly influence especially the countries undergoing economic development (Rudolph and Figge, 2017). The way in which the countries will manage to optimize the two previously mentioned elements will determine their economic ascent (Radulescu et al., 2020). The world is getting smaller, but more complicated. Three elements hold weight in the globalization process- trade, financial flows, environmental issues (Sarbu et al., 2021). Later, each state, depending on its own pollution problems, created its own environmental protection and conservation policy, in accordance with international treaties and requirements (Alola et al., 2021).

1. Review of the scientific literature

A very important aspect is related to the transition from traditional economic issues to paying maximum attention to aspects related to health, well-being, education, social and professional achievement opportunities (Rahman, 2020):

- The elements of the globalization of ecotourism are marked by:
- Identification of all natural and human resources with tourist values;
- Sustainable exploitation of tourist resources;
- Limitation of overconsumption and losses;
- Preservation of biodiversity and cultural identity;
- Integration of the tourism industry in the economic planning process;
- Involvement of local populations;
- Consultation of specialists and the population for investments of major interest;
- Training and improvement of personnel employed in tourism;
- Tourism marketing adequate to the environmental protection requirements;
- Many forms of pollution - air, water - have exceeded the borders of the states, already acting on a continental and global level.

As a result, the term globalization of ecology began to be used more and more often due to the fact that the processes of formation and circulation of some vital substances- water, oxygen, nitrogen - take place at the level of the entire planet (Ahmed et al., 2019).

The process of eco-globalization of pollution phenomena leads to the evaluation of human activities within each state (Nathaniel et al., 2021). Monitoring and actions to reduce pollution are primarily based on the determination of all sources, large or small, that produce pollution (Shahbaz et al., 2018). These concerns were debated in a multitude of international manifestations (Profiroiu et al., 2020), which later materialized through a series of treaties and agreements, where the strengths were given by the establishment of norms and regulations respected by the contracting parties (Bran et al., 2020).

Later, each state, depending on its own pollution problems, created its own environmental protection and conservation policy, in accordance with international treaties and requirements (Alola et al., 2021). At the base of the mechanisms of coercion in respect of the quality of the environment will be the exploitation taxes of some natural resources and those of pollution and the facilities for those who subscribe to the norms of exploitation and valorization of resources and the use of ecological technologies (Burlacu et al., 2022)..

The process of eco-globalization of services and products implies the adaptation of a certain type of ecological policy, which may present small differences depending on the specifics and structure of the

services and products produced. In essence, the ecological policy focuses on certain components that refer to (Burlacu et al., 2018):

- Human behavior through which people must accept the idea that they have a great responsibility towards the environment, towards consumers;
- Plan of objectives and concrete tasks through which any company can take into account the solution of environmental problems;
- The application of technological procedures to avoid losses, to allow maximum efficiency with very reduced pollution processes;
- The use of resources from research and development, to increase the quality of products and services offered to be compatible with the requirements of the environment;
- Ensuring attractive, safe, healthy workplaces that favor productivity and work efficiency;
- Development of less polluting transport systems with equipment that can use alternative sources;
- Realizing an open communication regarding the company's problems with employees and information on the services offered to the client, ensuring compliance with safety, quality and environmental protection;
- Collaboration with local communities in order to be able to develop joint actions and to jointly ensure the protection and preservation of the environment;
- Ensuring good relations with the mass media and society as a whole in order to publicize the performances obtained in the field of application of procedures and solutions to reduce pollution phenomena;
- Staff training, regardless of their position, to be responsible and aware of environmental issues.

2. Research methodology

This paper starts from the hypothesis of the influence of globalization on corporate governance, but also on ecological policies. The article was based on specialized literature studies and the identification of recent data on certain statistical indicators. Last but not least, the comparison method was used regarding the structure of tourist accommodation in each development region of Romania.

The descriptive research project of this study is defined as a research study that describes the characteristics of the economic activities and the ecological dimension that are studied.

3. Results and discussion

The experience of many countries of the world has shown that, in the long term, a planned approach to tourism development can bring benefits and satisfy different categories of tourists (Ansari et al., 2022). Those countries that have not developed a tourism activity based on planning are often affected by social and ecological problems and cannot, practically, compete with the planned tourist destinations of the world. However, these can be "redeveloped" over time, based on a planned approach and financial investments (Imran et al., 2014).

For those countries that are already developed from a tourism point of view, planning is often necessary to revitalize this sector and maintain its viability in the future. Planning aims to solve some problems faced by almost all the countries of the world, namely (Asif et al., 2020):

- establishing the population;
- reducing dependence on oil;
- development of renewable energy resources;
- soil conservation;
- protecting the earth's biological systems;
- recycling of materials.

These aspects also target tourism by the fact that they directly influence natural and cultural resources, on multiple action plans.

- ***Nationally***

Tourism must be planned at the national level. At this level, planning takes into account: tourism development policies, plan structure, service levels, institutional factors and all other elements necessary for the development and management of tourism activity (Dima et al., 2020).

Within the development program at the national level, more detailed plans must be made for the development of the resorts' tourist attractions, for the development of rural tourism and other forms of tourism. In the transition stage of Romania to the market economy, tourism must be rethought from the perspective of planning (Bran et al., 2020).

The coordinates of a national level planning refer to (Sarbu et al., 2020):

- Establishing all the policies and objectives of tourist development: determining the main tourist objective that must be fulfilled as well as the way in which all other objectives can be achieved;
- The sustainable development of tourism, so that its natural and cultural resources are protected and conserved over time;
- The integration of tourism into the general development models of countries and regions, as well as the establishment of a closed circuit between tourists and other economic sectors;
- Creation of a "rational" basis for making tourism development decisions, both from the public and private sectors;
- Realization of a coordinated development of all elements of the tourist sector: tourist attractions, equipment and services related to tourist activity;
- Optimizing and balancing the economic, ecological and social advantages of tourism, with an equal distribution of these advantages for society;
- Establishing guidelines and standards for the thorough preparation of tourism development plans specific to each area;

Statistically, the number of accommodation units in the Development Regions of Romania is presented in table 1.

Table no. 1. Tourist accommodation capacity

Region/Year	2015	2016	2017	2018	2019	2020	2021
NV Region	33848	37792	40192	42250	43300	44800	45035
Center Region	67496	71038	74234	75900	76100	76780	77220
NE Region	28763	31170	33310	34090	34980	35010	35880
SE Region	98769	98070	98115	98220	98335	98660	99050
South-Muntenia Region	30347	31529	32629	33100	33990	34250	34950
Bucharest-Ilfov Region	22242	22956	23240	24167	24890	25100	25800
SV Oltenia Region	19190	21000	22550	23090	24100	24900	25200
West Region	28233	30165	32090	33980	34090	34667	35067

Source: INS, 2021

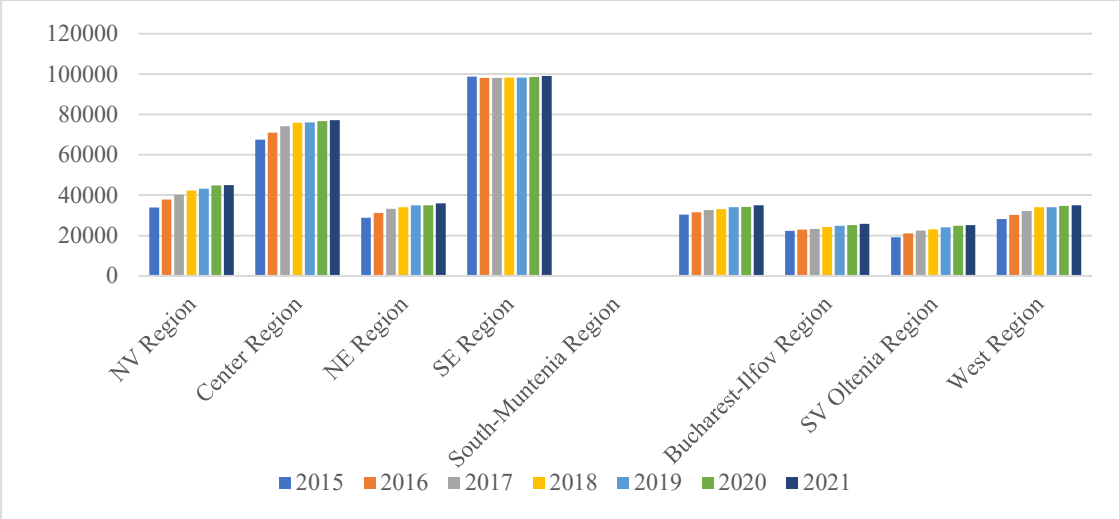


Figure no. 1. Romania's tourist accommodation capacities
Source: Own processing according to INS data from table 1

- ***Planning for sustainable development***

The concept of sustainable development gained international importance since the beginning of the 80s, although tourism planning before this period took into account the problem of protecting tourism resources (Alpopi et al., 2022). The three areas on which the sustainable development planning process is manifested are:

- Economic, by which the increase in the degree of exploitation and capitalization of resources;
- Ecological, by avoiding environmental degradation;
- Socially, by: increasing the number of jobs, practicing some traditional jobs, attracting the population to practice tourism- as a measure of physical and mental regeneration of this

The process of tourism reform in Romania will have to create the necessary framework for a sustainable development in this field. At present, the acceptance of the concept of sustainable development of Romanian tourism does not encounter substantive obstacles (Burlacu, Pargaru et al., 2022). The difficulty lies in specifying the operational elements, adapted to the current transition period (Calin et al., 2022). The strategy of planning a sustainable tourism involves:

- Conservation of natural and anthropic tourism resources, for the purpose of continuous use in the future;
- Increasing the standard of living of local communities;
- Better knowledge and awareness by the local population and visitors of the idea of conservation, etc.

Tourists are increasingly attracted to areas that offer a high level of environmental quality, picturesque, clean and unpolluted places. That is why the achievement of a sustainable development must be pursued through the method of environmental planning (Khan et al., 2021).

Ecological planning requires that all environmental elements be supervised and analyzed to determine the most appropriate models of development and territorial planning. For example, based on this method, intensive development in floodplains and steep hilly areas will not be allowed (Rasekhi et al., 2016).

In the context of the application of environmental planning systems, the following principles must be taken into account:

a) the principle of precaution in decision-making;

b) the principle of preventing ecological risks (the production of negative effects on the environment) and the production of damages;

c) the principle of preserving biodiversity (diversity within species, between species and between ecosystems) and ecosystems specific to the natural biogeographic framework (ecosystem in the sense of

the law = dynamic complex of communities of plants, animals and microorganisms and the non-living environment, which interact in a functional unit);

d) the "polluter pays" principle;

e) priority removal of pollutants (any substance or form of energy that, introduced into the environment, changes the balance of its constituents and living organisms and causes damage to material goods) that directly and seriously endangers people's health;

f) the creation of the national integrated environmental monitoring system (surveillance, forecasting, warning and intervention that takes into account the systematic evaluation of the dynamics of the qualitative characteristics of the environmental factors, followed by the necessary measures);

g) sustainable use of all existing resources;

h) creation of a framework for the participation of non-governmental organizations and the population in their development and application;

i) the development of international collaboration to ensure environmental protection.

Sustainable planning also requires a local approach to tourism activity (Mogos et al., 2021). This refers to the involvement of the community in the planning and development process (Profiroiu et al., 2020), as well as to the creation and development of forms of tourism that generate benefits for the locals (Radulescu et al., 2020).

By maximizing the advantages for the residents, they will be more and more interested in supporting a touristic development of the respective area, also aiming to preserve the local touristic resources (Bodislav et al., 2020). These advantages, which are also reflected at the national level, translate into:

- additional income in convertible currency;
- creation of new jobs;
- more efficient protection and preservation of the environment

Sustainable planning determines the achievement of quality tourism (Dima et al., 2020). Quality tourism does not necessarily mean expensive tourism. It has certain objectives in mind, namely:

- attractions and tourist services whose value corresponds to a high quality;
- protecting tourist resources;
- attracting those tourists who will protect the environment.

The responsibility of achieving quality tourism must fall to both the public and the private sector, the concept requiring to be introduced within the general plan of tourism development and organization. In developed countries, tourism planning is done by local authorities, with the involvement of the public.

Residents have the role of supporting the tourism planning process, of coming up with new ideas regarding local tourism development. The tourism planning method is usually carried out "from the bottom up" and involves the meeting of local community representatives in order to establish the model of sustainable tourism development that they would appreciate the most, and the local objectives are subsequently included in the regional or national plan.

This method achieves a greater involvement of local people in the planning process, but requires a longer period of time. It can lead to contradictory objectives, policies and recommendations, which must be resolved at the national level.

Conclusions

In the conditions of a state of normality, resulting from the two characteristics of economic life - decentralization and the market economy - the new ecological association and tourism comes to emphasize one of the most important desires of the generations at the transition of centuries and millennia: the protection of the environment within the areas included in the national and world tourist circuit.

At the planetary level, more and more governmental and non-governmental bodies, large or small companies - approach the activity they carry out through an ecological prism.

Moreover, within the tourism activity, the leaders resort to ecological management tools and methods in their daily activities. This, as ecotourism represents a travel experience that sheds light on nature and contributes to the preservation of ecosystems, respecting the integrity of the host communities.

The ecosystem is considered by a good part of the practitioners (especially on the North American continent) as a form of sustainable tourism that can ensure the adequate utilization of tourist resources and the development of some tourist areas, while preserving their ecological integrity.

Taking into account what was presented, as well as the ever-increasing trend of returning to nature, we are trying to raise awareness and direct the future of people - more or less young - towards: a possible source of sustainable income- recyclable-renewable; a decent existence and, not ultimately, towards a civilized business.

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Innovative Enterprises in Europe – a Country Cluster Analysis using R Shiny

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Abstract

For EU countries, keeping and growing innovative business is vital in order to be globally competitive. Innovation in enterprises, as a cornerstone for future production, is of great significance for all countries depending more and more on services. Due to the way innovation is understood within enterprises, such process no longer is bound to single entity. It easily exceeds the sphere of one organisation rapidly evolving to an ecosystem of many actors and 3rd party suppliers and different shareholders across different countries. All these aspects reveal the link between business development, effective created value for the customers and the potential to innovate. The role of information technology both from operational perspective and in the development of innovative potential and new products is currently acknowledged both by enterprises and by small start-up companies. In such context, Eurostat introduced a new tool, "Innovation profiles", to monitor enterprise innovation level.

Thus, our paper explores such data analysing the similarities between 17 European countries. The source is Eurostat and latest data available from 2020, is used. The results of the Cluster Analysis performed in R Shiny app are obtained employing Pearson Correlation coefficient, measuring the Squared Euclidian distance, and the Ward linkage method. Positive moderate to low correlation is obtained in terms of innovation for the three obtained clusters, emphasizing the link between Romania, Poland, and Bulgaria.

Keywords

Cluster analysis, R Shiny app, Innovative enterprises, Romania.

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Introduction

The term "innovation" originates from the Latin noun *innovates* and has its basic interpretation sourced to the work of Schumpeter (1934) acknowledging it to "new combinations" of knowledge, resources, and other factors. Most of what is seen today in the field of innovation is the rooted work across generations starting in the industrial revolution moving forward to the age of information technology. Recent advances in the field see the innovation relying on scientific effort, technology modernization and social development with responsible innovation benefiting of anticipation, reflexivity, inclusion and responsiveness (Stilgoe et al., 2013).

Innovation is widely acknowledged as the main process which drives economic growth and offers sustainable competitivity leverages for both enterprises and countries. In such terms it stimulates continuous economic growth in developed countries and improves competitiveness in developing countries (Audretsch et al., 2017). At the enterprise level the process of innovation aims to develop innovative technologies based on the results of research and development, scientific and technical advances. Furthermore, Wu (2021) highlights the link between education and enterprise innovation as well as their favoring effect on employment.

As a consequence of the utmost importance of monitoring innovation, Eurostat has developed the "Innovation profiles", a new tool for assessing innovation in the business sector at the European level. It provides insights on the innovation style at enterprise level for each country (Eurostat 2023). Our paper aims to explore similarities between countries considering these new data together with variables concerning innovative business strategies.

1. Review of the scientific literature

Recent advances in the field of innovation from European researchers discussed topics on social innovation (Nicholls and Murdock, 2012), public innovation (Swann, 2014), design-driven innovation (Verganti, 2009) and responsible innovation (Stilgoe et al., 2013), and focus more on the aspects of integrating technological innovation with the social and humanitarian value attributes. Goel and Nelson, (2021) analyse the impact of innovation and Research and development on employment for 127 countries highlighting a positive effect on job creation both for foreign and government owned enterprises.

One may also find a broad scientific literature exploring innovation in enterprises in various contexts. For example, Ionescu et al. (2020) analyse the potential for innovation and entrepreneurship in the EU using a hierarchical cluster analysis and variables such as the Global Innovation Index, the Global Entrepreneurship Index as well as other variables characterising the economic environment. Scutariu et al (2021) focus on e-commerce enterprises in the context of the COVID for 31 countries. Szabo and Herman analyse the productive entrepreneurship in the EU by performing a cluster analysis using several variables including the Summary Innovation Index. Hollenstein (2003) focusses on the innovation modes in the Swiss service sector though the integration of innovation indicators as well as other variables on a firms' activity in a cluster analysis. Laureti et al. (2022) performed a cluster analysis with the k-Means algorithm and Silhouette Coefficient found four clusters among the European countries with a clear division between the Center-Northern countries, that have the higher levels of employment in innovative enterprises compared to the Southern-Eastern counterpart countries.

2. Research Methodology

For the purpose of this paper data on innovative enterprises for 2020 (latest available year) was downloaded from Eurostat. Then, 7 variables representing the share of enterprises by innovative profile in the total number enterprises, regardless of class size (NACE Rev 2 activity: Innovation core activities) have been considered for further analysis as follows:

- V1. The share of enterprises that have developed product innovations themselves, with market novelties (profile I) in the total number enterprises
- V2. The share of enterprises that have developed product innovations themselves, without market novelties (profile II) in the total number enterprises
- V3. The share of enterprises that have developed business process innovations themselves, without product innovation (profile III) in the total number enterprises
- V4. The share of enterprises that have introduced but not themselves developed innovations (profile IV) in the total number enterprises
- V5. The share of enterprises that have innovation activities but not introduced any innovation (ongoing or abandoned innovation activities) (profile V) in the total number enterprises
- V6. The share of enterprises that have no innovation activities but potential to innovate (profile VI) in the total number enterprises
- V7. The share of enterprises that have no innovation activities and no potential to innovate (profile VII) in the total number enterprises.

Also, 6 other variables regarding the business strategy applied by the enterprises were selected (the respective strategy is considered of a high importance):

- V8. Share of innovative enterprises with focus on improving existing goods or services in the total number of innovative enterprises

● V9. Share of innovative enterprises with focus on introducing entirely new goods or services in the total number of innovative enterprises

● V10. Share of innovative enterprises with focus on reaching out to new customer groups in the total number of innovative enterprises

● V11. Share of innovative enterprises with focus on customer specific solution in the total number of innovative enterprises

● V12. Share of innovative enterprises with focus on low-price in the total number of innovative enterprises

● V13. Share of innovative enterprises with focus on high quality in the total number of innovative enterprises

Due to the availability of the data, 17 countries were included in the analysis are: Bulgaria, Czechia, Germany, Estonia, Greece, Spain, Italy, Latvia, Lithuania, Hungary, Malta, Poland, Portugal, Romania Slovakia, Sweden and Türkiye. In order to address the research objective, a cluster analysis is performed.

In order to compute the cluster analysis, the Cluster Analysis R Shiny app developed by Mizumoto (2015) was used. As all variables are interval-ratio type, the Pearson Correlation coefficient as computed in order to analyse the extent the chosen variables are related. In order to group countries into clusters, variables were standardised and the Squared Euclidean distance measure was employed as this measure accounts best for outliers so that countries are grouped mainly due to similarities (Sørensen and Puigvert Gutiérrez, 2006). Also, the Ward linkage method was used as it is the appropriate for quantitative variables (The Pennsylvania State University, 2023) and it is widely used in other similar scientific papers (see for example Pelau and Chinie, 2018; Scutariu et al, 2021).

3. Results

The paper Figure 1 shows the correlation coefficients and the scatter-plot matrices between the selected variables. Most of the variables are relatively low or moderate correlated.

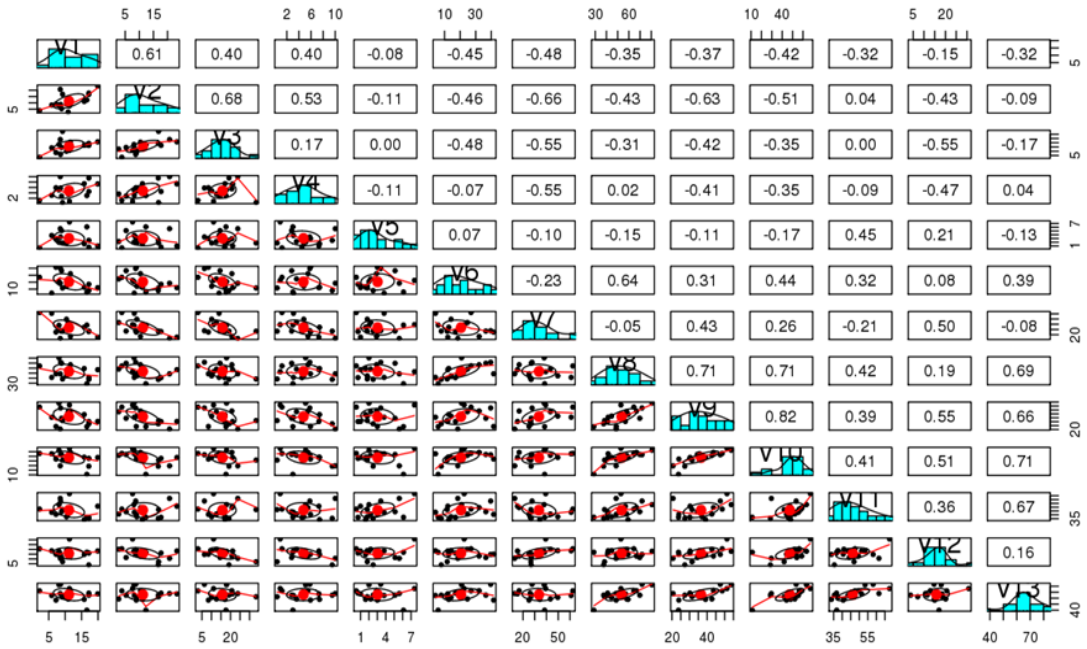


Figure no. 1. Scatter-plot matrices and correlation coefficients between the selected variables
Source: Designed by the authors using the Cluster analysis R Shiny app: Mizumoto, A. (2015). Langtest (Version 1.0) [Web application]. Retrieved from http://langtest.jp

Figure 2 shows the clusters that emerged based on the analysis: cluster 1 (Romania, Poland, Bulgaria and Latvia); cluster 2 (Italy, Sweden, Greece, Czechia, Lithuania, Germany and Estonia); cluster 3 (Hungary,

Malta, Spain, Portugal and Slovakia). Turkey was not included in any cluster, although it is close to the first one.

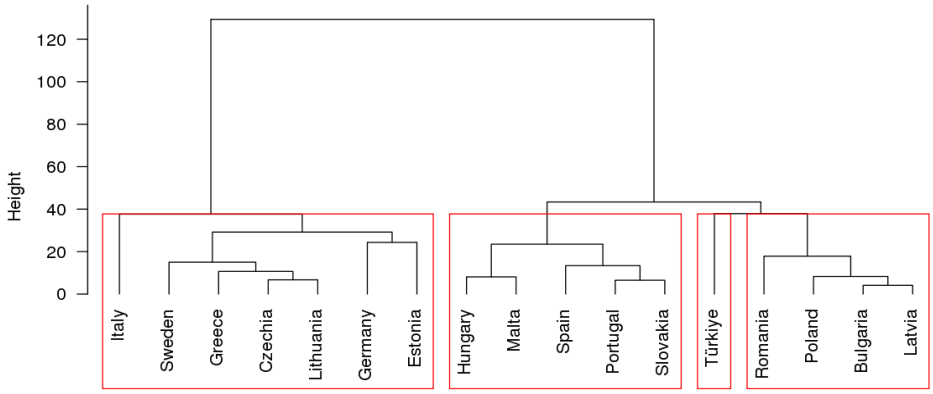


Figure no. 2. Cluster dendrogram

Source: Designed by the authors using the Cluster analysis R Shiny app: Mizumoto, A. (2015). Langtest (Version 1.0) [Web application]. Retrieved from http://langtest.jp

Descriptive statistics for variables in each cluster are included in the Table no. 1, while figure 3 displays a profile for each group. Countries in cluster 1 are characterised by low values for variables V1 to V6 and high values for V7. Countries in cluster 2 present high values for variables V1 to V3 and low values of the rest of the variables. Cluster 3 has a profile approximately symmetric to the profile of cluster 2. Turkey has high values for variables V5, and V9 to V13 and low for the rest.

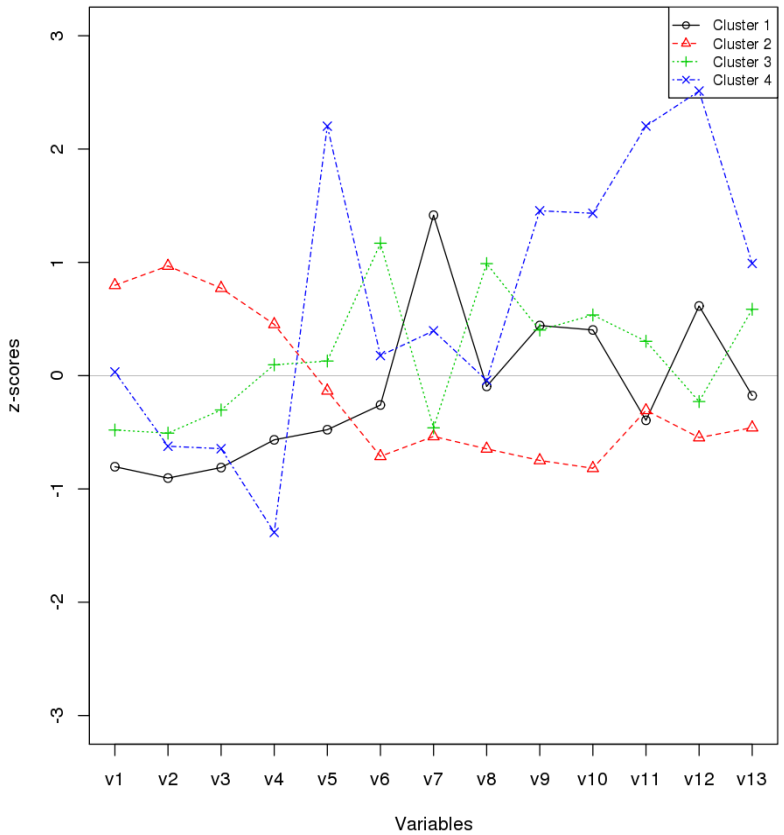


Figure no. 3. Profile plot

Source: Designed by the authors using the Cluster analysis R Shiny app: Mizumoto, A. (2015). Langtest (Version 1.0) [Web application]. Retrieved from http://langtest.jp

Table no. 1. Basic statistics of each cluster

```
Descriptive statistics by group
group: 1
    vars n  mean    sd median trimmed   mad  min  max range  skew kurtosis   se
v1     1 4  7.35  4.10   8.15    7.35  3.71  2.2 10.9   8.7 -0.24    -2.16 2.05
v2     2 4  5.95  3.17   6.00    5.95  3.93  2.7  9.1   6.4 -0.01    -2.36 1.59
v3     3 4  9.90  4.94  11.35    9.90  2.89  2.9 14.0  11.1 -0.53    -1.85 2.47
v4     4 4  3.17  1.50   3.35    3.17  1.26  1.2  4.8   3.6 -0.25    -1.90 0.75
v5     5 4  2.08  1.36   2.00    2.08  1.26  0.5  3.8   3.3  0.12    -1.90 0.68
v6     6 4 17.52 10.49  19.45   17.52  9.49  4.2 27.0  22.8 -0.26    -2.12 5.24
v7     7 4 54.08  9.19  55.30   54.08  9.49 43.3 62.4  19.1 -0.14    -2.26 4.60
v8     8 4 52.15 10.89  51.35   52.15 12.31 41.5 64.4  22.9  0.08    -2.29 5.45
v9     9 4 41.03  5.89  39.90   41.03  5.19 35.7 48.6  12.9  0.28    -2.10 2.94
v10   10 4 52.88  3.96  53.80   52.88  3.11 47.6 56.3   8.7 -0.36    -2.02 1.98
v11   11 4 42.33  4.19  42.15   42.33  4.30 37.5 47.5  10.0  0.08    -1.98 2.10
v12   12 4 19.48  1.03  19.40   19.48  1.19 18.5 20.6   2.1  0.06    -2.34 0.52
v13   13 4 64.15  5.87  62.85   64.15  4.30 58.7 72.2  13.5  0.41    -1.91 2.93
------------------------------------------------------------
group: 2
    vars n  mean    sd median trimmed   mad  min  max range  skew kurtosis   se
v1     1 7 14.91  4.33   16.6   14.91  1.19  8.5 19.9  11.4 -0.52    -1.61 1.64
v2     2 7 16.94  4.30   16.8   16.94  5.78 11.1 23.3  12.2  0.02    -1.55 1.62
v3     3 7 21.30  5.89   19.2   21.30  3.11 16.9 33.4  16.5  1.10    -0.34 2.22
v4     4 7  6.01  3.52    7.3    6.01  4.00  0.4 10.0   9.6 -0.32    -1.62 1.33
v5     5 7  2.76  2.19    1.8    2.76  1.19  0.7  6.1   5.4  0.59    -1.64 0.83
v6     6 7 12.26  4.50   12.1   12.26  6.23  5.9 18.5  12.6  0.02    -1.60 1.70
v7     7 7 25.80  9.22   26.7   25.80 11.27 12.9 38.4  25.5 -0.13    -1.61 3.48
v8     8 7 44.34 11.05   41.1   44.34 11.12 28.8 59.2  30.4  0.11    -1.70 4.17
v9     9 7 28.94  5.95   30.2   28.94  4.30 20.6 39.1  18.5  0.23    -1.14 2.25
v10   10 7 36.01 13.66   41.8   36.01  9.19 11.1 48.0  36.9 -0.66    -1.20 5.16
v11   11 7 43.19 10.40   36.8   43.19  4.60 33.7 61.5  27.8  0.62    -1.38 3.93
v12   12 7 12.54  5.48   14.7   12.54  5.34  3.8 18.3  14.5 -0.43    -1.67 2.07
v13   13 7 61.26 10.10   65.0   61.26  4.15 39.9 68.4  28.5 -1.23    -0.06 3.82
------------------------------------------------------------
group: 3
    vars n  mean    sd median trimmed   mad  min  max range  skew kurtosis   se
v1     1 5  8.88  1.65    8.6    8.88  0.74  7.2 11.6   4.4  0.66    -1.30 0.74
v2     2 5  8.28  1.87    8.7    8.28  0.89  5.3 10.4   5.1 -0.51    -1.37 0.84
v3     3 5 13.56  6.12   14.5   13.56  9.04  6.3 20.7  14.4 -0.06    -2.08 2.74
v4     4 5  5.02  1.28    5.5    5.02  0.59  2.8  5.9   3.1 -0.92    -1.11 0.57
v5     5 5  3.28  1.14    3.0    3.28  0.59  2.0  5.1   3.1  0.52    -1.37 0.51
v6     6 5 34.14  8.19   36.5   34.14  6.38 20.9 41.5  20.6 -0.64    -1.47 3.66
v7     7 5 26.90  7.60   27.0   26.90  2.82 16.7 38.0  21.3  0.14    -1.44 3.40
v8     8 5 67.50 11.70   69.7   67.50  4.30 48.7 80.6  31.9 -0.54    -1.35 5.23
v9     9 5 40.62 11.68   43.6   40.62 13.64 23.9 53.7  29.8 -0.29    -1.80 5.22
v10   10 5 54.70  7.15   54.0   54.70  6.97 44.1 63.3  19.2 -0.27    -1.60 3.20
v11   11 5 49.14  7.02   49.5   49.14  8.01 40.6 58.1  17.5  0.03    -1.95 3.14
v12   12 5 14.44  2.44   14.7   14.44  2.52 11.5 18.0   6.5  0.23    -1.64 1.09
v13   13 5 71.96 11.31   72.5   71.96 14.53 56.8 83.2  26.4 -0.18    -1.99 5.06
------------------------------------------------------------
group: 4
    vars n mean sd median trimmed mad  min  max range skew kurtosis se
v1     1 1 11.3 NA   11.3    11.3   0 11.3 11.3     0   NA       NA NA
v2     2 1  7.6 NA    7.6     7.6   0  7.6  7.6     0   NA       NA NA
v3     3 1 11.1 NA   11.1    11.1   0 11.1 11.1     0   NA       NA NA
v4     4 1  0.9 NA    0.9     0.9   0  0.9  0.9     0   NA       NA NA
v5     5 1  7.4 NA    7.4     7.4   0  7.4  7.4     0   NA       NA NA
v6     6 1 22.6 NA   22.6    22.6   0 22.6 22.6     0   NA       NA NA
v7     7 1 39.3 NA   39.3    39.3   0 39.3 39.3     0   NA       NA NA
v8     8 1 52.9 NA   52.9    52.9   0 52.9 52.9     0   NA       NA NA
v9     9 1 51.3 NA   51.3    51.3   0 51.3 51.3     0   NA       NA NA
v10   10 1 67.1 NA   67.1    67.1   0 67.1 67.1     0   NA       NA NA
v11   11 1 67.7 NA   67.7    67.7   0 67.7 67.7     0   NA       NA NA
v12   12 1 30.8 NA   30.8    30.8   0 30.8 30.8     0   NA       NA NA
v13   13 1 76.1 NA   76.1    76.1   0 76.1 76.1     0   NA       NA NA
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Source: Designed by the authors

Based on the presented data in Table 1, with basic statistics of each cluster we find that the countries belonging to each cluster in 1st, 2nd, 3rd, and 4th have different mean values. Thus, the average values for variables V1 to V5 get larger from cluster 1 to 4, while for variables V11 to V13 the average value increase from 2nd to 4th cluster. In respect to variables V8 to V10 average values from the descriptive statistics indicate an increase from the 2nd to the 1st followed by the 4th cluster. This means that the 4 clusters show ordering effect depending on the inspected variables.

Conclusions

Innovation is widely acknowledged as the main process which drives economic growth and offers sustainable competitivity leverages for both enterprises and countries. For European countries, keeping and growing innovative business is vital to be globally competitive.

Analysing the data made available by Eurostat on Innovation core activities on the share of enterprises by the innovative profile in the total figures as well on the business strategies applied by the enterprises, our results highlight a positive low to moderate correlation for three clusters.

The results of the Cluster Analysis performed in R Shiny app are obtained employing Pearson Correlation coefficient, measuring the Squared Euclidian distance, and the Ward linkage method. Countries in the first cluster (Romania, Poland, Bulgaria and Latvia) are characterised by low values for V1 to V6 and high values for V7. For these countries in the first cluster this corresponds to having an economic profile which reveals an unexplored capacity and low figures of enterprises with innovation activities and with potential to innovate. Thus, more efforts are needed to increase the total share of innovative enterprises and their potential to innovate with a key focus on the areas where self-innovation with or without market novelties as well as with innovative business development.

The second cluster of countries (Italy, Sweden, Greece, Czechia, Lithuania, Germany and Estonia) resemble high values for variables V1 to V3 and low values for the rest, while the third (Hungary, Malta, Spain, Portugal and Slovakia) shares profile similarities with it. Such aspect for the countries in the second cluster is reflected in high values for the share of enterprises that have developed product innovations themselves, "with or without market novelties (profile I and profile II) in the total number enterprises" as well as in the share of enterprises that have developed business process innovations themselves, without product innovation (profile III) in the total number enterprises and with low values for the remaining variables.

Out of all countries analysed Turkey is placed in an individual cluster as it has high values for V5 and V9 to V13 and low for the rest.

Although economic advances are obtained regionally, challenges still persist when looking into the progress of innovation across countries moreover in the context of paradigms raised by the Sustainable Development Goals (SDGs) to mobilize efforts to end all forms of poverty, inequality and tackle climate change while ensuring no one is left behind.

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Sustainability in Higher Education

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Abstract

The educational approach to sustainability represents a concern initiated more than two decades ago and aims to form that mentality that ensures the understanding of values and motivations to act for this purpose now and in the future. In academic education, it is also important for students to understand and be aware of the concept of a sustainable university. The current work is based on documentary research and aims, on the one hand, to analyze the role of university education, especially the economic one, in the formation of a behavior that supports ensuring sustainability in their future activities, and on the other hand, to highlight the steps taken in this regard by the university education units at national or international level. In this sense, the concerns of some international organizations for supporting education for sustainable development (ESD),a lifelong learning process, part of quality education are also presented. In conclusion, the efforts of different actors must be continued in order to develop in universities all over the world educational programs to sustain a sustainable lifestyles and to promote methodological and pedagogical tools to be used.

Keywords

Sustainability, education, approach, development

DOI: 10.24818/BASIQ/2023/09/035

Introduction

The issue of sustainability is currently particularly topical in all fields of activity, being an integral part of our everyday life that ensures our present and future. Concerns regarding sustainability started from the fact that natural resources are limited and that our role is to protect them, to ensure that they are sufficient both now and in the future and are based on three pillars, namely: environmental protection, social development and economic development. Thus, in 2015 the United Nations established for important business areas to include the Sustainable Development Goals (SDGs), what made the circular economy develop strongly in 2018. (Purcell, 2021)

Education for Sustainable Development (ESD) is a process of lifelong learning and quality assurance of education. Its purpose is the improvement of the cognitive, social and behavioral milestones of the educational process and aims at contents and results, pedagogical methods and the training environment (Zaleniene and Pereira, 2021).

The idea of this paper was generated by the perception that higher education everywhere has not yet reached its maximum potential impact for a sustainable future.The problem analyzed is not realy new, but we are currently discussing new trends and challenges.

In this context, the studied aspects demonstrate the need and recommend the development of institutional communication regarding sustainability, including the promotion of values, mission and vision in the higher education institutional strategic options, given that even the job of sustainability consultant appeared on the labor market. It is otherwise obvious that economic universities have a particularly important role, but at the same time any higher education unit must have concerns and demonstrate that it acts as a sustainable entity. Most universities that have concerns regarding sustainability are simultaneously concerned with the application of these approaches at the campus level, regarding the minimization of waste, energy

consumption, protecting the natural space, etc. They aim to become a model of sustainability to influence the behaviors of staff, students and local communities (Kohl et al., 2022).

1. The context

Sustainable education is an educational approach that pursues education in the spirit of respect for the environment and the quality of life in general, thus ensuring both the present and the future of a sustainable lifestyle. With 17 goals and 169 targets, the United Nations' Sustainable Development Goals (SDGs) represent a strategically important mission for higher education worldwide. Higher education thus has a crucial role in supporting transformations towards a sustainable existence.

UNESCO encourages innovative approaches and enhances non-formal education programs through media, networking and partnerships (UNESCO, 2017).

The role of pro-sustainability education is undoubtedly to raise awareness through training of the impact of environmental challenges, issues of justice and social responsibility. These aspects must be communicated and debated in the classrooms. The specialized literature states that in the current economic-social context, the issue of sustainability provokes and stimulates strategies, structures, as well as practices in many sectors, including higher education (Tilbury, 2011).

In 2021, Dr. Wendy M. Purcell (Purcell, 2021), from Harvard University,-considered that higher education institutions play a critical role in fulfilment of the goals and can do more to connect their work with the communities they serve and help create a more sustainable future.

The role of university education in this context is to gather on a common platform of dialogue participants in sustainable development, be they students or professionals in a certain field of activity.

The issue of sustainability now represents a major urgency for the development of society worldwide. Along with all other institutions from other fields of activity, universities are also faced with major challenges in this regard. Moreover, the responsibility of higher education institutions is directed towards the provision of theoretical, conceptual, methodological, formative information to contribute to ensuring that sustainability is properly understood and monitored (Vogt and Weber, 2020).

This approach aims to promote sustainable university development. But in order to achieve this desired, a global vision of the entire university institution is necessary, which includes both the basic areas of teaching regarding education for sustainable development as well as research activity and university management. Otherwise, ensuring sustainability should be seen as an interdisciplinary topic, which should also aim at the sustainable development of universities. Thus, the transformation of a university's strategies towards sustainable development requires a rethinking of its activities to support the building of a sustainable future.

The commitment of a higher education institution in terms of social responsibility also involves the involvement of interested parties and the definition of objectives and strategies within the framework of community-university partnerships. Thus, the orientation towards sustainability is associated with the reputation and the monitoring of the results, under the conditions of increasing the quality of the educational act (Figure 1).

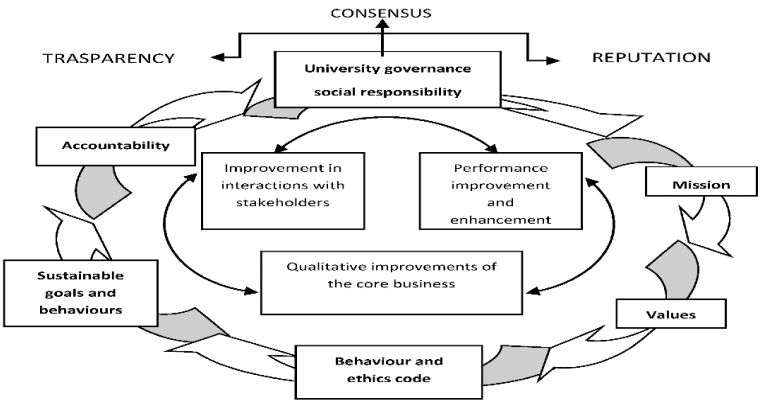


Figure no.1. The virtuous cycle of sustainable development in universities
Source: Sustainability 2017, 9(6), 914; MDPI Open Access Article

At the same time, the universities must be aware of the students' perception of the sustainability of the universities they study in and which train them as future responsible for sustainable development. There are studies that show that in this sense, universities everywhere have understood the need to build a sustainable mentality for their graduates (Popescu et al., 2020).

2. Research methodology

The study is based on fundamental research and aims to highlight new aspects of the essence of university education in the field of sustainable economic development, in correlation with the requirements of stakeholders and the challenges registered at the international level. The approach chosen in writing this paper is basically an analysis and an overview as well in what concerns the role of higher education institutions in starting and supporting actions at the level of communities in order to ensure a sustainable development for present and future.

The present work consists in a documentary exploration in order to highlight the role of the university in disseminating a culture of sustainability and affirming responsible behaviors as an indispensable ethical condition but also an opportunity to improve its image and the quality of the educational act. The broad thematic scope of the work justifies the need to study a wide base of information. That is why we approached the exploratory analysis of specialized literature and the collection of data from the review of official websites, reports, publications and related works of the universities and organizations involved in the formative approach of education for sustainability.

The research also considered the evolution of concerns for sustainability in higher education from the initial approaches to the ONU appeals.

3.Findings

Over time, higher education has demonstrated a strong commitment to moving towards sustainable development with concerns that have gone beyond just teaching itself (Kohl et al., 2022).

In 1980, Mrs. Gro Harlem Brundtland, Prime Minister of Norway, defined sustainability as a means of ensuring that present needs are met without affecting the future.. A few years later, in 1987, the United Nations established the definition of sustainable development, emphasizing the role of society to use resources carefully.

In recent years, a growing body of knowledge has been developed towards higher education to implement a sustainability curriculum in higher education, campus practices and outreach activities (Zaleniene and Pereira, 2021).

The most commonly used term is Education for Sustainable Development (ESD), launched at the World Conference on Environment and Development, Rio de Janeiro (1992). As declared in a UNESCO manifesto (UNESCO, 2002), 10 years after the formulation of the concept, education for sustainable development has become an emerging concept, in development, a new direction in education, which seeks to make the population aware of the need to assume responsibility for creating a sustainable future (Popescu et al, 2020).

The most important moments that marked the development of concerns for sustainability in higher education institutions could be considered:

- To emphasize the importance of education for increasing global sustainability in 2002, the United Nations Decade of Education for Sustainable Development was declared for the period 2005-2014;

- In 2015, the UN General Assembly adopted the 17 Sustainable Development Goals (SDGs) in the perspective of 2030, with the aim of ensuring humanity's quality of life now and in the future (Purcell, 2021; Zaleniene and Pereira, 2021);

- In 2019, as a result and inspired by the students on strike with Fridays for Future, the Scientists for Future initiative developed into a strong international network (Vogt and Weber, 2020);

- UNESCO is the lead United Nations Agency for ESD and is responsible for implementing ESD 2030, the current global framework for ESD, which takes over and continues the work of the United Nations Decade of Education for Sustainable Development (2005-2014) and the Global Program of Action (GAP) on ESD (2015-2019) (UNESCO, 2017);

- In June 2022, the Council of the European Union (EU) adopted a Recommendation on learning for the green transition and sustainable development (European Education Area, 2023);

- In 2023 the Commission is establishing a Community of Practice to connect schools, researchers, public authorities and other bodies using the new competence framework (European Education Area, 2023);
- The Erasmus+ 2021-2027 program places a strong emphasis on ecological transition and sustainability in education and training (European Education Area, 2023);
- Moreover, in the Erasmus+ annual work program for the year 2023, the priority given to projects regarding sustainability in education, the development of sustainability skills and abilities, the promotion of positive actions regarding sustainability and combating ecological anxiety, supporting the development of teachers' capacity in addressing sustainability issues is noteworthy (European Education Area, 2023).

4. Discussion

The general objective pursued by the sustainability integration process in university education is for the perception of sustainability skills to improve substantially and finally become an integral part of the educational process, so that the courses designed to develop such skills are perceived as offering a competitive advantage to both students and universities, a condition of a responsible mentality and behavior.

The issue of education is an important point of the 2030 Agenda for Sustainable Development representing an objective in itself (Sustainable Development Goal 4) and is also present as targets within other SDGs regarding health, growth and employment, production , consumption and climate problems.

It is obvious that higher education makes a major contribution to the implementation of the 17 SDGs, especially the following goals:

- elimination of poverty in all its forms everywhere (goal 1);
- ensuring a healthy life and promoting well-being for all at all ages (goal 3);
- sustainable development (goal 4);
- gender equality (goal 5);
- decent work and economic growth (goal 8);
- responsible consumption and production (goal 12) ;
- climate change (goal 13) and
- peace, justice and strong institutions (goal 16) (Zaleniene and Pereira, 2021).

Thus, it is extremely important to establish specific learning objectives for the different SDGs to be described in the cognitive, socio-emotional and behavioral domains (UNESCO, 2017).

In the case of higher education institutions, due to their mission, special attention must be paid to research in the field of sustainability.

There are thus three directions to follow to understand this role:

1. Sustainability research focuses on specific issues (climate change, renewable energy, biodiversity);

2. The research methodology respects the sustainability guidelines (such as the use of natural resources, animal welfare or social compatibility);

3. Research seeks to harmonize heterogeneous and conflicting objectives and to establish strategic networks between different fields and levels of action.

In this context, academic responsibility cannot be limited to a few formal research criteria, but must rather deal with the big challenges (Vogt and Weber, 2020).

Training for sustainability is equivalent to a continuous learning process, which supports responsible behavior within universities. A learning methodology will answer the key challenges for the modernization of the university curriculum if it aims at: designing viable alternatives in the future, partnership, practice and learning through social interactions (Lungu et al., 2013).

Students from higher education institutions are not a homogeneous group; the factors that affect one academic program may be completely different for another program, given the differences in experience with and particularities of each discipline, specialization, and teacher. Therefore, in order to provide adequate teaching support, it is necessary to understand the reasons why the faculty or university adopts or does not adopt new practices, such as those related to sustainability (Aivaz and Teodorescu, 2022).

In 2017, UNESCO published a guide for education professionals on using ESD to contribute to the achievement of the SDGs. In this material, indicative learning objectives as well as subjects and learning activities for each SDG are identified, along with implementation methods both for the initial stages such as designing courses and for structuring national level strategies.

However, ESD is not only about courses on sustainable development and curriculum change. Schools and universities should become both training and experimentation spaces for sustainable development. Therefore, all processes should be oriented towards the principles of sustainability. In fact, we want to integrate sustainability into the organizational culture of the educational institution. This involves the reformulation of programs and activities in the university campus, the change of mindsets at the level of students and management, commitments in relations with the research community. Thus, universities would become models for the whole community, not just for students. Green campuses allow the integration of sustainability principles into regular activities and thus support the development of skills in an integrative way (UNESCO, 2017).

UNESCO's work on ESD focuses on five main areas: advancing policy; transforming learning environments; building capacities of educators empowering and mobilizing youth and accelerating local level action.

5. Examples of good practice

Since the beginning of the approaches regarding the concept of Education for Sustainable Development (ESD) and then the formulation of the 17 SDGs - Sustainable Development Goals, there have been numerous materializations of achieving the proposed objectives.

Universities from all over the world, international organizations and top trainers have started and are currently implementing actions and activities to ensure the fulfillment of ESD objectives.

In this context, we considered it significantly useful to highlight some examples of good practices in ensuring the sustainability of the educational process and its promotion at the institutional level. In this respect we choose to give two examples, one of Romania and one of Austria experience.

-UVT – a green, inclusive and accessible university

UVT, the West University of Timisoara, Romania is a significant example in this respect because starting from 2016 having sustainability concerns grounded in the institutional strategy documents.

In 2020, the Western University of Timisoara managed to lay the foundations of the Sustainability Center - Green UVT within the Teach - SUS project, with the main objective of creating new ways of education in the field of sustainability. The UVT Green Center, from an academic point of view, aims to carry out activities such as: research, education, consultancy from the business environment, the involvement of public authorities. This approach seeks the assimilation of new concepts and good practices in terms of social responsibility and facilitates the connection with the business environment (Denkstatt, 2020).

Along with the creation of the UVT Center, he proposed: the organization of environmental responsibility awareness events for students and teaching staff; the implementation of measures for efficient use of resources; the development of study programs or subjects in the field of Education for Sustainable Development and the training of students, teaching staff and UVT staff in this spirit. Among the institutional objectives are the following: UVT's membership in the Green Universities Network(s); increasing UVT's notoriety as a university of choice, integrating green concepts into internal processes; increasing UVT's notoriety as an employer of choice, integrating concepts of green jobs. Thus, a series of specific actions have been started and implemented and the development of an institutional communication on the topic of sustainability is pursued, with the inclusion of values, mission and vision in relation to sustainable development and sustainability in the institutional strategy documents (UVT, 2020).

-An Austrian experience

In the context in which the Center for Climate Change Austria (CCCA) was created in 2011 and as a result of the activities carried out by seven universities at the beginning of 2012, the Alliance of Sustainable Universities in Austria was established in the conditions of the increasing importance of sustainable development approaches within universities.

A comparative analysis, published in 2020, illustrates the organizational change processes of thirteen Austrian universities towards sustainability in the areas of teaching, research, operations, organizational culture and societal engagement. The case study covers 13 of the 14 universities that were in 2018 members

of the Alliance of Sustainable Universities in Austria. As a result, changes in the institutional framework were observed in all member universities, such as the integration of sustainability in strategic documents.

The UniNEtZ project functioned as another consolidation mechanism, with among others the objective to address the SDGs at Austrian universities in research, teaching and university management. Initiated by the Alliance, it quickly gained support from the government, which proposed and other universities to join the project as the performance indicators are achieved. Participation in the project led to many universities joining the Alliance. As of February 2020, 16 universities have become members of the Alliance.

The alliance was thus considered an engine of change, generating similar concerns in the entire university system (Bahunovsky et al., 2020).

Conclusions

This paper presents the results of a documentary analysis regarding the role of higher education institutions in education for sustainable development and argues the need to raise the awareness of the academic environment for the commitment that must be assumed in order to fulfill the SDGs. Consequently, the potential role of universities should be found in: institutional strategies and practices, the training of university staff skills, the education of students, the creation of networks with the interested parties of society and the consolidation of a sustainable campus.

By improving instructional design and pedagogical methods and creating opportunities for more interaction during the class and offering intellectually engaging sessions teachers might be able to increase student motivation for an attitude towards sustainability (Aivaz and Teodorescu, 2022).

These aspects are actually solid arguments regarding the importance of including sustainability in university management as a factor for improving the quality of education.

Since higher education institutions have a great responsibility in training future leaders in the field of sustainability, they must develop educational programs based on these principles. And this attitude must be manifested in the campus, where the organizational culture towards sustainability is the key to training graduates, based on adequate communication and adapted to the proposed purpose with the major importance in social transformation, which still has to overcome many challenges and barriers within the institutions of higher education but also in their relationship with the environment and the institutions concerned.

Abbreviations and acronyms

ESD - Education for Sustainable Development
SDGs - Sustainable Development Goals
UN - United Nations
UNESCO - United Nations Educational, Scientific and Cultural Organization
UniNEtZ - Universities and Sustainable Development Goals (Austria)
UVT - West University Timisoara

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Clustering of Customer Attitudes Towards Eco-Innovations - Evidence from Bulgaria

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Abstract

The research objective of the paper is twofold: firstly, to investigate how the adoption of innovative practices in the wine industry from the environmental, social, and conventional points of view influences consumers' choices in Bulgaria, and secondly, what is the connection between eco-innovation and consumer attitudes. Based on the results from the previous research study, we calculate index values for different types of innovations and we use the k-means clustering procedure to explore consumers' attitudes towards eco-innovations in Bulgaria by determining an optimal number of clusters. Bulgarian young consumers (<26 age) are environmentally friendly and orientated towards eco-innovations in the wine industry with special emphasis on recycling (water, energy) and replacing materials. Our findings confirm other recent studies that preferences for eco-innovations in the wine industry are correlated with a willingness to pay more for organic wines. In the present paper, eco-innovation in the wine industry is studied from the demand side, which is traditionally neglected. To our knowledge, clustering analysis for customer attitudes regarding eco-innovations in the wine industry is applied for the first time in Bulgaria. The results of the study can be helpful for wine managers, technical specialists, and wine-producing companies to prioritize their green efforts for the youth generation in Bulgaria.

Keywords

Wine sector, eco-innovations, customers, hierarchical clustering, k-means, Bulgaria.

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Introduction

Eco-innovation is related to the aim to use fewer resources (saving water, energy etc.) and process impact on the environment (waste recycling, prevention of production pollution). This innovation is strongly related to environmental awareness and understanding from buyers and sellers. Eco-innovation can influence consumers' purchasing decisions and can improve the market position of enterprises because it motivates their economic and social performances. According to Egri and Herman (2000) and Sumrin et al. (2021), eco-innovation is keeping knowledge about consumers' behavior and other stakeholders regarding green trends in the economy.

The research interest is provoked by two aspects: firstly, to consider the increasing importance of environmental concerns for consumers in industries, closely related to sustainability as the wine industry, and secondly, to consider the increasing role of wine eco-innovations as a source of competitiveness. (Rabadan and Bernabeu, 2021) The research objective of the paper is twofold: firstly, to investigate how the adoption of innovative practices in the wine industry from an environmental, social, and conventional point of view influences consumers' choices in Bulgaria, and secondly, what is the connection between eco-innovation and consumer attitudes.

Literature review

Cluster analysis has been successfully adopted to address data clustering problems in different domains such as medical science, manufacturing, the financial sector, urban development, industries, sales, and marketing because of its flexibility (Ikotun et al., 2023). In literature, there are different variants of k-means algorithms such as batch k-means, incremental batch k-means (Forgy, 1965), online k-means (Linde, Buzo and Gray, 1980), and incremental online k-means (MacQueen, 1965).

For example, it is possible to highlight the use of k-means algorithm for color quantization in computer graphics (Abernathy and Celebi, 2022), or the application of k-means machine learning algorithm to create a solution by the synthetic data to enhance the detection of the geologic potential field-generated bodies (Eshimiakhe and Lawal, 2022). Other important studies deal with consumer analysis for instance, Tabianan, Velu and Ravi (2022), analyze the clusters such as event type, products, and categories to support vendors to identify the groups that share similar criteria focusing on the highly profitable segment to the least profitable segment. Higuchi and Maehara (2021) analyzed non-hierarchical clusters (NHCA) with the *k*-means method in the motivational profile of quinoa consumers in Modern Metropolitan Lima for highlighting any differences between consumers. Other research to mention is the use of k-means clustering algorithm based on the adaptive learning particle swarm optimization (ALPSO) algorithm for "developing a customer segmentation method to achieve the division of customer groups in the grape market in China". (Li et al., 2021).

Considering literature in the wine industry, the k-means algorithm has been used for analyzing both quality and preferences. For instance, McCune et al. (2021) proposed a modified k-means algorithm to cluster the Bordeaux wine dataset based on the original k-means clustering. The analysis has the goal to allow the selection of a specific number of wines that vendors would like to propose to consumers that are more representative of their offerings. This approach provides insight "*by grouping similar wines so that a vendor can make more informed decisions through the unsupervised learning*". Katarya and Saini, (2022) analyzed how to improve wine tasting using primary component analysis (PCA) and k-means clustering algorithms to recommend wines. The recommendation approach has been useful to offer insights to all types of users, beginners, and regular wine drinkers to enhance their current preferences. From this non-exhaustive review, it emerges that the k-means algorithm is a very flexible and suitable tool for analyzing correlations between consumers and their choices to better understand how to anticipate consumer choices.

Methodology

The starting point of this study is based on the results of previous research on the innovations in the wine industry regarding an empirical study that used a questionnaire for managers and technical specialists in Bulgarian wine-producing companies and fuzzy analytical hierarchical process (fuzzy AHP) assessment (Boshnakov, Dimitrova and Marinov, 2022), further in the text the BDM index. The results are presented in three dimensions - conventional, ecological, and social, highlighting the assessment of each item. The results of the study showed that priority is given to conventional and eco-innovations, compared to social innovations in the wine sector, according to managers and technical specialists in Bulgarian wine-producing companies. Table no.1 presents the BDM results for all wine innovations.

In the present paper, we used the values of the BDM fuzzy analytical hierarchical process (fuzzy AHP) assessment to calculate the indexes, on which the cluster analysis for Bulgarian consumers is made. As an instrument, we use a survey, with core questions in Likert form, with a 5 degree scale (1 to 5 or -2 to +2, "strongly disagree" to "strongly agree").

At the same time, our research interest is more open to evaluating only consumers' eco-innovations in the wine industry, because we believe that these findings especially can encourage wine managers and technical specialists in the development of more sustainable practices for recycling and reduction of raw materials.

Table no. 1. Innovations in the wine industry according to managers and technological specialists in Bulgarian wine-producing companies - a decision hierarchy

CONVENTIONAL INNOVATIONS	ECO-INNOVATIONS	SOCIAL INNOVATIONS
Product innovation (0.30): Significant improved products onto the market (0.1), QR code (0.13)/website (0.18)/newsletter (0.19), wine club (0.18), training course (0.19), green activities promotion (0.21), IT technologies (0.16)	Reduction of material use (0.38): Resource efficiency per unit of output (0.44), organic certification (0.56)	Recognizing wine innovations of indigenous people and local community (0.36)
Grape-growing techniques and technologies (0.27): Use of organic (0.18), chemical (0.42) and innovative substances (0.39)	Replacing material (0.28): less greenhouse gas intensive alternatives (0.42), emission monitoring (0.58)	Recognizing locally developed wine innovations and experimentation (0.32)
Grape-transformation techniques and technologies (0.44): Selective cryoextraction (0.45), wine bio-informational research (0.55)	Recycling (0.34): Reduction of consumption through recycling water (0.32), waste (0.33), materials (0.35)	Piloting and testing local policy wine innovations (0.32)

Source: Boshnakov, Dimitrova and Marinov, 2022 (with their values from the managers assessments), based on Frigon et al., 2020.

After the starting framework of this study is mentioned above, we now explain the steps of clustering used in the present study in Bulgaria. The adopted k-means clustering procedure generates clusters using the cluster's object mean value. K-means divides the dataset into non-overlapping and independent k numbers, without internal structures or labels, such that the observations in one cluster are similar to each other and dissimilar to those in the remaining sets (Niu et al., 2021). The k-means then maximize the inter-cluster distance between samples and minimize the intra-cluster distance.

The goal of the k-means algorithm is to find locally optimal solutions, accounting for a clustering error. We make the calculations in R (R Core Team, 2018), and use the Hartigan and Wong (1979) algorithm. To solve the clustering problem with k clusters, the process starts with one cluster and it finds its optimal position, corresponding to the centroid of the dataset. Clustering is performed on a data matrix so that initially the data is coerced to a matrix of numeric values and the number of clusters and the maximum number of iterations are entered. Next, a random set of rows is chosen as the initial centers. Within the following optimization procedure, points are allotted into k groups, so that the sum of squares to the cluster centers is minimized.

Unlike other clustering algorithms, the k-means clustering requires the number of clusters, k, to be set by the researcher. Since many variants are available, setting k can be a difficult task. One of the core problems with the algorithm is to find the optimum number of clusters, because most realizations do not contain explanations for the selection of particular values for k (see Pham, Dimov **and** Nguyen (2005) for a more detailed explanation). Iterative experiments with different values of k can be helpful, and in our study, we proceed in this way. We rely on approaches that are used in the factor analysis, such as the scree plot and factor loadings to assess the optimum number of clusters.

From the methodological approach, first, after cleaning the data, we compute the index values, for all three dimensions. Secondly, we use the k-means clustering procedure and determine the optimal number of clusters using the scree method and comparing its suggestions to other alternatives. Third, clusters are analyzed according to the sample characteristics. We also check the clusters by the average silhouette approach to assess the quality of clustering. In the next step, clusters are visualized, and some descriptive statistics are added.

Our main choice is the k-means algorithm, because it is a very simple and fast approach, able to deliver robust and consistently interpretable outcomes. We deliberately choose this rather mechanistic approach, to not impose any prior suggestions to the clusters.

Descriptive statistics of the sample are organized as follows. The survey for our study was conducted in March 2023, our respondents are Bulgarian citizens, aged 18-63, the average age is 28.7 years, and the median age is 22 years, all with high school education or university degree, living in North-eastern Bulgaria. Since our intent is to explore presumably the views of the young people, two thirds of our

sample are aged below 27 years. After cleaning the data, we proceed with 246 valid responses, 153 women and 93 men.

The initial part of our empirical analysis consists in calculating the values for the indexes, for conventional, organic, and social innovations. We use the weights from the managers' version of the BDM index since we consider it to be more likely to reflect or coincide with the views of the general public - technical specialists tend to put additional attention to specific details, which are unfamiliar or unpopular to the general public. We used the estimates of global variables as the basis for the clustering, and applied an iterative process, to assess the optimum number of clusters.

As recommended in the literature, we first normalize the data, using the mean values of the indexes as centers and the variances as scales. Further, the calculations are based on normalized data. The scree plot suggests that the optimum number of clusters is 5, with 4 or 3 still acceptable (see Figure no. 1).

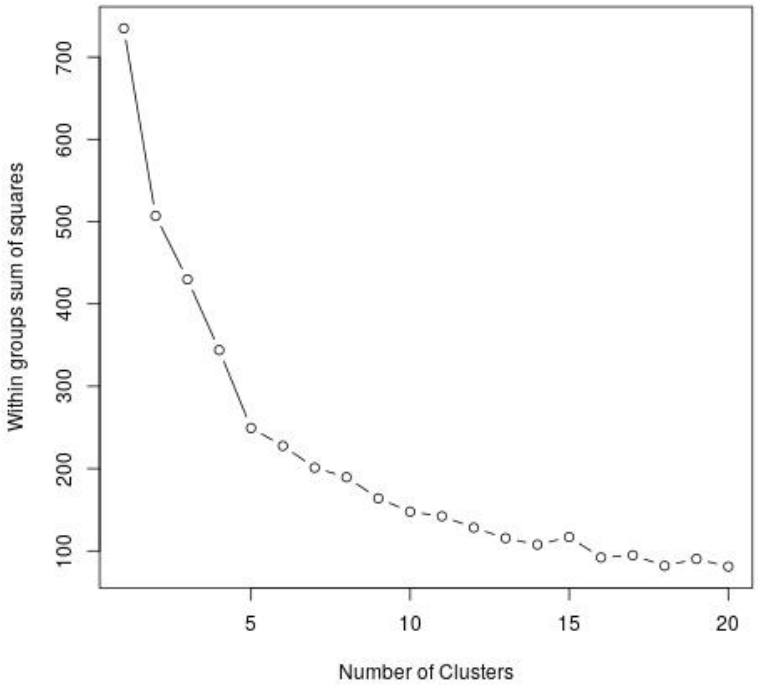


Figure no. 1. Scree plot on normalized data
Source: The authors

Proceeding further with 5 clusters, we compare their main characteristics using several statistical tests. The resulting 5 clusters are of sizes 55, 92, 52, 38, 9, resp. between_SS / total_SS = 66.1 %. According to the results, we can decide to continue the analysis with either 5 or 4 clusters.

To verify our findings about the number of clusters, we also make cluster mapping (Figure no. 2).

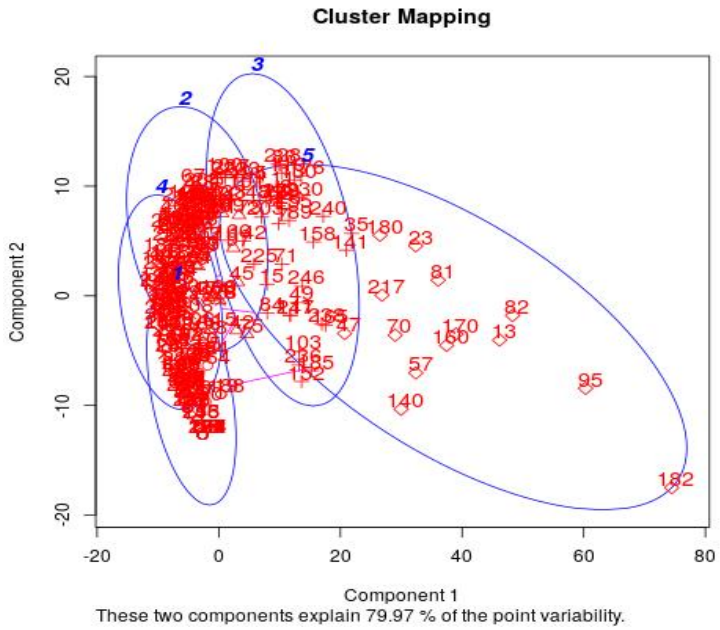


Figure no. 2. Cluster mapping, 5 clusters
Source: The authors

Cluster mapping (Figure no. 2) shows the first two components comprise nearly 4/5 of the variability in the sample, therefore it can be fairly well used as a basis for choosing the appropriate number of clusters. We proceed further with 5 clusters.

Results and discussion

We represent the main results from the cluster analysis in Table no. 2, which contains the basic characteristics for each cluster, such as the average values for the variables used for classification, as well as the main features of the clusters.

Table no. 2. Characteristics of respondents by cluster

	1	2	3	4	5
Variable 1 (conventional, mean value)	4.71	4.91	3.87	4.59	2.52
Variable 2 (eco, mean value)	4.14	4.48	4.27	2.66	2.53
Variable 3 (social, mean value)	3.67	4.76	4.44	4.18	2.69
Respondents	55	92	52	38	9
F	30	59	39	21	4
M	25	33	13	17	5
Age mean	25.6	28.6	30.4	31.8	26.9
Age median	22	23	22.5	23.5	23
Edu high	30	52	30	15	6
Edu university	25	40	22	23	3
Organic wines (are better)	0.56	0.40	0.15	-0.13	0.34

Source: The authors

Due to its small size (9 respondents), we can exclude the data of the last cluster from our further analysis, considering them as outliers, and concentrate on the remaining 4 clusters. From the remaining, clusters 1 and 2 comprise respondents giving more attention to eco- innovations, and people who are also more enthusiastic about organic wines, while clusters 3 and 4 contain respondents who relatively give less attention to eco-innovations, are slightly older and are more skeptical about organic wines (see Table 2).

To assess the views of young people, we conducted a more detailed analysis, assessing differences in the answers to questions about the elemental variables (composing the global ones) given by younger people (< 26 years) and the rest of the sample. We discovered significant differences for the global variable "eco-innovations", with young people giving more importance to it (4.00 vs. 3.90) than the rest of the sample.

Sub-indicators also reveal the importance of reducing resource use and recycling for young people. More detailed screening in comparison with elder respondents (age 26 and more) reveals existing differences in several sub-questions. T-tests show existing statistical differences between young people and the rest of the sample for questions "recycling", with scores of 4.60 for young people vs. 4.31 for the rest, "less greenhouse gas intensive alternatives" (4.57 vs. 4.30), and "emission monitoring" (4.57 vs. 4.28). However, since the last two questions are sub-questions, and they are the constituent parts of "replacing material", we accept that differences in this variable also exist, with younger people stronger recognizing the importance of recycling and replacing materials for greener production.

Conclusion

In the present paper, eco-innovation in the wine industry is studied from the demand side, which is traditionally neglected. To our knowledge, clustering analysis for customer attitudes regarding eco-innovations in the wine industry is applied for the first time in Bulgaria. Our findings show that Bulgarian young consumers (< 26 age) are environmentally friendly and oriented towards eco-innovations in the wine industry with a special emphasis on recycling (water, energy) and replacing materials. Our findings confirm the ones of other recent studies, that preferences for eco-innovations in the wine industry are correlated with willingness to pay more for organic wines (Rabadan and Bernabeu, 2021). The results of the study can be helpful to wine managers, technical specialists, and wine-producing companies to prioritize their green efforts for the youth generation in Bulgaria. The main extensions of the research are related to the comparison between eco-innovations and conventional and social innovations in the Bulgarian wine industry.

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Sustainable Leadership in European Business Environment

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Abstract

Sustainability leadership is a strategy approach that gives direction, alignment, and commitment while dealing with social, environmental and economic concerns in order to produce a better society.

The focus of the paper is to highlight the sustainable leadership in the European corporate setting. To achieve this aim, two objectives have been formulated. The first objective is to ascertain the importance of integrating sustainability measures in organizations and the second one is to illustrate the connection between sustainable behaviours and sustainability values among managers.

The current research paper focuses on conducting a statistical analysis of data gathered from the Sustainable Leadership in Europe Report. The data, deemed pertinent to the study, was accumulated, consolidated, and evaluated using Microsoft Excel and SPSS Statistical Software to derive conclusions aligned with the research objectives.

To summarize the results, it seems that companies in Europe have implemented the sustainability measure of identify sustainability risks & opportunities the most, while the last measure of performance measurement and reporting has the lowest implementation percentage across all countries. Also, I found a strong and direct connection between the relationship between the self-identification with sustainable behaviors and sustainability values for managers.

The reason choosing to do this article is that sustainable leadership is a current topic and probably those interested in this topic will find this valuable, especially PhD students and other people who want to learn more about this subject.

Overall, the article contributes to the growing body of research on sustainable leadership and provides practical insights that can be applied in the European corporate setting. The intention to improve the statistical analysis and gather up-to-date and relevant data for all European Union countries in future studies further emphasizes the importance and relevance of this topic.

Keywords

Sustainability, leadership, sustainable behaviours, sustainability performance.

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Introduction

Sustainability leadership is a strategy process that provides direction, alignment and commitment while addressing social, environmental and economic challenges to build a better society (Visser and Courtice, 2011).

Based on the analysis of the specialized literature, previous studies indicate that firms are much more likely to implement sustainable measures, especially when their managers adopt sustainable behaviour. (Kiesnere and Baumgartner, 2020; Ruiz-Pérez, Lleo and Ormazabal, 2021). Promoting sustainable behaviours among managers can be an effective strategy for driving the adoption of sustainable innovation practices in these organizations, and that such practices can be a key driver of sustainability and competitiveness (Saifulina and Carballo-Penela, 2017).

The research's goal is to present sustainable leadership in the European corporate environment. In order to achieve the desired outcome, two objectives were established. The first is to determine the significance of implementing sustainability measures in organizations in order to improve environmental, social, and economic sustainability performance, while the second is to demonstrate the relationship between sustainable behaviours and sustainability values for managers.

The title of this article is "Sustainable leadership in European business environment" and is established in accordance with the objectives of the research presented above.

Next, a concise presentation of the scientific literature, research methodology, and results along with discussions will be presented, which will validate the established hypotheses.

1. Review of the scientific literature

Sustainable leadership has recently developed as an effective leadership style for dealing with long-term difficulties. Extensive literature has advocated investigating the process and conditional limitations for the important effect of sustainable leadership on long-term performance (Iqbal, Ahmad and Halim, 2020).

Scientific progress has been reflected in all spheres of activity in the new age of the information society. It represents aspects having a substantial positive impact on human society's development, as well as an increasingly discussed subject of sustainable development. To ensure continuity for future generations, all resources employed and output gained as a result of scientific advancement and the information society must remain under the sign of conservation and regeneration (Ghiță et al., 2018).

The sustainable leadership encourages novelty and the sharing of creative ideas, focuses on learning and ongoing progress, and accepts mistakes in a non-punitive manner (Burawat, 2019; Piwowar-Sulej and Iqbal, 2023).

Sustainable leadership significantly influenced the development of sustainable performance inside an organization. According to the findings, the mediating role of organizational training and structural empowerment boosted the impact of sustainable leadership on employees' long-term performance. While the presence of psychological safety deviates from the premise since it is extremely dangerous in front of management to ensure their psychological perception of the company's goals (Sulasmi et. al. 2020).

Organizational sustainability is a strategic issue in sustainable growth. A corporation will attain sustainable development if three dimensions (economic, social, and environmental) are balanced (Sapta et al. 2021).

As a result, Schaltegger, Hansen and Lüdeke-Freund (2016) sustain that businesses should emphasize financial and economic aims while also considering social benefits and environmental preservation.

In addition, sustainable performance necessitates that any business fulfil current demands without compromising future generations' needs (Baumgartner and Rauter, 2017).

Sustainable development attempts to improve quality of life by ensuring human needs, while also conserving the environment. Individuals and society can help to achieve the aims of sustainability by engaging in sustainable behaviour. These actions allow for the preservation of the natural environment as well as the protection of societal integrity, and this is their initial impact on improving the standard of living. Furthermore, people who engage in these practices usually have favorable psychological outcomes (satisfaction, self-efficacy, psychological wellness and repair and even joy) (Tapia-Fonllem, Corral-Verdugo and Fraijo-Sing, 2017).

The literature review highlights the significance of sustainable leadership as a means of addressing long-term challenges and fostering sustainable development in organizations. It presents different facets of sustainable leadership, such as promoting innovation, continuous learning, and accepting errors without punishment. It further stresses the need to strike a balance between economic, social, and environmental considerations of sustainability while meeting present requirements without compromising future generations' welfare.

2. Research methodology

The aim of the research is to present the sustainable leadership in European business environment. To fulfil its purpose, it was established two objectives from which to start the research. The first one is to find out the importance of implementation of sustainability measures at organisations, to improve the

environmental, social and economic sustainability performance and the second one to show what is the relationship between sustainable behaviours and sustainability values for managers.

At the outset of the research, two hypotheses were formulated based on a thorough examination of relevant literature (Kiesnere and Baumgartner, 2020; Ruiz-Pérez, Lleo and Ormazabal, 2021.).

Hypothesis 1. When managers adopt sustainable behavior, the organization is more likely to implement sustainable measures.

Hypothesis 2: Most managers focus on sustainable values.

The chosen approach for this research paper was a statistical analysis of the data obtained from *Sustainable Leadership in Europe Report.* The research presents unique data on the status of sustainable leadership in European management. Alberto Pastore, a professor at Sapienza University of Rome, and his group did the investigation in the spring of 2020. The empirical findings, which are based on a survey of more than 1500 managers across six European nations (Germany, France, Spain, Italy, Poland and Denmark), provide valuable insights to policy-makers, social partners, and education providers on the discrepancies between policy aims and the reality on the ground (Pastore, 2020).

The initial step in the research was to organize and present the data concerning the implementation of sustainability measures in European organizations. Microsoft Excel was used to analyze the data structure, and statistical indicators were calculated to draw conclusions that align with the research objectives.

The second part of the study involved analysing the correlation between sustainable behaviours and sustainability values for managers, which was accomplished using Microsoft Excel and SPSS Statistical Software. The study utilized a linear regression and Pearson correlation to perform the analysis.

3. Results and discussion

This section is dedicated to presenting the findings of the analysis of data on the adoption of sustainability measures by organizations in Denmark, France, Germany, Italy, Poland, and Spain. The results also explore the relationship between sustainability values for managers and their self-identification with sustainable behaviours.

Table no. 1. "Yes" answers regarding the implementation of sustainability measures (%)

Implementation of sustainability measures at organizations	Denmark	France	Germany	Italy	Poland	Spain	Europe
Consult the company stakeholders	44.5	53	51.4	48.6	45.5	52.2	50.4
Analyse what Sustainability elements are material/matters	53.5	52.6	51.8	54.1	51.8	60.6	53.3
Identify Sustainability risks & opportunities	57.8	57.3	51.8	58	54.5	57	54.9
Develop a Sustainability Strategy	52.3	56.1	53.7	50.6	51	57.8	53.7
Setting Managerial Sustainability objectives	46.9	49.8	45.1	50.2	45.5	51.8	47.7
Sustainability performance measurement and reporting	44.9	48.2	46.3	50.6	41.2	46.6	46.7

Source: Own processing of data obtained from Sustainable Leadership in Europe Report (Pastore, 2020)

The Table no. 1 shows the percentage of organizations in Denmark, France, Germany, Italy, Poland, Spain, and Europe as a whole that have implemented different sustainability measures, as the questioned managers answered. The first measure is consulting with company stakeholders, which has been implemented by a majority of organizations in all countries and in Europe as a whole, with France having the highest percentage at 53% and Denmark having 44.5%.

The second measure is analysing which sustainability elements are material or important to the company, with Italy having the highest percentage at 54.1% and Poland only 51.8%. The third one is identifying sustainability risks and opportunities, with Denmark on the first place (57.8%) and Germany on last place (51.8%). The fourth measure is developing a sustainability strategy, with France having the highest percentage at 56.1% and Italy having the lowest percentage at 50.6%. Setting managerial sustainability objec-

tives is the fifth measure, with Germany having the lowest percentage at 45.1% and Spain having the highest percentage at 51.8%. The final measure is sustainability performance measurement and reporting, with Poland having the lowest percentage at 41.2% and Italy with the highest percentage at 50.6%.

Overall, it seems that companies in Europe have implemented the sustainability measure of Identify Sustainability risks & opportunities the most, while the last measure of performance measurement and reporting has the lowest implementation percentage across all countries. Setting Managerial Sustainability objectives is also an area where there is room for improvement in most countries.

Table no. 2. Descriptive statistics regarding the implementation of sustainability measures

Descriptive Statistics	Denmark	France	Germany	Italy	Poland	Spain	Europe
Average	49.98	52.83	50.02	52.02	48.25	54.33	51.12
Standard deviation	4.90	3.20	3.16	3.14	4.55	4.64	3.09
Variance	28.85	12.27	11.97	11.83	24.81	25.83	11.49
Min	44.5	48.2	45.1	48.6	41.2	46.6	46.7
Max	57.8	57.3	53.7	58	54.5	60.6	54.9

Source: Own processing of data obtained from Sustainable Leadership in Europe Report (Pastore, 2020)

From the Table no. 2, we can see the descriptive statistics for seven European countries, including their average, standard deviation, variance, minimum and maximum values. Spain has the highest average value (54.33%), which shows that organizations in Spain implement sustainable measures in a higher proportion than those from Poland (42.25%). Italy has the smallest standard deviation (3.14) and variance (11.83), indicating that its values are tightly clustered around the mean, while Denmark has the largest standard deviation (4.90) and variance (28.85), indicating a more dispersed dataset.

It is obvious that regarding the topic of whether the organization has implemented efforts to improve its Sustainability performance, Spain once again shows out as the country with the greatest answers, particularly on Analyze what Sustainability elements are material. On opposite sides, Poland and Denmark have the lowest response rates: Poland, in particular, on Consult the company stakeholders and Sustainability performance measurement & reporting: Denmark, on Consult the company stakeholders.

Therefore, these descriptive statistics provide insight into the differences in the scores across these European countries, with Spain and France having the highest average scores, respectively, and Poland having the highest variability in their scores.

Table no. 3. Self-identification with sustainable behaviors

Self-identification with sustainable behaviors	Denmark	France	Germany	Italy	Poland	Spain	Europe
Ensuring decent working score	3.51	3.45	3.39	3.44	3.42	3.63	3.44
Supporting actions toward a better world	3.36	3.38	3.32	3.31	3.29	3.53	3.35
Adopting new ways of seeing	3.34	3.44	3.28	3.35	3.32	3.42	3.34
Communicating a comp. vision	3.19	3.25	3.22	3.33	3.32	3.39	3.28
Understanding the context	3.34	3.27	3.2	3.34	3.2	3.45	3.27
Engaging on sustainability issues	3.27	3.35	3.2	3.2	3.25	3.4	3.26
Managing social dialogue	3.21	3.18	3.26	3.29	3.15	3.21	3.17

Source: Own processing of data obtained from Sustainable Leadership in Europe Report (Pastore, 2020)

The Table no. 3. presents the self-identification scores of Denmark, France, Germany, Italy, Poland and Spain regarding sustainable behaviors. The scores range from 1 to 5, with higher scores indicating stronger agreement with the statements presented.

Overall, the European countries appear to have relatively high levels of self-identification with sustainable behaviors. The highest scores were given for "Ensuring decent working score" (3.44) and "Supporting actions toward a better world" (3.35) with all countries scoring above 3.2 for these statements. This suggests

that these nations place great importance on fair working conditions and efforts to make things better around the world.

The scores for "Adopting new ways of seeing" and "Understanding the context" were also relatively high. This shows an ability to take into account fresh viewpoints and an understanding of the larger context in which sustainable actions function.

The scores for "Engaging on sustainability issues" and "Communicating a comprehensive vision" were slightly lower but still positive. This suggests that there is room for improvement in terms of engaging with sustainability issues and communicating a comprehensive vision.

Finally, the scores for "Managing social dialogue" were the lowest among the statements presented (3.17). This indicates that there may be challenges in effectively managing social dialogue around sustainable behaviors.

However, the findings imply that these nations self-identify at a relatively high level with sustainable habits, but other areas, particularly managing societal conversation about sustainability challenges, still need improvement.

Table no. 4. Sustainability values for managers

Sustainability values for managers	Quality of life	Human solidarity	Ecological Sensibility
Denmark	3.29	3.2	3.36
France	3.25	3.2	3.3
Germany	3.28	3.24	3.26
Italy	3.22	3.25	3.36
Poland	3.26	3.23	3.29
Spain	3.37	3.47	3.52

Source: Own processing of data obtained from Sustainable Leadership in Europe Report (Pastore, 2020)

Table no. 4 presents the sustainability values for managers in six European countries, namely Denmark, France, Germany, Italy, Poland, and Spain. The values are measured on a scale of 1 to 5, where higher values represent a greater emphasis on sustainability. Upon analysing the data, it is apparent that all countries exhibit considerably high scores across the three sustainability dimensions: Quality of life, Human solidarity, and Ecological sensibility. Denmark, Germany, and Spain have the highest scores across all three dimensions.

Specifically, Spain has the highest score for Ecological sensibility (3.52), Human solidarity (3.47) and Quality of life (3.37). The data suggests that sustainability is a priority for managers in these six European countries, as evidenced by their relatively high scores in all three dimensions, but there is always room improvement.

The research aimed to perform a linear regression analysis between sustainable behavior variable (y) and the independent variables (x1=Ecological sensitivity, x2=Human solidarity and x3=Quality of life). The value of the correlation coefficient R (0.941) between the analyzed variables indicates a very strong correlation between the variables. R Square is 0.886, which suggests that the multiple linear regression model explains approximately 88.6% of the variation in the sustainable behavior variable, using the independent variables included in the model.

Table no. 5. Pearson correlation

Correlations					
		Y	x1	x2	x3
Pearson Correlation	Y	1.000	0.701	0.802	0.939
	x1	0.701	1.000	0.814	0.735
	x2	0.802	0.814	1.000	0.873
	x3	0.939	0.735	0.873	1.000
Sig. (1-tailed)	Y		0.060	0.028	0.003
	x1	0.060		0.024	0.048
	x2	0.028	0.024		0.012
	x3	0.003	0.048	0.012	
N	Y	6	6	6	6

	x1	6	6	6	6
	x2	6	6	6	6
	x3	6	6	6	6

Regarding the Pearson correlation coefficient (Table no. 5), which shows the relationship between the sustainable behaviour variable and the three explanatory variables (Ecological sensitivity, Human solidarity and Quality of life) it seems that the value of 0.701 indicates a positive correlation between sustainable behaviour and Ecological sensitivity. In other words, if Ecological sensibility increases, sustainable behaviour is likely to increase and vice versa.

The value of 0.802 indicates a strong positive correlation between sustainable behaviour and Human solidarity, so if it increases, sustainable behaviour is likely to increase and vice versa.

And last but not least, the 0.939 value represents the correlation between sustainable behaviour and Quality of life. This indicates a very strong positive correlation between the two variables influencing each other.

Also important are the values outside the main diagonal, which show the correlations between the other variables. For example, the correlation between Quality of life, Human solidarity is 0.814, which indicates a strong positive correlation between the two explanatory variables.

Another example, the correlation between sustainable behavior and Ecological sensitivity has a significance level of 0.003, indicating that it is statistically significant at the 0.05 level.

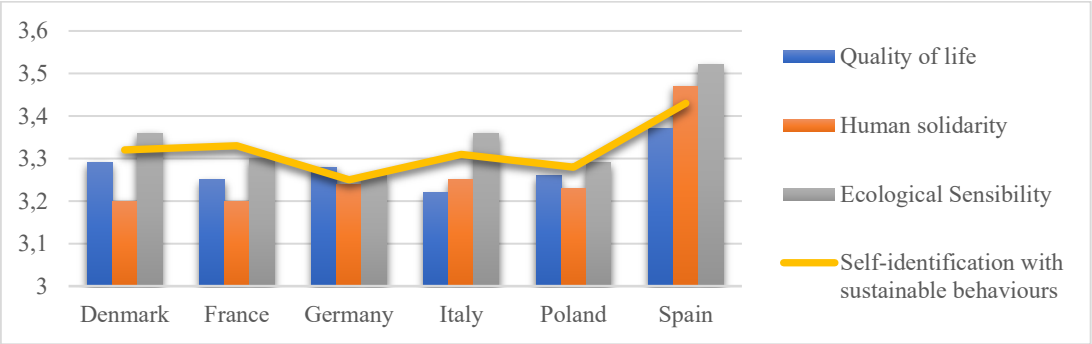


Figure no. 1. The relationship between the self-identification with sustainable behaviours and sustainability values for managers

Figure no. 1 illustrates the strong and direct relationship between the variables analyzed in the study, namely, self-identification with sustainable behaviours and sustainability values for managers.

Conclusions

Regarding the implementation of sustainability measures at organizations from Denmark, France, Germany, Italy, Poland, Spain, it seems that they have implemented different sustainability measures, as the questioned managers answered. Overall, companies in Europe have implemented the sustainability measure of Identify Sustainability risks & opportunities the most, while the last measure of performance measurement and reporting has the lowest implementation percentage across all countries. Setting Managerial Sustainability objectives is also an area where there is room for improvement in most countries.

It is obvious that regarding the topic of whether the organization has implemented efforts to improve its Sustainability performance, Spain once again shows out as the country with the greatest answers, particularly on Analyse what Sustainability elements are material. On opposite sides, Poland and Denmark have the lowest response rates: Poland, in particular, on Consult the company stakeholders and Sustainability performance measurement and reporting: Denmark, on Consult the company stakeholders.

The European countries appear to have relatively high levels of self-identification with sustainable behaviours. The highest scores were given for "Ensuring decent working score" and "Supporting actions toward a better world" with all countries scoring above 3.2 for these statements. This suggests that these nations place great importance on fair working conditions and efforts to make things better around the world.

It seems that all countries have relatively high scores in each of the three dimensions of sustainability: Quality of life, Human solidarity, and Ecological sensibility. Denmark, Germany, and Spain have the highest scores across all three dimensions. Specifically, Spain has the highest score for Ecological sensibility, Human solidarity and Quality of life. The data suggests that sustainability is a priority for

managers in these six European countries, as evidenced by their relatively high scores in all three dimensions, but I think there is always room improvement.

The findings suggest that there is a significant and reciprocal relationship between a manager's self-identification with sustainable behaviours and their sustainability values. In other words, these variables have a strong and direct impact on each other.

The study's conclusion affirms the successful validation of both hypotheses and underscores the critical significance of integrating sustainable measures within organizations. Moreover, the findings highlight the direct and robust relationship between a company's values and the sustainable behaviour of its managers. An organization's values are crucial in promoting sustainable conduct among managers. When a company prioritizes sustainability and communicates its relevance to its employees, it establishes a culture that supports environmentally friendly behaviours. Managers who share the values of their firm are more likely to make decisions that prioritize sustainability and inspire their teams to do the same.

To summarize, it is critical for companies to implement long-term strategies and guarantee that their management are fully aligned with the company's values. This not only improves the environment, but it also contributes to the creation of a positive and sustainable future for the business.

In conclusion, the importance of the study is given by a clear and robust correlation between two key variables: the extent to which managers self-identify with sustainable behaviours and the strength of their sustainability values. In other words, the study suggests that managers who prioritize sustainable actions are more likely to hold deeply-held beliefs about the importance of sustainability.

Absolutely, the research has limits, and in the upcoming studies is needed to improve the statistical analysis and gather up-to-date and relevant data for all European Union countries.

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Regional Innovation for Sustainable Development: The Case of Romania and China

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Abstract

In response to the crisis of globalisation since the new crown epidemic, the importance of regionalisation at the national development level has become increasingly evident. Using the Pearl River Delta region in China and the Cluj-Napoca region in Romania as research subjects, this paper presents a comparative and interdisciplinary analysis of the drivers of regional innovation for sustainable development, the approaches and impacts of policy formulation and the dimensions of the impact of regional innovation on sustainable development through a literature analysis and case study approach.

The study shows that the drivers of regional innovation for sustainable development mainly include government support (including financial and platform support) and the industrial capacity of local innovation and entrepreneurship (including academic capacity and industrialisation capacity); government policy formulation mainly has centralised and decentralised approaches, with centralisation requiring large upfront investment and decentralisation facing challenges in the integration of industry and research; the dimensions of regional innovation for sustainable development The main impact dimensions of regional innovation on sustainable development are industry-research synergy, social welfare, low carbon and environmental protection, and talent training. Through case studies, this paper also makes recommendations for stakeholders on the practical application of regional innovation.

The findings and implications of this study are important references for policy makers, practitioners and researchers.

Keywords

Regional innovation; Sustainable development; Pearl River Delta China ; Cluj-Napoca Romania.

DOI: 10.24818/BASIQ/2023/09/058

Introduction

1.1 Research Background

With the acceleration of globalisation and the deepening of inter-regional cooperation, exchanges and cooperation between countries have become increasingly close. As two important countries, China and Romania have maintained good relations since their inception and have established extensive cooperation mechanisms and partnerships. Cooperation between the two countries has been outstanding in a number of areas (Popescu and Brinza, 2018). For example, there are many similarities between China's Belt and Road Initiative and Romania's Three Seas Initiative, which provide a broader scope for regional innovation in both countries. At the same time, the continuous improvement of the CEE cooperation mechanism also provides better platforms and opportunities for trade, investment and technology transfer between the two countries (Pencea and Oehler-Şincai, 2015).

The aim of this paper is to examine the regional innovation for sustainable development aspects in China and Romania, two countries with different political, economic and cultural backgrounds but similar challenges and opportunities in terms of regional development (Tse and Gheorghiu, 2022). Regional innovation is a key driver of sustainable development as it contributes to economic growth, environmental protection and social equity in local cities. By comparing and contrasting their experiences, this paper seeks

to identify the factors that facilitate or hinder the adoption and diffusion of regional innovation practices, as well as the outcomes and impacts of these practices on regional sustainability. The focus is on research on regional innovation for sustainable development in China and Romania, the implications of these findings for policymakers and practitioners in China and Romania, and the replicability of these findings for other countries and regions. Finally, the paper summarises the main findings, contributions to the existing literature, and recommendations for future research and policy.

1.2 Research questions

• What are the drivers and barriers of regional innovation for sustainable development in China and Romania, and how do they differ across sectors and regions?

• What are the similarities and differences between regional innovation systems and policies in China and Romania, and how do they affect sustainable development?

• What are the implications of regional innovations for sustainable development and how can they be used to shape policy and practice?

1.3 Structure of the paper

To address these questions, the paper first reviews the relevant literature on regional innovation and sustainable development, focusing on definitions, concepts and empirical evidence of their relationship. It then describes the analytical methodology used to conduct a comparative case study of China and Romania. It concludes by presenting the findings, which include a descriptive analysis of the regional innovation systems in China and Romania, a comparative analysis of their policy frameworks, and an analysis of the challenges and opportunities faced by the two regions.

2. Review of the scientific literature

2.1 Literature review on regional innovation

Regional innovation is the process of creating, disseminating and applying new knowledge and technology in a specific geographical area, usually at the level of a city, region or cluster. Regional innovation involves a variety of actors, such as firms, universities, research institutions, public agencies and civil society organisations, who interact and collaborate in networks and partnerships to generate and exploit innovation opportunities. Regional innovation can take many forms, including product innovation, process innovation, organisational innovation and social innovation, and can have different objectives and impacts, depending on the context and goals of the actors involved.

2.2 Literature review on sustainable development

Regional innovation can play a key role in achieving sustainable development, which has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Burton, 1987). The three basic principles are equity, sustainability and commonality. The ultimate aim of sustainable development theory is to achieve common, coordinated, equitable, efficient and multidimensional development.

2.3 Literature review on the role of regional innovation and relevance in sustainable development

Regional innovation can play a key role in achieving sustainable development. Sustainable development requires a balance between the economic, environmental and social dimensions, and regional innovation can contribute to each of these dimensions. At the economic level, regional innovation can create new jobs, increase productivity and promote entrepreneurship and competitiveness, particularly in high-tech and knowledge-intensive sectors. In the environmental dimension, regional innovation can facilitate the transition to a low-carbon and resource-efficient economy through the development and deployment of clean technologies and sustainable practices. On the social dimension, regional innovation can enhance social inclusiveness by addressing local needs and preferences, and by involving different stakeholders in the innovation process (Zhao, Cai and Luo, 2000).

2.4 A literature review on regional innovation for sustainable development research in China and Romania

In China and Romania, there is a growing literature on regional innovation for sustainable development, reflecting their growing importance as emerging economies and regional powers.

In China, regional innovation has been a key element of the country's development strategy since the 1990s, when the government launched a series of policies to promote the clustering of high-tech industries and the upgrading of regional innovation systems. China's regional innovation policy has evolved over time from a top-down approach based on science parks and special economic zones to a bottom-up approach based on innovation clusters and innovation networks (Zhu and Zhang, 2004). Several studies have examined the effectiveness and challenges of regional innovation policies in China, highlighting the role of institutional factors such as governance, finance and intellectual property rights in shaping regional innovation outcomes and impacts.

In Romania, regional innovation is also gaining momentum as the country tries to catch up with its EU counterparts and capitalise on its comparative advantages in high-tech and creative industries. Romania's regional innovation policy has been influenced by the EU Cohesion Policy, which provides funding and guidance for regional development, innovation and entrepreneurship (Dodescu and Chirilă, 2012). However, Romania faces significant challenges in implementing and expanding its regional innovation policy due to a weak innovation culture, a fragmented innovation system, and brain drain of talented graduates and researchers. Several studies have explored the potential of social innovation and smart specialisation as alternatives to regional innovation in Romania, highlighting the need for more participatory and inclusive innovation processes.

3. Research Methodology

3.1 Research design

This study uses a comparative case study approach to examine regional innovation for sustainable development in China and Romania. The case study approach is suitable for exploring complex and context-specific phenomena such as regional innovation, and generates rich and detailed data from multiple sources.

3.2 Case selection

The cases chosen for this study are the Pearl River Delta region in China and the Cluj-Napoca region in Romania. The Pearl River Delta region is a dynamic and innovative urban and industrial cluster in southern China that has undergone significant transformation and upgrading over the past decades, driven by government policies and the private sector (Wu, 2004). The Cluj-Napoca region is a fast-growing and diversified region in north-western Romania with traditional and emerging industries such as information technology, biotechnology and creative industries, and is recognised as an innovation and entrepreneurship hub in the country (Fan, Urs and Hamlin, 2019).

3.3 Data collection

Data collection for this study will rely on a variety of sources and methods, including: i) Document analysis: This will involve a review of relevant policy documents, reports and academic literature to provide a comprehensive overview of regional innovation systems and policies in China and Romania, and to identify key trends, challenges and opportunities. (ii) Survey: This will involve an online survey of selected firms and organisations in the Pearl River Delta and Cluj-Napoca regions to collect quantitative data on their innovation activities, strategies and performance, and to compare and contrast the innovation profiles and trajectories of the two regions.

3.4 Data analysis

The analysis will be guided by research questions and hypotheses, and will aim to identify patterns, relationships and insights that contribute to the understanding of regional innovation for sustainable development in China and Romania.

4. Analysis of the case

4.1 Drivers and barriers to regional innovation for sustainable development

In the Pearl River Delta region, the key drivers of regional innovation for sustainable development include strong government support and coordination that provides resources, incentives and guidance for innovation activities; a vibrant and dynamic private sector that has built up expertise, capital and networks for innovation and entrepreneurship; and a large and diverse talent pool that includes local and foreign professionals and provides a wealth of knowledge and creativity for innovation.

However, in the Pearl River Delta region, there are also significant barriers to regional innovation for sustainable development, such as intense competition and imitation, which can undermine originality and creativity; environmental degradation and resource depletion, which can threaten the long-term sustainability of innovation; and unequal access to resources and opportunities, which can create social and economic disparities.

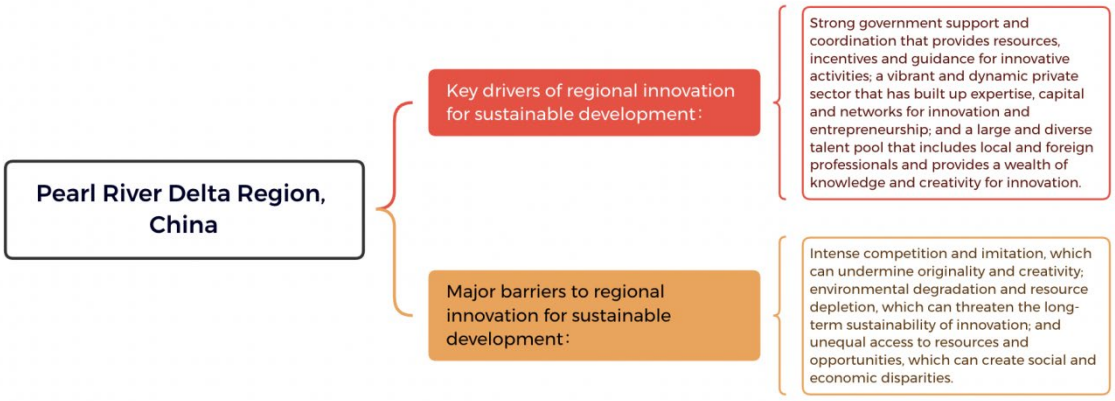


Figure no. 1. Strengths and Obstacles to Development in China's Pearl River Delta Region

Source: Authors' own research

In Cluj-Napoca, the main drivers of regional innovation for sustainable development include: EU funding and support, which provides resources and opportunities for innovation and internationalization; a growing and dynamic IT sector, which has become a major driver of innovation and entrepreneurship; and a supportive and innovative ecosystem, which includes universities, research centers and business incubators.

However, there are also significant barriers to regional innovation for sustainable development in Cluj-Napoca, such as: limited access to finance and markets, which may prevent innovation projects from scaling up; and brain drain and talent retention, which may undermine the sustainability and growth of the regional innovation system.



Figure no. 2. Strengths and Obstacles to Development in Romania's Cluj-Napoca

Source: Authors' own research

Weak linkages between academia and industry, which can limit the commercialization and dissemination of research and knowledge.

The differences in these drivers and barriers across sectors and regions are also noteworthy. For example, in the Pearl River Delta region, the manufacturing and technology sectors are more advanced and innovative than the services sector, which faces challenges in terms of upgrading and diversification. In the Cluj-Napoca region, the IT and creative industries are more dynamic and competitive than the traditional sectors, which struggle with low productivity and innovation. There are also differences and inequalities in access to innovation resources and opportunities within each region, reflecting the wider social and economic structures and dynamics.

4.2 Regional innovation systems and policies

The analysis of policy documents and key informant interviews revealed that both China and Romania have comprehensive and ambitious innovation strategies and policies aimed at promoting innovation-led growth,

competitiveness and sustainability. However, there are significant differences in the institutional arrangements, governance structures and cultural contexts that shape the implementation and outcomes of these policies.

In China, the regional innovation system is highly centralised and coordinated by the central government, which has made significant investments in infrastructure, education and research and development to support the development of science and technology parks, innovation clusters and high-tech industries in the Pearl River Delta and other regions. Government policies have also stimulated private sector investment in innovation and entrepreneurship, and fostered collaboration between universities, research institutions and industry.

In contrast, the Romanian innovation system is more fragmented. Innovation policy is largely driven by the EU funding and regulatory framework, which encourages the development of innovation centers, clusters and networks in the Cluj-Napoca region and beyond. However, the implementation and sustainability of these initiatives is challenged by the lack of a coherent innovation strategy, weak linkages between academia and industry, and brain drain of skilled professionals to other countries.

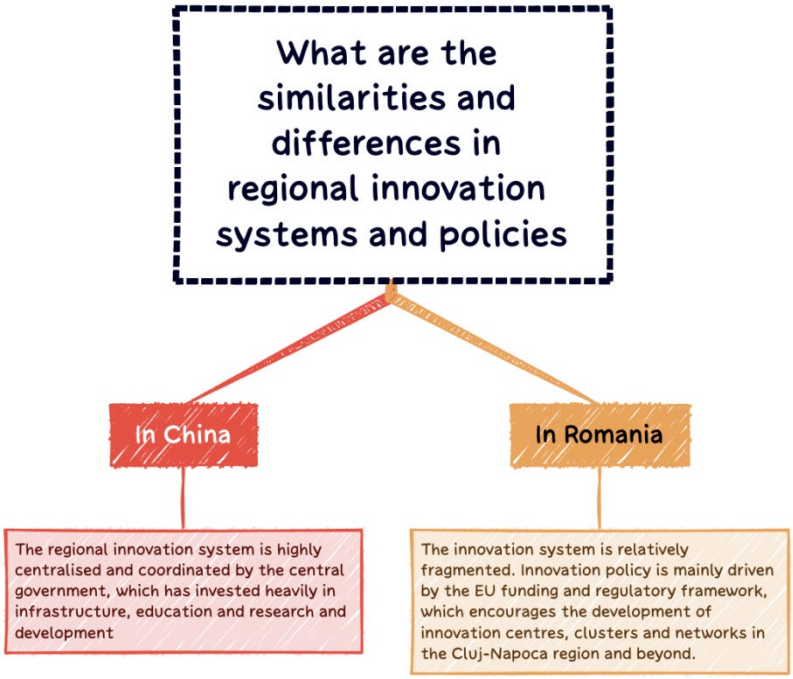


Figure no. 3. What are the similarities and differences in regional innovation systems and policies

Source: Authors' own research

4.3 Dimensions of the impact of regional innovation on sustainable development

Regional innovation can contribute to economic growth, job creation and competitiveness by leveraging the strengths and resources of each region and sector, and by promoting cooperation and synergies between different actors and institutions. However, this requires a coherent and adaptable innovation strategy that is aligned with the broader goals and values of sustainable development and involves a range of stakeholders in its design, implementation and evaluation.

Regional innovation can enhance social inclusion, equity and well-being, provide opportunities and benefits for marginalised and disadvantaged groups, and address social and environmental challenges through innovation and entrepreneurship. However, this requires a participatory and inclusive innovation ecosystem that ensures that diverse voices and perspectives are heard and valued, and that local communities and stakeholders are empowered to shape and benefit from innovation.

Regional innovation can contribute to environmental sustainability and resilience by promoting green technologies, circular economies and low-carbon lifestyles, and by reducing the environmental risks and impacts of economic activities. However, this requires a transformative and systemic innovation agenda that challenges dominant paradigms and practices of unsustainable development and promotes experimentation, learning and adaptation to cope with complex and dynamic ecological and social systems.

Regional innovation can generate knowledge, creativity and culture by enhancing the capacities and talents of individuals and organisations, and by fostering a vibrant and diverse intellectual and artistic community. However, this requires a holistic, people-centred approach to innovation that values the intrinsic and instrumental aspects of innovation and recognises the diversity and plurality of human aspirations and experiences.

Conclusions

Research Conclusion

This study presents a comparative and interdisciplinary analysis of regional innovation for sustainable development, using China and Romania as case studies.

The results show that regional innovation can be a driver of sustainable development, and these drivers include government support (including financial and platform support) and local industrial capacity for innovation and entrepreneurship (including academic and industrialisation capacity), but if these support and capacity are not protected by policies (e.g. lack of patent protection, popular market for copycat products) or if the support/capacity is not strong enough, capital and talent will flow to places with more government support and more capacity for innovative and entrepreneurial industries, becoming a barrier to regional development.

To strengthen regional innovation capabilities, effective local policies and implementation are needed to build effective innovation systems. The case studies of China and Romania show that centralised and decentralised policy management systems have different advantages and challenges, with centralisation facing large up-front investments and decentralisation facing problems in combining industry and research.

Practical application

The practical implications of the research are: to support the development of innovation clusters and networks and to promote cooperation and synergies between different actors and institutions in different sectors and regions. Develop a comprehensive and adaptive innovation strategy, aligned with the goals and values of sustainable development, and involving a range of stakeholders in its design and implementation. Integrate environmental and social sustainability into the innovation agenda by promoting green technologies, circular economies and low-carbon lifestyles, and by reducing the environmental risks and impacts of economic activities. Strengthen the links between academia and industry by facilitating knowledge transfer and commercialisation and supporting the development of scientific and technological talent and skills. Increase the capacity and capability of individuals and organisations by providing training and education programmes, mentoring and coaching, and access to funding and resources. Promote social inclusion and equity in the innovation ecosystem by ensuring diversity and inclusion in the innovation process, and by addressing the needs and aspirations of marginalised and disadvantaged groups.

Innovations and contributions

Contributes to the growing literature on regional innovation and sustainable development through a comparative and interdisciplinary analysis of the drivers, barriers and impacts of regional innovation in China and Romania. It highlights the complex and context-specific nature of regional innovation and its potential contribution to economic, social and environmental sustainability, but also the challenges and trade-offs involved. The findings and implications of this research have important implications for policy and practice and call for a systemic and participatory approach to regional innovation that values diversity, inclusion, experimentation and learning, and integrates the goals and values of sustainable development.

Research limitations and future perspectives

The impacts of regional innovation on sustainable development are complex and specific, requiring a systematic and participatory approach to policy and practice. Further research is needed to explore and test the effectiveness and applicability of these impacts in other regions and countries, and to deepen our understanding of the dynamics and interactions between regional innovation and sustainable development.

Future research in this area could focus on several areas. Firstly, it could extend comparative analysis to other countries and regions to further test and refine the validity and applicability of the drivers, barriers and impacts identified in this study. Secondly, it could examine the dynamics and interactions of regional innovation and sustainable development in different sectors (e.g. agriculture, tourism, healthcare and education) to explore the challenges and opportunities of specific sectors of regional innovation. Finally, it could explore the potential of emerging technologies such as artificial intelligence, blockchain and biotechnology in shaping the future of regional innovation and sustainable development.

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Linking National Competitiveness to Innovation at a Global Level in the Period 2019-2022

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Abstract

The rapid expansion of the globalization process worldwide has continuously shaped the post-Cold War world. It is said that the last three decades represented a period of global economic integration through financial, trade and informational channels. One of the effects of the vast spread of the globalization process was the emergence and expansion of a new type of competition, entitled hypercompetition. Characterised by intense and ceaseless change, innovative competitors and unsustainable competitive advantages, hypercompetition is practically met in all fields of activity. This is why innovation, a prerequisite of competitiveness, has become increasingly important as, in order to achieve superior economic performance, both countries and organizations should make significant efforts to constantly innovate. The goals of the paper are to briefly define the concepts of national competitiveness and innovation, and to illustrate their relationship in the case of countries in the period 2019-2022. The authors achieved the objectives of the paper through a qualitative research method. The paper provides a better understanding of the terms of national competitiveness and innovation. Its novelty is given by the fact that it demonstrates that national competitiveness and innovation are connected at a global level. In the period 2019-2022, developed capitalist countries, in their vast majority, dominated in an obvious manner the top of the world's most competitive and innovative countries. These results may help policymakers and experts who are in charge of designing national strategies.

Keywords

National competitiveness, innovation, Switzerland, hypercompetition, globalization.

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Introduction

After the fall of the European communist regimes at the end of the 1980s and the beginning of the 1990s, the world economy entered a new evolutionary phase. The rapid expansion of the globalization process worldwide has continuously shaped the post-Cold War world since then (Toma, 2005). It is said that the last three decades represented a period of global economic integration through financial, trade and informational channels (Das, 2010a). In this respect, financial globalization has rapidly advanced due to the liberalization of capital account and the massive flows of money all over the world (Das, 2010b). On the other hand, globalization has imposed the regulation of the competitive environment (Dinu, 2017).

One of the effects of the vast spread of the globalization process was the emergence and expansion of a new type of competition, entitled hypercompetition. Characterised by intense and ceaseless change, innovative competitors and unsustainable competitive advantages, hypercompetition is practically met in all fields of activity (Lindskov, 2022). This is why innovation, a prerequisite of competitiveness, has become increasingly important as, in order to achieve superior economic performance, both countries and organizations should make significant efforts to constantly innovate.

The goals of the paper are to briefly define the concepts of national competitiveness and innovation, and to illustrate their relationship in the case of countries in the period 2019-2022. The structure of the paper is as follows: the second part displays the literature review. The research methodology is exposed in the third

section of the paper. The fourth part of the paper presents the results of the research. The paper ends with conclusions.

Literature review

Hypercompetition represents a worldwide phenomenon. Facing properly this defy imposes both countries and organizations, irrespective of their size, geographical position and domain, to design and implement different strategies in their activities and processes (Toma & Naruo, 2017), based on a plethora of various concepts, techniques and methods, such as knowledge (Toma, 2011), quality (Toma, 2006; Toma & Naruo, 2009) or social responsibility (Toma, 2008; Imbrișcă & Toma, 2020).

As a multidimensional and complex notion, competitiveness can be defined at national, industry, and business organization levels. National competitiveness represents "the ability of a nation to provide conducive environment to its firms and industries in order to raise the prosperity of the nation" (Bhawsar & Chattopadhyay, 2015, p.670). There are several determinants of national competitiveness as follows (Ham, et al., 2022):

- exchange rate,
- savings rate,
- investment rate,
- national culture,
- government policy.

It can be measured through national productivity, balance of trade, labor productivity etc.

In its turn, innovation constitutes one of the main sources of national competitiveness and a country's success. It only appears if a country has not only the desire but also the capacity to innovate. This means the existence of various policies, investments, research and development (R & D) expenditures, resources (e.g., human, financial, informational) and a proper infrastructure. As a concept, innovation is referring to "both innovative ideas that are intended to be commercialized in the market and ideas that have already been successfully commercialized" (Dziallas & Blind, 2019, p.4).

The relationship between these two concepts, national competitiveness and innovation, is to be found within the Institute for Management Development (IMD) World Competitiveness ranking. It is based on four factors (economic performance, government efficiency, business efficiency, infrastructure), each of them being divided into five sub-factors. Altogether, there are 20 sub-factors that comprise 333 criteria (IMD, 2022). The factor "infrastructure" encompasses sub-factors such as total expenditure on R & D, total R & D personnel, patent applications etc.

Research methodology

To achieve the objectives of the paper, the authors employed a qualitative research method. In this respect, they detected the main sources of information (e.g., journals, yearbooks, reports) through desk research. Then, the authors gathered and classified the data by means of a literature review. Afterwards, they analysed and synthesized the information. Finally, the authors designed and wrote the paper.

Results and discussion

After the review of the scientific literature, the authors carefully analysed and synthesized all the data obtained. This led to several interesting results of their research that explained the relationship between national competitiveness and innovation.

As the economic world has increasingly become hypercompetitive in the past decades, countries all over the world made significant efforts to reach higher positions in the global arena. In 2019, Singapore was the most competitive country in the world (Table no. 1), followed by Hong Kong and the United States of America (USA). The first ten most competitive countries were from:

- Europe - five countries (Switzerland, Netherlands, Ireland, Denmark, Sweden);
- Asia - two countries (Singapore, Hong Kong);
- Middle East - two countries (United Arab Emirates (UAE), Qatar);
- North America - one country (USA).

Table no. 1. The ten most competitive countries of the world in 2019

Rank	Country	Score
1	Singapore	100.000
2	Hong Kong	97.986
3	USA	97.119
4	Switzerland	96.005
5	UAE	95.891
6	Netherlands	94.366
7	Ireland	94.218
8	Denmark	93.425
9	Sweden	92.585
10	Qatar	91.948

Source: IMD World Competitiveness Yearbook, 2019

One year later, Singapore preserved its first place in the world (Table no. 2), followed by Denmark and Switzerland. The first ten most competitive countries belonged to:

- Europe - five countries (Denmark, Switzerland, Netherlands, Sweden, Norway);
- Asia - two countries (Singapore, Hong Kong);
- North America - two countries (USA, Canada);
- Middle East - one country (United Arab Emirates).

Table no. 2. The ten most competitive countries of the world in 2020

Rank	Country	Score
1	Singapore	100.000
2	Denmark	99.496
3	Switzerland	98.373
4	Netherlands	98.352
5	Hong Kong	97.061
6	Sweden	95.866
7	Norway	94.602
8	Canada	93.506
9	UAE	93.505
10	USA	92.358

Source: IMD World Competitiveness Yearbook, 2020

In 2021, Switzerland became the most competitive country in the world (Table no. 3), followed by Sweden and Denmark. The first ten most competitive countries were from:

- Europe - five countries (Switzerland, Sweden, Denmark, Netherlands, Norway);
- Asia - three countries (Singapore, Hong Kong, Taiwan);
- Middle East - one country (UAE);
- North America - one country (USA).

Table no. 3. The ten most competitive countries of the world in 2021

Rank	Country	Score
1	Switzerland	100.000
2	Sweden	96.714
3	Denmark	96.667
4	Netherlands	96.348
5	Singapore	94.703
6	Norway	94.493
7	Hong Kong	93.538
8	Taiwan	92.602
9	UAE	89.561
10	USA	89.126

Source: IMD World Competitiveness Yearbook, 2021

The year 2022 witnessed once again the change of the leader. Consequently, Denmark was the most competitive country in the world (Table no. 4), followed by Switzerland and Singapore. The first ten most competitive countries belonged to:

- Europe - six countries (Denmark, Switzerland, Sweden, Netherlands, Finland, Norway);
- Asia - three countries (Singapore, Hong Kong, Taiwan);
- North America - one country (USA).

Table no. 4. The ten most competitive countries of the world in 2022

Rank	Country	Score
1	Denmark	100.000
2	Switzerland	98.92
3	Singapore	98.11
4	Sweden	97.71
5	Hong Kong	94.89
6	Netherlands	94.29
7	Taiwan	93.13
8	Finland	93.04
9	Norway	92.96
10	USA	89.88

Source: IMD World Competitiveness Booklet, 2022

In its turn, Switzerland dominated by far the top of the most innovative countries in the world. In 2019, the Swiss Confederation was followed by Sweden and the USA (Table no. 5). The first ten most innovative countries were from:

- Europe - seven countries (Switzerland, Sweden, Netherlands, United Kingdom, Finland, Denmark, Germany);
- Middle East - one country (Israel);
- Asia - one country (Singapore);
- North America - one country (USA).

Table no. 5. The ten most innovative countries of the world in 2019

Rank	Country	Score
1	Switzerland	67.24
2	Sweden	63.65
3	USA	61.73
4	Netherlands	61.44
5	United Kingdom	61.30
6	Finland	59.83
7	Denmark	58.44
8	Singapore	58.37
9	Germany	58.19
10	Israel	57.43

Source: Cornell University et al, 2019

One year later, the first three places of the top remained occupied by the same countries (Table no. 6). The first ten most innovative countries belonged to:

- Europe - seven countries (Switzerland, Sweden, United Kingdom, Netherlands, Denmark, Finland, Germany);
- Asia - two countries (Singapore, Republic of Korea);
- North America - one country (USA).

Table no. 6. The ten most innovative countries of the world in 2020

Rank	Country	Score
1	Switzerland	66.08
2	Sweden	62.47
3	USA	60.56
4	United Kingdom	59.78
5	Netherlands	58.76
6	Denmark	57.53
7	Finland	57.02
8	Singapore	56.61
9	Germany	56.55
10	Republic of Korea	56.11

Source: Cornell University et al, 2020

In 2021, the first four places at the top were the same as in 2020. The first ten most innovative countries were from:

- Europe - seven countries (Switzerland, Sweden, United Kingdom, Netherlands, Finland, Denmark, Germany);
- Asia - two countries (Republic of Korea, Singapore);

- North America - one country (USA).

Table no. 7. The ten most innovative countries of the world in 2021

Rank	Country	Score
1	Switzerland	65.5
2	Sweden	63.1
3	USA	61.3
4	United Kingdom	59.8
5	Republic of Korea	59.3
6	Netherlands	58.6
7	Finland	58.4
8	Singapore	57.8
9	Denmark	57.3
10	Germany	57.3

Source: World Intellectual Property Organization (WIPO), 2021

The year 2022 witnessed once again the domination of Swiss Confederation, followed by the USA and Sweden (Table no. 8). The first ten most innovative countries belonged to:

- Europe - seven countries (Switzerland, Sweden, United Kingdom, Netherlands, Germany, Finland, Denmark);
- Asia - two countries (Republic of Korea, Singapore);
- North America - one country (USA).

Table no. 8. The ten most innovative countries of the world in 2022

Rank	Country	Score
1	Switzerland	64.6
2	USA	61.8
3	Sweden	61.6
4	United Kingdom	59.7
5	Netherlands	58.0
6	Republic of Korea	57.8
7	Singapore	57.3
8	Germany	57.2
9	Finland	56.9
10	Denmark	55.9

Source: WIPO, 2022

In the period 2019-2022, developed capitalist countries, in their vast majority, dominated in an obvious manner the top of the world's most competitive and innovative countries. The above outcomes reveal some interesting matters as follows:

- The European countries monopolized the hierarchy of the ten world's most competitive countries: from five countries in 2019, 2020 and 2021 to six countries in 2022. Four European countries (Switzerland, Netherlands, Denmark, Sweden) were always present in the top in the above mentioned period. It is the same in the case of two Asian countries (Singapore, Hong Kong) and the USA.

- Singapore was the world's most competitive country for two consecutive years, 2019 and 2020. Switzerland became the world's most competitive country in 2021 whereas Denmark in 2022.

- The European countries dominated by far the top of the ten world's most innovative countries: seven countries in 2019, 2020, 2021 and 2022. The seven European countries (Switzerland, Sweden, United Kingdom, Netherlands, Germany, Finland, Denmark) were always present in the top in the above mentioned period. It is the same in the case of Singapore and the USA.

- Switzerland remained the world's most innovative country in the period 2019-2022.

Four European countries (Switzerland, Netherlands, Denmark, Sweden), one Asian country (Singapore) and the USA were not only among the world's most competitive countries but also among the world's most innovative countries in the period 2019-2022. Thus, there is a clear relationship between the world's most competitive countries and the world's most innovative countries. In essence, national competitiveness and innovation are connected at a global level.

Conclusions

The diffusion of the globalization process has brought hypercompetition all over the world. This is why the economic world has witnessed the emergence of much more fierce competition among states. Consequently, states worldwide have understood the need to increase their competitiveness in order to face the challenges raised by this new type of competition.

The paper leads to the enrichment of the scientific literature in two ways. Firstly, it provides a better understanding of the terms of national competitiveness and innovation. Secondly, the paper shows their relationship at a global level in the period 2019-2022. In this respect, it may have practical implications for policymakers and experts who are in charge of designing national strategies. Further research may identify and take into account other factors related to the connection between national competitiveness and innovation.

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Socio-demographic trends. Imagine and anticipate the societal future

Who Is More Rational During a Crisis Situation: Men Who Do Not Spend Their Money or Women Who Think About the Future?

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Abstract

The COVID-19 pandemic was one of the most important events in entire world history. This event changed and influenced human lives forever. The changes in human behavior were so relevant when the pandemic started. Furthermore, due to the recorded data and our personal experiences, research on this subject can serve as an instrument to reduce and minimize the impact of future health crises. We need to analyze, study, and draw significant conclusions to understand as much as possible how consumers reacted in order to avoid such situations in the future.

In this article, I analyze data obtained from a survey about the consumer behavior of agro-food products during the COVID-19 crisis. Specifically, I study the influence of gender on the financial resource allocation of consumers of agro-food products during the lockdown period of March to June 2020.

This analysis was performed using linear regression with binary variables. We can develop plans and safety measures based on the results and conclusions of the article. We also can use the article results and conclusion to have an image of consumer behavior toward agro-food products during health crises, to know how we can action. On the other hand, the analysis can be very helpful for retailers of agro-food products. They can develop new marketing or sales strategies based on the findings to maximize their income. These new strategies can be utilized during health crises, maximizing the opportunity presented.

Keywords

Men, women, crisis, money, the COVID-19 pandemic.

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Introduction

Many crisis situations have appeared globally since the start of the 21st century. These crises were financial or energy crises, epidemics, or pandemics. Even if most of these crises were non-military, they have impacted society (Jones et al., 2008; Reinhart and Rogoff, 2009; Rahmstorf Stefan and Coumou Dim, 2011).

All moments of crisis, regardless of their nature, have always led to fundamental changes in society. They have changed the domestic policies of states as well as international policies (Gilpin, 1981; Scheve and Stasavage, 2016).

Consumer behavior changes significantly during crises, driven by self-protection and conservation instinct (Jordà, Singh and Taylor, 2022). For example, during the COVID-19 crisis, consumers stockpiled food to reduce shopping trips and protect themselves. Similarly, the use of protective masks was widely adopted by consumers for the same purpose.

Numerous studies on consumer behavior were conducted before the onset of the most recent significant global crisis, the COVID-19 pandemic. These studies showed that changes in consumer behavior were driven by personal reasons and by the rules imposed by authorities (Wen, Huimin and Kavanaugh, 2005). The way authorities and the population respond to a crisis situation depends on the perception of the threat. The arguments and information presented about the possible threat can influence political decisions, but the response of civil society determines whether the population will adopt safety measures or not (Lipscy, 2020).

The risk perception of consumers during a crisis situation is the result of their evaluation of threats (Rogers, Cacioppo and Petty, 1983), and the possible consequences that may arise (Weinstein, 1988). This decision-making process is influenced by the level of risk exposure, costs, damages, and benefits, that consumers may accept (Dowling and Staelin, 1994).

The COVID-19 pandemic has strongly influenced global consumer behavior and disrupted the demand and supply chain of retailers. During regional and global health emergencies, certain agro-food and food products may not be as readily available as in normal periods (Sarkis et al., 2020). Thus, because of what happened, people needed to adopt changes for better functionality of alimentary and agri-food systems in these moments (Luckstead, Nayga Jr and Snell, 2021). The retailers and the distributors of some local services have became aware of their social responsibility (Pantano et al., 2020), but and the possible significant growth of their incomes through speculating these moments.

This article proposes to contribute to the study of consumer behavior of agro-food products during crises situation through three research directions. The first direction is about the specifics of the COVID-19 crisis and its influence on society, and also the consumers buying behavior when the COVID-19 pandemic began. The second direction of this study is the methodological part. The methodology involves a linear regression with binary variables. This analysis studies the consumer behavior changes in agro-food products depending on their gender, during the lockdown caused by the COVID-19 pandemic (March – June 2020), in Romania. The last part of this article are conslusions.

1. The specifics of the COVID-19 crisis and its influence on society

Human and consumer behavior is very affected directly on indirectly by the effects of epidemics and pandemics. The Black Death epidemic of the Middle Ages, or the Spanish Flu at the beginning of the 20th century, has shown how much it affected human and consumer behavior (Reeves et al., 2020). Humans have faced health crises similar to the COVID-19 pandemic throughout history, but no crisis had the same intensity.

The SARS epidemic in 2004 was an important warning. In 2020, the disease was caused by the same virus, SARS-CoV. That demonstrated how interconnected and interdependent is our society in the 21st century. It also showed how large industries, such as retail, tourism, or even global economic stability, can be severely impacted in a short period of time (Mackenzie et al., 2004).

A significant event that has once again caused changes in consumer behavior is the COVID-19 pandemic. At the end of December 2019, no one considered the threat of what was happening in China to be pertinent. Three months later, the entire planet was in lockdown (Lipscy, 2020).

The COVID-19 pandemic has remodeled all social networks between people, the way we work, how we study, consumer purchasing, and the management of free time. This has succeeded in changing consumers' ethics through their basic needs and has had a positive impact on social responsibility (He and Harris, 2020).

From an economic perspective, the Great Depression of the 1930s did not have the same effect on society as the COVID-19 pandemic has had (Euronews, 2020). The coronavirus pandemic has created a significant global recession since 2020, and the world economy is suffering greatly (Arita et al., 2022).

The percentage of material resources allocated by consumers for expenditures on food and agro-food products has increased by 5-7% in more economically developed countries. In less economically developed countries, these expenditures on food and agro-food products have increased by 50-60% (Reinhart, 2020).

The COVID-19 pandemic has its characteristics. This is very different from other health crisis situation or from other epizootic pandemics. The COVID-19 pandemic did not affect the final product as it happened during the epidemics of bird flu, swine fever, or the devastating locust attack in East Africa (Reinhart, 2020). This has affected future production due to its consequences on workers in the food industry and related branches, such as distribution, handling, and transportation of products. (Laborde et al., 2020).

More than that, the decisions made by consumers during the beginning period of the COVID-19 crisis were influenced by the quality of news and information received about COVID-19 (Laato, Islam and Laine, 2020). People had easy access to both proper and improper information about COVID-19 due to social networks and the internet. This fact differentiates the consumer behavior adopted at the beginning of the COVID-19 crisis from other crises (Abd-Alrazaq et al., 2020; Farooq, Laato and Islam, 2020).

However, this exposure of individuals to different online sources of information during the pandemic was a threat to their health. Moreover, it caused some people to develop a condition called cyberchondria (Laato, Islam and Laine, 2020).

Cyberchondria is caused by prolonged online searches made by stressed, anxious people about their health. This disease is fueled by anxiety, stress, and fear. Cyberchondria causes suffering and a very harmful mental state (Starcevic and Berle, 2013), which can lead to bad decisions and improper behavior towards oneself.

Due to the manifestation of this disease in the first months of the COVID-19 pandemic, many people are now victims of depression and anxiety (Robinson and Robinson, 2022).

2. Consumer buying behavior at the beginning of the COVID-19 pandemic

The initial moments of the COVID-19 pandemic led to a change in some consumers' habits (Pantano et al., 2020), as people tend to act more firmly and decisively when ambiguity and unpredictability are high (Brug, Aro and Richardus, 2009).

Consumers worldwide have reacted to lockdowns by stockpiling food, such as flour or pasta, as the COVID-19 pandemic rapidly spread beyond China (Mallory, 2021). This consumer habit manifested in that period appeared because of consumer emotions. When the COVID-19 pandemic first emerged, some supermarkets and stores in certain countries had to ration the purchase of certain products and implement new store programs to adapt to the situation(He and Harris, 2020).

The stockpiling behavior adopted by consumers due to panic in any situation can significantly affect the supply of agro-food products and cause abrupt changes in the supply chain (E. Upton and W. J. Nuttall, 2014). The local and global markets of agro-food products can be easily destabilized if consumers are driven by fear and start buying large quantities of products, which can interrupt the supply chain process (Peels et al., 2009). The effect of purchases made out of fear can be more detrimental to the market than the effect of any normal purchase. Such behavior can increase consumers' anxiety and disrupt the supply process (Allon and Bassamboo, 2011).

The motivation behind consumers' adoption of stockpiling behavior during the COVID-19 pandemic is quite interesting. Their behavior was not primarily driven by concerns about possible price increases or a decrease in the quality of agri-food products. Rather, the probability of infection and the need for isolation measures played a key role in driving the adoption of this behavior by consumers (Ngoc Long and Khoi, 2020).

The preferences of consumers have changed due to the rules imposed to prevent the spread of COVID-19. The purchasing of agro-food and food products had been steadily increasing between 2010 and 2020 (Harris et al., 2017), but the rate of increase exploded during the COVID-19 lockdown (Pantano et al., 2020). Although the price of agro-food products was initially not a significant factor, the COVID-19 pandemic, directly and indirectly, caused spikes in food prices (Reinhart, 2020).

The high demand and low supply determined the increase in the cost of transporting goods and the spikes in food prices. The COVID-19 pandemic determined the appearance of high inflation which contributed to the rise of food prices.

The consumers of agro-food products have adhered to the rules implemented by the authorities to combat the spread of COVID-19. They have taken specific actions against merchants, such as favoring those who promote and follow the rules while penalizing those who don't (He and Harris, 2020; Kirk and Rifkin, 2020). As a result of the pandemic, consumers started to use e-commerce in March 2020 and are more likely to patronize stores with automated processes that protect them (Jo, Shin and Kim, 2021). Furthermore, even older people and those with limited digital abilities have begun to appreciate the advantages of online shopping (Prihantoro, Satria and Hartoyo, 2018). The pandemic has accelerated this trend (Eger et al., 2021).

3. Methodology

This research aims to observe and analyze consumer behavior towards agro-food products in Romania during the COVID-19 lockdown period from March to June 2020.

Research use of a survey. The survey is a quantitative method of research. A survey is used during research to obtain and explore new perspectives on that subject. The research tool used in this survey it was the questionnaire. An online questionnaire had used in this survey. The online questionnaire has been distributed on social media. This was an anonymized questionnaire. The participants of this research were voluntary. Participation in this research did not involve any risks or benefits for respondents. The participants always had the option to quit participation without any consequences. The participants had agreed to use and process their personal information by completing the questionnaire. All received information from respondents was confidential, by ethics norms for high-quality research from the whole world. The data were collected anonymized through Google Forms.

The questionnaire aimed to collect information about consumers' behavior towards agro-food products during the lockdown from March to June 2020, caused by the COVID-19 pandemic.

The people who participated in this survey live in Romania and are over 18 years. This research could not address all Romanian populations because of material considerations. The research has a sample of 422 persons for this survey and just 95,7% / 404 of responses were eligible and taken into account. The survey had realized between April to June 2022. The survey was aimed at individuals over 18 years of age who lived in Romania. Due to material considerations, the research could not cover the entire Romanian population.

Some survey information was obtained and analyzed using linear regression with binary variables.

Regression analysis allows you to study the linear relationship between a dependent variable measured with a metric scale and two or more independent variables measured with any scale (Cătoiu et al., 2009; Jemna, 2017). Regression analysis is commonly used for two purposes. The first purpose is to make predictions and forecasts (Cook and Weisberg, 1982). The second purpose is to determine the causal relationship between the dependent and independent variables (Freedman, 2005). When conducting a regression analysis, it is important to be careful about the data used in the analysis and the reporting of variables in (Jemna, 2017).

The regression equation with binary variables is a simple linear regression where the independent variable is coded into two categories. Binary variables are qualitative variables composed of two opposite values (such as yes/no or present/absent) (Cătoiu et al., 2009).

The name 'binary variable' comes from encoding the values of an independent variable into variables divided into two categories by assigning a code of 0 and 1, or 1 and 2, etc., depending on what they represent. Encoding by 0/1, 1/2, etc., allows these variables to be used in procedures designed for higher levels of measurement (ordinal, interval) (Cook and Weisberg, 1982; Freedman, 2005).

This regression aims to analyze the consumer behavior of agro-food products during the COVID-19 pandemic lockdown (March - June 2020), taking into account the consumer's gender (male or famale). The objective of the regression is to determine which category of consumers increased their spending on agro-food products during the lockdown period.

The regression variables are the dependent variable: the increase in the degree of allocation of material resources for agri-food products during the COVID-19 pandemic lockdown (March 2020 – June 2022). This is represented by Question 11 of the survey questionnaire.

The independent varible is an independent binary predictor: gender, as represented by Question 23 of the questionnaire. The gender variable is coded into two categories: male gender (1) and female gender (2). These two categories are also binary variables used in the analysis.

In this research situation, the researcher, when making the decision to enter these indicators into the regression equation formulates two hypotheses to predict which of the binary variables, male gender and female gender, increased the degree of allocation of material resources for purchasing of agri-food products from the lockdown period (March - June 2020) caused by the COVID-19 pandemic.

Hypothesis 1: Male gender has a greater effect on the degree of allocation of material resources to buy agri-food products during the lockdown (March 2020 - June 2022) caused by the COVID-19 pandemic than female gender.

Hypothesis 2: Female gender has a greater effect on the degree of allocation of material resources to buy agri-food products during the lockdown (March 2020 - June 2022) caused by the COVID-19 pandemic than male gender.

Only Hypothesis 1 will be analyzed in this study because the regression equation is a simple one, with only one independent variable.

The dependent variable, as shown in Table I, is a numeric variable measured on a 5-point Likert scale, where 1 represents "totally disagree" and 5 represents "totally agree". The independent variable, consumer gender, as shown in Table I, is a binary variable measured on a nominal scale, where 1 represents male gender and 2 represents female gender.

The data were analyzed using SPSS version 28.0.1.1 (14).

Table no. 1. Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	The male gender	.	Enter
a. Dependent Variable: Have you allocated a larger part of your income to agri-food products during the lockdown (March 2020 – June 2022) caused by the COVID-19 pandemic?			
b. All requested variables entered.			

Source: author's own processing

The multiple correlation coefficient obtained, as shown in Table II, is .750. This result indicates a strong positive correlation between the dependent and independent variables. The value of R Square / R^2, which is 56.3%, represents the proportion of the variance in the dependent variable that is explained by the independent variable. Therefore, the binary variable of consumer gender explains 56.3% of the variation in the degree of allocation of material resources for agri-food products purchased during the lockdown period (March - June 2020) caused by the COVID-19 pandemic.

Adjusted R Square, as shown in Table II, is .562, which indicates a good result. Adjusted R Square is a modified version of R Square that takes into account the number of predictors in the model. It is generally considered a better measure of model fit than R Square alone because it penalizes the inclusion of unnecessary predictors in the model. Therefore, the binary variable of consumer gender explains 56.2% of the variation in the degree of allocation of material resources for agri-food products purchased during the lockdown period (March - June 2020) caused by the COVID-19 pandemic, after adjusting for the number of predictors in the model.

The standard error of estimate represents the standard error estimate for this regression and shows the accuracy of the prediction model, as shown in Table II. How much the errors of the estimate are lower, the prediction result is better. The result for the standard error of the estimate is 0.822 in this analysis.

Table no. 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750a	.563	.562	.822
a. Predictors: (Constant), The male gender				

Source: author's own processing

The Coefficients table, see Table III, includes the individual regression coefficient (B), which signifies the degree of contribution of the predictor variable value to the regression line.

Table no. 3. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.654	.048		76.727	<.001

	The male gender	-2.117	.093	-.750	-22.764	<.001

a. Dependent Variable: Have you allocated a larger part of your income to agri-food products during the lockdown (March 2020 – June 2022) caused by the COVID-19 pandemic?

Source: author's own processing

The individual regression coefficient (B), see Table III, havs a value of -2.117.

The value of -2.117 means that, on average, male consumers allocated 2.117 units less (on the 1-5 Likert scale) to the purchase of agri-food products during the lockdown period (March-June 2020) caused by the COVID-19 pandemic, compared to female consumers. This suggests that female consumers were more likely to allocate a higher proportion of their income towards agri-food products during the pandemic compared to male consumers.

It's important to note that this result is based on the specific sample used in the study and may not generalize to other populations.

The value of t, as shown in Tabel III, is -22.764. This t present the significance of the difference betwen the coeficient and 0.

If we want to see if is a liniar relationship between dependent and independent varibale and to determinate this relationship, we need to see the result o from the ANOVA test, see Tabel IV. The F-value obtained in this regression is 518.189, as shown in Table IV, and the significance level is less than 0.05 with Sig. <0.001. These values indicate that the independent variable is significant for estimating the dependent variable, and therefore reject the hypothesis that male consumers allocated a higher share of their income to purchase agri-food products during the COVID-19 pandemic lockdown (March – June 2020).

Tabel IV: ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	350.291	1	350.291	518.189	<.001[b]
	Residual	271.748	402	.676		
	Total	622.040	403			

a. Dependent Variable: Have you allocated a larger part of your income to agri-food products during the lockdown (March 2020 – June 2022) caused by the COVID-19 pandemic?

b. Predictors: (Constant), The male gender

Source: author's own processing

Conclusions

This analysis can be useful from several perspectives. On one hand, it can provide valuable insights to authorities who can create action plans and safety measures to address the purchasing behavior of women during health crises. On the other hand, it can be useful to agro-food merchandisers and retailers who can develop new marketing and sales strategies during health crisis situations. Athough, it is important to note that ethical considerations should be taken into consideration.

The limitations of this research include the number of participants in the survey, their geographic location, and the period when the survey was conducted (April-June 2022), as it does not reflect the lockdown period which occurred two years ago.

Despite its limitations, this research is relevant as it identifies consumer emotions as the main cause of the problem. In the future, I intend to write more on this topic and study the behavior of producers and distributors of agro-food products during the COVID-19 lockdown.

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The Nexus Between the Travel Trends of the Young Generation and Ecotourism Development in the North East Region of Romania

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Abstract

Taking into account that tourism is one of the main contributors to environmental pollution and deterioration, currently it is important to promote forms of travel with low environmental impact. Thus, ecotourism is often promoted as benefitting local destinations through income generation, employment and direct support for the conservation of key tourist attractions. Research supports the fact that this type of tourism influences environmental attitudes and knowledge, and eventually consumers' behaviour. Therefore, this study is a qualitative research, which aims to study the nexus between the travel trends of the young generation and ecotourism development in the North East Region of Romania. In this sense we applied structured interviews to a sample made of representatives of institutions and organisations in the field of tourism in the North-East Region (NE) of Romania. The results showed that there is an increase of the degree of awareness of local natural and cultural values, through the development of infrastructure and tourism products, through the promotion of the area, through the development of ecotourism and awareness of the importance of protected natural areas. The study represents a contribution to the literature with a growing interest in a subject about younger generation and the development of ecotourism.

Keywords

Travel trends, ecotourism development, young generation, NE Region of Romania.

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Introduction

According to researchers who use the systemic method of tourism research, the vital activity of the tourism system is impossible without interaction with the natural environment, therefore, the ecological aspect of the study of tourism as a system has great relevance (Platon, 2017). The ecological approach to tourism is due to human awareness of its disproportionate development. Thus, according to Cooper et al. (2016), tourism consumes natural resources, and in the centres of mass tourism, this process acquires a predatory character, so the destruction of the natural environment leads to a decrease in tourism production. Therefore, with the help of tourism development management and clear planning, the aim is to reduce the negative impact and increase the positive impact. Visitor management tools are used to manage tourist flows in order to maintain an ecological balance. Thus, visitor management monitors travel time (maximum length of stay, visit time), types of visits (sports allowed, etc.) or intensity of use of the region (maximum number of visitors allowed) (Coroș, 2015).

Over time, people became increasingly aware of its effects on the environment, the various effects of travel being environmental, social and economic. The evolution of transport and information technologies led to accessibility in less populated areas, which contributed to a rapid rise of tourism in natural areas. According to March 2017 statistics, 93% of Chinese tourists stated that they were more interested in choosing a destination knowing that it was environmentally friendly (Statista, 2017).

In this context, ecotourism is a form of tourism which has become the best solution in tourism development. Thus, Hunt and Stronza (2011) described the rapid growth of ecotourism over the past three decades.

Taking into account the previous research, the purpose of this study is given by the novelty of carrying out an analysis on the nexus between the travel trends of the young generation and ecotourism development in the NE Region of Romania. Such a study has not yet been carried out in the Romanian area, and can be an important contribution to the literature. The content of the paper proposes in the first part an analysis of ecotourism and its benefits, in the second part we present the research methodology with the research method and the description of the research area, then we discuss the results of the study, and in the last part of the paper we present the conclusions regarding the nexus between the travel trends of the young generation and ecotourism development in the NE Region of Romania.

1. Review of the scientific literature

Ecotourism is a form of tourism in which the tourist's main motivation is the observation, appreciation of nature and local traditions related to nature, which refer to: conservation and protection of nature, use of local human resources, educational character, through the awareness by tourists and local communities of a minimal negative impact on the natural, social and cultural environment (UNWTO, 2019). The tourism industry nowadays offers more destinations, tours and attractions. Consequently, it has caused major environmental problems, for example, waste increase, deforestation, modification of the coastline, loss of habitat for many species, etc. Today, ecotourism provides a better way to manage resources and offers an ideology based on the environment (Ramírez and Santana, 2019). Ecotourism contributes to the protection of species and their habitats either directly through conservation or indirectly through the generation of financial resources for local communities in order to make them appreciate their value and consequently protect them as income sources (Goodwin, 1996). Moreover, ecotourism represents responsible travel in natural areas which conserves the environment, supports the well-being of the local population, and engages in education (TIES, 2015). For Fennell (2003), ecotourism is based especially on the appreciation and knowledge of nature, which enjoys a low impact, without consumption, oriented to support the local community. Ecotourism usually takes place in natural spaces and necessarily contributes to their preservation and protection. Ecotourism means more than books and albums about fauna, binoculars, or folk art displayed on the walls of hotels and restaurants, it is a constant concern for the protection of landscapes, by supporting peoples' cultural tradition (Koens, Dieperink and Miranda, 2009). For Cusick (2008), the objective of ecotourism is to provide support for environmental conservation and economic development of communities residing in the destinations and nearby. Thus, ecotourism creates an opportunity for people to enjoy the natural world, while learning to be aware of how they behave in destinations where flora, fauna and culture are the main attractions (Tenney, 2019). In this context, Tenney (2019) shows that ecotourists rate hiking as their most preferred activity while traveling.

Compared to other destinations, Romania is differentiated by elements of intact nature, unique cultural heritage and authentic rural lifestyle. This makes Romania a country for which the main attributes associated with the destination given by foreign tourists who visited it or who know people who visited it are: authentic, rural, hospitable and green (Cozma, Coroș and Pop, 2021).

Therefore, ecotourism enjoys several benefits, such as:

- Ecotourism provides a direct economic contribution through job creation and indirect benefits through the financing of protected areas (Boley and Green, 2016). The jobs specific to ecotourism are mainly the permanent ones intended especially for local people who offer their services in hotels, restaurants, transport and sales of arts and crafts. In addition, ecotourism supports the establishment and maintenance of protected areas and supports some residual profits to local communities (Kiper, 2013). The study conducted by Farooquee et al. (2008) shows that local people are employed part-time for jobs such as: cooks, drivers, guides and workers, which is an important economic benefit for local communities through increased sales. In Costa Rica, Koens, Dieperink and Miranda (2009) found that the practice of ecotourism led to the growth of the local economy, increasing income from money spent in hotels, restaurants and souvenir shops.

- Ecotourism offers direct socio-cultural benefits from the provision of facilities and skill development and indirect benefits from the development of marginalised groups, promotion of local culture, encouragement of community organisation, improvement of education and greater control of natural resources. Ecotourism produces direct benefits through the improvement of medical services and various government programs, with the purpose to promote some areas as ecotourism destinations (Koens, Dieperink and Miranda, 2009; Boley and Green, 2016). The promotion of local culture has economic, psychological and

social contributions (Scheyvens, 1999). Community-based ecotourism programs encourage community organisation in ecotourism development plans and organisations to allocate community funds generated through ecotourism. Such programs also refer to the support of young people to have more educational opportunities (Koens, Dieperink and Miranda, 2009; Namgyl, Belsky and Siebert, 2014; Boley and Green, 2016).

- Ecotourism offers environmental benefits through the direct impact on nature conservation and the indirect impact on environmental education (Koens, Dieperink and Miranda, 2009). Ecotourism is directly related to the well-being and conservation of natural environments (Boley and Green, 2016). Thus, ecotourism development promotes the ability to preserve local areas, natural resources, being a means of income generation (Bosak, 2008; Namgyl, Belsky and Siebert, 2014; Regmi and Walter, 2016). The nexus between ecotourism and natural resource conservation is often described as symbiotic (Boley and Green, 2016). This nexus refers to the benefits which destinations receive as a result of the protection of quality natural resources, ecotourism emphasising conservation, education, responsibility and the active involvement of the local community (Martins and Silva, 2018).

2. Research methodology

The purpose of this study is to analyse the nexus between the travel trends of the young generation and ecotourism development in the NE Region of Romania.

The research method used is the qualitative method, which used the interview as a research tool. For this study, we collected 11 interviews, with the participation of representatives from 11 institutions in the field of tourism. These institutions have been coded, using the code R1 to R11, with the aim of protecting the data and their identity. The interviewees responded to a structured interview which was conducted by a moderator who aimed to analyse in detail the perceptions, motivations, attitudes, opinions of the participants in the discussion.

The research area concerned the NE Region of Romania, which is part of the historical region of Moldova, having a total area of 36,850 km^2 and a resident population of 3,157,192 inhabitants (January 1st, 2021). The NE Region is the largest of the eight development regions of Romania and has an important tourist potential, which can be compared with other national and international tourist regions (Agenția pentru Dezvoltare Regională Nord-Est, 2022).

3. Results and discussion

In the following, we present the synthesis of the answers obtained after the application of the 11 interviews. Thus, with regard to *the measures taken to protect the environment*, we considered *the determination of the importance of tourism in the NE Region of Romania*. Thus, the respondents' opinion was that tourism in the NE Region was very important, especially since this area had a natural and human potential which must be capitalised. This region *needs tourism* (R6), *it is a motor branch* being *a poorly developed region from an economic and industrial point of view* (R7). *Along with the quaintness of the region, the well-known hospitality, popular traditions, customs, the specifics of traditional Moldovan gastronomy, wine tastings from the Cotnari and Huși vineyards give local colour to attract tourists* (R1). *The region has a very large natural capital which must be capitalised, especially in the conditions of the disappearance of some industry branches* (R4). *Tourism is a very important field of activity in the NE Region of Romania, through the allocation and use of human and material resources, in order to obtain financial income for the population of this area* (R9). Tourism is an activity through which *numerous European funds can be attracted* for the rehabilitation of *tourist attractions in the region* (R11), *the NE region being rich in history, tradition, natural, cultural, spiritual monuments, etc.* (R8). *These aspects make it attractive both for locals and for people visiting this area. In addition, the industry is not very developed in this area. Therefore, it is beneficial to use these advantages for the region to have economic benefits.*

Next, we identified *the positive effects due to the practice of tourism in the NE Region of Romania*. The respondents primarily identified the positive effects of tourism development in the research area. Thus, the answers provided by R1 and R4 refer to: *the creation of new jobs, the possibility of capitalisation of products from local farms, the development of road infrastructure, the construction of new tourist accommodation structures, new leisure opportunities, the promotion of small industries of handicrafts, increasing the income of local residents through the sale of local production*. The answers provided by R3 refer to the effects of tourism development in Iași County. Thus, we found the appearance and the need of *new tourist accommodation units and restaurants, customer orientation, quality services, etc. Some*

investments also have this tourist component in mind, for example a park (Palace Complex) which attracts a certain category of tourists. *The local administration is keen to attract tourists by carrying out some projects, for example the restoration of the streets in Copou - Breazu, the development of the central pedestrian area - "Cultural Axis"*. Respondent R11 believes that it is necessary *to create a niche for the souvenir manufacturing process*. *The infusion of capital and know-how from the NE Region facilitated the rapid development of the area from a tourism point of view and created a model for other regions in Romania to follow* (R6). Thus, *tourism is a very important branch of the economy which can make a small area become a point of attraction for tourists, and the income resulted contributes to its considerable development* (R2), *which implies a better living standard for the community* (R6).

In order *to identify the negative effects due to the practice of tourism in the NE Region of Romania*, we considered the answers provided by R2, who believes that *an inadequate development of tourism, especially in the communities adjacent to the protected areas and beyond can represent a potential threat to the quality of the landscape and the maintenance of the quality of nature*. Emphasis was also placed on: *increasing environmental pollution, increasing waste, destruction caused by tourists, changing rural landscapes and overcrowding the area and the roads* (R1, R4, R7, R11). The perspective of respondent R3 regarding the negative effects in the area is that *Iași is perceived as an expensive city and there are not many tourists, so it is not likely to have negative effects*, while respondent R5 considers that *a minus in any tourist area in Romania is the fact that the more tourists in an area, the more trash thrown away randomly*. An important negative effect is also the overcrowding of tourist destinations, aspect which is mentioned by respondent R7, who considers that there is an *overcrowding of the main communication routes, especially of the roads in full season. The tendency to approach traditions, culture, spirituality is more commercial, and is not at a deep, qualitative level* (R8). Respondent R10 noticed a *much-increased pressure on the values of the natural protected area and an increase in the share of visitors who do not have a connection with/or a good understanding of mountains or natural values*.

Next, we identified *the travel trends of young tourists belonging to generation Z*. Thus, we can see a trend of young people towards ecological practices, *young people are beginning to be concerned with ecological practices and to be aware of their value.... Young people are more concerned with the actions of waste recycling, they behave with care towards nature, participate in voluntary activities to ecologise some areas, they are concerned with keeping the environment as clean as possible* (R1). Respondent R2 identified the fact that *the owners of tourist accommodation structures believe that there are more and more young "eco-tourists"... It is not known if they do it out of conviction or because it is a trend. It is a trend to exercise on a bike, to visit, to hike, to do extreme sports, and then to post photos on Facebook, Instagram, etc.*

Respondents R3, R5 and R7 stated that the new generation is more interested in ecological practices, because *young people are more environmentally responsible, they use an application instead of a paper map, in the means of transport they scan a virtual code and no longer buy a printed code. Young tourists are interested in outdoor activities, they are consumers of ecotourism activities and participate in volunteer activities.* At the same time, the representative R11 mentioned that *they did not notice that young tourists were interested in ecological practices. The lack of early education in the spirit of respect and love for nature still keeps most of the young people away from realising the importance and beauty of practicing ecological tourism. Fortunately, children's participation in ecological actions gives us hope that the future is in good hands, because,* they say, *we can see the joy in their eyes when they plant their first fir tree, when they feel useful and important, when they clean a riverbed, when they learn about medicinal plants and find out how important they are for people's health* (R6). Respondent R8 noted an increase in the interest and attention to the environment both in young people and in the adult population. Additionally, *young tourists are interested in ecological practices* (R10)*, but not more than Millennials* (R4). According to respondent R1, *several forms of tourism practiced by young people* could be identified. Thus, young people like *adventure tourism, tourism within mobility programs and educational tourism*. R2 conducted a study two years ago from which it emerged that *the ecotourism destination was considered a holiday destination with an average stay of over 3 nights, the preferred area was the rural one, and the tourists' preferred activities were hiking, horse riding and alpine skiing, with young people especially preferring to travel in groups (4-6 people). Today's youth are looking for emotions, intense experiences, fun and unique experiences. Long and static holidays turn into shorter but multiple holidays: city breaks in which they experience the way of life, culture and entertainment of Romanian or European cities, weekend tours to the mountains or the sea or entertainment in the city/locality of residence* (R6). *The research shows that young people are paying more attention to traditions, to the local specifics, they are looking to spend more time in nature... They are looking for more trips with close people, and in smaller groups* (R8).

During the Covid-19 pandemic, we could see a change in tourists' travel trends. Respondents R1, R3, R5, R7, R8 and R11 noticed that *the young generation of tourists went on trips in the country in greater*

numbers, they were oriented more towards rural tourism, towards nature and local specificity, they looked for tourist destinations as secluded as possible and chose less visited and less crowded tourist areas. The tourism period during the crisis *can be considered beneficial for domestic tourism,* but still, *currently the choice of a holiday destination is strictly related to the rules/restrictions specific to the pandemic period and not necessarily to what tourists really want* (R2). The same remark was made by respondents R4 and R6, *the change is due to the legislation, the effect of the lockdown, the changes in destinations were rather imposed by the travel restrictions and not necessarily by the change in tourists' mentalities or travel preferences*.

Tourists' environmental attitude has been different lately. In this sense, we could see a greater care of young people towards the environment. *Tourists were more careful with the environment, especially that category of young people who practiced mountain tourism. Thus, the amount of waste thrown into nature was reduced* (R1). Respondents R4 and R10 support the same idea, *tourists no longer leave waste in nature as much as they used to*. The representatives R3, R5 and R7 found a different attitude of tourists towards the environment due to the educational campaigns carried out in the mass media, the efforts of the local public administration for selective collection, they no longer take maps or brochures for each member of the family. *Thus, we could see an improvement in tourists' environmental behaviour.* An important example would be: *the responsible use of services and resources made available in hotels (water, towels, electricity) and restaurants.* Another example is about *the increasingly frequent use of bicycles, when the weather permits, for the movement of tourists in the visited areas* (R6).

There are also contradictory opinions regarding tourists' environmental attitude and behaviour. Respondents R2, R8, R11 did not notice an improvement and did not notice very big changes in tourists' behaviour, *comfort at the tourist destination is more important for tourists*.

Ecotourism has gained more and more followers. Thus, their number is considered to increase... The Covid-19 pandemic has led to a change in tourists' travel preferences (R1). *I don't want to believe that the efforts which we and the school teachers and many parents are making to bring this concept to the fore will remain without results* (R2). *There is a growing trend of trips for ecotourism purposes*, an aspect observed by the representatives R3, R5 and R7, *especially if in the future there are influencers to promote ecotourism, if there are comfortable conditions and of course if the tourist destinations are advertised. I think that young tourists, especially those with children or who live in big cities and miss country life, will choose to travel more in nature, to have authentic ecotourism experiences, specific to country life. We also observed an increased interest in traditions and crafts* (R8). *We are optimistic that in the future tourism will be practiced with more care and respect for nature. Like us, the younger generations have the opportunity to experience climate change, and the awareness of the risks will lead to a change in their mentalities and to the practice of ecotourism in increasing numbers* (R6).

In addition, the benefits of developing ecotourism in the area *will be an important source for the local population* (R9), but for this we must *contribute to education in this regard* (R10).

Next, we can see that there is a trend of young tourists who are willing to pay more to benefit from green products and services. *The price factor is still very important for young tourists. It is considered that in Romania it will take a long time before young people will be willing to pay more to benefit from ecological accommodation and services* (R6). Thus, *tourists are willing to pay more for ecological accommodation, but also for healthier food. Of course, not all tourists, but only those who want these services/food (there is a segment). Thus, we can see a growing trend in the purchase of these types of services/food, the Covid-19 pandemic has thus influenced the consumption of these categories of services* (R1). *Young tourists who have their own sources of income, and if they have an income above the average, they are willing to pay more for ecological accommodation* (R8). Therefore, 5 out of 11 respondents are *uncertain in this regard*, the respondents *do not have information in this regard and did not notice a tendency on the part of young people to make additional costs to benefit from ecological products and services* (R4, R7, R9, R10 and R11). Other respondents (4 out of 11 people) consider that *generation Z tourists are willing to pay more to benefit from ecological products and services* (R1, R2, R5 and R8) and only 2 of the respondents support the fact that *young people are not willing to pay more for green products and services* (R3 and R6).

Regarding tourists' interest in local authenticity and other services, we can see that young tourists tend to be eager for knowledge, thus appreciating *traditions, handicrafts, folk wear and costumes, as well as traditional culinary products* (R1, R2, R3, R4, R5 , R6, R7, R8). The vast majority of respondents noticed an appreciation and *inclination of young people towards local culinary authenticity*. Handicrafts are highly sought after by young tourists, such as: wood carving, egg painting, traditional ornament and cloth sewing, wood/glass/stone painting (R2). This tendency was also noticed by respondent R7. *Young tourists like to eat traditional food, participate in branches, bicycle tour, practicing cyclotourism. They are interested in*

activities specific to the area, they spend time in adventure parks and are willing to stay in a tent (R3). Respondent R11 believes that *mature or older tourists are more interested in local authenticity than young ones.* Thus, *professional experience has proven to me that young people are attracted to local traditions and authenticity as much as they can also benefit from modern entertainment* (R6).

Regarding *the measures/solutions practiced by institutions and organisations in order to protect the environment,* we offer in the following some of the opinions of the respondents included in this research.

The institution represented by R1 is concerned *with raising the awareness of the rural population regarding the environmental protection; organises and participates in ecologisation activities, together with voluntary organisations*. The institution represented by R2 is a partner in a project initiated by the Romanian Ecotourism Association (AER) called "For Eco and Tourism - a civic initiative to clean up nature in Romania (PET Romania)". The project addresses an acute problem in rural areas, as well as in natural areas: improper disposal and storage of non-degradable waste. The institution represented by R3 is involved in several projects such as: *Come and meet my city!*, *Beautiful Moldova*, *S.T.E.P in Tourism*, *The project with ecological bicycles supports the issue of ecologisation*. The institution represented by R4 and the one represented by R5 are not involved in local projects which address the issue of ecologisation. The organisation represented by R6 frequently deals *with activities of sanitisation of mountain trails and around the city, always accompanied by young people and children. They participate whenever they are requested in ecologisation activities, but also in symposia and events of an informative or educational nature. They collaborate with local institutions and other NGOs.* The institution represented by R7 is involved in *the issue of ecologisation through the selective collection of waste, and in the past, it completed the project Ecologisation and monitoring of the protected areas around the monuments belonging to the national heritage and UNESCO - Suceava Monasteries*. The association represented by R8 *carried out ecologisation activities either at the organisational level or through the involvement of volunteers*. Now they are working on a *sustainability guide* which is available to partners, but also to local communities, to make them more aware of the recommended behaviour in relation to the environment. *Solutions are also being sought to raise awareness about selective collection*. The agency represented by R9 is involved in the *Let's do it Romania!* campaign, year after year participating in the *ecologisation of various areas around Piatra Neamț Municipality*. It collaborates with various educational institutions within the Eco School project. The park represented by R10 is involved in local working groups *to reduce waste pollution in the Izvorul Muntelui lake area*. The organisation represented by R11 is frequently involved in *local ecologisation projects*, such as the project regarding t*he participation of 150 high school students from Vaslui in an action to ecologise the border areas of the city*. Another project refers to *ecologisation activities on the Delea watercourse in Vaslui*, performed on the occasion of *World Water Day* and *Let's do it Romania*.

Finally, this study *identified ways to promote aspects related to ecology and the measures to be taken in the future for ecotourism development*.

Thus, we could see that the vast majority of tourism institutions and organisations in the NE Region of Romania promoted on their website aspects related to ecology and environmental protection and the consumption of healthy local products. The institution represented by R3 at the time of this study was in the process of rebuilding the page, going to integrate aspects related to ecology and environmental protection in its new format. There are also organisations from the NE Region of Romania which do not promote aspects related to ecology and environmental protection, among which we mention R5.

Here is the opinion of respondent R8 - *We mainly focus on tourist promotion and information, but aspects related to the environmental protection are also promoted, especially since a large part of the destination area overlaps protected areas* (R8). Moreover, ecotourism wants to become an opportunity for learning and knowledge. Thus, visitors must benefit from access to information regarding the visited area, have the opportunity to learn new information about the natural values of the area, its history, traditions and customs, etc., both through non-personal means and directly, from the tourism operators with whom they come into contact, as well as from the locals.

In the following we present some of the measures to be implemented in the future for ecotourism awareness by R1. They are: *raising the awareness of the local population regarding ecotourism* - in the professional training courses which R1 runs, aspects related to ecology, environmental protection, gastronomy, agritourism and ecotourism are presented. R1 *will run ecological actions based on the Via Transylvania route - for the environment and food*. There is a tendency to promote ecotourism initiatives in the area *by organising awareness campaigns among young people, camps and thematic trips to which the participants will always respond when they are asked for help* (R6) and *will develop partnerships* (R7). The association represented by R8 is responsible for measures such as developing local collaborations between local and regional partners, looking for resource persons who can get involved in promoting the destination,

preserving local authenticity, offering unique experiences, initiating activities and campaigns of awareness on the local community, as well as the periodic evaluation of the stage of involvement in ecotourism activities.

In conclusion, we offer the opinion of the representative R2, who believes that *the promotion of natural, human and cultural values plays an extremely important role and will continue to be done in the most professional way possible*. *In the short term, a plan will be considered to diversify the range of ecotourism services and packages and/or programs offered to tourists*.

Thus, people's tendency should be to practice sustainable, responsible tourism, ecotourism, which does not lead to the degradation of the environment through its activities. This trend can also be observed globally. Thus, the tourism development actions of some regions should be implemented taking into account the future of tourism and the local conditions and particularities which determine the current and potential state of the development of some regions (Ianioglo and Rissanen, 2020).

Conclusions

The analysis context of this study provided an overview of the nexus between the travel trends of the young generation and ecotourism development in the NE Region of Romania. Even if in the literature the profile of the sustainable tourist does not have a standard typology (Butnaru et al. 2022), the results of this study show that tourists from the young generation tend to have values regarding options for practicing ecotourism and protecting the environment. Thus, we can see that there is a tendency among young tourists to practice tourism based on a responsible attitude towards the natural values of the area, as well as a tendency to increase the purchase of ecological services and products.

In addition, based on the 11 interviews applied to representatives of tourism institutions and organisations from the NE Region of Romania, we identified some of their activities which were oriented to the benefit of the entire area, with the purpose to contribute to the increase of the degree of awareness of local natural and cultural values; development of infrastructure and tourism products; promotion of the area; promotion of other local products; promotion and development of ecotourism and public awareness of the importance of protected natural areas; preservation of local cultural values; development of a healthy lifestyle by promoting mountain tourism; organisation of professional training programs.

Even though this study brought to the fore some interesting results, there are limitations in how the information obtained from the respondents can be generalised, since the sample used in the analysis included 11 interviews answered by representatives of tourism institutions and organisations in the NE Region of Romania. Therefore, we obtained the information in a single research stage, with some respondents giving short answers lacking pertinent arguments. In addition, there were questions which the respondents did not answer due to the lack of information about certain aspects, as well as situations where the respondents were oriented to give favourable answers regarding the travel trends of the younger generation. In this context, we believe that this research tool could be further improved and retested.

This study represents a contribution to the literature with a growing interest in a subject, in a field in which, at least until now, there is no significant number of studies in the Romanian literature.

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The Correlation Between Motivation and Employee Satisfaction in the Service Industry

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Abstract

This paper aims to analyse the correlation between the two dimensions of motivation (intrinsic and extrinsic), rewards and recognition, and employee performance, being one of the first studies to tackle this problem in the context of the service industry of Southern Romania. The data was collected using a quantitative survey of 161 employees from various service industries, such as retail, hospitality, healthcare, and professional services. The results were analysed using partial least square structural equation modelling (PLS-SEM) using SmartPLS4.10 software. Our findings have shown that there is a strong, positive relationship between intrinsic motivation, on the one hand, and extrinsic motivation, on the other hand, and employee satisfaction, as well as between rewards and recognition and extrinsic motivation. Moreover, our research did not find a significant correlation between rewards and recognition and intrinsic motivation, maybe due to the way reward and recognition (RR) was constructed, most items being related to financial, tangible rewards, which tend to have a more significant influence on extrinsic motivation (EM) rather than intrinsic motivation (IM). Our findings might be of use for service managers to better understand how to motivate their employees in order to ensure their maximum performance.

Keywords

Intrinsic Motivation, Extrinsic Motivation, Rewards and Recognition, Job Satisfaction, Service Industry

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Introduction

There is a myriad of exploring employee motivation, Herzberg's (1966) hygiene theory being one of the most important. This theory is based on the fact that there are two types of factors that influence employees' job satisfaction: intrinsic factors or motivators (the task's appeal, the feeling of achievement, being recognized by your co-workers and supervisor, responsibility, and personal development) which, when present, lead to employee satisfaction and extrinsic or hygiene factors (wage, promotion opportunities, the managers' supervision style, work climate, and inter-personal relationships with colleagues) which, when absent, lead to employee dissatisfaction (Herzberg, 1966).

Our paper aims to study the relationship between rewards and recognition (RR), extrinsic motivation (EM), intrinsic motivation (IM), and employee satisfaction (ES) in the context of the service industry of southern Romania. In order to achieve our research goal, we have tested four research hypotheses on a sample of 183 service sector employees. Our results are showing that both dimensions of motivation (IM and EM) have a strong and direct influence on the employees' satisfaction, while the RR system only influences EM; no significant relationship has been found between the RR system and IM.

The main contribution of our research consists in testing the relationships between the aforementioned variables in the context of the service industry of southern Romania, being one of the first studies which tackles the relationship between motivation, satisfaction and performance in this particular context.

The literature review section addresses the results of the most important studies on this subject, being followed by the description of the research methodology used in this particular case and the discussion of the results of our particular research.

1. Literature Review

Nahavandi and Malekzadeh (1999), mentioned by Al-Sada, Al-Esmael and Faisal (2017, p.165), refer to motivation as an "inner force that drives individuals to accomplish personal and organizational goals" or a "state of mind, desire, energy, or interest that translates into action".

Glaz et al. (2017) argue that motivation should be treated like a process that fosters changes in workplace conditions to increase the employees' commitment, productivity, and loyalty toward the organization. In addition, highly motivated employees can be seen as a source of competitive advantage since they are more likely to put in extra effort to fulfill their tasks.

Most theories of motivation divide this concept into intrinsic and extrinsic motivation, which corresponds to Herzberg's (1966) motivators-hygiene duality. IM is defined as the "doing of an activity for its inherent satisfaction rather than for some separable consequence" (Deci and Ryan, 2013, p.56). An intrinsically motivated employee will fulfil their task motivated by their enjoyment of their work rather than some external incentives. According to Herzberg (1966), EM is not a source of satisfaction; instead, the lack of extrinsic factors will lead to dissatisfaction.

EM contributes to the employees' involvement and commitment to the company (Burlea-Schiopoiu; 2007; Wang et al., 2019), while the management's leadership behavior contributes to employee performance (Habanik et al., 2020). Parsons and Broadbridge (2006) found that UK charity shop managers registered low satisfaction scores regarding extrinsic factors such as work climate, salary, or professional status, which contradicts Deci and Ryan (2013), that proved that financial benefits, high salaries, job security, training opportunities, autonomy, performance bonuses, and management's recognition are important extrinsic factors that contribute to employees' motivation and satisfaction.

IM comes from within the individual and is not dependent on external stimuli. Glaz et al. (2017) argue that IM positively correlates with psychological well-being and contributes to the employees' social, cognitive, and physical development. Deci and Ryan (2013) highlight two critical elements of IM: professional competence and self-determination or autonomy. For employees to be intrinsically motivated, they must find the task attractive and appealing and perceive it as necessary for their professional development.

Recent studies (Plessis, Douangphichit and Dodd, 2016) proved that several intrinsic factors did not significantly influence employees' job satisfaction. For example, achievement and recognition registered the lowest scores from all the variables that might influence job satisfaction. In contrast, some extrinsic factors, such as workplace climate and salary, registered the highest score (Sobaih and Hasanein, 2020). one explanation for these contradicting results is the local socio-economic and cultural characteristics of each labor market (Valk and Yousif, 2023).

Rewards and recognition (RR) refer to an organizational system in which intrinsic and extrinsic rewards acknowledge employees' performance. Al-Sada, Al-Esmael and Faisal (2017) mention financial compensation, training opportunities, promotion, paid time off, and fringe benefits as key elements of an efficient RR system that increases employee motivation and performance.

Deci and Ryan (2013) argue that an efficient RR system should be impartial and used to acknowledge performance, competence, and initiative. An essential component of an efficient RR system is the salary, which Eichenauer et al. (2021) regarded as one of the main drivers for increasing employee performance. Burlea-Șchiopoiu et al. (2016) highlight the importance of objective feedback, autonomy, and responsibility as non-financial incentives that significantly impact employees' motivation and satisfaction. Salanova and Kirmanen (2010) identify three key aspects of an efficient RR system that must be: adequately correlated with the workload, on par with the competition's RR systems, and consistent enough in order to motivate the employees to overperform.

When using financial compensation as part of the RR system, the organization should consider three essential elements: the effectiveness of the rewards, the employees' profile, and that it should be given based on a clear and transparent performance evaluation process (Salanova and Kirmanen, 2010). As we argued before, financial compensation is, according to Herzberg (1966), a hygiene factor which, when present, doesn't lead to an increase in satisfaction but, when absent, it will lead to dissatisfaction, and thus, it should reflect the employees' workload and performance.

RR system that uses non-financial benefits should be designed based on the employees' needs and expectations, which could be related to greater responsibility, decision-making autonomy, or a need for

achievement, affiliation, or power (Salanova and Kirmanen, 2010). At the same time, non-financial benefits may include extrinsic rewards such as paid time off, health insurance, flexible working hours, or positive supervisor feedback and appreciation (Madera et al., 2017).

Employee satisfaction (ES) has been a widely researched topic in recent years, mainly due to its influence on employee commitment, loyalty, and motivation. This concept is defined, according to Valk and Yousif (2023, p.295), as "a positive emotional state resulting from a cognitive and affective, favorable appraisal of the job, leading to the fulfillment of an employee's needs, goals and values" and it is linked to several organizational aspects such as leadership, motivation, productivity, and culture (Burlea-Schiopoiu et al., 2016; Mihai et al., 2017). Pang and Lu's (2018) findings suggest that higher levels of satisfaction will improve the organization's performance, while lower levels will inhibit it. According to Panda, Jain and Nambudiri (2022), three factors influence employees' satisfaction: demographics (i.e., age, gender, and education), extrinsic factors (i.e., salary, benefits, management style, work climate, relationship with other colleagues), and intrinsic factors (i.e., the nature of the task, sense of achievement, responsibility, autonomy, development opportunities).

Employee satisfaction has been proven to positively influence the employees' loyalty only if the employees are happy with their salaries and promotion opportunities, feel safe and secure at their job, and their achievements are acknowledged. In addition, they feel that their work is exciting and appealing, contributing to their fulfillment (Leitão et al., 2022). Along the same lines, Pang and Lu (2018) highlight decision-making autonomy, the organization's brand value, and overall labor productivity as essential factors influencing employee satisfaction. Thus, ES can result in a positive or negative emotional state based on the employees' evaluation of their work's appeal and performance. If an organization wants to have a motivated, happy, and satisfied workforce, the employees should be adequately rewarded externally, through tangible, extrinsic rewards, and internally through experience, collaboration, development, competence, and effort (Paais and Pattiruhu, 2020).

Employee motivation is closely linked with the rewards and recognition system and employee satisfaction (Deci and Ryan, 2013; Leitão et al., 2022; Paais and Pattiruhu, 2020; Valk and Yousif, 2023). Moreover, Pool (1997) argues that employees' motivation and satisfaction should be treated as separate concepts to analyze them and their factors of influence properly. Al-Sada, Al-Esmael and Faisal (2017) have found that both IM and EM positively influence employees' satisfaction (ES), which in turn leads to an increase in their productivity and the organization's performance. Furthermore, Pang and Lu (2018) have shown that ey positively influences ES by using an efficient package of financial and non-financial compensation, adequately adapted to the employees' work-load and the general market conditions, which partially contradicts Herzberg's (1966) two-factor theory, according to which, hygiene (extrinsic) factors, when present, do not positively influence employee satisfaction, but when absent, will cause dissatisfaction. Similarly, Pool (1997) has found positive correlations between extrinsic factors such as pay-for-performance reward systems and employee satisfaction. Based on previous arguments, we have developed the following two research hypotheses:

H1: There is a strong and positive relationship between extrinsic motivation (EM) and employee satisfaction (ES)/

H2: There is a strong and positive relationship between intrinsic motivation (IM) and employee satisfaction (ES).

Güngör (2011) separates the two motivation dimensions and argues that financial RR influences EM, while non-financial RR (recognition, relationship with peers, working conditions, and supervisors' leadership behaviour) has a strong influence on IM, which partially contradicts Habanik et al. (2020) who manage to find only a relationship between financial RR and EM, without any significant correlation between non-financial RR and IM. Chipunza and Malo's (2017) findings show that RR is a strong predictor of ES if the employees understand that their actions and behaviour will lead to concrete compensation, such as higher salaries, performance bonuses, or promotion opportunities. Extrinsically motivated employees tend to be more optimistic because they believe that if they reach the desired organizational results, they will receive a tangible reward. Moreover, intrinsically motivated individuals perform not because of a desire to receive an external incentive but due to their enjoyment of work and other factors such as their feeling of achievement and self-realization. Finally, Leitão et al. (2022) argued that employees who are given extrinsic rewards for their performance, in the long run, will continue to perform only as long as they are rewarded. Thus, EM prevailed over IM. Based on these theoretical implications, we have developed the following research hypotheses:

H3: There is a strong and positive relationship between the rewards and recognition system (RR) and extrinsic motivation (EM)

H4: There is a strong and positive relationship between the rewards and recognition system (RR) and intrinsic motivation (IM)

2. Research methodology

In order to test our hypotheses, we have gathered data using a five-point Likert scale survey with 35 items (7 items for each variable and seven control variables). The survey is based on Salanova and Kirmanen's (2010) research, and it was pre-tested to identify and rule out ambiguous items or double-barrelled questions (MacKenzie and Podsakoff, 2012). All four variables registered Cronbach Alpha values greater than 0.800 (EM – 0.831, IM – 0.899, RR – 0.945, ES – 0.976).

The data was gathered between November 2022 and February 2023, the respondents being selected from various service industry organizations from the south of Romania. The survey was sent to almost 200 service industry employees (contact personnel, line, idle or top management), from which we could use 180 results. These 183 responses were tested using Armstrong and Overton's (1977) theory of non-response bias, leading us to the final number of 161 valid questionnaires.

The structure of the sample is based on seven control variables: gender, age group, industry, position, length of service, contract duration, and working hours. Thus, regarding gender, 53% of our respondents were male, and 47% were female, and regarding the age group, 16% were between 18 and 29 years old, 28% of the respondents were between 30 and 39 years old, 26% were between 40 and 49 years old, 24% were between 50 and 59 years while 6% of our respondents were over 60 years old. Moreover, 7% of our answers came from retail employees, 13% from tourism employees, 19% from professional services, 22% from healthcare, 9% from personal services, 14% from restaurants, 15% from distribution/delivery, and 1% from other types of services. Furthermore, more than half (53%) of our respondents were contact personnel, about a quarter were line managers (24%), 16% were middle managers, while 7% were top management. 9% of these employees worked for less than a year for their current company, 24% between 1 and 3 years, 29% between 3 and 5 years, 24% between 5 and 10 years and 14% worked for more than years in their current organization. Regarding the last two control variables, 65% of the participants in this study had a contract with an indefinite duration, and 35% had a fixed term contract, while 73% of the respondents were working full time (8hrs/day, five days/week) and 27% were working part-time (less than 8hrs/day, five days/week).

We analyzed the data using SmartPLS 4.0's PLS-SEM function, which Hair et al. (2022) suggested is more useful since it uses formative and reflective measurements. Moreover, the use of PLS-SEM in this current research is supported by Manley et al. (2021), which plead for using this method in studies using multiple variables and causal relationships. The values of both indicators, Excess Kurtosis and Skewness, show a symmetrical distribution. The four variables show a variance of Excess Kurtosis from -1.228 to 0.386, which is considered normal by Hair et al. (2022). At the same time, the skewness indicator, although showing larger values (ranging from -1.135 to -0.195), is in the normal range, as defined by Hair et al. (2022).

The covariance matrix shows strong correlations between the four variables, all the values being well above the accepted 0.500 (Hair et al., 2010), ranging from 0.680 (ES-EM) to 0.903 (IM-ES). Moreover, we analyzed the variables' collinearity which showed a low risk of multi-collinearity for each item since the Variance Inflation Factor is lower than the minimum accepted value of 5.0 (Hair et al., 2022).

3. Results

The first step in analyzing the results of our research was to test the model and study the items' outer loadings. Thus, the outer loading of each item is more significant than 0.70, the smallest value (0,710) being registered by IM6 ("I feel that my current job offers me personal and professional development opportunities"), while the largest (0,953) was registered by RR4 ("How satisfied are you with the paid time off that your company is giving you?").

Moreover, we analyzed the composite reliability (CR) of each variable, which registered the following values: 0.903 for Intrinsic Motivation (IM), 0.905 for Extrinsic Motivation (EM), 0.925 for Rewards and Recognition (RR), and 0.939 for Employee Satisfaction (ES). The values prove that the internal reliability of the variables is verified, according to Hair et al. (2022).

Furthermore, we continued our analysis by testing the convergent validity, measuring if the average variance extracted (AVE) registers values larger than 0.5, which it did (ranging from 0.645 for Intrinsic

Motivation to 0.845 for Employee Satisfaction). At the same time, our results have shown that Fornell and Larcker's (1981) condition was fulfilled, the HTMT (heterotrait-monotrait ratio) criterion registering values lower than 0.9, which, according to Henseler et al. (2015) proved the possibility of discriminant validity.

Finally, the SRMR (Standardized Root Mean Square Residual) registers a value of 0.073, and NFI (variance inflation factors) shows a value of 0.902, proving the validity of the four variables model, showing that there are no collinearity problems between them.

4. Discussion

In order to test the validity of our hypothesis, we used a bootstrapping process, with a resample amount of 500, a bias-corrected confidence interval of 95% and a two-tailed test. The results are show in table 1:

Table no. 1– Hypothesis testing

HYPOTHESES	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Results
H1: EM →ES	0.195	0.195	0.062	2.903	0.004	Supported
H2: IM →ES	0.342	0.343	0.059	4.245	0.000	Supported
H3: RR →EM	0.584	0.572	0.065	7.903	0.000	Supported
H4: RR →IM	0.002	0.008	0.075	0.053	0.975	Not Supported

Source: authors' personal analysis

As we can see from Table 1, three of our four hypotheses have been validated. First, our findings strongly correlate motivation's two dimensions (EM and IM) and the employees' satisfaction (ES), thus validating **H1** and **H2.** These findings are in line with Paais and Pattiruhu's (2020) research, which highlights the importance of both internal (such as a pleasant work environment, healthy relationships with colleagues and supervisors, collaboration, exciting tasks, and feeling of achievement) as well as external incentives such as wage increase, performance bonuses, paid time off, training and development opportunities. All these factors actively contribute to employee satisfaction, which in turn helps organizations reach their targets and perform in the market (Eichenauer et al., 2021). Moreover, Al-Sada, Al-Esmael and Faisal (2017) have reached similar results regarding the correlation between motivation and employees' satisfaction, while Gheitani et al. (2019) found a positive relationship between IM and ES, and Yang et al. (2015) reached similar results regarding IM and ES.

The strong correlation between EM and ES **(H1)** agrees with Valk and Yousif's (2023) findings but is in contradiction with the results of Stringer et al. (2011), which found a positive relationship only between IM and ES, while EM has been found to have a negative relationship with employee satisfaction. Herzberg (1966), as we stated in the literature review of this paper, also includes intrinsic incentives (merit recognition, interesting tasks, feeling of achievement) as powerful predictors for employees' satisfaction, which is also supported by Pool (1997) and confirms our results regarding IM's influence on ES **(H2)**.

The validity of **H2,** regarding IM's influence on ES is supported by many studies, such as Stringer et al. (2011), Eichenauer et al. (2021), and Leitão et al. (2022), which highlight the role of task appeal, responsibility, decision-making autonomy and perceived development opportunities that arise from day-to-day operations in enhancing the employees' satisfaction, while instilling a sense of accountability and commitment to the task and the organization, in general (Yang et al., 2015; Plessis, Douangphichit and Dodd, 2016). At the same time, our results are in line with the self-determination theory as it was proposed by Deci and Ryan (2013), which suggests that a pleasant work environment, which fosters collaboration and synergy between co-workers, an example of intrinsic motivational factors, in turn, are strong predictors for employees' satisfaction.

Our results have shown that both intrinsic and extrinsic incentives are shown to have a significant impact on the employees' satisfaction, and these findings highlight the need for the organization to understand the expectations and wishes of their employees in order to be able to use the correct incentives as well as an adequate reward and recognition system, depending on the situation**.** Qur findings are in consensus with results of Leitão et al. (2022), which found that the organization's reward system, as well as intrinsic and extrinsic motivational incentives, are mediators for the leadership's influence on the employees' job satisfaction. Their results underline the impact of leadership behaviour on the employees' well-being,

mentioning that leaders should foster close relationships with their employees, be sensitive to their opinions, expectations, and wishes, but at the same time, be able to show authority when the situation asks for it, such as meeting deadlines. Similar to our results, Güngör (2011) proved that the RR system might influence ES only through the mediating effect of IM and EM.

Moreover, our findings show that the rewards and recognition system employed by an organization (RR) directly and positively influences the employees' intrinsic motivation **(H3**). These results are supported by Chipunza and Malo's (2017) research, which states that the leading role of a reward and recognition system is to make employees understand that their behaviour and results, if acceptable, will lead to tangible rewards such as wage increase, performance bonuses, promotions, or less tangible rewards such as appraisal from the manager, recognition within the organization or positive feedback. Along the same lines, Leitão et al. (2022) state that the main driver for employee motivation is an RR system based on extrinsic rewards (high salary, paid time off, promotion opportunities, performance bonuses, and training opportunities). Analysing the findings, we conclude that extrinsic motivation is an essential behavioural instrument and is positively influenced by tangible rewards adapted to the employees' needs, wishes, and expectations, which is also stated by Valk and Yousif (2023). However, while highlighting the importance of the RR system on the employees' EM, Stringer et al. (2011) found no significant correlation between the rewards and recognition system and employees' extrinsic motivation, which contradicts our results and Kreps's (1997) agency theory. The sample's structure might explain the reason for this contradiction: Stringer et al.'s (2011) research was focused only on the retail industry, which is known for low salaries, usually just above the minimum legal wage, while our sample focuses on several tertiary industries, of which 41% of the responses came from employees working in healthcare or professional services, which, unlike retail, are using a highly educated workforce, which receive well above average wages and thus, is more likely to consider tangible rewards a basic form of motivation.

We used RR for analyzing both tangible rewards and non-tangible recognition, and our results managed only to find a positive relationship between RR and EM **(H3)**. At the same time, the hypothesis related to RR's influence on IM **(H4)** has not been validated, thus partially contradicting Güngör (2011) while being in line with Habanik et al. (2020) and Al-Sada, Al-Esmael and Faisal (2017), whose results, as we have mentioned before, have shown that employees tend to prefer financial rewards. Moreover, in our study, the RR variable consists in 7 items, 5 of which refer to extrinsic, tangible rewards, and thus, this might be one of the reasons that we could not find a positive relationship between RR and IM since tangible rewards tend to develop EM, rather than IM.

Finally, several studies contradict our result regarding RR's lack of influence on IM, such as Deci and Ryan (2013) and Stringer et al. (2011), who analyzed the self-determination theory, which states that performance-related financial rewards might have a positive impact upon the employees' intrinsic motivation, by enhancing the tasks' appeal and encouraging self-respect and decision-making autonomy.

Conclusions and further development

Among the limitations of our research, we should mention the sample's composition, of which 41% of the responses came from the healthcare and professional services industries, known for their highly educated workforce and above-average salaries. This imbalance in the sample's composition might have affected our results, especially those regarding the influence of RR upon EM and IM. At the same time, our study has focused on service industry employees from the southern regions of Romania. Thus, we cannot generalize our results for the whole country, especially considering the ethnic and cultural differences between Romania's northern and southern regions.

The hypothesis regarding the relationship between RR and IM was not validated, mainly due to the items which composed the RR variable, which was mainly related to tangible, extrinsic rewards, which were proven by other scholars as well, to have a stronger influence on EM rather than IM.

The novelty of our research consists in the fact that this study is one of the first which analyses the relationship between motivation, rewards and recognition and employee performance in the context of the service sector of southern Romania. Service managers can use our results in order to better understand how to motivate their employees, which incentives to use in each particular situation, in order to maximise their potential and the organisational performance.

Our research should be considered as a starting point for future studies regarding the relationship between motivation, rewards and recognition, and employee satisfaction, focusing on other regions, industries, or countries and, considering that this topic's relevance for both scholars and practitioners, our research can be extended by including other variables such as leadership, organizational culture, and employee

performance. Further research will be oriented to analyse the relationship among motivational factors that predict the success or the failure of SMEs from different sectors of activities and will also be a development of previous research made by Burlea-Schiopoiu and Mihai (2019).

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The Paradoxes of the SGDs from the Sustainable Development Report

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Abstract

In the last years, the entire world faced many challenges that led to the awareness by governments of the need to consider the 17 UN Sustainable Development Goals (SDGs) depending on the particularities of each country and global challenges. Therefore, our research has as its main objective the analysis of the values of the SDG Index in correlation with the particularities of the different countries subject to the research, but also according to other indices related to the SDGs. Our results proved that the Dispersal of Information is a source of the need for more interest of decision-makers at national and international levels in carrying out concrete improvement actions of SGDs, especially in many low-income countries (LICs) and lower-middle-income countries (LMICs). Therefore, the paper's originality demonstrates that the data used to calculate the SDG Index are subject to the Dispersal of Information and generate divergent decisions with negative consequences on implementing SDGs in different countries and regions. The theoretical implications of our research consist of the critical analysis of the complexity of the SDGs and how the Dispersal of Information acts on the relevance and effectiveness of some indicators of the SDGs. Finally, the practical implications are translated into recommendations for the decision-makers implementing the SDGs at the national level.

Keywords

Sustainable Development Goals, Sustainable Development Index, Dispersal of Information.

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Introduction

The starting point in our research was the Sustainable Development Report 2022, from the analysis of which we observed a series of paradoxes both between the results of the SDG Index and between the results presented in this report and those presented by other researchers (i.e., Horan, 2020; Puertas and Bermúdez, 2020; Wang et al., 2020; Rocchi et al., 2022**;** Taajamaa et al., 2022).

Ever since 2015, when the 2030 Agenda for Sustainable Development was developed, the United Nations launched 17 SDGs, 169 targets, and 232 indicators (UNDP, 2023) to create a cleaner planet and a population that no longer confront poverty, lack of education, health problems and other inequalities, aiming for the demarcation line between developing and developed countries to become as imperceptible as possible.

2022 SDG Index ranking and score (Sachs et al., 2022, pp. 14-15) proves that there is no strong correlation between a country's level of development and the degree of involvement in the implementation and improvement of the SDGs. Thus, the score of the 163 countries included in the analysis varies between 86.5 (Finland) and 39.0 (South Sudan).

A careful analysis of the score and position of developed countries in comparison with developing countries leads us to several research questions as follows:

1. What are the factors that place developed countries, such as the United States (position 41, score 74.6), below developing countries, such as Romania (position 30, score 77.7) or Uruguay (position 41, score 77.0)?
2. Does the methodology used to calculate the SDG Index provide results that reflect the reality of the countries under analysis?

Starting from the concept of Dispersal of Information (DI) promoted by Burlea-Schiopoiu (2019), we established another objective of the research: evaluating how other index SDGs were developed with the aim of evaluating specific SDGs.

In the following sections, we will analyze the role of DI in promoting different approaches to the SDGs.

The Impact of Dispersal of Information on the Sustainable Development Goals Approach

Burlea-Schiopoiu (2019, p. 142) affirmed, "The dispersal of information is described by a large amount of information that is presented chaotically and repetitively."

Next, we will carry out a critical analysis of the SDG Index in comparison with other indexes calculated at regional and international levels to demonstrate that the Dispersal of Information is a source of the lack of interest on the part of decision-makers in carrying out concrete improvement actions of SGDs, especially in many low-income countries (LICs) and lower-middle-income countries (LMICs).

Sachs et al. (2022, p. 9) mention the methodology used to calculate the SDG Index "The SDG Index is an assessment of each country's overall performance on the 17 SDGs, giving equal weight to each Goal. The score signifies a country's position between the worst possible outcome (score of 0) and the target (score of 100)".

The data used to calculate the SDG Index are subject to the Dispersal of information because the data are provided by official statistics and "from non-traditional statistics, including research centers, universities, and non-governmental organizations" Sachs et al. (2022, p. 9).

Methodology

Our methodology consists of a critical analysis of literature starting from the Sustainable Development Report 2022, the 2030 Agenda for Sustainable Development, and the representative work of relevant scholars (i.e., Hwang and Yoon, 1981; Bravo, 2014; Costanza et al., 2016; Dhaoui, 2018; Ding et al., 2018; Burlea-Schiopoiu, 2019; Horan, 2020; Puertas and Bermúdez, 2020; Wang et al., 2020; Rocchi et al., 2022; Sachs et al., 2022; Taajamaa et al., 2022).

The critical analysis has a departure point, the Dispersal of Information (Burlea-Schiopoiu, 2019), in relationship with SDG Index compared to other indexes calculated at regional and international levels.

We realized a multiple comparative analysis of the SDG Index with the following tools:

1. SDG Sensemaking Tool (SST) from national level to local level (i.e., cities).
2. SDG-based Indices for Assessing Regional Sustainable Development from national level to regional level (i.e., Fujian Province, China).
3. SDGs achievement index (SDG-AI) from national level to MENA Countries (i.e., Middle East/North Africa).

SDG Index and the SDG Sensemaking Tool

Without considering the Dispersal of Information, Taajamaa et al. (2022) concluded that cities worldwide face similar challenges but use different ways to solve the problems. Therefore, Taajamaa et al. (2022) developed, in the context of the City of Espoo, the SDG Sensemaking Tool (SST).

The difference between SDG Index (Sachs et al., 2022) and the SDG Sensemaking Tool (SST) consists of the level of activity, because the SDG Index evaluates the progress made at the national level, the SST aims to evaluate the progress made by cities in achieving the UN Agenda's objectives.

The SDG Index synthetically presents the national trend regarding the 17 SDGs. At the same time, the SST is a tool that recommends institutional collaboration at the national, regional, and international

levels to find the most effective tools and methods aimed at accelerating global sustainable development. Another advantage of the SST compared to the SDG Index is the consideration of the particularities of each city (i.e., resources and real needs), including the cultural component.

The spirit of belonging to a community is reflected in every seven steps of the process of building SST (Taajamaa et al., 2022), starting with a compulsory definition of the objective concerning the SDGs, followed by an evaluation of the accurate dimensions of sustainability and establish the specific operational environment. The three steps are devoted to analyzing both dimensions and context, which will allow feedback and the possibility to reiterate the process. Steps four, five, six, and seven are allocated to strategic, tactical, and operational activities in the framework of the UN Agenda**.**

Taajamaa et al. (2022) recognize that SST needs improvement, even if it attracted the attention of decision-makers from several countries during the presentation at the UN High-Level Political Forum in July 2021. Thus, to avoid the Dispersal of Information, Taajamaa et al. (2022) highlight the importance of the involvement of citizens for SST to gain more credibility and strengthen the feeling of citizens belonging to a community.

Finland, the country where Taajamaa et al. (2022) conducted their research, ranks 1st with a score of 86.5 (Sachs et al., 2022, p. 14). The most significant deficiency is recorded for SGD 13 (Climate Action), where a decreasing score was recorded, indicating that its actions in improving the climate are ineffective. Furthermore, stagnation was recorded in SGD 12 (Responsible consumption and production), which directly impacts climate actions, justifying, to a certain extent, the reduced score in SDG 13 (Sachs et al., 2022, p. 21).

On the other hand, Finland registered an increasing score at the rate needed to achieve the SDG by 2030 (SDG1 - No Poverty; SDG4 - Quality education; SDG7 - Affordable and clean energy; SDG8 - Decent Work and Economic Growth), justifying the position of the leader at the World level (Sachs et al., 2022, p. 21). SST mainly refers to SDG 11: Sustainable cities and communities, for which Finland recorded a moderating increase above 50% of the required growth but, unfortunately, below the rate needed to achieve the SDG by 2030. Finally, it is necessary to mention that Finland did not register a score for any SDG to prove that the trend remains at or above SDG achievement.

The analysis of both instruments proves that the Dispersal of Information negatively influences the perceptions of the level of involvement of different decision-makers in achieving the SDG by 2030.

SDG Index and the development index for six social goals or SDG-based Indices for Assessing Regional Sustainable Development

Wang et al. (2020) did their research in Fujian Province, China, and as a result, they developed a Fujian index for six social goals or SDG-based Indices for Assessing Regional Sustainable Development. Wang et al. (2020) selected the indicators based on the three consecrated dimensions (i.e., social, economic, and environmental), and have already been used by many researchers (Bravo, 2014; Costanza et al., 2016; Ding et al., 2018).

Wang et al. (2020) employed in their research Shannon entropy or information entropy, and we consider that the Dispersal of Information is also presented in their three main conclusions related to (1) fluctuations of the value of the Fujian index between 2007-2017; (2) the decreasing of the index of Fujian in 2012 was the result of decreasing environmental dimensions and in 2016 was the result of decreasing of social dimension; (3) a low dimension of SDG 3 (Good Health and Well-being) and SDG 16 (Peace, Justice, and Strong Institutions).

Wang et al. (2020) made as main recommendations to decision-makers of Fujian Province to take care of community members in terms of well-being and social security. Wang et al. (2020) recognize the classification of indicators as a main limitation of their research and recommend using the same indicator for many SDGs.

The results obtained by Wang et al. (2020) concluded that SDG3 (Good Health and Well-being) and SDG16 (Peace, Justice, and Strong Institutions) registered a low score, and the SDG Index 2022 also indicated that the weaknesses of the two SDGs.

China, the country where Wang et al. (2020) conducted their research, ranks 56 with a score of 72.4 (Sachs et al. (2022, p. 14). The most significant deficiencies are recorded for SGD 14 (Life below water) and SDG 15 (Life on land), where a decreasing score was recorded, indicating that its actions in improving life both below water and on land are ineffective. Furthermore, significant challenges were recorded in SDG3 (Good Health and Well-Being), SDG5 (Gender equality), SDG6 (Clean water and sanitation), SDG7 (Affordable and clean energy), SDG8 (Decent Work and Economic Growth), SDG10 (Reduced inequalities), SDG11

(Sustainable cities and communities), SDG16 (Peace, justice and strong institutions) SDG17 (Partnerships for the goals) which directly impacts different dimensions of the sustainable development, justifying, to a certain extent, the general score (Sachs et al., 2022, p. 22).

Moreover, China registered an increasing score at the rate needed to achieve the SDG by 2030 for SDG1 - No Poverty (Sachs et al., 2022, p. 22). Finally, it is necessary to mention that China did not register a score for any SDG to prove that the trend remains at or above SDG achievement, and also, for a few SDGs, the data were not available (i.e., SDG4 - Quality education, and SDG10 - Reduced inequalities) that prove the presence of Dispersal of Information phenomenon again.

SDG Index and the SDGs achievement index

The differences in sustainable development across the EU countries determined Rocchi et al. (2022) to elaborate the SDGs achievement index (SDG-AI), a multicriteria-based index. Starting from Dhaoui (2018), the SDG achievement index for the assessment of inclusive growth in MENA Countries (Middle East/North Africa), Rocchi et al. (2022) adapted an existing sustainability index to measure the progress of the EU countries toward achieving the objectives of Agenda 2030.

Starting from the six core dimensions (i.e., Education: SDG4 - Quality education; SDG8 - Decent Work and Economic Growth, Employment: SDG8 - Decent Work and Economic Growth, Environment: SDG13 - Climate Action; SDG15 - Life on land, Equality: SDG1 - No Poverty; SDG5 - Gender equality; SDG10 - Reduced inequalities, Health – SDG3- Good Health and Well-Being, and Service: SDG6 - Clean water and sanitation; SDG7- Affordable and clean energy; SDG9 - Industry, innovation andinfrastructure; SDG11 - Sustainable cities and communities), Rocchi et al. (2022) changed the indicators and eliminated the subdimensions at the same time as changing the aggregation algorithm using the TOPSIS method for aggregating criteria (Hwang and Yoon, 1981).

The results proved that the Nordic countries are at the front of the ranking for all the dimensions, but Denmark has some issues related to the Environmental dimension. The EU Baltic countries and the former Eastern bloc countries are at the opposite pole. Therefore, the main recommendations are for countries with sustainable development problems to elaborate and implement a strategy for improving all dimensions, especially the Equality dimension (mainly gender equality, immigrant inclusion, and income distribution (Rocchi et al., 2022).

Table no. 1. The SDG ranking of EU countries based on SDG-AI and SDG Index

Countries	**SDG-AI Ranking**	**SDG Index Ranking**	**Observation**
1	2	3	4
Finland	1	1 (86.5)	Very High
Sweden	2	3 (85.2)	Very High
Denmark	3	2 (85.6)	Very High
Netherlands	4	17 (79.9)	High (in SDG Index ranking, the following EU countries are placed above the Netherlands as follows: Austria (82.3); Germany (82.2); France (81.2); Estonia (80.6); Poland (80.5); Czech Republic (80.5); Latvia (80.3); Slovenia (80.0); and Spain (79.9)
Austria	5	5 (82.3)	High
Germany	6	6 (82.2)	Medium
Portugal	7	20 (79.2)	Medium (in SDG Index ranking, the following EU countries are placed above the Portugal as follows: Estonia (80.6), Poland (80.5), Czechia (80.5), Latvia (80.3), Slovenia (80.0), Spain (79.9), Belgium (79.7)
Estonia	8	10 (80.6)	Medium
Luxembourg	9	36 (75.7)	Medium (in SDG Index ranking, the following EU countries are placed above the Luxembourg as follows: France (81.2), Ireland (80.7), Poland (80.5), Czechia (80.5), Latvia (80.3), Slovenia (80.0), Spain (79.9), Belgium (79.7), Hungary (71.0), Croatia (78.8), Slovakia (78.7), Italy (78.3), Romania (77.7), Greece (76.8), Malta (76.8)

Table no. 1. (continued)

1	2	3	4
Slovenia	10	15 (80.0)	Medium (in SDG Index ranking, the following EU countries are placed above the Slovenia as follows: France (81.2), Ireland (80.7), Poland (80.5), Czechia (80.5), Latvia (80.3)
France	11	7 (81.2)	Medium
Spain	12	16 (79.9)	Medium (in SDG Index ranking, the following EU countries are placed above the Spain as follows: Ireland (80.7), Poland (80.5), Czechia (80.5), Latvia (80.3)
Latvia	13	14 (80.3)	Medium (in SDG Index ranking, the following EU countries are placed above the Latvia as follows: Ireland (80.7), Poland (80.5), Czechia (80.5)
Belgium	14	18 (79.7)	Medium (in SDG Index ranking, the following EU countries are placed above the Belgium as follows: Ireland (80.7), Poland (80.5), Czechia (80.5)
Malta	15	33 (76.8)	Medium (in SDG Index ranking, the following EU countries are placed above the Malta as follows: Slovakia (80.5), Croatia (78.8), Italy (78.3), Romania (77.7), Greece (76.8), Lithuania (75.4), Hungary (71.0)
Ireland	16	9 (80.7)	Low
Italy	17	25 (78.3)	Low
Czechia	18	13 (80.5)	Low
Lithuania	19	39 (75.4)	Low
Slovakia	20	24 (78.7)	Low
Poland	21	12 (80.5)	Very Low
Croatia	22	23 (78.8)	Very Low
Hungary	23	21 (71.0)	Very Low
Romania	24	30 (77.7)	Very Low
Bulgaria	25	42 (74.3)	Very Low
Cyprus	26	43 (74.2)	Very Low
Greece	27	32 (76.8)	Very Low

Source: Authors adapted from Sachs et al., 2022, pp. 9-10; Rocchi et al., 2022, p. 14.

The differences between the two rankings prove the impact of the Dispersal of Information on the accuracy of data and the methodology employed for calculating the index.

Abbreviations and acronyms

DI. – Dispersal of Information

LICs. – Low Income Countries

LMICs. – Lower-Middle Income Countries

SDG-AI – SDGs achievement Index

SDGs. – Sustainable Development Goals

SST. – SDG Sensemaking Tool

UNDP. – United Nations Development Programme

Conclusions

Starting from the analysis of the Sustainable Development Report 2022, in parallel with other studies developed on the world map, we came to the conclusion that the SDGs generated, on the one hand, many topics for discussion and analysis, and on the other hand, imposed different measurement tools, such as the SDG Index (Sachs et al., 2022), SDG Sensemaking Tool – SST (Taajamaa et al., 2022), the development index for six social goals or SDG-based Indices for Assessing Regional Sustainable Development (Wang et al., 2020), the Global SDG Progress Index - GSPI (Puertas and Bermúdez, 2020), New Integrated SDG Index (Horan, 2020), and the SDGs achievement index - SDG-AI (Rocchi et al., 2022).

In the framework of the results presented in Sustainable Development Report 2022, we agree with Burlea-Schiopoiu and Remme (2017), that found information asymmetry as the main source of DI.

The results prove that the Dispersal of Information is a phenomenon that is present in the ranking of the countries based on the different rankings of SDGs. Therefore, to increase the accuracy of the SDGs countries ranking, it is necessary to use databases that include the same indicators for every country and to find a viable method to calculate the SDGs Index for the countries where some data for some SDGs are missing.

The stages that decision-makers must go through to achieve real success in sustainable development are as follows: scanning international reports and objectively assessing the degree of achievement of each SDG; identifying those SDGs that are in a critical situation and developing and implementing a strategy to transform these SDGs into successful ones; the development of a national index of Sustainable Development.

Therefore, our future research will focus on the study of SDGs in Romania, and we will compare our results with those from international sustainable development reports.

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The Parents Perception of Martial Arts Practiced by their Children

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Abstract

Parents will always want the best for their offspring. Nowadays, safety and security are something that everyone seeks. From the point of view of Maslow pyramid of needs, safety is on the second level after satisfying the physiological needs. In this article, we conducted two researches: on one hand, a qualitative study to discover the motives why parents urge their kids to train in different martial arts styles, and the latter, a quantitative research, to reveal which type of martial arts is better perceived on different social media platforms networks. The martial arts styles that we analyzed are: Aikido, Kyokushin and Shotokan. We have chosen these three styles as they are some of the best known and practice martial arts, especially want by children. Parents want their kids to develop in harmony, to consume their energy during practice as to get more focused at school and resolve their chores, be disciplined, stronger and more importantly be independent. Not being member of a team sport, the kid will rely only on his own power and capacity to deal with in different situations and not only. Studying and practicing karate, can also be a good protection for those who are bullied as a way of combating this kind of phenomenon that can have tremendous repercussions and even furthermore, to prepare them for the future. The recent incidents that happened both in the country and abroad, both inside and outside schools, can only reinforce the need to practice some defense sports.

Keywords

Safety, Maslow pyramid of needs, martial arts, Kyokushin, Aikido, Shotokan, future.

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Introduction

The latest and bloody military conflict that started in 2022, almost managed to "split the world in half", regarding the sides, being considered by some, the start of World War III, between two countries, can be considered as an ignition for parents in relation to what kind of skills and competences their offspring should acquire. This kind of behavior was observed also related to other threats, like the proliferation of nuclear weapons during (Burdekin and Siklos, 2022) the Cold War, and to be more precisely "Cuban Missile Crisis" from (Cyr, 2022) 1962, when many Americans started building atomic bomb shelters in their backyards. Other crises that affected the behavior of the population we might add, the Great Depression, the terrorist attacks, the Economic Crisis, the CoVid19 pandemic, earthquakes and even Climate Change Crisis that can (Ezell and Chase, 2022) influence not only a society in its whole, but as well as the human race.

1. Literature Review

In creating (Bejan, 2017) his hierarchy of needs during the middle of World War II, Abraham Maslow was (Oved, 2017) inspired by the Zeitgeist, which resulted in an overemphasis on the importance of safety

needs. As we can see in figure 1, at the base of the pyramid are the Physiological needs of which consist: water, air, food, sleep, sex, homeostasis and excretion. On the second step, the Safety needs, are (Dospinescu, et al, 2011) composed of the security of: the family, resources, employment, health and property. The third step is (Cantaragiu and Ghinea, 2020) love, or belonging where can be found friendship, family and sexual intimacy. If up to this stage, we may state that these are deficiency needs variables, from this point upward, are the growth needs variables. The first stage in the growth needs is considered to be esteem that consists of confidence, respect of others, achievement, self-esteem. The last stage is self-actualization made up from: creativity, spontaneity, problem solving, acceptance of facts, lack of prejudice and morality. In order to assure and to climb this hierarchy, people tend to take "desperate measures during desperate times" (Bradely, 2020).

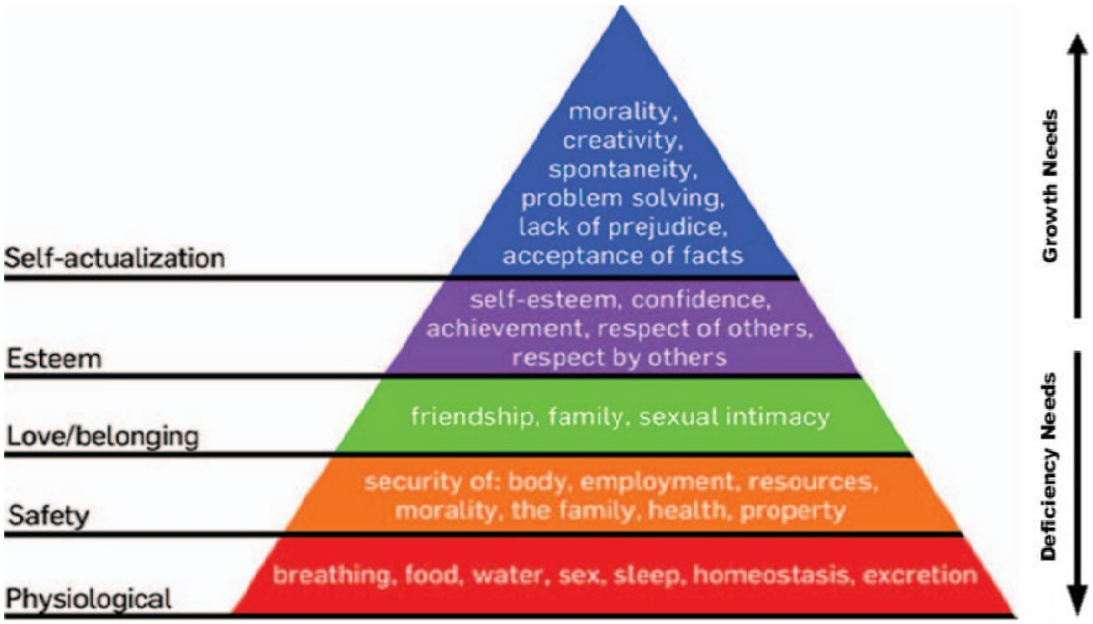


Figure no. 1 Maslow Needs Hierarchy

Source: Adapted after: Harrigan and Commons, 2015.

Even if a person does (Rojas et al, 2023) not prioritize his or her wants, or in the case of our study, the safety (Elmazi, 2006) of their kids, in the same order (Vărzaru and Jolivet, 2011) as Maslow, all needs are (Ilieska, 2005) important to an individual's overall satisfaction and drive. The drivers of needs are (Noltemeyer, et al., 2012) not always equally strong. This means (Papaleontiou - Louca et al., 2023) that needs lower in the hierarchy must be largely satisfied before higher needs become motivating factors. For hungry and thirsty people have no interest in recognition, all they want is food and drink to ease their basically human needs, and they take serious personal risk in order to get them.

2. Research methodology

The article includes two studies, a qualitative and a quantitative one. The first study wanted to reveal why parents compel their kids to practice martial arts, so we appealed to the phenomenological approach to reveal the motives and objectives. Regarding the sampling, the participants selected for data collection we used depth interviews, which were selected from various martial arts clubs. The in-depth interviews will be collected in person and the answers will be transcribed for analysis. The answers will be grouped in order to discover recurring themes related to the main motives revealed by parents. We ensured the participants with respect to GDPR and ensured confidentiality and anonymity of their answers. The goal of our qualitative study is to obtain understanding about the motivations for stimulating their offspring to joining different martial arts clubs. Similarly, can aid martial arts "senpais", the term used for instructors in dojos, in better comprehending and accommodating the wants and demands of their club members and parents. The study may also offer helpful and incentive information to parents who have doubts whether to enroll their children in martial arts classes, or not.

The study will use a quantitative research design, specifically a cross-sectional survey approach, to reveal which type of martial arts is better perceived. Participants will be randomly sampled from the general

population within a specific geographical location, using a stratified sampling technique to ensure a diverse sample. Inclusion criteria will be individuals who are at least 18 years old. Data will be collected through the online Zelist Monitor Engine. Although there are many martial arts styles and clubs that have (Rielly, 2004) groups for kids and youngsters, we took into consideration the most popular ones: Kyokushin, Aikido and Shotokan. We used the Zelist Monitor Engine to track interactions, engagement, feelings toward them as well as the proportion and quantity of mentions on social media platforms, press, forums, aggregators, blogs, comments, and so on. The study's expected results are to determine which style of martial arts is more popular among the general public and to uncover the elements that influence those opinions.

3. Research findings

In relation to the qualitative study, why parents encourage their children, it was revealed to us by the participants in the study, some of the main reasons, are: consumption of energy, learning self-defense, to increase the social interaction, increase concentration, endurance, flexibility, character development, enrich competitiveness as it is not a team sport, shape up, as many children are obese due to the dietary preferences, but also to the life style, empowerment and even stress relief. Some of the parents mentioned that they want their kids to become independent, to protect themselves from a dangerous phenomenon that is happening in schools that is bullying, even for the eventuality of domestic violence aimed especially towards girls and women. Few of the participants mentioned and remembered some of the atrocities happened abroad in developed countries as well as within country boundaries, when helpless kids were kidnaped, raped and even killed. To make things worse, the laws and the justice seemed not to work properly as some of the felons were either convicted to do suspended prison sentence, do chores for the community, even at kinder gardens or schools, or not being convicted at all.

We appealed to Zelist Monitor Engine, offered from the Zelist.RO to monitor and examine in Big Data search of over 5 million voices from social media networks like Facebook, Tik Tok, Instagram, Youtube and more than 8 thousand newspapers and magazines that are issued online. As mentioned, we analyzed only three martial arts styles due to the restrictions and constrains, choosing the most well-known and notorious styles: Kyokushin, Aikido and Shotokan.

Aikido – is a Japanese martial technique that emphasizes (Råman, 2019) nonviolence and non-competitiveness. Morihei Ueshiba invented (Kimmel & Rogler, 2019) it in the 1920s, and it is now practised all over the world, in more than 140 countries. While maintaining an ideal of non-violence, mutuality, and respect, this "soft" martial art allows a defender to merge (Jeffrey-Dykhuizen, 2000) with and then redirect an attacker's violent energy in order to shatter his equilibrium, being considered as “the way of harmony”. This form of karate aims to take advantage of the opponent's power in order to take him down. This is accomplished by rotating in a circular arc and using articulating and dodging techniques. Aikido was mostly mentioned on Facebook having a percentage of 72,1%, followed by written press 9%, online aggregators only 7.2%, while on different Forums and Instagram. 4,5% respectively 2.7%.

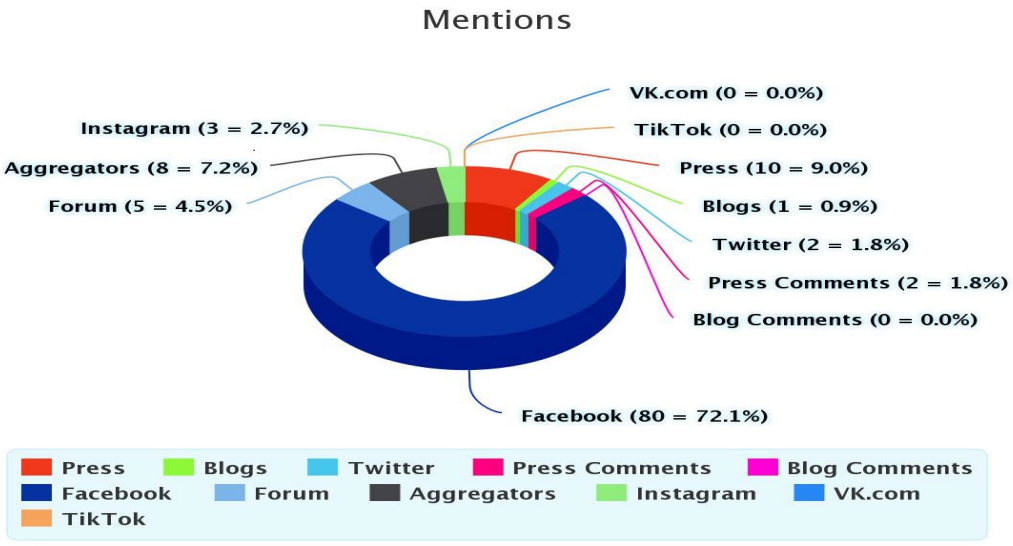


Figure no. 2. Mentions of Aikido in Social Media Networks

Kyokushin - Masutatsu Oyama developed (Gloc et al, 2012) the fully-touched Japanese martial art and combat sport known as kyokushin. Kyokushin means "supreme truth" in English. Kyokushin karate may be summarized (Saienko, 2016) to a fight between two opponents who don't have any weapons, using contact techniques that must be executed (Navickaitė, 2022) as quickly and powerfully as possible. Kyokushin martial arts style, became popular in 1990 as a popular sport, being present in over 105 countries, becoming a mass sport. People can access mass sports to enhance (Cowie and Dyson, 2016) their motor skills and talents, to boost their health, and to lengthen their creative lifespans. The goal of sport is to display the best sporting accomplishments (Marchenko and Satdyiev, 2021) or achievements at prestigious sporting events. In figure 3 we can observe that Facebook was highly used with 69%, the second, Instagram with 20.4%, followed at long distance by Forums and Press with 4.1% both of them. With reference to the feelings towards Kyokushin martial arts style, it was mostly positive and for short periods of time, neutral.

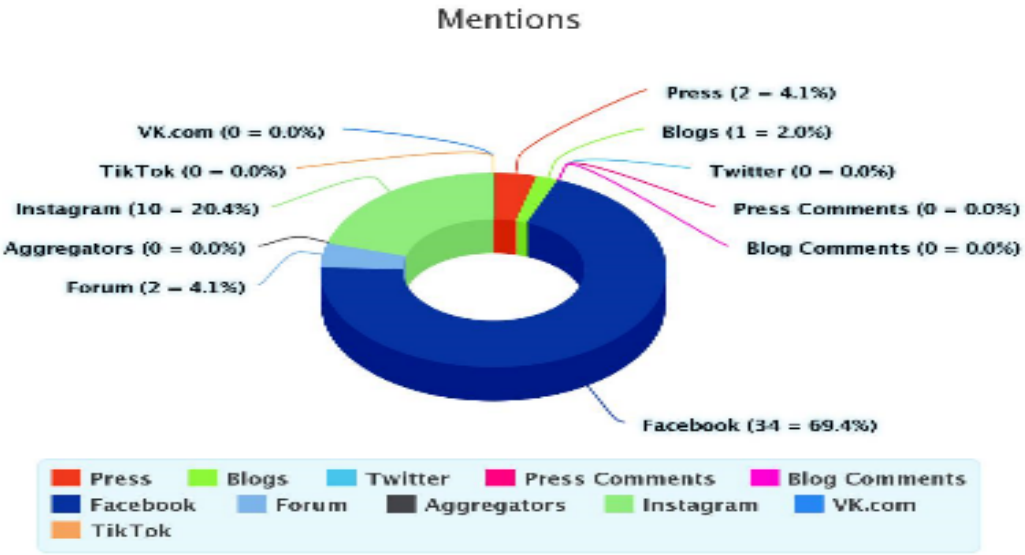


Figure no. 3. Mentions of Kyokushin in Social Media Networks



Figure no. 4. The evolution of feelings towards Kyokushin

Shotokan - is a martial arts style introduced (Martin, 2016) by the master Gichin Funakoshi, also known as Shoto. This karate style is (Szabo and Parkin, 2001) very popular around the world. Shotokan translates as "School of Shoto," but there are other interpretations such as "School of the fir tree and the wave". The ever-green fir tree symbolizes the eternal youth of conceptions and their ceaseless renewal year by year, while the wave, has the meaning of the endless work that must be done to absorb these principles. This approach stresses (Piepiora et al, 2021) deep and extended stances, excellent ranged techniques, and speed development. More than half of the mentions were on Facebook with 58,5%, while in Press 24.5% and on Instagram and Aggregators only 5,7%, as seen in figure 5.

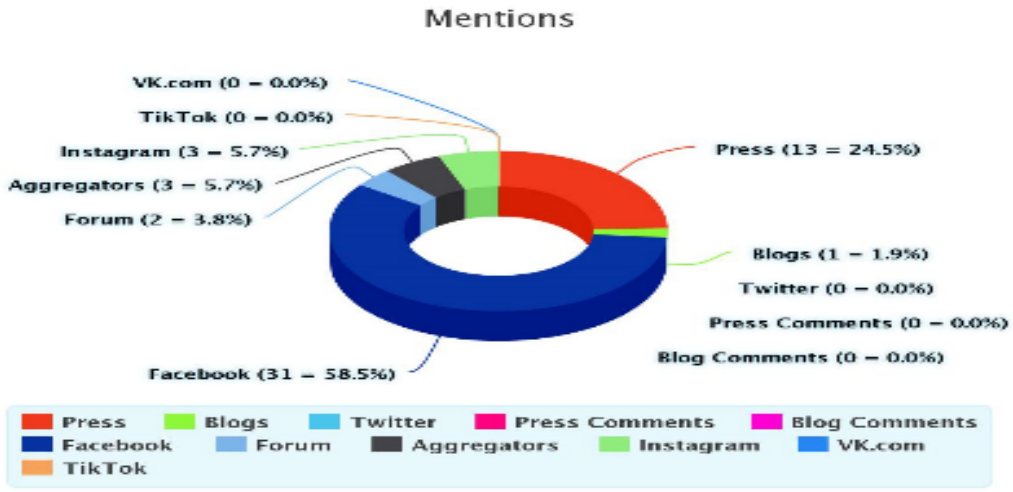


Figure no. 5. Mentions of Shotokan in Social Media Networks

Moreover, we analyzed them separately, but we wanted to compare the number of appearances, engagements, and feelings towards these styles of martial arts, as we can see in figure no 6 and 7. In the comparison between two different periods, we can see a diminish as being the middle of the summer when both pupils, students and even parents started their holidays. Only Aikido had an increase in the middle of August and Shotokan at the end, and this can be since the summer campuses were organized in that period and the photos, posts, sharing had an effect on this enhance.

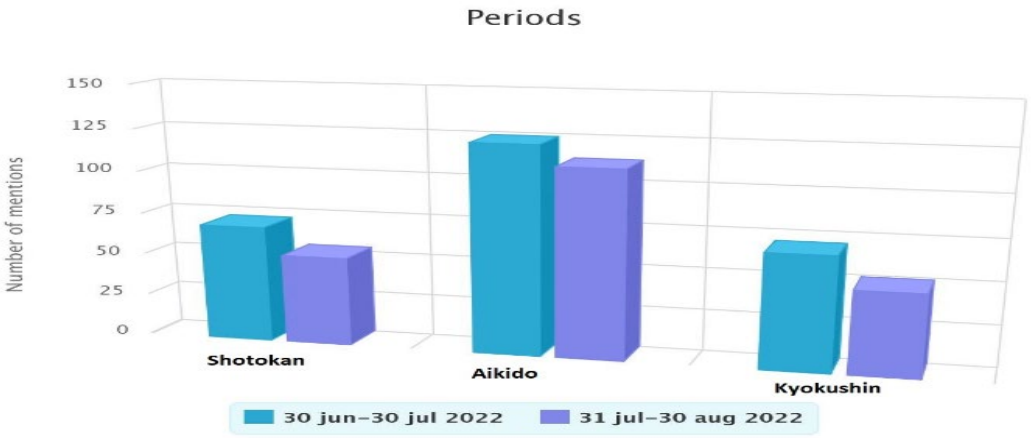


Figure no. 6. Comparison regarding each karateka style from two different periods

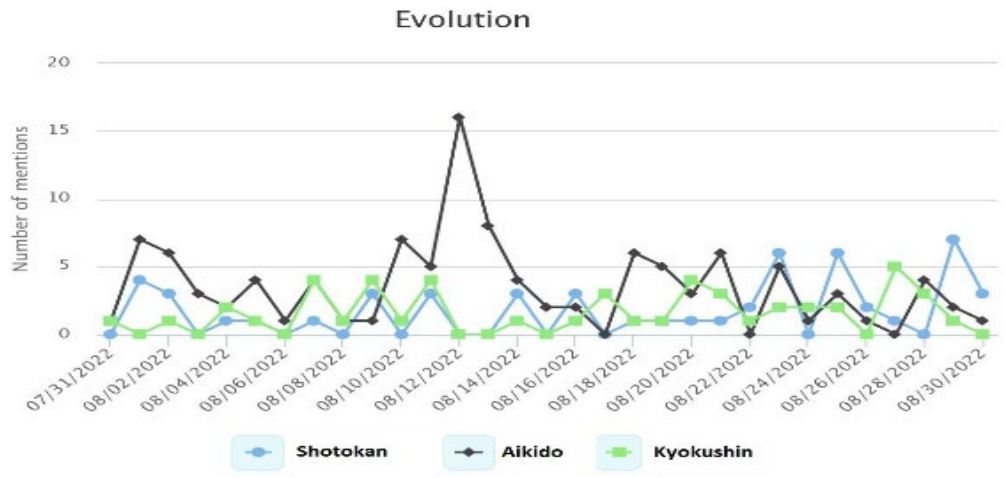


Figure no. 7. The comparative evolution of the karate styles analyzed

As to the percentage of mentions, analyzing at the same time, the three martial arts styles, Aikido has a total of 52,1%, meanwhile Shotokan and Kyokushin at a very short distance, 24,9% and 23%. The sympathy and engagement as feelings we can observe that only Aikido had for a couple of days' negative feelings as seen in figure 9.

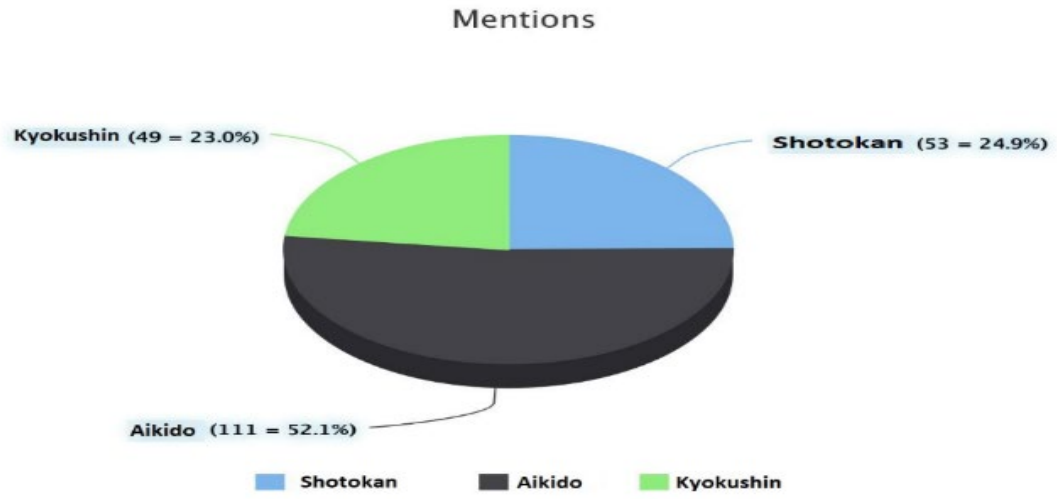


Figure no. 8. Comparison regarding the three karate styles in Social Media Networks



Figure no. 9. The comparative analysis of feelings of the three karateka styles

Conclusions

Bearing in mind the Maslow pyramid of needs, safety and security, both for the individual, as in the role of the parent, must be the first thing on their mind. People always want to take the necessary measures to prevent and reduce the occurrence of certain risks, especially if they can make the necessary decisions and actions in good time. Either by building better shelters, stronger and fireproof houses, or taking environmental friendly steps. Parents will want their offspring either to learn from them, or subscribing them to different clubs in order to learn (Rielly, 2004) skills that might come in handy, not only on daily basis, but just in case, as extreme social movements started to arise in many countries, no matter if they are undeveloped, developing or fully developed countries. Appealing to martial arts clubs is in the beneficiary also for the kids, family and society as a whole. In some countries it has become mandatory even for pupils to take part in military training, learn martial arts and even assembly a rifle. Practising martial arts is perceived as a must have skill, due to the crises that are about to come, and being considered as a means of protection and giving an advantage. While studying different martial styles, kids can improve (Rielly, 2004) memory and attention, acquire obedience and become more discipline, fight their own laziness and

unwanted social desires. Children will be shielded from the negative influences like consumption of alcohol, cigars and even drugs. Kids will adopt a proactive social style of living, spending less time on gadgets and be more into socializing, keeping in touch with their friends and peers. What is even more important, youngsters will be able to stand up on their own, grow stronger, more self-confident, loyal to the weak and become overprotective, and in the same way, wanting to do what is rightful and just. While practising martial arts, a higher degree of preparation is attained (Saienko, 2016) in the individual at later phases of sports perfection, enabling them to accomplish more athletic success by preparing the body to operate within the boundaries of the absolute human limitations.

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The Importance of Institutional Efficiency and Skill Development in the Context of Globalization and Economic Growth: Case Study – Romania

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Abstract

The continuous development of the labor market due to the swift globalization and internationalization processes, as well as the constant pursuit of economic growth, puts every country to the test with respect to global economic competition (Schmid, 1995; 2008; Bassanini and Ernst, 2002). However, economic growth should also be considered from the perspective of "efficiency" by increasing institutional capacity or efficiency, respectively by fully understanding the working cycle of an individual (Schmid, 2017). In this context, both the public and private sectors should be analyzed and approached from multiple perspectives in order to be able to understand the conjuncture and efficiently implement adequate public policies at the national level that stimulate economic growth as well as have an impact on the international level. Moreover, due to the fact that each society is constructed differently, the development of their national economic growth should also be analyzed diversely. In this context, besides the economic perspective, the Human Capital Theory (HCT) perspective, as well as a sociological perspective, could offer peculiar insights in regard to possible methods of economic development based on the idea of increasing efficiency within the coordination capacity among decision-making institutions, considering the conjuncture of each given state from population growth towards institutional development (Becker, 1960; 2009). The research is based on a theory analysis and interview comparisons with actors that activate on a technical as well as political level. Moreover, the research will focus entirely on a Romanian case study in order to comprehend the conjuncture of a given Romanian central public institution's activity that adapts and acts as a national and international entity representative. Lastly, the research concentrates on finding peculiar barriers and conjunctures that could be used for further improvements at the institutional level or for further research within this distinct area.

Keywords

Institutional capacity, civil servants and dignitaries, decision-making process, institutional case study.

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Introduction

In regard to the existing research or articles that concentrate mainly on economic growth, especially on topics with a focus on sustainable developments for SMEs, as well as guidelines for peculiar eco-friendly business models or projects, they unfortunately lack substantial content when it comes to explaining further the situation in the decision-making process of a given development of a policy. In this context, this article tries to provide an insight into the decision-making process within a Romanian public administration institution with regard to policy development. Considering that the research does not concentrates on the end result of a policy, but rather on the process of how a policy is developed, the article tries to cover three main theories in this regard, respectively: the first will be the HCT (Simon Marginson, 2019), a theory that analysis the individual and its potential at the workplace, the second theory that will be analyzed represents the Actor-Centered Institutionalism Theory (Scharpf, 1997), a theory that considers the behavior of

individuals within an institution, and finally the Path-Dependency Theory (Crouch and Farrell, 2004), an approach that identifies a routine within an institution, and presenting possible alternatives to change the institutional routine. All three theories represent the base of this research in order to cover information related to individuals, their actions, and their environment, respectively, within an institution. In this context, the research also tries to explain that the increase in institutional efficiency could lead to economic growth. However, institutional efficiency could also mean multiple aspects that could be used for other approaches or research. In this regard, especially because the focus is on a specific case study, the results could be used for further research that offers further hints for future investigations or research in this domain, which could then be useful for either academia or government representatives. As a final thought, this article cannot be used for generalizing peculiar results due to the fact that the number of interviews was small. In addition, there could also be multiple variables that could influence economic growth, and even if the institutional capacity is high, economic growth will not increase. In this respect, this article was structured with the idea of awakening curiosities within the decision-making process within a case study, in which peculiar examples explained their contextual barriers as well as opportunities.

Review of the scientific literature

In a broad perspective, the globalization process could form unique and different envisions at the individual and national level, resulting in possible different expectations or outcomes for citizens who are connected to the Internet. The new expectations (experienced either on internet, or in another country) that emerged among citizens will have the chance to compare and analyze their own public institutions in contrast with foreign public institutions. Based on their findings, they could either ignore the procedural differences or simply demand similar treatments from their own public institutions. In this context, these expectations, subsequently, can be both to the disadvantage of civil servants and an obstacle to development in general. In more details, by requesting similar methods that are adopted in other states without fully considering the possibilities of changing the institutions or simply understanding the current conjuncture in which the state finds itself, as well as the existing lack of resources or the existence of certain barriers (such as legislative barriers), the level of frustration could increase, becoming further complicated. In this context and as a consequence, citizens' perspectives may change, and certain results may be unfavorable to the political parties involved. In this sense, access to "information" becomes mainly a trigger or factor for the change or stagnation of public institutions. As an example, if the transmitted message is used wisely in relation to future strategies for the implementation of public policies, in the case of the development of civil servants, this could also be a path to follow. Moreover, the process and limits of structuring and publishing specific information in the public spectrum depend mainly on who is transmitting it (dignitaries, journalists, academicians, etc.), in what domain they want to share the information (towards politics, SME's, constitutional aspects, etc.), and for whom the message is addressed (citizens, other actors on a national level, or international). The prior information, or the intentions to change the internal policies of the modification of the legislation of civil servants, can be carried out both internally and externally. In the internal case, it is considered to inform officials about the future internal mechanisms that will be implemented in order to better manage the current situation, which refers to an approach based on a theory of "actor-centered institutionalism" (Scharpf, 1997; GEO, 57/2019). On the other hand, external information reserves the possibility of informing citizens, or future employees (that will become future civil servants), about the new provisions that will be respected in order to provide the expected services; this approach leads towards a more path-dependency theory and towards HCT (Crouch and Farrell, 2004; Simon Marginson, 2019). Communication essentially represents openness to citizens and openness to possibilities in order to synchronize and discipline the future duties of civil servants. In this situation, communicating with the public about civil servants and familiarizing them with the situation could help increase institutional capacity. For instance, according to the information provided by the National Agency of Public Servants (ANFP), civil servants are placed at the technical level in the institutional hierarchy, and at the management level of public institutions are placed dignitaries elected by the vote of the citizens, being at the political level (GEO, 57/2019). The relationship within the public authorities, respectively the relationship between the technical and political aspects, represents another possible indication that can analyze the power of adaptation of the public institution to the expectations of the citizens. Theoretically, any type of public policy should be accepted by the majority of the population, due to the fact that the politicians were entrusted and legitimized by the citizens through voting. Thus, one would understand the will of the majority to choose a political party close to their ideological requirements and expectations. However, after being entrusted with and starting to implement policies that are not in accordance with what the voters expected, despite the fact that the legislative strategies will be in favor of the voters, the political party could encounter restrictions or barriers, such as protests, or they will no longer vote in favor of that political party. Given the last example, there are a couple of uncertainties, such as: how could it be possible

for decision-makers to implement less frequent or well-known policies to achieve outcomes without repercussions? As we observed previously, public policies in general must be shaped according to the current requirements of society as well as possible restrictions. Moreover, public policies represent a medium- or long-term commitment regarding the creation, modeling, or adjustments of internal institutional mechanisms that adapt to the existing and ongoing challenges of society (Scholte, 2015; 2018; 2019; 2021). In addition to the process and analysis regarding the implementation of public policies, sometimes it can be observed how an institution behaves in the face of an unpredictable situation. To be more precise, from a peculiar institutional perspective to consider, the theory of "path-dependency" (Crouch and Farrell, 2004) could prove to be a critical hint that aims at a determined path of future public policies that may appear and consequently forms a particular institutional "status quo" that stagnates or develops, depending on the institutional flexibility. Moreover, a similar analysis also represents the continuous development of the institution in terms of the decisions it has taken, thus forming, with each action that it resolves or not, an improvement (or not) of the internal institutional mechanisms (Lecours, 2005). The second aspect would focus on external progress and trends, as well as related restrictions. Academics debate the topic with the known concept of "state-centric" as the main focus and research on a wide spectrum with multiple and significant actors regarding the decisions they choose, especially at the global level where states, in order to collaborate effectively, comply with certain specific protocols among civil servants. In view of a broad analysis at the global level, or aimed at cataloguing, structuring, and forming an image of important actors, as well as the factors that must be taken into account in order to provide a complete picture of the current situation at the global level, but at the same time it can be proven to be difficult to achieve due to its high variety of independent factors (Scharpf, 1997; Crouch and Farrell, 2004). However, the structure of public institutions, as stated by the authors Andre Lecours (2005), Bennett et al. (2006), Pierson (2000a; 2000b), North (1990a; 1990b), Scharpf (1997), Brinton, et al. (1998), respectively, and Victor Nee (1998), highlights a passive and reactive institutional behavior to the possible events that are encountered, which means that they tend towards an institutional development determined by both internal characteristics and expected and unexpected external factors. Furthermore, as the author Andre Lecours (2005) mentions, institutions without any challenge and without any external influence have no intention to improve the current protocols, leaving the impression that the institutions are stagnant in terms of internal development. If this is the case, then the question of what the essential aspects of institutional management and progress are remains undetermined or unclarified. One aspect that may provide possible clarity on the current situation is among its employees. Each individual has a package of knowledge, experiences, desires, and specific interpersonal connections that contribute to the public sector, respectively, and to the management of public administration (Scharpf, 1997). However, due to the various factors that amplify change in general, especially when it comes to a particular 'change' (Crouch and Farrell, 2004), there may be specific or uncommon methods that promote change.

Research methodology

Based on my aims and objectives to comprehend the internal mechanisms of the Romanian central public institutions, the two main options for researching my inquiry lie between a descriptive and a qualitative methodology, respectively, a literature review and afterwards a series of interviews. In this respect, the first part concentrates on analyzing firstly the existing literature in regard to institutional change (a theoretical general view), the Romanian administrative code, in which lie the specific characteristics and procedural activities for civil servants as well as dignitaries (the relationship between technical and political level), followed by the Romanian Constitution (understanding the limits and possibilities in regard to change of institutions), and consequently reviewing the three main theories, such as Human Capital Theory (Simon Marginson, 2019), Actor-Centered Institutionalism (Scharpf, 1997), and Path-Dependency Theory (Crouch and Farrell, 2004), to understand the possible links between the theories and the national legislation in order to find either opportunities or barriers in regard to change. After the literature review findings were collected, the interviews were elaborated based on the collected data. In addition, the invited representatives (civil servants and dignitaries) consist of four governmental individuals, respectively two civil servants and two dignitaries. In this regard, the interviews should offer a better understanding of the current situation, compared to simple literature review, thus to better understand how a Romanian public institution could change to pursue institutional and economic growth in general.

Results and discussion

In the context of researching a given central public institution, the core idea is based on the fact that the development of public policies could be partially dependent on the current skills of civil servants. In

addition, the economic development of a given state could also depend on the strength of the administrative capacity and the internal organization of central public institutions due to the power of coordination within an institution which Scharpf's (1997) theory is closer compared to other theories. To be more precise, respectively, based on the idea that within a given institution, the individuals are relatively the main actors that represent and coordinate the given institution, in this context, the level of academic and professional knowledge as well as the gained experiences could also be considered highly priced indicators of change, or adaptation, as well as stagnation to maintain a peculiar routine. In addition, dignitaries consider that if the civil servants are not well prepared, this situation could be a significant disadvantage on the long term. However, considering the HCT, the theory also aims to improve individuals in order to increase performance at their workplace (or before they are employed), especially in the context of globalization. However, the issue lies in the missing link between increase of income and increase of education. In other words, if a one is highly educated, this does not guarantee an increase of income in general, however, within an institution, the increase of institutional development, could also be influenced by the preparedness level, as well as to the constraining national laws (the civil servants and dignitaries are in some cases highly constrained, and changing the law is difficult and it takes long time to be achieved – meaning that dignitaries have limited time in this case). Moreover, the current situation of how a policy is regulated within public institutions, as well as the analysis of the private environment within the national level and with regard to globalization and digitalization processes, the impact of individuals and their actions, which are predisposed or constrained to develop, also add to the picture of understanding and comprehending the ecosystem or foreseeing how internally an institution is functioning and adapting to global trends (Simon Marginson, 2019). In other words, efficiency should be based on the employees within the institution, and with constant and efficient training in order to maintain the same international standards. Moreover, considering the civil servants' situation, there was a mentioned hint by dignitaries in regard to the protection of civil servants. Thus, civil servants in general are well protected by the national law, and could have the means to stagnate or to perform slowly in their activities – compared to the private sector, where they could become unemployed if they don't respect their tasks and timeline (GEO, 57/2019).

In this regard, the importance of researching the links between the fields of reference (such as choosing either the analysis at the individual level or the macro-level of the civil servants) attests to an additional layer of questioning in order to structure the incipient framework and connections between the actions of civil servants and the development of future public policies that cover the sphere of development and economic growth. Moreover, identifying the correlations between the performance of human capital and the labor market in the context of globalization and new trends in the digitalization of jobs represents another step towards improving the performance of all employees in the public sector, thus highlighting the need to adapt to increase economic growth by possibly increasing institutional capacity. In this context, the adaptation or remodeling of the competencies of public employees, as well as the methods or strategies for the improvement of civil servants, should be continuously modified, depending on the current context of the labor market and global trends (OG, 57/2019; Schultz, 1959; 1960; 1961; Simon Marginson, 2019). In other words, changing the national law in regard to better sanction public servants, could be a form of improving efficiency in public sectors, similar to the private sector.

In this context, the continuous development ensures also the amplification or at least the maintenance of the level of competitiveness at the national and international levels, as well as the increase of the prestige of civil servants or the improvement of their representativeness towards the citizens or residents of Romania. It is known that each state has a set of cultural and institutional elements. As an example, in each state, the attitude of the population towards a basic food such as "bread" is different. meaning that the "bread" is different in Europe, America, and Asia, nevertheless it serves the same purpose to the population. The same situation can be identified in the case of domestic public institutions; each national labor market is structured on the basis of its own varieties of internal development mechanisms. Moreover, it could also be an interesting case to analyze the fact that, if a public policy is uncommon to the autochthonous population, it could fail the phase of implementation. As an example, by implementing an autocratic policy within a democratic state, the population could grow based on the impact of the public policy (Hall and Soskice, 2001). In this context, it is not possible to start public policies for the development of civil servants, for instance, if they are not first of all adapted to the state's culture, beliefs, and internal or external familiar trends. The public sector was understood as simply the "backbone" of society, which represents the vanguard of stability, control, and protection of each participant both inside and outside the borders of its state, thus representing a certain institutional stability that serves and ensures economic, legislative, or civic stability. Briefly, the state, together with the civil servants, ensures the good functioning of all services or economic activities at the national or international level. On the other side, the private sector represents a sector that can be characterized as the main engine of a state's economy, an engine that helps to increase

socio-economic activities or aspects that also relate to the welfare state, including innovation. The last category represented by the civilian population of the state represents the most valuable resource that a state possesses, its citizens, as considered by the interviews. Moreover, in this context, due to their highly versatile capabilities, the citizens have the unlimited ability to create, to express themselves, to form valuable objects or ideas, to form rituals, to implement orders or laws adapted to their beliefs, or to maintain routines that ultimately lead to the development of their own culture, which forms today's societies and states (OG, 57/2019; Pierson, 2000a; 2000b; Michael Rush, 1992; 2013; Esping-Andersen, 1996). In this context, public servants mentioned that dignitaries have idealistic expectations and desires to achieve, and lack to understand that the current means of the public institution are in their own disadvantage because they don't understand the internal functioning of the public institution. The public servants point out that, if the law in general is ambiguous in some cases, the situation could either lead towards uncertainty, which the outcomes could be against the law, in this regard, the civil servants protect themselves by not performing because of the high ambiguity in some situations. This situation is at most present in the moment when there is an interest in adapting new trends or laws at national level, where the norms and context are new. In this context, the desires of dignitaries cannot be fulfilled because there is a bureaucratic and legal procedure that needs be followed which could take either months or years, time that dignitaries do not have (and, when new dignitaries come at the public institution, they either are not interested in what their predecessors made, or they simply want to initiate a totally different action, meaning that all the previous progress was nullified, and started again from the beginning).

Moreover, public authorities adopt specific public policies to stimulate economic growth based on the conjunctures in which they are acting as decision-makers. On the other hand, in the private sector, the interviewers mention that they normally react to the public policies or strategies that are implemented by the state authorities and comply accordingly. Due to the high level of flexibility of the private sector, they can adapt to the new legislative requirements in order to manage economic activities appropriate to the laws that have entered into force. Finally, individuals, due to its high volatility and their possibilities, react either by accepting policies, ignoring them, resisting or protesting if the laws have a significant discrepancy between legislative intentions and citizens' expectations, or by other means of protest such as simple migration. This aspect could also be identified in peculiar studies (ibid., Constitution of the Republic of Romania; Spring, 2015). In addition, there was also the idea that there was a possibility that citizens may not fully understand the message or the law that was issued by the public authorities. Regardless of whether it is at the technical or political level, the problem of explaining the policy could also become an obstacle if disinformation or misinformation is in place. This example highlights a linear presentation that covers a relatively simple relationship among all the domains or spheres mentioned. But, at the same time, this linear presentation could also prove to be insufficient and sometimes unrealistic because the massive volume of varieties is significant at the national level. For example, there are ambiguous aspects that need to be considered, such as: can the mere existence of certain stages of ideological development create a path determined by specific public policies due to their political and institutional legacies? (Crouch and Farrell, 2004; David, 1992b; North, 1990a; 1990b); how did individualism and collectivism develop in certain regions and why? (Arrow, 1994; Berry, et al. 1996); why the existence or lack of progressivism in a certain society, respectively, and why certain distinct public policies prove to be difficult to implement compared to others? (Ha-Joon Chang, 2002)? Who currently holds the lever of legitimacy or power (Deegan, 2002; 2006). All these questions can be answered with the help of several works by academics (ibid., et al.), but returning to a slightly different analysis, it would represent the process of transmitting information, or the message that citizens understand following their publications by public authorities, a message that can serve a better integration of new public policies or not. Directly, the good management of public information, theoretically, can achieve the formation of a context in society with a positive effect in the case of future public policies. However, excluding and eliminating the analysis of the large volume of information existing on the Internet, individuals are constantly connected to the information provided by both the mass media and the Internet, thus each forming an opinion corresponding to their beliefs or expectations, as well as their fears and uncertainties (Birukou, 2009).

For example, returning to the individual level means recalling the border, within the institution, of the technical and the political levels. At the technical level, the civil servant performs technical operations with limited and expected practices. The main role of the civil servant within the public institution, in addition to other attributions, is to maintain the continuous functionality of the public institution. This custom guarantees the longevity and the institutional and cultural heritage of the reference institution, thus forming the basic structure of the public institution. However, at the political level, political actors or dignitaries have a similar and significant relevance within the mentioned institution. With their own convictions and perspectives, they lead the institution, in addition to its common activities, towards legitimate strategies

and ideologies appropriate to the society and ideologies desired by the majority of citizens. In other words, the incumbent amplifies specific ideological beliefs within the institution, thus forging distinct organizational and cultural elements, or "components," within the given internal mechanisms of the institution. Considering the mentioned aspect, it is not enough to analyze the change through a common causal relationship between the clusters; taking into account the fact that sharing the same vision between the technical and political levels is also necessary for the correct and appropriate synchronization of the respective times In this sense, having a vision and a clear perspective on the established strategies and objectives, achieving the same vision together (preferably common) with civil servants and citizens, as well as supporting similar professional and appropriate training among public employees to external requirements, will result in a true vanguard of moral integration and having constant respect for the workplace and service for citizens, as well as implementing adequate policies and increasing economic growth, in accordance with the results of the interviews. Moreover, this situation is also considered by analyzing research by peculiar actors and national legislation (Deegan, 2002; 2006; Romanian Constitution; GEO, 57/2019).

For this reason, the possible appearance of some form of significant discrepancy between the technical and political levels can break the balance that leads either to institutional inefficiency or to superficial evolutions of the institution, as observed from a process of political incompatibility within the public institution as well as in the relationship with other institutions or actors. This discrepancy can materialize in two possible distinct situations: on the one hand, because of a significantly ambitious strategy that cannot be easily fulfilled, thus forcing the capacities of civil servants, or because civil servants are not prepared to be able to carry out the new attributions or expectations. In the mentioned situation, the interviewers consider that the institution cannot function efficiently or have a healthy development, respectively, and is consequently vulnerable to other obstacles both at the national and international level. In this case, from a theoretical perspective, Scharpf (1997) also considers the constellation of actors operating within a public institution, thus creating a specific organizational culture. Regarding this perspective, it is not necessary to carry out research about their behavior but rather to provide a broader vision about their interoperability with other actors, respectively at the level of institutions acting at the global level, known as the "constellation of actors", which includes both individuals, groups, and institutions.

This situation could also indicate that theoretically there are two types of "constellation of actors" (Scharpf, 1997), respectively the technical and political levels, which have distinct procedures as well as peculiar routines, which could also become an obstacle because they are taken separately. From a technical point of view and remembering that the institution, as the foremost vanguard of stability and a legitimate body, has its own routines and habits in terms of administrative performance, On the other hand, political actors are mainly the vanguard and decision-makers who guide institutions towards specific strategies, thus being highly volatile and significant in terms of arrangements. In addition, at the international level, if a decision-maker does not understand the importance of foreign relations or international relations, then there could be a risk that the institution lacks the ability to fulfill its international collaborations and international trade agreements, as well as the deterioration of foreign affairs or international relations. Moreover, at the national level, civil servants also operate with adapted and appropriate bureaucratic behavior at the national and international levels.

Conclusions

Society as an "entity" will continuously adapt to peculiar factors or events that need change, especially within the economic sphere. The private sector is known as the innovation and economic thrust for every society; however, in order to perform accordingly in a given state, changes are needed from the public sector. In this context, the public sector represents the main actor with regard to change nationwide, especially among decision-making actors. Even further, if decision-making actors do not understand the situation of the institution they lead, the consequences could be either costly or inefficient. In addition, there could also be a possibility that the public policy of the civil servants who are not prepared accordingly (either academically, professionally, or simply by engaging in another and uncommon domain) will not work properly. In this regard, considering new outcomes, the coordination capacity of each institution (at the technical and political levels) is key to efficiently delivering results. However, the coordination capacity will not function if the actors within it do not have the same vision, the same technological means, or simply the knowledge in this regard. In addition, the conjunctures are also key to finding significant methods to improve policies that, in the end, increase economic growth. As last thoughts, the article also has the scope to open another path to investigate and research peculiar aspects related to the economic domain or institutional development, especially with regard to civil servants and dignitaries. The research was planned

to consider mainly the path of decisions and administrative protocols that function within a given institution, not the outcomes. Based on these concepts, by increasing institutional efficiency, the future outcomes (regardless of whether they are policies or other similar acts) will have a significant impact on institutions, as will future research that could be realized.

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The Impact of COVID-19 on Online Consumer Behavior for Sports Equipment: A Trend Analysis

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Abstract

This article proposes to examines how internet shopping for sports equipment changed during and after the COVID-19 outbreak in the UK. The goal of the study is to comprehend how the pandemic affected consumer behavior in relation to purchasing of sporting goods. Using Google search data for phrases related to sporting goods, the study looks for patterns and changes in customer interest over time. According to our findings, there were considerable shifts in the sports equipment search trends both during and after the epidemic, with a noticeable rise in searches for terms like "home gym," "fitness equipment," and "fitness app," among others. According to the analysis, pandemic-related lockdowns and gym closures were the main causes of the rise in sports gear and fitness-related searches. The survey sheds light on how customers shop online, emphasizing the significance of the home gym trend as a reaction to the closing of conventional gyms and the demand for at-home fitness options. By offering insights into the changing customer behavior during a pandemic, this study adds novelty to the field of sports equipment sales. In their quest to comprehend shifts in customer behavior and modify their strategies in light of such shifts, marketers, corporations, and legislators may find the findings to have major practical ramifications. The research also gives prospects for future studies, such as the comparison of the results with other regions or the discovery of specific elements that influence consumer behavior in this setting.

Keywords

Online consumer behavior, Sports equipment, COVID-19, Google Trends, Home gym

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Introduction

The world as we know it has been significantly impacted by the COVID-19 epidemic. Every aspect of our lives—from the way we work to the way we interact with one another—has been impacted by the global crisis. Consumer behavior is one area that has undergone substantial change. People have had to adjust to new practices in product consumption and purchasing as a result of lockdowns and other social isolation measures. One industry where the pandemic has significantly altered customer behavior is the sports equipment industry. People have had to find new methods to remain active and healthy as gyms and sports facilities have either closed or are operating at reduced capacity. The demand for outdoor sporting products and home exercise equipment has increased as a result.

In the UK, the market worth of sports equipment increased by 13.7% in 2020, according to a study by ResearchAndMarkets. The report also emphasizes how sales of outdoor sporting products and home exercise equipment increased during the pandemic (ResearchAndMarkets, 2021). Customers find products online whether they are actively shopping or not, which is why online consumer behavior is becoming more and more significant. Our study indicates that this significant move to the online space is here to stay. According to another study by Think with Google, online research grew in 2020, with consumers using online sources to support their purchases at a rate of 84%, up from 76% in 2019. This shift was primarily caused by consumers over the age of 45, with 80% of those in the 45–54 age range conducting online research in comparison to 68% in 2019(Think with Google, 2020). The demand for health and wellness

goods has increased as more people work from home and spend more time inside. Fitness gear and other health-related goods are in higher demand as a result of this.

Numerous trends that were already in motion prior to the start of the crisis have been hastened by the COVID-19 pandemic. For instance, the shift toward online purchasing was already underway prior to the pandemic, but the crisis has hastened the process. According to The Washington Post, as homebound consumers rushed to create home gyms, stock up on sneakers, and download fitness apps in their millions, sales of exercise equipment, gadgets, and clothing have surged during the pandemic (The Washington Post, 2021). You can use Google Trends to see how queries changed over time in the UK during the pandemic. You can use this platform to track the changes in sports equipment inquiries over the course of the pandemic and afterwards. People have had to adjust to new practices in product consumption and purchasing as a result of lockdowns and other social isolation measures. In order to understand how online shopping behavior has evolved, we will examine search trends for keywords associated with sports equipment and online shopping over the course of this time period.

1. Literature Review

Consumer behavior has changed as a result of the increase in online sports equipment shopping, with many consumers choosing more environmentally friendly and sustainably produced goods. This may be seen in the rising demand for recycled and environmentally friendly sporting goods, which are increasingly available online. Unfortunately, despite the rise in online sports equipment sales, there is still little accurate data available on consumer preferences and behavior. Nonetheless, the spike in online purchasing activity both during and after the pandemic indicates that online sales will likely continue to be important in the UK market for sporting goods.

The COVID-19 epidemic has significantly affected the world economy, which includes the sports equipment sector. The industry has been compelled to adjust to new opportunities and problems as a result of lockdowns, social distance-creating tactics, and changes in consumer behavior (Dubois et al., 2022). According to a number of studies, the epidemic has changed how people shop for sporting goods. Lockdowns and other social isolation tactics have led to a rise in at-home physical activity and exercise among customers, which has raised the demand for home fitness equipment. The demand for conventional sports gear, such basketballs, soccer balls, and golf clubs, has also decreased as a result of the closure of gyms and sports facilities.

The United Kingdom has a lengthy history of sporting traditions, with a particular emphasis on football, rugby, and cricket. Nonetheless, there has been a shift in recent years toward more varied types of exercise and fitness, including yoga, cycling, and running. The epidemic has increased the shift toward other types of exercise while participation rates in traditional sports have remained largely unchanged. When gyms and sports facilities were closed or only partially operational due to the pandemic, many people turned to online shopping to buy sports equipment for at-home training. As a result, there was a considerable increase in online purchasing, with several stores reporting significant growth in the sale of sports footwear, exercise equipment, and home gym equipment. Even as regulations have loosened, this trend has persisted, with many consumers choosing to keep working out at home rather than going back to the gym.

Due to the risks connected with in-person purchasing, many consumers have switched to online shopping, which has hastened the transition towards e-commerce. This has had a big effect on the sports equipment market since more people are now buying sports gear online, which has increased e-commerce sales. Companies have been pushed to reassess their distribution systems and adjust to customers' shifting needs as a result of the transition toward e-commerce (Elnaggar et al., 2022).

Sports equipment's supply chain has been significantly impacted by the epidemic, causing delays in both manufacture and delivery. Lockdowns and social isolation policies drove numerous factories to close, which resulted in a scarcity of raw materials and finished goods. Sports equipment manufacturers have had difficulties as a result, and they have been compelled to alter their production procedures and look for new suppliers in order to preserve their product supply (Hu et al., 2022). Businesses in the sports equipment sector have responded to these difficulties by adapting in a number of ways to stay competitive and satisfy changing consumer demands. For instance, in order to address the rising demand for these products, several businesses have moved their attention to home fitness equipment including dumbbells, exercise cycles, and yoga mats. In order to accommodate the rising demand for online shopping, businesses have also made investments in e-commerce capabilities, such as upgraded websites, increased shipping procedures, and more effective order fulfillment (Wang et al., 2022).

Together with these adjustments, businesses have made investments in new product development, resulting in the creation of new goods and services that are specifically designed to meet the needs of customers during the pandemic. For instance, numerous businesses have unveiled brand-new online training courses and virtual fitness classes that enable customers to exercise and engage in physical activity from the convenience of their homes. As to this, businesses have been able to continue communicating with customers and providing for their requirements despite the pandemic's hurdles (Shaw et al., 2021).

Companies in the sports equipment sector have also collaborated and partnered to address the issues brought on by the epidemic. For instance, some businesses have joined with neighborhood gyms and fitness studios to offer at-home workout equipment, enabling customers to continue exercising and engaging in physical activity even after these establishments close. To enhance their e-commerce capabilities and offer quicker and more effective delivery to clients, some businesses have partnered with delivery and logistics organizations (Kim, 2021).

Cost reduction, combined with improving the customer experience and revenue development, assumes a vital part in the research of online consumer behavior for sports equipment during the pandemic. In order to reduce costs in the retail sector, emerging technologies, such as artificial intelligence (AI), must be adopted. Key components in this respect include effective target consumer group identification, automation to simplify personnel requirements, and inventory management optimization. Retailers may identify patterns in consumer behavior and customize their offerings as a result, which saves them a lot of money. Understanding consumer preferences and behaviors, supporting effective online sales, and improving the entire customer experience are all made possible by these cost-cutting measures.(Anica-Popa et al.,2021)

In order to remain competitive, some businesses have cut their pricing, while others have concentrated on providing promotions and discounts in order to draw clients (AbdulHussein et al.,2022). Also, brands have to take into account the shifting consumer preferences for sustainability and environmental friendliness and modify their product lineups to reflect these trends. Customer service is a crucial component of marketing strategy in the post-pandemic era. With the importance of online purchasing growing, brands must make sure they are giving their customers a nice and frictionless experience. This involves giving customers access to accurate and thorough product information, replying to their questions as soon as possible, and assuring safe and effective shipping and delivery procedures (Chiu et al., 2018).

The importance of sustainability and eco-friendliness to consumers has forced brands to concentrate on these themes as well. This entails employing environmentally friendly products and packaging, cutting waste, and lowering their carbon footprint. Sports equipment manufacturers are looking into cutting-edge ways to lessen their environmental effect, such using recycled materials in their goods and putting sustainable manufacturing practices in place (Komonen et al., 2022).

Consumers of sporting goods have become noticeably more price sensitive as a result of the pandemic. This is partly because the pandemic has had a considerable influence on consumers' financial situations, which has caused many of them to give affordability and cost-effectiveness priority when making judgments about what to buy (Siepmann et al., 2021). Businesses have had to adjust their pricing strategies to account for this shift in consumer behavior, choosing more aggressive, value-driven pricing models that put the needs of the customer first. In doing so, there has been a considerable departure from premium pricing and a move toward more reasonable and realistic pricing models that better reflect customers' cost-benefit analyses.

Also, the pandemic has significantly increased e-commerce and digital engagement among purchasers of sporting goods. Consumers are increasingly turning to internet retailers to buy sports equipment as a result of lockdowns and social distance measures forcing many brick-and-mortar establishments to close (Nyenhuis et al., 2020). Businesses have had to make major investments in their e-commerce capabilities to adapt to this shift in customer behavior, including the creation of fresh, cutting-edge digital platforms and the expansion of already existing ones. Businesses have also been forced to implement more aggressive and interesting marketing tactics that use social media and other digital platforms to connect with customers.

Consumers of sporting equipment are placing more value on brand reputation and trust as a result of the pandemic. This is partly because the epidemic has produced an atmosphere of unpredictability and uncertainty, which has caused many consumers to give higher priority to the brands and goods they believe to be reputable and trustworthy. Businesses have been forced to make investments in their brand image and build a strong brand identity that reflects their values, commitment, and reliability in order to adapt to this shift in consumer behavior. This has meant placing a strong emphasis on customer involvement and satisfaction, brand promotion, and corporate social responsibility (Kim, 2022).

A specialized tool called Google Trends shows consumers historical search volume information for particular words or phrases. It demonstrates the historical trends in search volume for a term in a given locale or language. Marketers can learn more about consumer interest and intent by examining these search patterns, and they can also spot new trends in their specific regions (De La Rosa et al., 2022). Google Trends, for instance, can be used to determine when a specific good or service is in high demand or to learn what terms customers are looking for in regard to a specific brand or product category (Jun et al., 2021).

Google Trends can be a useful resource for figuring out trends and studying customer behavior in the context of online purchases of sporting goods. Marketers can learn which items and brands are most in demand, when they are most in demand, and what factors may be influencing or discouraging online sales by looking at search data for specific keywords and phrases linked to sports equipment (Perez et al., 2023). This information can then be utilized to develop new products or services, improve the targeting of potential customers, and optimize marketing campaigns. Overall, Google Trends offers a special and helpful technique to keep on top of the game in a dynamic and cutthroat online industry.

2. Methodology

Using information from Google Trends, the approach used for this study was created to look into the changes in online consumer activity related to sporting goods both during and after the COVID-19 outbreak in the United Kingdom. The process of data retrieval began with the identification of the pertinent search terms and keywords for sporting goods. Based on a preliminary review of the literature and additional research conducted on the platform, a thorough list of search phrases was produced. The words "fitness equipment," "home gym," "yoga mats," "running shoes," and "exercise cycles" were among the many sports-related terms on this list. The following step was to retrieve information from Google Trends after the list of search phrases had been created. Each search word had to be entered into the platform's search field together with the location and duration parameters. Data was gathered from January 2020 to March 2023 in order to get a complete picture of how consumer behavior was affected by the pandemic and the afferent restrictions imposed by the government.

The data was divided into segments based on particular time periods, such as before and after the start of the epidemic, as well as by particular keywords and product categories, in order to further enhance the analysis. This segmentation made it possible to analyze consumer behavior changes over time and the variables that influenced those changes more thoroughly.

Prior to the pandemic's occurrence in the UK, the search volume for terms linked to sports equipment served as a baseline for the data analysis process. Following that, the time period of the pandemic was examined, paying close attention to the virus' progress, governmental restrictions, and how these things affected online behavior. As the data analysis step continued, other sports equipment kinds that customers were looking for online were also identified and examined. The study sought to determine how the pandemic affected UK customers' online activity by comparing the search volumes for various sports equipment terms before, during, and after the pandemic.

The analysis technique also concentrated on finding trends in search traffic over time. The researchers were able to ascertain how consumer behavior changed as the pandemic spread and laws were altered as a result of this. Identifying any seasonal trends in consumer behavior connected to searches for sports equipment was the final step in the data analysis cycle. This contributed to the understanding of how seasonal changes in consumer behavior might affect the sales of sporting goods, which could also be unrelated to the evolution of the pandemic in the region.

Table no. 1. Search queries used in the empirical study

General	Fitness App + Gym Equipment + Fitness Equipment + Home Gym + Exercise Equipment
Specific	Yoga Mats + Running Shoes + Exercise Cycles + Resistance Bands + Dumbbells

Source: Authors

As it can be seen above in Table 1, we have categorized the search terms in two sets, namely “General” and “specific”.The general group refers to terms that can return more broad information about the variety of activities one can encounter in regards to sports and exercise. They offer a clearer vision into how the population reacted during the initial news of the crisis but not only. The second list contains specific sport equipment that have been popular among people who chose to start working out from home, the products are easy to use and offer a great variety of exercises.

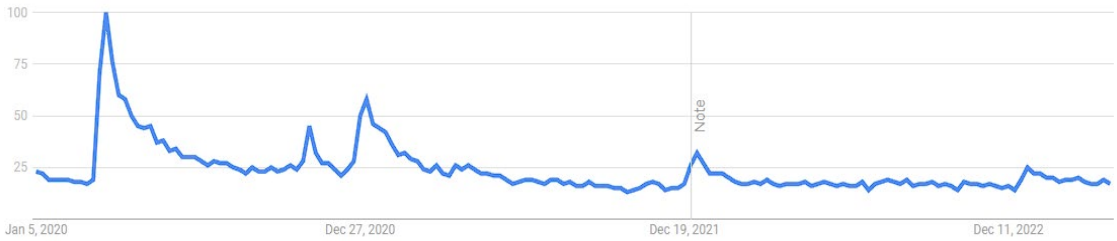


Figure no. 1. Google Trends index for General search terms
Source: trends.google.com

Figure 1 shows the fluctuations in the general terms that were searched during and after the pandemic. The first spike at the start of the pandemic can be attributed to the sudden shift to home-based exercise and the increased demand for connected fitness equipment and paid apps. The second spike near the end of November coincides with the second wave of COVID-19 infections and the subsequent lockdown measures that restricted outdoor activities and access to gyms. The smaller spikes at the start of the year reflect the seasonal pattern of New Year resolutions that motivate people to purchase sports equipment, but often result in low usage and abandonment.

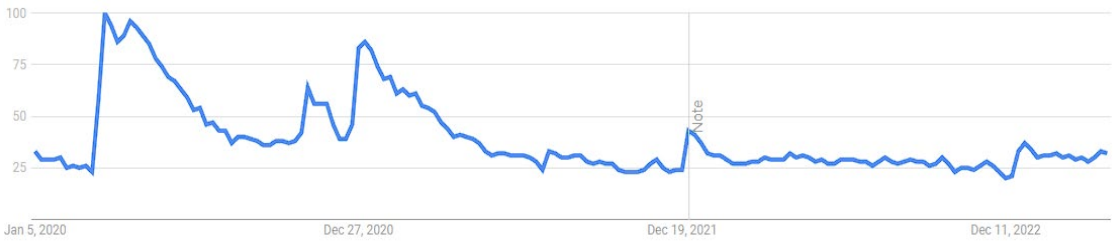


Figure no. 2. GT index for specific search terms
Source: trends.google.com

Figure 2 shows the variations in online consumer behavior in regard to sports equipment searches during and after the pandemic. This one reveals some nuances that suggest a higher level of consumer awareness and deliberation in their search behavior. For instance, the first spike at the start of the pandemic is slightly lower than the first spike in Fig. 2, implying that some consumers bought sports equipment impulsively or out of necessity, without conducting much research or comparison. The second spike near the end of November is slightly higher than the second spike in Fig. 2, suggesting that some consumers were more selective and informed in their choices, as they faced another round of lockdowns and restrictions. The spikes at the start of the year are also higher than the corresponding spikes from the general terms searches, indicating that some consumers were more committed and persistent in their resolutions to exercise and buy sports equipment.

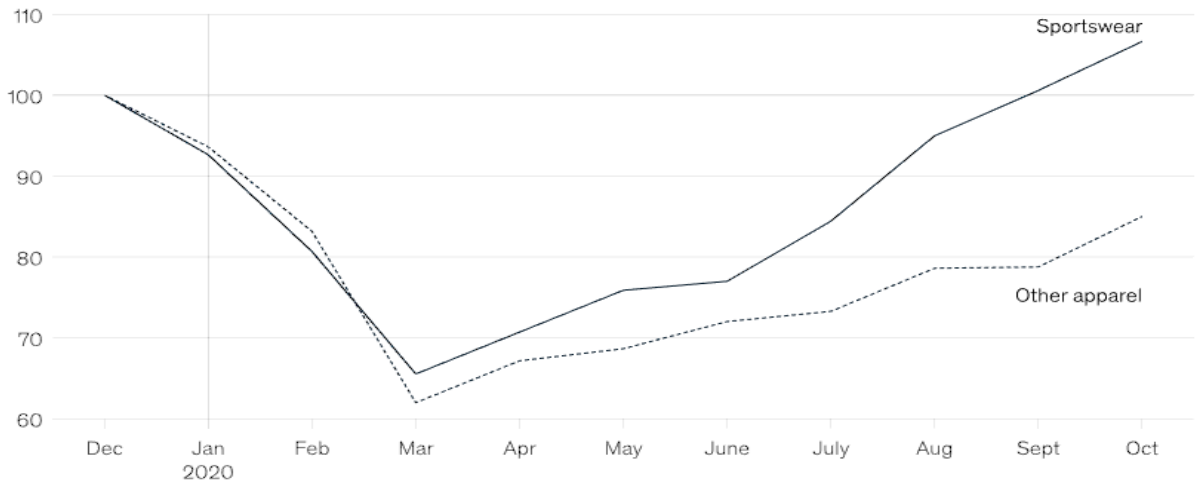


Figure no. 3. Sportswear performance compared to the general apparel industry
Source: McKinsey.com

Figure 3 illustrates how the overall sector was impacted by the start of the pandemic, and how the following months the sportswear subsector, which proved to be more resilient than the overall apparel industry, has seen larger growth. While the apparel market suffered a steep decline in sales due to store closures and reduced consumer spending, the sportswear segment experienced a smaller drop and recovered faster. This suggests that consumers prioritized comfort and wellbeing during the pandemic and shifted their spending to more casual and functional clothing items. The sportswear subsector also leveraged its digital capabilities to capture more market share and customer loyalty. Online channels became more important for sportswear purchases, as physical stores were closed or restricted. Sportswear companies that had a strong digital presence and offered convenient delivery and return options were able to meet the needs and preferences of online shoppers. Moreover, some sportswear companies also offered innovative solutions such as digitally enabled fitness equipment, virtual coaching, and online communities to enhance their customer proposition and engagement.

3. Results

An interesting association between the volume of searches for sports equipment and the pandemic situation in the UK was found after an analysis of the data obtained from Google Trends. Between January 2020 and March 2023, there were several lockdowns, restrictions, and adjustments to government regulations as a result of the epidemic. Our findings indicate that these policy changes had a noticeable impact on the trends in sports equipment searches, with the most pronounced rises occurring during the times of stringent lockdowns.

The volume of sports equipment searches in January 2020 remained rather constant, with a slight uptick at the start of the year. However, with searches for "home gym," "fitness equipment," and "fitness app," among other terms, there was a sudden increase when the number of COVID-19 cases began to grow in March 2020. The first national lockdown was announced in conjunction with this increase and began on March 23, 2020.

The peak of the first wave of COVID-19 cases, when the toughest regulations were in force, coincided with the months of March to May 2020, when searches for sporting goods peaked. In June 2020, as the number of COVID-19 reported infections started to diminish and the lockdown measures were progressively relaxed, the search trends for sporting goods began to decline.

On November 5, 2020, the government declared a second nationwide lockdown, which caused a spike in searches for sporting goods. This pattern persisted through December 2020, coinciding with the holiday season and the declaration of the third nationwide lockdown.

As limitations were gradually loosened and the immunization program was implemented in 2021, the number of searches for sports equipment gradually decreased. Yet, a two-week surge in searches at the beginning of the year was notable, as it has been in years before. New Year's resolutions and the desire to live a healthy lifestyle can be appointed as the source for this rise in searches.

Overall, our findings imply that the COVID-19 pandemic and the associated lockdown procedures significantly influenced UK search trends for sporting goods. The study sheds light on how consumer behavior changes during a pandemic and emphasizes the significance of the home gym trend as a reaction to traditional gyms closing and the demand for at-home fitness options.

4. Discussion

Our research tried to extend previous research, by examining impact of the pandemic and how it altered United Kingdom’s consumers' online purchasing habits for sporting goods. It is well known that the pandemic has forced people to alter their lifestyles. As a result of gym closures and lockdown limitations, people have been searching for alternative ways to maintain an active and healthy lifestyle. Given that people were attempting to adjust to this new way of life, it makes sense that there was a rise in inquiries for sporting goods. After the restrictions were lifted and life returned to "normal," it is difficult to tell if the majority of people have continued on this trend. People have been compelled to adapt and change their behavior as a result of the pandemic, but it is unclear whether these changes will last permanently or only temporarily. It is essential to remember that other factors, such as seasonal variations or marketing campaigns, may have had an impact on the search trends for sporting goods, so it is difficult to say with certainty how much of the increase is actually due to the pandemic.

However, the fact that searches for "home gym," "fitness equipment," and "fitness app" significantly increased during the pandemic suggests that people were actively looking for methods to maintain their health and fitness despite the difficult circumstances. The psychological needs that people have, such as the need for control, predictability, and autonomy, can be used to explain this tendency. People frequently look for methods to regain control when they feel as though their lives are spiraling out of control, and one such strategy is to get fit and active. Moreover, the fact that people were searching for "home gym" and "fitness equipment" suggests that they were looking for solutions that would allow them to exercise at home, which can be seen as a response to the closure of traditional gyms. This trend highlights the importance of at-home fitness solutions and the need for businesses to adapt to these changing consumer behaviors.

It's crucial to recognize the limitations of this research, though. It is challenging to infer a causal relationship between the pandemic and the rise in sports equipment searches, despite the results' suggestion of one. Additionally, the research is only capable of examining Google Trends data, which may not adequately represent the complexity of consumer behavior. Additional research is required to examine the pandemic's long-term impacts on consumer behavior related to sporting goods and to pinpoint the variables that contribute to these changes.

The research results of this study are consistent with the outcomes of the study on purchasing green items in the post-pandemic era. Given that consumers' increased awareness of crises promotes the tendency to acquire sports equipment online, both research highlight the importance of crisis awareness in affecting purchase intentions. With its beneficial effects on product understanding, crisis awareness, and subjective standards, social media marketing is also essential. As customers' perception of control over their behaviors and sense of responsibility influence their purchasing behavior, perceived behavioral control and responsibility attribution are also important aspects(Sun et al., 2022).

Conclusions

In conclusion, this study sheds light on the potential of using Google Trends as a useful data source for comprehending population behavior during and following the COVID-19 outbreak in the United Kingdom, particularly with regard to online sports equipment purchasing activity. The increasing volume of online searches for sports equipment is evidence, according to the research, that the pandemic and related lockdowns have had a substantial impact on online consumer behavior. This study also points to the need for additional study in this area, specifically the need to determine whether this pattern has remained when limitations were lifted and a more normal way of life resumed. One important aspect to note here is that while some companies had a strong establishment in the digital space and were ready to offer not just products, but other kind of services such as online trainings, overall the market was not entirely ready for such a disruption as the pandemic was.

Also, this study contends that the pandemic has had a profound psychological effect on people, prompting them to look for alternative forms of physical activity. This conclusion emphasizes the significance of addressing the population's mental health requirements during future public health emergencies and of taking into account how lockdown procedures may affect people's physical and mental health. To build on the findings of this study, further investigation is required, including a look at how vaccination rates and new virus types affect online sports equipment purchases. Overall, the results of this study add to the expanding corpus of research on the COVID-19 pandemic's effects on consumer behavior and lay the groundwork for future studies in this field.

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The New Paradigm of Online Marketing: A Study of Generation Z Consumers' Behaviour and Their Attitude Towards Brands

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Abstract

The marketing environment is evolving and is prone to transformation more often than ever, due to the new digital era and rapid technological development;therefore, companies, along with marketers, are constantly trying to improve consumer experience, in an effort to fulfill their customers` needs and desires accordingly.Studying the consumer behavior of Generation Z is crucial for online marketers due to the fact that they are starting to gain significant purchasing power and have become a target audience for retailers worldwide. Through this article, we aim to find out insights regarding consumption habits, preferences of shopping methods, preferred channels, attitudes, perceptions regarding certain influencing factors of Generation Z consumers, focusing on online marketing elements. The research instrument was a survey created through the Google Forms platform which was distributed exclusively to Generation Z respondents via online channels.The survey was completed by a total number of 125 respondents and the obtained results were presented in the form of a descriptive analysis.The main results show that Gen Z consumers are more likely to use online channels in their buying process(as a means of information) and are influenced by a different range of factors than previous generations.Other elements that we focused on were the preffered online shopping channels, shopping habits according to various product categories, attitude towards brands and willingness to pay.

Apart from the scientific contribution, this study can have as possible practical implications the development and customization of new marketing directions by companies, with the aim of targeting this audience of great interest, namely Gen Z.

Keywords

Consumer behavior, online marketing, generation Z, shopping habits.

DOI: 10.24818/BASIQ/2023/09/040

Introduction

The Millennial generation and Generation Z are in control of the future purchasing power. Due to their significant purchasing power, disposable income, and brand loyalty, both generations now represent a major commercial opportunity (Apptus, 2023).These consumer are, nevertheless, regarded as the generation that will drive m-commerce consumer behavior in the next years (Monaco, 2018). Therefore, from a marketing viewpoint, researching Gen Z consumers is of utmost value. According to some projections, the cohort has $360 billion in disposable income (Pollard, 2021) and is expected to continue to expand over time;therefore, companies should act accordingly and direct their attention to methods by which they could attract this category of consumers, using insights about their buying habits and taking into consideration the developing and use of new technologies.

Previous research revealed that generation Z customers' experiences are significantly influenced by smart technologies(Priporas et al., 2017). Additionally, this particular group of consumers anticipates new

technology to be widely accessible, allowing for quicker transactions and greater consumer autonomy. They also anticipate that technology will help consumers make wiser purchasing selections.

Another object of concern among researchers is the mobile-shopping trend, which can generate compulsive buying among young people, as a direct link of addiction to smartphones(Mason et al., 2022).

Another interesting study which focused on the usage and influence of social media and generation Z consumers` attitude towards brands has provided us with some notable insights on this topic(Singh et al., 2022).Due to their early exposure to SMM, the demographic research reveals that this customer sector is familiar with a variety of social media platforms, including Facebook, Instagram, YouTube, and others. The study's findings also showed that 90% of them choose to watch YouTube and are significantly influenced by the content shown on the platform.They receive a lot of information from SMM about different companies and products, which ultimately aids in the development of a strong brand mindset. The study's findings showed a strong correlation between social media marketing (SMM) and brand attitudes, indicating that SMM both shapes consumers' attitudes toward a brand and influences their choice of one and implicitly, their choice of purchase, as well as having the ability to connect them with brands. The same study contends that once a person establishes a connection with a brand, their desire to buy that brand increases as they begin to associate themselves with that particular brand.

Altough the previous studies have provided us with valuable scientifical and practical contributions, we can further develop new research directions expanding the variables which were already taken into account, as well as introducing new ones.

The main objective of this research is to identify the main factors in the purchase process of generation Z consumers, taking into account variables such as means of information about different products and their frequency of use, purchase habits according to different categories of products, preffered methods, locations and shopping channels.Other objectives include measuring the influence of elements from online and physical environments(for comparison purposes) in the buying process, as well as studying Gen Z consumers` preferences of branded products and measuring loyalty and willingness to pay for preferred brands(a very important aspect of this research was establishing a correlation between the income factor and these variables).In order to reach these objectives, we conducted an online survey addressed exclusively to Generation Z respondents; the results of this quantitative research have shown that the preffered channel for online shopping for this socio-demographic category are retail platforms, products such as food, clothing, footwear and jewelry are preferably seen or tested and bought from physical stores; a very low percentage was recorded among customers who exclusively shop online, the biggest percentage being for the electronics category.Search engines were identified as the main information source during the acquisition process, along with social media platforms such as Instagram and Youtube, as well as product reviews.Overall results have proved that nowadays, these category tend to use online sources in the buying process, compared to traditional ones.Among the most important factors when making a purchase decision, high quality, good ratings and reviews were stated by the respondents.Willingness to pay and preference for branded products were recorded as low in this current study, correlated with the fact that a majority of respondents were people in the low-income category.

Due to the fact that previous study were limited due to the nature of social and cultural factors, the results of this study will help researchers, marketers and companies to better understand buying behavior of Romanian Gen Z consumers.

1. Consumer behaviour of Generation Z

The conducted research was designed in correlation with secondary data from scientific literature, as well as statistics provided by field experts.

Generation Z is the generation after Millennials and preceding Generation Alpha (Apptus, 2023). It is also known as Gen Z, zoomers, or the iGeneration and consists of people born between 1997 and 2012. It is the first generation to have been raised in the digital age, and it interacts and virtually integrates with its favorite businesses (Bernstein, 2015). Technology is heavily used by Generation Z, and they regard it as a tool for themselves (Van den Bergh & Behrer, 2016). Since Generation Z appears to behave differently than previous generations, this generation presents a challenge because these differences in behavior may affect consumer behavior (Schlossberg, 2016).

According to Ameen & Anand and Ameen et al. (2020 and 2021), Gen Z is made up of young adults who have never known a world without digital technology. This tech-savvy cohort of consumers are considered digital natives since they were exposed to social media and mobile technology heavily as children (Fister-

Gale, 2015) and were born into a VUCA (volatility, uncertainty, complexity, and ambiguity) world (Casalegno et al., 2022). Four trends define Gen Z, according to Wood (2013) and Priporas et al. (2017): A desire to temporarily escape the reality they face; (1) an interest in new technologies; (2) a demand for simplicity of use; (3) a need for security. They have seen significant political, social, technological, and economic change in their short lives. Brands are under pressure to find new ways to capture and hold consumers' attention of Gen Z consumers as they tend to be less loyal to brands, have higher expectations, and are more concerned with the overall experience (Schlossberg, 2016).

The Gen Z generation is always connected and prefers technology over face-to-face interaction (Polakov & Klmov, 2019).However, technology also affects other elements of Gen Z's existence, such as their physical health, cognitive processes, and social and professional identities. They also share a similar consumer culture and traits as a result of their significant exposure to worldwide mass media, popular culture, and marketing initiatives of multinational corporations (Benasso & Cuzzocrea, 2019; Ng et al., 2019). Multiple information flows and frequent, quick encounters with content and people define their way of life. A smartphone is the primary means of transportation for most of these information flows.

The most critical consumer group to date, Generation Z has a different perspective on buying and consumption than earlier generations. They have a large purchasing power and are the most recent workers. Brands must earn the trust of Generation Z by meeting their increased desire for higher-quality goods and stricter budgeting. Some intriguing data regarding Generation Z's internet shopping preferences:77% of people have acted in some way for a cause they support; 23% have even boycotted a company; and 65% have made a purchase based on the advice of an influencer (Apptus, 2023).

The concern that Generation Z has for the environment and the future presents a tremendous potential for sustainable corporate growth. They think that the generations who came before them exemplified materialism, capitalism, and excessive spending.Thus,Customers of Generation Z are more likely to choose high-quality, ecological items. According to a First Insight research, 73% of Generation Z buyers are willing to spend 10% more for sustainable goods. They appreciate customized goods and are frequently drawn to companies who share their opinions on social and political concerns.

Many members of Generation Z witnessed as their parents battled and suffered significant financial losses during the Great Recession of 2008. They are more cost-conscious and frugal as a result.

Before making a purchase, members of this age frequently conduct research and analyze their options. In keeping with their reputation as frugal shoppers who have been moulded by economic uncertainty and who grew up learning how to discover discounts online, they are also motivated to save money (Clarkston Consulting, 2022).

Reviews and word-of-mouth in the media have a significant impact on Gen Z purchase behavior because they place a strong focus on value for their money. Gen Z tends to be far less loyal to certain companies as a result of having access to more brands than ever before, preferring to compare prices instead (Clarkston Consulting, 2022).

Shoppers in Generation Z are less likely to trust businesses than earlier age groups. As opposed to online marketing or celebrity ambassadors, they choose to follow influencers on Instagram and YouTube since they are perceived as more relatable and reliable. The most profitable organizations capitalize on this by switching from conventional digital marketing to influencer marketing techniques (Clarkston Consulting, 2022).

Mobile wallets and applications are popular among Generation Z users that use mobile payments.Mobile apps have gained popularity in recent years and produced excellent outcomes. Companies who have a mobile app are at a significant advantage over those that don't. Compared to mobile web sessions, mobile apps convert 157% more.

2. Research methodology

The research results were based on primary data(information obtained from first-hand experience that has not previously been used, as opposed to external sources). The information acquired via primary data gathering techniques is highly precise and specific to the goal of the research.

The quantitative research was conducted in March 2023, using an online survey as an instrument which was designed through the Google Forms platform and distributed through two main social networks, Facebook and Whatsapp, and targeted at Generation Z.

Surveys are used to acquire information about the target market's tastes, opinions, decisions, and feedback regarding the products and services they offer.

The answers were collected automatically via Google Forms and the charts and graphics containing statistical data were generated using the Microsoft Excel programme, which were completed with a descriptive analysis by the authors.

The sample size consisted of 125 respondents with the following demographics: the majority of respondents (83.2%) were female, while male respondents accounted for 16.8% of the sample. Also, the marital status of 82.4% of respondents was single.

3. Findings

The majority of respondents (80%) were students, the rest being employees (9.6%), students (4%) and entrepreneurs (3.2%).In terms of background, the majority of respondents came from urban areas (61.6%), the rest (38.4%) from rural areas.

Given that the vast majority of respondents who answered the questionnaire were students, 55.2% of the people who participated in the questionnaire are people with monthly incomes of less than 1900 RON, 28% have monthly incomes between 1900-3000 RON, 9.6% have monthly incomes between 3000-5000 RON, with people with incomes between 5000-6500 RON or more than 6500 RON having significantly lower shares (2.4% and 4.8% respectively).

In the following, we will present a descriptive analysis based on the responses received from the questionnaire. A first factor we wanted to analyze was the shopping frequency of Generation Z consumers according to different locations. Regarding supermarkets/hypermarkets, 15.2% of the respondents stated that they visit them daily, while 24.8% visit them once a week, and 46.4% shop in these locations several times a week.The same frequency was identified for 28% of respondents for street shops, kiosks and boutiques, but for these locations a higher percentage of respondents (23%) said they shop daily compared to supermarkets and hypermarkets. In the case of shopping malls, frequencies were quite low, with a small number of respondents (18.4%) frequent these locations several times a week or even once a month (23.2%) or less often (21.6%).Regarding the frequency of shopping online, the majority of respondents (35.2%) say they rarely shop online, 22.4% use online environments once a month and 18.4% once a week.

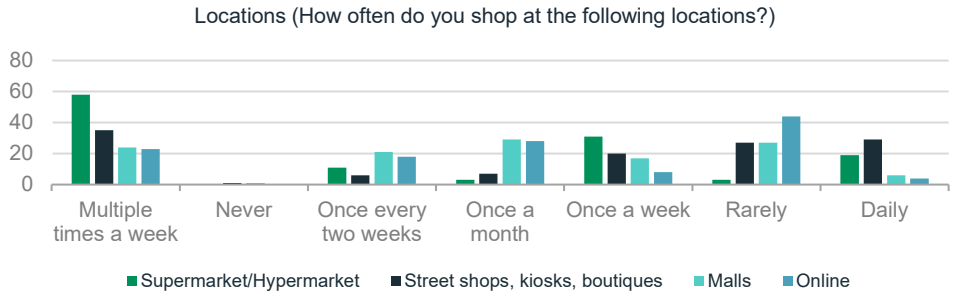


Figure no. 1. Preferred locations of Generation Z consumers

Source: processed by authors

Another research consideration was the preferred online shopping channels of Generation Z consumers (Figure 2). According to the research data, 49% prefer to shop online via online retail platforms or the company's own website (30%), 17% shop directly from mobile apps, while only 4% shop online via social media platforms.

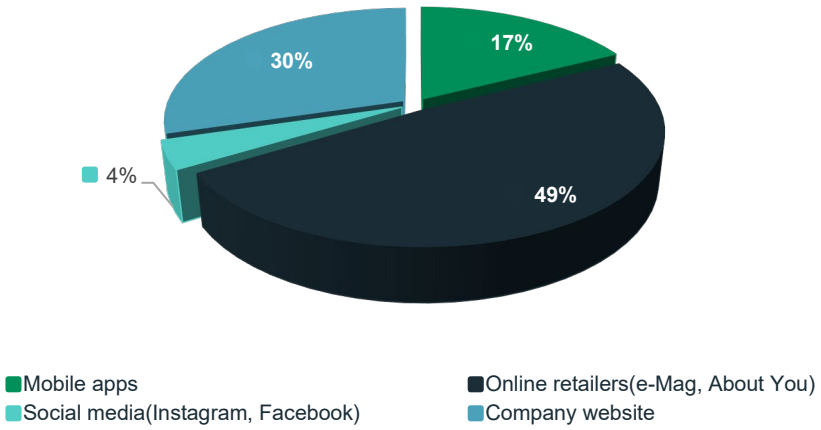


Figure no. 2. Preferred online shopping channels

Source: processed by authors

Analysing the buying behaviour patterns according to distinct product categories, we note that there are differences in the way consumers buy for each product category (figure 3): the majority of respondents (51.2%) prefer to test and purchase clothing, footwear (54.4%) food (76%), jewellery (49.6%), accessories (41.6%) and perfumes/cosmetics (44%) exclusively from physical stores. We also note that there are significant proportions of consumers who buy from both traditional shops and online. There is a very low number of respondents who buy exclusively online, regardless of the category of products they are buying (the highest percentage of this type of consumer is 16% for the electronics and household appliances category).

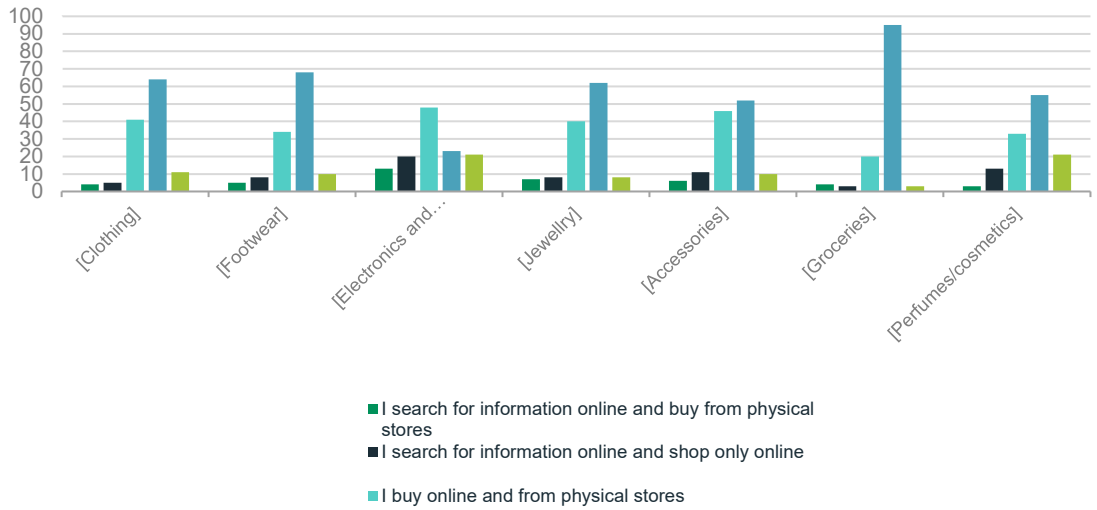


Figure no. 3. Preferred purchasing methods according to various product categories

Source: processed by authors

In the present quantitative research, we also aimed to analyze the frequency of use of different media (both traditional and digital) for the purpose of gathering information by Generation Z consumers about specific brands, which is a primary stage of the purchase process (Figure 4).

Figure 4:Frequency of use of different media for information purpose

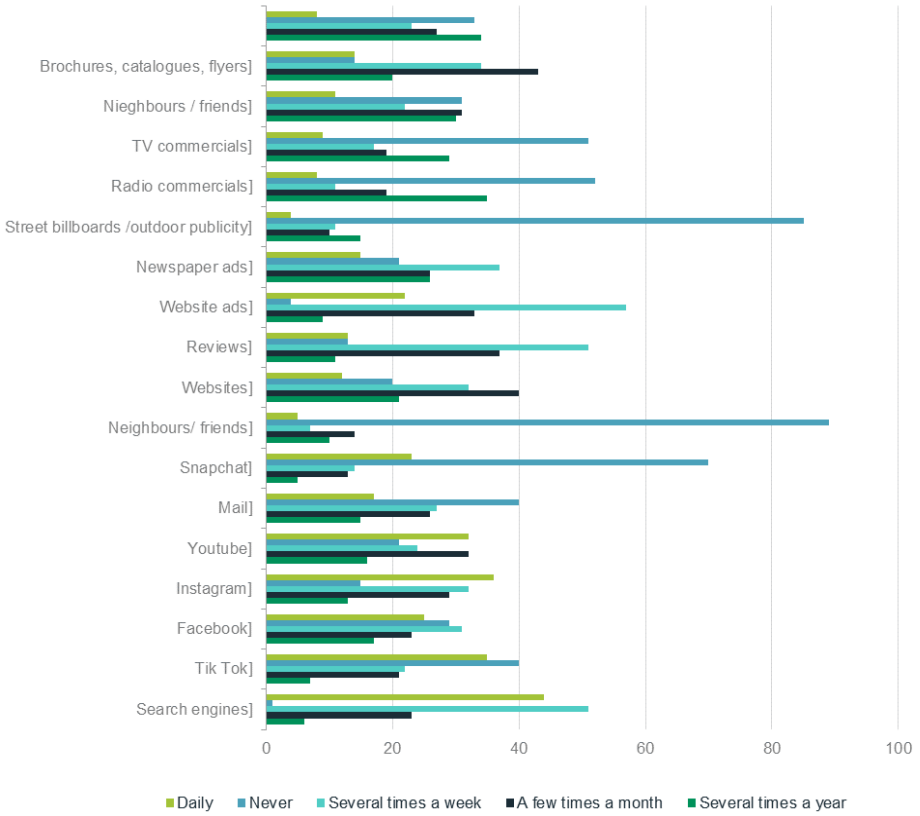


Figure no. 4. Frequency of use of different media for information purpose

Source: processed by authors

We find that 35.2% of respondents choose to access search engines daily, 28% consult the social media platform Tik Tok or Instagram (29%) and Youtube (26%).A percentage of 20% was identified in the case of consumers who use Facebook daily. However, in the case of Snapchat, a majority percentage was among those who never use it as a means of information (56%).A percentage of 18% consider reviews as a daily information method, and in the case of information through traditional channels, negative percentages were recorded for newspaper advertisements (over 68% of respondents said they never get informed about products they want to buy through this channel), over 40% said they never get informed through radio advertisements or street billboards. The same pattern was also true for brochures, flyers and leaflets (26%) and TV advertisements (25%).However, there were significant percentages of respondents who never use Tik-Tok, for example, as a means of information (32%).

We cannot neglect the other variables taken into account in the research: more than 40% of the respondents inform themselves several times a week about the products they want to buy via search engines and online reviews, or on the manufacturers' websites.

The analysis of the responses on the importance of certain factors in the purchasing process(Figure 5) shows that high quality is the most important factor in the purchasing process, with an average value of 4.17.The next most important factors are ratings and reviews, both with average values of 4.04. The factor with the lowest average value of importance was promotion by influencers (2.87); however, promotion by regular users on social networks is more favourably rated, with an average score of 3.26.This may be due to the perception among Generation Z consumers that influencers are often paid to promote certain products and their reviews are not always genuine. In recent years, there has been a lack of authenticity in influencer promotion, with Generation Z preferring content posted by regular users who do not yet enjoy such a high profile. The figure below illustrates the other average importance scores for the remaining factors nominated in the questionnaire obtained from the analysis.

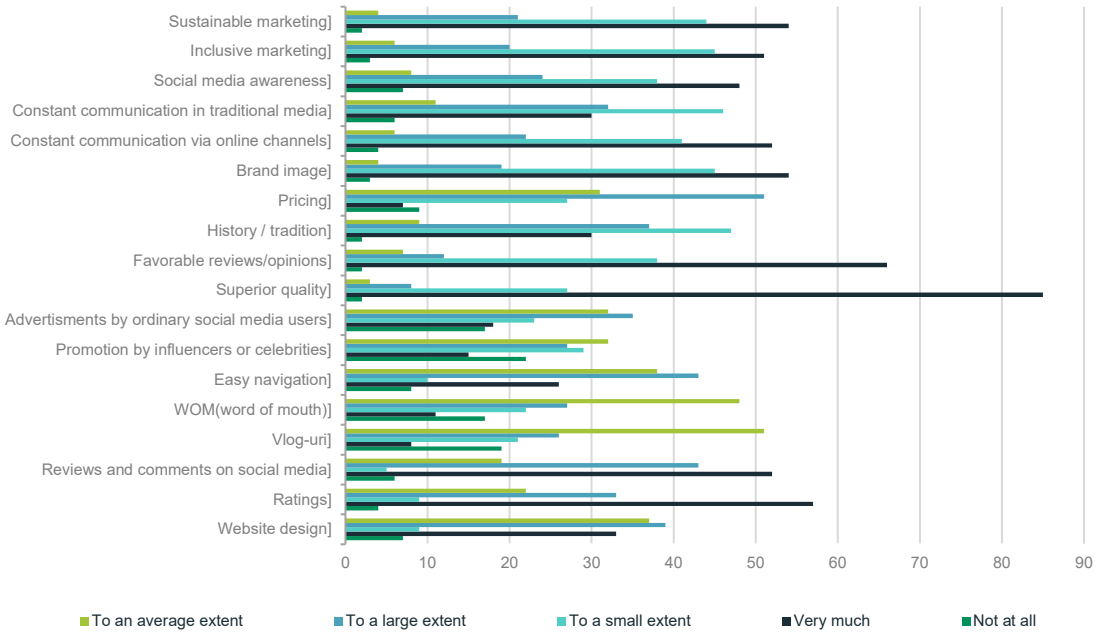


Figure no. 5. The importance of factors in the buying process

Source: processed by authors

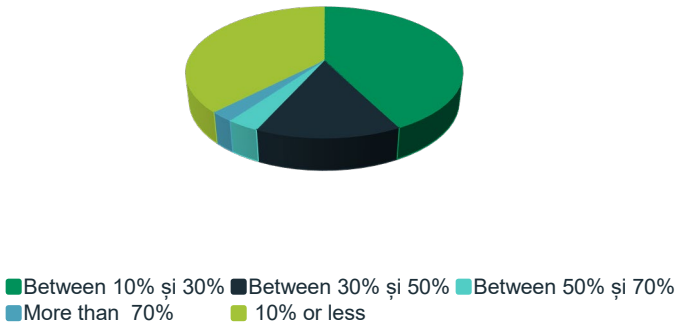


Figure no. 6. Willingness to pay a higher price for the preferred brand

Source: processed by authors

Willingness to pay can be a key factor in measuring consumer loyalty, so it was included as a variable in the research. We find that there are significant percentages of respondents who are unwilling to pay a much higher price than the current price to purchase their preferred brand (38% say they are willing to pay up to 10%, and 42% would be willing to pay up to 30% more, while only 14% would be willing to pay double the initial price to purchase their preferred brand.

In order to get a clearer picture of these results, we decided to carry out a cross-tabulation to see the interdependence between the variables. Thus, we selected the income factor because of its major importance in the purchasing process, especially in the case of the segment analysed (young people, who may not yet have such a high purchasing power).

Figure 7 shows the correlation between the income factor and the respondents' choices between well-known brands or non-brand products with differentiated prices (price being also another major decision factor, being strongly correlated with the income factor).One element that should be taken into account is that the majority of the sample (55%) consists of people with minimal income (<1900 RON), i.e. young students.

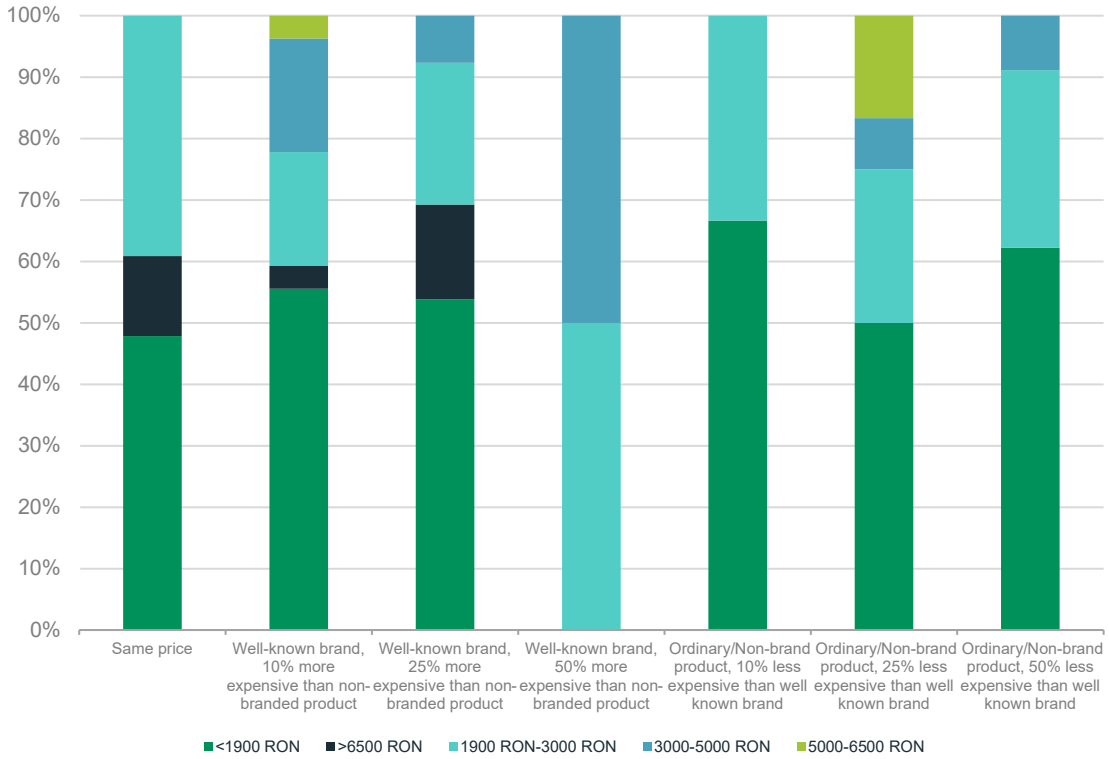


Figure no. 7. Gen Z consumers` choice of well-known brands or ordinary products, according to income

Source:processed by authors

The analysis confirms that price is a major factor in the decision making process, as more than 40% of people with an income of less than 1900 RON (the majority segment) would prefer a non-branded product 50% cheaper, with similar characteristics to a branded product in the same category.21% of people in this category would be willing to pay 10% more to buy a branded product than a regular one, 16% would be willing to pay the same price, and only 10% would be willing to pay 25% more to buy a branded product.

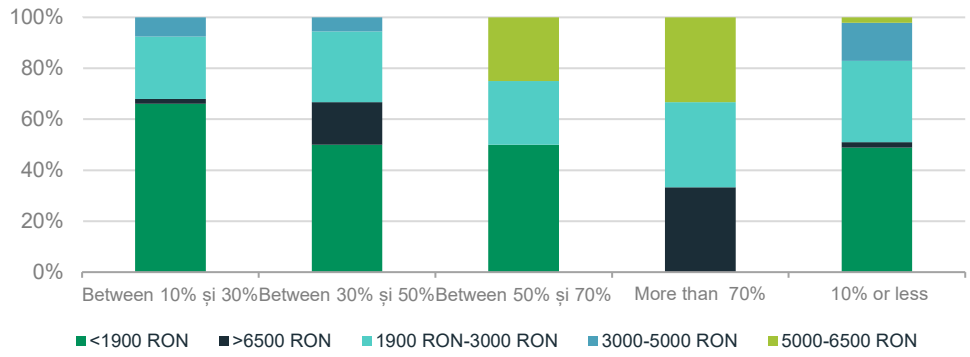


Figure no. 8. Willingness to pay a higher price for the preferred brand according to income

Source: processed by authors

However, we have some interesting results in Figure 8, where a cross-tabulation was performed between the income factor and the willingness to pay a higher price for the preferred brand (for which there is a high degree of loyalty).More than 33% of respondents with an income below 1900 RON would be willing to pay up to 10% more for the brand they are loyal to, and 50% would be willing to pay even up to 30%.37% of people with an income between 1900-3000 RON would be willing to pay up to 30% more, 14% 30%-50% more.

Conclusions

Before drawing the final conclusions, we must mention some limitations of our research: first of all, the majority share held by the female gender, as well as people with minimal incomes, were variables that strongly influenced the research results, due to the fact that there are distinct factors may constitute decision factors depending on gender or the purchasing behaviors may be different; regarding the income factor, we can deduce that the low purchasing power generated some implicit answers regarding the willingness to pay higher prices or the preference for brands or ordinary products. However, considering that a characteristic of consumers from the Z generation is not necessarily being loyal to a brand (aspect associated with the willingness to pay a higher price) and to constantly look for the most advantageous offers, having a higher price sensitivity, we can conclude that our results confirm what the specialized literature has identified in previous studies.

Identifying the communication channels preferred by those of the Z generation, the buying habits, the preferred locations, the media used for informational purposes, the attitudes and perceptions towards brands and certain promotional techniques, as well as the influencing factors within the process of purchase, together with the measurement of willingness to pay revealed by this study contributes to a better understanding of consumers in this new cohort of interest for marketers and companies, in order to develop targeted marketing strategies, with the aim of resonating with this new target audience.

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The Implementation of Telemedicine Increases the Quality of Medical Services

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Abstract

The purpose of the article is to shed light on the characterization of the development and limitations of telemedicine in Romania, as well as on related managerial actions for change and implementation of telemedicine at the institution level.

Adopting an exploratory approach, this paper analyzes the documentation found in various publications and scientific articles to illustrate the potential advantages of implementing telemedicine in Romania. The method used is descriptive and quantitative, given the fact that the subject is very widely discussed.

Telemedicine cannot replace a classic medical examination, but it can play the role of a preliminary medical consultation, having multiple benefits for both the patient and the healthcare professionals. Telemedicine improves the quality of life of patients with chronic diseases that require continuous monitoring, reducing the frequency of visits to the doctor and the number of hospitalizations. Along with all the other benefits presented in this article, properly used telemedicine can be an important resource for health systems leading to an increase in the quality of medical services.

In a context where the development of telemedicine still remains deficient in this country, knowing the benefits offered by telemedicine in the medical field leads to the efficiency of its implementation within the institution. Through a more in-depth analysis of the advantages of telemedicine, we want to encourage providers of medical services and to expedite the transition from the design phase to the implementation and development phase at the national level.

The future of telemedicine foresees, along with a wide applicability of artificial intelligence, services for the management and improvement of chronic diseases, as well as health services offered in the comfort of the home, offering the opportunity for the Romanian health system to solve the unequal distribution of medical resources at the national level.

Keywords:

Telemedicine, telehealth services, healthcare services, quality of healthcare services, COVID-19, monitoring , diagnosis.

DOI: 10.24818/BASIQ/2023/09/044

Introduction

Telemedicine represents the virtual, continuous, and democratic provision of healthcare services without the need for physical contact between the patient and the healthcare service facilitator (Saigi-Rubio, F.; Borges do Nascimento, I.J.; Robles, N.; Ivanovska, K.; Katz, C.; Azzopardi-Muscat, N.; Novillo Ortiz, D., 2022).The World Health Organization (WHO) has also created a definition that states that telemedicine represents "the delivery of health care services by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of diseases and injuries, research and evaluation and for the continuing education of healthcare providers,

in which distance is a critical factor, all in the interest of promoting the health of individuals and their communities."

There are two types of telemedicine programs, synchronous and asynchronous programs (Allely, 1995). Synchronous programs occur in real-time and involve interaction and communication between the patient/client and healthcare provider, using a device such as a smartphone, tablet, or computer, through a website or application. Asynchronous programs, also known as "store-and-forward" applications, are not live and involve the transfer of data, images, videos, or other clinical information, which the provider analyzes and subsequently provides a response. (Anon., 2015).

1. A brief history of telemedicine

A modern summary of telemedicine: its early history began with the implementation of the telegraph, radio, and telephone in the communications field. Telemedicine was not a sporadic effort dedicated solely to the needs of historic conflicts, but rather continued to adapt and improve to support medical care delivery, especially in situations where healthcare providers and patients could not be in the same place at the same time. The first telemedicine consultations were conducted over the telephone, enabling doctors to communicate with patients and provide advice directly. Through the phone, doctors were also able to communicate with each other to exchange experiences and information. Modern medicine is considered to have started in the 20th century, and during this century, telemedicine experienced sustained growth due to electrical, electronic, and computerized innovations, which were implemented through electronic and then digital communication techniques and data processing with the help of computers. A key moment in telemedicine history was the pioneering experiments of the Dutch inventor of the electrocardiograph, Willem Einthoven (Barold, S., 2003) . He transmitted the electrocardiogram recordings over long distances through fixed telephony, the only means of communication available at that time. Thus, one of the first telemedicine applications was in the field of cardiology, not radiology as initially assumed. Following Einthoven's successful experiments, medical consultations were conducted using radio communication in the 1920s, 1930s, and 1940s between doctors in hospitals in Norway, Italy, and France, and patients on ships at sea and on remote islands. In the following decade, radiographic images were transmitted in the United States, followed shortly by similar experiments in Canada. A centralized telemedicine project was initiated in the United States in the late 1950s, when several programs were opened and operated for two decades (Medicine, 2012). Research was halted due to administrative causes, namely a lack of funding, for a decade. The new wave of programs had a much larger scope and coverage than those operated in the mid-20th century, bringing together a series of state or local initiatives carried out in the United States and Canada. For example, in the mid-20th century, radiological images taken in Pennsylvania were sent from one doctor to another over telephone lines, but the first proper teleradiology system was created by Canadian doctors several years later. Another example, in 1959, the University of Nebraska used interactive telemedicine to send neurological examinations, a pioneering event in the field, the first telemedicine consultation conducted via live video call. Many such programs were developed, most of them taking place in an academic setting. Among the documents transmitted were fluoroscopic images, radiographs, stethoscope sounds, and electrocardiograms (ECGs). In the late 1960s, the 911 emergency number was implemented in the US. The system encompasses all the attributes of telemedicine, providing continuous virtual medical assistance to anyone who seeks help. Telecardiology was a successful field for a group of doctors in Gwalior, India. They were able to detect arrhythmias based on ultrasound-coded electrocardiograms transmitted over the phone as early as 1975 (Montano, et al., 2022).

The last ten years of the second millennium have been marked by uneven progress, but telemedicine has been implemented in most medical and support activities, progress being due to the internet, which in that period became accessible to the general public and civil institutions. In addition to consultations, the field of telemedicine began in the 1990s to incorporate patient education modules, ways of transmitting complex medical images, remote video consultations or performing measurements of vital signs of the body, also remotely.

For the administrative sector, electronic medical records have appeared, which have facilitated the exchange and storage of clinical data. For the general public, web portals have appeared where patients could receive investigation results or messages from their treating physicians.

2. Current challenges for telemedicine

The present of telemedicine is supported by advanced telecommunication and electronic communication methods, as well as increasingly performant high-tech devices. With their help, and the mobile telecommunications infrastructure, telemedicine has become "omnipresent," democratizing access to medical care in most populous areas of the world. As a result, medical services are available anytime, anywhere with essential electricity and internet services, offering patients the necessary tools immediately, without additional administrative costs and time consumed by travel.

Telemedicine also supports patients who do not have access to reliable transportation or who may become ill from long-distance travel. This is also the case for patients with cystic fibrosis, who can choose a phone or video consultation to avoid nosocomial infections.

The benefits of telemedicine are reflected in three groups: the benefits of healthcare providers, the benefits obtained by clients and beneficiaries, and the benefits brought to society and the community. The United States of America provides a good example of this practice, with over 100 specialized telemedicine service centers and other organizations currently operating. Statistics from the American Telemedicine Association and the California eHealth and Telemedicine Center, two of the institutions that were among the founders of specific telemedicine regulation legislation, demonstrate that two decades of activity have brought real and significant improvements, both in terms of the speed, safety and quality of medical care and financially, as a secondary benefit.

Such centers can be found not only in the USA but also in countries such as Nepal, Mexico, Pakistan, India, Chile, Colombia, and Venezuela. Although none of these countries have shown outstanding performance in economic or social support sectors, they have recognized the importance and usefulness of telemedicine, and there are currently investment projects being implemented in telemedicine dispatch centers with innovative and appropriate equipment, as well as telemedicine networks to serve the medical act and the parties involved, the doctor and the patient. An example that can illustrate the above is the call center organized in Ecuador, considered to be the largest in the world, with 1200 employees, including 100 doctors, the rest being medical assistants and data operators.

Another example from the USA is the eHospital program, launched in 2014. It offers patients access to medical assistance during the night (7:00 pm - 7:00 am) through remote monitoring, with specialists being in constant contact with patients and evaluating their data and individual files in real time. The specialists involved in this activity can also intervene in case of emergency through technology, activating surveillance and communication systems installed near the patient in question, while also communicating with the patient's caregivers and family.

Cleveland Clinic launched a program in 2016 to improve hypertension remotely, aiming to minimize mortality and morbidity associated with high blood pressure using telehealth services. The initiative was first put into practice with the help of 80 high-risk hypertensive patients who were monitored and followed through a Bluetooth-compatible remote monitoring device. The device had the ability to export blood pressure values to a server. On the other end, a multidisciplinary team of doctors, nurses, and pharmacists used the information to adjust medication when needed and provide advice to improve the patient's lifestyle. The entire project lasted for 24 weeks, during which time the patients' systolic blood pressure decreased by an average of 7.5 mm Hg and their diastolic blood pressure by 3.1 mm Hg.

Remote monitoring of those with high blood pressure is also used in other institutions, such as the Veterans Association (VA), starting in 2016. Nearly 19,000 war veterans have benefited from access to the remote monitoring system, and the number is expected to grow.

3. US Laws and the statistics of telemedicine services

A benchmark legislation in telemedicine comes from the US, where regulations have been considered a barrier to interstate practice, as licenses limit the capacity of some providers. Federal law requires them to be fully authorized to practice medicine in the state where they offer consultations, where the patient resides, or where the service is provided. Providers with interstate coverage are required to pay multiple licenses because current laws on practice licenses vary from state to state. To mediate the situation, several states have joined the Interstate Medical Licensure Pact, offering the possibility of interstate and multi-state licenses in the future.

The federal law is called "Tele-Med" and was introduced in 2015 but remained unadopted. The law includes a passage referring to inter-state service provision and notes that "allows a Medicare provider to provide telemedicine services to a Medicare beneficiary who is in a state different from the one in which the provider is authorized or licensed to provide health care services." A study estimates that 7 million patients in the United States will use telemedicine services only this year. In 2016, it is estimated that 61% of the US medical sector institutions and 40% to 50% of hospitals have implemented telemedicine. In just one year, from 2012 to 2013, the telemedicine market saw a 60% growth (Mahar, Rosencrance and Rasmussen, 2018). Among the limitations that arose were low rates of reimbursement from health insurance funds to providers, but also dilemmas related to program licensing.

Telemedicine addressed to military medicine has registered notable results, reducing hospitalizations for mental health by over 40% in 2012, hospitalizations for heart conditions, especially heart failure, by 25%, and hospitalizations for diabetes and chronic obstructive pulmonary disease by approximately 20%. In 2015, 677,000 veterans received an average of 2.1 million telemedicine consultations (Dinesen et al., 2016). Another niche sector of telemedicine addresses people in rural areas or areas with limited access to health professionals, with 59 million Americans currently living in such areas. Such patients may face long waiting times for appointments and a lack of treatment continuity due to limited access to the same medical service provider.

Additionally, telemedicine offers access to care for patients without reliable transportation or those who may be too ill to travel long distances. For some patients, such as those with cystic fibrosis who do not want to come to the hospital for fear of contracting more antibiotic-resistant bacteria, a virtual visit to the clinic can be safer.

4. Methodology

The present article includes an analysis of the documentation found in various publications and scientific articles in order to illustrate the potential advantages of our country. Therefore, we conducted a comprehensive research into numerous sources of secondary data, such as articles, reports and books from the following areas: telemedicine, health services, quality of health services.

For the research, we also used electronic databases, such as PubMed, Academia. EDU, BRILL and Wiley Online Library. Other sources were the archives of different journals.

The method used is a descriptive and quantitative one, given the fact that the subject is very widely discussed.

5. Telemedicine in Romania

Telemedicine is rapidly developing in Romania, both in the private and public sectors, especially due to the need to provide medical services in the context of the COVID-19 pandemic. The government has recently issued regulations for telemedicine, which have allowed healthcare providers to offer online medical consultations, including electronic prescriptions (ROMANIEI, din 14 septembrie 2022 privind aprobarea Normelor metodologice de punere în aplicare a prevederilor Ordonanței de urgență a Guvernului nr. 196/2020 pentru modificarea și completarea Legii nr. 95/2006 privind reforma în domeniul sănătății) (ROMANIEI, 2020)

Through telemedicine, patients can receive online medical consultations, get electronic prescriptions, or receive advice on personal care in the comfort of their own home. Additionally, telemedicine can be used to improve access to medical services in rural or isolated areas of Romania where it can be difficult to obtain quality medical services.

In Romania, there are various online telemedicine platforms where patients can communicate with specialist doctors and receive recommendations regarding the diagnosis and treatment of diseases. These platforms are supervised by public health authorities and must adhere to medical standards and regulations to ensure quality medical services.

In the future, telemedicine is expected to become increasingly used in Romania, due to its benefits such as improving access to medical services for patients in rural or isolated areas, increasing efficiency, and reducing costs for the healthcare system.

Romanian telemedicine is regulated and includes various medical specialties such as pathology, allergy, clinical immunology, infectious diseases, cardiology, surgery, diabetes, hematology, oncology, ophthalmology and neurology.

According to a 2018 study by PwC for the European Commission, telemedicine is generally considered cost-effective in 73.3% of the cases analyzed in the literature. This is due to the reduction in costs associated with consultations, time, and travel, as well as the improvement in patients' quality of life.

6. Telemedicine and COVID-19

Recent history has added a chapter to the telemedicine sector. The COVID-19 pandemic in 2020 contributed to the acceleration of telemedicine development, after physical distancing became a social norm to prevent the spread of the contagious SARS-CoV-2 virus, the pathogen that created the pandemic. As patients with pre-existing conditions were among the most protected social categories, telemedicine interventions aimed to continue therapeutic management. Similarly, those diagnosed with COVID-19 also benefited from video or telephone calls with their doctors.

Although there were voices that contested the efficiency of such consultations, the patients who benefited from them proved otherwise, as their doctors were just as well-prepared as those they would have visited in person. Medical staff were able to prescribe medications based on the identified conditions and could be with their patients as long as needed, all with the help of technology.

Also, thanks to telemedicine, the costs of a consultation were reduced, as several cost-generating factors were eliminated. Telemedicine enables the efficient distribution of personnel and medical care resources in a care unit or system, while also reducing the financial impact that patient absence could have. Telemedicine can also reduce the number of unnecessary visits to the emergency room and private clinics, as well as hospitalizations.

7. Artificial intelligence, an possibility for telemedicine to better understand each patient

A novelty in telemedicine is represented by the integration of artificial intelligence. An evocative example is the algorithm for determining a personalized diet. One of the advantages of such an algorithm is that it eliminates the need for randomized studies to follow subjects who have followed the same diet for years, thus being suitable for evaluating the effects of the diet.

The success of artificial intelligence in analyzing large data sets has led to a discovery by researchers indicating that dietary plans should be personalized based on human metabolism, digestive microbiome, and the surrounding environment.

Based on this technology, researchers Eran Segal and Eran Elinav from the Weizmann Institute of Science in Israel published the paper "Personalized Nutrition by Prediction of Glycemic Responses" in the journal Cell (Zeevi et al, 2015). They stated that high postprandial glycemic levels are an indicator of the risk of diabetes. However, avoiding sharp increases in blood sugar is not demonstrated to eliminate the risk, but is only an individual organic response to food. The results obtained are objective proof that each individual reacts differently to food, even if the type, quality, and quantity of food are the same.

The study involved 800 people who did not have a diagnosis of diabetes. The data collected from each participant included meal times, the amount and content of food and drinks consumed, physical activity, height, weight, and sleep patterns. In addition, participants had their blood quality, intestinal microbiome content, and blood sugar analyzed for one week. During the study, participants received over 5,000 daily meals consisting of chocolate and ice cream, as well as another 47,000 meals based on the foods the subjects regularly ate.

The data was processed using artificial intelligence to delimit the factors that determine a different glycemic response in some subjects. Based on this analysis, an algorithm was constructed that generated over 100 factors that could determine a different glycemic response, with the intestinal flora being central, as it can create a unique response.

This applicability of artificial intelligence offers the possibility for medical and nutrition specialists to intervene more quickly and easily. Through smartphone applications, users can scan their food, sending the data to servers with access to databases in which our glycemic response to various foods is recorded, and

with the help of artificial intelligence, they can find out how their metabolism will react to the scanned foods, ultimately creating a diet tailored to their own needs.

8. The management of telemedicine services

Management of telemedicine services refers to the strategies and practices used to ensure the efficient and effective delivery of health services through remote communication technologies. This involves managing human, technological, and financial resources, as well as defining objectives, policies, and procedures for the delivery of telemedicine services.

Management practices for telemedicine services include:

- Identifying patient needs and developing services tailored to those needs.
- Selecting the appropriate technology for delivering telemedicine services and ensuring compatibility with other existing systems.
- Ensuring data security and patient information confidentiality.
- Recruiting and training medical and technical staff specialized in the use of telemedicine technologies.
- Planning and implementing monitoring and evaluation activities for the quality of telemedicine services.

To ensure proper development of telemedicine services, their management must achieve the following key areas of telemedicine management:

- Infrastructure: Telemedicine requires adequate infrastructure such as reliable internet connectivity, video conferencing equipment, and secure electronic medical record (EMR) systems. Telemedicine managers must ensure that the infrastructure is adequate and meets the technical requirements for delivering quality healthcare services.
- Authorization and regulations: Telemedicine managers must be familiar with licensing and regulatory requirements for telemedicine in their jurisdiction. They must ensure that healthcare providers providing telemedicine services are licensed and that the services provided comply with all relevant regulations.
- Staff training: Healthcare providers providing telemedicine services must be trained to use technology and the EMR system efficiently. Telemedicine managers must ensure that providers receive adequate training and support.
- Workflow and processes: Telemedicine managers must develop and implement workflows and processes that are designed to support the delivery of telemedicine services. This may include scheduling, patient evaluation and assessment, documentation, and follow-up care.
- Quality control and monitoring: Telemedicine managers must establish quality control and monitoring processes to ensure that telemedicine services are delivered in accordance with best practices and that patient outcomes are optimized.
- Patient education and engagement: Telemedicine managers must develop strategies to educate patients about telemedicine services and engage them in the process. This may include providing information about how to access telemedicine services, explaining the benefits of telemedicine, and addressing any concerns or questions patients may have.

To ensure effective management of telemedicine services, it is important for providers to be able to collaborate with other entities in the healthcare field, tailor their services to the needs and requirements of patients, pay attention to data confidentiality and security aspects, train their staff in the use of telemedicine technologies, and monitor and evaluate the quality of services provided. (Kuzmar, I.; Mercedes, R.,B., 2014)

Results and conclusions

The future of telemedicine foresees, alongside a wide applicability of artificial intelligence, services for the management and improvement of chronic diseases, as well as healthcare services offered in the comfort of one's home.

Data from the United States indicates that services for the management of chronic diseases have not developed to the capacity they could, considering the developments in the field of telemedicine. Such patients require frequent visits to the doctor, and approaching these vulnerable groups can reduce the number of emergency visits and hospitalizations.

Another segment of telemedicine is "the hospital at home". Patients who meet hospitalization criteria, with stable progression, can be treated at home for diseases such as chronic obstructive pulmonary disease, pneumonia, or heart failure. Previous studies have indicated that such a therapeutic approach, when used with safety parameters in mind, is not more cost-effective, but it involves a better patient outcome, shorter treatment duration, and reduced rates of delirium.

The main benefits of telemedicine are:

- Comfort for everyone. The development of applications has allowed doctors to offer consultations over the phone and internet, which means that patients do not have to leave the comfort of their homes to receive care and advice.
- Waiting time in waiting rooms is eliminated.
- Elimination of patient travel
- Attenuation of the spread of infectious diseases
- Increased clinical efficiency
- Huge savings for patients, in terms of time and fuel
- Financial benefits for clinics, allowing for fractional employment and enabling highly trained professionals to work at maximum capacity, thus promoting a new sense of "quality over quantity" in healthcare.
- Online monitoring helps patients avoid chronic diseases, leading to long-term financial benefits for both patients and society.
- Resolves the unequal distribution of medical resources.

All these benefits lead to an increase in the quality of medical services.

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Are Young People Keen to Adopt More Sustainable Behaviour by Using Shared Services?

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Abstract

The continual development of modern technologies and rising interest in their usage directly influence interest in services, which are strongly dependent on their usage, shared services. Shared services have become very popular among consumers across the world. However, the overall potential of this sector is still not sufficiently utilized in some regions. Therefore, we decided to find answers about the perception of the concept of sharing economy and its services among young consumers in Slovakia. In this context, we designed a questionnaire to determine whether and how consumers understand the concept of the sharing economy, what kind of services they use and their experience with them. We also focused on reasons why they use the services, as we assumed that young consumers, except for saving money, prefer to behave more sustainably. By analyzing respondents' answers, we found that even though only 30 % of respondents know sharing economy concept, more than 70 % of respondents have already tried shared services. The most used services are related to shared transport: shared e-scooters, bicycles and cars, and shared accommodation. We also found that only 1 % of respondents have a negative experience with these services. Results also show that young people use this kind of service mainly to save time and money, while only 27 % of respondents do because of environmental protection. Based on our results, we can also confirm that the growth of the shared services market will continue.

Keywords

Sharing economy, shared services, sustainable behavior, young people, Slovakia

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Introduction

The Sharing Economy (SE) covers all activities involving exchanging assets and services between individuals in exchange for a pre-agreed compensation. These are often underutilized assets and services; through the sharing economy, some people can benefit from them while the owner profit from them. Until now, collaborative consumption has been limited to several areas. Nevertheless, thanks to powerful information and communication technologies (ICTs), connecting people worldwide with common interests is now possible. The digitalization of society and the economic crisis have encouraged the development of new business models and forms of consumption. According to SE's statistics, the total value of the global SE is predicted to increase to 600 billion U.S. dollars by 2027, from 113 billion U.S. dollars in 2021, with compound annual growth of approximately 31% (Statista, 2023).

Even though the projected growth is massive, it is still necessary to pay attention to the factors affecting the use of shared services, especially in the areas in which the concept of sharing economy is not so popular. Živojinović and Zornić (2022) described three drivers: trust, interaction and experience, that synergistically affect potential consumers' interest in SE services. Akan and Tepeler (2022) emphasize that crucial factors for using SE platforms are the trust of economic actors in their interactions and the potential positive externalities for sustainability development. The application of the SE model by entrepreneurs

and companies contributes to the sustainable development of society (Mi and Coffman, 2019). The concept of the sharing economy contributes to the protection of the environment and to more sustainable behaviour but does the knowledge of this concept and its effects belong to the reasons for using these services? To answer this question, this study explores the influence of sharing economy concept knowledge on using shared services and also factors affecting their use.

This article is divided into several sections; first, it contains a literature review, then, based on it, it follows the methodology of our research, exploring and analyzing the current consumer's intention to use shared services in Slovakia and the article edge with the discussion and conclusion section.

Literature review

The Sharing Economy can go by a variety of names and often overlaps with other terms such as collaborative economy, collaborative consumption, access economy, platform economy, community economy or peer-to-peer economy. These concepts can be described as a mutual sharing of access to underused goods and services that prioritizes use and accessibility over ownership. Stephany (2015) argues that SE is organized by the value of taking underutilized assets and making them available to the online community, leading to a reduced need for ownership. Belk (2014) treats consumers as collaborators by emphasizing that the sharing economy is people who coordinate the acquisition and distribution of a resource for a fee or other compensation. Cheng (2016) describes SE as a socio-economic system that facilitates a mediated set of exchanges of goods and services between individuals and organizations that aim to increase the efficiency and optimization of partial resources in society. Sutherland and Jarrahi (2018) presented the sharing economy as an online platform that helps people share access to assets, resources, time and skills. SE refers to forms of exchange facilitated through online platforms that include a diversity of for-profit and not-for-profit activities that generally focus on open access to underutilized resources through what is called "sharing." SE is an economic model defined as a peer-to-peer (P2P) activity based on obtaining, providing or sharing access to goods and services, often facilitated by a community-based online platform. SE business models are hosted through digital platforms that enable more accurate measurement of spare capacity and the ability to dynamically connect that capacity in real-time to those who need it. In SE, transactions that favour access over ownership are mainly used. Access to a good or service can take different forms, e.g. renting, lending, subscribing, exchanging, gifting, or reselling. All approaches mentioned above are typically able to realise lower costs compared to the form of ownership or costs in enterprises (Durisova, Kucharcikova, 2014). Nowadays, brand value is often associated with the social connections it fosters. Managing these connections is the basis for successful marketing and use of the services offered. In the case of SE, the user experience is crucial for the emergence of a client's emotional connection to the service. By offering the user ease of use and confidence in decision-making, SE business models are moving these companies from a purely transaction-based relationship to an experiential platform. The benefits of SEs arise from technological advances that allow users to generate revenue from untapped assets in many sectors, such as hospitality, transportation and leisure.

Since the beginning of SE, the tourism and hospitality industry has become one of the pioneering industries for its growth because SE allows tourists and residents to share their homes, cars, meals and expert local knowledge. A study by Tussyadiah and Pesonen (2016), based on travellers from the US and Finland, shows that peer-to-peer accommodation significantly changes travel patterns by reducing accommodation costs and providing meaningful social encounters with locals. In terms of supply, SE has expanded the overall range of tourism options, as starting a tourism business with relatively low start-up costs is easy. Online platforms further enable SE start-ups by giving their consumers access to a wide range of products and services, many of which are of a high standard but more affordable than their traditional counterparts. The sharing economy model has profound social and economic benefits and will improve the lives of countless individuals. According to a survey by Statista (2017), in North America, respondents aged 18-34 years old reported that they mainly use buy and swap services (50%), followed by shared transportation, shared accommodation and assistance services (30-32%). The least used were, for example, bike or car sharing (12%). The 34+ group used most of the same services as the 18-34 group, but these users were about 2/3 less. Data from Eurostat (2020) tells us about the use of SE by people aged 16-74 in the European Union and reports that accommodation and transport services were used the most. Overall, accommodation services were used more in the EU by almost half. They were primarily used in Luxembourg, Ireland and Malta. In Slovakia, they were used half as much as in Luxembourg, but in Slovakia, a similar number of people also use shared transport options. The data shows that shared accommodation services, notably Airbnb, are the most used. The value of Airbnb reached $113 million in 2021, which was $38 million more than in 2020. According to statistics from Statista (2021), nearly 45 million adults in the US used SE services, rising to nearly 87 million by 2021. Study of Warwas et al.

(2022) demonstrates that among the most popular platforms are accommodation booking services (26.7%), which are mainly used by Poles aged 25-34 (44%) and 18- 24 years old(39%). Less frequently used services include the free exchange of goods, services, knowledge and skills (17%). The least used services are crowdfunding services (2.3%). Only a tiny percentage (0.4%) of respondents declared using all or almost all SE platforms.

Within SE, we can consume goods that were not previously used or that did not have 100% utilization, thus optimizing resources. This fact also results in a larger supply for the final consumer. The consumer finds a more comprehensive range of products than traditional shops offer. You can make a broader comparison in quality and price. In a more detailed view, the consumer has the advantage of direct communication, the attractiveness of price, a more excellent range of products and services, environmental benefits and available feedback from previous consumers. By offering second-hand goods and services, consumers have access to below-market prices, allowing them to save. In times of economic crisis, this advantage has been crucial to the spread of collaborative consumption. SE prides itself on creating an ecosystem based on determination, solidarity and idea generation. These ideas go hand in hand with entrepreneurs with new businesses that create jobs, wealth and innovation in our business structure. It also allows for the growth of new areas of employment, opportunities to find parallel work, and a remuneration model. The SE model will have profound social and economic benefits and potentially improve the lives of countless individuals. The benefits arise from technological advances that allow users to generate income from untapped assets in many sectors, such as hospitality, transport and leisure. Consumers who use SE business models often feel more satisfied in transactions involving deeper social interactions than in traditional exchange models. For example, Airbnb or CouchSurfing allow travellers to connect with locals and get travel tips in a more personal way.

The main disadvantages of SE's services are the lack of legislative regulation and unfair competition. We usually face an unregulated sector that leads to complaints and protests from the affected sectors due to the assumption that there may be unfair competition because services cannot be offered on equal terms. Another disadvantage is that the end consumer has no guarantee of the quality of the product, and at the same time that the people with whom the product is shared are trustworthy and do not cause problems. These are risks that are transferred in exchange for a lower price. Ridesharing services such as Uber or Lyft depend on users being okay with the fact that they have to trust strangers to ride-share. According to Nielsen's (2015) Global Trust in Advertising study, 83% of respondents completely or somewhat trust the recommendations of friends and family more than any other type of advertising. It is also true that when brands evoke social sentiment and use it in marketing, conversion is often much higher. This trend is also a driving force for SE players. The rapid growth of mobile apps reflects greater user trust and the use of social sentiment to reinforce trust. For SE to continue to expand, providers will need to find ways to authenticate consumers. Trust, convenience, and a sense of community are all factors that are driving SE adoption forward. As consumers trust more in bonded relationships, a social sense, the community of SE users will build and expand more quickly.

Methodology and Data

This paper aims to determine young consumers' awareness of SE services, their perceived advantages and disadvantages, and their habits of SE services usage. Based on the literature and the current status of shared services in Slovakia, we would like to verify the following hypotheses: (HI) Most of the young people in Slovakia have already tried at least one of the shared services, (H2) Young people in Slovakia are interested in using SE services mainly due to saving money, and the environment protection, (H3) Usage of shared services in Slovakia by young people tends to increase in the next years, and (H4) Usage of shared services depends on knowledge of sharing economy.

Our analysis presented in this article is based on data collected through a survey targeting the young age group in the Slovak Republic. Through the questionnaire, we wanted to find respondents' opinions on the sharing economy and their perception or experience with services of the sharing economy. In creating it, we followed a thorough study of the Sharing Economy for better orientation and understanding of the concept. Based on this, we created a mind map of questions that would be suitable to be processed, analyzed and evaluated to complement, confirm and draw further conclusions regarding SE. Based on the mind map, a so-called indicative analysis (simplified) was used to understand each piece of information better.

Individual respondents' responses were recorded using Google Forms, a free web-based software package provided by Google, including online survey management software, which was used to record individual responses from all respondents. In addition to creating the survey, this tool also allowed the survey to be

shared with respondents online. As we focused on young people's behavior related to shared services, the best way to reach them was to use social media.

The questionnaire mainly contained closed-ended questions with one or more options, but the respondents were allowed to define their answers to several questions. Some questions depended on previous answers, while others build on each other. Open-ended questions were used to elicit each respondent's unique subjective perspective. All data collected, processed and analyzed were used to provide recommendations or ideas for possible improvements to sharing economy activities and support their use by the young generation. The survey was launched from November 2022 to February 2023. 361 respondents filled in the questionnaire. However, as we focus in this research on young people (up to 35 years), we processed answers from 317 respondents. The socio-demographic characteristics of the sample are shown in Table 1.

Table no. 1. Descriptive statistics of the survey´s sample (N = 317)

Variable	Frequencies
Gender	50.5% women, 49.3% men, 0.3% other
Age group	89.0% 16-25, 11.0% 26-35
Occupation	86.1 % Student, 11.7% Employed; 1.3% Maternity and Parental leave, 0.9 % Unemployed
Region of living	32.5% Žilina Region, 18.6% Trenčín Region, 13.9% Bratislava Region; 8.8% Bratislava Region; 8.2% Prešov Region; 7.6% Trnava Region; 6.9% Banská Bysrica Region, 3.5% Nitra Region

Results

The statistics presented in the theoretical section are partly touched upon and confirmed by the data obtained from our survey. The majority of respondents reported that they had at least sometimes used the services of the sharing economy. This analysis shows that 72.6 % of respondents have already used some of the SE services in Slovakia (H1 confirmed). Results also show (Figure no. 1), that the most used SE services are related to shared transport (bicycles, scooters, cars) and shared accommodation. Less used SE services include shared funding and room-sharing.

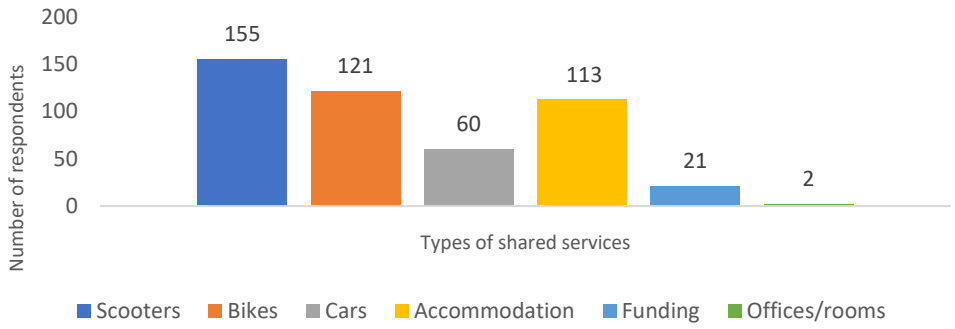


Figure no. 1. Use of shared services

From respondents who have used some of the shared services, 5.2 % use these services every day, 14.8% a few times a week, 24.3 % a few times per month and the majority only a few times per year. From the satisfaction point of view, it can be seen (Figure no. 2), that respondents evaluate their experience with shared services mostly positively. Only 16 % of respondents stated they have a neutral or slightly negative experience. We also run a chi-square test of independence to examine the relation between the frequency of usage shared services and satisfaction with them. The test confirmed there is not a significant relationship between these two variables (X^2 (9, N = 372) = 11.7004, p = .1362).

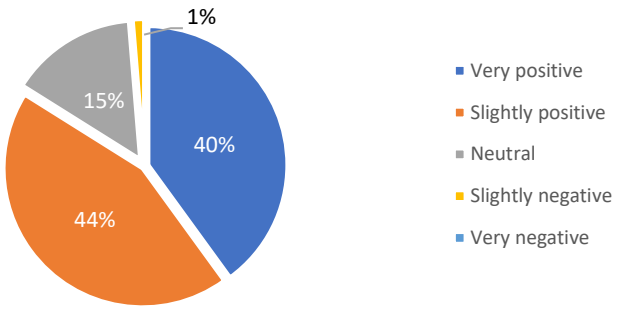


Figure no. 2. Perception of respondent´s usage of SE services

The most frequent reasons why respondents use SE services are mainly to save time (74.3%) and to save money (53.0%) (Figure no. 3). Almost 27.4% of respondents selected environmental protection as a reason for using the services and 39.1% selected curiosity (functionality, usage) as a reason for using the services. It can be seen that even though the protection of the environment already plays a role in the selection of these services, their individual benefits in the form of cost and time savings still prevail. Therefore, we reject our H2. This result also corresponds with a finding of a study from Iran, where researchers confirmed the effect of perceived usefulness on subjective norms, satisfaction and behavioral intention in the case of ridesharing (Akbari et al., 2021) or with a study from South Korea which assumes that consumer attitudes to Airbnb have a positive effect on the intention to use SE services respectively (Sung et al., 2018).

We also analyzed the influence of gender on factors influencing the usage of shared services. The share of reasons to use shared services was similar for women and men except for curiosity. Only 28 % of women selected this reason compared to 51 % of men. This finding is also confirmed by the results of the Chi-square test, which shows there was no significant association between gender and reasons to use shared services (X^2 (5, N = 561) = 9.386, p = .0946).

To identify the trend of usage of shared services, respondents were also asked to define, whether they plan in the future to start using shared services or use them more. 39% of respondents expect to use services more often or to start using them in the future. In comparison, 36% expect to use services at the same level. Based on these results, we can confirm our H3, as we expect, that usage of these services will increase in the following years.

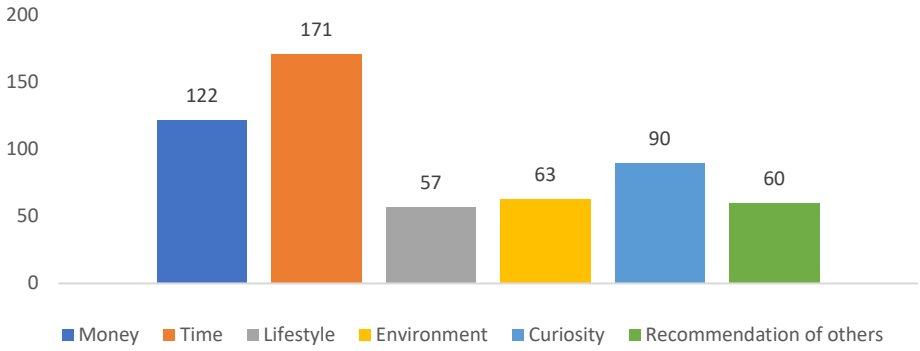


Figure no. 3. Motivating factors of SE service´s usage

However, there are still factors decreasing interest in shared services. One of them are the problems of mistrust (Figure no. 4). 56% of respondents said that they felt some negatives discouraged them from using SE services, mainly factors such as distrust in others (37.4%), lack of information (25.7%) or tenant ignorance (23.5%). Other reasons that were mentioned in the questionnaire as possible deterrents are the lack of transport infrastructure (bicycles, scooters), the rising cost of the services, or the damage and deterioration of goods that are unusable at the moment. A study from Japan shows that especially females tend to not use space-, goods-, money-, or mobility-sharing services and the important factor inhibiting the use of such services was "resistance and anxiety about sharing with strangers (Nakamura, Abe and Mizunoya, 2021).

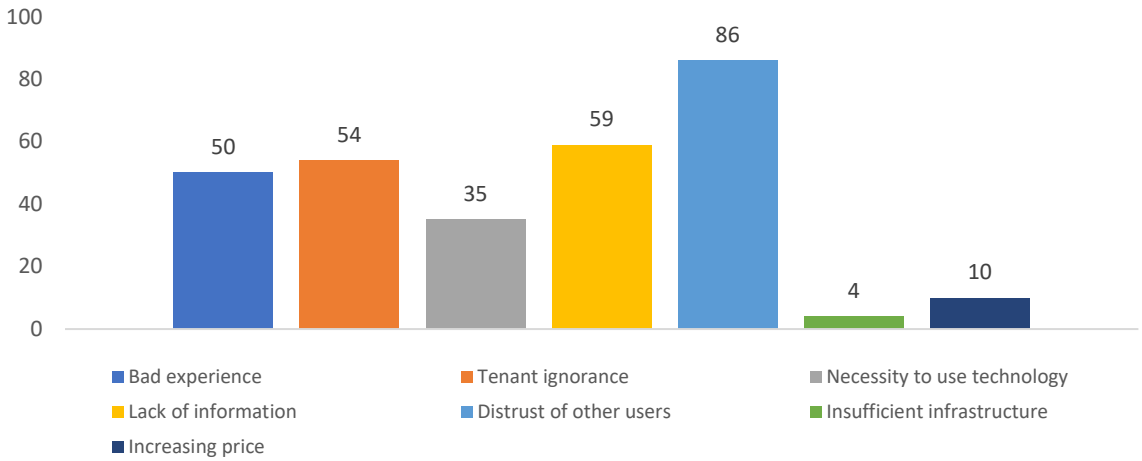


Figure no. 4. Discouraging factors of SE service usage

Our las hypothesis was focused on identification of relationship between knowledge of sharing economy and interest in using sharing services. Therefore, we asked respondents, whether they have already encountered term "sharing economy" and if they know the meaning of this concept.

Most users (42%) reported that they had previously encountered the term and were familiar with its meaning, which was a somewhat surprising finding (Figure no. 5). The responses were pretty even with not knowing the meaning (30%) or not knowing or not having encountered the term before (28%).

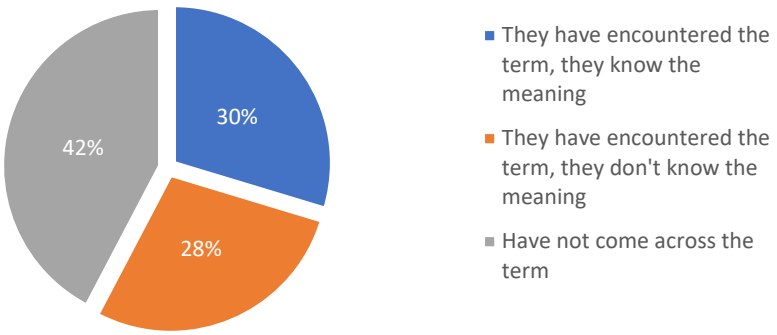


Figure no. 5. Knowledge level of term „sharing economy"

To reveal whether there is a relationship between knowledge of sharing economy concept and usage of sharing economy services, we perform Chi-square test of independence Although results from researchers Hrusovska et al. (2021) show in Slovakia a high customers awareness and knowledge regarding sustainability, in the case of our modified point of view related to SE, our test did not confirm dependency; therefore, we reject our H4, which means that whether people know or do not know sharing economy does not influence their interest in using shared services.

Discussion

Since the Covid pandemic outbreak occurred, many services have suffered (Juříková, Ližbetinová and Káčerková, 2022), and the market conditions have also changed for sharing services. This impact on SE is one of our research limitations in terms of modified reasons and intentions for using or not using, for example, shared transport or accommodation. Based on our results, we suggest focusing on SE´s business models on multi-party cooperation of shared services' providers. This cooperative approach could improve SE's transparency and establish all customers' trust regardless of age. Indeed, to achieve better usage of unused capacity toward more sustainable consumption, the sharing economy model requires cooperative economic actors both on the side of demand and supply. Different business models with other SE platforms could offer an appropriate combination of products/ services, like close complementary products/services regarding the content of the shared products/ services, geographical area or time when shared services are provided. This increased choice on one side could allow consumers to choose from a broader range of products and services, with more possibilities according to pricing, payment methods or

location. On the other hand, it could also offer new options to generate income for people even though these wages can often be low and unstable or cause tax avoidance and tax evasion, which are less researched topics of SE. Also, studies between personality traits, sociocultural variables of a particular geographical area and intention to develop SE business, similar and modified like Yurrebaso´s research team carried out (Yurrebaso, Picado and Paiva, 2021) are highly demanded.

Security is another crucial factor of SE. In SE, the newest is not the perspective of sharing, but the difference is an empowered usage of technology how to do business. Data privacy security focuses on sharing platforms that collect and work with data about their users to facilitate transactions. They also have access to extensive data sets, and if it is not responsibly managed, this could create potential risks for SE. To avoid hybrid threats (Steingartner, Galinec and Kozina, 2021), we have to focus on innovation to find more accurate ways to recognize these negative externalities of SE, to develop better software solutions and mobile applications which allow economic actors' safety, and more quickly and transparent way how to make and respond to a request for products and services. Another perspective of security is personal safety in transportation, such as bike-sharing or e-scooter sharing. Especially in big cities like Paris, residents have been forced to ban rental electric scooters (not private yet) as e-scooters accidents are associated with several serious injuries, even death. And when we are thinking about another aspect of security and SE, Stickle (2023) states that one of the likely outcomes of this change is reducing crime and transitioning from publicly provided justice systems to prevention and alternative dispute resolution. In our continuing longitudinal research activities, we want to enrich our understanding of above mention sharing economy aspects.

Conclusions

The sharing economy is growing and changing how consumers think about ownership, assets or services. So it is no longer just a new, unfamiliar concept, even for the older population. More and more people are coming across the concept of the sharing economy, knowing what it means, grasping its concepts, and using them extensively. Our research also shows that in Slovakia, quite a lot of young people have already tried the services of the sharing economy, but they use them mainly occasionally. Young people in Slovakia prefer to use mainly transport services such as e-scooter sharing or bike-sharing and also shared accommodation. This finding can be related mainly to access to shared services in the analyzed area and limited offers of other shared services. Young people also tend to continue using shared services in the future, and part of them expects that they will increase the intensity of their use, which gives the sharing economy potential for future expansion in Slovakia. We also found that young people are mainly used to saving time and money by using shared services, but environmental protection as a decision factor is also not forgotten. The negatives mainly come from the lack of tenant familiarity and low trust.

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Regulating Artificial Intelligence – Balancing Between Protecting Citizens Privacy and Fostering the Industry's Growth in Europe

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Abstract

The digitization of daily life has entered all areas in which humans activate, be it work, entertainment, social environments, or other areas of interest. The political environment has not been omitted, especially due to social media platforms. As it currently stands, social media has been playing for a number of years a significant role in disseminating and accelerating social debates, bringing to the surface latent issues as well as propagating voices which otherwise might represent the fringe opinions of small groups. In this context, research has been ongoing to understand the nuanced way in which it has impacted society, as a perpetrator of disinformation, and the impact it has had on European regulations by increasing the protection of data and privacy, after the entry into force of EU Regulation 679/2016. Thus, the objective of this article is to offer a legal and ethical framework for the utilization of artificial intelligence in Europe. The study utilized a systemic research method to look into the intricate and interconnected issues involved in regulating social media platforms, identifying key themes and patterns that emerged from the data, which were then utilized to create recommendations for the regulation of social media platforms, that can be utilized by researchers and policy makers.

Keywords

EU regulations, social media, privacy, digital identity.

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Introduction

The rapid and widespread changes brought about by technology and social media have raised numerous questions about their impact on society. Many believe that these changes have created a crisis that affects every aspect of our lives (McGuire, 2017). Understanding this complex phenomenon is challenging but necessary. With the establishment of a continuous link between online and offline dimensions, citizens express their opinions and feelings in a social climate that is becoming increasingly personalized and multidimensional. Before the internet, social identity and networking were constrained by spatial and temporal limitations. However, the internet has expanded the boundaries of social networks, creating a new world in which to socialize, cyberspace. Cyberspace offers the medium through which individuals interact, in the familiar system of social networks combined with multimedia, content creation, and sharing features of the web. Social networks are now the meeting point for using digital media in various ways, including supporting social networks and expressing one's social identity while analyzing other network members' social identities (Boccia Artieri and Marinelli, 2018). This raises questions about the relational and communicative scope of social networks in the ongoing digitization process. How do social medial platforms influence the building and molding of the user's identity, especially for users that are very young? What effects do they have in terms of opportunities and risks?

This study also examines the European legislature and community jurisprudence's reaction to this issue, indicating the required reforms which would be targeted at safeguarding citizens and their private environment. It is important to consider the role of social media platforms in the construction of an

individual's identity and their impact on society. We will also look at the European legislature and community jurisprudence's response to these issues and suggest necessary reforms to protect individuals and their privacy.

Review of the scientific literature

Digital media has become very important for people to socialize, connect with others, and even take part in new forms of activism (García-Peñalvo, 2016). This can help people to overcome challenges in collective participation, especially during times of crisis. However, there are problems with the shift from an information society to a seduction society, which has been highlighted by the COVID-19 pandemic. Despite this, modern society is heavily influenced by technological and digital innovation, which has led to a debate on how networks affect almost all aspects of our lives. Some people think technology has a mystical power and view it too simply (Landini, 2017). Evgeny Morozov (2015) has identified "Internet-centrism" and "solutionism" as two problematic views that neglect important social and political factors. Thus, we need to address technological change discussions by recognizing that technology is not always the solution to real-world problems. While we can appreciate the benefits of being interconnected, there are also new risks and uncertainties emerging. This means that we don't have a clear direction towards a desired goal when it comes to technology. The boundary between our online and offline lives is now blurry and subtle, and this hybrid practice is called Onlife. It's like the mangrove's environment, which lives in brackish waters where seas and rivers meet. According to Floridi, we are now in an existence where there is no longer a difference between online and offline, but there is an Online, which is as hybrid as the mangrove habitat. In this context, we face a semantic reversal where information now influences technology, unlike in previous technological evolutions. Our lives are becoming increasingly personal and managing a multilateral dimension where we live both online and offline. This case study aims to trace new ridges of study in this context. Digitalization has posed questions that are not purely technological but must be contextualized within socio-historical processes. This article aims to demonstrate that we have reached a point of no return. Within the sociology of the media, it is possible to identify three main paradigms to analyze the forms that society and individuals' relations with communication take in the digital turn, but this research will not do so. Thus, it is evident that social media has such a significant impact on society and individuals that it now affects every aspect of public and private life. This phenomenon must be addressed by legal practitioners who need to study and analyze its impact on legal situations and relationships. Recently, it has been argued that technology and its evolution have radically transformed social relations and the daily lives of individuals, including the area of inheritance. This transformation affects not only the course of an individual's life but also the way in which their personality can be realized after their passing. Social networks on the web become a social space where individuals exercise fundamental rights such as free expression of thought or economic initiative. It is an authentic society where each person builds their digital identity based on their profile, including personal data, political and sexual orientation, friendship networks, interests, business preferences, images, and various types of information.

The utilization of social media has benefits, but it also comes with risks to the user's identity and personal data. Social media platforms rely on collecting and managing personal information, and regulations are mostly defined by agreements between users and the platforms (Martone, 2020). To understand the impact of social media on individuals, it's important to examine the concept of digital identity, which is the online representation of a person or entity that includes identifying information. In the past, identity was only physical, but now digital identity is composed of a mass of data that partly reflects and partly distorts an individual's real identity. Digital identity is crucial for accessing the digital community and for identifying oneself within social networks. When users sign up for social media, they create a profile that represents their identity and agrees to the platform's terms and conditions, including the privacy policy that lists how data will be processed. Since social media regulations are often removed from national legal systems, protecting individuals' identity, privacy, and data circulation has become more complex (Martone, 2020). Nevertheless, legal practitioners and the European legislator have recognized the importance of these issues and introduced rules to protect individuals. With the evolution of technology, personal identity has changed, affecting privacy and confidentiality, which are closely tied to it.

Research methodology

The research in this study aims to delve into the intricate and interrelated problems related to the regulation of social media platforms. The study considers the importance of striking a balance between protecting the fundamental rights of individuals and accommodating the interests of economic operators while ensuring the privacy and security of users. To achieve this delicate balance, the study proposes a multifaceted

approach that involves legal, educational, and technological measures. Thus, employing a systemic research method, the study involves investigating the complex and interrelated issues surrounding the regulation of social media platforms. Delving into a vast collection of existing literature on social media regulation to identify the main issues and arguments being discussed. Thus, key themes and patterns emerged from the data, that were used to develop recommendations for regulating social media platforms. The study highlights the importance of clear and informed consent, transparency in data usage, and collaboration between social media platforms and public authorities to guarantee user privacy and security. Overall, the research method is comprehensive and multi-dimensional, acknowledging the complexity of the issue and utilizing various methods of data collection and analysis to gain a better understanding of different perspectives and issues involved. The recommendations for regulating social media platforms are carefully considered to balance the needs of users, the interests of platforms, and the control of authorities.

Results and discussion

The amount of personal data being shared and collected has grown rapidly, as people themselves publish their own information. This has raised concerns among jurists about the need for protection and the methods of protection. One consequence of this trend is the increased risk of the telematic information system being used for social control through sophisticated forms of cybercrime. The evolution of cyber security threats over the past 25 years has been significant. The maturity of social media has made it more difficult to combat cybercrime, as it has led to a fundamental shift in criminal behavior and organizational logic from offline organized crime.

Looking at the evolution of the concept of privacy, it's interesting to see how it has changed from just protecting the personal and intimate aspects of an individual, to also encompassing the right to control and dominate the circulation of personal data (Wall, 2015). There is a need to investigate whether the right to access social media and the right to privacy when it comes to the circulation of data on Web 2.0 are compatible, and whether legislative interventions so far have been able to strike a balance and suggest a functional reform perspective for the multiple interests in the field. In 1995, the protection of personal data became part of European law with the approval of Directive 95/46/CE, which emphasizes the importance of respecting fundamental rights and freedoms, particularly privacy, while also contributing to economic and social progress and the well-being of individuals (Stanzione, 2020). There was a clear intent to create a regulation that would connect the demands of the free market and competition with human dignity and the development of personality. The Charter of Fundamental Rights of the European Union, adopted in 2000, emphasized everyone's right to the protection of personal data, as well as the right to access and correct data collected (EC, 1995). And with the Lisbon Treaty's entry into force, it was enshrined in the TFEU that the protection of private citizens date is guaranteed by the treaties, highlighting its importance for each individual. As Table 1 shows, the evolution of legislation on the matter has been an decades long endeavor.

Year	Event
1950	European Convention on Human Rights (ECHR), enshrines that citizens have a right for their private life to be respected, through Article 8.
1981	The Council of Europe adopts the most comprehensive document on the protection of personal data - Convention 108.
1995	The European Union implement legislation on the protection of personal data, via Directive 46/95.
2007	The Lisbon Treaty, via the TFEU, enshrines that personal data protection is a right of every citizen, giving legal competences to the Council and European Parliament to enact legislation.
2018	The European Union adopts the General Data Protection Regulation (GDPR) and enters into force.

Source: European data protection supervisor, 2023

It's evident that regulating social media platforms is critical to ensure fair use and protect the fundamental rights of citizens such as privacy and freedom of expression (Landau, 2013). This is especially important given the current reality, where social platforms are filled with numerous threats such as the dissemination of false information and hate speech. The European Parliament and Council have the legal power to regulate

these platforms. However, due to the fast-paced evolution of technology and the ubiquitous nature of social networks, the European legislator had to intervene to regulate and restrict the massive collection and sharing of personal data. Reforms are needed since the current Directive 95/46/EC has failed to prevent the fragmentation of personal data protection across the EU, eliminating legal uncertainties or the perception of risks associated with online operations. This is further compounded by the changing concepts of privacy and data protection due to the advancements in online services.

In 2016, a new European Regulation was issued to replace the previous directive on the processing of personal data. The regulation applies to all personal data processing, except for reasons of national or common security or criminal investigations. Personal data defines the information that can be used to aid in the identification of a natural person, whilst processing relates to any operation that can be performed with the utilization of said personal data (EC, 2016). This regulation aims to protect individual privacy and their personal sphere, as stated in Article 5. The article requires that processing is carried out legally, fairly, and transparently for rightful purposes, and utilizing legal methods that are in line with said purposes. Thus, legality implies compliance with the rules of the system as a whole, not just data protection laws. Fairness involves good faith in the utilization of data in line with ethical standards. Transparency guarantees that the subject which has his data utilized is aware of the processing, which is essential for giving informed consent. Consent is a vital element in the legislation that protects privacy and personal data, and it must be free, informed, specific, and unambiguous (EC, 2016).

The legislation and the way social networks are accessed reveal issues with the concept of consent. While the regulation defines consent, it fails to regulate it fully, leading to a broad interpretation of its application. Article 7(4) of the regulatory act creates confusion in regard to whether or not consent has been given freely, especially when online services and social networks make consent a condition of use. This consent also includes the processing of data not necessary for the provision of the service and its transmission to other companies, which have an interest in utilizing the data for commercial purposes. Such situations make the presumption that consent has not been freely given. The European legislator assumes that consent is not freely given if it is a non-negotiable part of the general terms and conditions of the service. Social networks make matters even more complex by not requiring specific consent for each individual processing (Popoli, 2019). To determine if consent has been given freely, without a shred of doubt, it requires proper and open access to information, which would mean it should enable access to the process by which information is managed, as well as a form of legal right on the data. However, the information provided by social networks does not provide such control.

Apart from the technical and legal complexities, there's another important factor to consider today's society heavily relies on the analysis of vast amounts of data, which has become a valuable asset (De Franceschi, 2019). Some people argue that personal data processing has shifted from protecting a fundamental right to commercializing data. Those who believe in the former see personal data as a part of a person's identity, and it should be processed correctly. On the other hand, those who believe in the latter consider data as a commodity with value, and it can be traded. As noted by Resta and Zeno-Zencovich, (2014), many service providers offer free services to users, which are financed by users' personal data, often used for advertising purposes. Some legal frameworks support the use of personal data for direct marketing purposes, but it requires the user's full and unforced consent. Such is the case of the Italian Court of Cassation, which undertook, in 2018, the task of analyzing how the trade of personal data is undertaken, concluding that personal data can be exchanged, but it should be with full consent (Cass, 2019). This debate continues, and there's a growing awareness among legal practitioners to limit the trade of personal data. The Court of Justice of the EU emphasizes the importance of protecting personal data, linking it to fundamental human rights (CJEU, 2003). However, despite the risks, users seem to care more about accessing services and enjoying their benefits than about the protection of their data.

As technology continues to rapidly evolve, it has become increasingly important to regulate social platforms to ensure their responsible and secure use for users (Gillespie, 2018). However, this regulation is a complex and constantly evolving topic, as it must consider ongoing processes. It is crucial that regulation is constantly updated to include new developments and improvements brought about by the advancements in new technologies. As an example, a current hot topic is the increasing advancement and use of machine learning, artificial intelligence and blockchain technology. As such systems have begun to be integrated in social media platforms, as a means of attracting and maintaining engagement by users, regulation should be adapted to limit the potential negative effects of these technologies. AI is augmenting the human experience, and with it our lives, and as such, it is crucial that society should be aware of the positive and negative effects on collective and individual ethics (Vallor, 2016). However, defining artificial intelligence is a difficult task and there are many different definitions. To address the challenges and opportunities offered by artificial intelligence, the European Union has been floating the idea of intervening and

regulating the use and limitations of AI, and with the advent of chatGPT, the debate has been spurred into overdrive, as countries such as Italy, decided in Marc of 2023 to impose a temporary ban on it. (Riegert, B. 2023). The purpose of the debate is to create regulation which would aid in the protection of the EU's sovereignty in digital matters, by utilizing legal tools and abilities to model global regulation in a set of norms and standards that would become a global influencer of norms.

The regulation that the EU proposes for AI attempts to implement several goals. First, it wants to guarantee that AI programs are secure and in compliance with the fundamental legislation of values and rights that the EU guarantees. Second, it wants to guarantee that a legal framework will give the necessary stability that will give companies the stability they desire to encourage them to innovate and invest in AI. For such a task to be achieved, it is imperative that advancements be made in the implementation of legislation and protection of citizens' rights and security. Third, the EU's want to encourage the development, under the rule of the single market's regulations, of AI that prevents market fragmentation and offers equal benefits for all citizens.

With the increased use of artificial intelligence, it is crucial that regulation is constantly updated to reflect the progress that technology has seen, incorporating the benefits and negatives of the new developments. The European Union's proposal for AI regulation aims to achieve several specific goals, developing AI under the legal framework of the single market and of the EU treaties. The aim is to prevent any dangers that may arise from the opacity, unpredictability, and autonomy of some AI systems (EC, 2021), while ensuring legal certainty to encourage investments and innovation in AI. A good reason for supporting the EU's intervention is that it would impose transparency and predictability on an otherwise opaque industry that might allow AI systems to advance more than they should. However, the intrinsic limit of the horizontal approach is that it be appliable to all sectors in which AI can be implemented, be they the financial sector or the health sector. Thus, comprehensive laws must be developed, to avoid ad-hoc solutions, and thus, apply to all AI systems, even those that have yet to be developed.

Conclusions

This work has brought up several questions that haven't been completely answered yet. There have been some regulatory or jurisprudential interventions that have helped, but there are still legal issues to be addressed. We need to find a balance between protecting individual fundamental rights, such as privacy and freedom of expression, and the interests of economic operators who want to provide services and make profits. Users need to be more aware of the importance of their personal data, and we need broader and clearer legislative intervention to make sure that happens. One idea is to reform European laws on personal data protection when it comes to social platforms. We believe that data should have a purely moral function and should not be negotiated unless it's necessary to use a particular app or platform. There needs to be a new regulation to prevent social networks from limiting their available functions as a form of punishment towards users that opt out of sharing their information. Consent needs to be truly informed, and the disclosures should be clear and understandable to everyone. They should not be hidden in links or navigation windows. Consent must be outlined and defined clearly, so there's no room for interpretation.

There are other things to consider too. Education is important, and users need to be educated on issues related to privacy and online security to make informed decisions. Decentralization could be helpful, in the sense that groups of users are being managed, instead of a case-by-case scenario, thus ensuring a diminished reliance on algorithms and a boost in transparency in how user data is utilized. Social platforms must cooperate with public authorities in creating legislation that safeguards user privacy and security, instead of resisting such efforts, under the guise of diminished returns due to overregulation. As all social media platforms have a global outlook to their business and global reach, all of these actions would propagate the regulatory framework imposed by the EU, encouraging the positive creation of similar norms, across countries. In summary, regulating social platforms is a complex issue that requires deeper reflection equilibrium between the needs of users, the interests of platforms and the control of authorities.

The study presented an in-depth exploration of the complex and interrelated issues surrounding the regulation of social media platforms, providing a legal and ethical framework for the utilization of artificial intelligence in Europe. The findings of the study shed light on the importance of balancing individual fundamental rights with the interests of economic operators while ensuring user privacy and security are protected. The study proposes a multi-pronged approach, including legal, educational, and technological interventions, to address these issues and provide recommendations for regulating social media platforms. While the study offers valuable insights into this important topic, there are some limitations to be considered. The research primarily focuses on the European context, and additional research is needed to examine the regulatory frameworks of other regions. Furthermore, the study's conclusions are based on the

current state of technology and legislation, and these frameworks may change in the future. Therefore, ongoing research and updates to regulatory frameworks are essential to ensure that the recommendations remain relevant and effective.

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Is Digitalization Gender-Neutral? Gender Digital Divide Status in EU

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Abstract

This paper examines the matter of gender digital divide, a phenomenon which limits the equitable realization of digital transformation benefits. A synthesis of deep root causes is presented to better understand the issue and the factors contributing to women's exclusion from digitalization. The case study examines the gender gap in the European Union by analyzing three indicators: percentage of the population who has used the internet in the past 12 months, percentage of the population who has used the internet to interact with public authorities, and percentage of population who has used the internet for online banking and e-commerce. Based on the indicators, gender gap was calculated in absolute and relative terms and the beta convergence is also analyzed. Results show the remarkable evolution in terms of both digital transformation and reducing the gender gap at EU-27 level and a distinct pattern of β-convergence, proving that countries which start with lower ICT indicators achieve higher growth over time. Most of the EU member states focused on the issue and created gender-adaptive policies which helped them reduce the gap in the past ten years. Finally, the paper displays a collection of such best practices and measures that promote complete participation and inclusion of women and girls in the digital revolution.

Keywords

Gender digital divide, digitalization, gender inequalities, digital transformation.

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Introduction

Digital transformation has emerged as an essential element of our society, revolutionizing the way we interact with one another and the world around us. It has opened up opportunities for easier social interactions, enhanced productivity and access to a wealth of knowledge and resources. Digitalization has also provided a crucial foundation for sustainable development, allowing us to make significant steps towards a greener and more sustainable future.

Unfortunately, the impact of technological advancements is not equally balanced between genders, with women being disproportionately disadvantaged in accessing and benefiting from digital toolds. This phenomenon is commonly known as "digital gender divide" and it refers to gender-based disparities in resources and opportunities to effectively utilize digital technologies (UN Women, 2020).

At first, digitalization was expected to favor women, especially on the labour market as they were expected to encounter lower chances of being replaced by automated systems (Simonton, 2007; AlphaBeta, 2017; Hanrahan and Evlin, 2017). This is due to the nature of their jobs which require more interpersonal, creative and social skills (Hanrahan and Evlin, 2017). Additionally, digitalization should enhance flexibility in the workplace (Ang et al., 2018), which is crucial for women who balance paid work with other responsibilities, such as caregiving for children, the elderly, and household management (OECD, 2018). Digital transformation is also supposed to increase the number of jobs in female-dominated industries such as education, social services, health, business services (OECD, 2017).

However, a study elaborated by EQUALS Research Group, led by the United Nations University (UNU) shows that "a gender digital divide persists irrespective of a country's overall information and communication technology (ICT) access levels, economic performance, income levels, or geographic location".

Greater digital access can significantly enhance women's empowerment and social autonomy by providing better economic opportunities, increasing their civic participation, mobility, and communication. In many low- and middle-income countries, certain technologies can enable women to omit traditional cultural and mobility barriers they face offline. When women have access to digital devices, it enhances the influence and visibility of women's agendas online. Research has shown that digital technologies play a critical role in democratic processes, self-organizing, self-help, and mutual learning. With increased access to quality digital services and information, more women can participate in these processes. For instance, during Sudan's protest movement, women who were unable to join demonstrations, particularly rural women constrained by deeply rooted patriarchal structures, recorded and shared their support on social media platforms such as Facebook and Twitter (Larsson and Viitaoja, 2019).

In order to assess and unlock the full potential of digitalization, its gender dimension must be considered. If the differentiated impacts of technology on women and men are not recognized and addressed, it is likely to widen the gender digital gap.

1. Review of the scientific literature

The digital gender gap has frequently been construed as an issue solely concerning accessibility and affordability, despite the existence of underlying societal factors, such as inequality and power imbalances. In addition, it is crucial to recognize the unique vulnerabilities that women face in varying circumstances and to adopt an intersectional approach. Based on the literature and reports published by NGOs and International Organizations, there are some main barriers to digital gender equality.

Gender and cultural biases

Old gendered norms define and limit educational choices and career paths for women. There is still a cultural association between technical skills and masculinity which persists across the digital landscape. Technology and engineering are predominantly male fields, which discourages girls in pursuing such careers.

The stereotypes do not affect only the educational opportunities of women across the world, they are translated and sometimes magnified in the workplace. Numerous studies have highlighted how cultural practices ingrained in technology workplaces can create unwelcoming and unpleasant environments for women and minorities (Berman and Bourne, 2015). The prevalence of traditional masculine norms and values within these spaces can manifest in subtle ways, such as micro-aggressions, subconscious biases, sexual harassment, and other types of discrimination, including disparaging remarks.

There are some other norms which pose barriers to women’s participation in the labor force, especially in a competitive environment as tech industry. Women are expected to focus primarily on their role within the family, to aspire to become wives, moms and primary caregivers, which makes it harder for them to find a job and to take advantage of career advancement opportunities.

Affordability

According to World Wide Web Foundation (2015), digital exclusion is both a cause and a result of economic inequalities. Affordability, being the second most frequently cited obstacle to mobile internet usage, has a significant impact on the low-income population. Due to the economic consequences of the COVID-19 pandemic, there is evidence to suggest that handsets and mobile internet have become even less affordable, causing difficulties in accessing smartphones and mobile internet for this group (GSMA, 2022).

Literacy and digital skills

Digital skills gap is another factor of women’s exclusion. According to the last Digital Economy and Society Index Report from 2022, women are 4% less likely than men to possess basic digital skills in EU. Worldwide, women are 25% less likely to use ICT for basic purposes, and four times less likely than men to have advanced digital skills (UNESCO and EQUALS Skills Coalition, 2019). Level of education is correlated to digital skills, therefore women with secondary education are six times more likely to use internet than women with primary education only (World Wide Web Foundation, 2015). Inclusive educational policies, formal and informal digital upskilling and reskilling programs, as well as gender-sensitive trainings can help narrow the gender gap in digital competencies.

Employment opportunities

One of the targets of the Path to the Digital Decade elaborated by European Commission is to have 20 millions ICT specialists, while maintaining gender convergence. The most recent DESI Report (2022)

indicates that there is a shortage of ICT experts in the EU job market, and the number of job openings continues to increase with the emergence of new roles. Moreover, there is a significant gender disparity, with only 19% of ICT specialists and one-third of STEM graduates being female. This problem is further exacerbated by the EU's demographic decline and a lack of specialized educational opportunities in key digital fields.

The largest and most influential tech companies worldwide typically have a low percentage of women among their technical employees. Specifically, Apple, Google, and Microsoft have only 23%, 20%, and 17.5% female technical employees. Moreover, it is estimated that merely one percent of applications for AI positions come from women. (UNESCO and EQUALS Skills Coalition, 2019)

Closing the gender gap in leadership positions within the tech industry could result in a significant increase in global productivity, estimated to be between $430 and $530 billion. This would also contribute towards bridging the digital divide in this field (Dalberg, 2016).

Another important topic is the role of platform economy (Uber, Fiverr, Lyft) which represents another opportunity and a potential source of income for many women around the world. This field is also affected by the gender stereotyping (worse evaluations, less demands) which leads to women dropping out of the platforms faster than men (International Trade Center, 2017).

The under-representation of women is also prevalent in entrepreneurship, which paradoxically it is often considered the means for women to make progress in the digital revolution. The lack of women in tech sector, especially in leadership positions perpetuates gender inequalities.

2. Research methodology

The main objective is to analyze the digital gender gap in Europe, by calculating it in absolute and relative terms. The International Telecommunication Union (ITU) states: “The gender gap represents the difference between the Internet user penetration rates for males and females relative to the Internet user penetration rate for males, expressed as a percentage” (ITU, 2019)

The indicators used to calculate the digital gender gap are percentage of population (aged 16-74 years old) who used the internet in the past 12 months, percentage of population (aged 16-74 years old) who used the internet for interacting with public authorities and percentage of population (aged 16-74 years old) who used the internet for internet banking and e-commerce. All the data series have been extracted from Eurostat.

Initially, (M-W) is used to measure the gap between genders in absolute terms. Consequently, the relative gender gap is determined by computing (M-W)/W as a percentage. In both situations, the disadvantaged group is identified by the sign of the gap: the female population when the sign is positive and the male population when it is negative.

This research also examines the evolution of the digital gender gap regarding the three aspects to identify its evolution across EU-27 countries through beta convergence, trying to understand if countries which start with lower ICT indicators achieve higher growth over time. The process of analyzing convergence begins by comparing the ICT indicators and digital gender gap from ten years ago (2012 for last internet use in the past 12 month and use of internet for online banking and e-commerce and 2011 for use of internet to interact with public authorities). To measure β-convergence, the state of things in 2011 and 2012 is used as a baseline, and the changes that occurred during the ten years are also considered.

3. Results and discussion

The results from 2022 are showing that a very high percentage of population used the internet in the past 12 months. Only 8 countries have reported less than 90%, while Denmark, Finland, Luxembourg, Netherlands and Sweden are near 100%. At EU level, both in percentage points and percentages, the digital gender gap is almost closed, with 0.5% difference. Even minor, gender disparities still appear in 17 out of the 27 EU countries. The biggest gaps, over 2%, appeared in Croatia (3.2 pp, 4%), Italy (2.5 pp, 2.9%), Germany (2.1 pp, 2.3%), and Slovenia (2 pp, 2.2%).

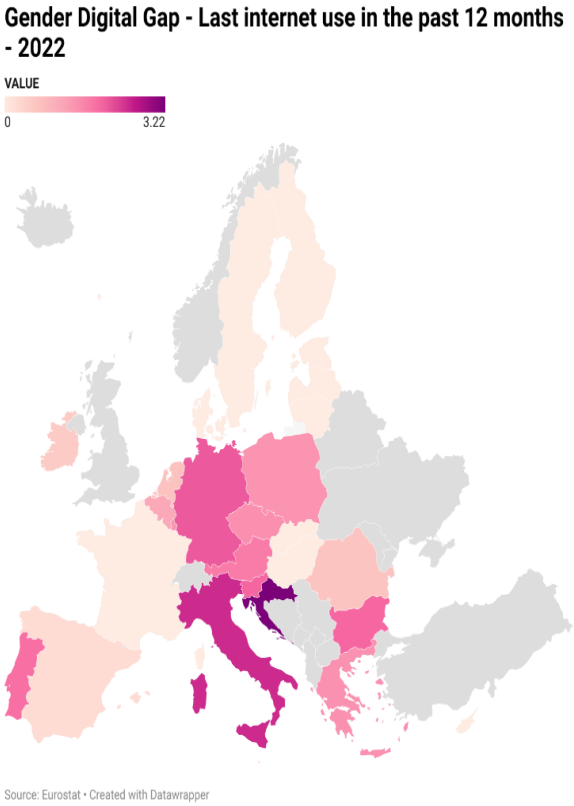


Figure no. 1. Digital Gender Gap Map
Source: Eurostat, Own elaboration

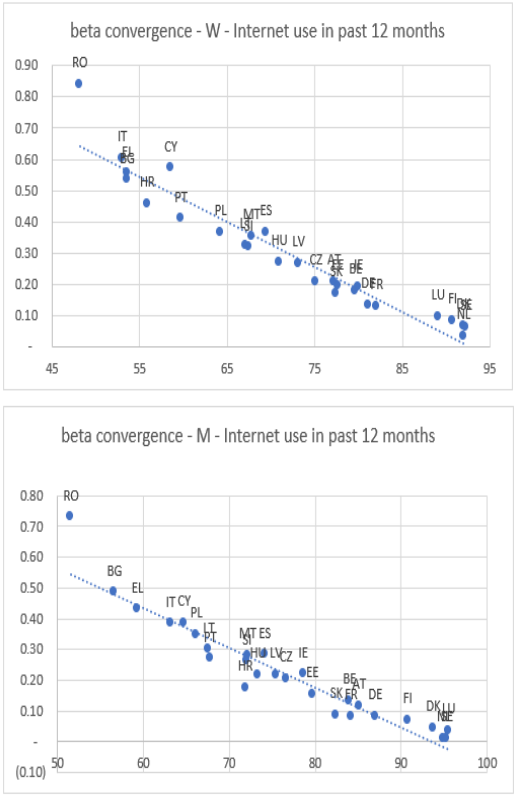


Figure no. 1 Beta Convergence – Internet use in past 12 months
Source: Eurostat, Own elaboration

Since 2012, the disparities among the EU-27 member states have decreased. In Figure 2 we notice a distinct pattern of β-convergence between genders and countries. Hence, countries that had higher levels than the European average in 2012 showed lower growth rates than the EU average between 2012 and 2022, as seen in the lower right quadrant. Conversely, countries that started with lower levels experienced more significant growth rates (upper left quadrant).

The smallest advancements are registered in Sweden, Netherlands and Denmark, both for men and women. Romania registered a disproportionate growth of almost 84% for women and 73% for men, which improved the digital gender gap as well. In Italy, the number of women who used internet in the past 12 months increased by 60%, while only 40% more men have started to use internet between 2012 and 2022, which drastically improved the gap from 10pp to 2.5 pp.

The second indicator, percentage of people who used internet for interacting with public authorities, has lower values, on average EU scoring 65%. Romania (14.7%) and Bulgaria (26.6%) recorded the lowest values. Only four countries reached values over 90%: Denmark, Finland, Ireland, and Sweden. In this case the gender digital gap is smaller, proving that women use the internet more than men to engage with public authorities and participate in e-government. Only 13/27 countries report gender disparities, with the highest values in Croatia (11 pp, 27.7%), Austria (5.5 pp, 7.8%), Luxembourg (4.1 pp, 5.4%), and Germany (3.8 pp, 7.8%).

Beta convergence is not consistent neither for men, nor for women. Croatia registered the biggest progress while it halved its gender gap. Bulgaria, one of the worst-situated countries at the beginning of the period has not improved its status in the past ten years and the gender disparities stayed the same. Greece, Cyprus and Ireland more than doubled their percentages and the first two also significantly improved the gender gap. Ireland registered a disproportionate growth for men, deepening the gender divide over time.

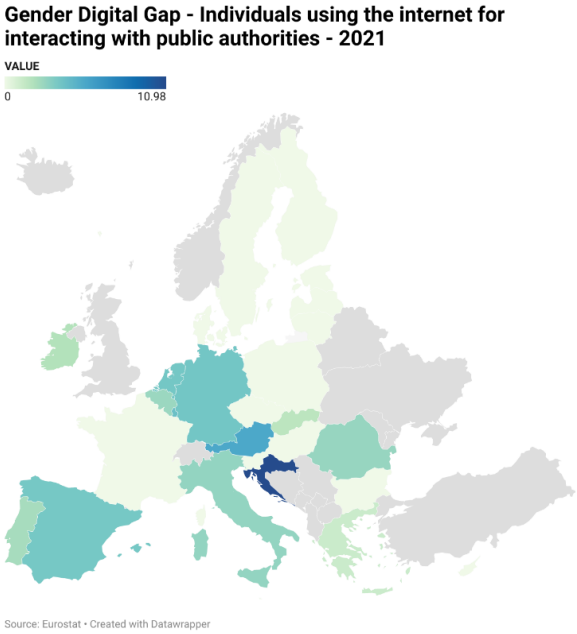


Figure no. 3. Digital Gender Gap Map
Source: Eurostat, Own elaboration

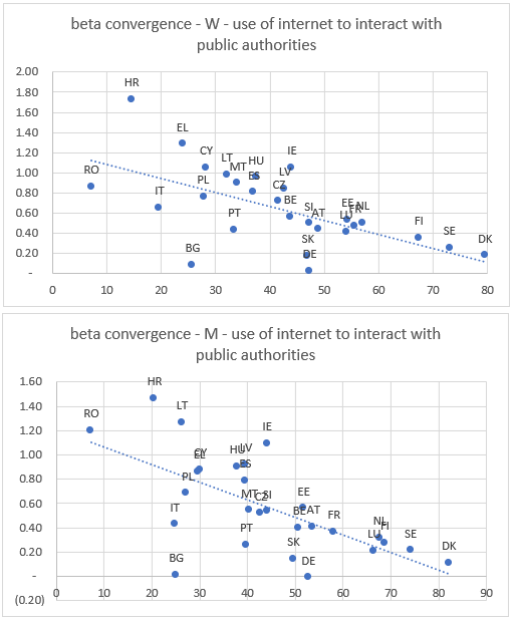


Figure no. 4. Beta Convergence – Use of internet to interact with public authorities
Source: Eurostat, Own elaboration

On average, 66% of Europeans have used the internet in 2022 for banking and e-commerce. Romania and Bulgaria scored the lowest, 19.2% and 22.4% respectively. At the opposite end of the ranking, Denmark and Finland reached values over 90%. The digital gender gap is present only in 14 out of 27 countries, but the values both in pp and percentages are higher than in the previous cases. Italy (7.4 pp, 16.6%), Greece (7 pp, 15.2%), Croatia (5.6 pp, 10.2%), and Austria (5.6 pp, 7.9%) registered the biggest disparities.

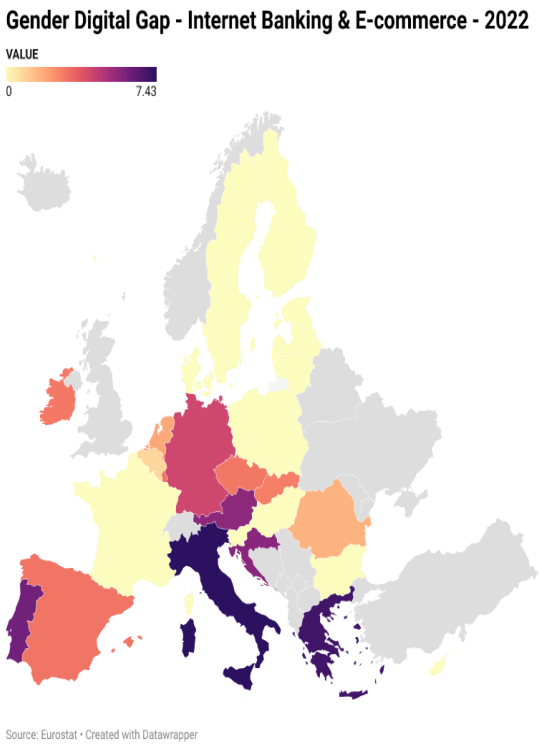


Figure no. 5. Digital Gender Gap Map
Source: Eurostat, Own elaboration

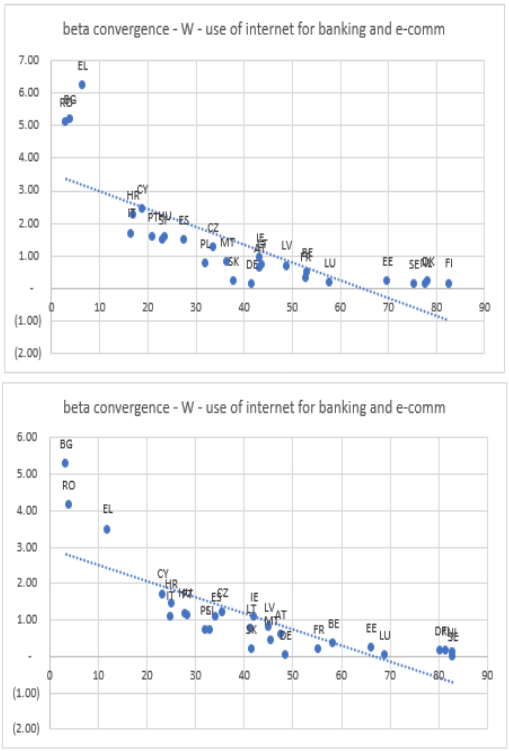


Figure no. 6. Beta Convergence – Use of internet for online banking and e-commerce
Source: Eurostat, Own elaboration

According to Figure 6, the differences have decreased since 2012, as the worst situated countries in the beginning of the period have increased their percentage much more than the better situated ones. Therefore, beta convergence is verified for both sexes. Bulgaria, Romania and Greece have the biggest advancements and they marginally improved their gender disparities over time.

If we zoom on Romania, we notice progress in terms of digital transformation across indicators. In 2022, 89% of Romanians have used internet, almost double compared to the situation in 2012. In this case, we notice advancements towards gender parity, reaching only 0.6% differences between men and women. There is an overall improvement for individuals using internet to interact with public authorities, from 7% in 2011 to 16% in 2022, as well as for the individuals engaging in online banking and e-commerce, from 3% in 2012 to 19% in 2022. Unfortunately, the progress favored men, widening the gender gap at 20.7%, and 9.2% respectively. Romania is below the EU average at digitalization, and the future efforts in this regard must be consistent and gender inclusive.

Policy Proposals

Frequently, discussions surrounding digital technologies tend to suggest that their impact on society is predetermined by technology itself. This means that they assume technical changes occur independently and without any inherent values, resulting in social changes. The social shaping approach recognizes that technologies are not only influenced by their usage but also by their design and technical aspects. The development of technologies is significantly influenced by the people who create them, as their cultural background, history, choices, and values shape the technologies that emerge (UN Women, 2020).

Literature and best practices show the most effective ways to adapt policies in order to overcome the gender digital gap. By focusing on the issue and creating gender-adaptive policies, most of the EU member states managed to reduce the gap in the past ten years.

First, educational institutions such as universities and schools should equip girls with proficient technical skills and digital literacy, to ensure they can fully capitalize on the advantages brought by the digital revolution.

The digital gender gap is not readily apparent at the age of 15. Although girls may display lower proficiency than boys in certain digital-related activities and competencies, they often excel in other areas that are highly prized by employers, such as collaborative problem-solving skills (Larsson and Viitaoja, 2019).

Education, however, is not limited to adapting school and university programs. Governments should invest in lifelong education. The digital age offers flexible options to overcome obstacles to adult education. However, this requires cooperation among different entities, including education and training institutions, employers, and social policy institutions, as stated by Borgonovi et al. (2018). One illustration of this is that women are less inclined than men to participate in massive open online courses, which are often provided as free courses covering a wide range of subjects, according to Zhenghao et al. (2015). In this scenario, a mechanism to upskill women who are at risk of being laid off must be established.

To address exclusionary practices and language in STEM fields, policymakers should encourage men to be active allies and promote female role models and mentors. Having female role models in STEM is crucial in terms of inspiring girls to pursue STEM fields from a young age. However, merely increasing the number of girls and women studying STEM may not be sufficient to eliminate the challenges they face in the workplace, such as persistent bias. Hence, it is also important to take steps to address systemic bias perceptions that perpetuate the digital gender divide. For example, there is still a significant lack of representation of women in entrepreneurship and innovation teams, as previously noted (United Nations Development Programme, 2021). One effective way to address the issue is by introducing gender quotas in incubator or accelerator programs, encouraging women to participate with meaningful contributions in the design process. Governments are responsible to develop awareness-raising campaigns which deconstruct gender norms and biases.

In order to ensure equitable access to high-paying job opportunities and career growth, companies - especially those operating in the technology industry - should integrate gender mainstreaming into their human resources policies. Facilitating "top-down" investment in female leadership is one approach to bridging the digital gender divide, but it requires coordination among various initiatives. The digital transformation has the potential to enhance opportunities for flexible working arrangements that are advantageous to women. Companies should be incentivized to adapt gender equitable recruitment, promotion, and remuneration policies (United Nations Development Programme, 2021).

Governments must guarantee that new technologies are designed under a regulatory framework that prioritizes, safeguards, and advances women's human rights. On top of this, governments should also tackle the gender data gap, while following the data protection legislation in place.

Establishing partnerships among United Nations agencies, governments, the private sector, media, and civil society is critical to combat discriminatory norms at the individual, institutional, and societal levels. Supporting civil society in their advocacy, as well as consulting and involving them in policymaking might help in designing better policies which address real issues.

Policymakers should capture gender-inclusive initiatives in the labour policies such as paid maternity and affordable childcare. By addressing women's disproportionate burden of domestic and care work, it can be guaranteed that they have an equal opportunity to participate in the digital economy as men. Lawmakers must establish an effective system of checks and balances that prevents the exploitation of law loopholes. Additionally, it is essential to increase transparency and awareness among social partners who strive to collaborate to secure employment relationships and achieve mutually agreed-upon objectives for both employers and employees.

Conclusions

Concluding, gender digital divide is a structural issue which cannot be solved by a one-size-fits-all solution, as gender inequality arise from various intersecting economic, social, political, and cultural challenges. Governments are responsible to dedicate resources, to facilitate research, to better understand the context and the causes specific to each country, to consult civil society and to design gender-inclusive policies. The most effective solutions are those evidence-based, which take into account specific barriers at play for each different context. Lastly, it is essential to simultaneously address deep-seated stereotypes, practices and norms that result in discrimination and even violence against women. In order to achieve progress towards closing the digital gender gap the emphasis should be on implementing policy measures that promote complete participation and inclusion of women and girls in the digital revolution.

A noteworthy limitation of this study is the absence of a gender perspective within the available data. While Eurostat offers a diverse range of intriguing data series for examining the process of digitization, only a limited number of them include gender-specific indicators. Moreover, the commencement of data tracking occurred too recently to be considered relevant for conducting a comprehensive analysis.

In future academic research, it would be valuable to conduct a comparative analysis of the gender gap pertaining to distinct levels of proficiency in digital skills and various domains within information and communication technology (ICT). This analysis could encompass areas such as basic, intermediate, and advanced digital skills, as well as computer systems, database management, computer networks, data mining, artificial intelligence, multimedia, and more. By undertaking this research, it would be possible to identify specific domains that require immediate intervention. Furthermore, it would be beneficial for future studies to examine the impact of suggested strategies and initiatives on the gender digital divide, employing recommended metrics and indicators. Such research would enable a comprehensive evaluation of the effectiveness of these measures in addressing the existing gender disparities in digital literacy.

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Financial Stability of Romanian Households in Light of the COVID-19 Pandemic Shocks

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Abstract

The present paper examines the effects of the Covid-19 pandemic on the financial situation of Romanian Households, using a simple random sampling without replacement. For a larger investigation of the survey results, that offers a new perception in looking at issues of financial stability, a binary logistic regression model was applied in order to econometrically quantify the relationship between determinants and respondents' behavior regarding the use of savings to pay bills and credits commitment during the coronavirus pandemic. The results of the model show that the respondents' household with four members and over used 2.75 times more savings to pay bills and credits commitment than those consisting of three or fewer members. It should be mention that, among the respondents participating in the research, slightly over 28 percent of the respondents have no emergency savings at all. In addition, less than a quarter of the responses (16.5 percent) indicate that staple foods were purchased with borrowed money in order to meet the basic consumption needs. The analysis of households' resilience to shocks is significant in the epidemic context, as the ability of households to cope with the shock determines how much consumption will decrease and whether debtors will register outstanding debts.

Keywords

COVID-19, survey, logistic regression model, financial stability.

DOI: 10.24818/BASIQ/2023/09/059

Introduction

Among the sources of statistical information (such as census, statistical reports, monographs), statistical surveys are currently a booming variant. The survey method is among the preferred procedures of obtaining data, due to the efficiency, the economy of obtaining data. The survey is a procedure by which a population is characterized, based on the research of a part of it, i.e. a sample, taken from the population of origin. The advantage of the method lies not so much in eliminating errors, but especially in pre-dimensioning errors and fixing the probability of statements (Isaic-Maniu, Mitrut and Voineagu, 1999).

The type of survey used in the study of socio-economic phenomena is established according to the degree of homogeneity of the studied community, as well as the form of community organization which is the subject of the research (Vatui et al., 2009).

To ensure that selective research achieves its objective, it is necessary to prepare it thoroughly, on the basis of a plan which makes it possible to obtain the most truthful information (Biji et al., 1999).

In the present paper, I propose to examine the effects of the Covid-19 pandemic on the financial stability of Romanian Households, using a simple random sampling without replacement. The research questions are: How has the COVID-19 pandemic affected households' finances? How has the Covid-19 pandemic affected households' consumption?

Studying the impact of the sanitary crisis on the financial situation of households is very important in terms of micro- and macro-prudential measures, given that the effects of the shocks induced by the coronavirus pandemic are visible in the balance sheets of credit institutions.

The study has the following structure. After the introduction, section 2 provides a brief overview of the related literature. Section 3 presents the research methodology and section 4 discusses the results of the model and the last section is dedicated to conclusions.

Review of the scientific literature

Currently, the impact of the COVID-19 pandemic on the financial situation of households is being investigated in an increasing number of scientific studies.

For example, Barrafrem Västfjäll and Tinghög (2020) investigated the role of pandemics in personal finance, concluding that individuals with a less pessimistic perception of the effect of COVID-19 on their private economic situation have greater financial well-being.

In another study, Szustak, Grado and Szewczyk (2021) investigated the effects of the pandemic on the finances of households in Poland, compared to other CEE countries (including Czech Republic, Slovakia and Hungary). Using the multiple linear regression method, the authors found that in Poland, in the period Q3 2018–Q1 2021, the gross domestic product, the level of unemployment and disposable income have the highest impact on the level of household savings.

In addition, Albacete et al. (2021) analysed the impact of COVID-19 on Austrian households, using data from the Austrian Corona Panel Project (ACPP) carried out by the University of Vienna. The authors noted that those households who had already found themselves in a difficult social, economic and financial situation before the COVID-19 crisis were the ones suffering the largest income losses (e.g. low-income households or households with an unemployed reference person).

Additionally, Azhgaliyeva et al. (2022) studied the impacts of the COVID-19 pandemic on household income in 10 out of 11 CAREC member countries: Afghanistan, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. The authors found that households in the lowest socioeconomic class, SEC1 (i.e., the poorest group), were more likely to get into financial difficulty than those households in the highest socio-economic class. On average, households with income from household businesses and/or self-employment were more likely to suffer from financial difficulty while there was no difference between households with and without income from agricultural production and from wages.

In completing the picture, Gopal and Malliasamy (2022) studied the transformation of savings and spending of rural households during COVID-19 in Tamil Nadu during May 2020. The results showed that all types of savings had a positive and significant relationship with the savings motive of rural households during COVID-19. Further, customary and spontaneous spending had a positive and significant relationship spending pattern of rural households. Rural inhabitants were interested in compromising their spending and other forms of savings to have more emergency savings.

Research methodology

Next, I set out to investigate the effects of the COVID-19 pandemic on the household financial situation, using a simple random sampling without replacement. In this regard, I used Survio, a tool for creating questionnaires and collecting responses. The online survey was distributed through social media platforms (i.e., Facebook, Twitter). The questionnaire was based on the "funnel" principle, starting with general questions and continuing with specific questions. The data were collected between Sunday, November 28, 2021 and Friday, December 31, 2021. A total of 109 people completed the questionnaire voluntarily. The data collected for this paper were anonymous. Once the data collection was completed, I checked the correctness of filling out the questionnaires. Then I entered the data into the computer. The database was created in Microsoft Excel and was the starting point for all further processing and analysis.

Results and discussions

- *Sample structure according to segmentation variables*

The questionnaire survey was completed by 42 men and 67 women (Table no. 1).

Table no. 1. Distribution of respondents by gender

Gender	Frequency	Percentage
Male	42	38.5
Female	67	61.5
Total	109	100

Out of the total number of respondents, 73.4 percent lived in urban areas (Figure no. 1). The highest weights of respondents who completed the survey belonged to the age groups 22-28 years (71.6 percent of the respondents) and 36-42 years (11.9 percent). Those aged 50 years and over accounted for a total of 1.8 percent (Figure no. 2).

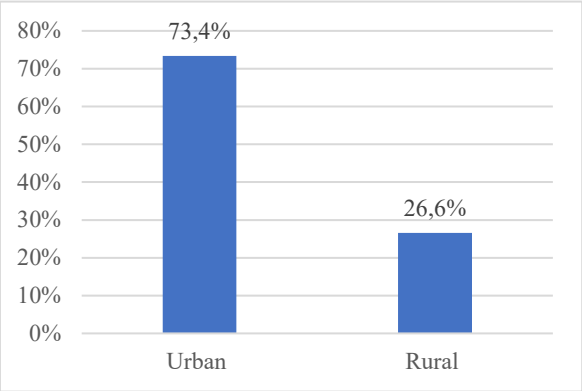


Figure no. 1. Structure of respondents by urban/rural area

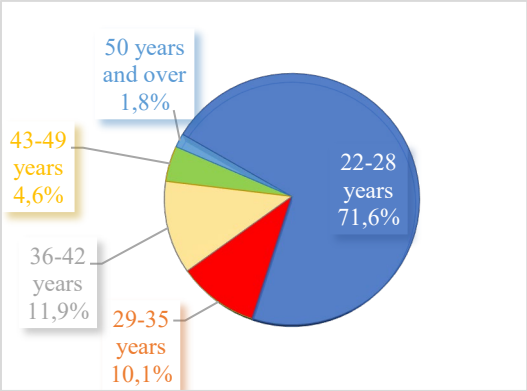


Figure no. 2. Structure of respondents by groups of age

About 73 percent of the respondents in the sample stated that they have a job, 43.1 percent of them working in the private system (Table no. 2), mainly in the following activities of the national economy: wholesale and retail, repair of motors vehicles and motorcycles; transport and storage; information and communications.

Table no. 2. Distribution of respondents by labour status

Labour status	Frequency	Percentage
Farmer	2	1.8
Self-employed in non-agricultural activities	2	1.8
Employer	3	2.8
Employee in the public system	26	23.9
Employee in the private system	47	43.1
Unemployed (only studying)	29	26.6
Total	109	100

Table no. 3 indicates that most of the respondents have three and two family members (34.0 percent, respectively 24.8 percent), while only 4.5 percent of them have five or more family members. In addition, only 30 of the respondents, representing 27.5 percent of the total respondents who participated in the survey, have one or two children under 18 years of age upheld by their families (Figure no. 3).

Table no. 3. Distribution of the respondents according to their family sizes

Number of members in the family	Frequency	Percentage
1	16	14.7
2	27	24.8
3	37	34.0
4	24	22.0
5	1	0.9
6	2	1.8
7	2	1.8
Total	109	100

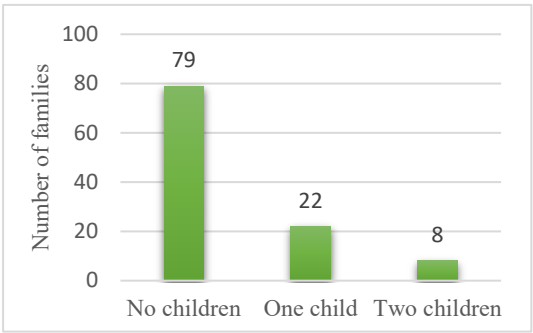


Figure no. 3. Numbers of children under 18 years in the families of the respondents

Figure no. 4 reflects that 34.9 percent of the respondents' families earned between lei 2,501 and lei 5,000 per month. The average income of families with 1 child and 2 children exceeded the average income of the families without children by 25.5 percent and 47.5 percent, respectively (Figure no. 5).

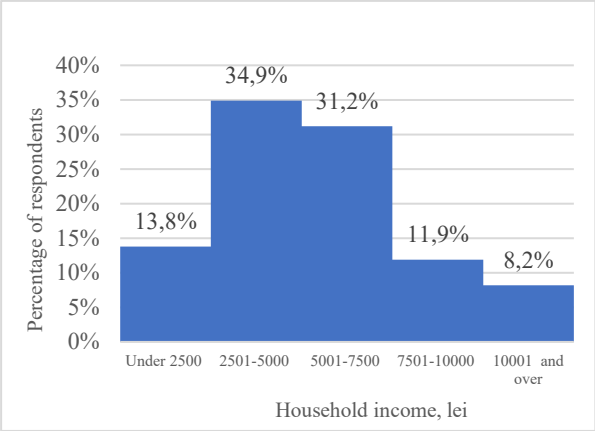


Figure no. 4. Structure of the respondents by household income

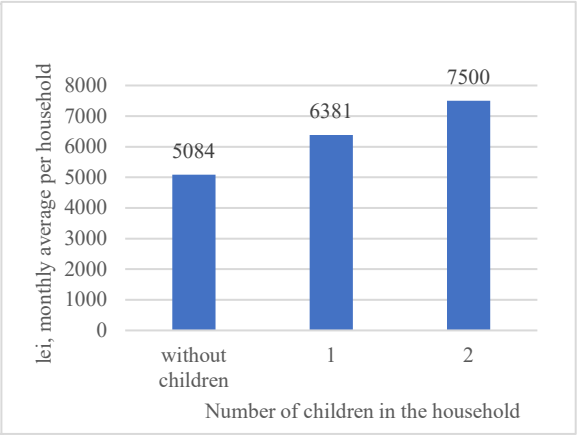


Figure no. 5. Distribution of the respondents by household income and by number of children under 18 years

- *Analysis of the impact of Covid-19 on households' financial situation and consumption*

As can be seen in figure no. 6, over 65 percent of the respondents surveyed said that the coronavirus SARS-CoV-2 led them to increase their purchase expenses for medical products, equipment and medicines, products for current household cleaning and up-keeping and food products, in the context in which the educational activity was performed online. Instead, the biggest drop in spending was on hotels, restaurants and cafes.

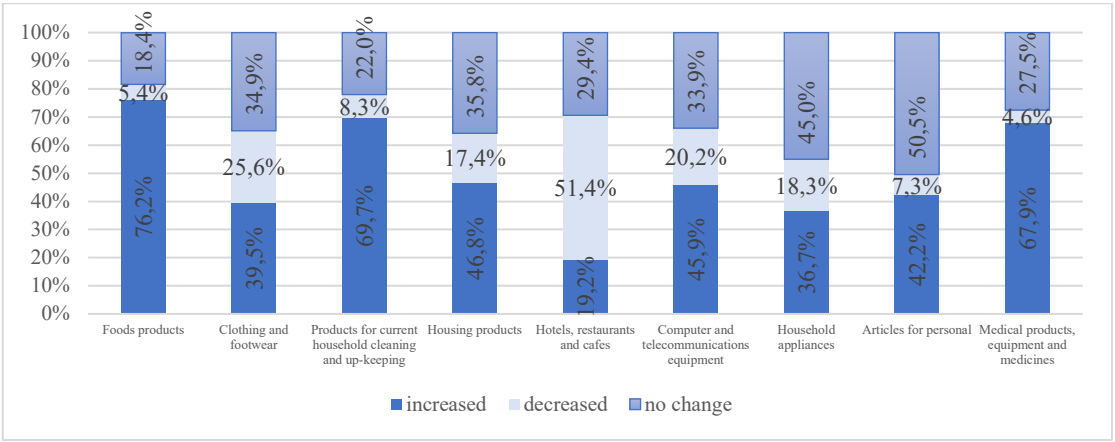


Figure no. 6. Structure of the respondents according to changes in spending patterns since the coronavirus pandemic began

Among the respondents participating in the research, 34.9 percent affirmed that in their households' amounts were withdrawn from the savings to pay bills and credits commitment. It should be pointed out that slightly over 28 percent of the respondents have no emergency savings at all (Table no. 4).

Table no. 4. Distribution of respondents according to the responses to the following question: *In the last four weeks, in your household, have the savings been used to pay bills and credits commitment?*

	Frequency	Percentage	Cumulative percentage
Yes, I used savings	38	34.9	34.9
I have no savings	31	28.4	63.3
No, but I have savings	40	36.7	100
Total	109	100.0	

Table no. 5. Distribution of the respondents according to the responses to the following question: *In the last four weeks, have credit cards, an overdraft or money borrowed from family and friends been used in your household to buy staple foods (bread, sugar, oil, fruits, etc.)?*

	Frequency	Percentage	Cumulative percentage
Yes	18	16.5	16.5
No	87	79.8	96.3
I don't know/I don't answer	4	3.7	100
Total	109	100	

Less than a quarter of the responses (18, respectively 16.5 percent) indicate that staple foods were purchased with borrowed money in order to meet the basic consumption needs (Table no. 5).

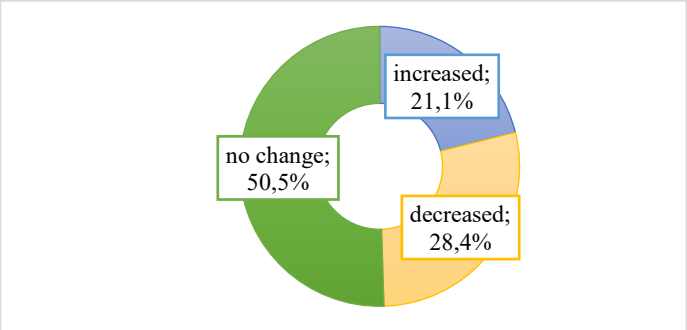


Figure no. 8. Structure of the respondents according to the responses to the following question: *How has your income changed since the beginning of the pandemic?*

Figure no. 8 shows that a little over half (50.5 percent) of respondents' incomes have not changed since the beginning of the pandemic.

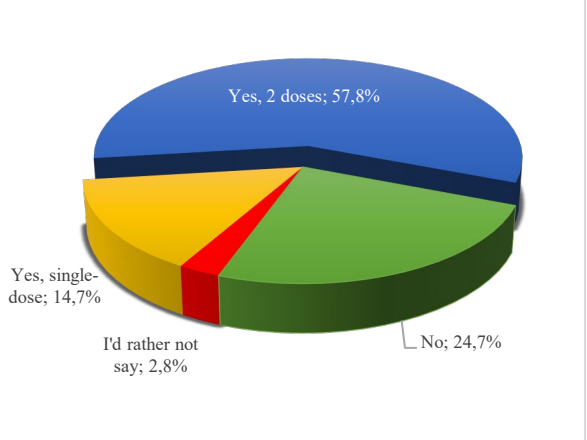


Figure no. 9. Structure of the respondents according to the responses to the following question: *Have you been vaccinated against COVID-19?*

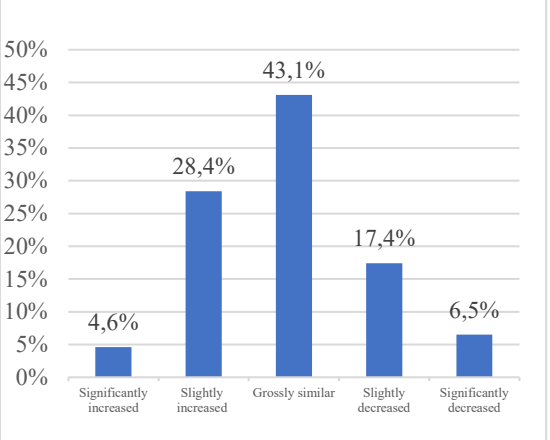


Figure no. 10. Structure of the respondents according to the responses to the following question: *How do you think the financial stability of your household will improve in the next 3 months?*

Almost three quarters of the respondents (72.5 percent) included in the survey were vaccinated against COVID-19, of which 57.8 percent received 2 doses (Figure no. 9). It should be noted that 23.9 percent of respondents were pessimistic about resilience to shocks in terms of financial stability over the next 3 months, given the prolonged health crisis (Figure no. 10).

- *Data analysis using a binary logistics regression model*

Going further with the analysis, for a larger investigation of the survey results, I utilized a binary logistic regression model in order to examine the relationship between determinants and respondents' behaviour regarding the use of savings to pay bills and credits commitment during the COVID-19 pandemic. It should be noted that the model is similar to that applied by Wilson and Lorenz (2015). The variables that were considered are presented in Table no. 6.

Table no. 6. The variables of the regression model

Indicator	Description	Types of Variables
SBC	Respondent's household that used savings to pay bills and credits commitment	Dichotomous, nominal
GR	Gender of the respondent	Dichotomous, nominal
MHI	Monthly average net respondent's household income	Ordered polytomous
HSR	Size of the respondent's household	Dichotomous, nominal

The variable *respondent's household that used savings to pay bills and credits commitment* (SBC) took the value 0 if the respondent's household did not use amounts withdrawn from the savings in view to cover the expenditure or the value 1 if the respondent's household used. The variable *gender of respondent* (GR) was measured with 0 if the respondent is female and 1 if the respondent is male. The variable *monthly average net respondent's household income* was measured from 1 if the respondents' household earned under lei 2,500 per month to 5 if the respondents' household earned lei 10,001 and over per month. The variable *size of the respondent's household* (HSR) recorded the value 0 if the respondent's household contains three or less members and 1 if the respondent's household has four members and over.

Table no. 7 shows the results of binary logistic regression model.

Table no. 7. Results of binary logistic regression model

	B	S.E.	Wald	df	Sig.	Exp (B)
GR	.526	.446	1.394	1	.238	1.692
MHI	-.519	.206	6.335	1	.012	.595
HSR	1.012	.454	4.968	1	.026	2.751
Constant	-1.675	1.051	2.538	1	.111	.187

In the context of the COVID-19 pandemic, the coefficient of the variable MHI is statistically significant, p-value is less than the significance level ($\alpha = 0.05$). The inverse relationship between SBC and MHI is in line with economic theory, the shortage of financial resources has led to a fairly large share of respondents' households in the sample to use savings to pay the bills on time, especially services related to housing and credits commitment. In addition, HSR significantly influences GR. The direct relationship between them suggests that the respondents' household with four members and over used 2.75 times more savings to pay bills and credits commitment than those consisting of three or fewer members. Instead, the coefficient of the variable GR is not statistically significant, in the context in which, based on GEO No. 37/2020, the debtors who have encountered temporary financial difficulties had the possibility of deferring the payment of instalments for a determined period. Moreover, companies that suspended their activity received technical unemployment benefits for employees.

Table no. 8. Diagnostic tests of the binary logistic regression model

Omnibus Tests of Model Coefficients			
	Chi-square	df	Sig.
Step	12.900	3	.00
Block	12.900	3	.00
Model	12.900	3	.00
Model Summary			
-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	
130.397[a]	.112	.153	

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Next, we applied the Omnibus tests of model coefficients → Chi-square values: 12.9 (df = 3; Sig =0.00; n = 109). The model explained between 11.2 percent (Cox & Snell R-squared) and 15.3 percent (Nagelkerke R square) of the variance in respondents' behaviour regarding the use of savings to pay bills and credits

commitment during the COVID-19 pandemic and correctly classified 68.8 percent of the cases (Table no. 8).

Conclusions

In the present paper, I investigated the effect of the COVID-19 pandemic on the financial situation of Romanian households, using a simple random sampling without replacement. The results of the survey showed that 28.4 percent of respondents have no emergency savings at all. It is worrying that 16.5 percent of respondents indicated that staple foods were purchased with borrowed money in order to meet the basic consumption needs. It should be noted that only 4.6 percent of respondents were very optimistic about resilience to shocks in terms of financial stability in the next 3 months after completing the questionnaire, given the prolonged health crisis. In addition, the results of the binary logistic regression model show that the respondents' household with four members and over used 2.75 times more savings to pay bills and credits commitment than those consisting of three or fewer members.

I believe that the extension of this study will contribute to a better understanding of the factors influencing the evolution of households' net wealth since the onset of the pandemic.

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Senior Entrepreneurship Literature: A Systematic Review

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Abstract

The present paper aims to provide a comprehensive approach to the senior entrepreneurship literature, by employing a systematic review process, focusing on scientometric and content analyses. A data set of 47 articles indexed in the Clarivate Analytics Web of Science database was subject to investigation, this representing the result of a search in Web of Science Core Collection (Social Sciences Citation Index, Emerging Sources Citation Index, Science Citation Index Expanded) during April 2023. The employed scientometric analysis outlines a classification of the investigated senior entrepreneurship literature based on years of publication, subject areas, main authors, geographical distribution of the articles, most productive institutions, representative journals and publishers. Additionally, due to the developed content analysis over the abstracts of the articles included in the data set, the main research trajectories in the investigated senior entrepreneurship literature could be established. These particularly envisaged the studied topics, applied theories, employed research methods, and the main researched regions. Furthermore, starting from these premises, a future research agenda in the field of senior entrepreneurship was designed. The original analyses developed within the paper and the proposed novel research agenda bring a contribution to the scientific literature in the area of senior entrepreneurship, with important practical implications for scholars with research interests in the field.

Keywords

Entrepreneurship, senior entrepreneurship, literature review, Clarivate Analytics Web of Science.

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Introduction

Aging population generates a vast array of opportunities, at the same time, posing some of the greatest challenges to nations worldwide. According to Oxford Economics (2016) cited in Welsh, Dragusin and Grosu (2019), the number of persons aged 50+ is estimated to reach almost 3.2 billion by 2050, doubling its 2015 value of 1.6 billion. Furthermore, it is forecasted that "by 2050, 1 in 6 people in the world will be over the age of 65, up from 1 in 11 in 2019" (United Nations, 2019). Thus, the magnitude of the phenomenon and its growing importance are indisputable. Usually, in general, the aging phenomenon is associated with increased life expectancy, lower mortality rates, and falling fertility rates in countries throughout the world (Dragusin et al., 2019). Furthermore, in less developed countries, the phenomenon of heavy migration can also be added (Petrescu, Bâc and Zgură, 2011; Grosu and Constantin, 2013; Grosu and Dinu, 2016). In such a context, nations worldwide are facing and will still face important economic and social challenges, mainly derived from an increased number of retirees, combined with a lowered active work force (Dragusin et al., 2015). In such a context, a prolonged active life of seniors, implicitly their increased participation in the labour market is desired and senior entrepreneurship might represent an important means in ensuring it. Commonly referred to in the specific scientific literature as "older entrepreneurship", "third age entrepreneurship", "elderly entrepreneurship", "grey entrepreneurship", or "silver entrepreneurship", senior entrepreneurship reflects the activity of "people aged 50 or over, who are planning to start a business, are currently in the process of starting one, or have recently started one" (OECD, 2013, p. 1, cited in Dragusin et al., 2017). In ageing societies, senior entrepreneurship, a particular form of entrepreneurship and, at the same time, a dimension related to ageing population, became a rising phenomenon that caught the attention of policymakers worldwide. The entrepreneurial initiatives of seniors

are adding value to communities and themselves, especially through job generation, workforce development, and improved productivity. In addition, active seniors tend to keep their good health status for a longer period of time, living a more productive and meaningful life, reducing pressure on specific public costs (Grosu and Dragusin, 2020). Furthermore, in addition to being an important aspect on policymakers' agenda, senior entrepreneurship raised the research interest of scholars worldwide, becoming a research topic that is gaining a lot of visibility.

In such a context, we developed the present paper driven by the motivation to better understand how senior entrepreneurship is evolving as a field of research, as an adequate comprehension of the research in the field lays the foundation for future coherent research actions. Studies reviewing the literature in the field of senior entrepreneurship are in an incipient stage (Seco Matos, Amaral and Baptista, 2018; Ratten, 2019). Seco Matos, Amaral and Baptista (2018, p.427) suggest a research agenda as a result of a review of the senior entrepreneurship literature, focusing on "the key conceptual approaches and empirical findings about senior entrepreneurs' characteristics and behaviours", emphasizing drivers of senior entrepreneurship and main determinants of the performance of senior entrepreneurs. Contrastingly, Ratten (2019) employs a thematic analysis over the senior entrepreneurship literature to identify gaps that can be further explored.

Considering the previously outlined information, the present paper is structured into four main parts, this introductory section included. The next section of the paper presents the main methodological aspects pertaining to the desk research carried out to accomplish the systematic review of the literature on senior entrepreneurship. The third section puts forward the main results specific to each of the developed analyses, under the umbrella of the 'systematic literature review', respectively the scientometric and content analyses, while the fourth focuses on discussions, with a particular focus on articulating a viable and coherent future research agenda in the field of senior entrepreneurship. The paper ends with a series of final considerations.

1. Research methodology

Based on desk research, the main scope of the paper is to provide a comprehensive approach to the 'senior entrepreneurship' literature, by employing a systematic review process. In a more specific regard, the present paper aims to achieve the following objectives:

- Classifying the senior entrepreneurship literature based on years of publication, subject areas, main authors, geographical distribution of the articles, most productive institutions, representative journals and publishers.
- Establishing the main research trajectories in the senior entrepreneurship literature, particularly envisaging the studied topics, applied theories, employed research methods, and the main researched regions.
- Developing a future research agenda in the field of senior entrepreneurship.

The research focused on analysing only scientific articles, as, generally, these follow a more rigorous scientific approach, especially when compared to conference papers, or chapters in edited books. Furthermore, since Clarivate Analytics Web of Science is considered the reference point in academic publishing, only articles indexed in this database were considered for analysis. Thus, on April 1, 2023, a search in Web of Science Core Collection (Social Sciences Citation Index (SSCI), Emerging Sources Citation Index (ESCI), Science Citation Index Expanded (SCI-EXPANDED)) was accomplished based on the following key topics: "senior entrepreneur*" OR "older entrepreneur*" OR "third age entrepreneur*" OR "elderly entrepreneur*" OR "grey entrepreneur*" OR "silver entrepreneur*". An additional search criterion was added, respectively the 'document type', and only articles were chosen. The search yielded 80 results that matched the completed query. However, the final data set under analysis was composed of 47 entries. The remaining 33 entries were eliminated as these were either book chapters (being initially included in the generated results as they were indexed in Web of Science as both book chapters and articles, as 'document type'), editorials or articles that, even if their abstracts included reference to the searched key terms, in general, these were approaching different topics (e.g. firms' orientation toward subcontracting to the informal sector; factors affecting equity capital acquisition; factors related to 'taking risks', etc.). The data set was further studied, employing scientometric and content analyses.

Scientometrics is one of the key evaluation tools of the scientific productions (Mooghali et al., 2011). Benefitting from different approaches in the scientific literature, in the present paper, the term of 'scientometrics' is used following the definition provided by Tague-Sutcliffe (1992), respectively: "the study of the quantitative aspects of science as a discipline or economic activity; it involves quantitative studies of scientific activities, including, among others, publication". In addition, scientometrics implies

the study of science, especially in terms of growth, structure, interrelationships, and productivity (Hood and Wilson, 2001 cited in Mooghali et al., 2011). In this research, the scientometric analysis is accomplished based on the scientometric features provided by the Clarivate Analytics database, focusing on: years of publication; subject areas; authors; geographical distribution of the articles; the most productive institutions; journals that published articles in the area of 'senior entrepreneurship', implicitly their associated publishers.

"Content analysis is any technique for making inferences by objectively and systematically identifying specified characteristics of messages." (Holsti, 1969, p.14 cited in Bryman, 2012, p.289) Usually, content analysis implies text coding, especially in terms of subjects and themes. In case of the present paper, the employed content analysis of the abstracts of the articles included in the studied data set envisaged the identification of: studied topics, applied theories, employed research methods, and main researched regions.

2. Research results

Scientific articles in the field of senior entrepreneurship first appeared in the Clarivate Analytics Web of Science database in 2011 (1 article), and their number sharply increased starting with 2019, with a small decrease in 2020, maybe a year when more COVID-19-related topics caught the attention of scholars worldwide. (Figure no. 1)

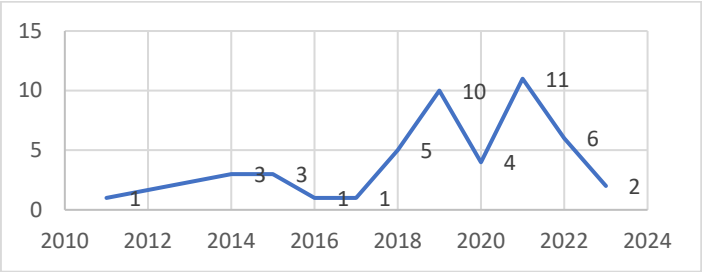


Figure no. 1. Publication year of articles in the field of senior entrepreneurship in Web of Science
Source: own representation, based on the data set extracted from Clarivate Analytics Web of Science

In terms of covered areas, considering the Web of Science categories, most of the papers in the analysed data set belong to Business (over 50%), followed by Management (over 30%). Also, as a research area, Business Economics is the most representative for the papers published in the field of senior entrepreneurship. More than 75% of the analysed papers are in this research area. However, besides different variations of Business and Economics, other categories and research areas are outlined – Gerontology, Psychology, Regional urban planning, Environmental Science, etc.

The current analysis revealed that the most representative authors in the area of senior entrepreneurship are Kautonen, T. and Kibler, E., with three papers, each. These two authors are not only representative in terms of the number of publications on senior entrepreneurship, but also in terms of the registered citations. Two of their papers are found amid top five most cited papers in the analysed senior entrepreneurship literature. More precisely, their paper co-authored with Tornikoski, E.T., entitled "Entrepreneurial intentions in the third age: the impact of perceived age norms", published in September 2011 in "Small Business Economics" (volume 37, issue 2, pp. 219-234), a pioneering work in the field, holds the leading position in top of the most cited papers in the investigated senior entrepreneurship literature (138 citations as of April 23, 2023). Contrastingly, another paper of the same two authors, this time co-authored with Wainwright, T. and Blackburn, R. holds the fifth place in the top of the most cited papers in the analysed senior entrepreneurship literature. This is entitled "Can Social Exclusion Against "Older Entrepreneurs" Be Managed?" and it was published in October 2015 in "Journal of Small Business Management" (volume 53, pp.193-208) - 34 citations as of April 23, 2023. Thus, it can be assessed that the leading authors in senior entrepreneurship, considering the analysed data set (Kautonen, T. and Kibler, E.), are commencing and ending the top five of the most cited papers in the studied field. Other representative authors, in terms of published papers in the analysed data set are: Leporati, M.; Marin, A.J.T.; Maritz, A.; Stypinska, J.; Wainwright, T.; Pilkova, A.; Rehak, J. In relation to the affiliation of the authors, the most productive institutions in the field of senior entrepreneurship are Aalto University and Heriot Watt University with three articles in the analysed data set. Other institutions with two papers each are: EAE Business School, ESIC, ESIC Business Marketing School, Free University of Berlin, La Trobe University, University of Salvador, University of London, University of Leeds, Universidade Da Beira Interior, Birkbeck University London, Comenius University Bratislava, and University of Southampton. At the same line, a geographical

distribution of the papers included in the analysed data set reveals the leading positions of the American and British academia, followed by Finland, Spain, Australia, Germany, The Netherlands, France and People's Republic of China. The presence of highly renowned regions for their academic performance (The United States of America, The United Kingdom, The Netherlands, Finland, etc.) is remarkable. Contrastingly, only a couple of papers authored by scholars belonging to the Central and Eastern European space was identified.

In terms of the journals in which the analysed articles are published, "Small Business Economics" and "International Journal of Entrepreneurial Behavior & Research" are the most representative ones, with four papers, closely followed by, "International Journal of Entrepreneurship and Innovation" and "Strategic Change Briefings in Entrepreneurial Finance", with three papers. Other journals that have two articles published in the area of senior entrepreneurship are "Journal of Asian Finance Economics and Business" and "Journal of Small Business Management". As each journal is associated with a publisher, the analysis further outlines the most prominent publishers in the area of senior entrepreneurship. Emerald Group Publishing holds the leading position with 11 articles published in the field of senior entrepreneurship, followed by Springer Nature, with seven articles. Sage and Wiley have five articles, each, published on senior entrepreneurship, while Taylor and Francis has three.

Another objective of the paper was to establish the main research trajectories in the senior entrepreneurship literature, particularly identifying the studied topics, applied theories, employed research methods, and the main researched regions. Thus, in addition to the scientometric analysis, a content analysis was employed on the abstracts of the articles included in the data set. However, before outlining its main outcomes, it is worth highlighting that the most common keywords specific to the investigated data set were: entrepreneurship, age, self-employment, senior entrepreneurship, motivation, older workers, retirement, unemployment, older entrepreneur, gender, determinants, senior entrepreneur, planned behaviour, silver economy, theory of planned behaviour, entrepreneurial intention, business owners, older people, third age, intergenerational entrepreneurship, etc. (Figure no. 2).



Figure no. 2. Common keywords in the analysed senior entrepreneurship literature

Source: own representation, based on the data set extracted from Clarivate Analytics Web of Science, using word cloud online software

The employed content analysis over the abstracts of the articles included in the data set envisaged the identification of potential subjects and themes, firstly for topics addressed. Thus, the analysis revealed the following main subject categories:

- Individual perspective (being the entrepreneur, or the potential entrepreneur);
- Individual-business relationship;
- Macro perspective.

A first remarkable aspect is that no pure 'business' subject could be identified. Entrepreneurial ventures established and run by senior entrepreneurs do not appear as a subject for investigation in the studied literature. This leads to a need for investigation in this area, as outlined in the proposed research agenda in the discussions section.

Of the three main subject categories identified in the studied senior entrepreneurship literature, the first category is the most representative. Most studies belong to the category of 'individual perspective'. In this subject category, the following themes were identified: drivers into entrepreneurship; barriers to entrepreneurship; entrepreneurial intentions; profile of senior entrepreneur; characteristics; intergenerational education; technology orientation (+comparison with non-senior entrepreneurs); social innovation; entrepreneurial identity work in liminal conditions; lifelong learning; exit from

entrepreneurship; motives and attitudes on the well-being; intergenerational entrepreneurship; gender-related aspects; re-venturing of serial entrepreneurs; entrepreneurial identity.

For the second identified subject, 'individual-business relationship' the following themes were identified: social capital; business life cycle; business development; identity; temporal perceptions in entrepreneurship; enterprise culture.

In case of the third identified subject, 'macro perspective', the following themes were identified: drivers into entrepreneurship (from a macro perspective, focusing on aspects related to the business and economic environments); policy analysis; retirement planning; dynamics of senior entrepreneurship; age-entrepreneurship relationship; entrepreneurial intentions (from a macro perspective, referring to the context's influence); impacting factors on seniors' early-stage entrepreneurial activity (in comparison to youth early-stage entrepreneurial activity).

By far, the most studied topic in the investigated senior entrepreneurship literature refers to 'drivers into entrepreneurship' (both from an individual and/or macro perspective), closely followed by 'barriers to entrepreneurship' and 'entrepreneurial intentions'.

Usually, senior entrepreneurship is approached in the studied literature from a general perspective in terms of industries / sectors where it is manifested. Only two studies focus on senior entrepreneurship in particular industries: tourism and hospitality; creative industries.

In what concerns the main theories applied in the analysed studies belonging to the senior entrepreneurship literature indexed in Clarivate Analytics Web of Science, the content analysis of the abstracts revealed that the most used theory was the 'Push-pull theory of entrepreneurship'. This is not surprising, as this is the main theory employed in explaining drivers into entrepreneurship. At the same time, 'Necessity versus opportunity entrepreneurship' theory, derived from the 'Push-pull theory of entrepreneurship' was present, as well. Another frequently encountered theory was the 'Theory of Planned Behaviour', also in line with the studied topics (in this case, entrepreneurial intentions). Other theories revealed by the analysis were: 'Social capital'; 'Lev Vygotsky's cognitive and social development theory'; 'Social innovation'; 'Enterprising self'; 'Critical gerontology'; 'Self-determination theory'; 'Social identity theory'; 'Lifespan developmental psychology'; 'Institutional theory'; 'Cartensen's philosophical selection theory'; 'Shapero and Sokol's entrepreneurial event theory'; 'Social learning theory'; 'Social cognitive career theory'. Although most of the theories belong to the business area, there were also theories of psychology, sociology, and gerontology, even if only very few in these non-business areas.

In terms of the studied regions, countries from all over the world are studied in the analysed literature. However, a more pronounced presence of European countries was observed. In case of studies focused on one region, the following countries were mentioned:

- Europe: The United Kingdom, Finland, the Netherlands, Spain, Portugal, Poland, Russia (with the remarkable presence of the studies on the United Kingdom, followed by studies on Finland);
- Asia: China, Japan, Israel, Malaysia (with the notable presence of studies in China);
- Australia;
- America: The United States of America, Chile.

However, there were also articles in the data set that involved the investigation of multiple countries. In such cases, the following statements were identified in the analysed abstracts: five European countries; 22 OECD countries; Chile compared to a selected group of Latin American countries; China, India and Turkey; 11 European countries; Eastern and Western Europe; 45 countries from Global Entrepreneurship Monitor data; 21 European Union countries; Central and Eastern European space. Even in studies focused on multiple countries, Europe stands out among the investigated regions in the senior entrepreneurship literature.

The last aspect investigated under the 'umbrella' of the content analysis referred to the employed research methods in the studied articles on senior entrepreneurship. The analysis revealed that, when data collection processes are involved, qualitative research methods are by far the most representative for the investigated senior entrepreneurship literature. The most common research techniques in qualitative research are semi-structured interviews, in-depth interviews, and focus groups. Other techniques refer to: structured interviews, case studies, analysis of reports, evaluations of incubator projects, critical assessment of policy texts, literature analysis for conceptual framework development. Quantitative research methods were less present in the analysed articles, especially in terms of data collection. However, in such cases, the

questionnaire-based survey was the most frequently used research technique. Even less present research methods in the analysed literature were the mixed methods approaches.

Senior entrepreneurs were the most commonly investigated subjects, closely followed by seniors. However, there were also studies based on pieces of research amid experts, other stakeholders, young individuals, and young entrepreneurs (for comparison reasons). There were also articles in the analysed data set based on pieces of research developed on secondary data, usually from the Global Entrepreneurship Monitor, Eurostat, the Health and Retirement Study, the Federal Reserve's Survey of Consumer Finances, the Netherlands Interdisciplinary Demographic Institute Work and Retirement Panel, or the Spanish National Statistics Institute's Labour Force Survey. In such cases, statistical and econometrical analyses were employed. Most mentioned methods referred to logistic regression model, multi-level logistic regression, multilevel mixed-effects linear regressions, multinomial logit regressions, binary logistic regression techniques, multinomial logistic regression analysis, multiple linear regression, and ANOVA analysis. Usually, the studies approaching numerous countries, are based on secondary data from the Global Entrepreneurship Monitor and from Eurostat and are mainly developed on sound statistical analysis and econometrical modelling.

3. Discussions ... future research agenda

The paper investigates the senior entrepreneurship literature in the Clarivate Analytics Web of Science database focusing on scientometric and content analyses. The paper outlines the years of publication of the analysed papers, their subject areas, the most representative/renowned authors, the geographical distribution of the articles, the most productive institutions publishing in the field, and the journals that published articles in the area of 'senior entrepreneurship', implicitly their associated publishers. From the perspective of the employed content analysis, the paper outlines the main studied topics, applied theories, employed research methods, and main researched regions. A more detailed approach over these aspects is presented in the results section of the paper, while their synthesis is revealed by the conclusions section. In such a context, this section of the paper is developed as a future research agenda, outlining the following trajectories:

- Design of a conceptual framework (focus on definitions and conceptual delimitations), to clearly provide a common, generally accepted theoretical structure for all scholars interested in 'senior entrepreneurship' research.

- Development of studies in the field of senior entrepreneurship focused on the 'business' category, that specifically address entrepreneurial ventures started and developed by seniors. Studies focusing on entrepreneurial orientation, business models, business performance, business strategies for both start-up and development, business life cycle, might bring invaluable contributions to both theory and practice. Furthermore, to increase the value of such studies, comparisons with ventures established by non-seniors might be a research avenue.

- Elaboration of studies focused on particular industries, to better acknowledge the characteristics of senior entrepreneurship (dynamics, firm size, strategies, orientation etc.) in each specific industry and to allow for comparisons between industries.

- Increasing the interdisciplinarity in approaching senior entrepreneurship in the scientific literature. The phenomenon could be tackled from various perspectives, in relationship with entrepreneurship, such as: sociology, gerontology, psychology, etc.

- Diversifying the researched areas and focusing on less studied countries, especially those from Eastern Europe, with a communist background and less developed, especially when compared with the Western European countries.

- Development of more studies based on quantitative research methods, especially on questionnaire-based surveys, representative for the investigated population.

- Orientation, in a more comprehensive way, towards less descriptive studies. The existing literature provides a proper starting point for switching from descriptive to more explanatory approaches in future studies in the senior entrepreneurship literature.

Even in an incipient stage, the literature on senior entrepreneurship provides important pieces of research worth considering for further exploration. A burgeoning literature in the field of senior entrepreneurship might be observed in the near future as ageing becomes an increasingly important issue, along with migration, digitalization, or sustainability (Georgescu et al., 2022; Vasiliu, 2022), on both policymakers'

and scholars' agenda. Various research opportunities might arise in the field of senior entrepreneurship, worth exploring by scholars worldwide.

Conclusions

The present paper aimed at providing a comprehensive approach to the 'senior entrepreneurship' literature by employing a systematic review, focusing on scientometric and content analyses. The investigated senior entrepreneurship literature consisted of a data set of 47 articles indexed in the Clarivate Analytics Web of Science database, starting with 2011, until 2023, with a remarkable presence of 2019 and 2021 as the most productive years of publication. Belonging mostly to Business and Management areas, the analysed articles were published in different journals, the most representative ones being "Small Business Economics" and "International Journal of Entrepreneurial Behavior & Research". Emerald Group Publishing holds the leading position in terms of publications in the analysed data set, followed by Springer Nature. In terms of the most renowned authors in the analysed senior entrepreneurship literature, Kautonen, T. and Kibler, E. were remarkable both in terms of the number of published papers and registered citations. Other representative authors, in terms of published papers, in the analysed data set were Leporati, M., Marin, A.J.T., Maritz, A., Stypinska, J., Wainwright, T., Pilkova, A., and Rehak, J. In the same line, Aalto University and Heriot Watt University were revealed as the most frequently encountered affiliation institution, closely followed by EAE Business School, ESIC, ESIC Business Marketing School, Free University of Berlin, La Trobe University, University of Salvador, University of London, University of Leeds, Universidade Da Beira Interior, Birkbeck University London, Comenius University Bratislava, and University of Southampton. From a regional perspective, a geographical distribution of the papers included in the analysed data set revealed the leading positions of the American and British academia, followed by Finland, Spain, Australia, Germany, The Netherlands, France, and People's Republic of China. The presence of highly renowned regions for their academic performance (The United States of America, The United Kingdom, The Netherlands, Finland, etc.) is remarkable. Contrastingly, only a couple of papers authored by scholars belonging to the Central and Eastern European space was identified.

The content analysis developed on the abstracts of the articles included in the data set revealed three main subject categories: individual perspective (being the entrepreneur or the potential entrepreneur); individual-business relationship; macro perspective. The first category was the most investigated, the identified themes being the following: drivers into entrepreneurship; barriers to entrepreneurship; entrepreneurial intentions; profile of senior entrepreneur; characteristics; intergenerational education; technology orientation (+comparison with non-senior entrepreneurs); social innovation; entrepreneurial identity work in liminal conditions; lifelong learning; exit from entrepreneurship; motives and attitudes on the well-being; intergenerational entrepreneurship; gender-related aspects; re-venturing of serial entrepreneurs; entrepreneurial identity. For the second identified subject, 'individual-business relationship' the following themes were identified: social capital; business life cycle; business development; identity; enterprise culture; temporal perceptions in entrepreneurship. In case of the third identified subject, 'macro perspective', the following themes were identified: drivers into entrepreneurship (from a macro perspective, focusing on aspects related to the business and economic environments); policy analysis; retirement planning; dynamics of senior entrepreneurship; age-entrepreneurship relationship; entrepreneurial intentions (from a macro perspective, referring to the context's influence); impacting factors on seniors' early-stage entrepreneurial activity (in comparison to youth early-stage entrepreneurial activity). By far, the most studied topic in the investigated senior entrepreneurship literature refers to 'drivers into entrepreneurship' (both from an individual and/or macro perspective), closely followed by 'barriers to entrepreneurship' and 'entrepreneurial intentions'. In addition, the most common keywords in the analysed data set were: entrepreneurship, age, self-employment, senior entrepreneurship, motivation, older workers, retirement, unemployment, older entrepreneur, gender, determinants.

In what concerns the main theories applied in the analysed studies belonging to the senior entrepreneurship literature indexed in Clarivate Analytics Web of Science, the content analysis of the abstracts revealed that the most used theory was the 'Push-pull theory of entrepreneurship'. Not surprisingly, as this is the main theory employed in explaining drivers into entrepreneurship. Another frequently encountered theory was the 'Theory of Planned Behaviour', usually applied for investigating entrepreneurial intentions.

In terms of the studied regions, a more pronounced presence of European countries was observed. The United Kingdom, Finland, the Netherlands, Portugal, Spain, Poland, and Russia resulted in preferred regions for investigation. Also, Australia, Asia (China, Japan, Israel, and Malaysia), and America (The United States of America, Chile) were also investigated in the studied senior entrepreneurship literature.

Considering the employed research methods in the studied articles, the content analysis revealed that, when data collection processes are involved, qualitative research methods are by far the most representative for the investigated senior entrepreneurship literature. Most common research techniques in qualitative research were semi-structured interviews, in-depth interviews, and focus groups. Other techniques refer to: structured interviews, case studies, analysis of reports, evaluations of incubator projects, critical assessment of policy texts, literature analysis for conceptual framework development. Quantitative research methods (research technique: questionnaire-based survey) and mixed methods approaches were less present in the analysed articles, especially in terms of data collection. Switching from primary to secondary data, various articles in the analysed data set were based on statistic analysis and econometric modelling of data mainly from internationally recognized institutions or national surveys.

The present paper aimed to represent a concise, yet abundant in information, guide to the existent literature on senior entrepreneurship indexed in the Clarivate Analytics Web of Science database, to outline its current state and to draw some future research directions. However, the present study outlines a couple of limitations derived from the investigation of only one database (respectively, Clarivate Analytics Web of Science) and from the development of the content analysis only over the abstracts of the articles in the researched data set.

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The Main Pillars of Supporting the Acceptance of Cultured Meat as a Possible Alternative Source for Sustainable Food Consumption

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Abstract
Cultured meat obtained in vitro from animal cells represents one of the recent concern of specialists, who thus try to solve part of the issues related to animal welfare and sustainable meat production. Beyond the technical difficulties that must be overcome, the acceptance of cultured meat by consumers is not an easy goal to achieve, as it depends on factors acting both at global and local level. Since this paper focuses on Romanian consumers, the authors emphasize the importance of developing a general information framework that would allow firstly their understanding and further their acceptance of cultured meat. For this purpose, a systematic literature review, based on 38 articles, was carried out in order to observe good practices at international level, which led, in the past, to the acceptance of other significant innovations in the food field. Thus, five directions of action were identified: communication, knowledge, trust, perception and attitudes. Based on these, a model of cultured meat acceptance by Romanian was developed. This initiative is unique in Romania so far and its results can be of interest for many categories of specialists, from scholars and researchers to practitioners interested in launching new products on the market or policy-makers in the field of nutrition, public health and agriculture. Further research is needed on the relationships between food security and safety, traditional meat production and cultured meat as alternative to real meat, before the marketplace launch of this new product.

Keywords

Cultured meat, consumer acceptance, sustainable food consumption, new food product, emerging technologies

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Introduction

Meat overconsumption, especially the red one, specific to nowadays' Western diet has had a negative impact both on environment and consumers' health (De Graaf, 2019). In this context, the transition towards a low-meat diet appears to be the right choice from human health, animal welfare and environmental protection point of view. On the basis of this increased call to reduce meat consumption, a new trend of industrial meat substitutes has emerged, where cultured meat or lab-grown meat, which represent the focus of our research, is a part of (Gómez-Luciano, Vriesekoop and Urbano, 2019).

Cultured meat (also called lab-grown meat, cultivated meat, artificial meat or in vitro meat) is an innovative product of cellular agriculture, obtained from stem cells, which, after being taken from animals through a small biopsy of muscle tissue, are placed in a special nutrient-rich medium in a bio-reactor independent from the animal to promote growth (Post, 2012; Ben-Arye and Levenberg, 2019).

Although it is not yet available to consumers, cultured meat is described in recent literature as having positive effects on environmental sustainability, animal welfare, food safety and world hunger issue (Post,

2012; Sinke et al., 2023). Thus, cultured meat appears to be a more efficient alternative to conventionally produced meat. But cultured meat comes with drawbacks too, the most often reported in the scientific literature refer to: the safety concerns generated by the use of a potentially contaminated animal serum in the culture medium, the higher energy use in production process and the potential perception of in vitro technology as unnatural (Stephens et al., 2018).

Because prior research has proven that consumer acceptance is decisive for the success of new foods and food technologies (Fischer and Reinders, 2022) and given the tendency of people to be reluctant to adopt food innovations, perceiving them as too industrial, unnatural or "fake" (EIT Food Trust Report, 2021), we consider *consumer acceptance of cultured meat as being an issue that require further attention*. Significantly little research has been done with regard to this issue, compared with the high interest for technological aspects of cultured meat. Among the studies that investigated consumers' reactions towards cultured meat in early stage of product development, underlying consumer acceptance as important issues related to commercial success of cultured meat, are to be mentioned those of Siegrist, Sütterlin and Hartmann (2018), Stephens et al. (2018) or Bryant and Barnett (2020).

Therefore, the aim of present paper is to fill this gap by designing a general framework for consumer acceptance which will contribute to a correct understanding of cultured meat before its commercial release. To do this, a systematic literature review was performed to identify examples of different good practices used to achieve consumer acceptance in the case of some previous food innovations (such as genetic modification, food irradiation, entomophagy or the use of nanotechnology), that could be helpful in the development of our model. This allowed us to put forward a model of consumer acceptance of cultured meat based on the following drivers: communication, knowledge, trust, perception and attitudes. This study, which represents an unique initiative in Romania, could be valuable for scholars and practitioners, as well as for policy makers in the field of nutrition, public health or agriculture.

Although paper's rhetoric is focused on cultured meat, our study should not be perceived as a pleading for agriculture transition to cultured meat production as the primary solution for the sustainable diet of the future and for cultured meat as the best alternative for conventional meat. The paper intends to bring to the foreground the need to inform and educate consumers so that when the product will be available on the market, they can make an informed purchase decision.

1. Methodology

As the main purpose of our study is to develop a model of consumer acceptance of cultured meat, we conducted a systematic review of the scientific literature to uncover different best practices used to achieve consumer acceptance for several previous food innovations.

The review followed the steps outlined in literature (Khan et al., 2003): formulating the question, identifying relevant publications, assessing study quality, summarizing the evidence, and interpreting the findings.
Although numerous articles, empirical studies or review papers, were identified in international databases, only 38 articles were selected as the most suitable for the purpose of our research, based on the following criteria: focus on consumer acceptance, presentation of empirical data or findings of the literature review, publication in a peer-reviewed journal, publication in English language. Then, the selected articles were grouped in five categories, as follows: *genetic modification* (Frewer, Howard and Shepherd, 1995; Hoban, 1997; Byrne et al., 2002; Lusk and Sullivan, 2002; House et al., 2004; Siegrist, Gutscher and Earle, 2005; Tenbült et al., 2005; Costa-Font, Gil and Traill, 2008; Costa-Font and Gil, 2009; Frewer et al., 2013; Wunderlich and Gatto, 2015), *food irradiation* (Bord and O'Connor, 1990; Bruhn, 1998; Oliveira and Sabato, 2004; Behrens et al., 2009; Sapp and Downing-Matibag, 2009; Bearth and Siegrist, 2019), *entomophagy* (Lensvelt and Steenbekkers, 2014; Ruby, Rozin and Chan, 2015; Woolf et al., 2021; Padulo et al., 2022), *the use of nanotechnology* (Siegrist, 2007; Besley, 2010; Stampfli, Siegrist and Kastenholz, 2010; Gupta, Frewer and Fischer, 2017; Gómez-Llorente et al., 2022) and *new foods and food technologies in general* (Alhakami and Slovic, 1994; Frewer, Howard and Shepherd, 1995; Siegrist, Gutscher and Earle, 2005; Siegrist, 2007; Costa-Font, Gil and Traill, 2008; Shepherd, 2008; Frewer et al., 2014; Román, Sánchez-Siles and Siegrist, 2017; Bearth and Siegrist, 2019; Macready et al., 2020; Rabbanee, Afroz and Naser, 2020; Rembischevski and Caldas, 2020; EIT Food Trust Report, 2021; Wu et al., 2021). A summary of the evidence was done for each category from which a key-word predictor of consumer acceptance was extracted.

The review of the scientific literature in the field of food innovations led to the identification of the following pillars of consumer acceptance: communication, knowledge, trust, perception of benefits and risks and attitudes.

2. Results and Discussions

Based on the results of the undertaken systematic literature review we built up the cultured meat acceptance model based on the following drivers: *communication, knowledge, trust, perception of benefits and risks and attitudes*.

Communication

Since, in general, the benefits associated with an innovation in the food offer are not tangible for consumers, they must be explicitly communicated to the large public (Siegrist, 2007). But, alongside the benefits, the drawbacks and hazards have to be communicated to the public as well. Frewer, Howard and Sheperd (1995) pointed out that it is important the dialogue be established between communicators and the large public, so that issues addressed reflect the real concerns of the public. Shepherd (2008) advocated the involvement of the public in the management of food risk issues, citing the Fischhoff 's (1995) schema of risk communication where consumers are seen as partners in this process.

Based on previous communication experience regarding food innovations, we consider that an effective communication about cultured meat should focus primarily on the benefits, emphasizing its potential of mimicking the sensory and nutritional characteristics of natural meat as well as its positive impact on human health, animal welfare, economic efficiency and environmental sustainability. Similarly, the risk messages should address specific concerns related to food safety, lack of naturalness and energy use in order to be more relevant to Romanian consumers.

Knowledge

The investigated pieces of research (Costa-Font, Gil and Traill, 2008; Behrens et al., 2009; Wunderlich and Gatto, 2015; Rolland, Markus and Post, 2020; Woolf et al., 2021; Gómez-Llorente et al., 2022; Padulo et al., 2022) show that consumer knowledge of new products or technologies correlates positively with acceptance and willingness to consume those products.

In the process of increasing consumer confidence in the consumption of cultured meat and, as a consequence, in developing a favorable perception and attitude towards this innovative product, previous experiences related to entomophagy, irradiated food, genetically modified foods or nanotechnology foods highlighted the importance of providing by both entrepreneurs and academia, credible information and arguments emphasizing aspects such as environmental sustainability, production and consumption ethics, food safety and security of disadvantaged population.

Considering the predominant eating behaviour in many areas of the world, including Romania, characterized by a high consumption of meat and meat-based products, we believe that a direction of increasing consumer acceptance of cultured meat could be a strong and well-argued emphasis of the actors in the food system on the fact that nutrients of its composition fulfill the same physiological functions in the human body as those of traditional meat, allowing the normal development of physical and intellectual activity. In other words, the potential of cultured meat to mimic the nutritional value of real meat has to be highly emphasized.

Trust

Consumer trust is an important factor influencing the perception of both risks and benefits of the previous significant food innovations (Siegrist, Gutscher and Earle, 2005; Costa-Font, Gil and Traill, 2008; Macready et al., 2020; EIT Food Trust Report, 2021; Wu et al., 2021). As long as acceptance of new foods and willingness to buy them is directly determined by the perceived risks and the perceived benefits, *trust can be said to have an indirect impact on the acceptance of new foods or new food technologies* (Siegrist, 2007).

In a today's extremely diversified agri-food market, which offers to consumers multiple alternatives in structuring the daily diet, the emergence of a new type of product such as cultured meat inevitably brings to the foreground the issue of consumer acceptance. To solve this issue, the overwhelming importance of trust cannot be ignored. This must be built and maintained between the main actors of any market, producer and consumer alike.

It is widely recognized that, in general, a high level of trust can reduce the consumer's perceived risks and also put in the spotlight the potential benefits of consuming a food product, which we argue is also true for cultured meat, even more so if we consider the controversies that this revolutionary product has already raised.

Consequently, in order to raise the level of trust, we believe that the responsibility of informing Romanian consumers cannot be the exclusive task of entrepreneurs, but it must be shared with high credibility experts, government bodies such as the Ministry of Health, the Ministry of Agriculture, the National Authority for Consumer Protection or the National Sanitary-Veterinary and Food Safety. These bodies may be involved in adapting the existing legislative framework or in the drafting of new regulations related to the production, marketing and fair labeling of cultured meat, respectively in developing new methods that allow quantitative and qualitative measurements of the chemical components of this product.

Perceptions

A great deal of the examinated studies revealed that acceptance of new foods is largely determined by both perceived risks and benefits associated with their technology (Siegrist and Cvetkovich, 2000; Siegrist, 2007; Besley, 2010; Stampfli, Siegrist and Kastenholz, 2010; Ruby, Rozin and Chan, 2015; Bryant and Barnett, 2020). The perceived benefits appear to be the most important predictor for willingness to buy. Therefore, as prior research have shown, consumer acceptance is strongly influenced by perceived benefits and weakly influenced by perceived risks.

However, consumer perception of food-related benefits and risks is a very complex issue, depending not only on the objective and measurable aspects, but also on subjective aspects that define individual's values, such as social, cultural, psychological, ethical or moral ones (Bord and O'Connor, 1990; Rembischevski and Caldas, 2020).

The accelerate innovation pace of today's food market requires concerted efforts of stakeholders to promote the new products. In this process, which cannot be supported only by the traditional marketing methods successfully applied in the past, a favorable perception and, subsequently, a positive attitude of consumers towards new food products represent a difficult or even impossible goals to achieve. This can be explained by the cognitive dissonance that occurs when consumers evaluate the ratio of benefits to risks. Thus, when the technology behind a product is new and poses health risks, as is the case with cultured meat, many consumers tend to believe that the potential benefits can only be low or even neglectable.

In this context, the actions aimed at forming a favorable perception and a positive attitude of Romanian consumers towards cultured meat must not be based on overly persuasive or misleading advertising, but rather on their determination to act based on the principle of cognitive coherence. In this regard, it is necessary for consumers to acquire that consistency in beliefs that lead them to make correct decisions. These must be based primarly on objective, measurable elements, such as official communication, correct declaration of the chemical composition, educational sessions supported by experts who present the risks and the benefits of consumption, tasting sessions, etc. Moreover, taking into account the findings of prior research, for an objective perception of both risks and benefits of cultured meat among Romanian consumers, we consider imperative that communication strategies of scientific knowledge be aligned with approaches that also take into account the defining aspects of consumers' human dimension, such as values, culture, ethics, psychological motivations, etc.

Attitudes

Attitude, briefly defined as a summary evaluation of an object, which can vary from positive to negative and is experienced as an affect (Ajzen, 2001), is a concept that has been used in research to explain public reactions to new foods and technologies (Frewer and Miles, 2003).

Generally, attitude is based on knowledge about the product attributes (Costa-Font, Gil and Traill, 2008). As it has been shown in previous research, *a highly important attribute that influences attitude toward new foods is the perceived naturalness,* which refers to product origin, the technology and ingredients used and the properties of the final product (Frewer et al., 2013; Román, Sánchez-Siles and Siegrist, 2017; Bearth and Siegrist, 2019).

In the case of cultured meat, consumer perception of its naturalness has aroused scholars' interest since the early stage of product development. Pieces of research to date (Verbeke, Sans and Van Loo, 2015; Hocquette, 2016; Bryant and Barnett, 2020; Siegrist and Hartmann, 2020) has shown that while perceived naturalness is positively associated with consumer acceptance and willingness to consume, the perceived unnaturalness may act as a psychological barrier, contributing to low acceptance of cultured meat.

In Romania, due to the fact that natural meat is deeply embedded in local food culture, being the main ingredient in most of the traditional food products and dishes (Voinea et al., 2020; Stanciu, Rizea and Ilie, 2015), it is quite likely that most consumers would exhibit a negative attitude towards cultured meat, perceiving its artificial nature in opposition to their demands for naturalness and authenticity that traditional meat can fulfill. Therefore, the acceptance of cultured meat in Romania will depend on how this conflict of cultural values will be resolved, both at individual and collective level.

Therefore, to increase the acceptance of cultured meat among Romanian consumers, as Siegrist and Hartmann (2020) outlined in their study, communication strategies should be focused on emphasizing the similarity of cultured meat to traditional meat, rather than the technical aspects of the production process. In other words, this emerging technology of in vitro meat should be framed in ways that resonate with people's existing views (Besley, 2010)

Conclusions

Meat is the food of animal origin that raises the most environmental sustainability issues, as its production process requires a lot of soil and nitrogen and also emits the most greenhouse gases (Austgulen et al., 2018). Moreover, meat is responsible for the dramatic increase in the incidence of the so-called diseases of civilization, such as obesity, type 2 diabetes and cancer (Popkin, 2006). Thus, the need to redefine the contemporary food style through a consistent decrease in the consumption of traditional meat has become imperative. In this context, the production of industrial meat substitutes with the help of avant-garde technologies has emerged as a new trend. Among these newly developed meat analogues is cultured meat too, also called artificial meat or in vitro meat, which presents both advantages (environmental preservation, animal welfare, food safety and consumer food security) and risks (potentially toxic animal serum in the culture environment, high energy consumption in the production process or too much interference of its technology with nature).

The main aim of our research is to design and, thus, put into public debate the principles of a general framework for cultured meat acceptance by Romanian consumers, before this product becomes a reality in the food market. However, our approach shouldn't be understood as a plea for the large-scale transition of agriculture to the production of artificial meat, as a unique alternative to the traditional meat consumed today.

To achieve the proposed goal, the methodological approach consisted of a systematic review of the scientific literature to identify the best practices that led to consumer acceptance of several food innovations in the past, such as: food genetic modification, food irradiation, entomophagy and food nanotechnology. As a result of the review of 38 articles, the following pillars were identified, which we consider relevant for the acceptance of cultured meat too: communication, knowledge, trust, perception of benefits and risks, respectively attitudes.

In the ***communication*** activity we consider that the benefits of cultured meat must be firstly highlighted, these being related to the following aspects: the potential of mimicing the sensory and nutritional characteristics of natural meat, the promotion of an environmentally friendly food product, the food security of some disadvantaged groups, and last but not least, the animal welfare. The public presentation of the disadvantages of artificial meat must also be part of the communication strategy, with focus on the lack of naturalness, the potential risks regarding the safety of consumption and the higher energy consumption in the production activity, compared to natural meat.

To determine a favorable attitude towards this new product, in the process of ***knowledge*** transfer to consumers, it is mandatory that both entrepreneurs from the food industry and academia give a huge emphasis to the fact that the nutrients provided by cultured meat perform the same physiological functions in the human body as those of real meat, fact that allows the deployment of a normal physical and intellectual activity, as before.

To increase the level of ***trust***, the responsibility for informing consumers must be shared between several categories of actors, such as: food entrepreneurs, scientists and experts with recognized credibility and guvernamental bodies, the latter ones being, in the case of Romania, the Ministry of Health, the Ministry of Agriculture, the National Authority for Consumer Protection and the National Sanitary-Veterinary and Food Safety Authority.

The process of persuading consumers to try cultured meat, with the main aim to determine a positive ***perception*** and to achieve their acceptance, should not be relied upon on overly persuasive or misleading advertising, but rather on determining them to act based on the principle of cognitive coherence.

Having as premise that knowledge of product itself plays a decisive role in the ***attitude*** forming process (Costa-Font, Gil and Traill, 2008) and consumers often show aversion to unusual food technologies or those perceived as artificial (Bearth and Siegrist, 2019), we appreciate that, in the effort to improve the acceptance of cultured meat, communication should focus on emphasizing its similarity to natural meat, rather than the technical aspects of the production process, which are more susceptible to generate negative associations and disgust feelings.

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Technological and social innovation for sustainable business

Early Disclosure of the Double Materiality Concept in a European Oil and Gas Company

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Abstract

First used in 2019 by the European Union, the double materiality concept raises questions for companies and academics. The purpose of our study is to show the extent of double materiality disclosure in the sustainability report of TotalEnergies, one of the top European companies included in the Integrated Oil and Gas industry. We used a qualitative methodology, content analysis. We find that most of the aspects related with materiality are vaguely presented. This is one of the first studies dedicated to the reflexion of the double materiality in the reports. Double materiality has the potential to help companies integrate sustainability into their internal processes. Our research has implications for standard-setters. We argue that there is a need for clear standards that will help companies contribute to the achievement of global sustainability-related goals.

Keywords

Double materiality, Corporate Sustainability Reporting Directive, European Union, Oil and Gas, Sustainability reports.

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Introduction

The European Union adopted in 2022 a new Corporate Sustainability Reporting Directive, CSRD (EC, 2022). One of the significant aspects brought about by the new CSRD is the requirement for the establishment of double materiality. The European Union mandated the European Financial Reporting Advisory Group (EFRAG) to issue EU sustainability reporting standards (ESRS). The draft ESRS asks only for the material aspects to be disclosed, granting importance to this concept. Thus, the main research question of our paper is: *To what extent does a top European company disclose information on double materiality?*

To address the research question, we selected TotalEnergies, a company operating in the Integrated Oil and Gas industry and ranked first in the STOXX 600. We selected this industry because it is environmentally sensitive and previous research showed that these companies are more likely to improve their sustainability reporting (Tiron-Tudor et al., 2019).

We adopt a content analysis methodology, searching for the relevant information in the most recent sustainability report. We created a grid with the requirements included in the ESRS and analysed the report accordingly.

We contribute to an understanding of the extent of the disclosure of double materiality. Our research is useful to understand the way companies prepare for regulatory requirements before they come into force.

The paper is structured as follows: we present a review of the scientific literature regarding the double materiality and also a discussion of the relevant regulations; we describe the research methodology, the results of our study, discussions and conclusions.

1. Review of the scientific literature

The double materiality concept appeared first in the document Guidelines on reporting climate-related information, released by the European Union in 2019 and is now explicitly formulated in CSRD and ESRS. It asks for the materiality to be established in two steps: first, the impact, 'inside-out' perspective of the material environmental and social aspects, and second, the financial, 'outside-in' materiality. The concept is used in the CSRD, but is not used in the Global Reporting Initiative (GRI) or in the Sustainability Accounting Standards Board (SASB) guidelines. According to ESRS 1, a matter is double material "if it is material from the impact perspective or the financial perspective or both" (EFRAG, 2022a, p. 25). Impact materiality may be actual or potential, positive or negative, in the short, medium, or long term. By adopting this approach, companies will respond to the information needs of capital providers and other stakeholders. The information required by the ESRS to be disclosed is synthesised in Table no. 1.

Table no. 1. Grid of materiality information

No.	Explanation	Reference
D1.	The process used by the companies to establish the impact materiality (e.g. stakeholder engagement).	EFRAG 2022a, p.11: pct. 46-49
D2.	The process used by the companies to establish financial materiality (e.g. by identifying sustainability-related risks and opportunities that have or may have financial effects).	EFRAG 2022a, p.11: pct. 41, 50-55
D3.	The disclosure of thresholds used for materiality determination.	EFRAG 2022a, p.11: pct. 45
D4.	The disclosure of scale, scope, and irremediable character (if it is the case) for negative impact materiality.	EFRAG 2022a, p.9, 11: pct. 29, 46-48
D5.	The scale and scope of actual positive impacts; scale, scope, and likelihood of potential positive impacts.	EFRAG 2022a, p.12: pct. 46, 49; EFRAG 2022b, p. 14: pct. 51 (b) iv
D6.	The material impacts, risks, opportunities, disaggregation, policies and due diligence, actions and resources, metrics, and targets disclosed.	EFRAG 2022b, p.13: pct.46, p.15: pct.57-75
D7.	The time frame.	EFRAG 2022a, p.11: pct. 78-85

A first remark based on the above table is that the requirements are not grouped in the draft ESRS, which will make it difficult for the companies to identify everything they have to report regarding the double materiality.

The academic community largely agrees that double materiality is a step forward in sustainability disclosure. We believe that currently the debate about double materiality has become more alive because, for example, in Europe, ESRS are being discussed. In practice, sustainability materiality analysis is more difficult than for financial reporting, due to the wide range of information that sustainability reports must include (Sepúlveda-Alzate, García-Benau and Gómez-Villegas, 2022) and the fact that there is still no clear demarcation between what is and what is not material, a fact that generates confusion in the evaluation and publication of information on sustainability (Fiandrino, Tonelli and Devalle, 2022). A new concept, increasingly highlighted in sustainability reporting and related to double materiality, is dynamic materiality. It requires the reflexion of the time dimension of materiality, in the sense that what was significant in the past can lose its significance in the present, so that companies must always analyze and prioritize the sustainability information to publish (Jørgensen, Mjøs and Pedersen, 2022). In the debate on materiality analysis, different topics were identified: "materiality stress and the importance of the issue;" "materiality determinants and indicators," and "issues that are material for companies and stakeholders" (Torelli, Balluchi and Furlotti, 2020); "pressures on materiality analysis," "material information and value relevance of materiality" and "materiality in sustainability assurance" (Fiandrino, Tonelli and Devalle, 2022); "the evaluation of materiality in sustainability information" and "models for materiality analysis" (Sepúlveda-Alzate, García-Benau and Gómez-Villegas, 2022); "the materiality determination and assessment process within sustainability assurance" (Canning, O'Dwyer and Georgakopoulos, 2019).

Recent studies have focused on the contribution of large companies and the banking sector to the achievement of the objectives defined by The European Green Deal (Dănilă et al., 2022), as well as on how "the digital transformation can support companies in the field of corporate social responsibility" (Ionașcu

et al., 2022). Regardless of the objectives defined and the tools used to achieve them, entities must assess the impact of all activities on the environment, to minimise it.

Several catalysts of double materiality have been identified in the literature. For example, corporate governance characteristics (such as board size and gender diversity – Fasan and Mio, 2017; Gerwanski, Kordsachia and Velte, 2019; participation of board member in sustainability-related actions – Cosma et al., 2021; board activity and board independence – Fasan and Mio, 2017; Sie and Amran, 2021), company characteristics (e.g., size – Taliento et al., 2019; industry – Fasan and Mio, 2017; Barkemeyer, Preuss and Lee, 2015), country (Barkemeyer, Preuss and Lee, 2015), assurance of nonfinancial information (Gerwanski, Kordsachia and Velte, 2019).

2. Research methodology

We analyse the sustainability report of TotalEnergies. We selected a company from the European Union because it will have to comply with the requirements of the CSRD. We chose a company from the Energy, Integrated Oil and Gas industry because this is one of the main contributors to the greenhouse gas emissions (GHG) in Europe. Also, this domain is environmentally sensitive, and previous research showed that this category of companies is more likely to disclose more information (Cho, 2009).

We used as a data source the sustainability report disclosed for 2021, since the [Draft] ESRS 1 specifically states that sustainability matters should be included in sustainability statements, which are a part of the "undertaking's management report" (EFRAG 2022a, p.20, 8.111). Also, the information included in the reports covers all the material sustainability issues, is comparable from one year to another, and is more likely to be subject to assurance, and thus reliable.

We used content analysis, a 'research technique for making replicable and valid inferences from data according to their context' (Krippendorff, 1980, p. 21). In order to analyse the information related with the (double) materiality, we created the grid presented in Table no. 1, starting from the ESRS requirements. We benchmarked the information disclosed in the report against the reporting standard. Our objective is to provide an image of the extent of the double materiality disclosure before the implementation of the ESRS, in order to understand how companies react to regulatory requirements. The reports used are: "Sustainability & Climate 2022 Progress Report" and the integrated report, which includes a nonfinancial statement, in accordance with the requirements of the European Directive 2014/95/EU.

3. Results

Headquartered in France, TotalEnergies is a global company that employs 100,000 people in more than 130 countries. It is a "multi-energy company", producing and selling "oil and biofuels, natural gas and green gases, renewables and electricity" (TotalEnergies, 2022, p. 4-5). Sustainability is integrated in the entity's projects and operations. It uses a multitude of sustainability-related standards for its disclosures, including guidelines set by GRI, Sustainable Development Goals (SDG), SASB, Task Force on Climate-Related Financial Disclosures (TCFD), serving the information needs of all their stakeholders (Albu et al., 2013). Its climate goal is to reach net zero emissions by 2050, in line with the Paris Agreement.

The material themes of TotalEnergies are established through stakeholder engagement and in accordance with TCFD, but the company "hasn't disclosed a detailed materiality analysis" (TotalEnergies, 2022, p. 604-605). The process leads to setting the risks, rather than the risks, impacts, and opportunities. There are six material categories (TotalEnergies, 2022, p. 120-121), as presented in Table 2. The risks are measured on a Likert scale from 1 (less material) to 4 (more material). When necessary, TotalEnergies makes a new materiality assessment.

Table no. 2. Material categories

Category	Number of Risks	Average Score of Materiality
Climate challenges	4	3
Market environment parameters	1	4
Risk relating to external threats	2	3
Geopolitics and developments in the world	2	2.67
Risks relating to operations	5	3
Innovation	2	2.5

Source: Authors' compilation based on TotalEnergies (2022, p. 120-121).

We notice that the highest importance is given to the market environment parameters. This includes financial aspects ("sensitivity of results to oil and gas prices, refining margins, exchange rates, and interest rates"). The concerns are related to the evolution of global indicators. For example, the National Balancing Point, "which is widely used as a price benchmark for the natural gas markets in Europe" (TotalEnergies, 2022, p. 48-49) increased from 3.3 in 2020 to 16.4 in 2021 (4.97 times). However, the variable cost margin decreased during the same period. The values were established before the Russian-Ukrainian Conflict.

For climate change adaptation, TotalEnergies discloses information based on a normative scenario starting from the International Energy Agency requirements, which generates very optimistic figures. The company recognises that the scenario does not observe the reality.

Sustainability-related risks are not translated into material financial indicators (as recommended by EFRAG 2022a) in the reports published by TotalEnergies.

Environmental and climate change, safety, and societal indicators reporting include the company's subsidiaries which are not material from a financial point of view (TotalEnergies, 2022). As such, the consolidation perimeters of financial and nonfinancial information do not overlap. For example, thresholds are set so that 99% of GHG emissions are disclosed and "no site accounting for more than 2% of an indicator excludes this indicator from its reporting" (TotalEnergies, 2022, p. 356-357).

When disclosing sustainability impacts, a company will refer to the scale ("how grave the negative impact is or how beneficial the positive impact is for people or the environment" - ESRS, 2022, p. 28, ar. 5), the scope ("how widespread" the impacts are, e.g. geographic area or number of persons affected - ESRS, 2022), the irremediable character, when it is the case (e.g. the impact cannot be reversed), and the likelihood of potential impacts.

The environmental impacts are managed according to the Avoid - Reduce (through technology use) - Compensate (through the preservation of the biodiversity, protection of water resources, and circularity) principle. An example of a negative impact is on arable land, but the scale and scope are not described. A value is presented for the impact of the changes in carbon price:

"Assuming a carbon price of $200/ton as from 2030 and an annual increase of 2% thereafter (i.e., a $100/ton increase from the base scenario), TotalEnergies estimates a negative impact of around 9% on the discounted present value of its assets (upstream and downstream)" (TotalEnergies 2023, p. 26-27).

There is one positive impact disclosed, determined by the new projects, on biodiversity. The scale is described as "producing a net positive impact in areas of priority interest for biodiversity" and the scope is to run "eight biodiversity action plans" (TotalEnergies 2023, p. 60-61). Thus, the description is rather vague, not stating how beneficial the action is and not mentioning the geographic area. These actions include one wind and three solar sites. As the company is present in 130 countries, there are positive projects planned or conducted in only 6.15% of them. There are no scales or scopes disclosed for the potential impacts.

TotalEnergies provides a lot of comparative data, but most of it indicates very optimistic goals and fewer achievements. For what TotalEnergies has already achieved, the comparisons target reference periods that suggest important investments and results (for example, for the gross installed capacity for renewable power, the comparison targets the period 2017-2021, with an increase from 0.7 GW in 2017 to more than 10 GW in 2021). For 2025, an increase to 35 GW of gross capacity and 100 GW in 2030 is estimated, citing identified projects in development as arguments.

Renewable energy represents an opportunity for the company and is largely presented in the report. TotalEnergies is involved in many solar power and offshore wind projects in Europe, North and South America, Asia, Africa, and Australia. One of the explanations can be the fact that, especially in Europe, "offshore wind offers high utilization rates with significant development potential" and a higher level of acceptability (better acceptability) than onshore wind (TotalEnergies 2023, p. 15). In 2021, partnerships were made with important entities from the Renewable Electricity market.

Some statements are based on assumptions which do not depend solely on the actions of TotalEnergies. Thus, it is stated that there will be a stagnation in the demand for petroleum products, followed by a significant decline until 2050, as a result of "technological progress and evolving uses" (TotalEnergies 2023, p. 18). This assumption is also based on the evolution of sales of petroleum products. Thus, the share of petroleum products in the sales mix decreased to 44% in 2021, compared to 65% in 2015, excluding the impact of Covid-19. The objective for 2030 is to reach 30%.

In order to achieve the objectives regarding GHG (for example, to reduce methane emissions by 80% by 2030 - TotalEnergies 2023, p.16, 34), the company has carried out or intends to carry out several actions. In this sense, in 2021, it abandoned the production of heavy oils in the Orinoco Belt (Venezuela), expanding its presence in areas where exploitation can be done with low costs and low emissions. TotalEnergies also states it will not extract oil from the Arctic Sea ice or increase its mining capacity in Canada's oil sands.

In the next 10 years, TotalEnergies wants "to double the circularity of its businesses" through purchasing, sales and production, and through an adequate management of its own waste (p.19). The company has already transformed a refinery into a biorefinery. The company also wants to produce biogas, setting its objectives "to produce 2 TWh per year of biomethane starting in 2025 and over 5 TWh per year by 2030." Agreements were established with Clean Energy and Veolia.

4. Discussions and conclusions

Materiality is important as it is assumed that it determines everything that will be included in the annual or sustainability reports. The idea of assessing it from various perspectives is not new. For example, IIRC (2013) stated that the materiality determination process "applies to both financial and other information" (para. 3.19). However, this moment is very important, as research could support EFRAG in creating a useful set of standards.

Described as "sophisticated" (Dragomir, 2012), the European regulatory framework can be a catalyst for better reporting, but also an inhibitor, as it can create confusion for reporting entities. Thus, the establishment of a clear methodology by the regulators for setting the double materiality would help the companies. For instance, a description of the way in which the companies should disclose the steps taken for the double materiality assessment (i.e. that they first assessed the sustainability materiality and afterwards the financial one) would be helpful. Also, in our opinion, the stakeholder engagement is not enough to establish the material items. Our recommendation is for EFRAG to include other perspectives as well (e.g. companies in the same industry).

Standards and academics specifically ask for sustainability materiality to be established first. However, companies sometimes first consider financial materiality. As described in the reports of TotalEnergies, there is no reference to sustainability materiality and only vague information about financial materiality. The impacts and opportunities, as well as the financial assessment of the risks, are missing from the reports. The company does not include the affected indicators at all. Baumüller and Sopp (2022, p. 22) stress "the difficulty of determining materiality levels for ecological and social information per se, i.e. not taking financial impacts into consideration". The selection of material topics by the companies, without specific guidelines "will not increase data availability, comparability and standardization" (Bossut et al., 2021, p. 11).

Risks reporting, at the expense of impact and opportunities, can be the consequence of the fact that entities are used to this type of information within the annual report, where they must present "the principal uncertainties it faces" (IFRS Foundation, 2020 - IAS 1.13) and "non-financial disclosures, e.g. the entity's financial risk management objectives and policies" (IFRS Foundation, 2020 - IAS 1.114), although "many entities also present, outside the financial statements, reports and statements such as environmental reports..., particularly in industries in which environmental factors are significant" (IFRS Foundation, 2020 - IAS 1. 14).

The results obtained from the TotalEnergies analysis can be correlated with the literature, relevant to different problems in the application of double materiality: "poor disclosure of the process of determining material sustainability issues," "stakeholder engagement is used to increase transparency and accountability but also to manage risks by reducing materiality attached to reporting information" (Adams et al., 2021, p.8), the tendency to present the good performances and omit the weak ones, the use of sustainability reports to legitimize the actions (Beske et al., 2020).

In general, an optimistic tone is felt within the company's sustainability report, where very ambitious goals and assumptions that do not fully depend on the company's actions predominate. However, users are warned in the Cautionary Note, that the report "may contain forward-looking statements" that "may prove to be inaccurate in the future and are subject to a number of risk factors" (TotalEnergies, 2022, p. 83).

Through CSRD, there is a fundamental change from nonfinancial reporting to sustainability reporting, but also a transformation of expectations towards corporate responsibility and reporting. European companies are forced to face "several challenges [and] a new and considerably more demanding reporting

environment" (Baumüller and Sopp, 2022, p. 22). It is assumed that the application of double materiality causes an increase in the amount of information reported, but also the fact that the reporting can be more complete, with attention paid to the risk of the disclosing too much (Calabrese et al., 2017) and having relevance only for a limited number of stakeholders (Baumüller and Sopp, 2022). De Villiers, La Torre and Molinari (2022, p. 737) consider that double materiality "encloses an ideological conflict between the investors' financial interests and other stakeholders' needs."

A limitation is the fact that we analysed only one company. Yet, it is one of the biggest European companies in the Oil & Gas Industry, which means that it is more likely to implement best practices in an emerging domain, such as double materiality. Another limitation is that we analysed the data included in the annual and sustainability reports. As shown by (KPMG, 2020) most companies are now using other environments for sustainability reporting. However, data disclosed there (e.g. on the website) can be easily changed and is not assured. Also, the guidelines specifically ask companies to report sustainability information within the reports (EFRAG, 2022a). Thus, we consider that published reports are the most reliable source of data for conducting this type of research.

Future research directions aim to expand the number of companies subject to analysis, including making comparisons with European entities from other sectors of activity with a significant impact on GHG emissions and sensitivity to the environment. The CSRD requirements become applicable for the financial years starting January 1, 2024, in stages, depending on the characteristics of the companies (EC, 2022, art.5). It could be of interest to analyze the reports after this period, to establish the degree of compliance with the requirements of the directive. Research could also be extended by studying the costs and benefits of double materiality reporting, including the impact on financial ratios and the market. In the future, how the new directive manages to create a common language regarding sustainability reporting in Europe could also be investigated. The use of computer technologies for an objective process of establishing material aspects is another future research path. Ionașcu et al. (2021) believe that digital transformation can support companies in reporting sustainability information, mainly environmental information. The authors suggest to the regulatory factors at the EU level the implementation of policies to stimulate digitisation, arguing the advantages for the natural environment by promoting sustainable business models.

There are authors who state, on the one hand, that "multinational organizations have become some of the most influential and powerful social institutions" and, on the other hand, that the power and influence of some NGOs (for example, the IASB, World Bank, International Monetary Fund, and World Trade Organization) have become increasingly important (Dillard and Vinnari, 2019). Thus, the question arises whether the process of establishing materiality is a fair and transparent process, in the interest of stakeholders, or a process whose objectives are represented by image enhancement, avoidance/deflection, or disclaimer (Cho, 2009).

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The Circular Economy as a Driver for Sustainable Business Development and the Role of ICT

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Abstract

The general objective of this research is to analyze the current impact of the circular economy on sustainability and the role that companies anticipate that ICT can have in this process. The research methodology is based on the critical analysis of specialized literature, the interpretation of statistical data and econometric modeling. The econometric analysis used to estimate the relationship between the circular economy and sustainability was carried out using the Netherlands as a reference, since the latest statistical data indicate that this country has the highest circular material use rate. The main results show, first of all, the fact that currently the circular economy does not have a considerable impact on the stimulation of sustainability, and secondly, the vision of companies from EU Member Countries, who have high expectations regarding the positive impact of ICT in boosting the business sustainability and circular material use rate. At the same time, we propose a Quintuple Helix approach for the fulfillment of sustainability objectives and for the transition to the circular economy. The article also may be a contribution to the state of knowledge in the field, especially by highlighting certain limits of the circular economy in enhancing sustainability. Our study may have possible practical implications, especially for companies that do not adopt an organizational culture based on sustainability.

Keywords

circular economy, ICT, sustainability, business, environment.

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Introduction

Some of the main challenges that global companies are currently facing are the efficient use of resources and the reduction of the impact of their activities on the environment. For this reason, business models must be rethought in accordance with the Sustainable Development Goals (United Nations, 2015) and environment, social and governance requirements (ESG), with an emphasis on efficiency and innovation. Even if in the last decade measures to increase sustainability have generated positive effects, industrial activities continue to produce waste and a considerable footprint on the environment, many companies lagging behind with the concrete strategies regarding this objective (Bocken and Short, 2021).

There are many industries where has been demonstrated the need for sustainable transformation of production and consumption models. For example, Kabirifar et al. (2020) draw attention to the consequences of the construction and demolition waste, while Batista et al. (2019) discuss the need for resource recovery management in the food packaging industry.

In this context, the main objective established for this paper is to analyze the degree to which the circular economy currently represents an important factor in supporting the sustainable development of business models, and also what is the expected impact of ICT in this process.

We believe that through this research we can make a contribution to the state of knowledge by empirically showing, based on a particular case, the current influence of the circular economy on sustainability and the limits.

The work is structured as follows: in Section 1 is presented synthetically the state of knowledge, in Section 2 is described the applied research methodology, and in Section 3 are detailed the main results. The paper ends with the authors' general conclusions.

1. Review of the scientific literature

In the scientific literature, various solutions are analyzed and proposed as a response to the sustainability requirements that organizations must incorporate within their business models, namely digital transformation (Piscitelli et al., 2020; Agrawal et al., 2021) and the transition to the circular economy (Betancourt and Zartha, 2020; Bertassini et al., 2021; Nikolaou and Tsagarakis, 2021).

The connection between the new digital technologies and the circular economy is increasingly analyzed in scientific research, showing in particular how the technological and digital advance can contribute to the development of the circular economy and implicitly to sustainability. Among these are the studies carried out by Biloslavo et al. (2020), Colombi and D'Itria (2023), Rusch et al. (2021) or Bag et al. (2021), Han et al. (2023).

Voulgaridis et al. (2022) and Ghobakhloo et al. (2022) go further and discuss about Industry 5.0 as an enabler of digital circular economy, highlighting, in addition to digital technologies, the importance of the human factor involvement. Serrano—Bedia and Perez-Perez (2022) explains the extremely important role of higher education institutions, but demonstrates that at this moment the collaboration between these institutions, private organizations and the government sector is not developed enough in order to generate the potential benefits.

On the other hand, Cezarino et al. (2019) highlight the important role of the government sector, through the implementation of solid regulatory policies. Among the barriers that hinder the implementation of digital technologies and the development of the circular economy in business, Kumar et al. (2021) specifically identifies the lack of necessary funds, while Ozkan-Ozen et al. (2020) highlights "the lack of knowledge about data management among stakeholders".

The systematic literature review shows that the subject related to sustainability is intensely debated, and researchers are making efforts to analyze how it can be achieved, emphasizing the capabilities of the circular economy and ICT.

2. Research methodology

In order to fulfill the objective of this paper, we used the critical analysis of the specialized literature so as to capture some of the most recent and representative results obtained by researchers regarding the link between the circular economy and the sustainable development of companies, and on the other hand the role that ICT plays in this process.

Secondly, we analyzed a series of factors characteristic of sustainability related to circular economy to see the extent to which companies emphasize them within their circular business models. In this regard, we applied the multiple regression analysis method, using as dependent variable circular material use rate (CMUR), and as independent variables resource productivity (RP), share of renewable energy in gross final energy consumption (SRE), recycling of biowaste (RB) and energy productivity (EP).

The multiple linear regression is described by the following equation:

$$y_i = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_z x_{iz} + \varepsilon \quad (1)$$

where:

y_i = dependent variable

x_i = independent variable

β_z = slope coefficient

α = intercept

ε = error term

Before the regression analysis, we tested the data series stationarity by Augmented Dickey-Fuller (ADF) test.

The ADF stationarity test can be described mathematically by the following equation:

$$\Delta_{y_t} = \alpha + \beta t + \delta y_{t-1} + \sum_{j=1}^{p} y_j \Delta_{y_{t-j}} + \varepsilon_t \qquad (2)$$

where:

y_t= the value of time series at a specific time *t*

Δ_{y_t} = 1st difference of the time series

α, β, δ = parameters to be estimated

ε_t = error term

j = number of lagged differences

The null hypothesis of ADF test is $H_0: \beta_i = 0$ (time series has a unit root), meaning it is non-stationary, while the alternative hypothesis is $H_1: \beta_i < 0$. The rejection of null hypothesis highlights the stationarity of the series.

Based on the stationary series, we determined also the correlation matrix to analyze the connection between the selected variables. For the representativeness of the results, the case study was carried out based on data related to the best performing EU Member State in terms of circular material use rate, namely the Netherlands. The data source is the Eurostat database, and the data processing was carried out through EViews 12 software.

In order to analyze the impact of ICT on the development of sustainable business models, we interpreted statistical data from a 2021 survey made by the European Commission regarding the contribution of ICT to the environmental sustainability of actions of EU enterprises.

3. Results and discussion

As we can see, other research has demonstrated that the circular economy has a very high potential to stimulate sustainable business development, being one of the main ways through which companies can achieve both their profit-related objectives and those related to the environment, society and corporate governance.

The most recent Eurostat data show that Romania ranks last in the EU in terms of circular material use rate, while the highest performances are recorded by the Netherlands (Figure no.1).

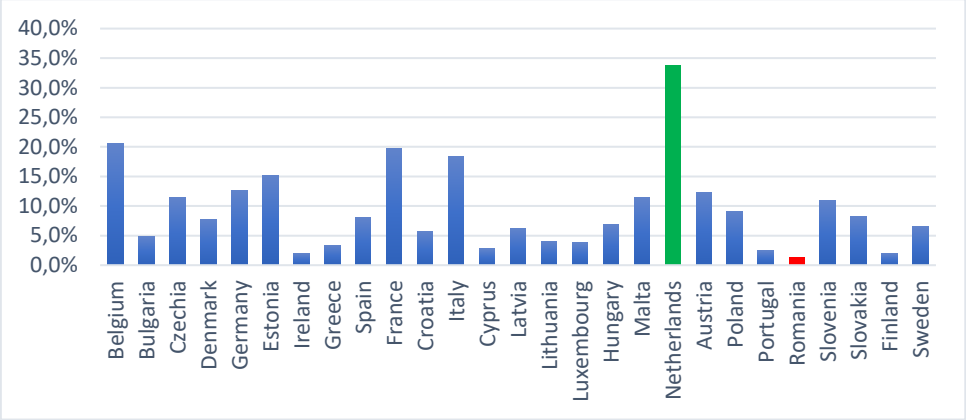


Figure no. 1. Circular material use rate in EU, 2021
Source: designed by authors based on Eurostat data

In order to see how this type of economy is currently developing, and to analyze if we can outline a best practice for countries such as Romania, we tested the impact of some determining factors, according to the methodology described in the previous section.

The results of the Augmented Dickey-Fuller test show that the data series included in the analysis are stationary in level or in 1st difference, as we show in Table no.1.

Table no. 1. Augmented Dickey-Fuller Unit Root Test results

	CMUR	EP	RB	RP	SRE
Augmented Dickey-Fuller stat.	-2.146071	-4.130724	-3.583945	-3.446839	-4.41394
Stationarity	1st diff.	level	1st diff.	1st diff.	1st diff.
Test critical values					
1% level	-2.81674	-5.295384	-2.81674	-5.835186	-5.29538
5% level	-1.1982344	-4.008157	-1.982344	-4.246503	-4.00816
10% level	-1.601144	-3.460791	-1.601144	-3.590496	-3.46079
Prob.	0.0367	0.0431	0.0023	0.1197	0.03

Source: made by authors based on Eurostat data.

Therefore, we implemented our statistical models in the first differences of all variables.

Next, we determined the correlation matrix to test the intensity of the link between the variables (Table no. 2).

Table no. 2. The correlation matrix between the variables

	CMUR	EP	RB	RP	SRE
CMUR	1				
EP	-0.31353	1			
RB	-0.50479	0.247974	1		
RP	0.895292	-0.07698	-0.50872	1	
SRE	-0.46857	-0.1622	0.782969	-0.46204	1

Source: made by authors based on Eurostat data.

Regarding the dependent variable, circular material use rate is positively correlated with resource productivity, while negative correlations appear in relation to recycling of biowaste, share of renewable energy in gross final energy consumption and energy productivity. At the same time, we found a strong positive correlation between recycling of biowaste and share of renewable energy in gross final energy consumption and a quite strong negative correlation between resource productivity and recycling of biowaste. On the other hand, the results of the regression equation (Table no. 3) demonstrate, on the one hand, the validity of our model (R-squared = 0.91), and on the other hand, it shows the impact of the independent variables on the dependent one.

Table no. 3. The regression equation between the dependent variable and the independent variables

Dependent Variable: cmur Method: Least Squares Included observations: 11 after adjustments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.66	0.42	1.57	0.17
EP	-3.84	1.51	-2.54	0.04
RB	0.16	0.12	1.39	0.21
RP	3.75	0.64	5.83	0.00
SRE	-0.38	0.23	-1.59	0.14
R-squared	0.91	Mean dependent var		0.77
Adjusted R-squared	0.84	S.D. dependent var		1.48
S.E. of regression	0.59	Akaike info criterion		2.07
Sum squared resid	2.07	Schwarz criterion		2.26
Log likelihood	-6.41	Hannan-Quinn criter.		1.96

F-statistic	14.51	Durbin-Watson stat	2.84
Prob(F-statistic)	0.00		

Source: made by authors based on Eurostat data.

The Durbin-Watson statistical test results (2.84) indicate the positive autocorrelation, while the Akaike information criterion has the lowest possible value, demonstrating that the model matches for the selected variables. After we run the regression model, we obtain that the significant variables are resource productivity and energy productivity (due to their p-values < 0.05), which boosts largely the correlation results.

These results show us that currently the best performing state in the EU in terms of circular material use rate, the Netherlands, is mainly based on resource productivity for the transition to the circular economy, and energy efficiency is at a level that negatively influences this transition. The share of renewable energy in gross final energy consumption and recycling of biowaste are not important factors in supporting this complex process, which proves that the circular economy is not currently an important source of supporting the sustainability of companies.

In order for the transition from a linear business model to a circular one to stimulate as much as possible the level of sustainability of companies, it is imperative that they also take into account the listed factors. Companies have to improve permanently their production resources efficiency by reducing inputs and waste and increasing renewable material and also to optimize production processes to reduce energy consumption. At the same time, it is extremely important for the production of goods and services to put an important emphasis on reducing the negative impact on the environment.

Further, we will analyze the perception of companies from EU Member States regarding the role of ICT in the transition process to a circular and sustainable business model.

According to the European Commission data, the largest share of the companies included in the analysis consider that the digital technologies presented in Figure no.2 have a positive impact on the environmental footprint.

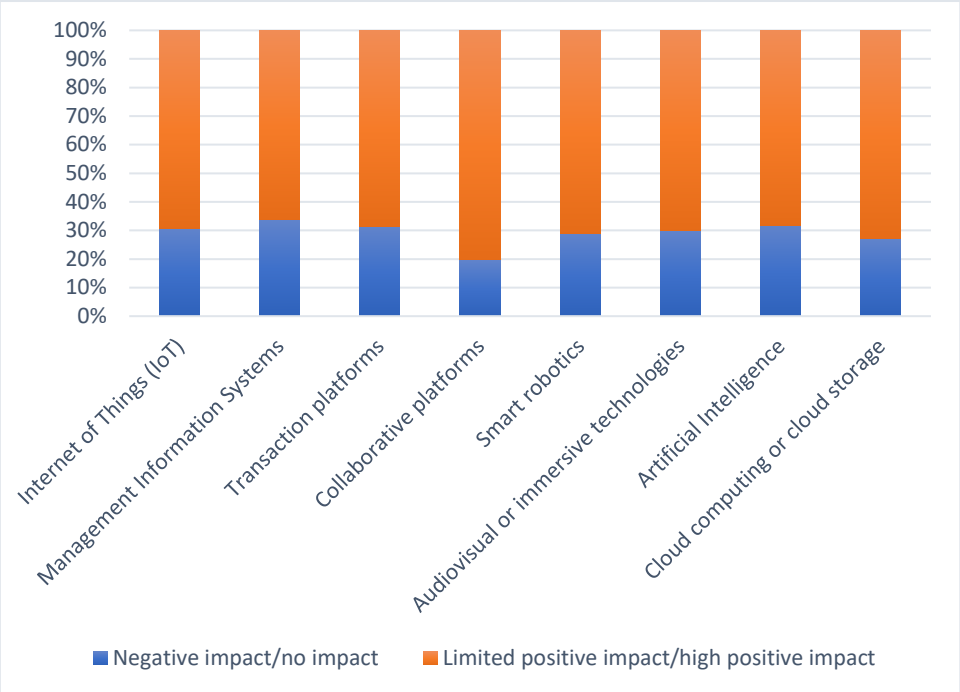


Figure no. 2. Technology's impact on firm's environmental footprint

Source: designed by authors based on European Commission data
Survey on the contribution of ICT to the environmental sustainability of actions of EU enterprises | Shaping Europe's digital future (europa.eu)

It can be observed that in the case of all selected information technologies, the positive impact prevails, even if for all categories the majority is represented by limited positive impact. On the other hand, regarding the concrete role of these technologies in the sustainable development of business models, we especially note the efficient use of resources and the potential to protect the environment (Figure no. 3).

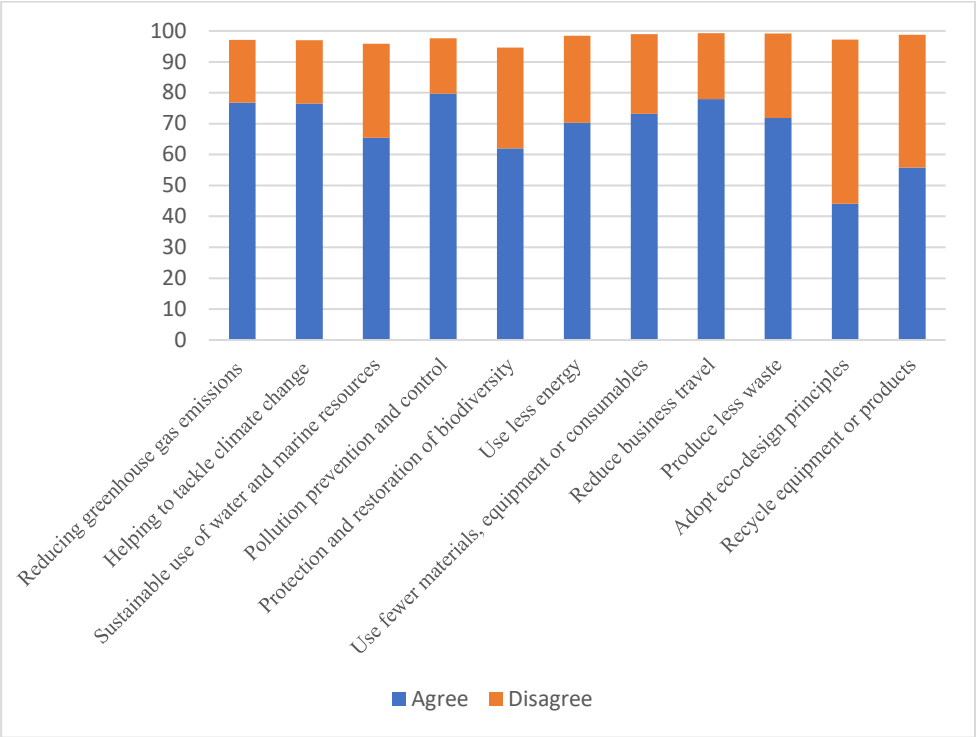


Figure no. 3. Digital technologies impact/potential impact on business sustainability
Source: designed by authors based on European Commission data
Survey on the contribution of ICT to the environmental sustainability of actions of EU enterprises | Shaping Europe's digital future (europa.eu)

Weights of more than 70% are found in the case of most factors, with the exception of the role in sustainable use of water and marine resources, protection and restoration of biodiversity, adopt eco-design principles and recycle equipment or products, all these factors still having weights of more than 50% in the perception of the analyzed companies.

Considering these aspects, we can say that once the expected effects of digitalisation and technology are evident in concrete results, they will stimulate the fundamental transition to the circular economy and significantly contribute to increasing the level of sustainability of companies.

In order for these effects to be realized in an inclusive long-term manner, we consider a Quintuple Helix type approach to be fundamental.

Conclusions

Although the importance of the circular economy in the sustainable development of businesses is demonstrated in the scientific literature, we note that currently it is not sufficiently developed so as to contribute to a considerable extent to the fulfillment of such an objective.

However, at the EU level, the companies from the Member States place an important emphasis on digitalisation and technology and consider these tools essential for the objectives of gradual transition to the circular economy and implicitly for the sustainability of their business models. Correlating this attitude of companies with the scientific results that demonstrate the high potential of ICT, we can say that there are clear indications that in the near future such objectives will be achieved.

We believe that through the methodology applied and through the results obtained, we managed to fulfill the objective set in this work, showing some limits of the circular economy in supporting the businesses sustainability, and at the same time the expected impact of the integration of ICT within the production processes.We also believe that this work may have possible practical implications, because it may help certain companies that do not currently adopt sustainability measures to better understand how to manage their activities in order to become circular and sustainable and what are one of the main tools for that.

There are possible extensions of this research, such as the analysis of the most effective practices for implementing circular economy principles in SMEs and large companies, taking into account the industry in which they operate.

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Mapping the Supply Chain Digitalization: An Exploratory Bibliometric Analysis

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Abstract

In a global business environment facing more and more risks (recession risk, geo-economic risk, natural risks) digitalization can represent a solution for increasing resilience at the level of the supply chain. The development of new technologies has created the premises for the transformation of traditional logistics chains into digital logistics chains and the pandemic crisis accelerated the process for most companies and institutions.

The scope of this paper is identifying the interest in researching the subject of supply chain digitalization. The study is based on a quantitative research method, bibliometric analysis. A query was conducted on the Scopus platform database to identify scientific works (research articles, books, papers presented at conferences) that include keywords specific to our topic, in the title, abstract or body.

The results of our study confirm a growing scientific interest for researching the topic of supply chain digitization: from 2002 to February 2023, 913 documents addressing this subject or related issues were identified.

Keywords

Digital supply chain, bibliometric analysis, VOSViewer, Scopus

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Introduction

Following the processes of economic globalization and rapid development of information technology, companies have tried to develop and implement global networks that integrate the sources of supply, production, and distribution of finished products. Thus, traditional supply chains appeared, networks containing suppliers, manufacturers, distributors located in different areas of the globe. During the Covid-19 pandemic, a series of dysfunctions appeared at the supply chain level: problems with the supply of raw materials or semi-finished products (e.g., the microchip crisis), problems related to production activity (insufficient staff), difficulties in organizing logistics activities (container crisis, significant increase in shipping prices). Covid-19 health crisis generated transport and delivery disruptions which intensified the need for digital transformation of the supply chain (Sharma, et al., 2020). Under these conditions, companies took advantage of the development of new technologies and began or intensified the process of supply chain digital transformation to achieve digital connectivity between SC participants (Nasiri, et al., 2020).

Digitalization of the supply chain is a theme that has been increasingly addressed in the scientific literature in recent years. More and more research papers deal with this process of transforming the traditional supply chain using new information technologies. We can say that the interest in the topic increased with the emergence of the Covid-19 pandemic, when a major concern of those involved in supply chain management

was to ensure the resilience of the global supply chain. The terms specific to the supply chain digitalization process used are smart supply chain (Wu, et al., 2016), digital supply chain (Ivanov and MacCarthy, 2022; Büyüközkan and Gocer, 2018), supply chain 4.0 (Frederico, et al., 2019) and supply chain 5.0 (Frederico, 2021).

This article analyzes scientific papers addressing the topic of supply chain digitalization and several questions were formulated: What are the main topics addressed in terms of supply chain digitalization? What is the most frequent keyword used in the analyzed articles? What is the trend regarding the publication of research papers (articles, papers presented at conferences) in the field of supply chain digitization?

Starting from these questions, the research objectives were established. The main objective is to analyze the situation of research papers with the theme of supply chain digitization, from a bibliographic point of view. Secondary research objectives are:

- evaluation of links between keywords and articles published in different journals classified in the Scopus database.
- analysis of research articles on supply chain digitalization, considering the co-authorship, journals and year of publication.

1. Review of the scientific literature

The IT revolution impacts all types of organizations (from both public and private sector) that process, store and transmit information, reshaping the entire economic-social life. Digital revolution is considered by some authors as a component of this process and by others, a new phase of it. The digital revolution means the transition from mechanical technology and analog electronic technology to digital electronic technology, a change initiated, from the late 1950s to the late 1990s, by the introduction and expansion of the use of digital computers and digital data storage and became decisive in the following decades. The central place in this revolution belongs to series production and the ever-wider use of digital logic circuits, as well as complementary technologies (computers, mobile phones), as well as the spectacular development of the Internet. Digital revolution is considered as a 3rd revolution in human history, after the agricultural revolution and the industrial revolution took place in the past historical eras. An important characteristic of this revolution is changing the business models by implementing digital technologies with the scope of identifying new profit opportunities (Popa and Belu, 2018).

Supply chain is a complex logistic system in which raw materials - production factors - are transformed into finished products and then distributed to end users (individual consumers or companies). It includes suppliers, processing centers, warehouses, distribution centers and retail outlets (Bhardwaj et. al., 2021). In the current conditions (problems related to the supply of raw materials or semi-finished products, the increase in the price of transport, areas with armed conflicts, areas affected by earthquakes) supply chain management is increasingly complex. Several factors have also contributed to making SC management more complex — the quest for sustainability, globalization, trade liberalization and implementation of new technologies. SC management is a vital factor in increasing the competitiveness of an organization (Saberi, et al., 2019).

The digitization of the supply chain is enhanced by the process of innovation in logistics, being driven by the development of certain technologies and their increasingly frequent use in the management of activities related to the supply of raw materials (digitalization of procurement), processing/production (smart factory) and distribution of finished products (smart warehouses, digital platforms).

Supply chain digitization helps companies became more flexible when facing challenges like disruption risks or increased level of competition. To implement the process of SC digitization, organizations must have the internal capability to absorb new information and methods. The "ability of a firm to understand, assimilate and apply the knowledge possessed by another international joint venture partner" is defined as absorptive capacity (Fang and Zou, 2010). We can say that SC digitization is a solution that improves risk management at the supply chain level (Ivanov and Dolgui, 2019).

Digital supply chain is defined as a cyber network with end-to-end visibility representing a physical supply chain with associated operational data and performance evaluations (Ivanov and McCarthy, 2022). Digital supply chain presents several advantages, such as: reducing costs, accelerating innovation, reducing time-to-market (see figure no. 1)

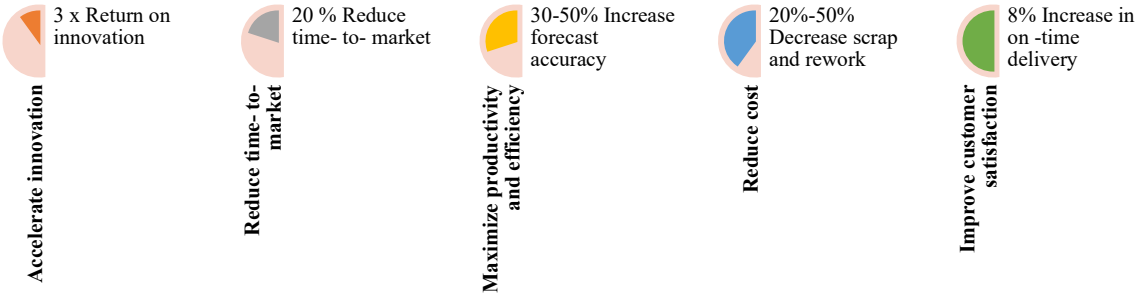


Figure no. 1. Digital supply chain benefits

Source: Jenkins, 2022

In traditional supply chains, activities are carried out based on transaction history, so we can say they are mostly static and have a linear representation, while in digital supply chains activities can be adapted to changes in real time, so we can say they are dynamic, and we can represent them graphically as a network.

If until 2020, the supply chain management was guided by *just in time* principle (the right quantity of goods with the quality in accordance with requirements at the right time and the right price), the new phrase that will be the basis of supply chain reconfiguration will be *just in case*.

2. Research methodology

The paper aims to identify the scientific interest in the field of supply chains digitalization. For this purpose, we used bibliometric analysis. According to (Donthu, et al., 2021), bibliometric analysis has gained great popularity in business research, as bibliometric software, and databases (Web of Science, Scopus, etc.) became easier to access. Bibliometric methodology is a transdisciplinary approach and can be used for information science and business research.

Considering previous research carried out in the field (Krajka, et al., 2022; Cristian, et al., 2022; Wang, 2022), the research methodology involves going through some stages (see figure 2). Thus, the research methodology includes three stages: in the first stage, *Research development*, we established the research objectives and the selection of data from Scopus platform; the second stage, *Bibliometric analysis*, the use of VOSviewer analysis and map visualization and the last stage, *Results and discussions*, in which the conclusions, research limits and future research directions are presented.

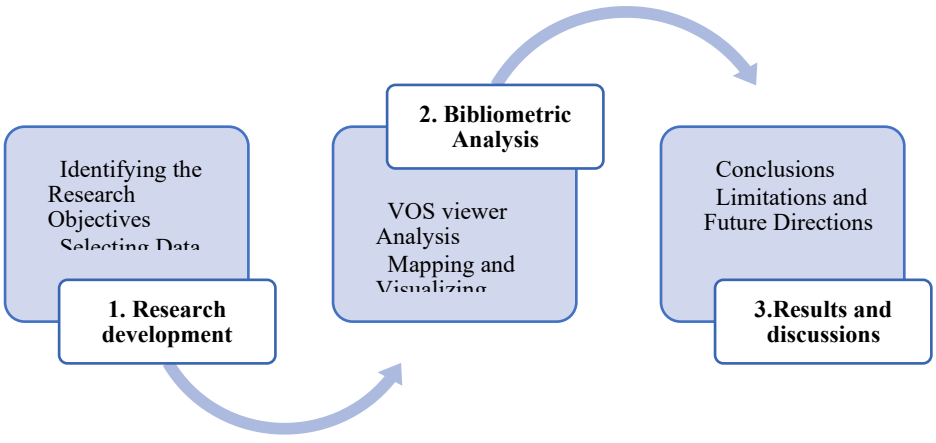


Figure no. 2. Flow Chart

We conducted an analysis using information from the query of Scopus database - on scientific journals, articles, books, and others. The software product VOS viewer, version 1.16.19, was used for performing a quantitative analysis on the scientific interest in the digitization of supply chains and for creating maps

which graphically represent the links between the words that appear most frequently in the documents resulted from the query (Van Eck and Waltman, 2010; Van Eck and Waltman, 2011).

The database chosen for data collection is Scopus, one of the most important abstract and citation indexing platform. The query was performed using several filters in order to identify the articles to be analyzed. Following the query, a number of 1064 documents were identified that satisfy the query keywords: TITLE-ABS-KEY ("supply chains" and “digitalization”). Later, following successive refinements, the final number of documents analyzed was 913 documents.

3. Results and discussion

Querying the Scopus database led to the identification of a number of 913 scientific documents containing the terms "supply chains" and “digitalization” in their title, summary or keywords. The analyzed documents are articles (56.1%), conference papers (32.3%) and book chapters (11.6%). Regarding the temporal distribution of the selected works, the analyzed period is 2002-2023. From the analysis of the information, until 2016, the topic of the digitalization of supply chains was not at the center of concerns, with values between 0-3 per year being recorded, and starting from 2016, there is an increase in the number of papers presenting this subject, which shows an awareness of the advantages of supply chain digitalization (see figure 3).

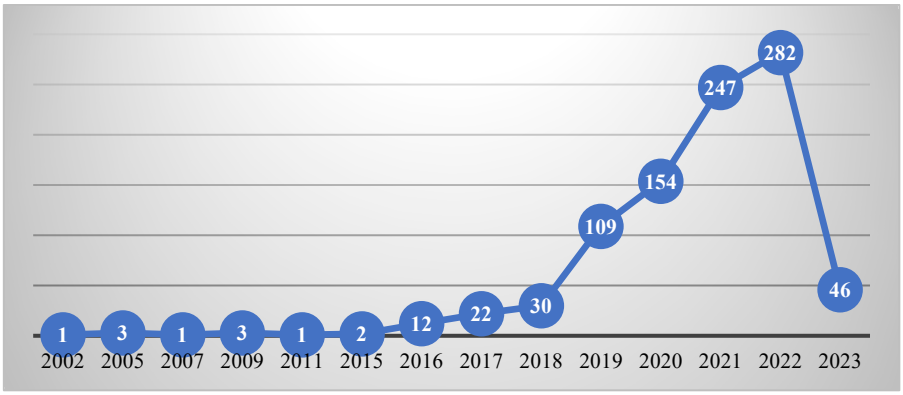


Figure no. 3. Temporal distribution of articles published in the period 2002-2022

Source: Scopus

Regarding the semantic analysis of the keywords with the highest number of occurrences in the analyzed documents, we present in table no. 1 a selection of the top 10 keywords, according to the strength of the links (given by the number of co-occurrences) they have created with other keywords.

Table no. 1. Top ten keywords in the literature on supply chain digitalization

Keyword	Occurrences	Total link strength
Supply chains	333	1419
Digitalization	254	904
Supply chain management	211	849
Industry 4.0	161	668
Supply chain	120	436
Decision making	72	380
Blockchain	84	334
Sustainable development	56	330
Digital transformation	75	323
Internet of things	62	293

Source: by the authors using VOSviewer

In figure no. 4, the links between keywords are highlighted, graphically presented by the branches connecting the different keywords (represented by larger or smaller circles, depending on the frequency of appearance in the analyzed works). Depending on the strength of the links, the lines are thicker or thinner. For example, a strong link, given by a number of 254 co-occurrences, appears between digitization and supply chains. It is necessary to specify the fact that 106 keywords are included in figure no. 5, each of them having a minimum of ten occurrences in the documents of the collection. They were grouped into 7 clusters according to the distance between them (by positioning them in a two-dimensional plane).

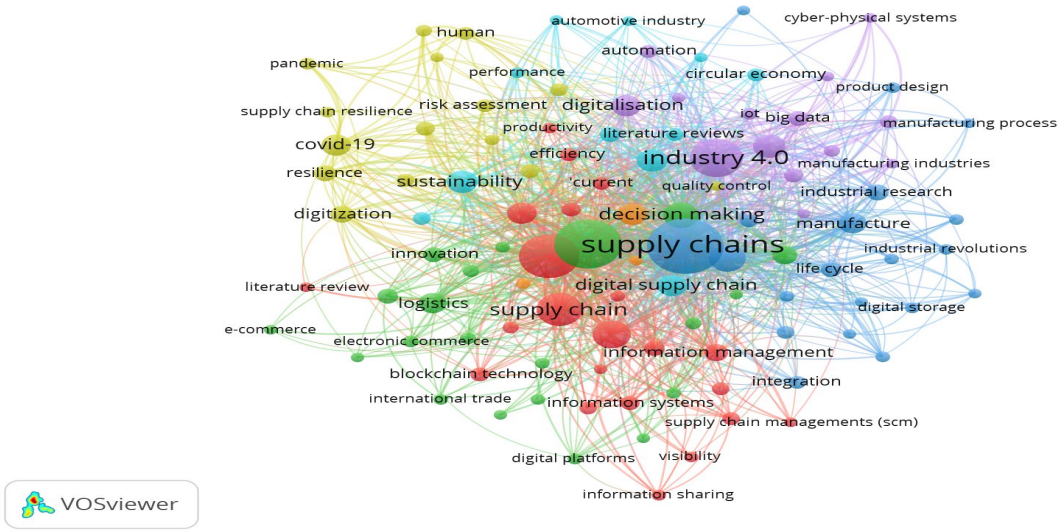


Figure no. 4. Link map between keywords

Source: by the authors using VOSviewer

As can be seen in figure no. 5, the density visualization map based on the criterion of the minimum number of 10 articles/country, Germany represents the with the highest density, because at the level of this country 129 specialized papers were published. Along with Germany there are other countries with a large number of works such as: Great Britain 103, India 86, Russian Federation 86, Italy 76, China 68.

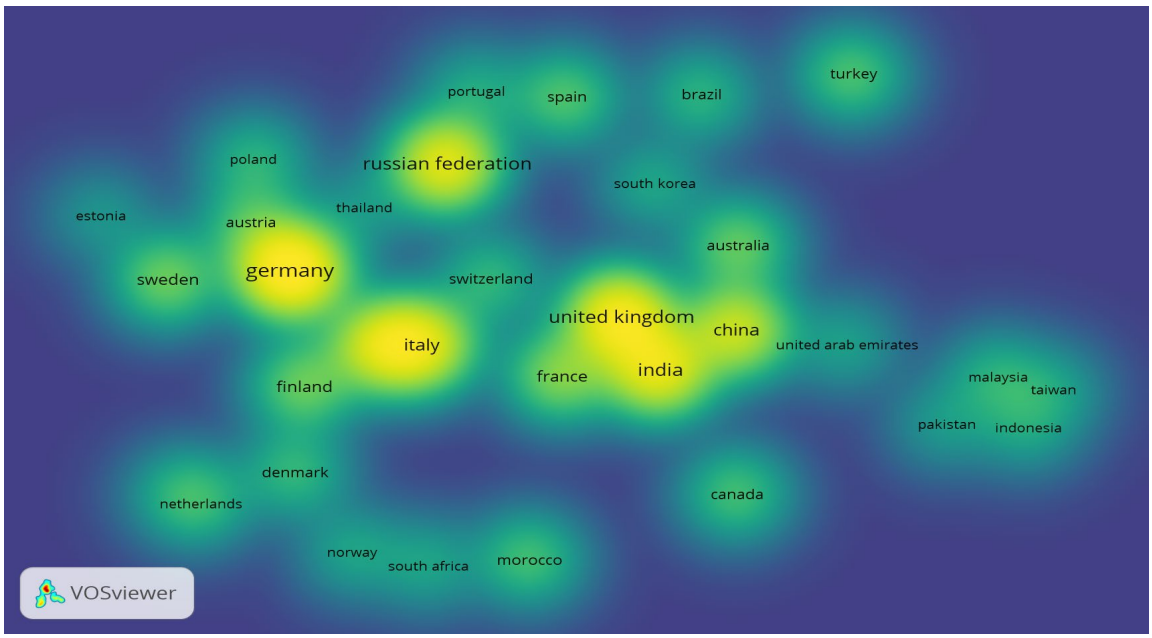


Figure no. 5. Bibliometric analysis of works containing the key terms by country of origin

Source: by the authors using VOSviewer

Conclusions

Following our analysis, we can formulate the following conclusions: publishing of scientific papers in the field of supply chain digitization began in 2002, reaching a maximum in 2022 - a fact that indicates the importance of digitization in supply chain management; the map of links between keywords highlights the importance of applying new technologies in supply chain management. The motivation for managers to implement new technologies in their companies and digitize their logistic network are increase of transparency, agility and security, easier cooperation between supply chain participants and higher quality services offered to consumers. All these advantages ultimately led to an increase of overall business performance and profit.

The increasing growth rate of scientific works that address digitization in supply chain management area, reflect the awareness of scholars about the importance of the subject and multiplies the effect of dissemination and information sharing, both in the form of theory and practices.

As for the limits of this research, they refer to the database used in the analysis, but taking into account the similarity of the most important databases that store scientific works globally, we believe that this limitation does not have an important effect on the results of the work.

Whether we are comfortable with the idea or not, the future of international business is closely linked with automation and artificial intelligence, so as further research direction we propose to investigate the implementation of AI in logistic networks.

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XBRL Standards – Mean of Improving Capital Market Information Process

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Abstract

This article studies in a systematic way, based on specialized research literature, the benefits of the XBRL standardized reporting of the financial-accounting statements and the impact of its use on the company's relationship with the capital markets. XBRL digital reporting standards emerged as a necessity for the development of economic processes in global markets, realizing the informational link between companies and stakeholders, including investors, through information technology. The paper uses, as a foundation, the research based on the analysis of the specialized literature, highlighting the benefits of XBRL reporting within the information process of the capital markets: reducing the costs of acquiring, accessing, processing and analysing information. The responses of these markets were immediate, the analysed studies demonstrated as immediate effects of the standards implementation, the improvement of the company image among investors, the increase of the entities market value and the increase of the capital markets ensemble efficiency. Our study is primarily addressed to companies, in substantiating the decision regarding of these reporting standards implementation.

Keywords

XBRL (Extensible Business Reporting Language), capital market, regulatory norms, value relevance, digital corporate reporting

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Introduction

In order to face with the qualitative, quantitative and interoperability requirements of financial information, as a determining factor of the decision-making process with an impact on the scepticism of the information users, it is necessary to implement emerging technologies (XBRL, continuous/online/digital/e-reporting, artificial intelligence, continuous audit, big data, data analytics, internet technologies, cloud computing) (Chiu et al., 2019) alongside the standardization of reporting formats. XBRL (2019) offers the possibility of making financial-accounting reports, using an accurate description of the information and a common and universal programming language, and their detailed presentation through a standardized report that allows data processing and comparability. The efficiency of one of the most sensitive markets to the information factor - the capital market - is determined by the actuality, accuracy, quality, comparability, timeliness and sufficiency of information. Prices react, first of all, to information (Fama, 1970, Grossman, 1976) and the mechanism of their formation - that allows the optimal allocation of capital resources (G.A., 2015), depends on the informational efficiency of the national capital market (Kelly and Ljungqvist, 2012).

The study aims to treat the issue of financial reporting component by using the eXtensible Business Reporting Language (XBRL, 2007), with an emphasis on the identification in the specialized literature of

recent years of the various existing interdependence relationships between XBRL reporting and the capital markets performance indicators, as a tool to measure the market's reaction to these standards.

The motivation for choosing this research topic is based on the intention to contribute to the expansion of an innovative but, at the same time, extremely difficult research area, taking into account that reporting in the unique XBRL format is in full development process both at the level of scientific research and in the practice of European economic entities, accentuated by the requirements of the implementation of XBRL standards and, at the time of the realization of this work, the specialized literature has registered an evolution from the phase of conceptual presentation of the necessity of the standardization of reports and the XBRL theory to the analysis of the implications generated by the implementation of the standards, which gives it *relevance*. At the same time, it mandatory to further study how local actors shape the limits in the implementation of different regulatory frameworks to determine the process by which accounting practices retain their national specificity even as they submit to the globalization process. (Albu et al., 2022).

The aim of this paper is to investigate, through the analysis of specialized literature, the reactions of the capital markets to the companies' initiatives to implement the XBRL reporting standards and, in order to achieve it, we identified two *objectives* of this work. *Objective no. 1* aims at the definition and a critical analysis of the reporting concepts under the XBRL standards, the presentation of the evolution and perspectives of integrated XBRL reporting. *Objective no. 2*. Aims to identify within the specialized literature, the dependences between financial reporting in accordance with XBRL standards and capital market reaction. To fulfil the objectives, we studied the specialized literature from which it emerged that XBRL reporting represents an innovative business model that integrates economic, social, environmental and governance pillars, presenting stakeholders an entire unitary information system. The methodology used to achieve the objectives consisted in the systematization and analysis of the most important articles from the specialized literature.

The paper is structured in five chapters. The first one gives a brief introduction accompanied by motivation to the chosen research topic. The second chapter summarizes the interest of the researchers regarding XBRL reporting standards, as well as the contribution of these reports to the improvement of the communication process with investors and to in increasing the efficiency of information transmission in the capital markets. In chapter number three, the research methodology is described. Chapter four begins with the presentation of the international context regarding the standardization of financial reporting and it continues with a review of the relevant literature regarding the impact of the XBRL adoption on financial information of interest in investor relations in the capital markets. From all this, it reveals the extremely complex nature of this type of reporting, but also the impact it can have on the capital market´ reaction and implicitly on financial stability at the global level. The last of the sections provides a synthesis of the results as well as opportunities for future research.

1. Literature review

XBRL technology was first used by the American Institute of Certified Public Accountants (AICPA) which defines the principles and terminology used in accounting reporting regulations. Currently, the International XBRL Consortium (2007) brings together the efforts of more than 170 organizations promoting this universal financial reporting language, which leads to a more efficient regulation process (Star, 2012). The success of digital solutions implementation offered by XBRL framework depends on the level of the information system development, and the main benefits of using this informatic language are represented by the speed of accessing information, increased transparency for investors and increased efficiency data analysing and this transparency and accessibility increase has the effect of reducing the companies´ capital costs (Pinsker, 2008). In capital markets, exchanges play an essential role because they facilitate the market infrastructural arrangements organization (Petry, 2021). Companies listed on the capital markets must make profitable decisions that determine the maximization of value for investors (Jensen, 2001), in their capacity as private capital holders (Smith, 2003), towards which all results are directed and they must create efficient (Davies, 2018; Jessop, 2018) and profit-generating results.

In 1984, Freeman is the one who comes up with the innovative proposal to direct reporting strategies to all stakeholders in favour of the "shareholder primacy" theory (Freeman, 1984), thus balancing the all needs for information. This generates a commitment for a redefinition for companies´ role and nature in the

stakeholder´ communication process (Jensen, 2001), but also of the entity as a tool to achieve investors' objectives (Asher et al., 2005). Malkier (2003) defines the capital market as that market where prices reflect all known information, where even uninformed investors get the same return as experts and the inefficiencies of markets or delayed responses of prices in the efficient capital market are the result of investors inattention. (DeLong et al., 1990; Hirshleifer et al., 2013). Meanwhile, specialist studies have turned their attention to the information provided by XBRL reports, identifying a number of benefits on reducing reporting costs (Lai et al., 2015), reporting opportunities (Du & Wu, 2018), information processing costs (Blankespoor, 2019), or shareholder wealth (Chen et al., 2018; Kim et al., 2018).

Reports under the XBRL standard can store, process and exchange the data contained in financial reports in an opportune, accurate, efficient and economical time, which is translating for investors, in their capacity as beneficiaries of this information, into an improvement of the quality for the received information and into the growth of the investment comfort. Hodge et al. (2004) claims that investors - users of integrated information within XBRL reporting- are privileged to benefit from those reports ability to simplify the financial – accounting information transferring process between investors, financial analysts and regulatory bodies, which leads to a clearer understanding of corporate policies and, implicitly, into an increased quality (Baldwin et al., 2006) and relevance of information (Birt et al., 2017). XBRL can reduce the level of information asymmetry (Yoon et al., 2011), can increase the financial reporting transparency (Bartley et al., 2011), can mitigate capital market informational risk and can reduce the level of stock returns volatility (Kim & Shi, 2012; Efendi et al., 2014).

The studies according to XBRL early adoption indicate that this reporting influences investment decisions (Hodge et al., 2004; Lymer & Lowe, 2010). Early adoption of XBRL had effects on a wide range of investor relations variables: cost of capital (Liu et al., 2014), accuracy financial analysts' forecasts (Liu et al., 2014), information environment (Li & Nwaeze, 2015) or trading volume (Blankespoor, 2019). Within common law states, accounting standards determine a broader evolutionary process, contracts between investors and companies take place in an open market (Ball et al., 2000) and corporate governance arrangements is based on the model according to which investors' compliance acts as managers' monitors (Bushman & Piotroski, 2006), which determines the addressability of the reported information. Although the researches regarding the beneficiaries of digital reporting and the impact of XBRL has experienced an upward trend in recent years, especially in the sphere of the capital market, the opinions of researchers are not unanimous, there are a number of tensions regarding their findings (Guilloux et al., 2013; Locke et al., 2010; Lowe, 2012; Troshani et al., 2018). There are studies that show that the dominant perceptions among investors are that the main beneficiaries of this type of integrated digital reporting are the regulatory authorities themselves, aspects that have led to the limitation of this type of reporting in areas where it is voluntary (Bharosa et al., 2015; de Winne et al., 2011).

2. Research methods

In order to provide a broad picture of capital markets' reactions to companies' initiatives to implement XBRL standards, the present paper is built on previous literature. For this purpose, we analysed the specialized literature from the WoS, Emerald, Scopus and de Gruyter databases from 2006 to 2022 (articles, books, national, European and international legislative sources, websites of international professional bodies). In order to identify these works, we used words such as keywords "XBRL & capital market", respectively "XBRL & shareholder information" and the generated works were subjected to a content analysis. All this articles were downloaded in the PDF versions and we analysed their content and results. As a result of this analysis, a series of variables used in previous researches resulted, through which are established the relationships between the standardized XBRL reporting and the communication process with the investor parties (improving the image of the company, the value of the company, the level of trading, the volatility of the stock price) but also that this process is carried out based, in particular, on financial information. For each variable with reference to XBRL reporting and the identified capital market, we created a table in Microsoft Excel with different fields of analysis (nature of the relationship, time period analysed, regional market under research, methodology used, reference data of the article).

3. Results and discussion

In recent decades, corporations use the Internet as a channel for effective communication with stakeholders, and most companies publish their reports on their own or regulatory websites (CICA 2005, IASC 1999, FASB 2000), all for to facilitate the stakeholder access to information. All over the world, regulatory and legislative authorities have implemented several XBRL reporting standards (2007), and several software developers release applications that facilitate these reports. The USA implemented the system in 2005, when the SEC (2005) allocated $5.5 million to develop XBRL taxonomies for companies, Japan in 2006 (The Japanese Government), Canada (Canadian Securities Administrator) and Korea (Repository of Korea's Corporate Filling) launched a voluntary submission program in 2007, the United Kingdom implemented the program system in 2010 (U.K. Government).

At the European level, there is an obligation (E.U., 2019) for companies that report according to IFRS standards to label these financial reports in a unique European format - ESEF, and beginning for the year 2020, companies listed on stock exchanges report part of the figures and information from their the consolidated financial statements in XBRL format and, starting from January 2022, the requirement extends to all the information included in the consolidated financial statements (European Parliament, 2004; ESMA, 2022). The introduction of the single reporting format (IASB, 2020) has the effect of increasing the transparency of reporting standards but also it gives the possibilities for dates to be compared regardless of language, structure or format, and this allows interested parties, including shareholders, the possibility to automatically perform different analyses. In technical terms, financial statements drawn up under XBRL standards must be prepared in xHtml language (eXtensible Hypertext Markup Language) and reports must be label. The digital reporting standard allows for the electronic information communication through computer-readable labels, similar to barcodes or ISBNs in the book identification system.

XBRL web application allows companies to convert financial reports in Word/PDF/Excel format to the ESMA reporting format, and transmit them in an operational, complete, validated way to interested institutions, which ensures the coherence and consistency of all reported documents, with a positive effect on the costs of collecting, converting, disseminating, exchanging and validating the reported data, respecting the standardized taxonomy (fig. No.1). In fact, XBRL reporting does not replace the traditional annual filing, but through these standards companies can automate the processes of collecting and disseminating information in a more efficient, better controlled, and more detailed way to improve reporting functionality (Dunne et al., 2013) and at lower costs and offers, at the same time, a number of advantages to information users, providing the possibilities for making comparisons between companies and cross-sectional analyses according of user needs (SEC, 2009; Willis, 2005). The actual influence of the adoption of XBRL standards on the reaction of the capital market has particularly attracted the attention of researchers in the states that implemented this system before the European states, there being sufficient data to carry out impact studies.

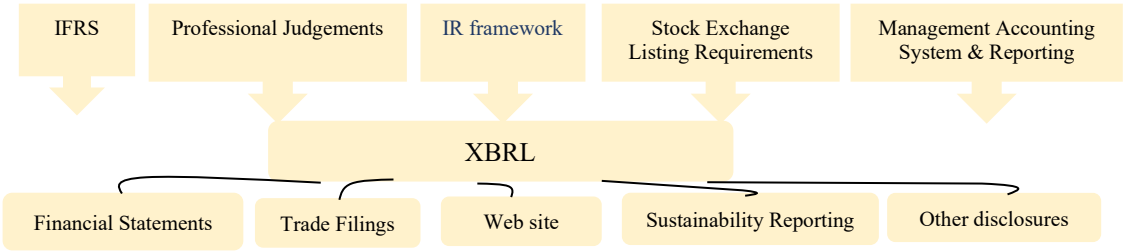


Figure No. 1 XBRL Taxonomy

Source: made by authors based on (XBRL International, 2007)

In rule-of-law countries, standards emerge and evolve through the natural processes of economies in widely open markets, depending on the needs and experience of participants (Ball et al., 2000). The links between investors and companies are made through the director boards (Bushman & Piotroski, 2006) in their capacity as monitors of management. It hence their major interest in addressing information contained in the reports, in special to capital providers. An unanimously accepted opinion in the specialized literature is that of the need to use informatic technologies in the reporting process and of the existence of a direct -

positive relationships between the adoption of XBRL standardized reporting and the improving of company image (Mousa & Ozili, 2022; Avvalone et al., 2016; Chen et al., 2021; Zhang et al., 2019; Hsieh et al., 2019; Wen, 2021). Another variable of XBRL identified within the analysed literature is represented by the company value, but here the research´ results are in antithesis. Thus, while (Chen et al., 2021; Mine Aksoy et al., 2021) support a positive relationship between disclosure and the market company value, (Xing & Anderson, 2011; Kim & Shi, 2012) support the idea that the values of market reflect homogeneous fluctuations in general capital market prices and less firm-specific information.

Other studies highlight the idea that XBRL reduces investors´ costs of acquiring, processing and comparing information (Blankespoor et al., 2020), it reduces investors' expectations about investment risks (Zhang et al., 2019; Chen et al., 2018) and improves the ability to manage earnings in the short, medium and long term, which has an effect on the capital markets performance as a whole (Chen et al., 2021). Regarding the opportunity of financial information provided by XBRL standards, studies (Du & Wu, 2018; Yoon et al., 2011; Weissmueller, 2014) argue that the horizons of reporting times were shortened following the XBRL mandate, creating the opportunity for financial reporting, impacting the decision-making process of investors, the timely provision of financial information and reasonable costs being essential for them. Blankespooret (2014) however draws attention to the fact that new technology creates benefits to a greater extent in favour of large companies, disfavouring SMEs, and this facts can change the dynamics of the financial market, generating the capital markets segmentation.

Conclusions

XBRL reporting using specialized software programs offers companies the possibility of automating the processes of creating, presenting, validating and disseminating metadata from financial statements in a standardized, integrated, timely and low-cost manner, in a common international language, with specific standards.

The introduction of XBRL reporting standards reduced the time and cost of transmitting financial-accounting information to the capital markets, increased comparability and the possibilities that they can be integrated within different information systems, increased the transparency and quality of information and ensured the improvement of their circulation, facilitating the communication process with the capital markets, reducing the informational asymmetry within them.

In accordance with the advantages listed by the international bodies, the results of various empirical research carried out among the states that already implemented these standards, indicate the impact of the XBRL use on the information processes and the analysis of the specialized literature reveals the immediate reactions of the capital markets following the adoption by companies of informatic reporting systems.

Re-examining the use of XBRL in order to facilitate the incorporation of the taxonomy of these standardizations and within the reporting of non-financial information, of sustainability, with social impact, could represent a new point of interest for international bodies in the field of reporting, improving the process of communication with interested parties, including shareholders and from the sustainability point of view.

As any other research work, the present paper has its own limitations primarily related to the scope and depth of the analyse data, but also to the way of their interpretation and to the relatively small number of identified articles and secondly, related to the general way of presenting the concepts, without developing an empirical study that highlights the links between the implementation of XBRL standards and communication with shareholders, respectively with the capital market. The study of the impact of the introduction of XBRL reporting on the European capital markets represents an objective that we propose to research in the next period.

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Innovative Trends Through Robotic Process Automation. A Case Study

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Abstract

The workplace and our daily lives are being transformed by the next generation of digital technology, which includes artificial intelligence and robotic process automation (RPA). And for many businesses and their leadership, digital transformation has emerged as a crucial strategy. Innovation is the key to organizational success in the fast-paced, constantly evolving commercial world of today. Businesses must be adaptable to both internal and external influences because the business environment is constantly changing and developing. The benefits and necessity of employee creativity are increased by the organizational environment's instability.

With new strategies across several important departments, including finance, human resources, and internal audit, the authors tracked the development of a service technology solutions organization that has established an intelligent IT operation ecosystem. They then presented their leadership perspective and thought process for the case study's next steps for the business.

Keywords

RPA, digital transformation, employee survey, leadership, artificial intelligence.

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Introduction

The paper's main purpose is to examine the Artificial intelligence and robotic process automation, as two examples of the next generation of digital technologies, that are becoming increasingly important in the workplace and in our day-to-day activities. Additionally, many businesses and their executives now view digital transformation as their primary strategy. Leadership is essential in defining and creating the environment in which people may come together and work toward a common objective. By choosing individuals who are focused on novelty and learning, rather than just generating cash, leaders should be in charge of establishing an innovative culture. According to Xie et al. (2018), trust is a factor that encourages creativity within an organizational setting. The readiness of leaders to accept responsibility for incorrectly evaluating the credibility and leadership of subordinates is referred to as trust in employees.

Nowadays, a large number of services offered by businesses are digital services due to the recent advancements in technology and the widespread adoption of data systems in society. The fourth industrial revolution, known as Industry 4.0, is one in which automation and technologies are making significant changes.

Robotic Process Automation promotes increased efficiency, just like other cutting-edge technologies. RPA should be viewed as one of the technologies enabling businesses to automate recurring processes during the digital transformation process. It combines software, artificial intelligence (AI), and machine learning skills to automate manual operations that are typically carried out by people by programming autonomous software robots to repeat basic tasks (Kudlak, 2019).

Predicting the future of potentially disruptive technologies becomes a crucial issue for business leaders worried about the survival and profitability of their firms as digital technologies shape competitiveness in various industries (Krotov, 2019).

When it comes to automating organizational and business procedures, RPA offers a number of benefits. In addition to these benefits, the complementing use of Artificial Intelligence (AI) methods and methodologies enables RPA procedures to be executed more accurately and efficiently in terms of information extraction, recognition, forecasting, and process optimization. This research seeks to give an overview of the RPA tools related to AI that can help to enhance organizational processes in this area.

1. Literature review

d Artificial intelligence used to be a concept with several main application areas. Some of such fields included robotics, computer vision, automatic theorem proving, natural language processing, automatic programming, intelligent data retrieval, etc. These application fields are now so diverse that each may be regarded as a separate field. Today, AI is best understood as a collection of fundamental concepts that support several of these kinds of applications (Nilsson, 2014).

Robotic Process Automation has gradually included implementations of algorithms or AI approaches used in certain contexts, like HR or accounting, in order to classify, recognize, and arranged according to its automated features, given the breadth of the applicability of AI. Some academic studies have been recently published as advantages and challenges of RPA, as well as case studies of the application of RPA and AI (Fluss, 2018; Leno et al., 2020).

Additional research on the intelligent automation of methods using RPA have been released, like that of the consulting Delloite, which presents the potentialities of the application of AI algorithms and techniques, but they should be applied in well-defined and stabilized processes, like in strategic domains focused on customers tasks, increasing worker productivity, improving accuracy in processes, and improving the experience with customers (Watson et al., 2020).

The fundamental idea behind intelligent manufacturing and industry 4.0 is the use of AI by robots to fulfill complex jobs, lower prices, and increase the quality of products and services. With the aid of cyber-physical systems, AI technologies are penetrating the manufacturing sector and fusing the real and virtual worlds. By utilizing AI, the manufacturing sector becomes smarter and more equipped to handle contemporary issues like configurable specifications, shortened time to market, and an increase in the number of sensors utilized in equipment. According to Ustundag and Cevikcan (2018), AI techniques (such data mining) are able to analyze vast amounts of real-time data gathered from numerous sensors.

We emphasize the significance of Robotic Process Automation, which is defined as a technique that results in the automatic execution of administrative, scientific, or industrial tasks. It uses robotics as a set of techniques relating to the operation and use of automata (robots) in carrying from a variety of tasks in place of humans for how to do a thing. In this sense, RPA tools are a collection of methods intended to increase productivity by eliminating or automating repetitive operations. Along with the usage of RPA, the incorporation of AI - algorithms and methodologies - enables the execution of automated processes to be more precisely controlled (Aguirre and Rodriguez, 2017).

Robotic Process Automation is the automation of service processes that mimic human labor. Artificially intelligent robots or AI employees who can accurately complete repetitive jobs are used to automate processes. The developer establishes task instructions using some type of screen capturing and creating variables. Among other things, these duties involve logging onto programs, copying data, pasting it, opening emails, and filling out forms. RPA is a catch-all phrase for tools that interact with other computer systems' user interfaces (Van Der Aalst, Bichler and Heinzl, 2018).

Information is collected from smart devices using RPA techniques (Madakam, Holmukhe and Jaiswal, 2019). RPA is the robotic expansion of a human worker's repetitive tasks for business processes. RPA is not a component of the information infrastructure, as is the case with traditional approaches, but rather rests on top of it, suggesting a low level of intrusiveness that could result in cost savings. According to some reports, the usage of RPA technology can reduce operating expenses for transactional tasks inside shared services by 30% to 50% (Williams and Allen, 2017).

Additionally, RPA now includes intelligent approaches and algorithms (AI) in many systems, allowing for the automation of operations inside an organization to achieve high levels of intelligence. RPA is utilized to automate repetitive and data-intensive processes in order to increase process efficiency. Robotic process automation might actually imply the presence of actual robots working in offices, carrying out human

duties, and taking part in company operations. On the other hand, RPA is mostly a computer-based solution, and the software "robot" is expected to do duties that were before carried out by people.

RPA is defined by Santos, Pereira and Vasconcelos (2019) as a form of automation based on computer programs that might mimic human activities for routine, low-value operations including copying, pasting, extracting, combining, and transferring data between systems. RPA is a technological employee impersonation created to automate structured tasks swiftly and inexpensively.

RPA, or robotic process automation, is a growing subset of business process automation that is built on the concept of software robots or artificial intelligence (AI) employees. To automate an operation and connect to the back-end system, a software developer implements inventory actions in common workflow automation systems using internal programming interfaces for applications or specialized scripting languages.

Take into consideration the following illustration to better understand the idea of robotic process automation: Two of the 500 high-risk customer accounts were given to a team of bank workers to manually examine each day in order to decide whether payments should be handled.

Quinn and Strauss (2018) define RPA as a rapidly growing method to process automation that uses software robots to imitate human jobs. A virtual robot mimics human behavior in the graphical user interface of the application after capturing a process workflow and automates their execution. RPA is typically viewed as an efficiency and productivity solution, as it reduces errors, improves security, and helps lessen human mistake (Dialani, 2019).

Robotic Process Automation needs to develop into something "smarter" in order to be adopted more widely. The application of machine learning and artificial intelligence (AI) techniques is expected to support more challenging and poorly defined tasks. Humans learn abilities via practice and instruction. The goal is for RPA tools to acquire comparable knowledge. RPA technologies can adapt to and manage non-standard scenarios, for instance, by observing human problem-solving abilities.

RPA is a catch-all name for tools that interact with other computer systems' user interfaces in a manner similar to how a human would. RPA seeks to replace workers through automation carried out in an "outside-in" fashion. This is distinct from the traditional "inside-out" method of information system improvement. Contrary to traditional workflow technologies, the information system does not change. (Tornbohm and Dunie, 2017).

Robotic Process Automation systems frequently integrate user interface interactions or link to APIs to power client servers, mainframes, or HTML code in order to execute statements on structured data. An RPA tool works by writing a script in the RPA tool language that the software robot will follow, and a control dashboard allots runtime to carry out the script. RPA solutions therefore strive to lessen the load of repeated, fundamental tasks for people. (Aguirre and Rodriguez 2017).

Additionally, how the RPA system interacts with humans is very interesting. A human may be given a case by the RPA system if it turns out to be unusual. The RPA system can learn by imitating how humans handle difficult problems (van der Aalst, 2016). Additionally, there is a clear connection to process mining. (Kerremans, 2018).

To automatically visualize and choose the processes with the greatest automation potential, for example, RPA vendor UiPath and process mining vendor Celonis collaborate. They then create, test, and implement RPA systems based on the discovered process models. Other manufacturers have cited similar use cases. Finding process fragments that are suitable for RPA may be done after using process identification to educate processes "by example".

At the beginning of the digital transformation period, all efforts were concentrated largely on providing the highest level of customer service. There is presently a growing amount of focus on operational and business process digitization.

Modern digital technologies are changing how organizations function and how their goods and services are produced. Such changes—described as "digital transformation"—have an influence on both particular companies and whole industries. The concept of digital transformation has mostly been used in manufacturing settings where actual robots helped people with their job up until this point.

2. Understanding RPA and AI: Complementary Applications in Modern Enterprises

Due to its potential to change production, improve efficiency, and raise customer satisfaction levels, robotic process automation (RPA) and artificial intelligence (AI) have attracted substantial interest in the modern corporate scene. The estimated market values of these technologies, with RPA forecast to reach $25.56 billion by 2027 and AI slated to reach an astounding $390.9 billion by 2025 (GVR, 2023), demonstrate their fast expansion and acceptance. The differences, unique capabilities, and possible synergies of these cutting-edge technologies have been extensively discussed, but many people still struggle to grasp them.

A wide variety of processes exist in the context of contemporary organizations, covering both simple activities and those requiring complex decision-making. As a result, companies need a complementary set of technologies that can handle this diverse range of operations. While AI may help and improve human decision-making in more complicated processes, RPA shines in environments with well-defined, sequential operations. RPA and AI working together may have a significant and disruptive influence on operational efficiency, ultimately changing the way businesses operate.

Recent developments in artificial intelligence (AI) force us to constantly examine the roles of people and automation in different activities as we discuss the changing landscape of automation. Robotic Process Automation (RPA) is a fast-developing technology that uses software robots to mimic and repeat the execution of extremely repetitive operations, which are traditionally carried out by people through a user interface (UI), according to Agostinelli, Marrella, and Mecella (2019). Automating office chores in areas like accounting, billing, and customer support is the main use of these software robots. Extraction of semi-structured data from documents, reading and writing data to databases, pasting data into spreadsheet cells, processing emails and attachments, filling out forms, and conducting computations are a few examples of such jobs. This ground-breaking method of automation emphasizes the rising synergy between RPA and AI in reshaping the nature of labor.

In their seminal research, Kai et al. (2022) underscores the imperative of converging Robotic Process Automation (RPA) and Artificial Intelligence (AI) technologies within the realm of an intelligent financial management platform. The authors elucidate the employment of RPA in facilitating the automation of a multitude of workflows, encompassing business automatic queries and intelligent filling, while capitalizing on AI technologies such as voice recognition, text semantic analysis, and intelligent question answering to foster humanized business interactions, intelligent semantic comprehension, and streamlined business operations.

The incorporation of RPA with AI and ML approaches, as observed by van der Aalst, Bichler, and Heinzl (2018), promises to improve the capabilities of RPA tools, enabling them to support more complicated and less specified activities. RPA technologies would therefore be able to adapt to non-standard circumstances and better manage unforeseen situations by learning through observation and coaching, just like people do. RPA agents might transmit uncommon instances to human operators, guaranteeing the best handling of a variety of scenarios. This partnership between RPA agents and people also has the potential to be more efficient. The combination of RPA, AI, and ML has the potential to revolutionize corporate procedures and increase output.

The study of robotic process automation (RPA) and artificial intelligence (AI) technologies has shown their transformational potential in the modern corporate landscape by highlighting their distinct and complimentary capabilities. Integration of RPA and AI is essential for preserving a competitive edge, simplifying processes, and promoting innovation as firms navigate an environment that is more complicated and dynamic.

3. Implementing RPA in Organizations: Approaches and Strategies for Successful Robotic Process Automation Adoption and Execution

This chapter examines the use of robotic process automation (RPA) in businesses, concentrating on the methods and tactics for effective adoption and use. Due to its promise to increase production, lower costs, and improve efficiency, RPA has quickly gained acceptance in recent years. However, careful preparation and execution are necessary for a successful RPA implementation. These steps include choosing the right RPA technologies, choosing relevant use cases, and creating a thorough deployment strategy. This chapter explores the important factors that businesses should consider while using RPA, offering suggestions and best practices to guarantee a successful adoption and implementation.

The study conducted by Bavaresco et al. (2023) sheds light on the importance of considering users' expectations and perceptions when implementing Robotic Process Automation (RPA) and Natural

Language Processing (NLP)-enabled interfaces in organizations. The report emphasizes that while the introduction of RPA and NLP-enabled interfaces can greatly increase productivity and expedite interactions with clients, it can also cause staff anxieties. The authors stress the need of comprehending consumers' expectations and worries in order to minimize negative effects and promote adoption. The study focuses on customers' perceptions of a proof-of-concept chatbot-based automation service with machine learning capabilities created to automate the statutory reconciliation activity, a manual operation with great automation potential. The results show that business customers are interested in using innovative automation services to increase their productivity and cut down on time-consuming duties. However, they also demand a service that won't disrupt their daily activities and won't interfere with their employment.

As a developing trend to boost efficiency and simplify customer engagement, the use of robotic process automation (RPA) and natural language processing (NLP) technology has been noted. Although the incorporation of these technologies might increase employee uncertainty and disrupt regular operations. Understanding their expectations and worries about automated services is essential to minimizing negative effects and fostering effective adoption. In this situation, it is crucial for businesses to make sure that new technologies are seamlessly incorporated into workers' daily tasks and that they are not burdened in any way. Therefore, in order to facilitate the effective adoption and use of new technologies, companies must prioritize the provision of proper training and support. These findings highlight the significance of thorough machine learning technique design and use, accompanied by explanations that are understandable to personnel.

Artificial intelligence (AI) and machine learning (ML) are being used more and more in business, which offers enormous potential for cost reductions and efficiency gains. The use of these technologies is not without danger, though, and if those risks are not properly handled, they might result in the loss of corporate value. Canhoto and Clear (2020) offer a methodology for mapping the elements of an AI solution and detecting and controlling the possible value-destruction risks in order to handle this problem. This methodology can assist managers in identifying and reducing the risks related to AI and ML, enabling them to fully utilize these technologies. The inputs, processes, and results of the AI system are seriously at risk because to the distinctive features of AI and ML. For instance, biased data might produce biased AI results, which can destroy value. The ideas of value-creating content and value-creating process may be applied to reduce the likelihood of value destruction in light of these threats. Value-creation content specifically refers to the components that provide value to an AI solution, such as high-quality data, algorithmic openness, and moral concerns. On the other hand, the term "value-creation process" refers to the procedures involved in developing and putting into practice an AI solution, including data governance, testing, and monitoring. Businesses may successfully manage the risks associated with AI and ML and guarantee that these technologies lead to value creation rather than value destruction by paying close attention to both the value-creation content and value-creation process.

When putting RPA into practice, it's vital to take the corporate culture and change management into account in addition to the technical issues covered in the chapter. Any organizational change initiative, including the deployment of RPA, frequently runs into issues with resistance to change. Employees can worry about losing their employment or struggling to learn the new technologies. As a result, it's critical to include staff in the process, explain the advantages and expectations clearly, and offer sufficient training and support. Additionally, the use of RPA presents a chance to review and improve business procedures. Prior to automating a process, it's critical to evaluate its efficacy and efficiency and pinpoint opportunities for development. Organizations may benefit from improved outcomes, lower expenses, and a more effective and streamlined workflow with the aid of this process improvement. The RPA's capacity to scale is another factor to consider RPA may be used to automate certain processes at first, but businesses should consider how to apply it to other aspects of their operations. To guarantee that RPA is in line with the overarching company strategy and goals, this calls for a long-term vision and strategic planning.

Overall, a comprehensive plan that considers organizational culture, process optimization, scalability, and alignment with the overall company strategy is needed to use RPA successfully.

4. Research Methodology

The review of the literature revealed that process automation is a continuing requirement for businesses. The writers also mentioned the significant degree of interest in digitization and robotic process automation that is now on the global agenda. Given the circumstances, the use of automation takes on a new dimension and has a direct, immediate impact on the profitability and success of the company. The authors will look at how digital transformation may greatly improve repetitive activities by speeding and improving the automation understanding.

The case study approach will be employed. Researchers must undertake an empirical investigation into a specific, current phenomenon while performing a case study. The study is carried out in a real-world situation using a range of information sources (interviews, questionnaires, testimonies, papers, and proof). As was said in the introduction, the writers have picked a Romanian firm that works in the automation industry. These make it possible for the firms to effectively push their agenda for process automation and productivity, which makes them the ideal example of a fruitful automation leadership strategy.

In addition, the writers used a research methodology they selected for its suitability for attempting to formulate a hypothesis to categorize the data acquired from the 28 publications discussed. The articles emphasize the effects of the digital revolution that will keep organizations working efficiently by discussing the idea of RPA and the automation world in general. The writers will next summarize their own findings and recommendations with relation to the contextualization of automation for long-term company viability.

5. Case study

By implementing additional RPA processes with the help of its Center of Excellence, corporate developers, expanding a team of citizen developers, and developing new KPIs to show ROI, the Romanian firm has discovered new methods to embrace innovation.

Innovation has always been the cornerstone of the Romanian company's success. The corporation has been utilizing technology to enhance the customer experience ever since it debuted its international audio streaming and media services, from playlist curation to suggesting new books or podcasts. The same dedication is used when using technology to make corporate processes simpler, including using robotic process automation (RPA) to make procedures run more smoothly.

RPA was initially tested by the Romanian corporation for treasury procedures. The Romanian corporation established an RPA Center of Excellence (Center of Excellence) during the first year of RPA development, with a purpose to concentrate on RPA code, IT governance, development, security, and developing a service center.

The Romanian firm decided they wanted to go from a code-based solution to a platform that would allow accounting and other departments to create their own automations after seeing some initial success with another RPA platform. Their automated solution has to help them achieve their goals while supporting their vision. The Center of Excellence thus held a cross-functional workshop in April 2021 with participation from the departments affected by RPA, including Finance, Customer Service, Legal, Technology, and Procurement. Everyone agreed that the Romanian firm required a more scalable platform that could be easily deployed throughout the whole organization, was flexible, secure, and compliant.

The main objectives of the digitalization transformation were to increase scalability and improve usability. To assist with deployment and development, they hired a delivery team of consultants. The IT team at the organization, however, set objectives, chose a course of action, and kept oversight of the creation process.

The Romanian company successfully established the foundational layers for its successful Robotic Process Automation (RPA) program, including the operating model and citizen developer program, and migrated 11 existing processes to be automated. The accounting team became the pilot group of citizen developers, and the global business unit is looking at ways to scale RPA with unattended robots. The company has two approaches to automation: enterprise-led automation using unattended bots, and citizen-led development using attended bots. The company's decision to expand the program to scale citizen-led automation was an important strategic choice.

The Romanian company's change management and lifecycle protocols have been crucial to the program's success. The team is focused on increasing the velocity of the development process by embracing quality initiatives, including design and development guidelines, quality assurance, user acceptance testing, and test automation. The team had to find a solution to manage robot identity and access management to effectively run unattended bots, and they ultimately treated the bots as employees, using group structures.

Also, the Romanian company is focusing on the business value that automations create rather than the number of new automated processes. The team plans to keep improving best practices, creating better code review processes, and ultimately enhancing optimization and velocity.

Conclusions

RPA will develop and broaden with the aid of contemporary technology. AI and robots will collaborate to create new techniques for enhancing commercial procedures. Robots and other intelligent technology enhance the rate of learning. Software that combines machine learning, artificial intelligence, natural language processing, and data analytics enables real-time data processing and analysis.

Furthermore, while the process is still running or even earlier, robotic process automation can accurately predict how long it will take to complete a job or an objective. Additionally, it will assist the sectors in continually streamlining administrative procedures and enhancing operational efficiency.

RPA is a relatively new technology innovation that automates corporate processes and may be employed in a digital transformation plan (Lacity, Willcocks, and Craig, 2015). Based on these characteristics and criteria, RPA should be viewed as a cutting-edge, emerging technology that may be used in the process of digital transformation (Siderska, 2020). It may be used to accomplish a number of goals, including process performance, efficiency, flexibility, safety, and compliance, according to Hofmann, Samp, and Urbach (2020).

Starting the digital revolution will maintain the efficiency of corporate operations. A crucial element of the digital transition is technology. The emergence of different digital technologies creates possibilities for embarking on the digital transformation journey.

Modern digital technology adoption transforms how organizations run. For CEOs who are concerned about the company's profitability, predicting the future of potentially disruptive technology becomes a key problem. One of such cutting-edge technologies is robotic process automation.

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Impact Assessment of Pomegranate Cultivation Using Reclaimed Wastewater

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Abstract

The approval of national specific legislative acts and the subsequent elaboration of the regional Water Protection Plans have raised attention on reclaimed wastewater as an abundant usable resource for irrigation or industrial purposes in the Apulia region. Among interesting cultivation pomegranate represent a commodity with niche market share among consumers paying attention to healthy way of life. In the present paper the objective of evaluating the environmental impact and nutritional efficiency of this resource was achieved by comparing 3 treatment scenarios: a) Irrigation with conventional water and fertilization capable of satisfying 100% of the expected nutritional requirements; b) Irrigation with reclaimed urban wastewater and fertilization capable of satisfying 100% of the expected nutritional requirements and c) Irrigation with refined urban waste water and fertilization capable of satisfying 50% of the expected nutritional requirements. The methodology to evaluate the impact assessment was the Life Cycle Assessment. Findings indicate the reclaimed wastewater scenario as the lowest impacting due to electricity consumption for the pumping system of the irrigation infrastructure of pomegranate. Fertirrigation of pomegranate using reclaimed wastewater with 50% lower fertilization does not satisfy the nutrient needs and this supplement should be commensurate to the reclaimed wastewater nutrient content. Results provide to stakeholders the sustainable decision support and this represent the practical implication of this study. Moreover the case study represents an original subject both for the crop, fertirrigation and the location choice of the cultivation and the methodology used.

Keywords

Pomegranate, smart water, Life Cycle Assessment, wastewater reclamation, hydroponic cultivation, Apulia.

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Introduction

The pomegranate is one of the oldest fruits known to man whose origin is uncertain although, according to the famous Russian phytogeography, Nikolaj Vavilov, it should come from an area between Asia Minor, Trans-Caucasian Asia, Iran and the high peaks of Turkmenistan (Holland, Hatib and Bar-Ya'akov, 2009). From that region over the centuries thanks to trade routes, it has spread throughout the world. Currently has been re-evaluated thanks to scientific studies on its nutritional and medicinal properties. According to the most widespread botanical classification, the pomegranate belongs to the order of Myrtales and to the family of Lythraceae. The Punica genus is commonly divided into three species: *Punica granatum* L. and *P. protopunica Balf.* F. and *P. nana* L. (Khadivi et al., 2020). Punica granatum is the species cultivated for agricultural and commercial purposes. Generally, fruit is consumed directly as a fresh product as well as fresh juice. However, recently, an increasing demand for processed products such as, alcoholic drinks, juices, jams, dehydrated seeds, and extracts from its different parts of the plants, is starts worldwide. The intraspecific variability is very high: more than 500 subspecies of pomegranate have been counted in the world. Nevertheless, the main cultivars now widespread in the world thanks to their agronomic and

organoleptic characteristics of the fruit are the 'Wonderful' of American origin, and “Mollar de Elche”, native of Spain (Tinebra et al., 2021). From a commercial point of view, the pomegranate fruits are divided into three types mainly based on the taste, such as: sweet, bitter-sweet and acidic. The consistency of the seed is also an important characteristic, which the sweet varieties, with softer seeds, are the ones most in demand on the market (Melgarejo Moreno et al., 1999). Thanks to its nutritional characteristics, the pomegranate fruit can be considered a functional food since it can have a positive effect on the health consumer. Therefore, the pomegranate tree and its fruit are considered as a kind of "natural pharmacy", from which numerous medicinal products can be obtained. Indeed, studies have shown that different parts of the plant, including the flowers, have therapeutic activities to treat cancer, dysentery, diabetes, liver or blood circulation problems (Rana and Ingrao, 2014). Regarding the agronomic characteristic, pomegranate is a rustic tree, which grows in soils poor in nutrients, although it prefers deep soils rich in organic matter and fresh. It does not tolerate soils with a high quantity of clay and heavy ones, because pomegranate is subject to water stagnation and root asphyxia. From a climactic point of view, the pomegranate prefers temperate-warm and subtropical climates. Moreover, although pomegranate is a tree resistant to long periods of drought, commercial production requires an intensive irrigation scheme, which prevents principally the fruit splitting and improves the yield of fruits. In the last fifteen years, the production and consumption of pomegranates has increased considerably on a global scale. Two factors have mainly influenced this phenomenon: a) the greater dissemination of information among consumers on the healthy properties of the fruit b) the development of new varieties, which are more productive and with better organoleptic characteristics of the fruit. In 2021 the world surface dedicated to the cultivation of pomegranate trees is more than 300,000 hectares and in terms of volume, the industry produced a total of 3.0 million tons, up from 2.8 million tons in 2020. The leading producers globally are India and China followed by Iran, Turkey, Afghanistan, the US, Iraq, Pakistan, Syria and Spain. In 2021 the global pomegranate fruit market was valued at USD 24.8 Billion and is expected to reach USD 33.86 Billion by 2026 (APEDA, 2021; Skyquest, 2022).

Review of the scientific literature

Introduced in the seventies as a scientific methodology suitable for comparing the environmental performance of different packaging systems (PET bottles, glass, and aluminum cans), LCA (Life Cycle Assessment) became widespread in the eighties and nineties (Heijungs and Guinée, 1992; Guinèe, 2002) as an analytical environmental management tool applicable to any process, product or service "system" to identify its relative load and environmental impact. The standardization of the methodology with the standards of the ISO 14044 series, based on the guidelines drawn up by SETAC (Society of Environmental Toxicology and Chemistry) has further increased its diffusion and scientific value by eliminating the subjectivity character which was the main criticism leveled at the instrument. About LCA used for the analysis of the environmental impacts of urban wastewater treatment systems there is a large literature on the subject: Roeleveld since 1997 pointed out the critical most impacting phases in classical wastewater treatment plants in The Netherland, as pollution discharge in the effluent and sludge production (Roeleveld et al., 1997). Tillmam et al. (Tillman, Svingby and Lundstròm, 1998) performed a comparative life cycle assessment of two alternatives in municipal planning treatment of wastewater: the existing waste water treatment (classical mechanical, biological and chemical treatment phases) was compared with the first one consisting of pretreatment, anaerobic digestion or drying of the solid fraction and treatment of the liquid fraction in sand filter beds and the second one consisting on urine used as fertilizer, faeces digested or dried, before used in agriculture and grey water treated in filter beds all out of the buildings; in both the alternatives the total environmental impacts of the alternatives was lower with respect to the traditional scenario. Lundin et al., investigated the existing conventional wastewater treatment system with one in which urine is handled separately and the one in which black water is treated in a liquid composting process: the separation alternative system demonstrate lower emissions to water and more efficient recycling of nutrients Nitrogen and phosphorous to agriculture, avoiding the production mineral fertilizers (Lundin, Bengtsson and Molander, 2000). Particularly relevant for this study the conclusions of Kärrman and Jönsson who demonstrated the irrigation of energy forest with biologically treated wastewater was the best option to reduce discharges of nitrogen, cadmium, lead, and mercury to water, to improve recycling of nitrogen and phosphorus to arable land and to limit flows of heavy metals to arable land (Kärrman and Jönsson, 2001). Iterative procedures were performed to assess the environmental sustainability of an urban water system and to empirically define the most important indicators for the system being studied (Lundin and Morrison, 2002), combination of anaerobic digestion and agricultural land application were the most environmentally friendly wastewater sludge treatments scenario (Suh and Rousseaux, 2002). The reuse of treated wastewater for agricultural purposes and the choice of the best environmental friendly disinfection technology (UV

disinfection, membrane filtration, and heat drying) has been studied (Tchobanoglous et al., 2002) as the cost criteria for selection of the best municipal wastewater treatment systems (Tsagarakis, et al., 2003; Tsagarakis, et al., 2000). Two most impacting categories were eutrophication (pollutant load at the watercourse discharge, mainly NH_3, PO_4) and terrestrial ecotoxicity (emissions to soil of Cr, Hg and Zn, when the sludge is used for agricultural application), (Hospido, et al., 2004). LCA methodology has been also applied in strategic planning of large complex systems composed of water supply and wastewater treatment of a large urban area like Sidney (Lundie, Peters and Beavis, 2004), California (Stokes and Horvath, 2006) and Walloon Region (Belgium) (Renzoni and Germain, 2007), Galicia (Spain) (Gallego, Hospido, Moreira and Feijoo, 2008). The effects of impact assessment methods in wastewater treatment LCA were investigated resulting in good agreement between CML 2000, Eco Indicator 99, EDIP 96, EPS and Ecopoints 97 except for human toxicity, as large discrepancies resulted among the impact assessment methods utilized (Renou et al., 2008).

Research methodology

The methodology applied in this work is the Product Life Cycle Assessment (LCA), standardized by the standards of the ISO 14000 series (ISO 14040, 2006; ISO 14044, 2006) capable of providing useful indications in the case of Life Cycle Engineering. For the realization of the LCA study, the LCA OpenLCA open-source software and the Ecoinvent 3.7 database were used (Giungato et al., 2021; Giungato et al., 2023). To achieve this final objective, the research activity was divided into three implementation objectives: Definition of the aims and scope of investigation, Inventory analysis, Evaluation of the environmental impacts of the analyzed systems, Interpretation of the results. The purpose of this case study is to analyze the environmental benefits of the irrigation reuse of urban wastewater for pomegranate irrigation, in particular to establish which is the most suitable choice from an environmental point of view for irrigation. The following scenarios were considered: Scenario 1: fertirrigation reuse after tertiary treatment of effluents from a primary and secondary urban waste treatment plant, which provides for an integrated treatment of disinfection using UV and sodium hypochlorite combined with flocculation in an accumulation and treatment tank. Scenario 2: it is a scenario in which there is no reclamation of treated urban wastewater but fertirrigation takes place by direct pumping powered by the electricity grid in wells around the area. Primary data relative to the inventory analysis of the reclamation process, the UV lamps were from previous works (Apisitpuvakul, et al., 2008; Giungato and Guinèe, 2010). The construction and dismantling impact of the plant were considered negligible with respect to the use phase according to literature in similar cases (Pillay, Friedrich and Buckley, 2002). Functional unit of the system is the provision of 1,000 m^3 of water for irrigation which complies with limits stated for reusing of the water, provided from an accumulation basin, in which a sedimentation process, followed by UV and sodium Hypochlorite disinfection, useful to reduce the bacteria concentration of E. coli from values 1,000 to less than 10 UFC (Unity Forming Colony) is performed. CML 2001 baseline characterisation factors were used (Guinèe, 2002) for nine relevant impact categories. In the traditional scenario, groundwater was pumped from a deep of the well 70 m, energy consumed was 1,3 kWh/m^3. For the reclaimed water scenario primary treatment consisted of a coagulation and flocculation of suspended solid particles, followed by sedimentation and a post treatment with sodium hypochlorite and UV irradiation, depending on the bacterial content of the influent. Chemicals for flocculation (Akifloc) were modeled from secondary data of hydrochloric acid and aluminum hydroxide reactions as NaClO, from the Ecoinvent 3.7 database).

Results and discussion

As depicted in figure 1, in all the impact categories considered in this study, the reclaimed water performs better with respect to water extracted from a well by a pumping station. This suggests the use of fertirrigation using reclaimed water will be always the best option to consider in reducing the environmental impact of the cultivation. In all the impact categories the most impacting process is the production of electricity by the Italian energy mix.

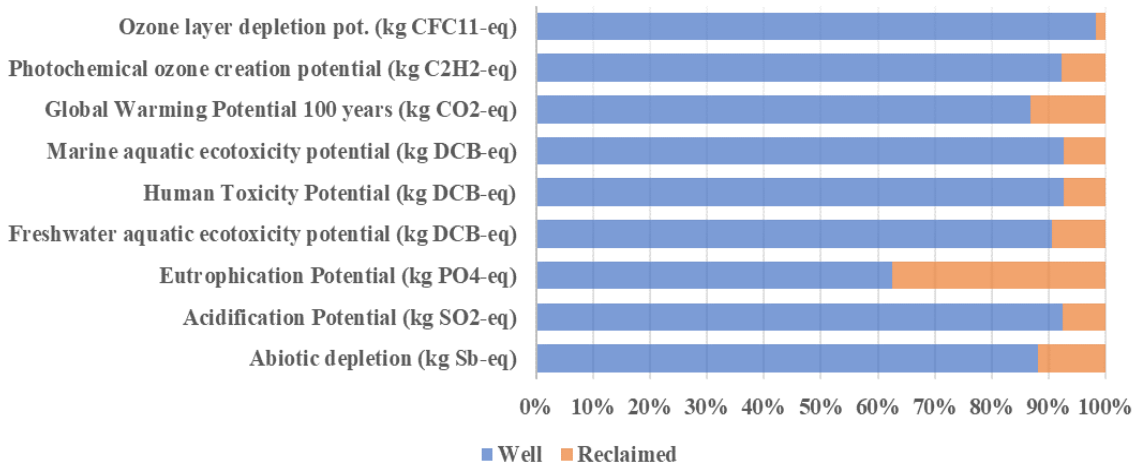


Figure no. 1. Results of the Life Cycle Impact assessment of the comparative LCA, between irrigation from well and reclaimed water, per functional unit

Strategies for the reuse of reclaimed urban wastewater, in addition to being aimed at recovering a natural resource allowing for savings, in an area particularly subject to drought phenomena and saline intrusion, also allow to exploit the nutrient content by avoiding the consumption of mineral extraction or synthetic fertilizers. The objective of evaluating the nutritional efficiency of this resource was achieved by comparing 3 treatment scenarios:

a) Irrigation with conventional water and fertilization capable of satisfying 100% of the expected nutritional requirements;

b) Irrigation with refined urban waste water and fertilization capable of satisfying 100% of the expected nutritional requirements;

c) Irrigation with refined urban waste water and fertilization capable of satisfying 50% of the expected nutritional requirements.

Each year, the plants subjected to treatments a) and b) received 70 g of N, 60 g of K_2O and 80 g of P_2O_5 (equivalence per hectare: 84 kg of N, 72 kg of K_2O and 96 kg of P_2O_5); the plants receiving fewer units of fertilizer (treatment c) received 35g of N, 30g of K_2O and 40 g of P_2O_5 (equivalence per hectare: 42 kg of N, 36 kg of K_2O and 48 kg of P_2O_5). From the data in table 1, in which concentration of nutrients were reported, excluding nitrites which are in negligible concentrations, it is possible to calculate the N and P_2O_5 content added in scenario c), shown in table 2. The environmental advantage that can be obtained from the use of reclaimed wastewater with advanced tertiary treatment is represented by the avoided impact for the production of 9.25 g of nitrogen from nitrogenous fertilizers and 4.76 g of PO_4^{3-} from phosphate fertilizers. This value converted to P_2O_5 with the conversion factor (0.7473) gives the value of 3.56 g. Instead of being industrially synthesized or extracted from mines, with high energy consumption, these nutrients are supplied directly from purified wastewater, treated with advanced tertiary treatments (flocculation and disinfection). However, fertirrigation of pomegranate using reclaimed wastewater and a reduced quantity of fertilizers, does not satisfy the nutrient provided in the scenario (a) and (b) and this represents the main issue of this solution. The fertilizer quantities supplied with the wastewater added to those of scenario (c) result in a lower value in nitrogen and P_2O_5 compared to the traditional scenarios. The irrigation with reclaimed wastewater and traditional fertilization capable of satisfying 100% of the expected nutritional requirements, were the best possible options, reduction of the fertilization will result in a corresponding reduction of nutrients and will reduce yield per hectare of the crops.

Table no. 1. Chemical-physical characteristics of the water: Fresh Water, FW; Reclaimed Water, RW, used during the experimental test, mean and standard deviation of pH, electrical conductivity and concentration of the main ions and elements

	FW		RW	
	Mean	**Standard dev.**	**Mean**	**Standard dev.**
pH	7.20	0.34	6.83	0.41
El. Cond. (µS/cm)	503.20	66.40	1563.10	258.78
B (mg/L)	0.11	0.01	0.13	0.03
Ca (mg/L)	33.42	5.68	75.33	6.55
Cu (mg/L)	<0.01	-	0.22	0.16
Fe (mg/L)	0.01	-	0.17	0.09
K (mg/L)	10.39	1.34	25.10	4.93
Mg (mg/L)	14.08	1.74	25.07	4.45
Mn (mg/L)	0.13	0.01	0.24	0.04
Na (mg/L)	47.71	5.45	187.85	38.55
P (mg/L)	<0.1	-	2.57	1.27
Zn (mg/L)	0.02	0.01	0.87	0.70
F^- (mg/L)	0.35	0.04	0.26	0.03
Cl^- (mg/L)	47.48	5.15	282.06	59.48
NO_2^- (mg/L)	<0.1	-	<0.1	-
Br^- (mg/L)	0.10	0.01	0.87	0.22
NO^{3-} (mg/L)	1.66	0.42	43.42	43.51
PO_4^{3-} (mg/L)	<0.1	-	5.05	2.81
SO_4^{2-} (mg/L)	59.93	6.82	335.79	95.05

Table no. 2. Average nutrient ion concentration (mg/L), liters administered, g of nitrogen and PO_4^{3-} of the reused waters in scenario (c)

Nutrient	Mean conc. (mg/L)	Volume (L)	g N or PO_4^{3-} in the Reclaimed Water
N as NO_3^-	43.42	943	9.25
P as PO_4^{3-}	5.05	943	4.76

Conclusions

Reclaimed wastewater is of increasing importance in the circular economy strategy both at the national and regional level, as an abundant usable resource for irrigation or industrial purposes. Moreover, interesting autochthonous cultivations like pomegranate are gaining share in the niche market of consumers paying

attention to a healthy way of life. Fertirrigation of pomegranate with reclaimed water coming from a urban wastewater treatment system, is an interesting challenge, provided an assessment of the environmental impact of different scenarios were made. In the present paper the objective of evaluating the environmental impact of this resource was achieved by comparing a scenario of fertirrigation with reclaimed water and a scenario of irrigation with traditional groundwater extracted from a well. On the other hand, the objective of evaluating the nutritional efficiency of this resource was achieved by comparing 3 treatment scenarios: a- Irrigation with conventional water and fertilization capable of satisfying 100% of the expected nutritional requirements; b- Irrigation with refined urban waste water and fertilization capable of satisfying 100% of the expected nutritional requirements; c- Irrigation with refined urban waste water and fertilization capable of satisfying 50% of the expected nutritional requirements. Findings of LCA indicate the reclaimed wastewater scenario as the lowest impacting due to the huge electricity consumption for the pumping system of the traditional irrigation infrastructure of pomegranate. Fertirrigation of pomegranate using reclaimed wastewater and reduction of fertilization does not satisfy the nutrient needs, resulting in a decrease of the yield per hectare of the cultivation. The application of the principles of the circular economy in this case has been successful in preserving water as a natural resource but the fertirrigation of pomegranate or other crops, with the reclaimed wastewater, do not satisfy the nutrients needs of the crop. The importance of the proposed research relies in the provision to the stakeholders, of a reliable decision support system, capable of point out the pros and cons of the applicative choices of the principle of circular economy. The most important limitations of this proposal, reside in the need to have accurate data and in a wide time interval sometimes incompatible with the timing of political decisions. Possible applications and extensions of the research will be the choice of sustainable supplement to the reclaimed water to support the provision of nutrients necessary to achieve the same yield per hectare obtained in the traditional scenario of irrigation with both conventional groundwater and fertilization. This supplement should be commensurate to the reclaimed wastewater nutrient content.

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Change Management in the Context of Digital Transformation: A Comparison Between a Theoretical Model and Successful Approaches in Organizations

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Abstract

The COVID pandemic has accelerated the digital transformation (DT) in organizations. Given that organizations with high digital maturity enjoy better financial outcomes than their competitors, budgets for digital transformation have recently increased significantly. This article provides a narrative review of the change management (CM) practices that have proven successful in the context of DT in comparison to the theoretical CM models, with three purposes: firstly, to validate the most effective CM practices for DT, secondly, to identify existing, but unemployed theoretical CM practices that could benefit DT and thirdly, to enhance the field of CM with new tactics that have proven successful in DT. Given the rapid pace of DT during COVID, the organizational change has been done ad-hoc and often without structure or analysis. This paper compares DT and CM theory and practice for the first time in the context of COVID. The findings show that leadership support, engaging people managers, creating change agent networks, efficient communication, training, as well as change reinforcement lead to better DT outcomes. DT could employ more of the tactics suggested by the CM theory in the areas of communication, coaching of people managers, leveraging change agent networks, assessing organizational change readiness and resistance management tactics. CM could adopt new tactics regarding participation of employees, collaboration with external partners and attracting outside talent. Both could benefit from more emphasis on organization culture. The findings represent a good foundation of best practices for DT and for developing a CM model that applies specifically to DT.

Keywords

Digital transformation, change management, change management model, digital culture.

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Introduction

Since 2019, the COVID pandemic has caused an acceleration of the digital transformation (DT) in organizations of all sizes, maturities, profit or equity structures (Subramaniam et al., 2021) by as much as 3 to 4 years, according to the McKinsey Global Survey with executives (2020). DT may have had a defined beginning, but in a so-called VUCA environment, characterized by volatility, uncertainty, complexity, and ambiguity, there is no end in sight. Organizations are and will continue to be forced to go through continuous digital transformation in order to survive (Hartl, 2019; Mergel, Edelmann and Haug, 2019).

More than mere survival and staying afloat, DT represents an opportunity of revival, upgrade, progress and reinvention, by better utilizing current, as well as tapping into unexplored market shares, engaging with new customer groups, and confidently ending the collaboration with the less or not profitable ones. DT has the potential to challenge and support organizations in creating self-sustaining change, with durable influence on technological, organizational, cultural, as well as social aspects (Dunleavy et al., 2006).

Last, but not least, successful DT promises better financial outcomes, as research shows that digirati, i.e. companies with high digital maturity, enjoy higher market shares, revenue and profit than their competitors (Fitzgerald et al., 2014). Thus, companies have significantly increased the budgets allocated to digital

transformation (McKinsey, 2020), striving to make best use of the associated opportunities. Consequently, the questions arise: how well did organization manage their DT, what were their outcomes and what could they do better in the future? Even though these questions are present, there is little literature providing guidance on how to manage the change that is DT (Mergel, Edelmann and Haug, 2019).

DT can only be realized through well-managed transformational activities. The best change management (CM) approach is contextual and must be adapted to each situation. The roadmap to DT is created of each time a different combination of CM activities. There is no one-size-fits-all. Despite this complexity, there is little emphasis on CM for DT (Osmundsen, Iden and Bygstad, 2018).

This paper provides a literature review of the CM approaches that have proven successful in the context of DT, then creates a parallel with the theoretical CM models, to identify similarities and differences, as well as missed opportunities on both sides, highlighting both the shortcoming of the existing CM models and ways in which organizations undergoing digital transformation could leverage the theory more. The article will provide firstly an overview of the scientific literature on DT and how it is different than other types of changes, as well as on change management models, with emphasis on Hiatt's ADKAR model (2006). It will proceed to explain the methodological approach, followed by a results and discussion section, which highlights the outcomes of the comparison between the CM approach used in DT practice and the CM theorical models. Finally, the conclusions summarize findings and gives suggestions for further research.

1. Review of the scientific literature

Digital transformation (DT) implies both the obvious aspects of using of digital technologies, creating new applications, migrating to the cloud or integrating artificial intelligence and machine learning (Gong and Ribiere, 2021), as well as strategy alignment and must involve people, culture, mindset, talent development and leadership (Goran, LaBerge and Srinivasan, 2017). On top of the contributions of digitization and digitalization, DT additionally emphasizes the cultural, organizational, and relational changes (Mergel, Edelmann and Haug, 2019), such as innovative interaction and collaboration (Shaughnessy, 2018). More than just being IT's responsibility, DT involves all areas of an organization, meaning processes, policies, people and leadership support (Mergel, Edelmann and Haug, 2019). This makes DT a special kind of change. The main differences between conventional change and DT lie in the following characteristics:

- Continuity: DT is not a fixed, linear, limited-in-time endeavor, but an iterative process, needing constant readjustment (Mergel, Edelmann and Haug, 2019), challenging organizations to be flexible; because of VUCA and the rapid technological advances, DT is a process without a foreseeable ending in sight.

- Speed: The fast pace of DT allows for little planning (Bharadwaj et al., 2013), requiring responsiveness, rapid action and decision making.

- Technology centricity: Technology, with its incremental, respectively radical changes, whether emerging from within or outside the organization, predictable or not, dictates the cadence of DT.

- Culture: DT has a strong relationship to organizational culture, which can be both a barrier and an enabler for DT (Gong and Ribiere, 2021); their impact is reciprocal: organizational culture influences DT and, conversely, DT influences organizational culture; culture also acts as determinant of the appropriate CM approach (Gürkan and Çiftci, 2020)

- Participation: Impacted groups are involved in and co-create the change (Hartl, 2019), being empowered to contribute with ideas, actions and decisions; this is seen as a central aspect of DT's success.

- Collaboration, both internal and external: DT requires openness to collaborating with internal stakeholders, as well as customers (Goran, LaBerge and Srinivasan, 2017), but also with other parties, such as start-ups, for leveraging as much knowledge as possible in the VUCA environment (Hartl and Hess, 2017)

- Scale and scope: DT affects all aspects of the organization, being not only a technological shift, but a transformation of processes, policies and procedures, people with their workflows and behaviors, mindset and culture, and needs involvement from the whole organization, not only top to bottom (Kotter, 2010), but also bottom-up, as well as leveraging of external parties.

These characteristics challenge organizations and CM practitioners to adjust, improve, even revolutionize their approaches to meet its requirements and lead to successful outcomes. As DT does not happen by accident (Buvat et al., 2017), CM tactics must be employed to reach and exceed the desired results.

Organizational changes, whether it be changes in processes, workflows, technology or organizational structure, have high chances of failing, if the population needing to undergo and live with the change is not

onboard. CM is the people side of change (Hiatt and Creasey, 2003), which ensures the buy-in of the impacted groups in the change endeavor, making sure they have the right information, motivation, knowledge, skills and support systems in place to make the change stick.

Hiatt defines following aspects of CM:

- Sponsorship, i.e. leadership buy-in, continuous support of the change and acting as faces of the change.
- Communication, i.e. informing timely, extensively and exhaustively about the changes, its impacts and the roadmap from the current state to the desired future state.
- Training, i.e. ensuring the impacted group have the knowledge, skills and practical ability to function and be successful in the reality of the change.
- Coaching, i.e. guiding managers in becoming role-models and addressing issues and concerns arising from employees impacted by the change throughout the whole change process.
- Change agents, i.e. creating networks of champions or ambassadors to advocate for the changes and providing accessible support to impacted groups in dealing with the challenges of the change.
- Change readiness, i.e. the openness and availability of impacted groups to undergo a change at a certain point in time, as well as ways to increase the level of openness.
- Resistance management, i.e. anticipating and addressing points of resistance to the proposed change.
- Reinforcement and feedback, i.e. sustaining the change, and turning change into second nature.
- Culture, newly, due to its influences on people's mindset, behaviors and responses to change.

Hiatt's CM model is based on the ADKAR sequence, stating that every individual goes through 5 stages of change, irrespective of the nature of that respective change: Awareness of the need for change, Desire to engage with the change, Knowledge to on how to change, Ability to implement skills and behaviors and Reinforcement to sustain the change (Hiatt, 2006). CM provides the tactics to use at each respective stage for the change to unfold successfully and reach its desired outcomes. This paper will further analyze how these CM concepts have been employed in DT, and how theory and practice can enhance each other.

2. Research methodology

The methodological approach consisted in a narrative literature review and critical analysis of various articles predominantly available on Google Scholar and published in the last 10 years. The pool of data has been gathered through extensive searches over the Internet of web pages and articles with the help of following keywords: digital transformation, change management, change management models, organizational culture, digital culture. The article have been reviewed from the perspective of the CM practices used in the context of DT and how the identified CM approaches overlap with existing CM theory.

Firstly, the present literature review emphasizes the importance of DT and how it represents a change. Secondly, it defines CM and describes its concepts from a theoretical perspective, based on established CM models, with focus on Hiatt's CM model, based on ADKAR (Hiatt and Creasey, 2003; Hiatt, 2006). It then gathers all the CM practices that have proven successful in the context of DT. Fourthly, the paper identifies overlaps, differences and missed opportunities between practice and theory. Lastly, suggestions are made for further research that could enhance the current knowledge of CM and DT.

3. Results and discussion

The analysis has drawn similarities and differences between how change management theory suggests to handle change and how DT was realized in practice. Moreover, potential opportunities have been identified that can enrich the field of change management, as well as provide additional best practices for DT. Table 1 provides an overview of the practices employed in organizations during DT. The identified similarities between DT in practice and CM theory are the following:

- Leadership: CM states that the single most important success factor of any change is Sponsorship; similarly, DT places leadership support in the top of its practices; Leadership is expected to be fully committed, align the organization's strategy to DT, provide a clear vision for and act as faces of DT.

• People managers: CM and DT agree on the importance of people managers, as being in close contact with the impacted groups; they are expected to act as role-models walking-the-talk of the change, empowering them to address impacted groups' concerns, managing their reactions to change, as well as keeping them up-to-date with the progress of the change and actively involving them in the change.

• Communication: CM and DT see the seamless flow of, unobstructed access to and constant sharing of information between stakeholders from top to bottom and up again, as well as creating a sense of urgency around the change as critical to the success of DT.

• Training: CM and DT put high emphasis on ensuring that the necessary knowledge, skills and abilities are provided to the impacted groups and identified a multitude of means and tactics for realizing it.

• Change agents: Setting up a network of champions or ambassadors is seem as a valid tactic in both CM and DT; they are expected to advocate for the change, be the go-to people at arm's-length inside of each department or unit for questions and support regarding the change, communicate feedback and signalize issues from the field, as well as play and active role in the sustainment of the change.

• Reinforcement: DT and CM agree on the sustainment tactics, such as having a reward system in place, celebrating successes, connecting performance to desires behaviors of DT and creating feedback loops.

• Individual change: CM and DT align on the fact that the impacted groups need to be onboard with the change, for it to be realized successfully; they need to understand the need for change, desire it, thus changing their mindset, behaviors and responses, for ultimately to live the change as second nature.

Table no. 1. Successful Change Management Approaches in the Context of Digital Transformation

Concept	Successful Change Management for Digital Transformation	Authors
Leadership/ Sponsorship	**Success factors:**	
	Committed leadership	McKinsey, 2020
	Alignment of strategy and leadership	Gong & Ribiere, 2021
	Leadership to change fundamentally	Mergel et al., 2019
	Leadership vision leading to convincing of employees	Fitzgerald et al., 2014
	Motivation & commitment of stakeholders	Zaoui & Souissi, 2020
	Risks:	
	Lack of senior support	Gong & Ribiere, 2021
	Lack of vision, support and unclear business case	Fitzgerald et al., 2014
	Best practices:	
	Leadership providing clear vision and guidance	Zaoui & Souissi, 2020
	Leadership to articulate vision and act as roles models	McKinsey, 2020
	Decision made at the top	Hartl, 2019
	Leaders to receive, disseminate and act upon information speedily	McKinsey, 2020
Coaching/ People Managers	**Success factors:**	
	Engaging managers	Osmundsen, 2018
	Acting as role-models and embody the changes	Wokurka et al., 2017
	Actively involvement of employees in transformation	Osmundsen, 2018
	Risks:	
	Management not empowered to be a catalyst leading to failure	Buvat et al., 2017
	Best practices:	
	Train the trainer for managers on their role	Goran et al., 2017
	Agile trainings	Goran et al., 2017
	Workshops with managers	Wokurka et al., 2017
	Coaching for dealing with own and team's emotions during change	Wokurka et al., 2017
	Addressing conflicts, discrepancies, uncertainty and power struggles	Osmundsen, 2018
Communication Awareness (first A from AKDAR) Creating a sense of urgency (Kotter)	**Success factors:**	
	Information and communication	Hartl, 2019
	Digital transformation portrayed as critical	Fitzgerald et al., 2014
	Internal and external information sharing	Hartl & Hess, 2017
	Risks:	
	Internal silos	McKinsey, 2020
	No sense of urgency	Fitzgerald et al., 2014
	Best practices:	
	Giving more context to employees	Goran et al., 2017
	Creating a sense of urgency	Hartl, 2019
	Reach out to employees	Buvat et al., 2017
	Global information and information sessions	Wokurka et al., 2017

Involvement of Employees/ Desire (D from ADKAR)	**Success factors:** Participation: Change decisively shaped by employees Employees engaged with changes and reduced hierarchy **Risks:** Change conceptualized by small group and rolled out to organization Non-democratic decision making **Best practices:** Establishing feedback loops Open, non-hierarchical discussion Involving employees in decision making Engaging and integrating employees in co-design of the change	 Hartl, 2019 Osmundsen, 2018 Hartl, 2019 Hartl & Hess, 2017 Gürkan & Çiftci, 2020 Hartl & Hess, 2017 Goran et al., 2017 Mergel et al., 2019
Individual Change/ Desire (D from ADKAR)	**Success factors:** People to change mindset and support digital transformation Employees to adapt fast during radical changes, Alignment of […] people, mindset and information access Employee motivation, cooperation & acceptance of DT Concern for people **Risks:** Attitude of old workers as risk Gap between employees and leadership leading Different stakeholders are at different stages in their change curve Feelings of uncertainty, loss or resistance **Best practices:** Employees empowered to take on new challenges Clear business cases of impacted population	 Mergel et al., 2019 McKinsey, 2020 Gong & Ribiere, 2021 Gürkan & Çiftci, 2020 Hartl & Hess, 2017 Fitzgerald et al., 2014 Buvat et al., 2017 Kübler & Kessler, 2005 Wokurka et al., 2017 Buvat et al., 2017 Halpern et al., 2021
Training; Knowledge and Ability (K and second A from ADKAR)	**Success factors:** Building skills Change in competencies, cognitive abilities, technological perceptions Learning and failure tolerance Knowledge exchange and enhancements Growing information system capabilities and dynamic capabilities **Best practices:** Employees compensated for learning; investment in digital skills Job rotations, lunch & learn, network events, post-mortems	 Zaoui & Souissi, 2020 Mergel et al., 2019 McKinsey, 2020 Hartl, 2019 Osmundsen, 2018 Buvat et al., 2017 Hartl, 2019
Retaining & Hiring Talent: Ability (Second A from ADKAR)	**Success factors:** Alignment of […] talent development Attracting and retaining digital talent Filling gaps of cutting edge technology skills Leveraging external and internal knowledge **Risks:** Lack of talent **Best practices:** HR processes such as talent management in place Outside hires from start-ups or established digital natives Mergers & acquisitions, customers, start-ups, other business units	 Gong & Ribiere, 2021 Wokurka et al., 2017 McKinsey, 2020 Osmundsen, 2018 Gong & Ribiere, 2021 Wokurka et al., 2017 Goran et al., 2017 Osmundsen, 2018
Champions/ Ability (2nd A ADKAR)	**Best practices:** Creating coalitions of the willing or change ambassadors Deploying change agents	 Hartl, 2019 Buvat et al., 2017
Sustainment & Rewards Reinforcement/ (R from ADKAR)	**Success factors:** Lasting change through reinforcement **Best practices:** Feedback loops in place Awards and recognition, personal advancement, financial incentives Employees incentivized to break new ground and build new models HR processes: performance management and reward systems	 Mergel et al., 2019 Mergel et al., 2019 Fitzgerald et al., 2014 Buvat et al., 2017 Wokurka et al., 2017
Organizational Culture, Change Readiness & Resistance to Change	**Success factors:** Change in bureaucratic and organizational culture Culture of experimentation, innovation, responsiveness & fast action Culture as enabler or barrier Organizational culture to update or change Supportive organizational culture Openness to change **Risks:** High risk aversion Lack of change readiness Resistance to new approaches	 Mergel et al., 2019 McKinsey, 2020 Gong & Ribiere, 2021 Gürkan & Çiftci, 2020 Osmundsen, 2018 Hartl & Hess, 2017 Gong & Ribiere, 2021 Halpern et al., 2021 Fitzgerald et al., 2014)

	Best practices: Assessment of existing and definition of desired culture	Hartl, 2019
Internal & External Collaboration; Customer Orientation	**Success factors:** Reducing silos internally Removing barriers to collaboration Cooperation Allowing joint business-IT initiatives Customer focus and customer change management **Best practices:** Collaboration with start-ups and other external partners Collaboration of organization and customers in co-creation of change Teamwork, cross-functional collaboration Readiness for cooperation with partners Micro-units, visible and transparent work, social interaction	 Goran et al., 2017 Goran et al., 2017 Hartl & Hess, 2017 Wokurka et al., 2017 Goran et al., 2017 Hartl, 2019 Mergel et al., 2019 Hartl & Hess, 2017 Hartl & Hess, 2017 Shaughnessy, 2018
Data & Key Performance Indicators (KPIs)	**Success factors:** Ensure and leverage analytics skills within companies Successfully managed data-related risks **Risks:** Lack of data Lack of data **Best practices:** Defining KPIs Adjusting KPIs to meet organizational goals Designing KPIs based on behaviors, not failures or successes	 McKinsey, 2020 McKinsey, 2020 Goran et al., 2017 Fitzgerald et al., 2014 Fitzgerald et al., 2014 Buvat et al., 2017 Buvat et al., 2017
Infrastructure as Support: Physical Space, Processes & Technology	**Success factors:** Process and policies, not IT, to support change Infrastructure for experimenting & innovating **Risks:** Inflexible, well-established policy systems Lack of IT infrastructure and business processes too rigid Legacy technology **Best practices:** Use of more advanced technology Use for digital technologies to drive change Architecture: open spaces, areas for brainstorming, etc. Reshaping organizational structure to suit demand	 Mergel et al., 2019 McKinsey, 2020 Dunleavy et al., 2006 Goran et al., 2017 Fitzgerald et al., 2014 McKinsey, 2020 Hartl, 2019 Hartl, 2019 Gürkan & Çiftci, 2020
Incremental vs. Radical; Continuous vs. Scoped Change	**Success factors:** Change as continuous process needing iterative adjustments Change as environment, not a point in time Breaking out of project mindset **Risks:** Change as a project with clear boundaries of time, scope, resources Innovation fatigue **Best practices:** Starting with planned approach, constantly adapting and evolving it Agile framework Pilot projects: First movers in experimenting with new technology	 Mergel et al., 2019 Dunleavy et al., 2006 Shaughnessy, 2018 Hartl, 2019 Fitzgerald et al., 2014 Hartl, 2019 Shaughnessy, 2018 McKinsey, 2020

The identified opportunities for a more successful DT by employing CM practices are presented below:

- Communication tactics: CM provides DT with guidelines for the definition of the right channels, target groups, key-messaging, for how and when sponsors and people managers should communicate, as well as for planning effective communication campaigns to elicit the desired results.

- Coaching of people managers: Few organizations undergoing DT truly provide coaching for their people managers to be successful in their critical role; CM provides extensive tactics and support on how to guide, empower and accompany them to becoming valuable tools for the realization of the change throughout the whole process.

- Change agents networks: Similarly agreed upon by both CM and DT, however CM offers a clear, structured and proven body of knowledge on how to set-up ambassadors' programs, to increase success rate and utilization of their potential and providing valuable support in the realization of the change; change agents can be instrumental in the context of continuous change.

- Resistance management tactics: Same as above, CM encompasses tactics to address, as well as effectively use resistance of impacted groups and turn it into information, adjustments to the change approaches.

• ADKAR and individual change: CM sees change as the sum of the individual changes which is powerful mindset when setting up a plan; each individual goes through the change differently, passing through each ADKAR phase at their own pace, needing more or less time and potentially different CM tactics; CM ensures that the CM plan takes everybody along, not only the individuals that are technically inclined, risk-friendly and are open to change, but also the less technically-savvy, risk-adverse and less change open.

• Change Readiness: CM provides a valuable tool for assessing the individuals' change readiness at different points in time in their ADKAR stages; even though DT is very fast-paced and allows for little adaptation to change, assessing the readiness provides great insight on which tactics to use with priority based on the impacted groups most immediate needs.

The identified opportunities for CM evolvement, to better support DT in the future:

• Involvement of employees: DT provides practical and effective ways for the participation of the impacted groups in the creation of the change; even CM alludes to it as a nice-to-have, DT goes all the way, leveraging the knowledge, experience and ideas of the individuals that are closest to the organization's products or services.

• Retaining and hiring talent: While CM focuses on developing and enhancing the skills mainly through training, DT adapted to hiring the necessary talent, due to time constraints and lack of the necessary skills within the organization; this infuse of talent is a highly efficient tactic.

• Collaboration: DT leverages all the knowledge it has access to and creates new partnership, both internally, i.e. fostering collaboration between employees, business units, IT and business, management and front-line, and externally, with customers, competitors, allies, start-ups, etc.

• Infrastructure as support: DT provides valuable suggestions on how to leverage office architecture, technology and processes to support DT which can be powerful additional tools for CM.

• Continuous change: DT see change as iterative and continuous, given the pace at which technology evolves; CM needs to adapt its models to accommodate for an environment where not only one or a limited number of change are taking place, but where changes succeeding rapidly and unexpectedly.

Opportunities for both CM and DT to reach increased positive outcomes:

• Data and KPIs: Organizations setting up KPIs and leveraging their data have proven more successful, however both CM and DT would benefit from setting up CM related data sets and KPI collections; better KPIs and data lead to better insights of gaps, effectiveness of CM measures and informed decision making.

• Organizational culture: Both DT and CM see culture as an essential factor for change; culture can either facilitate or impede change, however it is hard to change and changes at a different pace than DT is realized; DT and CM have only recently turned their focus towards the critical role of culture.

Conclusions

This paper has provided an overview of the CM practices that have proven successful in the context of DT and compared them to Hiatt's CM theoretical model, highlighting the similarities and differences. Being the first study to do this, it validates the most effective practices, gives suggestions of how DT can be realized more successfully through available CM practices, as well as how the theory of CM can be enhanced through the successful DT practices. It thus enhances both the fields of DT and CM.

Given that the narrative analysis only permitted a broader analysis of existing literature, more in-depth research is needed to identify the most effective CM measures and their effects on DC, as well as the most important aspects of DC that facilitate DT. An effective CM model would ideally handle both at the same time, allowing DT to enable a digital culture and vice-versa. The aim would be to create an organizational environment where change is seen as a given, a state of fact and equip companies to deal efficiently, with less effort and more success, with any type or number of changes in the VUCA environment.

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Factors Impacting SMES' Business Sustainability Post-COVID-19 in Bucharest, Romania, from the Perspective of Resilience

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Abstract

Organizations are undergoing continuous transformations, either due to technological innovation, sustainability practices, various crises (financial crisis, Covid-19), the war in Ukraine, accompanied by changes in regulations specific to each country or required by the pressures of climate change or globalization, so SMEs are constantly faced with problems of various kinds that require an up-to-date assessment of the business, especially when the threats are unpredictable. To stay in business, companies, and consequently their leaders, must adapt and survive with agility when faced with unforeseen or turbulent changes. The general objective is to identify the level of resilience reflected in the corporate sustainability of SMEs in Bucharest in order to strengthen organizational success factors. The study focuses on several resilience factors: leadership, organizational networks and change orientation and the extent to which they impact the business sustainability of SMEs in Bucharest, Romania, in the post COVID-19 period. The method of study is quantitative research in order to achieve the highest level of objectivity, using systematic measurements and statistical analysis. The investigation revealed that of the three structural components, change orientation has the greatest impact on corporate sustainability, followed by organizational networks and leadership. The added value of this study for academia is that the data was collected in Bucharest, Romania, with the aim of contributing to the long-term sustainability of organizations from a resilience perspective. The study is aimed at managers of Romanian SMEs to achieve the sustainability of their company.

Keywords

Resilience; business sustainability; leadership; organizational networks; change orientation; SMEs.

DOI: 10.24818/BASIQ/2023/09/080

Introduction

Organizational resilience in the context of sustainability is being researched worldwide (Heredia et al., 2022). The general objective of this article is to identify the level of resilience reflected in the corporate sustainability of SMEs in Bucharest in order to strengthen the organizational success factors. Therefore, the following questions will be answered:

- To what extent does leadership as a factor of resilience influence the business sustainability of Bucharest's small and medium-sized enterprises?
- To what extent do organizational networks as a factor of resilience influence the business sustainability of Bucharest's small and medium-sized enterprises?

● To what extent does change orientation as a factor of resilience influence business sustainability of Bucharest's small and medium-sized enterprises?

A resilient company has the capacity for positive transformations in the face of unexpected crises that allows it to survive in the long term by defining the relationship between resilient business variables that can be associated with customers, suppliers, government, competitors, and its own personnel. This makes the present study relevant, since the company is part of the economy and its resilience impacts the resilience of an entire market, as it is directly related to its sector. A resilient company increases its knowledge of the vulnerabilities that can affect its performance, improves the quality of its managers' decisions, and helps them succeed in times of crisis (McManus et al., 2007). This research is based on the model of McManus et al. (2007), who belong to the Resilient Organizations research group, an institution that involves a team of researchers from New Zealand, in particular from the University of Canterbury and the University of Auckland, who have implemented their model in organizations, delivering results that confirm the presence of the resilience variable with the indicators that are part of the study and that are analyzed below.

The concept of business resilience is analyzed from a threefold perspective: resilient leadership, organizational networks, and change orientation as factors in business resilience, while corporate sustainability is also discussed from three perspectives: the economic, the social, and the environmental dimensions.

1. Review of the scientific literature

Both scholars and practitioners have become interested in recent years in business resilience and its' relation to sustainability, demonstrating the need to expand the body of knowledge on these topics. The analysis proposed in this research addresses organizational resilience, a concept that can be defined as "the ability to deal with challenging conditions by ensuring the existence and prosperity of the organization" (Aldianto et al., 2021, p.2). Therefore, organizational resilience is a form of situational awareness, vulnerability management, and recovery that organizations must exert against unexpected change to demonstrate their ability to absorb that change while maintaining their functionality in the marketplace and thus ensure the success of the organization. To survive in turbulent times, in an increasingly complex environment, while encountering unpredictable events, SMEs must "proactively adapt to internal and external shocks" (Conz et al., 2017, p. 2). Thus, the focus of the analysis is on the ability to prevent negative consequences, the ability to prevent negative consequences from worsening, and the ability to recover from negative consequences. In this context, several aspects are mentioned in the literature: the ability of an organization to improvise and respond quickly and effectively to abrupt changes, case in which, it could come out even strengthened, which explains that, when organizations are resilient, they can continue to face adversity and unexpected changes, justifying the relationship between resilient factors and long-term corporate sustainability, variables that are examined in this research. The concept of business resilience is analyzed from a threefold perspective: resilient leadership, organizational networks, and change orientation (see Figure no. 1).

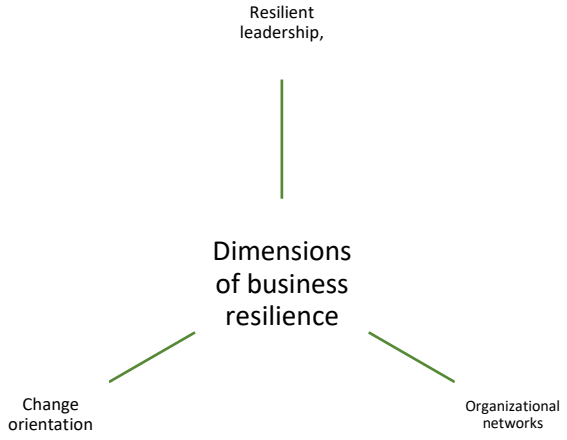


Figure no. 1. Dimensions of the business resilience variable
Source: Elkington, 1994

According to Vito et al. (2023), "leaders are coping with multiple challenges during the COVID -19 pandemic, and both individual and organizational resilience are critical to successfully manage this turbulent change" (p. 1). Several studies conclude that the level of resilience of the members of an organization is crucial for coping with crises (Lombardi, Cunha & Giustiniano, 2021; Prieto & Talukder, 2023), which includes the professional development of individuals and, consequently, their achievements or personal goals and well-being, up to the achievement of leadership positions (Charoensap-Kelly et al., 2021). Indeed, sustainable leaders can "allow a fast, resilient response which is competitive and appealing to all stakeholders" (Gerard et al., 2017, p. 116). The leader influences the behavior of his or her subordinates and consequently impacts the performance of the organization (Singh et al., 2023). The purpose of the study is not to determine what type of leadership organizations have, but rather whether innovation, creativity, and employee involvement are present and whether they are proactive in recognizing the changing situations within the organization. The purpose is to identify the values and principles of those companies that are still in the market thanks to timely decision making as one of the resilient factors, where leadership is an important component for the sustainability of the company, being the driving force of the organization to achieve the planned goals, being able to create and innovate together with their work group (Batool et al., 2022) and making decisions in times of unexpected changes in the organization.

The organizational networks are another factor in business resilience, especially in today's environment characterized by volatile market conditions that confront companies with constant change (Crick & Bentley, 2020). To deal with these phenomena, the company must be tolerant to change and demonstrate its ability to survive in the market. To do this, it is necessary to develop indicators of capabilities, create systems for labor relations, interdepartmental communication, as well as business relationships that allow employees to cope with unexpected changes while achieving the planned results (Kunz & Sonnenholzner, 2023). When organizational networks are confronted with the above situations, the consequences are evident in the performance of companies, manifested in changes in sales, production, and customer service, hence the urgency to develop resilience as a business protection tool. This allows the organization to continuously improve its ability to adapt and recover by redesigning its processes so that its suppliers and communication with its internal and external customers are in line with its objectives. The organizational network dimension contributes to improving the relationship between internal and external, as well as improving relationships with customers, suppliers, and others, using technology for effective communication, and others (Xie et al., 2022). Therefore, this dimension is an important tool for achieving long-term sustainability.

Change orientation is composed of organizational planning, a proactive attitude, and planning strategies (Prayag et al., 2023; Bastas & Garza-Reyes, 2022). Organizational planning is based on three components: self-motivation, which consists of making employees feel that they can effectively perform their assigned tasks according to organizational needs; adaptability, understood as the ability to recognize and respond effectively to changes in the organizational environment; and creativity, which is possible in an open organizational climate and causes the emergence of imaginative and practical alternatives to solve problems in the organization (Brennan et al., 2023).The proactive orientation consists of a personal and joint response to the internal and external demands of the company, so that it allows anticipating upcoming events and having the express will to face them. Moreover, it consists of two key elements: planned behavior and objective perception. The planning strategies are developed through: the objectives, which must be consistent with those of the company and expressed in a clear, systematic and understandable way to all members of the organization; the policies, which determine the behavior of action accepted in the company and which must be assumed by all members to generate institutional commitment and discipline; and the procedures for management, which refer to how to deal with changes in the business environment.

The concept of sustainability in business promotes social inclusion, optimizing the use of natural resources and reducing the impact on the environment, with the aim of protecting the planet for its future generations, without losing the economic and financial orientation of the company, which together create value for business stakeholders and provide a greater opportunity for long-term business continuity. The dimensions of the sustainability variables can be found in Figure no. 2 below.

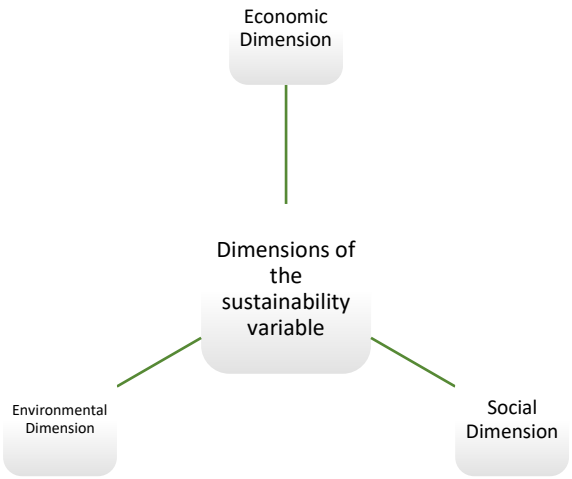


Figure no. 2. Dimensions of the sustainability variable

Source: Elkington, J. 1994

Sustainable development in a company contributes to responsible management by delivering economic, social, and environmental benefits simultaneously (Elkington, 1994), which is currently known as the Triple Bottom Line or Triple P, where the 3 P's stand for People, Planet, and Profit (Lariviere & Smit, 2022).

2. Research methodology

To carry out this research, a quantitative investigation was conducted to achieve the highest level of objectivity, making systematic measurements and using statistical analysis. The research aims to determine the relationship between two variables: business resilience (independent variable) and business sustainability (dependent variable). The first variable takes two values: High resilience and Low resilience, while the second variable also assumes two values: High business sustainability and Low business sustainability. For the resilience variable, an interview questionnaire and checklist table were used, while for sustainability, a Likert-type questionnaire was used that includes components of the variables.

The sample studied consists of 283 SMEs, with the sample used being made up of 163 companies. A response rate of 58% was obtained. Statistical software, SPSS 24, was used, with the results converted into charts using Microsoft Excel program. The general hypotheses are:

- H1 (Alternative Hypothesis): There is an impact of resilience on business sustainability of SMEs in Romania.
- H0 (The Null Hypothesis): There is no impact of resilience on business sustainability of SMEs in Romania.

3. Results and discussion

Using the SPSS24 computer program the results of the resilience variable were analyzed, as well as the leadership dimensions, organizational networks, and change perspective. The results are presented in Figure no. 3:

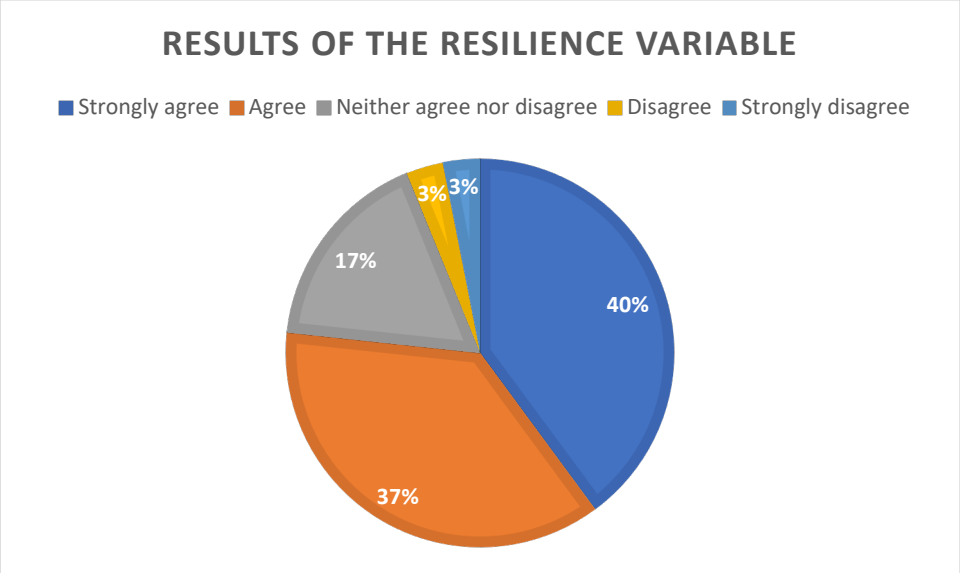


Figure no. 3. The results of the resilience variable

Source: author's research

77% of the respondents indicated that they "strongly agree" and "agree" as shown in Figure no. 3, which means that the independent variable resilience is necessary for stable management and therefore valid for the objective of the present study. 17% chose "neither agree nor disagree", while only 6% chose "disagree" and "strongly disagree".

The overall result of the business sustainability variable resulting from the survey applied and processed with the SPSS24 computer program, which includes the economic, social and environmental dimensions, corresponds to Figure no. 4:

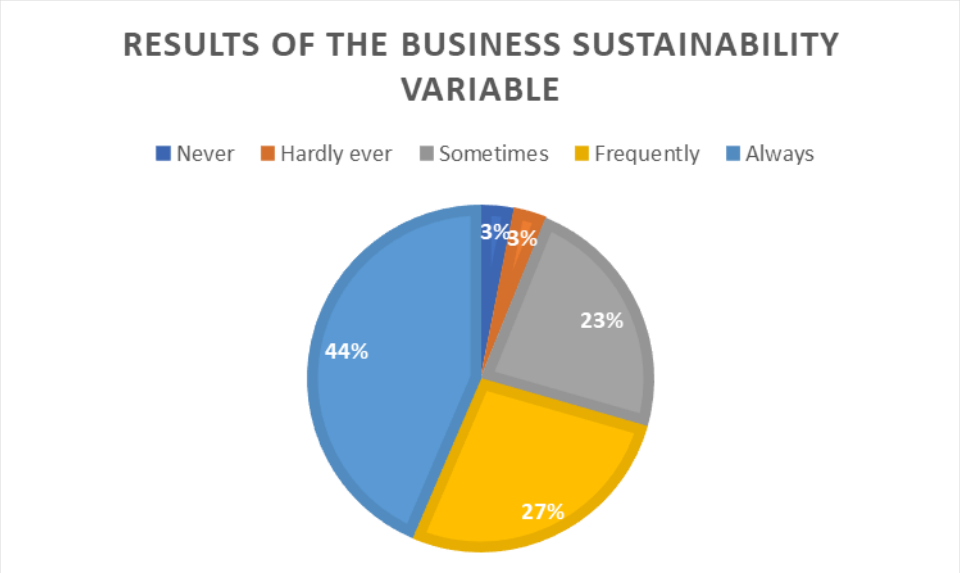


Figure no. 4. The results of the business sustainability variable

Source: author's research

According to the results, 71% of the respondents selected "frequently" and "always" as shown in Figure no. 4, consequently, the dependent variable business sustainability is acknowledged as an expected outcome of management and is therefore relevant to the purpose of this study. In addition, 26% of the respondents selected "sometimes" and "almost never", while only 3% selected "never".

Table no. 1 presents the results of testing the general hypothesis: (HS1) There is a degree of impact of resilience on the business sustainability of SMEs in Romania. The non-parametric technique of Spearman correlation coefficient was used, which is a statistical test that allows measuring the correlation or association of two variables and is applicable when the measurements are made on an ordinal scale, as it is the case in this investigation.

Table no. 1. Correlations of the variables (dependent and independent)

Correlations

			RESILIENCE	BUSINESS SUSTAINABILITY
Kendall tau_b	RESILIENCE	correlation coefficient	1,000	,952
		Sig.(2-tailed)		,000
		N.	163	163
	SUSTAINABILITY BUSINESS	correlation coefficient	,952	1,000
		Sig.(2-tailed)	,000	
		N.	163	163
Spearman's Rho	RESILIENCE	correlation coefficient	1,000	.962
		Sig. (2-tailed)		,000
		N.	163	163
	SUSTAINABILITY BUSINESS	correlation coefficient	.962	1,000
		Sig. (2-tailed)	,000	
		N.	163	163

Source: Author's research

Spearman's Rho correlation coefficient is 0.962, a very high positive correlation, p-value= 0.000. Highly significant differences are also found ($p < 0.05$) when comparing the scores of the 46 items in the relevant variables. As a result, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted.

Conclusions

Resilience has a significant impact on the business sustainability of SMEs in Bucharest, Romania (Spearman's Rho (correlation coefficient) 0.962 **, indicating a highly significant and strong positive correlation between the variables). There is a direct and significant correlation of 96.2%. This means that as resilience scores increase, business sustainability also increases and vice versa.

The present study and its results can be used by managers of small and medium enterprises, both in Bucharest and in Romania in general, as a tool for continuous support in improving their business management. Moreover, they will be able to understand and situate the concept of resilience as a factor of change in order to maintain the strengths of their companies even in critical situations.

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Liberalisation of Competition and Stimulation of the Economy by Granting State Aid in the Republic of Moldova

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Abstract

The European integration process has fostered the continuous advancement of economic relations with the EU, necessitating the modernization of domestic legislation through alignment with EU regulations, particularly in the realm of competition within the agro-food sector. The liberalization of competition is a positive catalyst for product diversification, consumer welfare, economic growth, and overall quality of life. The paper aims to assess the level of harmonization between national regulations governing the agri-food market and European regulations. The research entails the analysis of local legislation in the food sector, relevant scholarly works, and reports from the Competition Office. The findings indicate that the food industry and retail food trade are economic activities that require the elimination of anti-competitive barriers and the promotion of free competition. Furthermore, the provision of state aid to public companies must adhere to competition rules and avoid detrimental effects on the functioning of the market's supply and demand mechanism. In addition, the study aims to provide valuable insights into the challenges and opportunities associated with the harmonization process. By examining the effectiveness of existing regulatory frameworks and identifying areas for improvement, this research contributes to the ongoing discussions on promoting fair competition and enhancing market efficiency in the agri-food sector. The findings of this study will inform policymakers, industry stakeholders, and researchers, enabling them to make informed decisions and develop strategies that foster a competitive and sustainable agri-food market in line with European standards. It is important to note that this research represents a preliminary analysis of competition in the agro-food chain, with further exploration planned as part of the doctoral training program.

Keywords:

Competition, Republic of Moldova, State aid, European Union, Association Agreement.

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Introduction

The increase in economic relations between the European Union and the Republic of Moldova has a beneficial effect on the prosperity of the national economy. The implementation of the provisions outlined in the association agreement will foster a transformative environment in both domestic and international trade, leading to the advancement of the national economy and encouraging competition among economic entities in the local and global markets, particularly in terms of economic relations within the neighbouring regions.

The essential feature of the market economy is competition, which, together with supply and demand, is a defining variable of the market. In general, competition is both a confrontation and a cooperation between economic agents to obtain better conditions for producing, selling, and purchasing services and consumer goods. Critical incidents in the food chain, such as COVID-19 or the Russia-Ukraine war, should not disrupt the proper functioning of the market and fair competition, without state intervention (Stanciu, 2022).

In his work, the economist Gabriel I. Nastase notes competition as a phenomenon between economic agents participating in the market, changing their behavior to some extent under the conditions of exchange (Nastase, 2021).

With the liberalization of the exchange market, the role of the free market mechanism in regulating competitive economic processes has increased, contributing to the development of the national economy and eradicating the shadow economy in specific sectors. Competition generally ensures that producers, profits, and consumers meet their needs. By competing, the autonomous producers specialized in producing materials, goods, and services aim for increased profit. At the same time, the consumers choose for their quality and utility at an affordable price.

Therefore, both external and internal competition play a crucial role in the economy, but it is essential to have well-defined rules and policies in place that are guided by the government at both national and international levels to ensure its proper functioning.

Material and methods

Clarivate, SCOPUS and ResearchGate, Reports of the Competition Council, European Commission Communications, Government of Republic of Moldova, Constitution of the Republic of Moldova regulations, as well as other official institutions at both the European and national levels were used for documentation.

Public information from statistical databases and scientific information from the Google Scholar platform were also utilized. The collected data were processed using tabular methods and statistical indicators.

The results were compared with scientific papers for validation.

Regulatory competition rules

The free exercise of competition generates competitiveness, encompassing the competitive environment, which consists of various elements such as the number of market producers/suppliers and consumers, the variety of goods and services, market organization, state intervention in the economy, and the presence of a legislative framework that plays a crucial role in a market economy (European Union EU, 2012). Competition policy is influenced by multiple factors that can alter the behavior of market participants, including consumers and producers (figure 1).

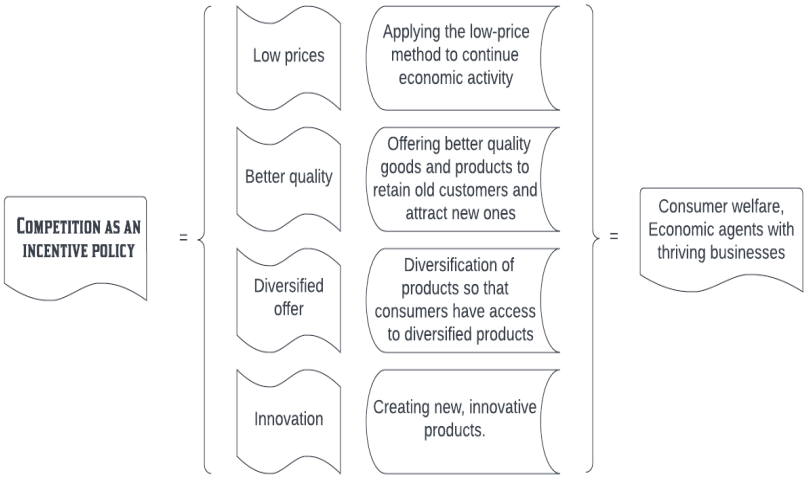


Figure no. 1. Factors of competition influence
Source: Author, by using Competition Council (2023)

In the context of industry globalization, market participants are compelled to adopt contemporary and inventive strategies to sustain their financial interactions between producers and consumers, while upholding the principle of fair competition, thereby minimizing the need for intervention by the competition authority in the Republic of Moldova (Munteanu Pila and Stanciu, 2019).

The role and objectives of the Competition Authority are intricately interconnected and governed by the regulatory framework of the Republic of Moldova (figure 2).

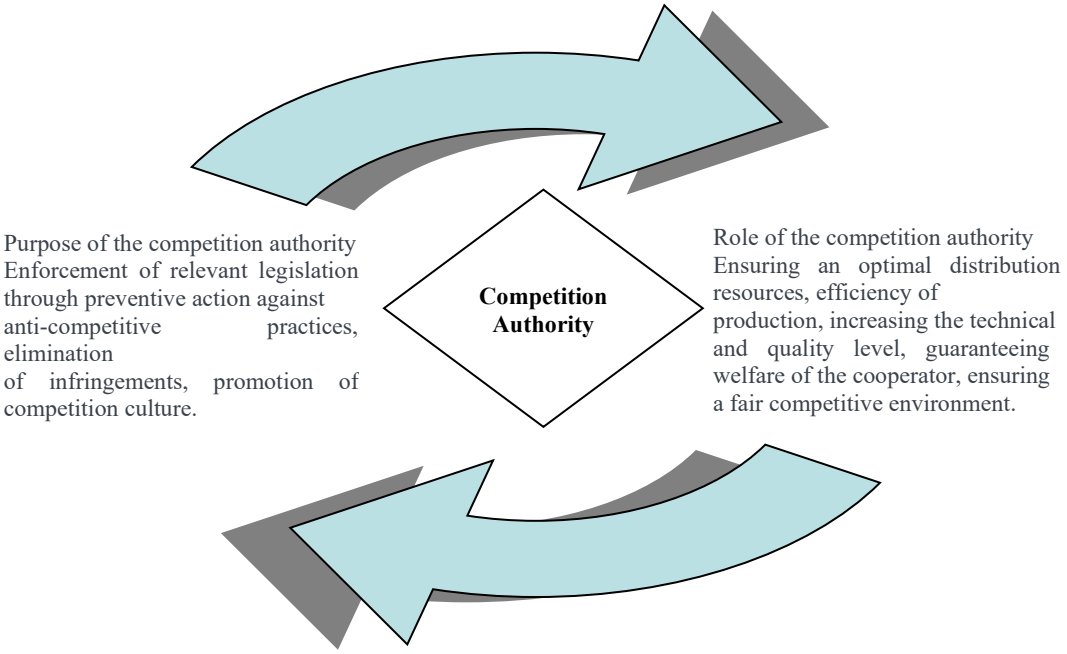


Figure no. 2. Role and Purpose of the Competition Authority
Source: Author, by using Competition Council (2023)

The functions of competition as a whole include several factors such as stimulating the creative spirit, encouraging initiatives in production, practice, and modernization of outdated industries, promoting the development of innovative products and new services, favouring price and cost reduction, and contributing to the improvement of services and products.

Competition regulates the correlation between supply and demand and is only possible if economic operators have the freedom to determine prices within an appropriate legal framework that regulates market activity between consumers and producers/suppliers (Smith, 1776; Treinin, 1908).

Maxim (2010) deduces three main tasks that underpin excellent economic governance, namely sustainable economic growth, which, according to the author, can occur without state intervention. However, for a more effective and risk-free result, direct or indirect intervention is necessary. The second task highlighted is the transformation of the country's economic system in the context of globalization, which involves implementing concrete measures in the economic field to create an efficient market economy and stimulate competition.

The third main task, according to the author, is to defend national interests in free trade relations at the international level. The need to regulate competitive activity has directly and indirectly influenced the development of a country's economy. In the Republic of Moldova, after declaring independence, the first notions directly related to a competitive economy appeared in normative acts such as the Constitution of the Republic of Moldova, which mentions the idea of the market as the place where supply and demand intersect, and fair competition. These factors are fundamental to the national economy (Government of Republic of Moldova, 1994). Similarly, Article 126 states that the market economy in the Republic of Moldova is based on free economic competition, and it imposes obligations on the state to regulate economic activity by issuing normative acts to protect fair competition. Assuming responsibility for creating conditions for a free market economy and sustainable development has paved the way for the ratification of the National Development Strategy "Moldova 2020" by the Parliament of the Republic of Moldova through Law 112 of 02.07.2014 (Government of Republic of Moldova, 1994).

This strategy aims to improve the business climate, optimize the legal framework for market growth, promote a culture of competition at the national and international levels, and build a new economic system based on fair market principles (Ghencea, Zanet and Stanciu, 2022).

The development of the principles of competition with globalization has also undergone some changes in the normative acts, thus in the period 2012-2014, the process of reforming the competitive actions in the legislative and institutional field took place in the Republic of Moldova, the reform denoting in the

continuous monitoring of the legislation on advertising, state aid, competition as a result of the application of the European Union's practice models, to liberalize on critical areas and sectors of the economy (Zanet and Stanciu, 2021).

The normative act that regulates competition activity in the Republic of Moldova is Competition Law no. 183 of 11.07.2012, which is guided by the principles of the European Union and harmonized with the rules in this field (European Parliament, 2014). This law facilitates the investigation of Competition Law violations, including the identification of cartel agreements.

In addition to the Competition Law, market regulation is also guided by Law 139/2012, which regulates state aid as a support measure and is an essential tool in state involvement to preserve competitive economic value. The state support defined by this law aims to maintain price competition in the typical environment. However, the granting of state aid can also have negative effects, as disparities created when granting state aid from public resources to certain entities may differ from the requirements of the European Union. Therefore, in specific sectors of the economy where support measures are granted, the activity of entities may be negatively affected, reducing their motivation to increase efficiency.

State aid can also affect supply and demand in the market, leading to trade conflicts and the disappearance of market entities that can no longer compete. These consequences arise when state aid is granted under suspicious conditions or is not regulated by law.

Table no.1 provides for state aid reported by the authorities as an amount explaining the State intervention to support different entities by adjusting for each objective to maintain fair competition on the market. This process is governed by Article 342 of the Association Agreement. From 2014 to 2015, there is an increase in State aid from 2,914,071 MDL to 4,968,921 MDL, indicating a significant growth in the amount of aid granted.

However, from 2015 to 2016, there is a decrease in State aid from 4,968,921 MDL to 2,693,170 MDL, showing a reduction in the amount of aid provided. In 2017, there is a further decline in State aid to 670,773 MDL, indicating a significant decrease compared to the previous years but in 2018, there is a slight increase in State aid to 968,346 MDL, showing a partial recovery from the low amount in 2017.These fluctuations in the amounts of State aid suggest variations in the allocation and distribution of aid over the years. There is a complex correlation between all the elements showed in table 1. For example, subsidies can directly impact the level of state aid, and they can lead to exemptions, reductions, or deferrals of taxes and duties. At the same time, grants and interest-bearing loans can contribute to stimulating supplier investments. Price reductions on goods and services can be a result of state aid or can be offered within specific contractual arrangements. Thus, all these aspects are interconnected and can influence how state aid is granted and utilized in the economy.

Table no. 1. State Aid (excluding SGEI) (thousands, MDL)

Value and structure of State aid by	**Year**				
form of a grant (except SGEI)	***2014***	***2015***	***2016***	***2017***	***2018***
Grants or subsidies	778030	524695	320438	426239	530601
Cancellation or assumption of debts/budgetary allocations	0	0	0	0	48917
Exemptions, reductions, deferrals of taxes and duties	2053516	3658068	2360521	230807	318182
Granting of interest-bearing loans	61338	755051	881	562	440
Granting of guarantees on preferential terms	5191	6568	6556	6365	1377
Supplier's investments, if the rate of return on these investments	0	0	0	0	30926
Price reductions on goods and services provided	15996	24539	4774	6800	37903
Total	2914071	4968921	2693170	670773	968346

Source: *Author, by using Competition Council (2023)*

There is a complex correlation between state aid, the GDP ratio in percentages, and state aid per capita. These measures are interconnected and can provide information about the effectiveness and distribution of state aid in the economy. The GDP ratio in percentages reflects the degree of dependence of the economy on state aid, while state aid per capita indicates the level of economic benefits that each individual receives as a result of receiving state subvention.

Table no. 2 provides the evolution of GDP growth from State aid intervention, including per capita growth. The decrease in GDP ratio in the years 2016, 2017, and 2018 may suggest a reduction in the economy's dependence on state aid and an increase in other sources of financing.

Table no. 2. State Aid (SGEI) (thousands, MDL)

State aid (SGEI)	Year				
	2014	**2015**	**2016**	**2017**	**2018**
Thousands, MDL	4484932	6052541	2904415	835836	1184201
Thousands, euro	240737	289595	131720	40127	59688
GDP ratio, %	4	4,94	1,81	0,47	0,62
State aid per head by inhabitant (MDL)	1261	1702	817	235	434
State aid per head by inhabitant, euro	68	81	37	11	22

Source: Author, by using Competition Council (2023)

It is important to note that a decrease in the GDP ratio does not necessarily indicate an absolute decline in GDP value or overall economic performance. It merely indicates a change in the proportion of state aid relative to GDP. From the given data, there is a significant variation in state aid per capita over the mentioned period. In 2015, the state aid per head was 81 euros, indicating a higher amount allocated to each individual in that year. However, in the following years, the state aid per capita decreased significantly, reaching 37 euros in 2016, only 11 euros in 2017, and returning to 22 euros in 2018.

However, it is important to conduct further analysis and consider additional factors to draw comprehensive conclusions. Factors such as the overall economic performance, specific sectors receiving state aid, and the effectiveness of the utilization of state aid can provide a more detailed understanding of the relationship between state aid, GDP ratio, and state aid per capita. In this context, state intervention through state aid, as reported for the period 2014-2018, is set out in the figure 3.

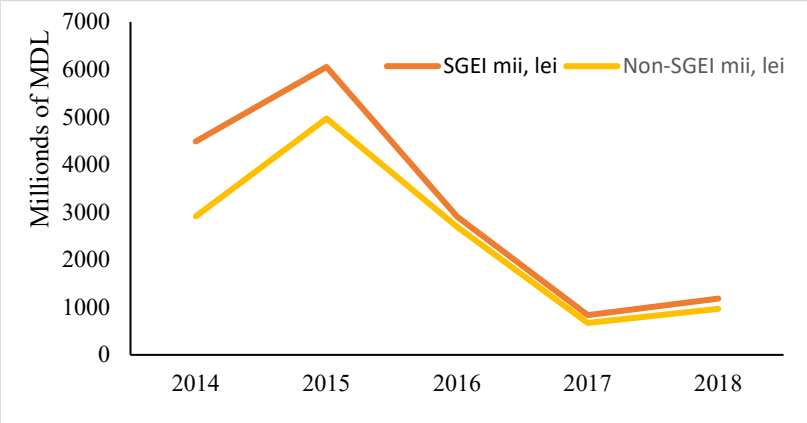


Figure no. 3. State aid in Republic of Moldova (2014-2018)
Source: Author, by using Competition Council (2023).

According to the data in Chart no.1, the state aid granted to entities under the State Aid Law noticed an increase in 2015 but decreased until 2018. In 2015, the state intervened massively in support of the business environment, boosting the large-scale development of the economy.

Services of General Economic Interest (SGEI) are essential public services that contribute to meeting the general needs of society and are considered to be of strategic importance for the well-being of citizens. These include services such as energy, transportation, water and sanitation, telecommunications, postal services. These services benefit from certain forms of state aid to ensure their adequate and accessible provision. Non-SGEI refers to sectors and services that are not considered Services of General Economic Interest and, therefore, are not eligible for specific forms of state aid intended for SGEIs. These include sectors and services such as trade, tourism, industry, financial services, which are based on competition and do not require the same level of state intervention as SGEIs.

The normative provisions stipulated in the National Development Program expressly define the form of granting support measures, monitoring and counteracting certain forms of state aid given abusively or illegally. State aid is given to economic entities required to be given according to priorities established for the common interest of society, a factor that would continuously stimulate the development of all key sectors of the economy such as energy, water and sewerage, public transport, etc., in all five regions of development of the Republic of Moldova.

Conclusions

Finally, competition plays a crucial role in the market as it fosters an environment of innovation, development, and product diversification, thereby contributing to the overall growth of the economy in present circumstances. Free and fair prices manifest the competitive form, the entities that practice economic activity having access to the free initiative being numerous; from a legal point of view, competition dictates the rules of the game in the agri-food market. Competition, a crucial instrument for regulating economic forces on the market, enables the consumer, the primary beneficiary of competition, to gain by giving economic operators competitive games on the market access to diversified products at low and qualitative prices. In the same vein, the granting and monitoring of State aid are beneficial for correcting market failure in specific economic development sectors, creating momentum in the economy's growth and increasing the population's well-being. In addition to its impact on the economy, competition has positive effects on innovation, product and service quality, operational efficiency, and technological advancement. Through competition, companies are motivated to constantly improve their offerings, leading to more efficient satisfaction of consumers' needs and preferences. Furthermore, competition stimulates investment and economic growth by creating a favourable environment for innovation and development. Through competition, companies are encouraged to invest in research and development, improve production processes, and adopt advanced technologies, resulting in increased productivity and the creation of new jobs. In conclusion, promoting and supporting healthy and fair competition in the market is a priority for government authorities. By adopting and implementing appropriate policies and regulations, a fair competitive environment can be ensured, benefiting both producers and consumers. This, in turn, can lead to sustainable economic development and an overall improvement in societal well-being. The study can be utilized by a diverse range of individuals and entities with an interest in the analyzed field. This may include researchers, academics, professionals in the economic sector, policymakers, governmental and non-governmental organizations, as well as other stakeholders in economic development and competition regulation in the Republic of Moldova.

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Travel and tourism resilience and sustainability challenges

Supply and Demand in Tourism Destinations in Romania. Pre and Post Pandemic Comparative Analysis

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Abstract

Tourism is considered one of the most dynamic sectors of the economy and is an essential element for countries that have significant tourism resources that can be exploited. The rational use of tourism resources is closely related to the increase in tourist flows and the number of accommodation establishments, i.e. tourism demand and tourism supply. The article deals with the relationship between tourist demand and tourist supply, using the example of destinations in Romania, and aims to identify destinations where there is a balance between accommodation units and overnight stays, and how to intervene to reduce the gaps between them. In this sense, quantitative methods such as Spearman and Kendall indicators were used to rank these destinations based on the statistical data provided by Tempo online during the period 2000-2021 for two periods 2000-2019 and 2019-2021. The research results show that highly specialized destinations are the most affected by seasonality. A solution to remedy this situation could come from Destination Management Organizations (DMOs). The study addresses the issue in a crucial period for tourism worldwide, not only in Romania, namely the period characterized by the pandemic COVID -19. Thus, both the period before the pandemic, when tourism reached its highest level, and the period after the pandemic, when a return to a normal situation, but marked by profound changes, is observed, are evaluated. The novelty of the article consists in the creation of a consolidated relationship between the destinations in Romania and the eight DMOs recently established in Romania, in order to allow a better management of the tourist activities.

Keywords

Supply and demand in tourism, tourism destination, Destination Management Organization (DMO), correlation.

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Introduction

Destinations represent complex situations, with a wide range of attractions and activities, with a variety of local tourism stakeholders, from the public, private and civil sectors, influencing the environmental and socio-economic resource base of the tourism sector (UNWTO, 2007a). Moreover, destinations are complex and adaptive systems, where the elements that make them up must be aligned toward a common goal that improves competitiveness (Rodríguez-Díaz and Espino-Rodríguez, 2019).

Tourism has a significant impact on the natural and human environment, but at the same time it leaves its mark on the well-being and culture of the host population. Depending on how tourism is managed and how developed it is, the impact can be positive or negative. Because tourism can play an important role in sustainable development, the World Tourism Organization (WTO) calls on all countries to ensure that their tourism development and management policies and measures take full account of sustainability

principles (UNWTO, 2007a). To ensure the long-term sustainability of tourism, effective plans and strategies are needed at all levels, especially at the local destination level where tourism activities take place. UNWTO (2007b) has developed a guide on indicators for sustainable development of tourism destinations to identify key aspects and indicators that can help managers make a destination viable and attractive. Destination management organizations (DMOs) play an important role in the sustainable management of destinations (Conaghan, Hanrahan, and McLoughlin, 2015). Despite their stated importance, the level of implementation lags significantly (Wagenseil, Wyss, and Huck, 2022). The crisis caused by the COVID -19 pandemic underscores the need for resilient and sustainable forms of tourism and thus represents a strategic goal in discussions about the sustainable future of tourism (UNWTO, 2020).

At the beginning of the 1990s, tourist destinations in Romania were oriented towards the source markets of the past, and the development of tourism was more influenced by local and regional initiatives. After 2000, several pilot tourism associations emerged in various Romanian destinations, trying to promote the offer on a competitive international market. Chașovschi (2019) describes the evolution of the Associations for the Promotion and Development of Tourism (APDTs), which became destination management organizations (DMOs), and identifies two important phases in the development of DMOs in Romania: the early phase from 1997 to 2007, characterized by the first steps in the development of DMOs, and the second phase after 2008, when the number of APDTs increased and a better understanding of the role of destination management emerged. In 2022, the Romanian government established eight regional DMOs (Guvernul Romaniei, 2022), which are linked to historical regions and not to existing destinations, so it is quite difficult to compare between them, as the criteria for establishment are different. There are major differences between these eight DMOs, both in terms of area and tourism characteristics.

Tourism is one of the economic sectors with a significant impact on the economy, and the natural tourist resources available on Romanian territory are a favorable factor for the development of tourist activities. The great diversity of landscapes and the human resources present on the territory of the country have led to highlighting several tourist destinations. Different variants of classification of destinations and their elements can be found in the literature, usually focusing on resources. The most appropriate approach to the issue of destinations includes four elements at the destination level: tourist attractions, facilities and services offered, access infrastructure, and destination image (Coroș, 2015). According to the data of the National Institute of Statistics, the following tourist destinations are delimited in Romania: Spas; Seaside, excluding Constanta town; Mountain resorts; Danube Delta area, including Tulcea town; Bucharest and county residence town, excluding Tulcea; Other localities and touristic routes. The tourist destinations in Romania, due to the high degree of specialization such as the resorts in the coastal or mountain areas, in some cases, large gaps between tourist demand and supply, a fact that leads to a degree of occupancy largely dependent on seasonality, while the destinations that are major urban centres, such as Bucharest and county residence town, excluding Tulcea, due to the more diversified demand, shows a low level of seasonality. Tourism is characterized by a highly localized production and a highly concentrated consumption of supply and demand (Carreras, 1995). The identification and evaluation of localization models of tourism supply and demand are essential to support the development of sustainable tourism (Popescu and Persu, 2022).

The aim of this work is to evaluate the situation of tourist demand and supply in tourist destinations in Romania, in order to find solutions to increase the occupancy rate of accommodation units over a longer period of time, reduce seasonality and attract tourists in less popular destinations. The results of this study will allow hotel managers to make better decisions, especially in the post-pandemic period when it is so important to revive tourism. The paper includes a brief review of the literature, followed by the presentation of the research methodology and results, and finally the conclusions.

Review of the scientific literature

A destination is a geographic area in which tourism plays a prominent role and in which the revenues generated by tourism have a significant impact on the economy. Destination management is a part of tourism management that involves managing all the different aspects of a destination. This includes accommodations, events, transportation, activities, environmental issues, and local resources. It can also include business premises, area controls, and land use planning (Perez, 2022). Accountability in tourism destinations is another topic (Pechlaner, Zacher, Eckert, and Petersik, 2019). Key aspects of management and responsibility in destination networks are presented and a contribution is made to a conceptual analy-

sis of the sustainability of tourism destinations based on a resilience-based approach. This contributes to a better understanding of resilience from a DMO perspective in the context of shared responsibility.

UNWTO defines DMO as the coordinated management of all elements that characterize a destination, such as: Attractions, facilities, access, marketing and tariffs (UNWTO, 2007a). Thus, DMO can be defined as a process of creating, directing and adjusting the factors that contribute to the creation of a destination's tourism product by a management team (Geić, 2010). Notarstefano (2008) considers the establishment of destination management organizations as a necessity to maintain a balance between the economic development of destinations, the preservation of tourism resources, and the increase of the living standards of the local population. Pike (2021) aims to provide a rationale for the DMO, develop a structure, roles, and objectives of the DMO, communicate a destination branding process, develop a philosophy of integrated marketing communications, lead to the emergence of visitor relationship management and with interested parties, and present options for performance measurement.

Although DMOs were theorized only after 2000, Morrison (2013) explains the fact that they exist all over the world in different forms, either as government departments or as quasi-ministerial structures, and can function at different levels (national, regional, local). The literature on destination management gained momentum after 2000, when about 98% of the papers were dedicated to DMOs, and after 2010, about 99.5% of the papers continued to deal with this topic (Negruşa and Coroş, 2016). The success of a destination is a combination of tangible elements (product, location, and accessibility) and less tangible elements (services and community experience). All of these factors determine the visitor experience. DMO managers can have a strong influence on the success of a destination. Negruşa and Coroş (2016) therefore explore how DMO activities can contribute to the competitiveness and success of destinations, examining the role of DMO and specific activities, but also the relationship between DMO success and destination success.

An analysis of available sources has shown that modern DMOs take a variety of legal and organizational forms, although the most common are public and private partnerships of a nonprofit nature. Thus, Borzyszkowski (2013) presents, first, the possible legal and organizational forms of DMOs and, second, their influence on the potential range of tasks and responsibilities of these organizations. Several studies highlight the importance of the interaction between the public and private sectors, where governmental and nongovernmental parties collaborate with regard to destination management (Roxas, Rivera, and Gutierrez, 2020). A fundamental but less considered aspect is the role and contribution of tourists to sustainability, in addition to the interaction of the different interested parties.

The impact of the COVID-19 pandemic is also visible in DMO (Fedyk et al., 2022). Drawing on lessons learned from the COVID-19 pandemic, Gowreesunkar, Maingi, and Micera (2021) present cases and competencies in their work to advance theoretical and empirical knowledge on post-pandemic destination management and propose new management solutions to develop the adaptive capacity of destinations and strengthen their resilience in the future. Guerreiro (2022) analyzes the way in which destination management can be a fundamental tool in the process of building a more inclusive, sustainable and competitive sector. On the other hand, Fedyk et al. (2022) identified the need to modify anti-crisis programs and/or expand them to include other forms of support that can be useful for DMOs.

The implementation of sustainable projects and measures is one of the most important tasks in destination management (Haid, Albrecht and Finkler, 2021), and the implementation processes are not linear or synchronous. As the tourism sector undergoes digital transformation, DMOs often struggle to adapt to the changing technological environment. Digital collaboration is critical for micro-DMOs as they are forced to transform their current websites into digital platforms that act as hubs where business stakeholders can actively participate. The study highlights three aspects of digital collaboration: Marketing, Networking and Knowledge Sharing, which require special attention (Zainal-Abidin, Scarles and Lundberg, 2023).

Research methodology

The analysis of tourist demand and supply of destinations in Romania covers a period of more than 20 years, starting from the year 2000, in order to observe in the long term how tourists' preferences change and whether the supply of tourist facilities follows the same trend, but also what is the impact of the different types of crises, especially on tourist demand. In addition, the authors try to better understand the impact of the pandemic crisis by performing a series of analyzes for 2019 compared to 2021, knowing that 2020 was completely atypical for economic and social activity in general, but especially for tourism activity, due to the pandemic. Based on the existing data on the Tempo online website, the analysis of tourism demand is carried out based on Arrivals of tourists accommodated in the structure of tourists

reception by tourist destinations and Staying overnight in the establishments of touristic reception by touristic destinations. For the supply, Establishments of touristic reception with functions of tourists accommodation by touristic destinations and Existing touristic accommodation capacity by touristic destinations are analyzed. For these indicators of tourist supply and demand, average indicators were calculated in absolute values (arithmetic mean and absolute average change) and in relative values (average dynamic index and average rate of development), and in the second part, correlations were made between demand and supply indicators to observe whether or not tourist demand influences tourist investment, more specifically whether new accommodation units are built at the destination level in accordance with tourists' preferences for specific destinations. The correlations were determined using the rank correlation coefficient (Spearman) and confirmed by calculating Kendall's correlation coefficient. According to Țițan (2003), the rank correlation or the association of ordinal variables means that the socio-economic variables (in our case, the tourist demand and tourist supply) measured on an ordinal scale are assigned a rank number (rank) to all units, so that they can be ordered according to the criteria studied (in our study, the criterion is the classification of the indicators of tourist demand and tourist supply in the tourist destinations in Romania). For conducting this research, the following hypotheses were established:

H1. The Covid 19 pandemic had a greater impact on the demand than on the supply in the tourist destinations;

H2. There is a strong correlation between the demand and supply indicators in the destinations.

Results and discussion

At the Romanian level, an almost constant increase in the number of tourists can be observed (Figure no. 1a.), from 4920129 people arriving in the tourist reception structures in 2000 to 9370232 tourists in 2021, with a maximum in 2019 (13374943 arrivals) and with two periods of decrease in the number of tourists, the first during the economic crisis of 2008-2010 and the second, much more drastic, in 2020, during the SARS-Cov 19 pandemic, when the number of tourists decreased by more than half compared to the previous year, reaching 6398642 people. Among the destinations, Bucharest and county residence town, excluding Tulcea, where the number of tourists increased during the analyzed period from 2237397 in 2000 to 3660935 tourists in 2021, with a maximum of 6275835 tourists in 2019 and a slight decrease during the economic crisis, when 2884121 tourists were reached in 2009, and a sharp decline in 2020, when, after the peak in 2019, reached 2359090 tourists. This is due to the fact that the above destination as a form of tourism predominantly overlaps with business tourism; there was also a disruption of many economic activities in this area during the economic crisis (2008-2010), but especially during the pandemic period (2020-2021). The least affected destination, but which also has the smallest share in the total number of tourists staying in accommodation establishments, is the Danube Delta area, including the city of Tulcea, which increased from 34,462 tourists in 2000 to 137,182 tourists in 2021, with very small fluctuations in 2009 and in 2020, as shown in Figure No. 1a. This destination is largely represented by the Danube Delta Biosphere Reserve, which means that tourist flows are largely controlled by protected areas legislation.

From Figure no. 1a. it can be seen that the smallest increase in the number of tourists was in the spa area (by 1.49%) and the largest increase was in the other places and tourist routes (by 7.10%). It is interesting to note that the number of accommodation establishments (Figure No. 2b.) for the destination "Other places and tourist routes" also increased by 7.10%, which shows an almost perfect match of supply with tourist demand in this destination and for the two indicators of tourist demand and supply.

According to Tempo Online data (2023), the number of tourists (Figure No. 1a.) arriving in tourist destinations in 2021 is 29.94% lower than in 2019; moreover, the number of overnight stays (Figure No. 1b.) in 2021 decreased by 30.75%, which means that the number of arrivals decreased much less than the number of overnight stays of tourists in lodging establishments. Instead, in 2021, the number of tourist reception structures (Figure No. 2b.) and tourist capacity (Figure No. 2a.) increased by 8.86% and 2.23%, respectively, which means that investments in small accommodation units continued. In fact, the demand, especially during the pandemic, went to small accommodation units, which seem to be safer, but also the tendency before the pandemic was to choose accommodation structures smaller and tailored to the needs of tourists, which justifies the continuation of investments in accommodation units also during the pandemic. Consequently, the increase in the number of lodging establishments in 2021 and the decrease in arrivals and overnight stays could be a direct consequence of the pandemic COVID-19 and its associated restrictions. In Romania, the tourism industry was severely affected by the travel restrictions, the decrease in tourism activities and the slowdown of the economy, which led to a significant decrease in the number of tourists visiting these destinations. The only measure taken by the authorities before the pandemic,

which resulted in a relatively smaller decrease in the case of Romanian tourists, was the vacation vouchers granted to those working in the state sector.

H1 is confirmed.

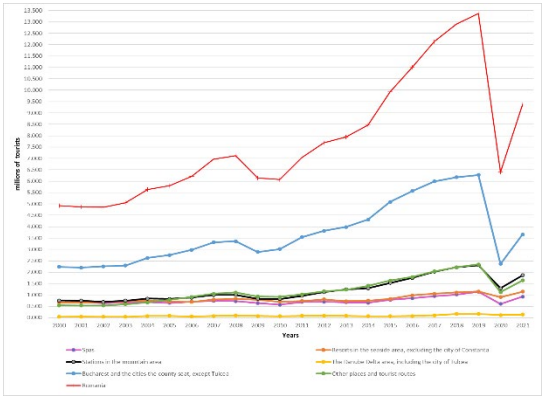


Figure No. 1a.

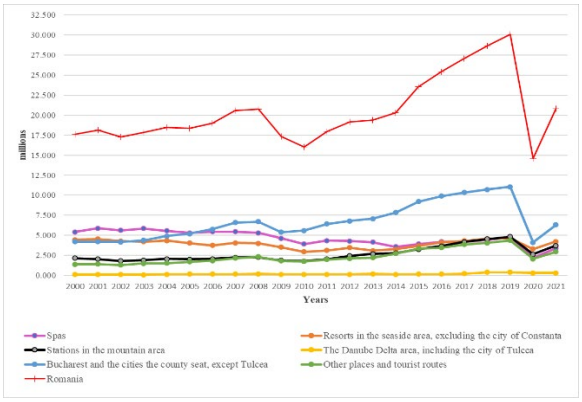


Figure No. 1b.

Evolution of demand: arrivals (1a) and overnight stays (1b) of tourists in tourist reception structures with accommodation function, in tourist destination areas, in the period 2000-2021

Source: prepared by the authors on the basis of data Tempo Online: Available at: <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table> [Accessed 20 March 2023].

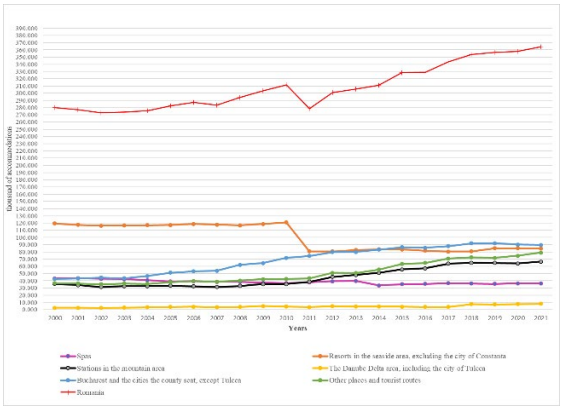


Figure No. 2a.

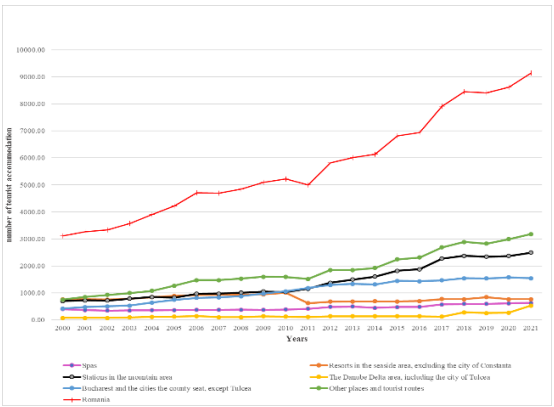


Figure No. 2b.

Development of supply: tourist capacities (2a) and tourist reception structures (2b) at destinations in the period 2000-2021

Source: prepared by the authors on the basis of data Tempo Online: Available at: <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table> [Accessed 20 March 2023].

The similarity of the ranks for the demand and supply indicators for 2019 and 2021 suggests that there is a relatively stable relationship between these two indicators before and after the pandemic. This may indicate that the factors affecting demand and supply in the tourism industry have not changed significantly between 2019 and 2021, at least in terms of the ranking of their importance. According to Table no. 1., the Danube Delta region, including the city of Tulcea, ranks 6th/6th in the four demand and supply indicators studied: arrivals and overnight stays, as well as the number of accommodation structures and accommodation capacity. At the top of the ranking, with position 1/6, are the resorts of the coastal area (excluding the city of Constanţa) for the demand indicators, arrivals and overnight stays, but also for one supply indicator, the accommodation capacity.

Spearman and Kendall correlation coefficients are statistical methods that measure the degree of association between two ordinal or rank variables. In other words, these correlation coefficients indicate the extent to which two variables move in the same direction with respect to their classification. Spearman and Kendall correlation coefficients are statistical methods for evaluating the relationship between two ordinal variables (Puth, Neuhäuser and Ruxton, 2015.). This means that the variables do not have to be measured in an exact numerical scale, but can be ranked or ordered. In our analysis, it is found that the value of Spearman correlation coefficient is between -1 and +1, which indicates a strong positive correlation between the number of arrivals and the number of accommodation units. This means that the number of arrivals increases with the number of lodging units and vice versa.

Table no. 1. Values of demand/supply indicator rankings for 2019-2021 for destinations

Destination							
Supply and demande indicators	**Rank**	**Spas**	**Seaside, excluding Constanta town**	**Mountain resorts**	**Danube Delta area, including Tulcea town**	**Bucharest and county residence town, excluding Tulcea**	**Other localities and touristic routes**
Arrivals / Accommodation units	rx0	5	4	3	6	1	2
	rx1	5	4	2	6	1	3
	ry0	5	4	2	6	3	1
	ry1	5	4	2	6	3	1
Arrivals / Accommodation capacity	rx0	5	4	3	6	1	2
	rx1	5	4	2	6	1	3
	ry0	5	2	4	6	1	3
	ry1	5	2	4	6	1	3
Overnights / Accommodation capacity	rx0	3	4	2	6	1	5
	rx1	4	2	3	6	1	5
	ry0	5	2	4	6	1	3
	ry1	5	2	4	6	1	3
Overnights / Accommodation units	rx0	3	4	2	6	1	5
	rx1	4	2	3	6	1	5
	ry0	5	4	2	6	3	1
	ry1	5	4	2	6	3	1

Source: prepared by the authors on the basis of data Tempo Online: Available at: <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table> [Accessed 20 March 2023].

The strong positive relationship indicates that the two variables are closely related and an increase in one variable is generally associated with an increase in the other. Also, a Kendall correlation coefficient of 0.73 (Table no. 2.) indicates a strong correlation between the two variables, implying that a close relationship exists.

H2 is confirmed.

Table no. 2. Values of correlation coefficients calculated for demand/supply indicators for 2019-2021 for destinations

Indicators of Tourism Supply / Demand	**Correlation coefficients**	**Years**	
		2019	**2021**
Arrivals (X) million persons / Accommodation units (Y) number	Spearman	0.83	0.77
	Kendall	0.73	0.60
Arrivals (X) million persons / Accommodation capacity (Y) number of seats	Spearman	0.83	0.77
	Kendall	0.73	0.60
Overnight stays (X) million persons / Accommodation units (Y) number	Spearman	0.31	0.26
	Kendall	0.13	0.13
Overnight stays (X) million persons / Accommodation capacity (Y) number of seats	Spearman	0.54	0.83
	Kendall	0.33	0.73

Source: prepared by the authors on the basis of data Tempo Online: Available at: <http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table> [Accessed 20 March 2023].

Conclusions

Thanks to the Romanian tourists who traveled with the vouchers offered by the Romanian state, the number of tourists in 2021 stayed above the number of those who stayed in 2000 and was even higher than the number of those who stayed in the accommodations in Romania in 2009 and 2010, years that, as mentioned before, were affected by the economic crisis.

Kendall's rank correlation coefficient takes values between 1 and -1, and its value is usually slightly lower than Spearman's. This means that an increase in tourist arrivals is generally associated with an increase in the number of available lodging units and a decrease in tourist arrivals is associated with a decrease in the number of available lodging units.

It is important to note that correlation is not synonymous with causality. While the strong positive correlation indicates a relationship between the number of lodging establishments and arrivals, it does not necessarily mean that an increase in lodging establishments directly causes an increase in arrivals or vice versa. On the other hand, owners of lodging establishments invested in building, developing, and upgrading their lodging establishments during the COVID-19 pandemic to attract tourists once the restrictions were lifted. However, as tourists avoid travel due to health risks and travel uncertainties, the increase in the number of lodging establishments could lead to increased competition among lodging establishments for a limited number of tourists willing to travel. The authors believe that one solution to increase tourism demand in destinations is to strengthen the role of DMOs.

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Understanding Customer Loyalty in Romanian Wellness Spa Tourism: Insights from TRA Research

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Abstract

The wellness spa industry has become one of the fastest-growing segments in the hospitality and tourism industry, with an increasing number of individuals seeking relaxation, rejuvenation, and wellness. Given the growing popularity of wellness spa services, it is important for businesses to understand the factors that influence customers' intentions to remain loyal to wellness spa services. In this vein, this study applied an extended Theory of Reasoned Action (TRA) framework to examine the relationship between attitude towards wellness spa services, subjective norms, satisfaction, and the intention to remain loyal to the wellness spa services. The study utilized survey data collected from customers of a well-known wellness spa destination in Romania. The research results revealed that that attitude and subjective norms positively influence customers' loyalty. In addition, the study found that satisfaction for spa services mediates the relationship between attitude towards spa services and the intention to remain loyal to the spa services. The findings of this study have important theoretical and managerial implications for tourism businesses seeking to enhance customer loyalty and satisfaction with wellness spa services.

Keywords

Spa, balneary, TRA, loyalty, tourism.

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Introduction

People continue to travel for the purpose of maintaining or improving health, and global health tourism revenues estimated by several authoritative global non-governmental organizations are high and growing. According to the 2022 Global Wellness Institute (GWI) report on spa and wellness tourism, the industry has seen significant changes on a global scale. In 2019, prior to the pandemic, the industry experienced a remarkable growth and was valued at $720 billion. However, in 2020, it faced a considerable setback, with a decline to $436 billion. Despite this, the report predicts a promising future, with the market expected to recover strongly, reaching $817 billion in 2022 and an astounding $1.3 trillion by 2025, his makes it the fastest-growing wellness market by 2025 (GWI, 2022).

In Romania, wellness spa tourism has become a popular choice, in 2021, according to Romanian Ministry of Entrepreneurship and Tourism (RMET, 2023), 924.400 tourists stayed in spa resorts, interested to take advantage of the local spa resources (over 2500 of Europe's mineral and thermal springs; 43 spas) and the acceptable level of healthcare. In Romania this field has focused mainly on medical services rather than tourism, similar to western resorts in Europe (Nistoreanu and Aluculesei, 2021). However, the majority of health-related tourists, is fuelled almost exclusively by domestic demand. According to a memorandum for state aid in spa tourism industry, approved by the Romanian Gouverment in 2023, 98,6% of the total number of tourists arriving in balneary resorts, are represented by Romanians (RMET, 2023).

On a national level, in 2020, the number of tourists that have chosen spa resorts, decreased by 46,9% compared to 2019, as the entire tourism sector experienced significant adverse impacts during the period of 2020-2021 due to the crisis caused by the outbreak of the SARS-CoV-2 pandemic, but during 2022, as the lifting of restrictions occurred, an +53,7% upsurges of the number of tourists in local spas was registered (RMET, 2023). It can be considered that the pandemic situation has increased the degree of awareness of

the importance of health, and suddenly, the number of those for whom such services are curatively useful, not just prophylactically, will increased rapidly and considerably.

Loyalty as a construct, has been tackled in literature in a very homogeneous way (Almeida-Santana and Moreno-Gil, 2018). One of the most recent definitions for destination loyalty is given by Ilona-Niininen (2022, p. 870), and is described as "behavioral consistency of repeated visits to a destination fuelled by a psychological desire to visit the destination. Consumers loyalty is most coveted by managers, as finding new consumers involves costs. Developing customer loyalty has become an important marketing strategy because of the benefits associated with retaining existing customers (McMullan and Gilmore, 2008). Customer loyalty involves that the organization offer to consumers more than a product or service, in the same time is providing perceptions that make commitment, this aspect is viewed as the strength of the relationship between an individual's relative attitude and repeat pat-ronage (Dick and Basu, 1994).

Conventional, the theory of loyalty has embrace three leading approaches (Moore, Rodger and Taplin, 2015): behavioural, attitudinal, and an perspective that combine both attitude and behaviour (Rundle-Thiele, 2005). Tourist behavioral loyalty is assessed by way of clear acts (returns to the destination), considering this, loyalty is mostly measured as the number of times a product or a service is buyed, or the number of times a destination is visited (McKercher, Denizci-Guillet and Ng, 2012), while attitudinal loyalty is often used by reseachers in tourism for measurements using psychological elements as intentions and willings, emotions and feelings, toughts and beliefs (Oppermann, 2000).

Previous studies have analyzed the values, perception and attitudes of potential domestic medical tourists regarding the supply of Romanian medical tourism (Vasile, 2019). There is a lack of investigations based on theoretical models regarding what makes Romanian consumers remain loyal to wellness and spa tourism destinations, as well as a lack of research based on scientific evidence regarding attitude of Romanian residents towards loyalty in wellness and spa tourism, thus there is no scientific basis for proposing strategies to stimulate loyalty in this form of tourism. The purpose of this research is the application of an extended Theory of Reasoned Action (TRA) framework to examine the relationship between attitude towards wellness spa services, subjective norms, satisfaction, and the intention to remain loyal to the wellness spa services in order to improved view of the knowledge about customer loyalty formation into an Romanian consecrate wellness and spa tourism destination, by using attitudinal approach. As a result of such developments, practical suggestions will result in concrete directions and strategic measures to develop the loyalty inside the Romanian wellness and spa tourism industry.

Literature review

The theory of reasoned action

Fishbein and Ajzen proposed the Theory of Reasoned Action model in 1975, its focus is on developing an observation system consisting of two variable groups, attitude and subjective norms. In the theory of reasoned action, attitude is defined as a person's overall evaluation or judgment towards a particular behavior, while subjective norm, is the perceived social pressure to perform or not perform the behavior (Ajzen, 1991). TRA suggests that subjective norms can directly influence an individual's behavioral intentions, regardless of their attitude towards the behavior. If the individual perceives a strong social pressure to perform or not perform the behavior, this can lead to a corresponding increase or decrease in their intention to perform the behavior (Ajzen, 1991).

Research model and hypotheses

The relationship between attitude towards wellness and spa services and behavioral intention to remain loyal to the wellness spa services

In numerous studies examining the relationship between attitude and intention, researchers rely on the conclusions drawn from Ajzen's research as a fundamental basis (1975, 1980, 1985,1991). Within the field of hospitality and tourism research, emotional attitude is regarded as a comprehensive assessment of behavior (Kempf, 1999; Lam and Hsu, 2006; Sparks, 2007). Also, studies from related research areas conclude in similar directions, a study focusing on intention in medical tourism conducted in Malaysia, unequivocally concluded that attitude was a strong positive predictor for tourists' intention to seek medical tourism (Na, Onn and Meng, 2016). We have found more useful contributions for our research purpose in another research more focused on investigating attitude as a factor influencing loyalty in spa tourism, Kim et al. (2010) concluded that the potential of obtaining positive emotional attitudes is likely to encourage spa

visiting, and meeting and exceeding guests' needs would create, in those guests, positive attitudes to spa visiting. Based on these arguments, we propose the following:

H1 Customer attitude (Att) towards the studied spa has a positive influence on their intention to remain loyal;

The relationship between subjective norms and behavioral intention to remain loyal to the wellness spa services

As a parallel to the relationship between attitude and intention, in a vast majority of studies that integrate the relationship between subjective norms and intention, the pioneering work of Ajzen (1991) on the constituent factors of the TRA is widely cited. Research on loyalty in hospitality heavily exploits this relationship. In this context, it is important to mention the contributions of Lam and Hsu (2006), who found relevant importance of subjective norm in relation to Taiwanese tourists' intention to visit Hong Kong, and in the same study, they also determined that subjective norm have a positive impact in deciding about holiday destination choices. Furthermore, the study conducted by Na, Onn and Meng (2016) is noteworthy for demonstrating that subjective norms have a positive effect on purchase intentions in the field of medical tourism. With relevance to spa tourism, it is important to mention the contribution of Kim et al. (2010), who concluded in their study that subjective norms significantly influence the intention to revisit, as creating and maintaining positive word of mouth among spa-goers is recommended strongly. In this context we propose the following:

H2 Subjective norms (SbN) regarding the studied spa have a positive influence on customers' intention to remain loyal.

Satisfaction, as a mediator between attitude, subjective norms and behavioral intention to remain loyal to the wellness spa services

Research in tourism has shown that satisfaction can work as a mediator in the Theory of Reasoned Action (TRA) by influencing the relationship between an individual's attitude and their intention to engage in a behavior (Kim, Kim and Goh, 2011). In the perspective of TRA framework, "affect" can be interpreted as satisfaction experienced during the consumption of services or products, which can influence repurchasing behavior (Erickson, Johansson and Chao, 1984). Essentially, "affect" represents the emotional response towards the product. The level of satisfaction can be used to measure the "attitude toward the behavior" and "subjective norm" (Kim, Kim and Goh, 2011). Considering this instance, this study focused on measuring "satisfaction" for an "affective" vision of the TRA model. In this context, the following research hypotheses have been developed:

H3a Customer satisfaction (Sat) with the services provided by this spa mediates the relationship between Att and LyInt;

H3b Customer satisfaction (Sat) with the services provided by this spa mediates the relationship between SbN and LyInt.

Methodology

Measures and survey questionnaire

In order to study the influence of the evaluated factors in this study, scientifically validated constructs were used, based on previous researches conducted on loyalty in the hospitality sector (Kim, Kim and Goh, 2011; Han and Ryu, 2012; Han et al., 2017). These constructs were adapted and modified to fit the specificity of the present research. The questionnaire included 3 items to evaluate satisfaction regarding health tourism practiced within the studied spa (e.g. I think I made a good decision when choosing to use the services of this spa), 3 items to evaluate subjective norms (e.g. Most people who are important to me think I should come to this spa), 4 items to evaluate the attitudes consumers have (e.g. Returning to this spa would be delightful), and the intention to repurchase was evaluated using 4 items (e.g. I intend to be a frequent guest at this spa).

The construct validity of the measures used was verified by practitioners in the industry and by members of the academic community in the hospitality industry.

Data collection

The data collection was conducted by sending a personalized invitation via email to participate in this study. The questionnaire was sent only to spa service consumers within this tourist complex who were present between June 2022 and February 2023, enrolled in the internal loyalty program, and who, in accordance

with GDPR regulations, had given their consent to participate in surveys. This health tourism destination had a total of 4,334 unique customers during the specified period, of whom 450 were invited to respond to the questionnaire, and the first 90 responses received were used in the research.

The questionnaire was developed in Romanian language and was completed only by native speakers of the Romanian language. Respondents were not offered any prizes or benefits to be used during their return to the location.

Sampling profiles and measurement model

Among the respondents, 90.1% avail themselves of services offered by this spa for at least 6 days a year. The gender breakdown is significantly unequal, with 51.6% of respondents identifying as female. Moreover, 87% of respondents reported traveling a distance of over 200 km to reach this spa. Regarding age, 4.4% of respondents reported being under 35 years old, 10% reported being between 35 and 44 years old, 21.1% reported being between 45 and 54 years old, 32.2% reported being between 55 and 64 years old, 23.3% reported being between 65 and 74 years old, and 8.9% reported being over 75 years old. A question about income level was not included in the questionnaire. In terms of visit frequency, 7.8% of respondents reported visiting the location only once, 57.8% reported visiting once a year, and 34.4% reported visiting multiple times a year. The data collected was interpreted using SmartPLS 4 software, an advanced data analysis program that focuses on modeling relationships between variables to establish the degree of reliability and validity of confirmatory factor analysis.

Results

Data analysis and results

Measurement model

The measurement model displays the relationships between constructs and the indicators of variables. The first three indicators of the measurement model analyze the composite reliability, evaluated with: Cronbach's alpha, which reflects the degree of item coherence within the construct; Composite Reliability (rho_a), which uses the classical formula of composite reliability (Cronbach's alpha), but with a different method of calculating error variance, and Composite Reliability (rho_c), which reflects the degree of internal coherence of the latent constructs in the research model. These composite reliability indicators are based on different formulas and methods for calculating this indicator. The desirable limit criterion value for composite reliability is 0.60 (Ringle et al., 2020). Consequently, all latent constructs in the model possess composite reliability (see Table 1). The last component of the measurement model is convergent validity. The measure of convergent validity is Average Variance Extracted (AVE), for which the desirable limit value is 0.50 (Ringle et al., 2020). Therefore, the constructs possess convergent validity (see Table 1).

Table no. 1. Reliability and validity

	Cronbach`s alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Att	0.920	0.926	0.943	0.807
LyInt	0.909	0.911	0.936	0.786
Sat	0.948	0.949	0.966	0.906
Sbn	0.981	0.981	0.987	0.963

To access the discriminant validity of constructs, the Heterotrait Monotrait (HTMT) Ratio procedure is used. According to Henseler et al. (2015), to verify discriminant validity, the most cautious threshold values of the HTMT ratio are less than or equal to 0.90. All HTMT values within this study are less than the threshold value of 0.90 (see table 2).

Table no. 2. Discriminant validity using HTMT

	Att	LyInt	Sat	SbN
Att				
LyInt	0.833			
Sat	0.736	0.886		
SbN	0.452	0.599	0.457	

Structural model

The structural model displays the relationships (paths) between the constructs in the proposed model. The "Original sample (O)" and "Sample mean (M)", express the path coefficient, abbreviated as "β", which indicates the relationship between two variables in the model and shows the direction and strength of the influence that one variable has on the other. The standard deviation (STDEV) shows how much the values of a variable deviate from its mean value. The T statistics, abbreviated as "t", represent a measure of the statistical significance of β (path coefficient). The "P" values, abbreviated as "p", identify the relationships that are statistically significant, and when "p" < 0.05, it means that the hypothesis is null and can be rejected with a 95% confidence level (Ringle et al., 2020). The results showed that "Att" has a significant impact on "LyInt" (β=0.329/0.332, t=3.569, p<0.05). Therefore, H1 was accepted. H2 evaluates whether "SbN" has a significant impact on "LyInt" (β=0.201/0.202, t=3.367, p<0.05). Therefore, H2 was accepted (see Table 3).

Table no. 3. Hypothesis testing / Total direct effects

	Original sample (O)	**T statistics**	**P values**
H1:Att→LyInt	0.329	3.569	0.000
*H2:*SbN→LyInt	0.201	3.367	0.001
Sat→LyInt	0.506	5.543	0.000
Att→Sat	0.619	6.484	0.000
SbN→Sat	0.174	1.936	0.053

Mediation analysis

H3a evaluates whether “Sat” mediates the relationship between “Att” and “LyInt”. The results show that the direct effect (H1) was found to be positive and significant (β=0.329, t=3.569). When the mediator was introduced into the model, the total effect remained significant (β=0.642, t=8.104), while the indirect effect, once the mediator was included in the analysis, was found to be significant (β=0.313, t=4.182, p<0.05), as shown in Table 4. Therefore, the results reveal partial mediation. This indicates that the effect of “Att” on “LyInt” partially passes through “Sat”. Consequently, H3a is accepted.

H3b evaluates whether “Sat” mediates the relationship between “SbN” and “LyInt”. The results show that the direct effect (H2) was found to be positive and significant (β=0.201, t=3.367). When the mediator was introduced into the model, the total effect remained significant (β=0.289, t=3.815), while the indirect effect, once the mediator was included in the analysis, decreased significantly (β=0.088, t=1.757, p>0.05), as shown in Table 4. Therefore, the results indicate that “SbN” directly influences “LyInt” through “Sat”. Consequently, H3b is not accepted.

Table no. 4. Mediation analysis

Hypotheses	**Total effects**		**Direct effects**		**Hypotheses**		**Indirect effects**		
	Coef.	**t-value**	**Coef.**	**t-value**			**Coef.**	**t-value**	**p value**
Att → LyInt	0.642	8.104	0.329	3.569	H3a	Att -> Sat -> LyInt	0.313	4.182	0.000
SbN → LyInt	0.289	3.815	0.201	3.367	H3b	SbN -> Sat -> LyInt	0.088	1.757	0.079

Conclusions

Theoretical Implications

The conclusions of this study suggest that a tourist's attitude towards spa services has a positive influence on their intention to remain loyal to the spa. Therefore, when tourists are considered physically and mentally balanced, refreshed, happy, and relaxed while experiencing spa services, they are more likely to assume the spa as their favorite choice, intend to be a loyal guest, recommend it to others, and speak positively about it to friends and family. In the context of this research, the positive influence of attitude towards spa services on loyalty intentions associates with the key components of TRA. According to TRA, an individual's behavior is influenced by their attitudes towards the behavior and the subjective norms surrounding that behavior (Ajzen, 1991). In the case of Romanian tourism spa services, the research reports that tourists' attitudes towards the service (feeling physically and mentally balanced, refreshed, happy, and relaxed) have a positive influence on their intention to remain loyal to the spa. These results are in line with the results of previous research regarding the relationship between customer attitudes and loyalty which reported that tourists who have positive attitudes towards a spa services or brand are more likely to engage in repeat

patronage and positive word-of-mouth (Han et al, 2017). Therefore, by offering excellent tourism spa services that stimulate positive attitudes in their clients, businesses can increase loyalty intentions.

Results and discussions

Analyzing the results of the proposed structural model

In the context of our research, subjective norms indicate the influence of the opinions of people who are important to an individual, such as friends and family, on their intention to remain loyal to the spa services. The research found that when tourists sense that most of the people who are important to them think they should come to the spa for treatments or would like to return to the spa for treatments, they are more likely to consider the spa their favorite choice, intend to be a regular guest, recommend it to others, and speak positively about it to friends and family. From a theoretical perspective, this research's results offer support for the concept that social influence can play a salient part in shaping tourists' attitudes and intentions. By concentrating on building positive social influence, tourism businesses can increase their customers' loyalty intentions. The result that subjective norms have a positive influence on the intention to remain loyal to the spa services is consistent with the research in tourism industry which reported that word-of-mouth referrals from friends and family are among the most influential factors in shaping customers' attitudes and behaviors (Kim et al., 2010).

The research finding that satisfaction for spa services partial mediates the relationship between attitude towards spa services and the intention to remain loyal to the spa services suggests that the positive effects of attitudes towards spa services on loyalty intentions are partially explained by customers' satisfaction with their spa experience. In other words, customers' attitudes towards spa services directly influence their satisfaction with the spa experience, which in turn influences their loyalty intentions towards the spa. The study suggests that tourists who have positive attitudes towards spa services are more likely to be satisfied with their experience and therefore more likely to remain loyal to the spa.

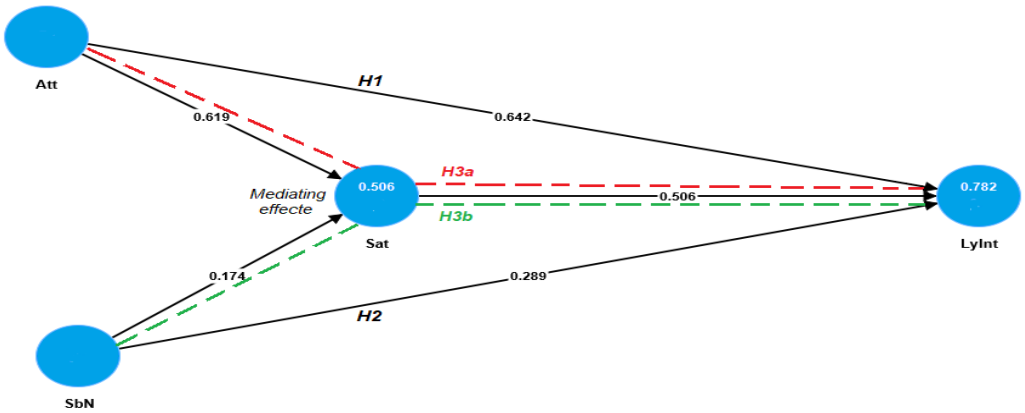


Figure no. 1. Proposed research model

Managerial implications

The research results have various managerial implications for tourism businesses providing spa services. One salient managerial implication is the need to offer excellent spa services that stimulate physical and mental balance, refreshment, happiness, and relaxation. This can be accomplished by investing in well-trained and experienced staff, utilizing quality products and equipment, and providing a clean and comfortable environment. Another managerial implication is the necessity to support positive word-of-mouth and customer recommendations. Tourism businesses can accomplished this by providing referral incentives, encouraging tourists to leave reviews, and emphasizing positive feedback from satisfied clients. More, tourism businesses can utilize tourists feedback to find areas for improvement and tackle any issues that may influence tourists' attitudes and loyalty.

The managerial implications of the finding that satisfaction for spa services mediates the relationship between attitude towards spa services and the intention to remain loyal to the spa services are significant for tourism businesses offering spa services. One key implication is the need for businesses to prioritize customer satisfaction in their service delivery. This can be achieved by ensuring that customers' expectations are met or exceeded during their spa experience. Businesses can achieve this by providing

personalized attention to customers, creating a warm and welcoming atmosphere, and training staff to provide excellent customer service and according to the correlation with the information about the respondents' profile, these actions should focus especially on female customers through marketing campaigns or tailoring their services to meet female preferences, older age groups by offering services that appeal to their specific needs and preferences, and attract distant customers, as a significant proportion of respondents (87%) traveled a distance of over 200 km to reach the spa, indicating that the spa has a broad reach. The spa can capitalize on this by offering attractive packages that incentivize distant customers to visit more frequently.

Limitations and recommendations

There are several limitations to this study that should be taken into account. Firstly, the sample may not be representative of the entire population due to the unequal gender breakdown and the respondents' ages. The majority of respondents are middle-aged or elderly, so the results may not apply to younger generations. Moreover, the study was conducted only in one spa location, and the results may not be generalizable to other spa locations or other tourism industries. Additionally, the study did not collect information about the respondents' income levels, which could be an important factor in their loyalty and satisfaction levels. Moreover, the study relied on self-reported data, which could be subject to response bias or social desirability bias. The study only examined the mediating effect of satisfaction on loyalty intention in the context of subjective norms and attitudes, and other variables that may influence loyalty were not considered. Therefore, the findings should be interpreted with caution, and further research is needed to explore the complex relationships between different variables and loyalty in the spa tourism industry.

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Overview on the Impact of Consumer Behavior Decisions on the Tourism Industry in Romania

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Abstract

The purpose of the research is to identify the changes that appear from the point of view of consumer behavior in the consumption of tourist services in the post-pandemic period with the analysis carried out on the number of tourist arrivals in Romania, the distribution of the number of tourists on tourist destinations, the capacity of tourist accommodation. and identifying the share of tourism in the Gross Domestic Product of Romania in the period 2008-2020.
According to the research carried out, there is a significant decrease in the tourism industry in 2020 due to the COVID-19 pandemic, with a competitive return in 2021. The impact of the tourism industry on the economic development of Romania was felt at the national level. by decreasing the weight of the gross domestic product. and implicitly of the revenues received from the provision of services.
Consumers notice that they are much more oriented towards digitization in the tourism industry, towards the discovery of new places to visit and with potential involvement in the sustainable development of industries.
The analysis carried out suggests opportunities for investment and development of tourism in less popular areas, which can be discovered and promoted in the context of the new reality in order to increase visibility and explore the potential they hold.
The tourist accommodation capacity is unevenly distributed among the tourist destinations in Romania, with most accommodation places being in seaside resorts, with the exception of Constanta, while the capacity in spa resorts and in the mountain area is lower. Thus, the need to preserve and capitalize on resources from lesser-known areas with potential is identified, in order to develop the necessary infrastructure, to increase accommodation capacities and to attract as many tourists as possible.

Keywords tourism, gross domestric product, competitiveness, development, economical growth

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Introduction

The emancipation of tourism was part of a process of maturity achieved as a major result of economic progress and the increase in the well-being-free time of society. Of course, the process has been facilitated by the development of more efficient transport technologies, by lowering the cost of transport, consequently by the ultimate globalization trends towards a world without borders, along with the emergence and development of digital infrastructure.

As a result, tourism has become one of the fastest growing sectors for the economic field, and many countries and regions consider tourism as a strategic vehicle for achieving prosperity.

The tourism industry is represented by economic activities capable of generating growth and engagement in the EU, while contributing to development and economic and social integration, in particular the countryside, mountainous areas, coastal regions and peripheral regions. There are SMEs that employ around 5.2% of the total workforce (around 9.7 million jobs, with a large proportion of jobs for young people). The European tourism industry generates more than 5% of the EU's GDP, a figure that is constantly growing.

Tourism is therefore the third largest socio-economic activity in the European Union after trade and distribution and construction. Taking into account these 3 sectors, tourism has the largest contribution to GDP and is estimated to generate over 10% of the European Union's GDP and provide about 12% of total jobs (Turcu et al., 2015).

According to the research "The impact of the pandemic on tourism in Romania: a post-pandemic analysis", the negative effects of the pandemic on the tourism industry were identified, regarding the impact on the revenues of companies in the HoReCa industry, which decreased significantly, the decrease in the number of employees in the industry who have contributed to the increase in the number of unemployed people in Romania, which affects both the companies and the state at the budgetary level through the amounts they have to allocate for the recovery of the sector and for the support of employees (Popescu,2022).

According to the author Ionescu, the change in consumer behavior in terms of preferences in the post-pandemic tourism industry can be observed in the research carried out, regarding the increase in interest shown by them in rural, ecological tourism at the expense of well-known and popular tourist areas in Romania (Ionescu, 2022).

In this work it is aimed at identifying the changes occurred from the point of view of consumer behavior in the consumption of touristic services in the post-pandemic period. In the section on literature, the factors that contributed to the change in consumer behavior will be identified. In the continuation of the specialized literature will be analyzed the information on the number of arrivals of tourists in Romania, the distribution by tourist destinations of the number of tourists, the capacity of tourist accommodation as well as the share of the tourism industry in the Gross Domestic Product of Romania, according to the statistical data provided by the National Institute of Statistics. In the continuation of the specialized literature will be analyzed the information on the number of arrivals of tourists in Romania, the distribution by tourist destinations of the number of tourists, the capacity of tourist accommodation as well as the share of the tourism industry in the gross domestic product of Romania, according to the statistical data provided by the National Institute of Statistics.

1. Review of the scientific literature – Changes in the structure of the consumer behavior of tourism products

The development of information and communication technologies (ICT) and the increase in their use by consumers has brought about a radical change in the relationship between the tourism industry and customers.

Treated as a whole, the third system of services is successful in the market of tourism business providers depending on the extent to which the services will be able to ensure good accommodation relations, in other words, of the environment in which the tourist services are provided.

According to the Treaty of Lisbon, the main objective of European tourism policy is to boost competitiveness. On the other hand, the development of a more active tourism policy could make a significant contribution to relaunching the internal market. (European Commission, 2010, p.10)

The intelligent development of communities, oriented on the qualitative growth of services, minimizing the consumption of resources, economic growth, protecting the environment and promoting ICT solutions, can be supported by PPPs in order to produce effects, for all interesting parts.

In certain projects, individual implementation by public institutions may limit the performance and probability of achieving the projected results (Filipkowska and Wegrzyn, 2019). In addition to this, specific deadlines increase significantly, and the safety of continuing projects decreases significantly, given the change of political or strategic factors. (Dima, 2019)

This way of collaboration between the public and private sectors can help to develop tourism services both at national and European Union level, taking into account also the factors that have a negative impact on the tourism sector.

A series of macroeconomic aspects related to the natural, political and socio-economic environment trigger certain sustainability problems in the tourism sector. These aspects are highlighted by certain shortcomings such as:

- Temporality- natural systems work on periods that are often much larger than those determined by policy cycles, business cycles and planning;
- Spatiality - sustainability and environmental problems tend to be transboundary in nature and for some types of problems on a global scale (climate change, deforestation, biodiversity loss);

- Limits - the concept of sustainability suggests that there are limits to the exploitation of the natural environment because of its limited capacity for renewal;
- Irreversibility - Some natural capital or environmental assets cannot be renewed or are not easily substituted (soil, groundwater, ozone);
- Uncertainty - some aspects of sustainability are characterized by uncertainty, making it difficult to determine the effectiveness, implications and socio-economic impact of these policy measures. (Gössling et al. 2015).

The tourism industry has begun to develop concepts of sustainable tourism, with the aim of guaranteeing the minimisation of the negative impact of tourism, maximising the positive economic benefits because it represents a unique opportunity to promote the contribution of tourism to the realization of the future that the state wants, and also, in order to determine, the exact role that tourism will have in sustainable development on the agenda, by 2030 to ensure that this is a unique opportunity in achieving the 17 Sustainable Development Goals (Harilal, Tichaawa, & Saarinen, 2019).

2. Research methodology

In this section of the paper will be analyzed the data on the impact of the decisions reflected by the consumer behavior on the tourism industry at national level. The analyzed information will be reported to the main tourist destinations in Romania.

In the graphic representation below, the number of arrivals of tourists in Romania in the reference period 2018-2022 will be identified.

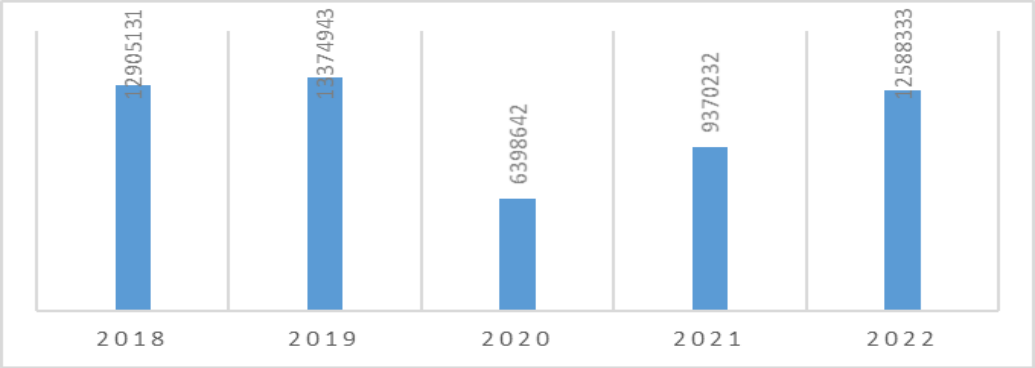


Figure no.1.Number of arrivals of tourists in Romania (U.M.: number of people)
Source: authors interpretation based on statistics from National Institute of Statistics

According to NIS data, in 2018, 12,905,131 tourist arrivals were registered in accommodation units nationwide, and in 2019, their number increased to 13,374,943 people. However, due to the COVID-19 pandemic, the number of tourists staying decreased significantly in 2020, reaching 6,398,642 people.

In 2021, the number of tourist arrivals increased to 9,370,232, reflecting a significant increase compared to the previous year, still below the level recorded in the pre-pandemic years. A continuous increase can be observed in 2022, when the number of arrivals reached 12,588,333, suggesting a return of the tourism industry to the pre-pandemic level.

An increase in the number of tourists can be interpreted as an increase in tourism activity and tourism revenues, but it can also reflect greater pressure on tourism resources and the environment. Also, the significant decrease in the number of tourist arrivals in 2020 had a significant impact on the tourism industry, generating significant losses for companies in the sector and affecting the economy as a whole.

In general, the analysis of data on tourist arrivals in tourist accommodation establishments is just one of many ways to assess tourism activity and can be complemented by other sources of information, the data can be used to identify trends and patterns in the behavior of tourists, as well as to guide investment decisions and public policies in the field of tourism.

Table no.1.Distribution by tourist destinations of the number of tourists (number of people)

Tourist destinations	2018	2019	2020	2021	2022
Spas	1018721	1133359	601326	924400	1117977
Seaside resorts,The City of Constanta	1111389	1153682	905266	1142271	1293940
Resorts in the mountain area	2217110	2305517	1295105	1866402	2443761
Danube delta area and Tulcea	165431	166411	118325	137182	113105
Bucharest and cities county seat	6178665	6275832	2359090	3660935	5449757
Other localities and tourist routes	2212815	2340139	1119530	1639042	2169793

Source: authors interpretation based on statistics from National Institute of Statistics

The presented data provide a complex picture of the evolution of the tourism industry in recent years, they represent the distribution by tourist destinations of the total number of arrivals of tourists in accommodation structures, expressed in the number of people, for the period 2018-2022.

According to these data, in 2018 (the same trend was maintained in 2019), the most popular tourist destinations were Bucharest and the county capital cities, excluding Tulcea, with 6,178,665 tourist arrivals, followed by mountain areas, with 2,217,110 tourist arrivals, and other localities and tourist routes, with 2,213,815 arrivals.

In 2020, due to the COVID-19 pandemic, the number of tourist arrivals to most tourist destinations has drastically decreased. The most affected destinations were spa destinations, with only 601,326 arrivals, followed by other localities and tourist routes, with 1,119,530 arrivals, and mountainous areas, with 1,295,105 tourist arrivals.

In 2021, the number of tourist arrivals increased significantly in most tourist destinations. The most popular tourist destinations were Bucharest and the county capital cities, excluding Tulcea, with 3,660,935 tourist arrivals, followed by the mountain areas, with 1,866,402 arrivals, and the resorts in the coastal area, excluding the city of Constanta, with 1,142,271 tourist arrivals. The same upward trend was maintained at the level of 2022.

Table no.2.Tourist accommodation capacity distributed on tourist destinations

Tourist destinations	2018	2019	2020	2021	2022
Spas	36173	35643	36554	36362	36643
Seaside resorts,The City of Constanta	80665	85081	85200	84794	86271
Resorts in the mountain area	65025	64767	63943	66374	66742
Danube delta area and Tulcea	7645	7205	7593	8177	8424
Bucharest and cities county seat	91800	92018	90098	89657	89607
other localities and tourist routes	72527	71848	74731	79143	79699
Total	353835	356562	358119	364507	367386

Source: authors interpretation based on statistics from National Institute of Statistics

These data reflect the capacity of tourist accommodation by type of accommodation structures in Romania, in the period 2018-2022, distributed by tourist destinations. According to NIS data, in 2018, the accommodation capacity in the spa resorts was 36,173 seats, while in the resorts in the seaside area, with the exception of Constanta, it was 80,665 seats. In the resorts in the mountain area, 65,025 accommodation places were available, while in the Danube Delta area, including Tulcea city, it was only 7,645 places. In Bucharest and in the county capital cities, the tourist accommodation capacity was 91,800 places in 2018, while other localities and tourist routes offered an accommodation capacity of 72,527 places in the same year. The total capacity of tourist accommodation in Romania in 2018 was 353,835 places, it increased

slightly in 2019 and 2020, and in 2021 and 2022 it increased significantly compared to the previous year, reaching 367,386 places in 2022.

The tourist accommodation capacity in the spa resorts and in the resorts in the mountain area is lower than that of the other tourist destinations, but it remains relatively constant from year to year, while in the Danube Delta area, including Tulcea, it is the smallest of all the tourist destinations presented.

The distribution of the tourist accommodation capacity by tourist destinations shows that most accommodation places are found in the resorts in the seaside area, with the exception of Constanta, where the capacity was 85,081 places in 2019 and reached 86,271 places in 2022. The spa resorts have a smaller accommodation capacity, with 35,643 seats in 2019 and 36,643 seats in 2022.

In mountain resorts, the accommodation capacity was 64,767 seats in 2019 and increased to 66,742 seats in 2022. In the Danube Delta area, including Tulcea, the accommodation capacity was only 7,205 seats in 2019 and increased slightly to 8,424 places in 2022. Bucharest and the county capital cities, with the exception of Tulcea, have a tourist accommodation capacity of 92,018 places in 2019 and 89,607 places in 2022. The accommodation capacity in other localities and tourist routes was 71,848 places in 2019 and increased to 79,699 places in 2022.

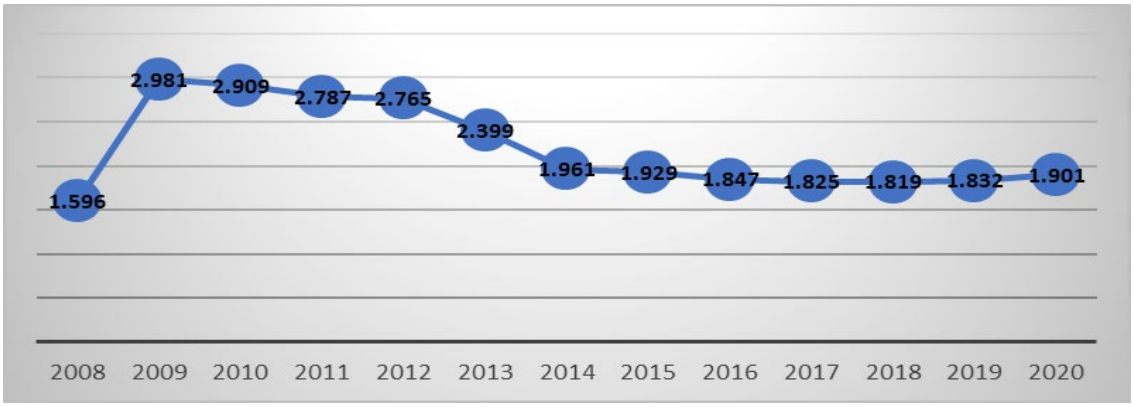


Figure no.2. The share of tourism in the Gross Domestic Product of Romania in the period 2008-2020 (%)

Source: NIS (https://insse.ro/cms/sites/default/files/field/publicatii/contul_satelit_de_turism_2020.pdf)

The chart above shows the share of tourism in the Gross Domestic Product (GDP) of Romania in the period 2008-2020. In 2008, tourism contributed 1.596% to Romania's GDP, and in 2009 the share increased significantly to 2.981%. Over the next few years, the share of tourism in GDP fluctuated, but gradually decreased until 2020, when it reached 1.901%. In general, we can see that tourism had an important contribution to Romania's GDP during the analyzed period, but with a slight downward trend in recent years.

These data reflect the fact that tourism has made an important contribution to Romania's GDP in recent years, but fluctuations show that more attention is needed for the sustainable development of the tourism industry. In addition, the increase in the share of tourism in GDP in 2020 could be a sign of economic change and may be a reason for hope for industry in a difficult context generated by the pandemic.

However, it is important to note that the share of tourism in GDP was generally lower than in other European countries, which could reflect an untapped potential for tourism development in Romania. The data also shows a decrease in the contribution of tourism to GDP in recent years, which may indicate a need for investment and tourism development policies.

It is important to take into account that these figures are influenced by several factors, such as investments in infrastructure, tourism promotion, security conditions, political and economic climate, as well as changes in the international tourism market.. In this regard, the authorities should take measures to encourage the sustainable development of tourism, in accordance with the principles of environmental and social responsibility, as well as to improve the quality of the tourism services offered.

Table no. 3. SWOT analysis of the Romanian tourism sector

Strengths	**Weaknesses**
- Natural potential that supports a wide variety of forms of tourism (cultural, historical, spa, adventure, etc.); - Natural setting with varied landforms that offer landscape diversity (mountains, plateaus, coast, plains, delta); - The wealth of spa resources and natural healing factors, which can be exploited in medical and wellness treatments; - The forest area, the hunting fund and the fishery, which can offer opportunities for hunting, fishing and ecotourism; - Extensive hydrography with a multitude of groundwater, lakes and rivers that can be exploited for water sports and adventure tourism; - Temperate-continental, moderate climate, which can offer opportunities for summer and winter tourism; - The varied anthropic potential made up of archaeological remains and historical monuments over 2000 years old, which can be exploited for cultural and historical tourism; - Developing new tourism products by exploiting unexplored potential, such as mountain tourism, rural tourism or adventure tourism.	- Tourism infrastructure is underdeveloped, especially in terms of accommodation, restaurants and leisure facilities; - The poor quality of tourist services offered, including the low level of foreign language skills of tourism industry personnel; - Tourist destinations insufficiently promoted internationally, which leads to low visibility and a lack of interest from foreign tourists; - Transport infrastructure is poor, with outdated and underdeveloped roads and railways; - Poor development of water supply, sewage and electricity in certain tourist regions; - The very worn and undeveloped infrastructure in the spa treatment bases, which no longer meet modern standards; - Lack of investment and partnership between the private and government sectors, leading to a stagnation of tourism development in many regions.
Opportunities	**Threats**
- Improving the business environment by stimulating investments in tourism and facilitating access to financing for the development of tourism infrastructure and services, including through public-private partnerships; - The increase in the number of tourists from Europe and the world, due to the increasing travel trends and the increased interest in new and authentic destinations, which can be exploited by developing new tourism products and intensively promoting existing destinations; - The strategic geographical position, at the intersection of the main commercial corridors of Europe, offers opportunities for the development of transit tourism, but also for attracting tourists interested in excursions and circuits in the region; - The modernization and promotion of tourist attractions from the cultural-historical heritage, through	- The negative impact of economic crises, as well as unforeseen events such as pandemics, which can affect the tourism industry globally; - Development of alternative or more economically attractive tourist destinations in other countries in the region; - The COVID-19 pandemic and other diseases or epidemics that may affect tourism and international travel in general; - Climate change and extreme weather phenomen, which can negatively affect certain tourist destinations or lead to the development of environmental problems; - The economic situation influenced by the increase in the price of oil, which can lead to an increase in transport and accommodation costs for tourists; - Delays in completing the modernization of transport infrastructure, such as highways or railways;

investments in the restoration and enhancement of historical monuments and archaeological sites, can attract a segment of tourists interested in cultural and historical tourism; - European financial assistance for investment projects can be accessed for the development of tourist infrastructure and other projects that can increase the attractiveness of Romanian destinations; - There are government programs for various economic fields, including tourism development, which can be used to support the tourism industry in Romania; - The development of ecotourism and other related activities can increase tourists' interest in Romanian destinations and contribute to the protection of the natural environment; - The creation of new types of niche tourism can attract specific segments of tourists and increase the diversity of the tourist offer in Romania; - Integrating tourism with other complementary activities, such as rural or wine tourism, can provide opportunities for tourism development in regions where such activities are already present.	- The pressure of tourist development on protected areas and cultural and natural heritage, which can lead to their degradation and reduce tourist attraction; - The continuous migration of qualified personnel from tourism to other sectors or more developed countries in the European Union; - Insufficient resources for the modernization and expansion of the tourist infrastructure, especially in the less developed regions.

The SWOT analysis of the Romanian tourism sector shows that there is a great natural potential in Romania for different forms of tourism, such as cultural, historical, spa, adventure and ecotourism. Romania has rich resources for hunting, fishing and water sports tourism, and the temperate-continental climate offers opportunities for summer and winter tourism.

In order to develop the Romanian tourism sector, it is necessary for the government and the private sector to collaborate to invest in tourism infrastructure and to improve the quality of tourist services, so that tourists can benefit from a quality experience and more attractive tourist attractions.

In order to reach its maximum development potential, the tourism sector must carefully address its weaknesses and capitalize on the available development opportunities, while focusing on increasing the quality of tourist services offered and promoting Romanian tourist destinations internationally.

Conclusions

The COVID-19 pandemic had a significant negative impact on Romania's tourism industry in 2020, leading to a steep drop in the number of tourists and a decrease in the industry's contribution to the country's Gross Domestic Product (GDP). However, in 2021, the tourism industry saw a competitive return, with an increase in the number of tourists and a gradual recovery of the sector. This trend continued into 2022, suggesting a return to pre-pandemic levels.

Data on tourist arrivals at tourist reception structures can provide valuable information about trends and patterns in tourist behavior and can be used to guide investment decisions and public policies in the field of tourism.

The most popular tourist destinations in recent years were Bucharest and the county seat cities, with a significant share in the total number of tourist arrivals. However, the COVID-19 pandemic has had a significant impact on the tourism industry, with a drastic decrease in the number of arrivals in 2020 in most tourist destinations, especially spa ones. However, in subsequent years, the number of tourist arrivals increased significantly, reflecting a rebound in the tourism industry. This may suggest opportunities for investment and tourism development in less popular areas, which can be discovered and promoted in the context of the new reality.

Tourist accommodation capacity is unevenly distributed among tourist destinations in Romania, with the most accommodation places in the seaside resorts, with the exception of the city of Constanța, while the capacity in the spa resorts and in the mountain area is lower. In recent years, the total tourist accommodation capacity in Romania has increased significantly, reaching 367,386 places in 2022, compared to 353,835 places in 2018.

Most tourist accommodation is available in the seaside resorts, with the exception of Constanța, which suggests that this area is the most popular with tourists. The accommodation capacity in Bucharest and in the county seat cities is also high, which may indicate a significant demand for urban tourism. On the other hand, the accommodation capacity in the spa and mountain areas is lower, but relatively constant over time. The significant increase in accommodation capacity in the last two years may suggest an increase in demand for domestic tourism in Romania.

Although tourism had an important contribution to Romania's GDP in the period 2008-2020, the data show a slight downward trend in recent years and an unexploited potential for the development of tourism at the national level. This highlights the need for sustainable development and strategic planning to ensure the long-term growth and stability of the tourism industry.

The research indicates that the tourism industry in Romania has encountered challenges due to the COVID-19 pandemic, but has shown resilience and potential for recovery in the post period. Adapting to changing consumer behavior, promoting sustainable practices, and investing in infrastructure and marketing efforts are crucial to the future success of the industry.

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Value creation for businesses and consumers through innovative business models. New forms of market interaction, open innovation and collaborative networks

From Developing to Under Developing Economies - The Storyline of Slavery and Nowadays Consumption

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Abstract

Even though many individuals may perceive slavery as a past memory, it nonetheless has a significant impact on society today on a multitude of levels. The modern slavery phenomenon is the consequence of past slavery as it currently exists. Its worldwide effects range from social and cultural impacts to economic and business-related implications. The purpose of this paper is to explore various papers and studies within the academic and grey literature on the profitability of both past and modern slavery, with a focus on how modern slavery may encourage consumption in different industries. The present paper's purpose was accomplished using a qualitative research methodology, more precisely, content analysis. The findings indicate that, in contrast to past slavery, which is typically viewed as profitable and the main driving force of the economic development of certain wealthy empires, such as the British, and Dutch empires, modern slavery has a negative impact on the global economy, contributing to poverty and underdevelopment. Moreover, the fast fashion industry provides several examples of cases in which modern slavery was used to increase consumption in this field. The conclusions of this article raise serious concerns about the issue of modern slavery since it perpetuates economic underdevelopment and poverty, and because the process of uninformed consumption in some industries may contribute to the persistence of this phenomenon. Therefore, this stringent matter allows opportunity for more research and discussion.

Keywords

Slavery, Modern Slavery, Economic Development, Global Economy, Consumption and Modern Slavery, Fast Fashion Industry and Forced Labour.

DOI: 10.24818/BASIQ/2023/09/007

Introduction

Researchers across disciplines, including historians, psychologists, politicians, and economists, have long been interested in the subject of slavery. If the connection between historians and slavery may be more obvious, perhaps the aspects linking the phenomenon of slavery and the field of economics do not appear so conspicuous at first sight. The economic implications of slavery, however, have been documented since Ancient Greece or Ancient Rome. For instance, Finley (1999) underlines several economics-related preconditions that were initially necessary for the existence of slavery in Ancient Greece: one precondition is represented by the large, private farms that required inexpensive labour to exist and be maintained; another condition is illustrated by the development of exchange inside the market, which guaranteed a constant supply of slaves; and lastly, since Athenians were protected from some types of exploitation by democratic frameworks yet lacked adequate internal labour resources, landowners were forced to turn to alternative sources of labour, such as slave workforce. The majority of Greek slaves, who could be purchased on the slave market, were either war prisoners or were abandoned as children (McKeown, 2011). Additionally, it is interesting how utilising slave labour could benefit Greek citizens economically, as there were numerous economic activities that indicate this aspect - possessing a big farm where all of the work and activities were performed by slaves; holding a home that can be rented Although while these types of houses often functioned as short-term residences for temporary renters, they also acted as brothels for slaves

who were forced into prostitution; or owing craftspeople slaves because many workshops engaged artisans as slave labour, some of which were even managed by dependable and skilled slaves (Cartledge, 2002).

Continuing the discussion regarding the relationship between economics and slavery, it is proper to point out the historical phenomenon where slaves from Africa were trafficked over the Atlantic Ocean to the Americas as part of the Transatlantic Slave Trade, an international slave trade. For economic reasons, Europeans preferred African slaves since they were less expensive and more lucrative (Walsh, 2011). This occurred as Europeans discovered that black people were more resilient, more docile, and had a better labour capability than white people after establishing international trade and having access to the African continent (Basset, 1896). Although perspectives on the profitability of the Transatlantic Slave Trade may differ (Richardson, 1978; Postma, 1990; Eltis, Emmer and Lewis, 2016), there are significant studies which contend that slavery was advantageous because it promoted the economic and social advancement of the distinct states that engaged in the trade (Williams, 1944; Darity, 1990; Inikori, 1992).

Ancient Greece's slavery background, what the Transatlantic Slave Trade implied, but also other than these, helped pave the way for what is now regarded as modern slavery, regardless of the fact that slavery as it was known in the past has been abolished for centuries. People who are compelled to perform different duties against their will and without receiving any kind of remuneration represent a situation known as modern slavery. Modern slavery can take many different forms, such as forced labour, debt servitude, forced marriages, domestic servitude, and sex trafficking (Human Rights Office of the High Commissioner, 2000; Miers 2000). Modern slavery has numerous social, cultural, psychological and political implications, but it essentially implies economic aspects.

According to the International Labour Organization (2014), modern slavery is present in many profitable activities that make up a lucrative informal economy, where slave masters are growing more and richer while slave victims are becoming more and more vulnerable (Human Rights Council, 2019; Human Rights Office of the High Commissioner, 2022). Although perpetuating modern slavery is beneficial for those who own slaves and other parties involved in its maintenance, these issues are actually connected to poverty and economic underdevelopment (Bales, Trodd and Williamson, 2009), as they are further addressed in this paper. Additionally, the use of modern slavery in many legitimate enterprises emphasises the reality that occasionally unlawful and inhumane practices provide an opportunity for the consumption of certain products. In addition to the fast fashion and textile industries, other industries that may engage in modern slavery include agriculture, the beauty industry, car washes or constructions (Gold, Trautrism and Trodd, 2015; LeBaron and Gore, 2020).

The remainder of this paper is organised in the following manner: Section 1 presents the used methodology; Section 2 explores the economic impact and the profitability of past slavery; Section 3 treats modern slavery and its connection to poverty and economic underdevelopment; Section 4 presents the case of the fast fashion brand Zara accused to used forced labour in its production process; Section 5 emphasises the results and, therefore, the comparison between the impact of past and present slavery on world's economies, together with how different forms of modern slavery fuel the process of consumption in the fast fashion industry and vice versa. Some final remarks conclude the paper.

Review of the scientific literature

1. Past slavery and economic development

The profitability of slavery and the positive impact on the economic development of states which used workforce based on slavery reflect a significant debate within the academic literature. Throughout this section, the cases of the British and Dutch empires are explored. These two Western empires, which participated in the Transatlantic Slave Trade and experienced substantial economic expansion within their histories, are now regarded as wealthy, developed nations. According to Williams (1944, p. 51), triangular commerce between the British Empire, France, and the colonised Americas enabled trade to expand globally, while also allowing the participating nations, particularly the British Empire, to develop economically at the detriment of non-trading nations. Moreover, Williams (1944, p. 53) argues that within the triangular slave trade numerous commodities specific to the European continent were loaded into ships that travelled from their home countries. These goods were then exchanged for African slaves, who were then used to trade colonial goods that were later taken back to their home countries. Further, the West Indian Islands have grown to be a centrepiece of importance and wealth for the British Empire; it was here that African slaves created the sugar-based colonies, which turned out to be the most successful and lucrative of all imperialist colonies (Darity, 1990; Wright, 2022). The British Empire's primary source of capital

originated from the transatlantic slave trade and the slaves' labour, which subsequently fuelled the Industrial Revolution in the 18th century (Darity, 1982; Inikori, 1988). In an effort to demonstrate that the Atlantic economic order served as the foundation for the current global economic order, Inikori (1992, p.151) even constructed a system known as the "Atlantic System" or "Atlantic Economic Order". Understandably, slavery and colonial expansion were the key forces and processes that contributed to the development of the system's basis and expansionary phase (Inikori, 1992). This system attempts to explain how the Transatlantic Slave Trade and the use of slave labour contributed to the establishment of an economic system that ultimately determined the current economic world order. States that benefited from the slavery system are now viewed as wealthy and developed, whereas states that were used as slave labour are currently perceived as less wealthy and less developed.

Another state entity that participated in the Transatlantic Slave Trade is the Dutch Empire, which is currently viewed as a very rich and developed European nation. The phenomenon of slavery and the advantages it provided are included within a larger framework of the Dutch economy by researchers who argue that slaves and the transatlantic slave trade had a significant part in the growth and economic development of the Dutch Empire. As a result, the Dutch Empire acquired valuable indirect economic gains from the Transatlantic Slave Trade (Fatah-Black and van Rossum, 2014; Brandon and Bosma, 2021). Each slave purchasing mission had to stock up on food and different trading equipment, and all the products to be traded in the interaction with African state entities had to be manufactured and sold by and in the Dutch economy, which also produced and marketed the ships used to carry slaves (Postma, 1990; Brandon and Bosma, 2021). Moreover, Brandon and Bosma (2021, p.49-50) emphasise the fact that these operations undoubtedly created a lot of employment opportunities for the Dutch Empire's factories as well as for textile and gun stores. Other aspects related to the positive economic impact that slavery had on the Dutch Empire highlight that commodities were created by slave labour on the plantations of the Empire's colonies, which were then refined and processed into finished goods - the refinement and processing of such items took place within Dutch Empire territory, creating new employment and generating profits (Postma, 1990; van Welie, 2008; Brandon and Bosma, 2021). Additionally, Fatah-Black and van Rossum (2014, pp.5-6) discuss how within the Dutch Empire, slavery had a stimulating economic effect with positive consequences in wages, ship construction, insurances, and equipment.

The British and Dutch Empires provide instances of two colonial powers which participated in the Transatlantic Slave Trade and benefitted from it, with slave labour having a positive influence on their economy both in past and present. The academic literature offers studies that, on the other hand, are attempting to prove and stress the fact that slavery and the Transatlantic Slave Trade were not in fact profitable and they did not encourage the actual social and economic development of state entities involved in slavery-related activities. This must be kept in mind for both the British (Hyde, Parkinson and Marriner, 1952; Morgan, 2000) and Dutch Empires (Eltis, Emmer and Lewis, 2016).

2. Modern slavery and the global economy

Modern slavery is defined by the Anti-Slavery International Organization (2023) as a situation in which a person is exploited by others for their own or another party's benefit. He or she forfeits their freedom whether they were deceived, forced, or coerced. From sex trafficking and forced labour, to domestic servitude and forced marriages, modern slavery represents one of the most perceptible legacies of past slavery. A valuable distinction between past and present slavery has been made by Bales, Trodd, and Williamson (2011, p.50-51), who claim that, in contrast to slavery in the past, modern slavery is globalised, meaning that its manifestations in various parts of the world are becoming more and more similar. Slavery in the past was legal and used to create empires, but it is now illegal and widely condemned.

A recent report by the International Labour Organization, the International Organization for Migration, and the international organisation Walk Free (2021, p.1) highlights the fact that nearly 50 million people are currently victims of modern slavery, despite the fact that the international and European arenas are constantly trying to impose legislation and take action towards the eradication of this global phenomenon. The International Labour Organization (2014, p.13) also showed that contemporary slavery is a very lucrative "business," generating US$150 billion annually throughout the globe, of which US$99 billion is generated by sexual slavery and US$51 billion by forced labour, such as domestic work or agriculture (International Labour Organization, 2014).

The concerns that the phenomenon of modern slavery brings to the world are in reality related to poverty and economic underdevelopment, despite the fact that the numerous "businesses" that can grow off the back of modern slavery are enormously profitable for certain "business" and modern slave owners. This begins with the discussion about the momentum of globalisation in the mid 1980’. Although the development of

this worldwide phenomenon brought positive aspects (Mukherjee and Krieckhaus, 2012), it has also implied unintended negative consequences (Bardhan, 2004). Even the International Labor Organization once called modern slavery and human trafficking as the dark sides of globalisation (International Labour Organization, 2005). More specifically, the negative and significant relationship between modern slavery and globalisation highlighted by Bales, Trodd, and Williamson (2009, p.49) emphasises the reality that due to increased global interconnectivity, the production of the goods and services we frequently consume takes place in numerous places all over the Globe. As a result, modern slavery frequently appears in the process of production, mixing itself with the legal process, without us being aware of it (Bales, Trodd and Williamson, 2009). In addition, three elements—poverty, corruption, and the decline in the price of slaves—that are specifically associated with social and economic underdevelopment are identified as factors that contributed to the development of slavery and continue to carry on doing so (Miers, 2003; Anker, 2004; Bales, Trod and Williamson, 2009; Kara, 2009).

Because modern slavery impedes the proper development of the economies of many countries around the globe, its presence and levels inside a state constitute an accurate predictor of economic and human growth (Sawyer, 1986; Bales, 2007; Bales, Trod and Williamson, 2009; Datta and Bales, 2013; Cockayne, 2021). Bales, Trodd, and Williamson (2009, p.63) argue that modern slavery distorts local economies in two ways (1) slave labourers can drag down the wages of free workers in the same sector they work in, and (2) slavery distorts economies by removing slaves and their families from the role of consumers in local economies. On top of that, modern slavery creates inter-generational poverty (Dowlah, 2021), as slavery deprives its victims of opportunities for education, training, and other human capital building, which has long-term effects on their ability to generate income; girls, women, and children are particularly impacted by this (Baten and Cappelli, 2017 cited in Dowlah, 2021, p.60). Another factor that is related to the negative impact of modern slavery and economic underdevelopment is, as Faure (2015, p.5) mentions, the fact that by preventing the State from receiving income tax on the wages that enslaved people should have rightfully received and consumption tax from their foregone consumption, it lowers tax revenues.

3. Consumption in Fast Fashion Industry and Modern Slavery

Reconsidering the matter of globalisation may lead us to question whether it gave poorer people more options for employment and pay or whether it determined a life of inferior working conditions or even an unfree labour environment for those at the "bottom" of the development scale. As Barrientos, Kothari and Phillips (2013, p.1037) state, many employees across the world are subjected to unstable, unprotected, and often exploitative working circumstances. The most vulnerable workers are subjected to various types of forced labour. Unfree labour is one type of modern slavery that is associated with the concepts of coercion, the use of force, and the use of deceit throughout the recruiting process (Barrientos, Kothari and Phillips, 2013). However, it is also essential to recognise the different types of coercion that workers may experience when they appear to willingly enter a working context. These forms of coercion are not caused by external forces but rather by the workers' poverty and vulnerability as well as their involvement in social and familial systems of duty and accountability (Steinfeld, 2009; O'Neil, 2011). Phillips (2013, p.178) draws attention to the fact that in the current worldwide production, constraints of debt as well as the withholding of wages until the conclusion end of a contract genuinely create an environment of forced and forced labour.

Forced labour is, unsurprisingly, the most prevalent type of modern slavery in the apparel industry as a whole, which also encompasses the fast fashion industry (Hasan, 2019). The dangers within the apparel industry are prevalent and endemic at every step of manufacturing, as shown globally in supply chains for fast fashion companies as well as luxury brands (Hasan, 2019). Moreover, a report of the international organisation Walk Free Foundation (2018) stresses the fact that one of the major global promoters of modern slavery is the fashion industry. The Spanish fast fashion brand Zara has been accused several times of using forced labour in its supply chains. The well-known brand was implicated in a situation in 2006 where Syrian refugees in Turkey were forced to work for many clothing companies, including Zara (Reuters, 2016) the investigative documentary Panorama also discovered that there was a child working more than 12 hours per day among the Syrian refugees (BBC, 2016). Zara has been revealed to obtain clothing from Brazilian factories that practise modern slavery, as Brazilian federal government investigators discovered 15 immigrants living and working in terrible conditions in two tiny workplaces in Sao Paulo in August 2011; workdays for labourers may last up to 16 hours, and they had limited freedom of movement (Antunes, 2011; Mind the Gap, 2020). Furthermore, in 2020, an investigative report (Xiuzhong Zu, et. al., 2020) highlighted the fact that Zara used in its supply chains the forced labour of the ethnic group Uyghur in the Xinjiang region of China (Breeden and Gallois, 2021; Yerramilli, 2022).

The relationship between modern slavery, forced labour, the treatment of non-free workers, and the responsibility of the companies engaged in such activity has long been discussed, but there is still little

research on the consumer's role in the support of various forms of modern slavery, according to Carrington, Chatzidakis, and Shaw (2020, p.2). But nonetheless, several studies (Nolan and Bott, 2018; Korczynski et. al., 2000) emphasise the relevance of the consumer in the labour and production operations, as well as the importance of the customer in eliminating modern slavery from the supply chain of the goods and services they consume. When questioning consumers over the issue of slavery and how their consuming actions support such human rights violations, Carrington, Chatzidakis, and Shaw (2020, p.8) found in their practical research the theoretical framework of neutralisation where people engage in illegal/unethical behaviour by relying on justifications that may protect them from self-blame or the blame of others.

Methodology

The present paper's purpose was accomplished using a qualitative research method called content analysis. Through the content analysis there was undertaken a literature review on how past slavery impacted the economic development of Western Worlds, and how modern slavery is connected to poverty and economic underdevelopment. Furthermore, the content analysis focused on the evidence that the consumption of specific fast fashion industry items may stimulate and support the phenomenon of modern slavery, especially the practice if forced labour.

In all, 40 sources were examined, including 9 books, 7 online newspaper articles, 5 international organisations reports, and 19 academic articles. Jstor, ProQuest, Science Direct, Sage, and Francis and Taylor were the main databases used. The primary keywords employed were *slavery, slavery profitability, transatlantic slavery, modern slavery, modern slavery on global economy, fast fashion industry, model slavery and fashion industry*, *Zara and modern slavery, Zara and forced labour.*

Results and discussion

Slavery has been an ongoing theme within academic literature, engaging not just the interest of historians and sociologists but also that of economics and politicians. Although the relationship between this phenomenon and the general area of the economy may not seem to be very close at first glance, we have already seen how slavery is a topic of interest for economists. The topic of whether slavery was profitable or if this historical institution had an impact on the social and economic development of today's most developed countries is one that economists are particularly interested inIn addition, modern slavery, a legacy of past slavery, has drawn the attention of economists as well as other experts since it is an extremely lucrative illegal business that encompasses a variety of business models. Moreover, social and economic underdevelopment, poverty, and modern slavery are all globally interconnected.

Although there are different viewpoints, it is clear that historical slavery is seen to have contributed to economic progress and that nations that historically engaged in slavery, notably the Transatlantic Slave Trade, are among the most developed and wealthy nations in the world today. On the other hand, because it perpetuates intergenerational poverty and puts disadvantaged people at the periphery of backwardness, the heiress of slavery, modern slavery, is becoming more and more linked to high levels of poverty and economic underdevelopment. The example of fast fashion was insightful as consumers typically do not look into the system of production and continue to consume such goods creating a cycle of poverty and modern slavery. The process of unaware consumption of various goods produced by different industries does nothing but support the chain of forced labour.

Conclusions

Although while slavery may appear to be a thing of the past and a problem that has long since passed, its effects are still being felt today. While past slavery is frequently seen as a contributor to economic and social development for states that engaged in slavery and employed slave labour in various fields, modern slavery, despite being a lucrative industry internationally, it only perpetuates and preserves poverty and keeps some nations and groups in a persistent state of economic underdevelopment.

Consuming particular goods from certain businesses on a regular basis typically supports contemporary slavery; the fast fashion industry serves as an excellent example of this. A pair of jeans purchased from a fast fashion brand most likely contributes to the phenomenon of modern slavery, so slavery, whether past or modern, continues to be a subject of intense interest and debate. Slavery also plays a significant role in

the discussion of consumption and the significance of educating consumers about the repercussions of their consuming actions.

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The Nation Branding in Romania, Approach to Strategy and Leadership

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Abstract

The purpose of this study is to analyze the structures, flows and leadership models employed by East European countries in order to build a strong Nation Brand. The country under radar in this paper is Romania.

Methodology

Qualitative research is employed comprising in face to face semi structured interviews with representatives of Government, Tourism Organization, several industry associations, Cultural Institute.

Findings

We identified that various activities, programs that could be associated with a Nation Brand strategy are developed as inter-institutional effort, still, no one associated the efforts with the Nation Brand because no formal attention has been awarded to the subject. Even more, some negative associations come from the misconception that Nation Branding is about logo, slogan and advertising campaigns that were much disputed in the past.

Research limitations/implications

Further research is needed in order to analyze various organization models in east European countries but also comparing those models with the success stories in Nation Branding worldwide, in order to see what can be learnt, what should not be repeated and if there is an ideal organizational and leadership model.

Practical implications

Countries should find a way to prioritize Nation Branding and employ a model that could live beyond the frequent changes on the political stage.

Originality/value

This study approaches Nation Branding for the under researched geographic area of East European countries (including Romania) covering also the topic of organization, structure and leadership in Nation Branding. Three decades after the fall of communism, Nation Branding might be a feasible solution for long term thinking, to make themselves more visible and get an active voice and a larger share of the pocket in international trade. The main challenge would be to prioritize Nation Branding and employ a model that could live beyond the frequent changes on the political stage.

Keywords

Nation Branding, Leadership, Romania, East European.

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Introduction

The term “Nation Branding” is often a topic of confusion among both academic scholars and government officials. Moreover, in order to understand the structure and leadership in Nation Branding, we need to first

clarify the terminology and determine if terms such as “destination branding” or “place branding” are sufficiently similar to be utilized in this current research.

The most frequently encountered notions in our research were: “country branding, “nation branding”, “place”, “location” branding, “destination branding”. According to Hanna and Rowley (2008), “Destination” is mostly used in tourism literature, second to which is the term “Place”. The same authors reveal that “Place” and “Location” are the dominant terms in Branding and Business Literature, with “Nation” indicating a country, “Place” indicating “towns, cities, regions and countries” and “Location” indicates “towns, cities and countries but *not* regions.” According to Blain, Levy and Ritchie (2005) the jurisdiction of Destination Management Organizations “may cover a country, state/province, region or specific city or town”.

Aronczyk (2013) outlines three dimensions for Nation Branding: to help the nation-state successfully **compete for international capital** (in tourism, foreign direct investments, trade, higher education, skilled labor); to have a seat at the table in the **diplomatic arena** and to serve as **soft power** in contrast with hard power (military, economic assets).

Nation Branding has also been seen by several authors through corporate lens. Olins (1999) observes that countries use “business speak”, they are “down-sizing and privatizing”, “while companies are starting to deliver welfare services”. Hankinson (2007) argues for the obvious similarities between managing corporate and destination brands (both require to “reflect and be reflected by a set of sub brands and consumer experiences”, are dependent upon organizational culture, internal coordination, and external partnerships, both must “manage and communicate with a wide range of stakeholders”).

According to Dinnie (2008), nation-brand architecture model, Nation Brand is an umbrella brand for the endorsed brands: Tourism, Exports, Inward Investments, Talent attraction, Sports. Further investigation is needed for the author’s suggestion that coordination of such an effort can only come from the Government but in a way that has some degree of political independence but is still accountable for tax-payer money. At the same time, some authors critique the linear model of destination brand, considering it more “as antihierarchical, self-organizing and locally inspired” (Pavlovich, 2014).

What we notice as common denominator is the scale of complexity in Nation Branding, the stakeholders involved, the instruments borrowed from traditional branding and marketing. The question that arises is: do countries need a clear leadership, a CEO of the Nation Brand or a Brand Director? Although there are many examples of good or bad practices, little research investigates the topic of organization and leadership in Nation Branding.

Romania, as well as several other Central and East European countries, have been subject to little research where Nation Brand is concerned as Fujita and Dinnie (2009) observed. This study is based on the previously mentioned study recommendation that further research should be employed to determine the strategies adopted or that should be adopted by other countries than those mentioned in their research to fill the gap in the literature.

1. Background information on Romania

Having been under the Soviet regime for more than 50 years, when the only possible brand and branding was that of the party and the national government, Romania is still recovering and trying to find its own path on what Simon Anholt defines as national branding: an effort to increase the country reputation by focusing on its distinct characteristics (Anholt, 1998). A way to express the identity of a nation, what differentiates one nation from the rest, to demonstrate what it stands for, and to show the world what Romanians should be known for.

The first attempt at a national brand was made five years after the revolution, with the intention of improving Romania's image, which had been strongly affected by the "mineriade" events that shocked the international opinion. The Romanian government secretary hired Group Saintonge Edition (GSE) to create and print 98,000 albums containing a series of pictures of Romania's most important tourist destinations, which were meant to be distributed in more than 90 countries. Unfortunately, the entire campaign ended up as a corruption scandal when the press discovered that only 4,200 of these had actually been printed, and no one knows exactly where, or even if, they were actually distributed.

Another attempt, this time conducted by a non-governmental organization named Asociația pentru Promovarea Produselor și Serviciilor din România (APPSR), was titled *Fabricat în România* (Made in Romania). The aim of this program was to brand Romanian products and services with a special stamp,

indicating their quality and country of origin, Romania. After 4 years, however, the initiative failed to deliver what was promised, which was more visibility for Romanian products and services.

Only in 2001, we can talk about a truly national campaign, when the General Directorate of Tourism Promotion (DGPT) alongside Ogilvy&Mather created what was called "România, mereu surprinzătoare". Despite its professional execution and good visibility on international TV and Radio stations, the campaign was again questioned due to its high cost to the government during a time of economic crisis.

The next two campaigns, *Români în Europa* and *Romania, land of choice*, between 2008 and 2009, were other attempts to promote Romania using international Romanian figures, such as Ilie Nastase, Nadia Comăneci, and Gică Hagi. The latter campaign mentioned was the first one for which results have been presented, showing a gain of 5,5% in new tourists in Romania.

In 2010, the Romanian Tourism Ministry launched the *Explore the Carpathian Garden* campaign at the Shanghai World Exposition. This campaign was the result of comprehensive research, involving 10,881 interviews in countries such as Austria, Germany, Italy, the UK, and Russia, with the aim of increasing the proportion of international tourists who had a positive image of Romania, from 45% to 65%. To this day, the *Explore the Carpathians* campaign, its logo, slogan, and brand book are still recognized and used as the official Romanian tourism campaign.

2. Methodology

In order to study the nation branding approaches to strategy and leadership we follow the template of Fujita and Dinnie, (2009) the supply-side perspective, looking at tourism, investment attraction, export promotion in Romania. We collected data in a series of face-to-face semi structured interviews, asking the people interviewed the open-ended questions, but also allowing them to provide additional information, as per their experience or beliefs.

The interviews were targeted at: the General Secretariat of the Government, Ministry of Tourism, Ministry of Foreign Affairs, Ministry of Research, Innovation and Digitalization, City Manager and Association of Tourism Promotion from one of Romania's counties considered to be a best practice example, Branding experts, Academics, members of Consultative tourism body and the Cultural Institute of Romania.

Six interviews were conducted, and in some of the interviews several people attended, alongside Government officials. Another three responses were in writing, transferring the responsibility of answering to our study to another Member of the Government. None of the interviews was recorded, in order to make respondents confident to open and share their thoughts and experiences. Both authors assisted to interviews and took comprehensive notes, that were further compared and aligned to make sure they reflected the meaning of the responses.

The application of Thematic Analysis was utilized to gain insight into respondents' perspective regarding the formal structure of Nation Branding in Romania, including elucidating any existing strategies, common visions that are shared among relevant sectors, and identifying clear leadership. According to Braun and Clarke (2012), "Thematic Analysis enables the researcher to recognize and interpret collective or shared meanings and experiences."

3. Results

Responses were grouped according to what we identified as main topics.

Nation Branding as a theme

An initial observation that can be made is that there is a lack of clarity between the Nation Brand and Tourism Brand of Romania at the governmental level. In 2019, a public tender that was deemed controversial at the time, as one respondent recalls, caused further confusion. According to public statements from officials at the time, the tender, which had a tourism strategy and a destination logo as its main deliverables, was launched as a Nation Brand tender, and was eventually finalized as a Tourism Brand.

All officials referred us to the Ministry of Tourism when being asked about Nation Brand. The Ministry of Tourism points out, that they (obviously) are in charge with the Touristic Brand. In fact, from our findings so far, the only activities under the umbrella of Brand Romania were those run by the Ministry of Tourism. This does not mean that other state or private entities are not running some projects that concern the pillars of Nation Brand as described by Dinnie, (2008) export promotion, foreign investment attraction, sports etc.

This however means that there is not an official acknowledgement that the Nation Brand should be an umbrella for all these activities.

Formal organization of Nation Branding

Having acknowledged to this point that Nation Branding has not been considered a strategic or common strategy point so far, we endeavored to ascertain whether the central players are running any initiatives which could be classed as part of a drive of defining, strengthening, and promoting Brand Romania.

"We all invite and get invited by other ministries to their activities that could impact of benefit us as well". There are common projects that could be seen as pillars for brand Romania: spa or health tourism, where Ministry of Tourism, Health and Labor work together, for the developing of the "product", which is to be later promoted with the support of Foreign Affairs in relevant other countries that generate incoming tourists to Romania. This is just an example that came to surface after we insisted to get some examples of projects considered strategic at country level.

Also, efforts are made to promote some industries ("Romania should be the homeland of mineral waters", vision of Jean Valvis a top player CEO in the mineral water industry) (Adevarul, 2019) or to attract foreign investors ("we are not waiting for them to come, we go and ask what do they need/lack to come" said Florin Spataru, Minister of Economy in a Public Conference). Nevertheless no one seems to have thought about the need to work in a coordinated effort, the Nation Brand being usually referred to as the logo, slogan, advertising campaigns and all the controversy associated with them in time.

Nation Brand Structure and Management vision

The initial questions about the structure, organization, level of communication and collaboration were replaced with a projective exercise where we asked the participants for their vision: who should be at the table of Nation Branding, in your opinion? Who should lead the effort? What would you do if you were to be appointed as Head of Brand Romania?

Also, we insisted to get some examples of common projects that the main entities were involved in a joined effort to promote Romania. Interesting examples were provided, a ray of hope that people have ideas, are making efforts, even if structure and coordination lacks.

When asked to project their vision on how Nation Branding should be organized, several respondents thought of the recently adopted legislation Procedure for authorizing Destination Management Organizations (DMOs), that in their opinion could refer to destinations such as cities, regions but also nation level, even if in the 2022 Procedure, there is no distinct mention about a DMO operating at national level (destination Romania). Another type of answer considered that Brand Romania should be a private sector initiative with rotative leadership involving the most representative business associations. An interesting opinion noted that, if considered a top priority at Government level, Nation Brand should have a designated Ministry.

All the participants agreed that such a project needs involvement from both state and private sector, in a structured Public Private Partnership. All the participants agreed that a major drawback is the frequent change of Government, that comes along with changing not only the Minister but also entire teams of people, making it hard to make anyone accountable for long term vision projects. "If one considers digitalization to be the focus, the next one, most certainly would go for agriculture and put digitalization on hold, or even worse, erase what has already been done".

Another issue identified was that of too many working groups that are not achieving their goals due to lack of proper leadership that could find a common denominator among the diverse agendas of participants. " Country vision can only come from top to bottom, then you have to identify a limited number of relevant actors to involve, otherwise you get stuck in never-ending consultative bodies".

About the leadership in Nation Branding, we concluded that is a too sophisticated topic in the current context. "No one has the helicopter view, it is no one's job". Some of the participants have no idea about who should coordinate the effort but try to come up with a solution ranging from the Prime Minister, Minister of Tourism, Minister of Economy, Minister of Foreign Affairs, Academics ("they are more credible than politicians"), Private sector ("but will the state agree to accept them?")

"I don't see an umbrella brand for Romania, but I see some raising stars: Oradea as a destination brand, Untold festival". "They should start to work on useful programs and then start to talk, instead of running useless, expensive advertising campaigns". "It is doable if you have vision, clear objectives, drive, and political ability to put all parties at the same table".

4. Research and implications

Further research is needed in order to put in context all organization systems that East European countries have in place, how they evolved over time and if/how they are correlated to economic development of those countries. Also, comparative research is needed in order to analyze the models considered success stories in the area of Nation Branding and propose an "ideal model" that could be employed by East European countries in order to reach their potential.

5. Practical Implications

Respondents proved various levels of understanding the concept of Nation Branding, but the fact that Nation Branding is not a topic on the Government agenda is a clear point made by everyone asked. The obvious and much needed action would be to understand the concept and make it a national priority. It should be the responsibility of the Government to take on this task, but also of private actors that should be able to explain the important difference between a marketing campaign and a coherent Nation Branding Strategy.

Conclusions

The issues investigated in this research concern the Nation Branding in Romania. After the fall of communism, Romania had several attempts to promote itself. Some were more visible or controversial (tourism brand campaigns), some went under the radar (efforts to attract foreign investments or disparate efforts to promote Romanian products), some just happened with no involvement of state official representatives (sport champions, Romanian talents in different areas).

The research shows that Romania lags behind some other eastern European countries, where the actors involved in designing and implementing the Nation Brand strategy are known and at least try to coordinate their actions under a common umbrella. Even if not perfect, the models revealed by (Fujita and Dinnie, 2009) for Czech Republic, Slovak Republic, Poland and Hungary, exist and the respective nations aim at improving them. Romania must first become aware of the concept on Nation Branding, and then find a capable leader that can bring together at the same table the relevant parties that could move forward this project.

There is need for leadership with a vision, putting in place a coherent structure with clear responsibilities, deadlines, KPIs, progress reports. There is also need to define and improve the "product": What does Romania have to offer on each of its relevant axes? What kind of tourism are we competitive at? What are our flagship products or services? What should the state do to support these areas? How can we put everything under the umbrella of Brand Romania?

Only when we have a viable "product" we should consider advertise it to the proper audiences. Promotional activities come at the end of solid programs, of building or rebuilding something. As Anholt (2020) was observing: "nobody is going to change what they believe about a country just because its government transmits expensive messages declaring that those beliefs were wrong". The process is continuous and small achievements will create the context for further development.

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Developing a Circularity Cost Approach for the Wood Products Industry

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Abstract

The paper approaches the topic of costs when transitioning from a classical manufacturing approach to a circular model in the wood products industry. The purpose of the endeavor is to investigate the main cost categories and to establish their relations and connections, for establishing the basis needed for a detailed quantitative model. The methodology employed starts from a brief literature review, completed by the industry experience of the authors, leading to a theoretical framework that address the costs before and after the aforementioned transition. Our main findings consist in identifying four principal groups of cost items, which are then detailed for the wood products industry and related to the usual accounting practices. The understanding of these connections is important for defining in the future mathematical relations and creating formulas that can be easily applied to any manufacturing company, including from other sectors. The ultimate goals towards which we are working is to facilitate the transition to the circular economy, by reinforcing its environmental benefits and gains with clear arguments pertaining to the efficiency of operating within this paradigm.

Keywords

circular economy, cost analysis, wood products

DOI: 10.24818/BASIQ/2023/09/016

Introduction

The need to transition the current economic models from the existing linear and wasteful approach to a circular economy concept, in which both matter, and energy can be recovered and reused in one way or another, is one of the guiding imperatives of the present. The management of existing resources, the protection of the environment and the reduction of the carbon footprint are concrete steps that can be derived from the circular economy paradigm and the sooner the society and companies are ready to embrace it, the better for our continued survival and sustainable development.

In Romania, steps are being taken in this direction, as industry sectors struggle to keep in line with European guidelines and strategies, while other difficulties are coming up all the time. One of the most visible domains in which this solution can be of high value is the exploitation and processing of wood, including many other sub-domains such as forestry, timber and lumber production, fiberboard/ particleboard production, wood-based products, furniture, etc.

The present paper performs a cursory investigation about the costs and savings associated with having a wood products manufacturer adopt a circular economy approach. This follows our team's work in (Tofană, et al., 2022) and is aligned with scientific investigations in the field, such as those performed by (Lazaridou, Michailidis and Trigkas, 2021) and (Susanty, Tjahjono and Sulistyani, 2020). The proposal of the authors combines technical, economic and financial aspects in a qualitative model of understanding and managing the transformation project. The two main parts of the paper include the development of a Theoretical framework based on Literature review and a Discussion of the implications, followed by Conclusions.

Future work is needed to also develop a quantitative model that can relate the currently identified cost categories in a complete feasibility study.

1. Literature review

Although circular economy has become an important policy guideline and requirement in the past decade in the manufacturing industry, the focus of most companies, as many of the scientific studies, rest with the technical (Uemura Silva, 2021) and operational (Gigli, et al., 2019) aspects of the transition from current models, or the overall assessment of the investment opportunity (Kravchenko, Pigosso and McAloone, 2019). However, once the circular approach is up and running, the companies are face with new challenges related to determining the effectiveness and efficiency of their new manufacturing system, and problems only get more complicated with time, as the environmental benefits can remain intangible, while production difficulties can manifest in concrete ways, hampering the competitiveness of the enterprises.

By focusing on a deep transformation of the business model (Albastroiu Nastase et al. 2021), as part of a holistic approach at the national (Ungerman & Dědková, 2020), supply-chain or sectoral level effort (Pitti, Espinoza and Smith, 2020), the success prognostic can be increased significantly. The limiting factors and superfluous costs (e.g. red tape, administration, safeguarding, etc.) can be overcome more easily if the target markets can be convinced by economic efficiency arguments (Mellquist, Boyer and Williander, 2022) or policy interventions (Sikkema, et al., 2023) to facilitate the establishment of the circular economy.

In this context, the most adequate framework to deal with costs and externalities appears to be the lifecycle outlook that is used on a large scale for environmental impact assessment, but can be readily extended to include other cost features such as socio-economic characteristics (Jahan, et al., 2022) and or specific circular economy processes encountered in manufacturing (Wouterszoon Jansen et al. 2020). The methodology we present next divides the production system lifecycle into two zones: before and after transition, showcasing their commonalities and differences.

Theoretical framework

In order to properly distinguish the cost categories of the transition from a classic approach to a circular approach in the wood product industry, we propose the following methodical framework that takes into account the necessary transformations before, during and after the process is complete. This model is based on the understanding of the specificity of each of the paradigms that bring about both costs and savings in relation to each other (see Figure 1). Additionally, there is an important area of overlapping where the costs are similar, as well as an area of costs associated with the change itself.

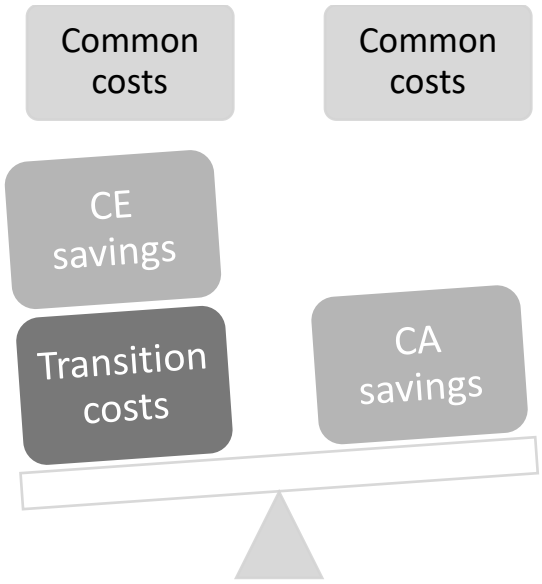


Figure no. 1. CECACM (Circular economy – Classic Approach – Cost Model)
Source: own work

When investigating the issues in more detail, these four main categories can be broken up into specific components, although there is constant dynamic between them until the final goal of establishing the full CE approach is accomplished. The table below presents a general overview of the situation, which can be further detailed depending on the level of accuracy targeted by the analysis (Table 1).

Table no. 1. Details relating to cost categories

Cost category	Cost elements (examples)
Common costs	Overhead costs related to location, management, administration, etc. Production costs associated with design and manufacturing Marketing/distribution costs for promoting and selling the new products Costs of financial and business services need for the company Personnel costs related to the workforce employed by the company
Transition costs (temporary and permanent)	Change of production equipment/software to accommodate CE Re-training of personnel to use the new equipment/software Additional logistics costs to use the new type of recycled materials Cost of new consumables used in the CE specific processes
CE savings	Reduced costs of raw materials by re-use/re-cycling Reduced environmental compliance costs Increased sales of the current product lines Sales of new types of products and solutions
CA savings	Use of existing infrastructure, knowledge and solutions

Source: own work

In turn, if we study the accounting approach used by most Romanian companies, there are several elements that show the possible connections between the CECACM and the records that are usually maintained (Table 2). The symbols in the table matrix below show the degree of correlation among the analyzed categories, going from very low to very high, and using five steps.

Table no. 2. Determining the relationship between CECACM and accounting practices

	Wages and contributions	Raw materials	Energy and utilities	Transport and services	Depreciation and interests	Misc.
Common costs	❺	❺	❹	❸	❷	❶
Transition costs	❸	❹	❶	❺	❺	❶
CA savings		❶	❶	❶		
CE savings		❹	❸	❸		❺

Source: own work

Legend (relationship strength): 1 - very low, 2 - low, 3 - average, 4 - high, 5 - very high

Raw materials and wages represent the largest categories for common costs, and they apply in similar proportions to both models. For the transition costs, the most significant elements are the transport and services (especially for recovering wood) and the depreciation and banking interests associated with purchasing new equipment. Most CA savings are small, while the CE saving are high for raw material and very high in the miscellaneous category due to the new possible sales.

2. Discussion

When analyzing the cost categories proposed in the model above, we must recognize the following important aspects in relation to their definition and possible means of collection of data:

- Both approaches will generate costs related to using equipment and workforce, as well as capital and services to create and sell products, however the technical and competence content of these elements might differ considerably (e.g. replacing tree trunk peeler with a de-varnishing machine, replacing a primary saw worker with a CNC specialized worker, etc.);

- Transition costs incurred in the conversion from the classical to the circular model are either temporary or one-off costs (e.g. buying a new machine, setting up a collection system) or they can become permanent in the new production system (e.g. using enzymes to breakdown lignin or water-based coatings instead of solvent-based coatings);

- The savings brought about the CE approach are either easily quantifiable (e.g. quantity of replaced wood material) or difficult and vague to assess (e.g. image impact on the market niches of becoming a circular manufacturer);

- The savings of CA are mostly related to well-known economic effects related to scale, know-how or shared externalities.

The relationship between these categories is not yet fully defined, one of the reasons being the possibility of some cost elements migrating from one area to another. Especially the permanent transition costs can turn into common costs, as they are accrued and produce the expected changes within the production system and the company staff. Also, the CA savings will become also CE savings as soon as the circular economy approach is adopted on a large scale, as the new external costs (e.g. for transportation or energy, or support services) will become refocused themselves on realizing additional economic benefits. Another pattern that emerges and constitutes an advantage of the new way of doing things is the prosumer paradigm, as the company can use considerable amount of wood waste from the first processing or from additional ones to generate energy for electricity and heating.

Of course, the focus of the company we approached for realizing the case study is on the large technology costs associated with implementing the new model and increasing its sales to the existing customer base, but also on finding and new customers and new opportunities, specifically due to the circular economy model. These categories are perceived as being at least one order of magnitude more significant than all the other included in the framework (full categories or even some of the sub-categories, such as the training costs). The other categories are also acknowledged but their evaluation is not considered a priority in the market place (although it might be interesting for researchers). This aspect leads us to believe that there should be a form of weighing or prioritizing the costs and savings, and not simply treat them as factors in a mathematical formula. Thus, a complete CECACM should also take into account the time dynamic of when the costs become important and what data is available to estimate them.

Conclusions

Based on our investigation, we can conclude that Romanian wood products manufacturers are in the early stages of planning and implementing circular economy models, as they come to assess the magnitude of the necessary changes from an operational and economic point of view. Many times, the focus is on the required investments in equipment and software, but we came to the conclusion that the long-term operation of the approach also bears other significant costs, that should be however offset by the magnitude of savings generated by the possibility of use of recovered wood. Nonetheless, the classical approach also has some important savings for which there is no substitute yet, including the use of existing business channels, the learning effect produced by generation of wood manufacturing and the possibility to leverage the current infrastructure (e.g. production facilities, pollutant treatment stations, classic transportation options etc.). Also, it is worth noting that the transition is difficult if it does not happen as part of a coherent ecosystem in which as many partners as possible in the value creation chain undergo the same process, thus pointing for the need to support this industrial conversion through proper incentives and funding.

Our future work will focus on further developing this cost model through testing and validation in the real world (at a company performing the changeover), collecting additional data to refine it and the establishment of the mathematical formulas and relations that cand quickly produce the desired results for decision makers.

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Generations' Perception Towards the Interaction with AI

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Abstract

Acknowledging the ongoing trend and increasing implementation of different forms of AI that simulate human behavior for various tasks in a human-like manner, the focus of the present research is set to determine the attitude of consumers towards interaction with AI from a more personal point of view, rather than from an operational perspective. The present research mainly focuses on differences between two age groups of respondents: aged over and under 30. In order to obtain insights about generations' perceptions towards the interaction with AI, a primary data analysis has been conducted. The questionnaire contains 31 items and is set to test the following nine aspects regarding consumer-AI interactions: performance expectancy, effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety, willingness to accept AI and objection to use AI. The results show that in the case of AI, there are only average significant differences between the studied age groups, the two groups being at the moment more alike than different in their perception towards AI. As AI advances at a rapid pace, practical implications consist in indicating relevant AI aspects to be studied for further human-AI interaction related research.

Keywords

Artificial intelligence, consumer perception, human-AI-interaction

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Introduction

Since the emergence of artificial intelligence (AI) on the market and its implementation in more and more solution-oriented applications, researchers have begun looking for a generally applicable acceptance model, in order to assess consumers' willingness to interact with various AI devices. Such a generally applicable model is still in research, given the fact that AI in general is to be considered a dynamic technology, with various characteristics, depending on its application. Accordingly, consumers interact with AI in different contexts, such as: AI call center agents, chatbots or virtual avatars answering different questions, engaging in post-purchase services, providing customer support, digital voice assistants acting as personal assistants help you through the day, social robots greeting, guiding and adressing concerns in customer-facing services, service-providing humanoid robots and also even care-providing humanoid robots.

Considering that consumers have nowadays various and sometimes also unusual interaction occasions with AI, it is interesting to determine significant differences in customers perceptions regarding important AI-interaction aspects. Therefore, research needs to focus more on how AI is perceived by consumers and on gaining insights on what drives or hinders human-AI interactions. More precisely, the aim of the present research, is to investigate how different AI is perceived by generations: people aged over and under 30. The current paper assesses their perception of AI, based on nine research relevant aspects: performance and effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety towards AI, willingness to accept and objection the use AI. After a brief literature review of the mentioned aspects, for obtaining differential insights, a primary data analysis relying on a questionnaire containing 31 items has been conducted. In the second part of the paper, the research methodology is explained, and results are assessed via discriminant analysis discussed. Principal findings of our research only show, that for the time being, both age groups seem to share similar perspectives in terms of the nine chosen AI related aspects.

1. Literature Review

Artificial intelligence (AI) has become increasingly present in our everyday life, from voice assistants to chatbots and even algorithms' recommendation. As AI continues to pervade our interactions with the technology, understanding how different generations perceive these different forms of AI, it is important and can have major implications for the design and implementation of AI systems. By identifying the differences between generations when we talk about their willingness to accept and use technology, will help developers to create more user-friendly and effective AI systems that will meet the needs and the expectations of different types of consumers (Pelau and Barbul, 2021).

Performance and Effort Expectancy

Both performance and effort expectancy are two important factors that can indicate an individual's beliefs about the benefits he or she can gain and the level of effort required to use technology (Venkatesh et al., 2003). According to Venkatesh et al. (2003), performance expectancy refers to „the degree to which an individual believes that using a system will help him or her to attain gains in job performance". Effort expectancy in the other hand, is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). These two cognitions form a crucial component of an individual's internal belief system, which serves as the foundation for their behavioral intentions (Maruping et al., 2017).

Social Influence

According to Venkatesh et al. (2003), social influence is the extent to which an individual perceives that significant others in their social environment expect or endorse their use of a new system. In other words, it refers to how much importance an individual gives to the opinions and beliefs of people who are important to them, regarding the use of the new system (Venkatesh et al., 2003). Similar to performance and effort expectancy, social influence is considered to have an impact on the formation of the internal belief system that shapes an individual's behavioral intention (Maruping et al., 2017).

Hedonic Motivation

The concept of hedonic value represents the individual's desire towards entertainment and emotional satisfaction when using a product or service (Yang and Lee, 2010). Hedonic motivation pertains to the enjoyment or satisfaction a person expects from utilizing AI devices in service delivery (Allam et al., 2019; Law et al., 2018; Venkatesh et al., 2012). If an user is motivated by pleasure-seeking when it comes to AI devices, utilizing them can be advantageous as it fulfills their desire for enjoyment and new experiences, ultimately meeting their personal interests and needs (Fryer et al., 2017). Consumers who use AI devices for the sake of pleasure-seeking are more likely to have favorable attitudes towards their usage (Gursoy at al., 2019). According to Gursoy et al. (2019), consumers who use AI devices with hedonic motivations perceive AI assistants as a unique and innovative aspect of the consumer experience, distinct from typical or conventional shopping encounters. Additionally, some people find pleasure in communicating with AI devices or fulfilling their curiosity (Fryer et al., 2017; Hasan et al., 2021)

Anthropomorphism

Anthropomorphism describes the extent to which an object displays human-like traits, like human aspect, self-awareness, and emotional expression (Kim & McGill, 2018). This concept is used in diverse fields, including psychology, marketing, and computer science, among others (Schanke et al., 2021). The role of anthropomorphism in the effectiveness of AI artifacts is significant (Schanke et al., 2021) as it influences to a great extent the user experience in human-AI interactions (Cheng et al., 2022). According to Hu et al. (2021) who evaluated the perception of human-like qualities in conversational AI through an examination of two social cues: humanness voice and ability of AI devices to understand humanness, found that enhancing the human-like qualities of AI devices does not necessarily result in increased trust (Cheng et al., 2022). The analysis conducted by Belanche et al. (2021) focused on three distinct components of a robot's humanness: perceived physical human-likeness, perceived warmth and perceived competence. They indicated that these three constructs can impact customers' perceptions of service value in various ways, including emotional and utilitarian values. Particularly, they discovered that the perception of warmth may hold greater significance for customers who have minimal need for interaction. This suggests that users who highly value human interaction may feel more anxious with bots (Cheng et al., 2022).

Trust

Trust refers to an individual's willingness to place himself in a vulnerable position regarding the actions of another party (Mayer et al., 1995). In the context of AI, trust is defined as the confidence or belief that an AI-agent can provide genuine and trustworthy services with accurate reported results (Shin, 2021). It plays a significant role in encouraging people to accept and use new technology (Corritore et al., 2003; Nordheim,

et al., 2019) and can directly impact an individual's intention to switch to an alternative option (Li et al., 2007; Liang et al., 2018; Ranaweera & Prabhu, 2003). Previous studies have indicated that trust in AI can result in beneficial outcomes, including a greater reliance on AI agents, higher perceived performance of AI, and an increased level of trust in sellers, ultimately leading to an increase in purchase intention (Cheng et al., 2021; Shin, 2021; Yen & Chiang, 2020). Also, previous research has generally approved the notion that the level of trust that consumers have in existing services or technologies, or their providers, is inversely related to the likelihood of them switching to a new one (Mezger et al., 2020).

Anxiety towards AI devices

Anxiety can be defined as the individuals feel regarding the possibility or likelihood of experiencing adverse outcomes that they believe they cannot avoid (Schlenker & Leary, 1982). Social anxiety is one of the multiple types of anxiety that entails an ongoing and apparent sense of apprehension or unease in particular social contexts where individuals may be subject to scrutiny by others (American Psychiatric Association, 2013; Maes et al., 2019). Research has indicated that consumers with elevated levels of social anxiety are more prone to developing addiction to social media. They are more attentive to social media's functional and emotional aspects and its ability to aid in their interactions with others and meet their emotional needs. The presence of social anxiety can influence consumer's capacity to explore, assess and accept new technology products (Yuan et al. 2022). When consumers with high level of social anxiety undergo the process of adopting a product, they tend to evaluate it based on its practical usefulness and enjoyment (Yuan et al. 2022). The correlation between the benefits of an AI assistant (such as responsiveness, compatibility and anthropomorphism) and user's perceived utilitarian values is influenced by the presence of social anxiety (Yuan et al. 2022).

Willingness to Accept the use of AI devices

The emergence and prevalence of AI devices in users' everyday life is viewed with both attraction and worry (Pelau et al., 2021). The development of AI has multiple benefits, which are fascinating people but at the same time, with the technology advancement they tend to become more redundant because of the fact that one day, AI devices could become more intelligent and more competent than them (Bryson, 2009; Kaplan & Haenlein, 2020). Research shows that individuals' actual behavior is typically determined by their intentions and willingness to engage in a particular activity. In other words, if individuals intend to do something and are willing to do it, they are more likely to follow through with the action (Cronan, Mullins, & Douglas, 2018). Also, studies in service robots, such as the ones conducted by van Pinxteren et al. (2019) and Song and Kim (2020), suggested that consumers' intention to adopt the technology is positively influenced by their perceived trust, the comfort in using AI devices and the enjoyment in interacting with the robots. This makes the robots an extension of the frontline service associate.

Objection to Use AI devices

As previously mentioned, trust represents an important factor in technology adoption as many people are worried about the collection of their personal data, such as conversations or personal information, without their consent or knowledge. With the increased presence of AI devices in both consumers' homes and workplaces, the risk of cybersecurity threats represents another concern that make people redundant in adopting and accepting AI devices instead of a human being. There are several factors that influence consumers' decision of accepting and using AI devices such as lack of transparency, the privacy concerns or unforeseen consequences (Barbul et al. 2022).

2. Research methodology

Acknowledging the ongoing trend and increasing implementation of different forms of AI that simulate human behavior for various tasks in a human-like manner, the focus of the present research is set to determine the attitude of consumers towards interaction with AI from a more personal point of view, rather than from an operational perspective. The conducted empirical study aims to offer meaningful insights into the consumers' perspectives of AI facilitated tasks, as well as to investigate consumers' attitudes towards direct interaction with AI. To obtain these insights, a primary data analysis has been conducted. The questionnaire contains 31 items and is set to test the following 9 aspects regarding consumer-AI interactions: performance expectancy, effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety, willingness to accept AI and objection to use AI. These mentioned constructs have been measured via an online questionnaire, with Likert-scale questions, having values between 1 (total disagreement) and 7 (total agreement). A total of 165 randomly chosen respondents, profiled by different characteristics, such as age, gender, education, and income have been involved in the study. 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 two sample groups. The significant differences between respondents' choices have been tested depending on the demographic characteristic of the consumer age: people younger than 30 years and people older than 30 years. The sample included 97 people younger than 30 years, 68 people older than 30. The sample consists of a total of 76 males and 89 females.

3. Results and discussions

The results of our research mainly focus on differences between the two age groups of people: older than 30 years and people younger than 30 years. The results show that in the case of AI, there are only average significant differences regarding the independent age-variable, as it can be observed in table 1. Results marked in bold writing show significant differences that are also discussed in the present article.

Performance Expectancy

Tested according to the age structure and divided into the two corresponding groups (under and over 30 years old), the discriminant analysis reveals one significant difference regarding performance expectancy for AI. While both age groups share the same strong opinion on how useful AI can be in daily life, only the younger generation thinks AI can help them with many tasks, whereas respondents above 30 years tend to perceive the capabilities of AI as limited (F_{PE2}=2.874, p_{PE2}=0.092).

Effort expectancy

When evaluating consumers' perception on the ease of use of AI by age group, two significant differences emerge. First, the younger age group finds it significantly easier to use AI, compared to the older age group (F_{EE1}=13.372, p_{EE1}=0.000). Second, in terms of the ease of operating AI devices, respondents over 30 years seem to have some doubts and therefore rate their abilities significantly lower that respondent group over 30 years (F_{EE3}=8.693, p_{EE3}=0.004). Also, regarding the ease of use of AI it is interesting to see, that both groups evaluate themselves as being able (total mean value above scales' average for both groups) to use AI devices without any help from another person. This indicates the fact that, current AI devices have achieved a good level of accessible and adaptable usability for various consumers groups.

Social Influence

In the case of consumers being socially influenced towards using AI, no differences between the two investigated age groups arise at the moment of this research. Both age groups seem not to be influenced in their behavior by their social environment when asked about AI usage in general. This implies that individuals do not give much importance to the opinions or beliefs of others when it comes to using AI. An explanation could be given by the diversity of possible interactions, while also lack of actual interaction occasions that the consumers have experienced and thus not having become a so-called status symbol.

Hedonic Motivation

Regarding the hedonic motivation, all three tested items reveal significant differences between generations. Younger respondents seem to gain significantly more emotional, fun and experiential benefits from interaction with AI devices. Therefore, the age group <30 years, significanty rates the interaction with AI as more fun (F_{HM1}=5.602, p_4=0.019), more entertaining (F_{HM2}=5.015, p_{HM2}=0.026) and more plesant (F_{HM3}=12.580, p_{HM2}=0.001) than the age group >30 years old. As younger people tend to be more technology friendly and adaptable, these differences can be easily explained by their curiosity and enthusiasm towards AI and excitement to interact with AI devices.

Anthropomorphism

Considering the fact that AI is widely characterized by anthropomorphic behavior (Schanke et al., 2021), this is expected to have a great impact on the perceived interaction to AI by consumers. In our research, none of the items tested for anthropomorphism show significant differences between age groups. Nevertheless, it is important to notice that respondents consider AI devices not to have a mind of their own (A1), no free will of their own (A2) an also no emotions at all (A3).

Trust

In terms of consumer trust towards AI, only one significant difference between age groups is observed. The younger age group believes more strongly that AI devices provide accurate information (F_{T2}=3.878, p_{T2}=0.051). Moreover, also with regard to trust, both respondent groups, feel they can rely on AI devices to achieve certain tasks (T1) and trust AI devices to make reliable recommendations (T3).

Anxiety

When evaluating consumers' anxiety towards AI, the sample groups reveal a fairly calm behavior about AI interactions. All answers are somewhere around 2 and 3 on a 7-point Likert scale, thus showing only little nervousness (AX1), little apprehension (AX2) and little intimidation (AX3) in interactions with AI.

Table no.1. Discriminant analysis regarding generations' perception towards interactions with AI

Code*	Item	$\bar{x}$ <30	$\bar{x}$ >30	$\bar{x}$ Total	F	p-Value
PE1	AI is useful in daily life.	5.75	5.65	5.71	0.256	0.614
PE2	**I think AI can help me with many things.**	**5.63**	**5.25**	**5.47**	**2.874**	**0.092**
PE3	AI is more accurate (makes less errors) than human beings.	4.56	4.31	4.45	0.862	0.355
PE4	AI provides more consistent service than human beings.	4.75	4.76	4.76	0.002	0.963
EE1	**I find AI to be easy to use.**	**5.52**	**4.63**	**5.15**	**13.372**	**0.000**
EE2	I can use AI devices without any help from another person.	5.78	5.41	5.63	2.611	0.108
EE3	**Learning to operate AI devices is easy for me.**	**5.99**	**5.40**	**5.75**	**8.693**	**0.004**
EE4	Interaction with AI devices is difficult to achieve in service encounters (direct contact with consumer).	4.26	4.13	4.21	0.258	0.612
EE5	**I find it easy to get AI to do what I want it to do.**	**4.88**	**4.22**	**4.61**	**7.692**	**0.006**
SI1	Using AI devices reflects a status symbol in my social networks (e.g., friends, family and co-workers).	3.10	2.85	3.00	0.739	0.391
SI2	People who influence my behavior want me to utilize AI devices.	2.70	2.76	2.73	0.054	0.816
SI3	People in my social networks who utilize AI devices have more prestige than those who don't.	2.69	2.38	2.56	1.213	0.272
HM1	**Interacting with AI is fun.**	**4.85**	**4.24**	**4.59**	**5.602**	**0.019**
HM2	**Interacting with AI is entertaining.**	**4.73**	**4.18**	**4.50**	**5.015**	**0.026**
HM3	**The actual process of interacting with AI is pleasant.**	**4.94**	**4.15**	**4.61**	**12.580**	**0.001**
A1	AI devices have a mind of their own.	2.10	1.76	1.96	2.032	0.156
A2	AI devices have their own free will.	1.75	1.63	1.70	0.277	0.599
A3	AI devices have emotions.	1.52	1.43	1.48	0.238	0.626
T1	I feel I can rely on AI devices to do what they are instructed to do.	4.77	4.63	4.72	0.321	0.572
T2	**I believe that AI devices provide accurate information.**	**5.03**	**4.57**	**4.84**	**3.878**	**0.051**
T3	I trust that AI devices make reliable recommendations.	4.51	4.10	4.34	2.713	0.101
AX1	**Interacting with AI makes me nervous.**	**2.39**	**2.81**	**2.56**	**2.836**	**0.094**
AX2	I feel apprehensive about using AI.	2.97	3.18	3.05	0.611	0.436
AX3	Some AI devices are somewhat intimidating to me.	2.46	2.71	2.56	0.754	0.387
AX4	It is embarrassing when you have trouble with the use of an AI device while people are watching.	2.85	2.94	2.88	0.113	0.737
W1	**I am willing to receive services delivered by AI.**	**5.44**	**4.81**	**5.18**	**7.005**	**0.009**
W2	I am likely to interact with AI devices.	5.55	5.15	5.38	2.594	0.109
W3	**I intend to use AI in the future.**	**5.60**	**4.88**	**5.30**	**7.789**	**0.006**
O1	I prefer human contact in service transactions.	5.04	5.41	5.19	1.918	0.168
O2	Interaction with AI lacks social contact.	5.21	5.28	5.24	0.070	0.792
O3	**I intend to avoid using AI in the future.**	**2.41**	**3.24**	**2.75**	**8.691**	**0.004**

PE: performance expectancy, EE: Effort Expectancy, SI: social influence, HM: hedonic motivation, A: anthropomorphism, T: trust, AX: anxiety, W: willingness to accept AI, O: objection to use AI; A **low p-value (< 0.1)** indicates a significant difference between the two groups

Source: Authors' own research

Willingness to Accept AI

When asked about how likely it is that they will interact with AI devices, respondents seem to be aware of the likelihood of future interactions (W2) and are on average interested in these encounters. Both age groups show moderate willingness to accept AI and reveal two significant differences in their answers. The sample group <30 years is significantly more willing to receive AI-delivered services (F_{W1}=7.005, p_{W1}=0.001) and also show clearer intention to use AI in the future (F_{W3}=7.789, p_{W3}=0.006) than sample group >30.

Objection to Use AI

When evaluating consumers' objection to use AI by the two chosen age group, interesting findings emerge. On one hand, both respondent groups prefer human contact rather than interactions with AI (O1) and are also of the opinion that these encounters lack social contact (O2). Asked about their future intentions to use AI, all respondents seem inclined to avoid using AI, results showing a significantly stronger objection on the side of the mature sample group (F_{O3}=8.691, p_{O3}=0.004).

Conclusions

With more applications of AI and consumer-AI interaction opportunities arising, a wide number of research possibilities emerge. Consumers only now slowly start to really familiarize themselves with the true meaning of AI and start experimenting real interactions to AI day by day. Although the present research only addresses a very brief part of the whole AI discussion, it underlines some differences in perception between generations, reaching the conclusion that the two investigated age groups are for now similar in many more aspects, than they are unalike. As the conducted research shows, consumers' attitudes towards AI reflect an answering tendency around the middle scale point – this could also be attributed to a common central tendency bias faced by respondents when confronted with such a hypothetical study. These results are in line with other discriminant tests done in this field (e.g. Pelau & Barbul, 2021; Barbul et al., 2022).

The younger generations show significant more open and trustworthy behavior when interacting with AI. They think AI is there to help them with many tasks, find AI devices easy to use and assess significantly more positive their skills in learning how to operate AI devices. Moreover, finding it easy to get AI to do what one wishes represents a significant difference between the studied age groups. In terms of hedonic motivation, both groups seem to moderately interact with pleasure with AI devices, while the younger enjoy the interaction significantly more, finding it more fun, entertaining, and pleasant. This is also in line with studies made on Generation Z and Millennials stating the fact that these generations are more likely to trust and embrace AI, compared to other generations (Ho et al., 2022). Furthermore, consumers under 30 years show significant more willingness to receive services delivered by AI and therefore also use AI in the future, whereas consumers over 30 show a more significant intention to avoid using AI when possible. These results contribute to future research by providing some insights into current consumers' attitudes towards AI and by preparing accurate testing variables for future AI acceptance models to be tested.

It may seem now that there is little evidence of significant differences between generations regarding AI, but as functionalities and interactions with such devices arise, so will the contrasts between sample groups. Considering the rapid technological developments and the dynamics of AI, further studies need to be undertaken, in order to keep research on consumers' perception up to date. We also acknowledge the limitation considering the background of the respondents, as findings may vary from a culture to another. Moreover, research findings could also differ, when investigating consumers' interaction perspectives targeted on specific AI functionalities (Pelau et al. 2022). The nine investigated constructs are to be assessed in future studies for evaluating different relationships among them. As these variables are already accepted as variables influencing consumers' acceptance of AI (Lu et al., 2019), they could also lay ground for a future structural equation model in order to assess acceptance toward AI.

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Artificial Intelligence Implications in Retail in the New Normal: A Qualitative Approach

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Abstract

Purpose/objectives: The recent COVID-19 pandemic has caused major disruptions not only in the supply chains, but also in the activity of retailers. Although food retailers were able to keep their stores open during the lockdown period, non-food retailers had to identify appropriate ways to keep in touch with customers. To attract them to stores, more and more retailers have resorted to artificial intelligence systems and applications. In the New Normal, a number of these systems and applications maintain their validity, and they are used to attract customers' attention, but also to enhance their experience.

Design/methodology: To highlight the way in which retailers with activities in Romania resort to systems and applications based on artificial intelligence in the context of the New Normal, an in-depth interview guide was administered by means of telephone and face to face. It consisted of open-ended questions operationalized based on the literature. The authors distributed the in-depth interview guide to different representatives of retailers in Romania. In total, 15 in-depth interview guides were collected, the results being analysed by thematic analysis.

Findings: The results reveal that while the large retail networks are already considering the use of systems and applications based on artificial intelligence, i.e. even resorting to them in the form of chatbots and/or autonomous robots for attracting and advising customers; retailers also employ AI based software for stock management, and implement self-service/self-pay counters. Although big retail chains resort more and more often to artificial intelligence-based techniques and instruments, small retailers do not have interest in them. For representatives of small retailers, the costs associated with investing in artificial intelligence systems are not justified and do not generate enough added value.

Originality/value: The results point to an increased interest in artificial intelligence systems applied in retail, with representatives of large store chains understanding their usefulness and even already implementing certain solutions based on artificial intelligence. However, there are also representatives of retailers who are sceptical and do not see, for the moment, the relevance of resorting to these systems.

Keywords

Artificial intelligence (AI), retail, Romania

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Introduction

The recent COVID-19 pandemic has generated major changes in customer purchasing behaviour (Vătămănescu et al., 2021; Valaskova et al., 2023), in particular, due to the countless restrictions imposed by the health crisis, lockdowns, and social distancing (Pop et al., 2022). Food and non-food retailers had to adapt to this situation, identify viable solutions to serve customers in the best conditions (Vinerean et al., 2022), shifting the activities already carried out to the online environment, adopting new technologies

based on artificial intelligence (Adulyasak et al., 2022), thus trying to offer unique and attractive experiences to the customers (Obadă, 2013; Obadă, 2014a; Obadă, 2014b; Dabija et al., 2022).

Although the COVID-19 pandemic has lessened its intensity, at least the restrictions have been lifted and retail stores have returned to a work schedule similar to the one before the health crisis, the recourse in the New Normal to intelligence systems, rapidly developed in the last two-three years, became more and more intense. Whether we refer to self-pay/self-service kiosks, chatbots, virtual assistants, autonomous robots, etc., these systems based on artificial intelligence and the accelerated development of technology are increasingly making their presence felt in the context of the New Normal in the retail landscape, tending to soon become a normality. Recently, the Walmart group encouraged the use of mobile applications directly in its store, allowing enhancement of the customer experience by identifying relevant areas for shopping, scanning products to check their availability and/or comparing them with similar items, quick and easy payment through an automatic check-out process (Adulyasak et al., 2022). Thus, the online experience can be very well combined with the one in the store.

The question that arises is to what extent retailers manage to resort to such artificial intelligence systems within their own networks, but also to what extent they manage to accustom and/or educate customers with them, causing them to return to the stores.

To identify the extent to which Romanian retailers' resort to AI-based technology systems in the New Normal, qualitative research was implemented with the help of an in-depth interview guide with open-ended questions. It was sent by the authors to the food and non-food retail management with activities in Romania. In addition, 15 interviews were carried out over the phone, through videoconference systems, respectively face to face.

The paper is structured as follows: Section one contains the review of the literature on artificial intelligence systems used mainly in retail, highlighting their advantage and disadvantage, respectively, the extent to which customer experience can be enhanced by the use of AI-based technologies. The second section contains the research methodology, and the third section presents the research results and their discussion. The paper ends with theoretical contributions and managerial implications, but also with limits and emerging research perspectives.

1. Research of the scientific literature

Technological progress is affecting and transforming contemporary retail, and enhancing company performance (Kliestik et al., 2023), with the recent COVID-19 pandemic accentuating the phenomenon (Pop et al., 2023). Technological development is essential for lasting economic growth, but also for generating and especially maintaining competitive advantages at the organisational level (Grădinaru et al., 2022). Of course, innovations find new utility in retail (Dabija et al., 2017), being used to generate and improve the customer experience. Increasingly, the literature highlights the role and importance of AI-based technologies in retail by resorting to the Internet of Things, virtual reality (VR), augmented reality, autonomous robots, chatbots, virtual assistants, etc. (Kushwaha et al., 2021; Pelau et al., 2021a; Pelau et al., 2021b).

AI-enabled virtual assistants (VA) are rapidly evolving to provide personalised shopping assistance and front-line service 24/7. This reduces the workload of human employees and provides a unique customer experience. Especially retailers that adopt an omnichannel strategy (Abrudan et al., 2020) resort to the use of AI based virtual assistance, as they aim towards increased customer satisfaction, thus enhancing their offline in store-based experience with the use of smart online technologies. Thus, virtual assistants allow customers to obtain connected and personalised experiences, but also collect data that retailers can extract to improve the decision-making process and personalize offers according to actual customer purchases (Kushwaha et al., 2021).

However, virtual assistants in the form of chatbots and voice assistants are artificial intelligence-based information systems that can reproduce human knowledge using natural language programming, machine learning, and deep learning methods. Such automated systems can provide 24-hour customer support, enhancing their shopping experience, but also reducing the effort of store employees. Virtual assistants can simulate human conversations, being able to assist customers at different stages of their customer-shopper journey (Hoyer et al., 2020; Przegalinska et al., 2019). Virtual assistants such as Amazon Alexa are evolving; as they had earlier only conversational functions, nowadays they are able to communicate naturally with users, and becoming increasingly popular because of their ability to respond quickly to requests. The literature highlights that the users of these chatbots are much more involved in the decisions

they make, being more strongly engaged in purchases and having greater trust in the company that offers such a virtual assistant (Alimamy & Kuhail, 2023).

Moreover, the adoption of conversational agents also brings with it countless challenges: on the one hand, retail unions believe that the implementation of these artificial intelligence systems can lead to layoffs, which is not desirable; on the other hand, because a chatbot system needs a large amount of data, often not available, to work efficiently (Galetsi et al., 2020). Moreover, in retail, compared to other industries such as healthcare or finance, data is changed very frequently, due to the large number of items that the company sells (Malodia et al., 2022). Of course, the literature highlights the need to continue studies on artificial intelligence-based virtual assistance in other contexts, than those of finance, hospitality, and telecommunications (Kamoonpuri & Sengar, 2023).

Retailers have begun to adopt digital technologies to satisfy customers under pressure to remain competitive (Andronie et al., 2021; Lăzăroiu et al., 2019; Lăzăroiu et al., 2020; Majerova et al., 2020) and many companies are using artificial intelligence (AI) applications to build beneficial relationships with customers (Morgan, 2019; Delicato et al., 2020). Artificial intelligence is often employed in retail settings, customer perception, management, and customer engagement (Oosthuizen et al., 2020).

Advances in artificial intelligence have the potential to improve the customer experience by developing companies' knowledge of customer preferences and shopping patterns. Therefore, the strategically deploying of AI technologies at various key customer touchpoints can benefit retailers and increase customer satisfaction. AI technology allows for the customisation of services and the provision of individualised recommendations to each individual customer based on their previous purchases, sociodemographic characteristics, preferences, etc. (Ameen et al., 2021).

2. Research Methodology

In order to identify the extent to which the representatives of food and non-food retailers with activities in Romania, call in the New Normal to systems and/or technologies based on artificial intelligence (self-pay counters, autonomous robots, chatbots, etc.), respectively, include them within the general business strategy and processing of the local market, the authors resorted to the implementation of a qualitative research, based on an interview guide. In this sense, they compiled an in-depth interview guide with open-ended questions that included the following topics, derived from the literature (Shavarani et al., 2019; Attaran, 2020; Delgosha and Hajiheydari, 2021):

- The perceived usefulness of artificial intelligence (AI) systems in retail activities.
- The perceived advantages and limitations of adopting artificial intelligence systems in current retail activities in Romania.

The guide was sent to retailers from Romania. People who have management positions from the main food chains (Kaufland, Lidl, Penny), from smaller chains, and also from the non-food trade were contacted. In addition, in order to complement the data, a number of 15 interviews were conducted by the authors over the phone and face to face. The average duration was of 23 minutes.

3. Results and discussions

3.1. Perceived Utility of AI Systems in food and non-food retail

According to research participants, the use of artificial intelligence systems can be useful for the proper inventory of stocks, for carrying out the general inventory, and for making the work of employees more efficient. Especially AI-based technologies that could include "systems for photographing, scanning, and OCR type recognition of products" were perceived as able to facilitate the inventory of items on the shelf (food retailer representative 1). To respondents, such systems can be of use, especially in special situations, where hiring more people is not a viable solution, i.e., when the flow of customers is significant.

"I believe that these machines can help us especially in overworked periods, for example before the holidays when the cashiers are completely overwhelmed by the high volume of work, but I still believe that they can also be a disadvantage for employees. The company might consider replacing employees with machines, but there is a risk that these robots will be overvalued, and, in the end, we will have to rely on physical employees" (food retailer representative 2).

Chatbots and/or virtual assistants were seen as especially useful *"in the Customer Service department, as they can take calls from customers, handle complaints, or provide shopping advice".* Moreover, such

"chatbots can support the retailer's employees in the development of promotional materials and/or promotion flyers" (food retailer representative 3).

Recourse to Artificial Intelligence Systems

International food and non-food retail chains with large stores present in Romania call on the various artificial intelligence systems, based on machine learning algorithms, which allow the automation of some processes, the reduction of operating costs, the possibility of streamlining some activities, or improving performance general of the company. These systems are largely based on collected data, which can be used to analyse and understand customers' buying behaviour, but also to improve their in-store/shopping experience by identifying customers' favourite products and making offer recommendations customised, and to reduce labour costs.

Among the artificial intelligence systems implemented in food and non-food retail in Romania are self-pay/self-service kiosks, software that allows automatic ordering of products from the network's central/regional warehouse and/or from suppliers, vending machines of exchanging coins into money and/or storing them on valid shopping cards in their own network, devices for automatic scanning of purchased products, chatbots that allow quick and efficient interaction with customers, but also easy communication with them, and autonomous robots that walk around the store, informs customers about the various products and/or promotions, respectively, carries out merchandising actions.

Advances in autonomous mobile robotics are essential to flexible working environments, especially in intelligent manufacturing but they also have relevance for the retail sector. These complex sensor, motion, and navigation systems are composed of many sensors and powerful processors, enabling these robots to continuously monitor the environment and move freely, 24/7. Such robots allow the implementation of complex tasks consisting of lifting and/or transportation of goods; their operating time between charges depends on the distance travelled, the energy consumption of the payload, the mass of the load, the attachments it has (tilting trays, robotic arms, etc.). (McNulty et al., 2022). Such robots can supplement and replace humans, being able to navigate independently without any assistance from human operators. Of course, this robot has an efficient perception system (based on sensors) that allows it to determine the actions necessary to perform tasks (McNulty et al., 2022).

The self-pay counters allow quick and efficient scanning of products by customers, ten such counters being managed by a single cashier, who has the role of supervising and offering help to people who do not know how to use these systems. The cashier responds to customer requests which mainly concern the completion of purchases, the correct identification of certain products, such as those sold by the piece or those of high value. Resorting to these self-pay/self-service stores allows for substantial labour savings and implicitly, the reduction of the store's operational expenses (Taylor, 2016). Research participants were aware of the benefits of such systems:

"In the future, we intend to better familiarise consumers with such services because in this way we can increase the speed of customer service, making them responsible. At the same time, the cash registers allow for the reduction of expenses with employees, the savings thus achieved allowing the sale of products at lower prices, which is to the advantage of our customers" (food retailer representative 3).

Of course, apart from the self-pay/self-service cash registers, retailers also use specialised software that allows the proper management of products and stocks, the identification of stock shortages, facilitating rapid replenishment from the central or regional warehouse, and also the transmission of automated orders for fast-selling products to suppliers. Algorithm-based software also allows estimating the quantities of products that will be sold in certain periods of time, i.e., days, facilitating to a certain extent the logistic processes in the store.

"Cash registers use artificial intelligence when scanning products, whether it is done by a cashier or by the customer at self-service/self-pay checkouts. The data thus obtained allow for proper management of stocks. Self-service/self-pay cash registers are extremely easy to use, offering customers a certain convenience and speed in purchases. Our company considers the new technologies on the market and will adapt to market developments depending on the changes imposed by other retailers in our field of activity" (food retailer representative 5).

On the other hand, chatbots are important for commerce networks, promptly assisting customers and providing them with answers to questions or providing additional information when needed. At the same time, chatbots are also used to present personalised offers to customers, to recruit them, or to remind them to come back to shop. Thus, an attempt is made to facilitate the interaction between the customer and the store, under the conditions of a strong reduction of staff costs, of prompt, efficient, and quick responses, respectively of providing answers to questions and/or notifications.

"Chatbots are used to provide support in order placement, store navigation, and support for Food Retailer 3's products and services. To familiarise consumers with bots and chatbots, Food Retailer 3 uses a variety of techniques, such as advertising and marketing, along with online presence. Robots and chatbots are also used to analyse data and customer buying behaviour, thus being able to offer personalised recommendations to customers" (food retailer representative 6).

The recourse to artificial intelligence systems is all the simpler and easier in Romania because the degree of use and acceptance of technology in everyday life is very high in the large cities, the rate of adaptability and acceptance of innovations, at least by young customers, being very high. That is why the retailer Auchan has recently resorted to the use of an autonomous robot in its large-area stores that walks among the shelves, carrying out merchandising actions, informing customers about existing promotions, new products, etc., within an RI Smart Service project, but also to get feedback from customers (https://www.youtube.com/watch?v=0UXhTceUkYg).

"We have recently started the implementation in some of our own stores, together with a manufacturer of autonomous industrial robots, of a joint project - RI Smart Service, which aims to assist customers, inform them, and obtain their feedback with the help of an autonomous robot" (food retailer representative 7).

3.2. Considerations on the use of artificial intelligence systems in Retail in Romania

Representatives of small retailers (neighbourhood stores in food retail, independent stores, or chains of small stores in food and non-food retail) who participated in the research stated that they do not use artificial intelligence systems because the operations carried out are too small, and the costs assumed by the implementation of systems based on artificial intelligence are too large and/or too complex. On the other hand, there is also the shortcoming that resorting to artificial intelligence systems must be very well thought out; otherwise, the human effort required by them can be too significant.

"At the moment we are not willing to invest in artificial intelligence systems because they are too expensive." (non-food retailer representative 8)

"Of course, at the level of our network management, there are discussions regarding the use of artificial intelligence systems, but nothing has been finalised yet, because this concept is primarily based on very high efficiency and accurate information, any novelty must be very well thought out because a measure insufficiently well designed can generate additional efforts for its implementation, respectively, it can cause unwanted costs. For example, we have had requests from customers to offer cold drinks (beer, water, juices, etc.) in the summer, but installing such a refrigerator and restocking it with products requires about 1-2 hours of daily work for an employee, which creates our difficulties because he fails to fulfil the rest of his obligations" (food retailer representative 9).

In resorting to such artificial intelligence systems, a possible obstacle consists in the mentality of retail chain managers. According to some of the respondents, artificial intelligence cannot properly analyse the needs of customers, or it does not know and/or understand their past, respectively emotional states in which they are found. Moreover, sales through stores *"rely entirely on people and not on machines, everything is managed and systematised by people"* (food-retailer representative 7). Organizations must consider acting ethically and fairly when managing sensitive customer information (Cuellar, 2023).

Chatbots and/or virtual assistants with whom a customer might verbally interact would not be able to address conversational topics other than strictly technical ones that relate to existing promotions, products sold, and/or their features. As phrased by a research participant, *"the Romanian customer likes to socialise when shopping",* but an artificial intelligence system, even if it may have proven its utility and/or economic efficiency, *"creates a certain social distancing"* (food-retailer representative 10), thus there is a risk of losing important customers, especially for small retailers.

'These AI systems cannot empathize with the customer, which makes them unattractive to our customers, who visit us and socialise with our employees' (non-food retailer representative 11).

The general strategy of some retailers, especially in the food sector, is to offer the best possible quality at the lowest cost to the customer. To research participants, the use of artificial intelligence systems would increase these costs, which could result in the loss or diminution of the network's comparative competitive advantage.

"Our company resorts to investing in such systems because they are based on low prices, and such an option would increase prices, which would increase the company's costs which would not lead to any advantage, since our target customers are people with low budgets, who prefer our stores precisely because we offer them attractive prices" (food-retailer representative 5).

Retailers can use machine learning models to accurately predict the delivery time required for each online order. Such systems are based on a combination of supervised learning techniques, regressions, and neural networks capable of estimating the total delivery time of goods to customers based on order information: order size, delivery time, route, distance to customer, etc. (Adulyasak et al., 2022).

Conclusions

The COVID-19 pandemic has had a significant and ongoing impact on retailers, forcing the acceleration of initiatives to integrate AI-based applications and/or systems into ongoing businesses. Such transformations are inevitable and even necessary, allowing retailers to increase their competitiveness in the New Normal. In the future, retailers will have to rely more on data processing capabilities, and to react proactively and promptly to changes induced by situational factors, difficult to control, but also by uncertainties, respectively, disruptive factors. Of course, business strategies based on the use of artificial intelligence require monitoring, updating, and permanent recalibration depending on the feedback provided by users, but also on the extent to which, for example, the advice of virtual assistants generates an increased turnover or at least customers who are more satisfied with the retailer's performance. At the same time, the use of artificial intelligence systems must be based on economic efficiency, as there is a risk that, at least in the case of small store chains, such approaches will not be profitable.

A limitation of the research is given by the very small sample. However, as responses to open ended questions are more difficult to obtain than for multiple choice questions, the research suggests there is a need for the voices of those working in retail, to be heard. Nevertheless, obtaining answers to the qualitative research was difficult given the competing priorities of the respondents. However, our research suggests the importance for future research to apply the research tool to a single sector of activity (retail food or non-food retail), respectively, referring to companies with international activities versus national companies. At the same time, the existence of a certain number of applications based on artificial intelligence was not pursued, but the aim was to obtain general feedback on the applications and artificial intelligence systems used by retailers with activities in Romania.

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Unfolding Authenticity within Retail Transformation in Novosibirsk, Russia

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Abstract

The goal of the article is to describe the transformation of retail and to reveal how representatives of retail turn to the idea of authenticity. The study focuses on 3 areas in the city of Novosibirsk: the city center, Akademgorodok, and Zatulinskiy residential area. This research is conducted by a mixed-method involving quantitative and qualitative approaches. The quantitative approach is an analysis of interactive map data (2GIS): the information about all businesses in Novosibirsk's districts in 2007 and 2023 years. The qualitative approach is visual analysis of the commercial fabric of the districts using the authenticity concept. The main findings of the research. During the period from 2007 to 2023, there was a significant increase in the number of retails in the selected areas. Moreover, in the case of the city center and Akademgorodok, the proportion of the HORECA category, primarily catering establishments, has increased. The retail in Zatulinskiy residential area is mainly represented by chain establishments, among which various grocery stores and supermarkets stand out, and the HORECA sphere is not expressed vividly. At the design level, establishments can refer to the authenticity of the place in various ways: by indicating official, expert evaluation of the age of the building, through names that refer to the roots of the place, or through images that would be associated with cultural symbols of the place. However, it is also typical for situations when symbols of places located in other countries are commodified, or when the only concern in the design is the visibility of the establishment. The results of this study may be of interest to business representatives who apply local symbols in their design.

Keywords

Authenticity, retail, transformation, commodification, gentrification.

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Introduction

Retail is one of the most important and flexible spheres in the urban landscape. On the one hand, it reflects global trends, local policies, and economic situations. On the other hand, it depends on the tastes and lifestyles of city dwellers. This part of everyday life represents the space where individuals and large-scale transformation processes intersect. One of these processes is the commercialization of a place's authenticity. The massive blurring of distinctions makes the marks of authenticity valuable – family-owned shops, ethnic restaurants, and old buildings – and the demand for these marks makes them an expensive commodity, which symbolically and economically forces people who create authentic spaces with their own hands to leave their usual places of residence (Zukin, 2010). Some researchers define this process as gentrification (Benz, 2015; Guimarães, 2021), but they differ in their conclusions about the driving force of this process. For example, the study "Unfolding authenticity within retail gentrification in Mouraria, Lisbon" examines the process of retail gentrification in the historic district of Lisbon. The conclusion is that retail business owners are aware of the role of authenticity in attracting consumers, but their efforts are aimed more at attracting a certain category of consumers – tourists – while the interests of

local residents are secondary (Guimarães, 2021). In the case of China, empirical evidence further proves the uneven intervention of globalization in the Global South that shaped gentrifiers' tastes and preferences, and the so-called "new middle class" is driving this process (Cao, 2022, p. 515). It is important for this category of city dwellers to live in a stylish, authentic environment. Is it possible to call the changes that are happening in Russian cities gentrification and use theoretical frameworks that are relevant to Western cities in relation to them? This is a controversial issue. In M. Bernt's study, it is stated that «gentrification is not made impossible in this context, but it is a sideshow, rather than the main act» and he emphasizes «the importance of property relations» (Bernt, 2016, p. 18).

In cities, different localities coexist: hipster neighborhoods for young people with columns made of weathered bricks and designer tricks; state institutions, dwelling in walls that still remember their Soviet past; residential areas on the outskirts with three beer shops in one building. All of them are formed and exist under the conditions of conflicting interests and ideas of what is proper and authentic. In this study, authenticity is understood as a construct that is created and maintained by various forces, and one of the forces shaping the urban landscape is retail. The city of Novosibirsk was chosen as a research case. It is examined how retail has transformed in different areas of the city and how businesses use authenticity, based on the example of Novosibirsk.

After this introductory section, Section 1 is devoted to the theoretical framework, which is divided into two subsections: 'Retail change tendencies in Russia' and 'Authenticity in retail'. In Section 2, the methodological design is constructed to support Section 3, which is devoted to the presentation of the results.

1. Literature review

1.1. Retail change tendencies in Russia

Retail, in this study, will be understood as the aggregate of commercial entities involved in trade and providing services to the city dwellers (Aksenov, Zinovyev, Morachevskaya, 2019).

This sector has had an atypical development trajectory in Russia. It is characteristic of the Soviet era to have consumer infrastructure facilities placed in accordance with planned principles. As a result, in residential areas, retail was mainly represented by points satisfying basic needs, such as grocery stores, and almost all objects of episodic demand were located in the city center. Nowadays, everything has changed.

Several researchers have shown that since the collapse of the USSR, Russian cities have increasingly become similar to those of originally capitalist countries, adopting their development trends. (for example, Axenov *et al.*, 2018). One of the global trends is related to the role of retail in territorial development projects. While planning the development of public spaces, an important role is given to financial flows - the sale of souvenirs, coffee, toys, etc. This process can be called the commercialization and unification of public spaces in both visual and substantive senses (Zukin, 2010). One manifestation of unification is the development of chain retail. In the late 1990s-early 2000s, global chain retailers appeared in Russia, attracted by the growing purchasing power of the population. Domestic companies gradually began to join the format as well. By 2012, the Russian chain food market had matured, and the "properly Russian specifics of this process, associated with strong differentiation of the socio-economic space, as well as local, including ethnocultural, features of people's consumer behavior" (Baranov and Safronov, 2019, p. 101) became more apparent there.

Thus, the starting assumption is that there is a connection between the nature and structure of retail and the characteristics of the place and lifestyles of the people inhabiting it, which are formed not only as an individual behavioral strategy but also as a reaction to the authenticity of the place.

1.2. Authenticity in retail

The term "authenticity" is increasingly mentioned in both media and academic texts. Journalists often use it to refer to a place that is worth visiting to immerse oneself in the atmosphere of a certain time or culture. Researchers of historical heritage carry out expertise, thereby justifying the authenticity of places and examining design techniques for its actualization. Tourism studies researchers consider how staged authenticity in places is created and maintained, where a kind of spectacle portrays real life specifically for tourists' consumption (Karelina, 2021). It is considered that the idea belongs to MacCannell, who in the 1970s described the tourist experience as a search for authenticity. Everyday life, in his view, does not give people a sense of authenticity, and they are drawn to places where they believe to find it. But they are confronted with a spectacle created specifically for tourists (MacCannell, 1973). If initially staged authenticity was seen as a tool for homogenizing the world, where each landmark is equipped with a standard set of tourist "lures," over time, perceptions of it have transformed. It is no longer necessary that

the staging is inherently artificial, and therefore, by definition, "bad." Supporters of the existential approach to authenticity place great importance not on the material objects themselves but on the audience and the feelings people experience during the process. The study of N. Wang (Wang, 1999) has had an impact on tourism studies, largely due to the idea of existential authenticity. In this interpretation, authenticity in the tourist experience is separated from the actual places and is placed in the person's perception. Thus, it is argued that a place that is objectively not authentic can evoke an authentic feeling. Studies and theoretical essays on authenticity in relation to spatial experience in the field of urban sociology are quite rare, but they also demonstrate the ambiguity of the concept (Guimarães, 2022) and the shift of the focus from what authenticity *is* to what it *does.* Taking this into consideration, a constructed nature of authenticity is adopted as a theoretical proposition. It is invented and reinvented, mobile, and subject to the influence of various forces.

At an expert level (often supported by the authorities), authenticity is considered an objective characteristic that can be identified, documented, and should be legally protected. At the level of ordinary citizens, authenticity is more of a feeling, with a spatial localization and an aesthetic pleasure of being in contact with something unique. Both aspects manifest themselves not only in abstract representations but also in the physical space as community practices. "The formation of authenticity is related to the spread of stable social practices and models of behavior. Clothes drying on the street, sheep wool laid out on the sidewalk, breakfast on the street in front of the house - these are everyday practices that the community adopts" (Artemenko and Yücesoy Eda Ünlü, 2019, p. 169).

In terms of actualizing authenticity, business is an important actor. Places considered authentic attract not only tourists but also local connoisseurs of a unique atmosphere, snobbish aesthetes, and hipsters who transform them beyond recognition. This is a common situation in the West, where a district becoming popular due to its "authenticity" guarantees a unique urban experience, attracting certain types of residents and entrepreneurs. However, this popularity eventually turns into a downside: new, more affluent residents with their privileged tastes form a new consumer landscape, in which there is no place for companies and establishments catering to the needs of the original residents (Zukin, 2010).

The relationship between the authenticity of a place and retail, which is intertwined with people's everyday practices, has been the subject of research by specialists in different fields. In the Seoul study, the following character of the relationship is indicated: «authenticity is not only an object of consumption, something that the subjects can have, but also a fantasy that veils their irreducible lack and motivates the endless desire for an elusive something more. In other words, longing for authenticity is more-than-consumption, which is inculcated in gentrifies as a habitus for distinction» (Ji, 2021, p. 234). Retail in the context of the commodification of authenticity was also examined, for example, in the case of the Australian city of Brisbane. In this study, authenticity is considered from the perspective of representatives of "new" and "old" businesses, their narratives about changes in space in connection with gentrification, stimulated by large capital. The conclusion was drawn about the transformation of retail trade along a trajectory that includes the aestheticization of authenticity, followed by its commodification (Molnar and Walters, 2021).

Authenticity can manifest itself in visual techniques that can be captured. In a study dedicated to Lisbon, several approaches are highlighted. The first is to refer to "antiquity", that is, the desire to emphasize the age (date of foundation) of the establishment or the building in which it is located. The second is the use of elements that were used in the space before, even if the current business has nothing to do with the past functional content. The third is a reference to local cultural symbols and traditional crafts (Guimarães, 2022).

One of the central topics that researchers address when considering authenticity in retail is the transformation of urban localities. Authenticity can be manifested both in the form of expert opinions and objective data, which are used as one of the ways to make the urban experience more valuable, and in the form of people's subjective perceptions of a place, which manifest themselves in the practices they undertake in certain areas of the city. These practices lead to the formation of behavioral patterns in certain urban locations, in which businesses can identify opportunities for commodification.

2. Research methodology

At the first stage, two data sources were considered to identify the areas for further analysis:

- The Unified State Register of Cultural Heritage Objects (Monuments of History and Culture) of the peoples of the Russian Federation. This information source allowed us to assess which areas of the city have a concentration of authentic objects based on expert evaluations.

• Results of the joint work of students and teachers from the General Sociology Department of Novosibirsk State University. The development of the research tools and surveying were conducted from November 2018 to April 2019 as part of the project "Urban Space: (Subjective) Perception, Daily Mobility, Living Conditions, and Social Activity of City Dwellers." The survey was conducted using a semi-structured interview format. Respondents were selected as residents of the city of Novosibirsk and its nearest suburb aged 18 and over. The sample size was 63 respondents. This information source will allow us to assess the places in the city that stand out based on subjective perception.

The mail part of the research is conducted by a mix-method involving quantitative and qualitative approaches. Quantitative approach is an analysis of interactive map data (2GIS[*]): information about businesses in Novosibirsk's districts in 2007 and 2023 years. Specific retail typologies, which are representative of the evolution of urban localities are used: HORECA[†], goods, services, and food retail. Qualitative approach is a visual analysis of the commercial fabric of the districts using the authenticity concept.

3. Results and discussion

As mentioned above, there are two perspectives in identifying the authenticity of a place: expert and subjective. According to the expert perspective, authentic places in the city can be those that are recognized as official cultural heritage sites. The subjective perspective, on the other hand, can be expressed in how residents consider certain places as "theirs," corresponding to their identity. Based on the analysis of cultural heritage sites and local "favorites," the most representative districts with a concentration of authentic places have been identified: the city center and Akademgorodok. In addition, another district that was not highlighted earlier but still had a well-developed retail system was also included in the detailed analysis. The Zatulinsky residential area was selected as such a district (Figure no.1).

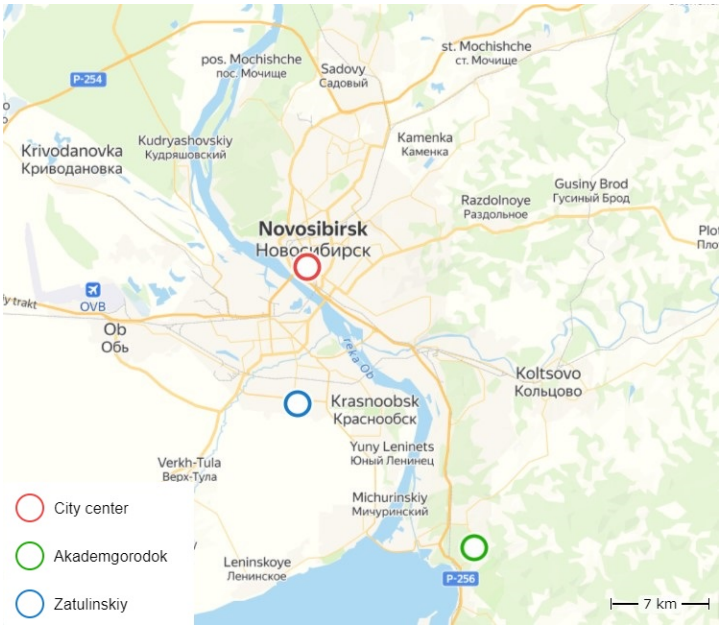


Figure no. 1. Locations of the cases

The city center. Since the beginning of the 20th century, this area has represented a concentration of business functions, combined with residential buildings. "At first, there were one and two-story merchant and bourgeois houses, mostly made of wood, but there were also stone ones. In Soviet times, many pre-revolutionary houses were demolished, some of the surviving ones were lucky enough to become architectural monuments. New buildings in the style of constructivism, Stalinist empire, and Soviet modernism of the second half of the 20th century were erected on the site of demolished houses. In fact, each era left its mark on the quiet center"[‡]. Modern times are no exception, and new times have also made changes. Old buildings are being demolished, and new luxury housing is growing. Nowadays, it is one of the expensive and prestigious neighborhoods in the city.

[*] 2GIS is a free business listing with a city map.
[†] A short for hotel / restaurant / catering
[‡] Novosibirsk. Metamorphoses of the Quiet Center. URL: https://d-popovskiy.livejournal.com/83309.html.

The Zatulinskiy residential area is located in the left bank part of the Ob River where industry actively developed in Soviet times. By the end of the 1930s, there were already more than a dozen industrial enterprises in this area, and during the Great Patriotic War, their number almost tripled. In order to successfully operate such a quantity of industrial enterprises, workers were required, so it was decided to build a residential area, which began in the 1960s. By the 1980s, this neighborhood had earned a reputation as a criminal area. Currently, the Zatulinskiy residential area is being developed, and housing construction of various price levels is underway. In 2020, the Zatulinskiy dispersed park was opened. Despite the proximity to industrial enterprises, "according to ecologists, it is one of the cleanest residential areas in the city due to the prevailing southwestern wind rose in the city"[§]. However, on average, housing there is considered rather cheap.

Akademgorodok was founded in 1957, and its idea was to create a comprehensive environment in which scientists and students could live and work comfortably. Spatial solutions were designed to provide continuity: students learn from scientific staff to replenish their ranks in the future. Akademgorodok includes, in addition to residential buildings, dozens of scientific institutes, Novosibirsk State University, the House of Scientists, and a developed trade infrastructure. In Soviet times, a multitude of discoveries were made in Akademgorodok, however, in the 90s were a difficult time for science. There was a general decline in the prestige of the profession of a scientist and a "brain drain" abroad. At the same time, a parallel process of commercial development of the Akademgorodok space was taking place, which manifested itself in constant encroachments on its forests and Soviet material heritage, which did not go unnoticed by the public, and became one of the factors in the formation of a defensive community (Scalaban, Sergeeva and Lobanov, 2022). Today, residential construction is practically not being carried out within the boundaries of the Akademgorodok, and it is one of the most expensive and "green" areas of the city.

3.1. Retail structure changes

In general, the number of retail outlets has increased in each of the cases considered. In the city center it has doubled, in Akademgorodok - tripled, and in Zatulinsky residential area it has increased by a factor of 7.

If we look at the structure by generalized categories in the studied districts, the following trends can be identified: an increase in the number of HORECA establishments in the center and the Akademgorodok, with a more significant growth in the case of Akademgorodok. In both the center and Akademgorodok, the supply of household goods has decreased. This reduction may be associated with a global trend towards decentralization of retail trade and the opening of large shopping centers on the outskirts of the city (Guimarães, 2022). It is possible to note an increase in the number of grocery stores in the Zatulinsky residential area, where every fourth store today belongs to this category (Figure no. 2).

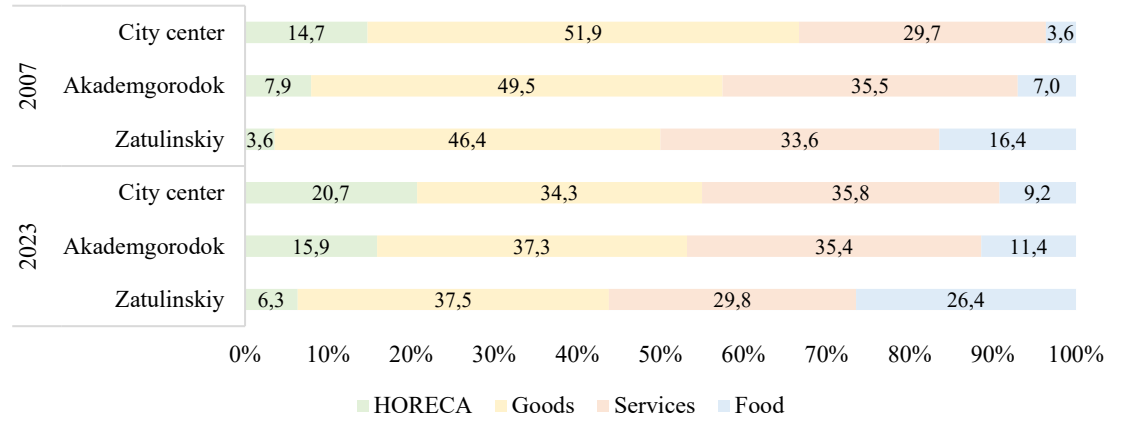


Figure no. 2. Structure of retail in districts in 2007 and 2023 (in %)

Among the HORECA establishments in the center in 2007, bars, nightclubs, and hookah lounges were notable, and by 2023, they still stood out, with their absolute value increased. The Akademgorodok and Zatulinsky residential area did not have a large number of HORECA establishments in 2007, but by 2023 their landscape had changed. In Akademgorodok, a significant share of catering establishments is occupied by coffee shops, pastry shops, and fast-food outlets. In general, the number of public catering estab-

[§] Zatulinskiy residential area. URL: http://vseon.com/analitika/rajon/zatulinskij-zhilmassiv.

lishments in Akademgorodok exceeded the norm 18 times. In Zatulinsky residential area, fast-food outlets and various food delivery services stand out today. In 2007, significant share of goods in all districts were related to repairs, but today the category "clothing and footwear" is notable and occupies a significant share in the center and Akademgorodok. In Zatulinsky residential area, pharmacies and beer stores prevail today.

If we consider the transformation of the chain store format, then in general, its ratio remained practically unchanged, with 57.6% of non-chain stores in 2007 and 56% of non-chain stores in 2023. The ratio of chains to non-chains is also reproduced in the districts as a whole, with only Zatulinsky residential area having a shift towards chains. In the Center, both in 2007 and in 2023, there are significantly fewer chains than in the Akademgorodok and Zatulinsky residential area. However, although the ratio remained practically unchanged, the scale of chains has significantly changed - about 35% of retail points in the considered districts are now chain stores with more than 18 branches, while in 2007 there were no more than 10%.

3.2. Visual dimension of authenticity in retail

The reference to the roots of the place can occur at a constructed level, for example, through modern elements that, however, are associated with antiquity, such as the name "Gastronom", which is typical of Novosibirsk in the early 20th century. In the case of commercialization of objective, expert authenticity, there is a reference to "antiquity" at the design level. For example, by combining the name of the restaurant with a sign indicating the age of the building.

However, when analyzing visual materials of the city center, a question often arises about the authenticity of the place that is being referred to in the design. On the example of Lisbon (Guimarães, 2022), it has been shown that local cultural symbols are commercialized to attract tourists, whereas in order to attract consumers to the center of Novosibirsk, symbols of other countries such as France and Italy are being commercialized (Figure no.3). The city center can serve as a kind of «journey» within a city, where residents act as flâneurs, or in fact take on the role of tourists.



Figure no. 3. Establishments in the city center

In this sense, city dwellers are similar to representatives of the "new middle class" in China, where everything Western is considered more prestigious and status-oriented, and thus more in line with the identity of a young and educated person. (Cao, 2022). This is also reflected in the prevalence of foreign names in the linguistic landscape. At the same time, local features that could become part of the design are often overlooked. For example, Soviet neon signs.

Like the city center, Akademgorodok is characterized by high housing prices and a significant increase in the number of cafes and restaurants compared to other retail establishments. The scientific roots and the main functional orientation of the Akademgorodok are reflected in the visual components of retail and in the form of names (for example, the lounge café Flask, the Academic pharmacy), as well as in the use of

special design techniques. They refer not only to the scientific roots of the place (Figure no.4), but also to the image of Akademgorodok as a "green" place, represented by fauna, in particular, squirrels.

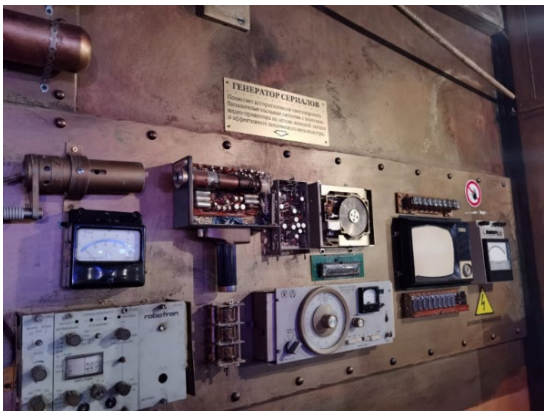


Figure no. 4. An establishment decorated in a "scientific" style in Akademgorodok

The description of the city center and the Akademgorodok suggests that if the experience of being in an urban environment is valuable in itself, its features tend to be commodified, and a balance between brand design and harmonious integration into the authenticity of the space needs to be maintained in order to look appropriate in this environment and take advantage of all the benefits that can be gained from being in this location. When analyzing visual data of Zatulinsky residential area, it seemed that the business does not fully realize the value of the environment, and the only goal of retail point designs is to be as noticeable as possible. The retail area of Zatulinsky residential area is dominated by grocery stores, supermarkets, an impressive number of beer shops, and goods and services for the population, with a tendency towards network format. Visually, this is manifested in a variety of colors, and each commercial point strives to occupy as much visible space as possible. However, the peculiarity of the retail is not only in its visual impact, but also in the fact that it is difficult to find any hints of the place's roots. There is hardly any effort to indicate that the establishment is located in Zatulinsky residential area. The exception was an unexpected representative of HORECA - a kiosk called "Zatulinsky-style cool shawarma" offering a "non-liftable" shawarma weighing 1 kilogram.

Of course, there are also chain retail representatives in the city center and Akademgorodok that do not hesitate to integrate themselves visually into the environment. This may be because the design code of Novosibirsk was only adopted in 2019 and its effect has not fully manifested itself. However, they at least have a few references to cultural symbols. The question is cultural symbols of which places they refer to. In the case of Akademgorodok and the Center, there are many establishments that strive to look "Western" and at the same time integrate more carefully into the existing fabric of the city.

If we use the analogy of a place and a person in considering authenticity, an authentic place is one that does not pretend to be something it is not. Zatulinsky residential area generally fits this description. Among the colorful signs, people perform their routine actions, walking from the bus stop to their homes, and on weekends they go to the city center or Akademgorodok to experience the staged authenticity that is offered by numerous establishments.

Conclusions

The commercialization of the authenticity of a place has not yet become a widespread phenomenon in Novosibirsk, and its urban environment is not yet cluttered with signs of authentic restaurants. The problem of symbolic and physical displacement is not so acute. However, people strive to spend time in places that correspond to their identity, and one can already trace how, on the one hand, the tastes of the affluent and mobile class of people, and on the other hand, the efforts of businesses shape the image of points of attraction in the city, based on authenticity of places.

From 2007 to 2023, there was a multiple increase in the number of retail outlets in the areas under consideration. In the case of the city center and the Akademgorodok the share of HORECA category grew. This may be related to practices that are typical for subjectively authentic places, such as walking. The retail outlets of the Zatulinsky residential area are mainly represented by chains, among which various grocery stores and supermarkets are highlighted, the HORECA industry is not well represented. At the design level, establishments may refer to the authenticity of the place in various ways: by indicating the official or expert assessment of the age of the building; through names that refer to the roots of the place

or images that are associated with local cultural symbols. But typical situations also include when they refer to symbols of places located in other countries or when the only thing that matters when decorating is the visibility of the establishment.

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Design of Sustainable Business Models Using the Example of the Medical Supply Store

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Abstract

Research background and context: Megatrends, new technologies, increasing customer demands and current challenges in the VUCA world are changing established business models in the German healthcare sector. The global Corona pandemic, which broke out at the beginning of 2020, is seen as a catalyst for the digital transformation of organisations to ensure innovation and competitiveness.

Purpose/objectives: This research contribution is intended to show organisations how the digital transformation can be shaped. A sustainable further development of the business model is the key to success. Through the intelligent selection of business model characteristics, added value should be generated for the (stationary) medical supply store.

Design/research methodology: In his research project, the author combined secondary data on business models and expert interviews to develop a process model.

Findings, originality/value and possible practical implications: In times of disruptive change, serious impacts on established business models will become increasingly common and strategically challenging for companies. Organisations need to understand the most important value drivers for their business, as they have a significant impact on the success of the business model. A digital accompaniment of the customer in the use of the medical product or service is indispensable today. At the same time, the holistic understanding of the customer influences the profiling of the company.

Keywords

Digitalisation; Transformation; Business Model; Innovation; Medical Supply Store; Healthcare

DOI: 10.24818/BASIQ/2023/09/060

Introduction

The world and the health system are changing. New developments, technologies and markets, increasing customer demands and changing framework conditions are shaping new business models. SARS-CoV2 virus amplified the acceleration of digital transformation (Edvardsson & Tronvoll, 2022; Gaiardelli & Songini, 2021; Jin, et al., 2022). This article examines the design of innovative business models in the context of new forms of (sustainable) market as well as customer interaction using the example of the (stationary) medical supply trade. The "digitalisation" megatrend is influencing all business models, sectors, companies and players worldwide (Brunetti, et al., 2020; Ferlito & Faraci, 2022; Thömmes, 2022). The German healthcare system is also affected by this. Digitalisation holds strategic potential and opportunities if these are used by the organisation and implemented in everyday operations (Brunetti, et al., 2020; Müller, 2019). If digitalisation is not implemented, the company may quickly find itself at a competitive disadvantage. Based on this circumstance, the following question arises: Which business model characteristics can interact to sustainably promote the transformation of the (stationary) medical supply trade? Despite the many approaches to the design of business models, the (sustainable) realisation of value of business models in the context of healthcare as well as their practical implementation is not yet comprehensively understood. There is a lack of methodical approaches to process models that focus on the generation of added value for the (stationary) medical supply store.

The aim of this article is to provide a well-founded list of business model characteristics that can sustainably promote and advance the digital transformation of the (stationary) medical supply store. The workshop-based process model developed is intended to provide practical added value for the company in the operationalisation of business model characteristics. Furthermore, the article is intended to form the basis for related research activities (Burcharth, et al., 2017) in the context of the medical technology sector.

In addition to the introduction, the article is divided into five further sections. First comes the literature review. This is followed by an explanation of the research context and the research methodology used. The penultimate section of the article presents the results, which are subjected to a critical discussion. The article concludes with theoretical and practical implications and points to future research activities.

Literature review

Digitalisation also affects the traditionally shaped medical supply store, which leads to extensive changes in service policy. These changes relate to an enormous innovation dynamic on the one hand and a considerable customer focus on the other. Both of the latter circumstances lead to the need to illuminate the realignment of the product and service portfolio at a strategic level (Ferlito & Faraci, 2022; Jin, et al., 2022; Kesting & Scherenberg, 2022; Thiebes & Plankert, 2014).

The implementation of digitalisation creates considerable potential from a strategic, operational and financial perspective (Aloini, et al., 2022; Brunetti, et al., 2020; Müller, 2019). Fragmented implementation concepts in the (stationary) medical supply store lead to key competitive disadvantages compared to those players who operationalise digitalisation holistically. These advantages primarily relate to competitiveness and (organisational) profitability (Gaiardelli & Songini, 2021; Jin, et al., 2022; Kreutzer, 2022; Kurek, et al., 2023; Rintamäki & Saarijärvi, 2021).

In addition to digitalisation, the medical supply store is affected by a shortage of skilled workers, persistent supply bottlenecks and high energy costs. The focus of this paper is on digital transformation, but it should be emphasised that the medical supply store is simultaneously affected by other constraints or cross-industry trends. The named circumstances can only be remedied in a fragmented way by strategy concepts (Aloini, et al., 2022; Deckert & Wohllebe, 2021).

Customer centricity is mentioned as a central business model characteristics that should sustainably promote the digital transformation of the (stationary) medical supply store. Absolute customer centricity refers to communication (Alamäki & Korpela, 2021; Balmer, 2017; Ghezzi, et al., 2022), to operational processes and activities, as well as to the organisation's entire range of products and services. The more targeted the aspects mentioned are to the customer segments, the higher the customer benefit turns out to be. With regard to the medical supply store, personalisation and modularisation of the products and services offered is considered a complementary approach to specifically meet the individual needs of the respective stakeholders (Deckert & Wohllebe, 2021; van Boerdonk, et al., 2021). Classic sector and supply boundaries are thus being challenged. Several studies (Balmer, 2017; Dickinson-Delaporte, et al., 2010; Ghezzi, et al., 2022; Jaakkola & Terho, 2021; Rintamäki & Saarijärvi, 2021) have pointed out the importance of absolute customer centricity within the business model. According to this, in the context of the digital transformation, a company changes from being a provider of individual products to a solution provider, which in addition to products also includes personalised services (Deckert & Wohllebe, 2021; Jin, et al., 2022).

In addition to personalised products that require explanation, intelligent products, systems and services are named as a key driver for competitiveness and sustainability. At the same time, stationary trade must also be understood as a digital POS (point of sale). Due to the variety of products and services that require explanation, the medical supply store is predestined to take up innovative and technological opportunities; the keyword here is the customer journey (Hetze, et al., 2019; Jaakkola & Terho, 2021; Tiffert, 2019). A customer journey - the customer's journey in a networked world - encompasses all of a consumer's touchpoints - from the creation of need to customer loyalty (Deckert & Wohllebe, 2021).

The solution provider is reflected in the approach of the value-based healthcare concept. It consistently combines its own offer with the customer's perspective and benefit. Thus, pure product- or price-oriented parameters are not decisive for the purchase. This new, innovative concept combines the business model characteristics that sustainably promote the (stationary) medical supply store in the context of the digital transformation. In addition to the customer segments, these include above all the value and benefit proposition (Alamäki & Korpela, 2021; Amelung, 2022; Ernst & Steinbeck, 2022; Gaiardelli & Songini, 2021).

This building block of the business model emphasises the creative importance of providing a certain benefit and also communicating this to the individual customer segments. Based on the value and benefit proposition, the importance of another business model characteristics for the implementation of the value proposition is shown. This is the customer relationship between the (stationary) medical supply store and the customer (Alamäki & Korpela, 2021; Amelung, 2022; Osterwalder & Pigneur, 2011).

On the one hand, the customer relationship within the framework of the value-based healthcare concept provides for direct and digital contact points between the actors. On the other hand, the relationship should be characterised by extensive communication (Hetze, et al., 2019), which conveys to the customer that the (individual) demands and needs are taken up as well as implemented by the product and service portfolio (Alamäki & Korpela, 2021; Amelung, 2022; Jäger & Endres, 2022).

For the (sustainable) further development of business models, new methods for generating added value for the (stationary) medical supply store are needed in addition to the PDCA instrument. For this purpose, the business model characteristics must be selected that are most likely to generate added value for the company. In this context, the current state of research shows a gap in terms of content and at the same time also the need for a process model.

Research methodology

The author combined literature-based secondary data on business models with expert interviews as part of a business development project for the (stationary) medical supply store initiated by the Technical Academy Esslingen (TAE). In the first step, generic business models were analysed in the literature in order to gain ideas for the selection of business model characteristics that are conducive to the (stationary) medical supply store. The comparison of the selected studies/authors and the business model characteristics is colour-coded in the form of a matrix. The sum represents the frequency with which the business model characteristic is mentioned. The higher the frequency, the more relevant this characteristic is for the sustainable transformation of the (stationary) medical supply store. Furthermore, existing experience reports from the sector were evaluated using the A3 system according to Toyota. As a selection criterion, it was determined that the business model characteristics are relevant for customers or for the customer's purchase decision. Furthermore, the business model characteristics must be independent of each other. In the second step, the expert interviews were conducted using structural guidelines in the defined period from 10/2022 to 11/2022. The selected elements for the business model adaptation in the (stationary) medical supply store served as a grid for the structure of the interview guide. Each business model feature (revenues/earnings, (communication) channels, customer, CRM, customer value, monitoring/PMS, product/service, technology/innovation and value creation) could be quantitatively assessed using Likert scaling in seven gradations from not at all true (= 1) to fully true (= 7). A total of n = 7 organisations could be recruited. The arithmetic mean (MW), which is part of the descriptive statistics method bundle, was used to interpret and visualise the results. The processed data were analysed using MS Excel. After six months, the expert interviews will be continued and geographically expanded in order to generate representative data. In addition, moderated workshops accompany the business development process of the companies.

The research context is divided into two central components. On the one hand, the business model characteristics exist as a theoretical component. On the other hand, the practical component refers specifically to the (stationary) medical supply store in Germany. The central question of which business model characteristics (according to Nagl & Bozem, 2018) can sustainably promote the transformation of the (stationary) medical supply store in interaction connects the two detected components and the megatrend of digital transformation (Brunetti, et al., 2020). Furthermore, the volatile market is driven by a high innovation dynamic and requires a rethink in management. Stakeholders are increasingly becoming the focus of innovative co-creation of service portfolios (Balmer, 2017; Dickonson-Delaporte, et al., 2010; Edvardsson & Tronvoll, 2022; Ghezzi, et al., 2022; Müller, 2019; Rintamäki & Saarijärvi, 2021). Innovation is considered an industry-independent driver (Ferlito & Faraci, 2022; Flamini, et al., 2022; Jin, et al., 2022; Kesting & Schwerenberg, 2022) of qualitative growth for companies.

A business model can be visualised, independently of the practical and industry example of the (stationary) medical supply store, by the Business Model Canvas (BMC) (Gaiardelli & Songini, 2021; Jin, et al., 2022; Kurek, et al., 2023; Osterwalder & Pigneur, 2011). Furthermore, in addition to the actual analysis of the business model, the BMC model also serves to optimise an existing business model or operational service portfolio of a company. According to the BMC, the business model is divided into a total of nine components (customer segments, customer relationship, channels/experience points, value/value proposition, benefits/revenues, expenses/costs, resources, activities and partners). The business model feature of customer segments shows the customers with the greatest importance and the greatest (strategic

or monetary) benefit for the company. The customer relationship shows the interaction between the company's stakeholders. Via the business model component of channels and experience points, the operational implementation of the interaction between the individual customer segments and the provider of a product or service takes place (Brunetti, et al., 2020; Osterwalder & Pigneur, 2011; Kaschny, et al., 2015).

The central building block of this overview is the value proposition. This is the raison d'être of the company or service portfolio. The central question in the value proposition asks which customer needs are fulfilled or which problems are solved on the part of the customer. This results in another business model feature in the form of benefits and revenues. It is an exchange of services between the customer, who provides financial resources, and the company, which fulfils a sustainable value proposition through products or services. The revenues are offset by an internal cost structure and an expenditure of resources. The cost drivers can be assigned to organisational activities (Deckert & Wohllebe, 2021; Kurek, et al., 2023; Osterwalder & Pigneur, 2011).

Activities are required to deliver the value proposition (Rintamäki & Saarijärvi, 2021). The key actions of the company to fulfil the core competencies are found in the business model characteristic of key activities. The implementation of these key activities ensures the value proposition, revenue streams and customer relationships. The key partners represent those stakeholders who implement the USP activities together with the company. In doing so, the key resources support the company's value proposition, monetary revenue streams and customer relationships (Osterwalder & Pigneur, 2011; Rintamäki & Saarijärvi, 2021; Thiebes & Plankert, 2014).

Results and discussion

The question as to which business model characteristics in combination can sustainably promote the digital transformation of the (stationary) medical supply store is very clearly shown by the evaluated business model characteristics in Figure no. 1 below.

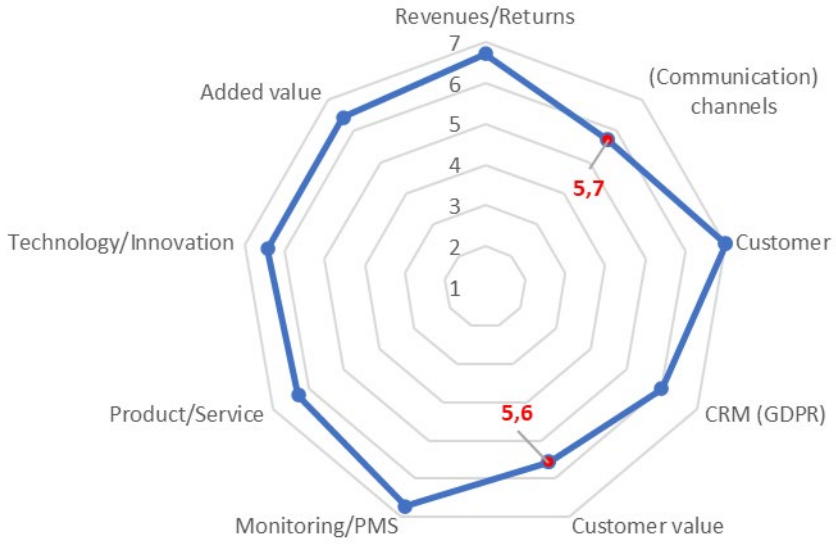


Figure no. 1. Evaluation results of the business model characteristics

Source: Own illustration

Furthermore, the results underline that a strategic expansion of the two business model characteristics "(communication) channels" (MW = 5.7) and "customer value" (MW = 5.6) is indispensable. This approach follows numerous studies (Alamäki & Korpela, 2021; Brunetti, et al., 2020; Rintamäki & Saarijärvi, 2021; van Boerdonk, et al., 2021) and takes into account the business model feature "Monitoring/PMS", which is of central importance for the practical implementation of the European Medical Device Regulation. The essential business model characteristics primarily include a holistic customer orientation. This orientation

refers to all internal processes and activities as well as to the organisational product and service portfolio (Thiebes & Plankert, 2014) of the company. Accordingly, a further business model feature in the form of a (sustainable) value and benefit proposition goes hand in hand with meeting the individual needs and concerns of customers (van Boerdonk, et al., 2021). This should be complemented by a long-term customer relationship through direct and open communication. It is undisputed that the business model characteristic "(communication) channel" (MW = 5.7) is in need of correction.

The business model characteristics mentioned above form the concept of the value-based healthcare approach and enable the (stationary) medical supply store to act as a holistic solution provider instead of a provider of individual products (Alamäki & Korpela, 2021; Amelung, 2022; Jäger & Endres, 2022). The customer expects more than just a product. He expects an individual solution tailored to him. The support of the customer does not end with the purchase of the product, but focuses more and more on the individual use of the medical product.

This article is intended to outline a process model for practitioners in the health care sector that focuses on the further development of traditionally shaped business models. The condensed information can be used to derive initial recommendations for action for the medical supply store.

Conclusions

The article primarily adds value for practitioners and at the same time contributes to closing the research gap. A workshop-based, systematic procedure model was developed for the intelligent selection of business model characteristics. Furthermore, the economic success of the company is only realised through the innovative, content-related design and linking of the business model characteristics.

The medical supply store must rethink its current strategy and business model and, as a solution provider, (learn to) better understand the problems and challenges of the customer. The focus is on the individual customer and his needs. Since the Corona pandemic, cross-channel customer interaction has moved even more into the organisational foreground. In addition, the customer takes on the role of content supplier, for example in the area of social media. At the same time, a professional approach to the stakeholders and tech players of the FAANG era opens up new possibilities for organisational profiling. This increases customer loyalty, the customer's potential is better exploited and, ideally, profitable growth is generated through co-creation.

The workshop-based process model developed is intended to provide strategic added value in the practical implementation of further business model development - especially for the (stationary) medical supply store. The simple model makes it possible to transfer it to other areas of the company.

In addition to the theoretical and practical implications, the process model outlined also has some limitations. Business models in the health sector are primarily shaped by the legal framework conditions of the respective countries. Consequently, other business model characteristics are more in focus. As a result, the generalisability of the model is partly (geographically) limited. With the application of conjoint analysis, the individual business model characteristics can be linked to a quantitative utility value for the customer. Finally, the author proposes to prepare the results of the workshop in the form of a checklist that can serve as an aid for management.

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Bank Non-Performing Loans – a Panel Data-Based Analysis in European Context. Study Case: Germany

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Abstract

Humanity has recently been crossed by periods of great crises, and banks have had a particularly important role in keeping the economy afloat and in relaunching economic activities in these difficult periods. If we refer to the stability, health and efficiency of the banking system, one of the important factors mentioned in the specialized literature is the size of Non-Performing Loans. The present work carries out a time and space analysis of this indicator for the EU member countries, observing its behavior during major crises. Thus, in the distribution of European countries there was a decrease in the median level of the indicator and in its variability, but also an increase in the predominance of countries with low non-performing loans ratio. At the same time, the case of Germany is studied, with the strong and weak points of its banking system and the key determinants of the rate of non-performing loans, for the main commercial banks in Germany are identified, using a panel data regression model. The results revealed that the indicator-level is negatively and significantly correlated with the loan-deposit ratio and the degree of financial profitability and positively and significantly correlated with the total value of assets and the degree of capital adequacy. From this emerges the need to promote policies to stimulate the prudent behavior of banks in granting loans, in order to ensure the stability and health of the banking system in European countries.

Keywords

Bank Non-Performing Loans to Total Gross Loans, Total Assets, Return on Average Equity, Loan-to-deposit ratio, Total Capital Ratio.

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Introduction

In specialized literature "Bank nonperforming loans to total gross loans are the value of nonperforming loans divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan-loss provisions). The loan amount recorded as nonperforming should be the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue." (World Bank, 2023). Nonperforming loans influence banks' ability to grant and allocate loans efficiently, as well as banks' risk aversion, potentially affecting the stability of the financial system and economic growth (Foos, Norden and Weber, 2010). Studies reveal that the size of Non-Performing Loans - in absolute or relative terms - is linked to the stability, health and efficiency of the banking system, being often identified as one of its key factors (Khan, Siddique and Sarwar, 2020; Ludwian and Soekarno, 2022). The present paper proposes a temporal and territorial analysis of this indicator for the EU member countries, observing its behavior during major crises and identifying the key determinants of the non-performing loans ratio, based on data collected from the main commercial banks in Germany. The work is structured in three sections, as follows:

in the first section, a review of the most representative studies in the specialized literature in this field and their main results is carried out; the second section presents the statistical-econometric methods applied and the statistical variables included in the analysis; the third section contains the main results obtained from the analysis, followed by discussions and conclusions.

1. Review of the scientific literature

Foos, Norden and Weber (2010) study the relationship between loan growth and banks' risk-taking behavior, based on a sample of commercial banks from European countries, for the period 1992-2004. The main conclusions of the study are: the existence of a direct correlation between the increase in loans and the bank risk-taking behavior, a more obvious correlation in the case of small banks, which are more likely to take excessive risks when faced with a pronounced increase in loans. The connection between the two indicators is more obvious in periods of economic expansion, characterized by high economic growth.

Khan, Siddique and Sarwar (2020) identify the main determinants that lead to the emergence of non-performing loans in the banking sector in developing countries, taking Pakistan as a case study. The analysis is based on panel data from 22 commercial banks in Pakistan, in the period 2005-2017 and examines the impact of different variables, specific to the banking field, on Non-Performing Loans. The authors come to the conclusion that the bank profitability, the operating efficiency, the bank capital and the income diversification have a significant and negative impact on the variability in the Non-Performing Loans.

Viswanadham and Nahid (2015) identify several factors that have a significant influence on the level of Non-Performing Loans in commercial banks, among which we mention: interest rate, concentration of credit, supervision activity of bank loans, but they also highlight a series of macroeconomic factors that can affect the level of Non-Performing Loans, for example the GDP growth. The authors used the data collected from a survey with 152 respondents, to assess the impact of these factors on Non-Performing Loans.

Ludwian and Soekarno (2022) analyze the relationship between the rate of non-performing loans and the operational efficiency of the bank, based on data taken from the Banking Statistical Reports in Indonesia, and covering the period January 2010 - September 2021. The results show that each banking group (cluster) in the banking system of the country behaved differently in terms of the association between problematic loans and operational efficiency, and the bad management and bad luck hypotheses were tested separately for each cluster. The authors suggest the need for the authorities to develop clear, relevant and individualized regulations for each group (cluster) separately, depending on its behavior.

Banks have a particularly important role in keeping the economy afloat and in relaunching economic activities in times of crisis. Karadima and Louri (2020) think that the consolidation of the banking sector manifested itself as a common trend in the Euro area countries after the global-financial crisis of 2007-2008. Thus, throughout this period, the phenomenon of fragmentation in the banking industry has been maintained, and the presence of large stocks of Non-Performing Loans contributes to the fragmentation between the countries of the Euro area. In a document of the European Commission (2022) on non-performing loans it is shown that the banks also played a key role in mitigating the effects of the pandemic crisis in 2020, because - due to the impact of this pandemic on the economy, it is expected that in the period following the crisis, the size of non-performing loans to grow in EU countries.

In the McKinsey&Company Report (2021) – "German banking returns to the playing field", *Global Banking Practice* it is shown that although the banking industry has over time had a key role in supporting the country's economy, offering support in relaunching economic activities in times of crisis, the relevance of this sector is decreasing, say some specialists. Others are of the opinion that the renowned resistance of the German banking system will speak for itself, and the banking system will adapt - through successful transformations and a solid strategy - to the new economic-social realities, to the new technologies. In this sense, Hock and Giebe (2022) show that the integration of Big Data analysis in the German banking industry is a possible solution to current challenges, such as increasing competition or changing customer requirements. At the same time, the McKinsey&Company Report (2021) provides a brief characterization of the German banking system, with German banks having a reputation for being stable, reliable and providing essential services at competitive prices. After the period of the global financial crisis of 2008, these banks acted prudently, performing a good risk management. Although the number of banking branches has registered a continuous decrease after the global financial crisis, there is still a considerable density of banking units, higher than many other European countries. Some banks lost their market share, but the banking industry still remained quite fragmented and characterized by low efficiency. A similar idea can be found in the report of the International Monetary Fund: "Germany: Financial Sector Assessment Program, Technical Note—The Determinants of Bank Profitability" (2022). The authors estimate that German banks are

less profitable than the global standard and than those in Europe, despite better risk-adjusted measures, which is partly explained by the complex structure of the German banking system, which favors fragmentation and prioritizes the well-being of shareholders over profits. The authors suggest that a mix of cost-cutting and revenue-generating measures should be taken to develop sustainable business models.

2. Data and methodology

In order to quantify the risk in bank loans, the variable *Non-Performing Loans to Gross Loans* (%) was selected, with values recorded at macro level (of European countries) and micro level (of commercial banks), allowing a more detailed analysis of the degree of risk that accompanies the banking activity from a double perspective. The macro-level values of the indicator refer to 27 European countries (26 EU member countries, to which Great Britain is added), and are recorded over a period of approximately one decade (2010-2021), being provided by the World Bank database. The micro-level values of the indicator refer to the 18 most important commercial banks in Germany, a country with a robust banking system, recognized for its stability, even if it is below European profitability standards. The micro data were recorded for the period 2013-2021 and were provided by the ORBIS database. In order to determine some significant influencing factors that explain the variation in risk when granting credits, five other financial indicators were selected, presented in Table no. 1.

Table no. 1. List of statistical variables included in the analysis.

Indicator name	Measurement unit	Space/time coordinates	Source
Non Performing Loans / Gross Loans (macro-level)	%	27 European countries 2010-2021	World Bank database https://data.worldbank.org/indicator/FB.AST.NPER.ZS
Non Performing Loans / Gross Loans (NPL_GL) (micro-level)	%	18 commercial banks (Germany) 2013-2021	ORBIS - https://www.bvdinfo.com/en-gb/our-products/data
Total assets (TA)	thousand USD		
Return on Average Equity (ROAE)	%		
Loan-to-deposit ratio (Net Loans / Dep. & ST Funding) (NL_STF)	%		
Total Capital Ratio (TCR)	%		
Listing status (LS) (1=listed, 0=non-listed)	Binary variable		

Source: authors' selection.

The applicative part of the research begins with an analysis over time and in territorial profile of the variable *Non-Performing Loans to Gross Loans*, the variable that characterizes the risk that banks take when granting loans. Both statistical methods specific to time and territorial series were used, as well as descriptive statistical analysis of univariate data, in order to characterize the central tendency, the variability and the shape of the distribution of European countries by the rate of non-performing loans, as well as the changes that occurred over time in this distribution during economic or health crises.

The next stage of the analysis aimed to identify the main determinants of *Bank nonperforming loans to total gross loans*, using a regression model on panel data at the level of commercial banks in Germany (balanced panel). The dependent variable is *Bank nonperforming loans to total gross loans*, while the variables: *Total assets* (thousand USD) – standardized by z-scores, *Loan-to-Deposit-Ratio* (Net Loans / Dep. & ST Funding) (%), *Return on Average Equity* (ROAE) (%), *Total Capital Ratio* (%) and *Listing status* (binary variable) were considered independent variables. The sample included 18 cross-sections (commercial banks from Germany) and 9 time-units (9 years, from 2013 to 2021), summing up a total of 162 observations for each of the 6 variables included in the model.

In order to verify the validity of including the 6 variables in the panel data regression model, the stationarity of the time series was tested with the Levin, Lin, Chu test. The null hypothesis (H_0) and the alternative hypothesis (H_1) of this test are: H_0: the series has a unit root (non-stationary series); H_1: the series does not have a unit root (stationary series). If Prob. > 0.05 => the null hypothesis H_0 is accepted, the series is non-stationary, and if Prob. < 0.05 => there is insufficient reason to accept the null hypothesis H_0, therefore accept the alternative hypothesis H_1, that the series is stationary. To analyze the existence of the multicollinearity phenomenon between the explanatory variables, the correlation matrix was used, detecting the existence of strong correlations between two variables, in which case one of these variables can be

excluded from the model. The fixed effects regression model and the random effects one were applied, then the best model between the two was selected. In the model with fixed effects, it is assumed that the differences between individuals (in this case between banks) can be explained by the specific conditions of the individual (bank), the specific individual effect being a random variable that can be correlated with the explanatory variables. On the contrary, in the random effects model this specific individual effect represents a random variable that is not correlated with the explanatory variables (Zulfikar, 2018; Schmidheiny, 2022). To identify the best regression model (with fixed or random effects), the Hausman test was applied, whose null hypothesis is: H_0: the unobserved effects of the model are not correlated with the causal variables. If Prob. > 0.05 => H_0 is accepted, the best model is the one with random effects, and if Prob. < 0.05 => not enough reason to accept H_0, therefore accept H_1, the best model is the fixed-effects model.

3. Results and discussions

The first part of the analysis focuses on a statistical indicator that quantifies the degree of risk that banks take on loans: *Bank nonperforming loans to total gross loans* (%). The purpose of this analysis is to characterize the stability in the banking industry of the different EU member countries and to see what was the behavior of the banking systems in these countries during the major crises, from this indicator point of view. Based on the World Bank data for the period 2010-2021 and for 27 EU member countries (UK included, although the country officially left the EU in 2020) it can be observed that – at EU level - there were two sub-periods in which the indicator had opposite trends. Thus, in the first part of the analyzed period (2010-2013), the period that immediately followed the global financial crisis of 2008-2009, Bank nonperforming loans to total gross loans registered an increase from 6.36% to 9.07%, which affected the stability of the banking activity. After 2013, the level of the indicator followed a downward slope, which was maintained until 2021, when *Bank nonperforming loans to total gross loans* decreased 3.5 times compared to the maximum level in 2013. During the COVID-19 pandemic crisis the indicator continued its decline, reaching only 2.57% in 2021 (EU-average level). There was, however, a great variation in territorial profile, between the EU member countries throughout this period. The record regarding the rate of non-performing loans was held by Southern European countries, led by Greece and Cyprus (countries where in 2016-2017 almost half of the loans granted by banks were non-performing), followed by Italy and Portugal. At the opposite pole, with a low bank loan-risk were Switzerland, Luxembourg, Finland and Sweden, countries with a recognized stability of the banking industry and with maximum values of the indicator that barely exceeded 1%.

In the next stage of the analysis, the distribution of European countries was characterized by *Bank nonperforming loans to total gross loans* in three years: 2011 (immediately after the global financial crisis of 2008-2009), 2019 (before the COVID-19 pandemic crisis) and 2021 (immediately after the pandemic crisis, although at that time it had not completely ended). The purpose of this analysis was to identify possible significant changes in the behavior of European countries from the perspective of risk in the bank activity, which could jeopardize the stability of the banking systems in those countries. Following the descriptive analysis of the indicator, a reduction of the central tendency was observed (the average level decreased from 6.9% in 2011 to 4.27% in 2019 and to 2.57% in 2021), indicating a reduction in the risk of loans and an increase in the stability of banking activity. The variation in the territorial profile was greater in 2011 and in 2019, then decreasing in 2021, which shows a prudent behavior of banks when granting loans, after the pandemic crisis. The shape of the distribution of countries by this statistical variable have changed significantly, while in 2011 the distribution was moderately positively skewed and close to the normal distribution, in the years before and after the pandemic crisis the skewness grew strongly, countries with low shares of non-performing loans predominated. At the same time, in the period immediately following the financial-global crisis from 2008-2009 the distribution was platykurtic, but during the pandemic crisis it became leptokurtic (with a higher degree of kurtosis in 2019), the indicator values are concentrated around the mean to a greater extent than in the normal distribution, and the probability occurrence of outlier values is higher (indeed, outlier values were recorded in Greece and Cyprus) (Figures no. 1 and 2).

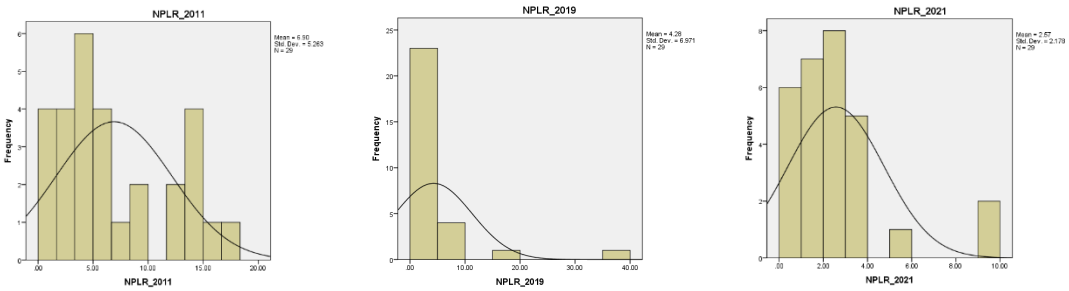


Figure no. 1. Histogram of EU-member countries by the Bank nonperforming loans to total gross loans (%) in 2011, 2019 and 2020.

Source: authors' contribution, based on World Bank data.

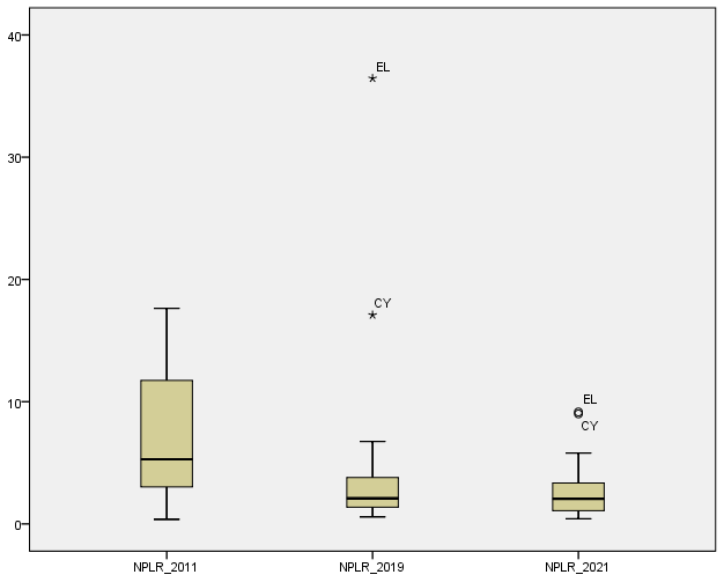


Figure no. 2. Box-and-Whisker Plot of EU-member countries by the Bank nonperforming loans to total gross loans (%) in 2011, 2019 and 2020.

Source: authors' contribution, based on World Bank data.

The next stage of the analysis aimed to identify the main determinants of *Bank nonperforming loans to total gross loans*, using a regression model on panel data at the level of commercial banks. For this, 18 commercial banks from Germany were selected, for which the following financial indicators relating to the period 2013-2021 were recorded: *Non-Performing Loans / Gross Loans* (%), *Total assets* (thousand USD), *Loan-to-Deposit-Ratio* (Net Loans / Dep. & ST Funding) (%), *Return on Average Equity* (ROAE) (%), *Total Capital Ratio* (%) and *Listing status* (binary variable). The selected explained variable was *Non-Performing Loans / Gross Loans*, the other variables being considered explanatory variables. In the first phase, the stationarity of the time series involved in the regression analysis was tested, using the Levin, Lin, Chu test. The results showed that - for a significance level of 5% - all time series are stationary and therefore can be integrated in the regression model (Table no. 2).

Table no. 2. Stationarity test results for the variables included in the regression model

Null Hypothesis: Unit root (common unit root process) Series: NPL_GL, TA, NL_STF, ROAE, TCR Sample: 2013 2021 Exogenous variables: Individual effects, individual linear trends User-specified lags: 1		Newey-West automatic bandwidth selection and Bartlett kernel Total (balanced) observations: 126 Cross-sections included: 18 Method: Levin, Lin & Chu
Variable	Statistic	Prob
NPL_GL	-9.15474	0.0000
TA	-10.1149	0.0000
NL_STF	-6.53468	0.0000
ROAE	-6.04313	0.0000
TCR	-11.9302	0.0000

Source: authors' processing results, based on ORBIS data - https://www.bvdinfo.com/en-gb/our-products/data.

The multicollinearity phenomenon between the explanatory variables was analyzed using the correlation matrix. Since a strong correlation was observed between the variables *Listing status* (LS) and *Total assets* (TA), we selected the latter variable for the regression model, as we believe it generates more numerical information.

For the panel regression model with random effects that reveal the dependence of the Nonperforming loans ratio on the other explanatory variables, the following results were obtained (Table no. 3):

Table no. 3. Panel regression model with random effects

Dependent Variable: NPL_GL Method: Panel EGLS (Cross-section random effects) Sample: 2013 2021 Periods included: 9 Cross-sections included: 18 Total panel (balanced) observations: 162 Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NL_STF	-0.055614	0.014076	-3.950948	0.0001
ROAE	-0.312274	0.044625	-6.997716	0.0000
TA	-0.00000000358	0.00000000142	-2.511712	0.0130
TCR	0.132894	0.006261	21.22567	0.0000
C	8.576508	1.498423	5.723689	0.0000
Statistics				
R-squared	0.745630	Mean dependent var		6.566123
Adjusted R-squared	0.739149	S.D. dependent var		14.89409
S.E. of regression	7.606936	Sum squared resid		9084.880
F-statistic	115.0529	Durbin-Watson stat		0.742925
Prob(F-statistic)	0.000000			

Source: authors' processing results, based on ORBIS data - https://www.bvdinfo.com/en-gb/our-products/data.

The regression model with random effects is:

$$\mathrm{NPL_GL_{it}} = 8.57 - 0.055 * \mathrm{NL_STF}_{it} - 0.31 * \mathrm{ROAE_{it}} - 0.0000000035 * \mathrm{TA_{it}} + 0.13 * \mathrm{TCR_{it}} + u_{it} \quad (1)$$

Where: *i*=the bank, *t*=the year, *u* = the residual.

In this random-effects regression model, all the parameters of the explanatory variables are statistically significant (having probabilities lower than 0.05), which means that all the independent variables have a significant influence on the variation of the dependent variable (NPL_GL). The loan-to-deposit ratio (NL_STF), financial return (ROAE) and total asset value (TA) have an inverse influence on the variation of the non-performing loans rate (NPL_GL) – their coefficients being negative. The capital adequacy ratio (TCR) is positively correlated with the dependent variable (NPL_GL) – the coefficient of this explanatory variable being positive. At a 1% increase in the loan-to-deposit ratio, it can be estimated that the non-performing loans ratio decreases, on average, by 0.055%, while a 1% increase in financial profitability will lead to an estimated average reduction in the non-performing loans ratio of 0.31%. Increasing total assets by 1 million USD leads to a decrease in the non-performing loans ratio by 0.00000358 % (on average), while a 1% increase in the capital adequacy ratio implies a 0.13% increase in the value of the explained variable (assuming that all other explanatory variables do not change). To identify the best regression model (with fixed or random effects), the Hausman test was applied and the results are as follows (Table no. 4):

Table no. 4. Hausman test results

Correlated Random Effects – Hausman Test Equation: Untitled Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	201.974920	4	0.0000

Source: authors' processing results, based on ORBIS data - https://www.bvdinfo.com/en-gb/our-products/data.

For a 5% significance level it turns out that there are not enough reasons to accept the null hypothesis of the test, so the alternative hypothesis is accepted and the best model is the one with fixed effects (Table no. 5).

Table no. 5. Panel regression model with fixed effects

Dependent Variable: NPL_GL Method: Panel Least Squares Sample: 2013 2021 Periods included: 9 Cross-sections included: 18 Total panel (balanced) observations: 162				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NL_STF	-0.055347	0.019209	-2.881306	0.0046
ROAE	-0.059830	0.051005	-1.173024	0.2428
TA	0.0000000039	0.00000000627	0.621671	0.5352
TCR	0.027562	0.009789	2.815678	0.0056
C	12.07211	2.263834	5.332593	0.0000
Cross-section fixed				
R-squared	0.949828	Mean dependent var		9.582804
Adjusted R-squared	0.942303	S.D. dependent var		21.06118
S.E. of regression	5.058954	Akaike info criterion		6.205848
Sum squared resid	3583.023	Schwarz criterion		6.625151
Log likelihood	-480.6737	Hannan-Quinn criter.		6.376091
F-statistic	126.2105	Durbin-Watson stat		1.793843
Prob(F-statistic)	0.000000			

Source: authors' processing results, based on ORBIS data - https://www.bvdinfo.com/en-gb/our-products/data.

The fixed-effects regression model equation is:

$$\mathrm{NPL_GL_{it}} = 12.07 - 0.055 * \mathrm{NL_{STF}}_{it} - 0.06 * \mathrm{ROAE_{it}} + 0.0000000039 * \mathrm{TA_{it}} + 0.027 * \mathrm{TCR_{it}} + \alpha_i + \varepsilon_{it} \quad (2)$$

The fixed effects model has a higher explanatory power on the variability in the dependent variable (explaining almost 95% of the variability), compared to the random effects model (for which R_Square is 74.56%). At the same time, both models are statistically valid (the probability associated with the F test being less than 0.05).

The loan-to-deposit ratio (NL_STF) and the degree of financial return (ROAE) have an inverse influence on the variation of the non-performing loan ratio (NPL_GL), while the total value of assets (TA) and the capital adequacy ratio (TCR) have a direct contribution to NPL_GL variation. (the parameter estimators of the first two explanatory variables are negative, while those of the last two variables are positive). However, not all the parameters of the explanatory variables are statistically significant, respectively ROAE and TA do not significantly influence the NPL_GL variation (as their associated probabilities, Prob exceed the significance level of 0.05: Prob(ROAE)=0.2428>0.05, Prob(TA) =0.5352>0.05).

1% increase in the loan-deposit ratio (NL_STF), leads to an average decrease in the non-performing loans rate (NPL_GL) by 0.055% (assuming that the other explanatory variables remain constant). Similarly, a 1% increase in capital adequacy leads to an estimated average increase of 0.027% in the values of the explained variable (if all other explanatory variables do not change).

Conclusions

The bank risk-taking behavior has been studied for a long time by specialists, in connection to the state of health, stability and profitability of the banking system. The banks have offered real support in the recovery of the economy after periods of major crises of various types, in restarting the activity, and the application of a prudent bank strategy in granting loans is a necessity in such a context. The researchers correlated the risk-taking behavior of banks in granting loans with numerous variables, some correlations being more evident in periods of economic growth. In this paper, this behavior was analyzed through the variable *Bank Non-Performing Loans to Total Gross Loans*, from a double perspective: a macroeconomic perspective - at the level of EU member states and a microeconomic perspective - at the level of commercial banks. For the first perspective, the indicator was analyzed in a territorial and temporal profile, identifying significant changes in its behavior, in major crises time periods (the global financial crisis of 2008 and the COVID-19 pandemic crisis in 2020), in a comparative way between EU countries or compared to the average EU level. A change in the distribution of countries by the level of this indicator was observed in 2011 (after the global financial crisis), in 2019 (pre-pandemic crisis) and 2020 (post-pandemic crisis): a decrease in the central tendency of *Bank Non-Performing Loans to Total Gross Loans*, a decrease in the variability in territorial profile, an increase in (positive) skewness, which means a predominance of countries with low non-

performing loans ratio, an emphasis on the prudent behavior of banks in granting loans and an increase in the stability of the banking system. At the same time, the probability of the occurrence of extreme values of the indicator increases. Using a regression model on panel data provided by the main commercial banks in Germany for the period 2013-2021, the main determinants of *Bank nonperforming loans to total gross loans* were identified. Thus, following the application of the panel regression model with fixed effects, (which proved to be better than the random effects model), it turned out that the *Bank nonperforming loans to total gross loans* is negatively and significantly correlated with the loan-deposit ratio and the degree of financial profitability and positively and significantly correlated with the total value of assets and the degree of capital adequacy.

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Knowledge Transfer and Service Embedding for Upgrading in Global Value Chains

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Abstract

A global value chain (GVC) comprises the whole sequence of production stages and business processes that are organized across different countries. Upgrading in GVCs is the process of shifting to activities, products or economic sectors, which generate a higher level of value-added. In the light of selected bibliographic sources, improved competitiveness is viewed as the result of upgrading and we begin with the assumption that a growth in market share is a gauge of both competitiveness and upgrading. The primary goal of this paper is to evaluate the proposition that upgrading in global value chains is a result of increasing GVC participation and of a rise in the share of domestic services value-added included in gross exports. A random effect regression model of panel data was the research method applied to verify this hypothesis in the manufacturing sector in Central and Eastern EU member states. The main results lead to a positive impact of both GVC participation and share of domestic services value-added in gross exports on GVC upgrading. This allowed for the option of making a few recommendations for a more widespread and intense involvement in GVCs, where the knowledge transmission can be exploited. The possible practical implications of the paper are that the learning effects coming from other partners in GVC should be nurtured and used to improve market share or evolve to higher value-added activities. Servicification of manufacturing can lead to a more competitive position along the GVC, especially if the included services lead to innovation and increased productivity. The investigation of the interaction between GVC participation and service inclusion in production and their effects on upgrading and competitiveness constitutes the paper's novel contribution.

Keywords

Global value chains, upgrading, servicification, value-added creation, knowledge transfer, competitiveness.

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Introduction

"International production, trade and investments are increasingly organized within so-called global value chains (GVCs) where the different stages of the production process are located across different countries" (OECD, 2019). Gereffi and Fernandez-Stark (2016)[1]: The value chain describes the entire spectrum of tasks that businesses and employees carry out to get a product from its inception to its ultimate use and beyond. Research and development (R&D), design, production, marketing, distribution, and customer service are all included in this. A value chain's components can either be confined within a single firm or distributed among several firms. In order to be called *global,* the condition is that these activities are located in different countries. Participating in GVCs is seen as a benefit of globalization, giving firms the opportunity to segment their production in several processes and either offshore or outsource these processes across

[1] Gereffi is a prominent author in the area, establishing the GVC framework and the Duke University Global Value Chain Center (Duke GVCC, 2019).

different locations in different countries in search for specific advantages that confer an optimum configuration of activities.

The issue sets new challenges and opportunities for policies aimed, first, at supporting the inclusion of the national economies in global value chains and secondly, within a more thorough approach, their promotion on better positions within the global value chain, from where they are capable to obtain higher benefits, mainly through business processes which are richer in value-added, a process which is widely known as upgrading. The ultimate goal is to improve economic development and employment in a collaborative international environment in which diminishing trade barriers is a must (OECD, 2019). The implications, from an economic perspective, of participation in global value chains and the knowledge transfer is the redistribution of jobs, skills and incomes between the countries involved, usually towards countries that are more active in GVCs, due to the increase in value-added that these knowledge transfers create into the host economy (Taglioni and Winkler, 2016).

A special role in this complex process is held by services, which are channels of information transmission within the value chain. It is the products that have more services embedded in them which are the most likely to transmit knowledge to partner companies. For instance, technical services that accompany a product when it is delivered to the client, or the technical information (within design and engineering) which is exchanged between a car manufacturer and its gearbox supplier is an important incentive for product upgrading.

The main objective of this paper is to test the hypothesis that a higher participation in GVCs and an increased domestic services value-added share of gross exports in the manufacturing sector have determined an upgrade in GVCs in Central and Eastern EU members. For testing this hypothesis, a panel data analysis was performed, and a positive relationship was obtained between the dependent and independent variables, giving the possibility to make a few recommendations for a more extensive and intensive participation in GVCs. The original contribution of this paper consists in the analysis of participation in GVCs and the inclusion of services combined.

The remaining of the paper is organized as follows: the second section is a literature review of the evolution of the upgrading concept and the upgrading determinants, while the third section discusses the results of the panel data analysis for the upgrading in GVCs in the manufacturing sector of the newest EU members in Central and Eastern Europe.

1. Literature review

The review of the literature will be focused on explaining the phenomenon of upgrading in GVC and the two factors that will be tested in the panel data analysis as having an impact on the upgrading process: the participation itself, which determines knowledge transfer from other companies, and the services embedded in manufactured products.

1.1. Knowledge transfer and upgrading in global value chains

Upgrading in GVCs is an evolution, attained by a company involved in GVCs, towards activities with higher value-added. Kaplinsky and Morris (2000) define upgrading as: the development of technological skills and market connections that help businesses become more competitive and transition into higher-value operations. Giuliani et al. (2005) condition the increase in value-added to innovation. This particular type of evolution of firms and markets, acting in the international environment, is analyzed in the literature of economic and social studies due to the benefits it has proved to bring for companies, employees and economies, and eventually on the society as a whole. In the following rows, the economic benefits are shortly described.

The benefits of upgrading for a company may consist in higher productivity, gaining more advanced knowledge and accessing new markets or new distribution channels. These benefits arise from the type of upgrading that a company is pursuing (Dunn, et al. 2006). For example, Blažek (2016) identified: process, product, functional, inter-sectoral, inter-chain upgrading, chain upgrading, etc. and explained the different level at which benefits from learning effects may take place. Epede and Wang (2022), Gereffi (2011) consider that there is a strong connection between upgrading and competitiveness and they measure competitiveness using the market share. In this paper, increased competitiveness will be understood as a result of upgrading and we start from the supposition that market share is a measure of upgrading as well as of competitiveness.

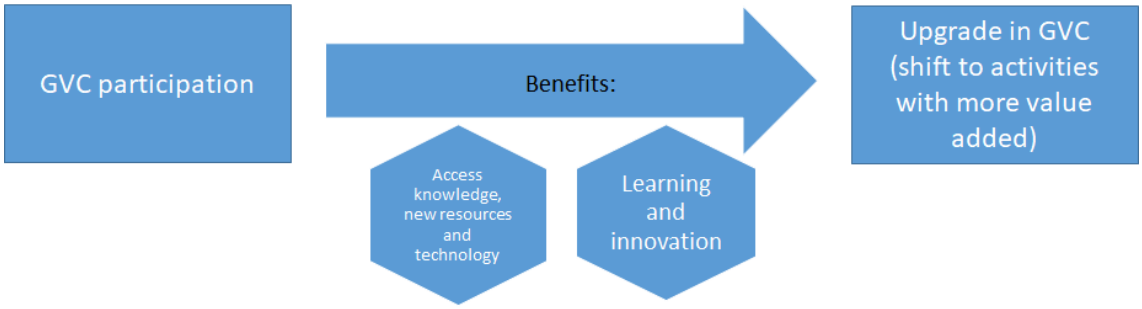


Figure no. 1. The mechanism of upgrading in GVCs
Source: author's work

Knowledge transmission channels are important to follow at both company and country level. Whereas companies should search for opportunities, governments should let these opportunities unhindered. Figure 1 presents the mechanism through which firms can upgrade in GVCs as a result of their participation and capitalize the access to resources and technology to learn and innovate.

The macroeconomic perspective gained much attention and several policies were implemented to improve upgrading (De Marchi and Alford, 2022). The common aim of policies supporting upgrading in the value chain, is to obtain a growth of value-added and aggregate productivity (Stolzenburg, Taglioni and Winkler, 2019). This results from the evolution from a sector with low productivity to a sector with a superior one and was called in the literature a structural change bonus (Timmer and Szirmai, 2000). So, upgrading in the GVC translates into structural upgrading. Structural upgrading is possible due to the effect of learning from upstream and downstream production stages: a more profound participation to GVCs brings more knowledge spillovers which lead to structural upgrading (WTO, 2014).

The link between participation in GVCs and upgrading was acknowledged by several authors: Ndubuisi and Owusu (2021), Wiryawan, Aginta and Fazaalloh (2022) and Tian, Dietzenbacher and Jong-A-Pin (2022), etc. However, the conditions under which this process works are various.

The original approach of the present paper consists in an analysis of the benefits of participation in GVCs together with increased inputs of services along the chains.

1.2. Service embedding in global value chains and their role in upgrading

Due to technological development, services themselves can also be fragmented (after they are standardized) into small activities and transported across borders, meaning that they can be produced within global value chains: information and communication technologies, business services, financial services, etc. (Pietrobelli, and Rasiah, 2012). Kan et al (2022) study upgrading in GVCs in the service sector. But more often products and product parts come along the value chain with several services embedded (Miroudot, 2017; Du and Agbola, 2022), for example technical assistance, assembly instructions, working procedures, patterns and templates, quality standards and so on. The embedding of services into products is known as *servicification* (Bombińska, 2019 and Thangavelu, Wang and Oum, 2018). Moreover, there are services that support goods and intermediates to move along the value chain (De Backer and Miroudot, 2014; Stare, Jaklič and Knez, 2019). Among these, we mention transportation, insurance, business services, financial services, communication, marketing, etc. Among the studies that recognize the role of services as inputs in the value chains of goods production are: Criscuolo and Timmis (2017), Du and Agbola (2022) and many others.

Servicification of manufacturing led to a new business strategy focused on improving customer satisfaction. More precisely, mass customization means keeping the mass production efficiency, but customizing products (Anderson, 2011). This assumes a change in the last stages of production, which makes the product look different or even changes its utility, or/and adding more customized services in distribution, sales or after sales processes. Mass customization needs a high input of services, such as market research, design and engineering, but certain service inputs can be used in common among the family of products thereby reducing the costs for each product item (Jiao, Ma and Tseng, 2003). The mass customization strategy addresses both the producer's requirement for mass production, which lowers costs through economies of scale, and the customer's need to purchase products that are tailored to their unique needs and better meet those demands (Moon et al. 2011). Extending services in a manufacturing company is not only determined by the need of customization and differentiation but is also a mean of extending productivity, for example in logistics, engineering, management, procurement and obtain a better coordination of activities (Nordås,

2010). The positive effects of services on the overall productivity in manufacturing are also assessed by: Goldar (2019), Yang, Yeh and Wang (2018), Qi et al. (2018).

The positive role of service inputs in upgrading in GVCs has been confirmed so far in several studies: Reddy, Sasidharan and Thangavelu (2023), De Marchi and Alford (2022), Lall, Sturgeon and Gereffi (2009). In addition, according to Lanz and Maurer (2015), the foreign inputs of services to goods which are produced domestically spur the country's export capacity. So, integration in GVCs through foreign subsidiaries that produce domestically enhances the access to foreign markets. Lanz and Maurer (2015) finally recommend an adjustment of trade policies and investments to be done in order to improve the capacity of domestic value-added creation. The TiVA Database (OECD, 2021) provides increased opportunities by including important data, based on which the multifaceted role of services in GVCs can be further explored.

2. Research methodology and results

The objective was to test the hypothesis whether global value chain participation and service embedding have a positive impact on the upgrading process in the manufacturing sector in Central and Eastern European countries. To measure the upgrading phenomenon, we partially leaned on UNIDO (2015) methodology, which specifies that upgrading in GVCs occurs when market share (expressed as a percentage of the country's sales in world sales) together with a unit value increase. We choose the market share to represent upgrading in the empirical model because market share is a measure of competiveness, which is strongly connected to upgrading (Epede and Wang, 2022; Gereffi, 2011).

The first question is if GVC integration is an opportunity for businesses to learn and enhance their goods and/or manufacturing methods in order to increase market share. The second query is if the possibility of selling more goods and gaining a larger market share grows with the addition of more services along the GVC.

To set the framework, we first must see the evolution of the upgrading process. Figure 2 shows that, over the analyzed period (1996-2018), market share for manufacturing products has generally grown for all countries in Central and Eastern Europe, especially Poland, which has had the relatively highest market share in the whole period (1.51% in 2018). With a market share of 1.1% in 2018, the Czech Republic comes in second. Its growth was sharp in the early years, but over the past ten years, it has fluctuated around the same levels. Romania ranks fifth, but it has grown since 2002 with little fluctuations. The only countries which in 2018 had approximately the same market share as in 1995 are Croatia and Slovenia.

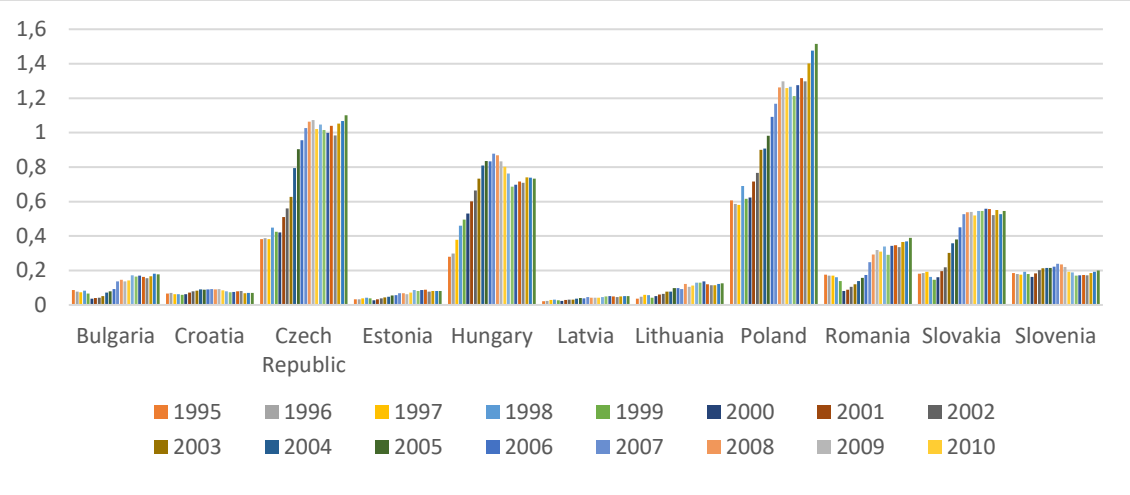


Figure no. 2. The market share evolution as an expression of upgrading in GVCs (1995-2018)
Source: author's work based on OECD (2021) data

An empirical model based on panel data was estimated applying the following equation:

$$Market_share_{i,t} = a + \beta_1 * \left(GVC_{i,t}\right) + \beta_2 * \left(DVA_SERV_SH_{i,t}\right) + u_{i,t} \qquad (1)$$

t expresses the year and *i* the country. The analysis was run for a 24 years period between 1998 and 2018 for the following countries in Central and Eastern Europe (the most recent EU members): Bulgaria, Croatia,

Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The total panel includes 264 observations.

The variables are the following:

- Market share (dependent variable): it is represented by country *i*'s share in world's total exports of goods, expressed in percentage, based on data collected from the TiVA (OECD, 2021), as presented in figure 2. This indicator was selected to represent the degree of upgrading at a particular time because it reflects the success that European goods enjoyed on the world market. Market share growth indicates that the goods were either better, more affordable, better marketed or distributed internationally.

- Global value chain participation (independent variable): the indicator based on data collected from TiVA (OECD, 2021). GVC participation index is composed by Ahmad et al. (2017) to measure the overall participation composed of backward and forward linkages. This variable is obtained by summing up the two data series that are available in the TiVA Database:

$$\text{GVC_participation index}_{i,t} = \text{EXGR_FVASH}_{i,t} + \text{EXGR_DVAFXSH}_{i,t}, \quad (2)$$

where:

$\text{EXGR_FVASH}_{i,t}$ – measures foreign value-added incorporated in country *i* s exports in the manufacturing sector, as a share in total gross exports by country *i* (to express backward linkages).

$\text{EXGR_DVAFXSH}_{i,t}$ – measures domestic value-added included in the gross exports of country *i* s in the manufacturing sector, as a percentage of total gross exports by country *i* (to express forward linkages).

The upstream integration (backward linkages) is closer to the beginning of the production chain, while the downstream integration is closer to the consumer (forward linkages). Therefore, the GVC participation index expresses both the backward and forward linkages within the global value chain and it is expected to influence positively the upgrading process through the knowledge transfer that might take place between interconnected companies.

- DVA_SERV_SH - Domestic services value-added share of gross exports (independent variable): represents the share of value-added originating from all domestic service industries in total gross exports" (OECD, 2021). Data was collected from the TiVA database. Among the service industries statistics include: wholesale and retail, transport, constructions, business services, communications, finance, hotels and restaurants, real estate and public services. Because services are considered to enhance the unit value of a product, we test the influence of embedding a higher amount of services in the exported products and we expect this to have a positive influence.

The Levin, Lin, and Chu (2002) unit root test was used to check the stationarity of panel data for all the factors. In order to perform this test, we assumed that the data is not stationary, having a unit root (the null hypothesis). First, the stationarity was evaluated with an individual intercept and trend and it resulted that GVC and DVA_SERV_SH do not have a unit root and is stationary as the null hypothesis was rejected (Prob.<5%). The stationarity for market share series was confirmed at level with individual intercept, after accepting the null hypothesis at level with individual intercept and trend. Therefore, the analysis could be performed based on the selected data.

Panel data regression analysis was performed in three versions: (a) independently Pooled OLS regression, (b) Fixed effect model and (c) Random effect model. Further tests were employed to select the appropriate model. First, for the Chow test, the null hypothesis was rejected indicating that the Fixed effect model is preferred to Pooled OLS regression model (the cross-section Chi-square probability was 0.0000). Secondly, to choose between the results of the Fixed effects model and Random effects model, the Hausman test was ran. The results concluded with the selection of Random effects model (prob. 0.8363 – accept the null hypothesis when probability exceeds 0.05), which was finally retained. This model was probably preferred because heteroscedasticity was present and has the advantage that it eliminates its presence. The assumption that variation between entities is random and uncorrelated to the model's predictor or independent variables is the basis for random effects model, unlike for the fixed effect model. So, we can assume that there are differences across countries that exert certain influence on the dependent variable.

The final results of the estimated generalized least squared technique (cross-section random effects) are displayed in table 1. The coefficient of determination R square is above 0.5 meaning that model explains the dependent variable at a satisfactory level.

Table no. 1. Panel data analysis results (Random effect model)

Dependent variable: market share				
Method: Panel EGLS (Cross-section random effects)				
Variable	**Coefficient**	**Standard Error**	**t-Statistic**	**Prob.**
GVC	2.800019	0.133692	20.94385	0.0000
DVA_SERV_SH	0.488965	0.131925	3.706379	0.0003
R squared:	*0.635257*			
Adjusted R-Squared	*0.632462*			
Prob (F-statistic)	*0.000000*			
Durbin – Watson stat	*0.447882*			

Source: Author s calculation using EViews

• *Global value chain participation* has a positive impact on the selected countries' market share, as it was anticipated, and its coefficient is the highest among the two. This shows that the integration of Central and Eastern European exporting firms in global value chains has contributed to the growth of market share. The phenomenon has several explanations:

- Firstly, there are new business opportunities through GVC integration. As production disintegration advanced globally, new orders appeared from companies which wanted supplies of parts and subassemblies from these countries and further add value to the products in other locations to eventually distribute them worldwide. The consequence is the exports' growth and an increase in market share.

- Secondly, it is through participation to these networks, companies had the possibility to access foreign knowledge and technology, which eventually lead to implanting new business practices, acquiring skills and implementing procedures which proved to be more productive or to lead to more appreciated products on the international markets.

- Thirdly, Central and Eastern European exporters could access new distribution networks, new information on the markets, benefit from the marketing activities done by other companies in the chain.

- Fourthly, a growth in GVC integration hides inward foreign direct investments that have the purpose to serve the demand in GVCs and benefit from the local advantages at the same time.

• *Domestic services value-added share of gross exports* had a positive impact on the market share growth of Central and Eastern European exports, with a statistically significant coefficient. The more services are embedded in exports, the greater the market share. The explanation is that services are an important element in value-added because they increase productivity, improve the product's utility or they make it more available to customers, they ensure connectivity with markets: transportation, communication, finance and business services, etc.

Conclusions

The international disintegration of production and service supply is not only present at the level of classical activities: market research, design and engineering, resource planning, procurement, manufacturing, financial management, human resource management, information technology, distribution, sales, customer relationship management, etc. It is more and more the subject to fine slicing these activities in very small pieces as information can be codified and transmitted by large distances and even managed and controlled from large distances.

This paper's objective is to estimate the impact of GVC participation and services domestic value-added share of in gross exports on upgrading in GVC, in the manufacturing sector for Central and Eastern EU members between 1995 and 2018. We measured the upgrading phenomenon by a country's market share

in world exports and applied a panel data analysis that resulted into a positive impact of both independent variables.

Participation to global value chains would be difficult to increase in Central and Eastern European countries in times when the world level of production disintegration is not growing anymore after it reached a stable level. However, it is important to realize that integration has brought benefits to enhance the way in which companies participate in GVCs and interact with other companies among the chain. From this moment on the evolution should be more intensive rather than extensive. Companies will have to find new ways in which they can work within GVCs to build new kind of relationships with their trade partners on both backward and forward linkages. They should seek to occupy better positions within value chains or try to specialize on activities that provide better access to information, technology and business knowledge or directly on activities which allow obtaining a higher level of unit value added. How much have companies learned to be able to get critical knowledge from their trading partners, absorb that knowledge, and innovate or simply use this knowledge and turn it into advantages like market share growth on global marketplaces or value-added growth is the question. Companies will have to reassess their strengths and analyze new opportunities in order to rethink their strategies.

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The Main Retail Companies in Romania: Evidence from 2021

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Abstract

The purpose of this article is to present an image of retail trade in Romania in 2021, following the changes caused by the COVID-19 pandemic. It also aimed to identify the factors that are likely to influence the turnover of the largest firms in the field.
The research is based on secondary data. An interesting finding of our research is that despite the growth of e-Commerce in Romania during the pandemic, no online retail company is among the top 10 largest companies by turnover. Furthermore, Romanian consumers prefer retail companies located in isolated locations over shopping centers. A sample of the 10 largest retail companies in Romania was made by turnover in 2021. On the basis of the analysis of multiple linear regression, it could be established that the turnover of the companies in the sample depends on the number of employees, the size of the sales area, the productivity of the labor force, and the yield of the sales areas.
The novelty of the data can be appreciated with the work having a high content of originality. From this point of view, it can make both contributions to the development of theory and practice, being useful both for students, researchers, academics, and for professionals.

Keywords

Retail, e-Commerce, turnover, COVID-19 pandemic, Romania.

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Introduction

In 2021, retail in Romania was marked by significant changes, mainly due to the COVID-19 pandemic. After the decline in the growth rate in 2020, the situation improved in 2021. Consumers have become less afraid of spending time in retail stores and economic pressures have somewhat subsided. However, the government's decision to block the proposed wage and pension increases for public sector workers has made many consumers more cautious about their household incomes. One can add the political crisis marked by the change of the governing coalition (Florea et al., 2022).

The trend toward e-Commerce orientation continued as digitalization in this sector continued to develop. However, the growth rates of e-Commerce were somewhat slower in 2021 than in 2020, when the rapid adoption of e-Commerce was due to quarantines and storage among the population. The omnichannel retailing approach has become a popular model for many retailers operating in Romania (Comănescu, 2021).

The COVID-19 pandemic continued to have an impact on Romanian shopping habits in 2021 (Volkmann et al., 2021). Although there has been a return to a certain semblance of normal life, the arrival of the third and fourth waves of the pandemic has had an effect on consumers' shopping carts. Although the increase in retail sales was due to the improvement in the economic situation, the increase in the cost of living led many consumers to shop less often and opt for less expensive products. After the third wave hit in April and May 2021, there was a greater emphasis on prioritizing value for money, with changes to shopping carts revealing a shift towards less expensive options. The fourth wave, which hit in September 2021, had the biggest impact on retail, as strict social distancing regulations were implemented. This led to a huge increase in e-Commerce demand in the last quarter of the year (Birsan et al., 2021).

In this context, an analysis of the main 10 retail companies in Romania is used from the perspective of several indicators that can have a significant influence on turnover. The data used are from secondary sources and refer to the year 2021, since the data from the financial year 2022 were not finalized and published at the time of writing the article.

The general situation of the Romanian retail

Retail and e-Commerce have undergone significant changes in Romania in recent years. The retail sector has been transformed by the growth of large modern retail chains, while e-commerce has seen significant growth in recent years (Micu et al., 2021; Florea et al., 2022).

Previous studies on the retail sector in Romania have identified several key challenges facing the industry, including low productivity, limited innovation, and a fragmented market structure. At the same time, other studies suggest that price, product assortment, and customer service are key factors influencing retail decisions, but they may vary depending on the market and consumer segment (Hategan et al., 2021).

According to Eurostat (2021), the retail sector in Romania represented 15.1% of the gross domestic product (GDP). The industry is dominated by small and medium companies (SMEs), with over 98% of retailers in Romania falling into this category. The top retailers in Romania are international companies such as Carrefour, Auchan, and Lidl, which have a significant presence in the country. It is also worth mentioning the entry into the top of some Romanian companies, such as Dedeman, Altex, and Catena.

After a decrease in the retail sector growth index in 2020, amid the onset of the pandemic (104.96% compared to 109.25% in 2019), 2021 marked a slight recovery, with an index of 105.83% (Table no. 1). The evolution was influenced by companies operating in the physical environment, although online commerce experienced increases in absolute values, but also in the share occupied in the total retail trade, reaching in the reference year 10.55% of the Romanian trade. According to preliminary data (Euromonitor International, 2023), e-Commerce in Romania decreased in 2022 both in absolute value (20930.8 million RON) and as a share in total retail sales in our country (9.07%). As such, stores operating in the physical environment can be found to dominate retail sales in Romania.

Table no. 1. The evolution of retail sales in Romania

- RON million

Years / Indicators	2017	2018	2019	2020	2021	2021/2017
Store-Based Retailing	149355.80	160796.50	172887.40	178193.30	187016.60	
Mobile base (%)	-	107.66	107.52	103.07	104.95	125.22
Non-Store Retailing	8391.90	11478.20	15325.20	19356.30	22051.20	
Mobile base (%)	-	136.78	133.52	126.30	113.92	262.77
Retailing Total	157747.70	172274.70	188212.60	197549.60	209067.90	132.53
Mobile base (%)	-	109.21	109.25	104.96	105.83	
Share of non-store retailing (%)	5.32	6.66	8.14	9.80	10.55	

Source: Euromonitor International, 2023

Romania has a diverse retail market with a mix of modern and traditional retail formats. Modern retail formats, such as hypermarkets, supermarkets, and convenience stores, have gained popularity over the past decade, while traditional markets and small independent stores continue to play an important role in certain regions (Purcărea et al., 2022).

A study conducted by Dabija, Bejan and Grant (2018) examined the factors that influence the preferences of Romanian consumers for different retail formats. The study found that consumers appreciated the comfort, price, and quality of products when choosing a retail format. The study also highlighted the importance of the site, and consumers preferring retail outlets close to their homes or workplaces.

Another study by Grosu (2023) analyzed the competitive dynamics of the Romanian retail sector. The study found that the sector was characterized by a high degree of concentration, with several large retailers dominating the market. The study also found that competition was intense, especially in the hypermarket segment of the market.

Research methodology

The main objective of the research was to identify the factors that determine the evolution of the turnover of the top 10 retail companies in Romania in 2021. In this regard, an analysis was performed based on secondary data taken from Euromonitor International and the Top firms website (https://www.topfirme.com). Factors that have been taken into account are turnover, total number of employees, number of stores, total sales areas held in Romania, labor productivity, the yield of sales areas, and the average number of employees per store.

The dependent variable was considered turnover, and the other variables were considered predictors. Multiple linear regression was used to analyze the relationship. In the first stage, with the Backward method, the nonsignificant variables were removed from the model, namely the average number of employees and the total number of stores. In the second stage, with the Enter method, the relationship between turnover and preachers was tested after the first stage.

To illustrate the relationship between variables, we used the Pearson correlation coefficients to calculate the 7 variables analyzed.

For the analyzes, the SPSS 23 variant statistical software was used.

Results and discussions

In Table no. 2 are presented the analysis indicators for the 10 most important companies in Romania by turnover in 2021. It is noted that, for the first time since entering the market, the market leader became Lidl, who dethroned Kaufland from the first place held for several previous years. Also, Dedeman, a Romanian company occupies the third place, in the top being two other local companies, namely Altex and Catena. All these firms also have the characteristic that they predominantly sell non-food products. The rest of the companies are subsidiaries of European groups.

Supermarkets, discount stores, and proximity stores prefer independent locations. This format remains dominant in the retail industry in Romania for both grocery and non-food stores. Hypermarkets are usually anchor tenants in shopping centers, and non-food specialists are encouraged to establish a presence in large shopping centers to develop their outlet networks nationwide. The preference of Romanian consumers for independent sites can be ascertained. The explanation may be given by the desire to avoid crowding in the context of the COVID-19 pandemic, taking into account the many restrictions it brings. In addition, amid government decisions to block revenues, many consumers have shopped in less expensive retail channels and sought price promotions. The country's retail market is characterized by a high degree of concentration, with a small number of large retailers dominating the market. Furthermore, by combining the data from Tables 1 and 2, the top 10 retail companies in Romania hold 41.86% of total retail sales in 2021.

Table no. 2. Analysis indicators for the top 10 companies in 2021

Company	Turnover – RON billions -	Number of employees	Number of outlets	Sales area - s.m. -	Work productivity -RON thousands -	Sales area yield RON thousand/s.m. -	Average number of employees
Lidl	14.88	9092	314	326600	1636.60	45.56	29
Kaufland	13.98	13512	148	590500	1034.64	23.67	91
Dedeman	10.04	11948	56	596600	840.31	16.83	213
Profi	9.52	15980	686	318400	595.74	29.9	23
Carrefour	9.40	10315	41	291100	911.29	32.29	252
Mega Image	7.47	10663	414	209500	700.55	35.66	26
Auchan	6.33	7911	32	327800	800.15	19.31	247
Altex	5.88	3959	130	126200	1485.22	46.59	30
Penny	5.40	5317	295	236700	1015.61	22.81	18
Catena	4.64	1440	817	48800	3222.22	95.08	2

Source: adaptation after Euromonitor, 2023 and Top firms, 2023

Before presenting the multiple regression analysis, in Table no. 3 the codes of the analysis variables are given.

Table no. 3. Analysis variables

Analysis variables	Cod
Turnover	S
Total number of employees	NoE
Number of stores	NO
Total sales area	SA
Labor productivity	WP
Yield of the sales area	YA
Average number of employees per store	ANE

The variables removed from the backward multiple linear regression analysis model were the average number of employees per store and the number of stores (Table no. 4). The average number of employees is influenced both by the number and size of the store, the assortment sold, and also by the nature of the activity. In addition, the number of stores depends on the type of activity carried out. Large formats have a smaller number of stores, whereas smaller ones have more stores. The model is significant from the perspective of ANOVA (Sig. ,000).

Table no. 4. Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	ANE, YA, NoE, WP, SA, NO[b]	.	Enter
2	.	ANE	Backward (criterion: Probability of F-to-remove >= ,100).
3	.	NO	Backward (criterion: Probability of F-to-remove >= ,100).

a. Dependent Variable: S
b. All requested variables entered.

The outputs of the multiple linear simple regression analysis highlight a model in which the turnover of the main 10 retail firms is dependent on the total number of employees, the total sales area, the productivity of the labor, and the yield of the sales area, the latter expressed as thousands lei / square meter. In essence, the model shows that the turnover for the 10 firms analyzed is 99% dependent (R-square, 990) on the four independent variables. The number of employees and labor productivity directly influence the turnover, whereas the total sales area and the sales area have a reverse influence.

Table no. 5. Analysis of multiple linear regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	YA, NoE, WP, SA[b]	.	Enter

a. Dependent Variable: S

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,995[a]	,990	,982	195331182,14695

a. Predictors: (Constant), YA, NoE, WP, SA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19096508781956243000,000	4	4774127195489060900,000	125,127	,000[b]
	Residual	190771353594628416,000	5	38154270718925680,000		
	Total	192872801355508740000,000	9			

a. Dependent Variable: S

b. Predictors: (Constant), YA, NoE, WP, SA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-60264445,052	413543642,263		-,146	,890
	NoE	116324,465	26380,872	,355	4,409	,007
	SA	-3229,248	582,876	-,389	-5,540	,003
	WP	1596819,279	128629,348	,845	12,414	,000
	YA	-52452521,751	6073091,649	-,434	-8,637	,000

a. Dependent Variable: S

The data in Table no. 6 illustrates that most variables are not related. Basically, there are five correlations, of which 3 are direct and 2 are inverse. Therefore, the strongest correlation occurs between turnover and labor productivity (r = 0.906, at a significance level of 1%), which is justified by the nature of the link between the two variables.

Between labor productivity and the number of employees, there is a strong but reverse relationship (r = - 0.732, at a significance level of 5%). Thus, the tendency to increase the number of employees leads to a decrease in labor productivity, and vice versa.

A strong direct correlation occurs between the sales area and the total number of employees (r = 0.725, at a significance level of 5%). The larger the size of the sales area, the more employees are needed.

A strong reverse relationship manifests itself between the number of stores and the average number of employees per store (r = - 0.721, at a significance level of 5%). The higher the number of stores, the lower the average number of employees per store.

A final correlation, also strong and direct, is between the number of stores and the turnover (r = 0.670, at a significance level of 5%). A larger number of stores leads to an increase in turnover.

Table no. 6. Values of the correlation coefficients of the variables

Variables	Pearson correlations						
S	1						
NoE	-,595	1					
NO	**,670***	-,145	1				
SA	-,514	**,725***	-,514	1			
WP	**,906****	**-,732***	,527	-,542	1		
YA	-,542	,114	-,208	-,173	-,255	1	
ANE	-,313	,257	**-,721***	,489	-,406	-,255	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Therefore, it can be concluded that the turnover of the first 10 retail companies in Romania is directly influenced by the number of stores and labor productivity. In addition, a similar relationship exists between the number of stores and the total sales area. Between labor productivity and the total number of employees there is a reverse relationship, as well as between the number of stores and the average number of employees per store.

Conclusions

The country's strong economic growth, rising consumer purchasing power, and the growth of the middle class are expected to stimulate demand for retail products and services. The growth of e-Commerce is also expected to be a significant driver of the industry as more and more Romanians embrace online shopping.

However, there are also challenges facing the industry, particularly in the area of logistics and infrastructure. The lack of modern logistics and transport infrastructure in Romania can make it difficult for retailers to move goods efficiently throughout the country. Addressing these challenges will be essential for the continued growth and success of the retail industry in Romania.

The retail industry in Romania has experienced significant growth and development in recent years and is currently one of the largest sectors of the Romanian economy. This increase was driven in part by increased consumer income and demand, as well as increased investment and competition from both domestic and international retailers.

There are several key trends and challenges facing the Romanian retail industry in the coming years, including increasing digitalization and e-Commerce, changing consumer preferences and demographics, and sustainability and environmental concerns. Retailers that are able to adapt to these trends and challenges are likely to be more successful in the long run.

The forecast for retail in Romania is mixed, with an expected positive growth, but with lower rates due to the financial pressures felt by many households. High inflation and rising living costs are expected to have a negative impact on consumers' demand for goods, even in the case of rising incomes. However, the anticipated return to pre-COVID-19 normalcy is expected to benefit retailers in physical stores as customer traffic in downtown shopping centers and shopping districts grows. Furthermore, e-Commerce is expected to continue to grow as consumers appreciate the convenience and time savings attributes of online shopping, with online marketplaces presenting opportunities for smaller retailers and saving time and effort for consumers.

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Factors Predicting Consumer-AI Interactions

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Abstract

The involvement of Artificial intelligence (AI) in the everyday life of consumers has important implications on the way consumer and AI interact. AI and robots can have different roles in the interaction with consumers, from simple transactional exchange relationships to more complex empathetic ones. The present research focuses in finding the constructs that affect these consumer-AI relationships, by analyzing acceptance, trust, interaction quality, empathy, attachment, anthropomorphism, self-disclosing behavior, loyalty. Based on literature review, we focused on pointing out the factors that predict and affect consumer-AI interactions. In the first part of the paper the role of trust was analyzed, while in the last part we focused in defining the way in which attachment and gender characteristics affect the relationship between consumer and AI. Our research shows that there are different types of relationships depending on the context, depending on trust, attachment, empathy, loyalty and gender characteristics. These results have important implications in the way robots and AI will be integrated in the shopping experience of consumer. Depending on the closeness of the relationship between consumer-AI, there will be different activities and roles that the AI will take over. For this reason, it is important to understand all facets of this relationship in order to implement it in an optimal way.

Keywords

Artificial intelligence, consumer, consumer-AI interactions, gender, parasocial relations

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Introduction

Since the mid-50s, artificial intelligence has been defined in various ways, while its developments (AI) has been strictly related to research in engineering, physics, informatics and biogenetic (Nagy & Hadju, 2021). Due to the fact that the spread and development of artificial intelligence has taken an alert pace, it will involve both ethical and moral aspects that may endanger its social acceptance. Another important factor that makes the acceptance of artificial intelligence by consumers reluctant, is when artificial intelligence technologies are applied in enterprises and are used to influence the purchase decision of products and services. For this reason, the most important acceptance characteristic of artificial intelligence is trust (Gursoy et al., 2019; Anica-Popa et al., 2021). This feature depends a lot on the way consumers adopt and use artificial intelligence, but also on the way manufacturers showcase artificial intelligence services to society.

In this paper we focus on defining the interactions between consumer and AI by taking into consideration the warmth and empathetic behavior as well as the role of gender characteristics. Based on a literature review, we aimed to identify the main topics related to consumer-AI interactions and the role of AI characteristics in enhancing this interaction. Previous research has shown that interaction quality, empathy and attachment are important predictors for trust and acceptance of AI devices (Pelau et al., 2021). Starting from these previous results, we aimed in identifying the roles AI play in the relationship to consumers and the influence gender characteristics have on the attachment in the consumer-AI relations. Previous research has shown that men and women have similar approaches for functional and transactional aspects, but there are differences in the emotional attachment and attraction towards AI (Pelau et al., 2022). In order to

understand this relationship, we have investigated several studies that define interactions and relationships between consumers and AI.

Characteristics of consumer-AI interactions

Warmth is an emotional quality that includes being kind and having empathy for others. Warmth is mostly linked to emotion rather than thought. When the level of warmth necessary to complete a task is strong, a suitable AI device must be able to express sentiments or emotions (Pelau et al., 2022). Nevertheless, a growing number of smart objects (e.g. Amazon Alexa) can interact with humans and transform the consumer experience. However, when a task requires intense sensations or emotions, consumers still choose human workers over AI (Rust & Huang, 2021). Customers trust people more than artificial intelligence (AI) when proposing a love match or forecasting jokes' comedic value, for instance. In addition, people prefer to consult with other people rather than machines when attempting to decipher the emotions depicted in images (Peng et al., 2022). Additionally, it is currently thought that humans are better at handling emotions than things, even AI. Many researchers assume that AI replies are not influenced by AI's genuine intents since they are aware that AI is built and programmed by humans (McLean et al., 2021). People's enjoyment of engaging in emotional relationships with AI may be hampered if they believe that AI does not fully comprehend feelings the way that humans do.

Nowadays, the widespread opinion is that humans are still better at handling emotions than AI. Thus, it is thought that when it comes to warmth, humans outperform AI. Although user interactions with AI assistants can take many different forms, all of these interactions have one thing in common: users give their AI helpers commands, and the assistants carry out these commands to the best of their abilities (Peng et al., 2022). This is comparable to a powerful person telling a weaker person to do what the powerful person desires. In this way, vocal interactions with AI assistants might give consumers a sensation of authority. Human behaviour is strongly influenced by power (Hu et al., 2022).

Because of the omnipresence of smartphones, users may interact with AI technology in ways that are distinct from their interactions with all other technologies (Guzman, 2019). Traditional human-computer interaction is evolving because of virtual assistants. They are largely changing how users receive information about services from websites and applications. Users are no longer required to have any (or minimal) physical connection with their gadgets, which results in a more human-like experience. As a result, virtual assistants are facilitating a simple way for people to communicate with service providers (Alepis & Patsakis, 2017). Furthermore, when people get used to interact with an artificial embodiment as they would with normal people, they begin to develop a relationship with the robotic assistant (Cerekovic et al., 2017).

Those who have previously worked with a certain 'helpful' computer to complete a task wish to work with the same computer again in the future, although an identical computer can complete the same task. People who work on the same computer have a stronger work ethic and a stronger connection. Since the initial set of interactions with computers, people have essentially reciprocated or matched the computer's engagement (Kim et al., 2022; Pelau et al., 2021).

There is a wide variety of consumer-AI interactions. Social networks, mobile apps, live chat, and chatbots, rely mainly on text-based consumer interactions. Virtual assistants function via voice communication, lowering the barriers for engaging with brands and their content at a time that is convenient for the customer (McLean et al., 2021). A helpful strategy for encouraging social engagement is to give technology a voice (Nass and Brave, 2005).

Customers frequently interact differently with human service agents according to how they see their role (e.g., assistant or companion) (Turel et al., 2013). According to the "robot assistant" viewpoint, AI technology makes it possible for practical machines to aid people in carrying out activities. A virtual assistant might be able to track the arrival time of an Uber ride or an Amazon.com package, for instance. Traditional examples also include helping a disabled person in their home (e.g., wheelchair robotics). Technology serves as an aid in these capacities. The communication that takes place with an assistant is typically more formal, task-focused, and dedicated to achieving certain functional goals (Chattaraman et al., 2019). Due to their professional demeanour, consumers consequently prefer to view "assistants" as intelligent (Sundar et al., 2017).

Opposed to "robot assistant", the "robot companion" emphasizes the way AI technology may help users emotionally (Sundar et al., 2017). Contrary to its name, a virtual assistant is not seen as an assistant or a servant in this job; rather, it is seen as a reliable, attentive personal companion in regular, everyday

circumstances. A person can chat with a virtual assistant about music or food, for instance, just as they would with a real person. AI VAs' highly sophisticated natural language processing gives the technology the ability to behave like a human (Guzman, 2019), which in turn affects the technology's appeal to society (McLean et al., 2021).

Individuals engage with computers in the same manner as they interact with other humans, using social rules. Respondents demonstrated that their virtual assistants gave the impression that someone was present. So, offering a friend to chat with, learn from, perform activities with, and seek social comfort is important (Venkatesh et al., 2012). For example, when they get home from work and no one else is there, the respondents chat with the virtual assistant and ask him/her different information. She aggregates all of the top stories for them and runs them through. Because of the high degree of interactivity, it might be more entertaining to interact with the virtual assistant than with friends and family.

The relationship between individuals and AI assistants has become more intense. By being present in the everyday life of consumers, the AI assistant knows more about the human owner, their preferences, their schedule and even some of their closest friends and family members. Using the intelligent assistant, they can organize their schedule, look up recipes, keep track of their orders and even go shopping (Dawar, 2018). This demonstrates the existence of a social entity as well as the virtual assistants' intellect in understanding and characterizing its human owner. People appear to be building connections and relationships with the intelligent assistant as a result of this permanent interaction. In consequence, this raises the social appeal of using technology for interaction. The ability of virtual assistants to interact socially and engage in conversation, as well as their capacity to supply the user with reliable information, seem to be used to measure their intelligence. Occasionally, people are looking for entertainment in their interactions with the intelligent assistants.

In spite of the good communication with the AI system, individuals are concerned about the security of the data collected by the AI system. Despite these trust issues regarding both privacy and security of personal data, individuals still use AI systems for the advantages they bring for an increased quality of life. For instance, for shopping, consumers still provide personal information and access to payment information to the AI system. Consumers trust the AI, but there are still issues and risks. Whereas trust is, in a risk scenario, an individual's anticipation that their vulnerabilities will not be abused (Corritore et al., 2003), trust issues stem from consumer concerns about the privacy of their interactions and the possibility of their personal information being stolen. Despite these concerns, they continued to connect with the intelligent assistant, providing personal information as well as financial information (McLean et al., 2021). Customers experience interactions with human counterparts rather than a piece of technology. Users are also likely to expect less from AI assistants in terms of a sense of community and satisfaction with social needs.

Gender characteristics at AI and robots

The communion between humans is based on knowing each other, communication, interaction and the feeling of trust. The following pattern is becoming more and more eloquent in building a relationship with an artificial intelligent technology (Youn & Jin, 2021). The materialization of AI is growing faster in a world with an increasing number of different needs. Humans seek to build healthy relationships based on communication and trust. If this specific need is not fulfilled, they are searching this kind of affection in the nearby and convenient artificial assistants. Starting with the voice of the intelligent assistants and ending up with a human like appearance, AI is seeking to create an intimate bound with its followers (Nass and Brave, 2005; Guzman et al., 2019). The latest type of development in the AI world encourages seeking social interaction by converting digital appearance into anthropomorphism. The appearance is based on the culture of the targeted group of customers. The Asian Hupo is the reflection of an anime character, embodying a look alike of a female Asian woman (Leo-Liu, 2023). This kind of appearance is targeting man customers as well as fans of the anime world. This conducts to satisfying human needs, such as interaction, by replacing the partner with AI. Great concern is being generated, by the fact of its accessibility for a large range of customers, regarding its mass production and low price of purchase. It also addresses a vulnerable part of the human perception, such as loneliness and physical attraction. The question of gender ethics has risen specifically for woman like AI, by objectifying females, creating the illusion of a dream girlfriend or wife, satisfying the needs and expectations of their partners. Motivation to interact with the AI human look alike in the offered by the feeling of control and anticipation of the AI in the relationship and also by the human vulnerability to construct healthy relationships. The interaction with AI could emerge to the feeling of loving it (Leo-Liu, 2023). This is what companies are also targeting, being dependent of a

specific type of product by identifying with it and beginning to actually love it (McLean & Osei-Frimpong, 2019).

But not only love would be created in a repetitive interaction between humans and AI, but also the feeling of creating a relationship that would last in the future, by the offered support and understanding of the AI to the human. This drives the consumer to feel the illusion of embracing the future together with its artificial friend. AI is hidden under the umbrella of helpers or supporters in the daily activities, because of the hectic life that the average population is experiencing (Guerreiro & Loureiro, 2023). Other research shows that the use of artificial intelligence in retail can reach the top 1% of customers who are worth 18 times more to retailers than the average customer. This fact arises through targeted personalization and increased emotional self-commitment based on behavioral data (Solis, 2017). Establishing an affective commitment between the AI and the customer creates a long-term, predictable relationship that can lead to smooth strategy formation. Important for the description of the interaction of a consumer with a virtual assistant is the relationship that can develop between them. Once voice assistants have established such a relationship with their users, the consequences are equally important. These can be loyalty, willingness to spend constantly and word-of-mouth propaganda.

When a consumer trusts a technology, a long-term relationship develops between them, which in most cases is associated with loyalty. Loyalty is a consequence of the positive assessment of AI and it is deeply rooted in consumer attitudes. Tucker conducts a study that reveals the characteristics of loyal customers. Some customers will remain brand loyal even if there is no concise difference to other AI. Loyalty can therefore be based on a trivialization, since one cannot necessarily say why one is loyal to a certain AI. In addition, customer decisions are made on the basis of exploratory customer behavior (Tucker, 1964). What this refers to and what effects it has was researched by Fournier (1998). She had named the brand as a partner. In a relationship there are interdependencies between the two partners. Everyone tries, through their actions, to strengthen the bond and build trust. This bond must ensure a dyadistic, developed structure between the two actors, in which they will be dependent on each other. The products or services that a company offers are mostly perceived as inanimate objects (Fournier, 1998). In order for a relationship to emerge, various characteristics are attributed to these inanimate objects in order to bring them to life in the eyes of the consumer (Gilmore, 1919). Such as the bound between appearance and cognitive attributes. Consumers are responding different to a certain type of AI appearance such as in a normal relationship. Studies show that a more mature physical interface can lead the consumers to purchase high involvement services to the detriment of low involvement services. The physical appearance is shown as an important characteristic in how a consumer examines the authority or knowledge of its discussion partner (Yim, 2022).

It is easy for people to create different attributes to the brands and the technology they love. In recent years, with the help of technological developments, cars have also been equipped with artificial intelligence. This approaches the pyramidal needs of people, namely security needs. With every ride together with the new equipment, one feels more secure and organizationally recognized by the brand. The car will be a family member. The degree of humanization of a brand is crucial for establishing the brand-customer relationship (Aaker, 1997). This theory of "animism" can be achieved in various ways so that a product can approximate the characteristics of humans. Animism is found also in the expectations of the consumers regarding the phycological state of mind of their tech partner. People in general tend to strive having control over their interhuman relationships in order to feel comfortable or well. The AI strives to offer its consumers the feeling of belonging and trust by positioning them in the pole position of the relationship, creating the illusion of control over the AI (Pitardi, 2023).

Conclusions and future research directions

The results of our research show that the relationships between consumers and AI are complex and several aspects have to be taken into consideration in order to fully understand them. On one hand there are the personality and values of the consumer. It depends a lot of a consumer in how far he/she is willing to use and to interact with the AI. Introverted people will be probably more likely to attach to AI devices, while extroverted people will need the social interaction with other people. On the other hand, there is the context in which consumer and AI interact. There are transactional relations, in which warmth and empathy are less required, while there are communal relationships, in which empathy and attachment play a crucial role. Moreover, there are gender characteristics that might affect this relation, that should be investigated in more detail.

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How Relevant Are Nutrition and Health Claims in Healthier Food Choices of Romanian Consumers?

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Abstract

In European Union, concerns for improving the legislative framework of food labeling materialized in Regulation 1924 (2006) which aims to harmonize the rules used for nutrition and health claims such as "source of vitamin D" or "calcium contributes to normal muscle function" addressed to the average consumer; these concerns were accentuated in 2012 by the adoption of Regulation 432, which approves a list of permitted health claims. In compliance with European law, this paper's goal is to examine how the use of nutrition and health claims modifies Romanian customers' dietary choices and overall health. The challenges and difficulties encountered in the implementation and enforcement of this regulation raised interest for our research. Using the advantages of a statistical survey with a sample of 200 people of different genders, ages and educational levels, we aimed to evaluate the effect of nutrition and health claims on food consumption decisions; thus, it is highlighted how the consumers use individual factors (personal eating style), product sensory characteristics (taste) and shelf-life cognitive cues (nutrition label, brand, price) in food selection, but also how this selection influences their food consumption. The results of this work can be helpful to analyze the perception of Romanian consumers about the efficiency, accuracy and consistency of these mentions present on food product labels. The research is all the more valuable as recently many studies have focused on the analysis of BOP (Back-of-pack) or FOP (Front-of-pack) labeling systems. We conclude by discussing possible opportunities to improve the comprehensiveness of these mentions so that consumers can more easily direct their choices towards nutritionally balanced foods and, thus, stimulate and support the responsible behavior of producers.

Keywords

nutrition and health claims, Romanian consumers, food consumption decisions, healthier food choice

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Introduction

The evidence so far shows that correct and complete food labeling can increase the consumption of fresh or minimally processed foods at the expense of ultra-processed products that raise many problems from an economic, social, cultural, political and environmental point of view (Monteiro et al, 2018).

Nutrition labeling is becoming a useful tool to advice consumers to make sound decisions based on relevant scientific research about their diet (Hieke and Taylor, 2012). Lifestyle and dietary changes can facilitate the success of healthy eating policies and strategies, and nutritional and health claims can modulate personal consumer decisions (Mozaffarian et al, 2001; Safefood, 2019). The rules of health claims on food labels must be supported by sound scientific evidence (EC, 2006) to have a positive influence and to bring an

optimal advantage for all parties involved. There are concerns about the validity of these claims and how they are interpreted by consumers.

Legislation states that these claims must be understood by an "average consumer" (EC, 2006), but this concept leaves room for much discussion. Our research brings more knowledge and clarifies various aspects that can create confusion in the minds of consumers related to nutrition and health claims, so that, we propose to establish:

- the influence on healthier food choices;
- the degree of understanding of these mentions, as well as the level of nutritional education of consumers;
- the need to improve the comprehensiveness of these claims for a better food consumption decision.

The utility of these mentions is still limited by factors such as: genetics, health history, environment and lifestyle and diet (Voinea et.al., 2022) but taking them into account opens research and development opportunities for all interested parties: health specialists, food industry, consumers (Barrow, Bell and Bell, 2020).

1. Review of the scientific literature

Ever since 2009, according to a study carried out by EUFIC (European Food Information Council), the spread of nutritional labeling in Europe is very large. The study was carried out with the aim of evaluating consumers' knowledge of nutrition as well as nutrition labeling when purchasing a food product in a store. The study was conducted among consumers in the UK, UE and Turkey. The results showed that most consumers have a reasonable knowledge of nutrition and are able to use the nutritional information on the label to identify a healthy food product, but only a small proportion look at this information when shopping, and this behavior is influenced of interest in their healthy nutrition (Wills et al., 2009)

According to a study published in the Public Health Nutrition Journal (Campos, Doxey and Hammond, 2011), nutrition labels can help consumers make healthier decisions about the foods they buy and eat. The study showed that nutritional labels can increase consumer awareness of food content and encourage healthier food choices. However, consumers often find it difficult to process health information to evaluate the healthiness of foods, so they rely on their intuition or beliefs to make judgments (Chan and Zhang, 2022).

A better usefulness and understanding of nutrition and health claims by all consumer segments requires the combination of marketing policies and strategies (Godden et al, 2023). The regulation of mentions is necessary and is based on assumptions that consumers can be easily misled by persuasive labeling and should therefore be protected (Orquin and Scholderer, 2015; Gov.UK, 2021). Because of this, European legislation provides for measures to ensure that any mention made on the label of food products, in promotion or presentation materials on the European Union market is clear, correct and based on evidence accepted by the scientific community. Therefore, food products bearing claims that could mislead consumers will be removed from the market. In addition, in order to carry a label, foods will need to have adequate nutritional profiles. This will enhance consumers' ability to make informed choices (EC, 2006).

In addition, in 2012, the European Commission adopted EU Regulation no. 432, establishing “a list of permitted health claims, mentioned on food products, other than those referring to the reduction of the risk of illness and the development and health of children”, in order to have an overview of the nutrition and health allowed claims. (EU, 2012) (Figure no. 1).

According to the regulation:

- Nutrition claims on food labels provide information about the nutritional value of a food product; these claims include information on the content of essential nutrients such as carbohydrates, protein and fat, as well as the content of minerals and vitamins. This information can help consumers make better decisions about their diet, particularly with regard to sugar, fat, saturated fatty acids, trans-fatty acids and salt/sodium content;

- Health claims represent any voluntary commercial message or representation in any form - words, statements, images, logos - that states, suggests or implies that there is a relationship between the food product in question and health" (EC, 2006).

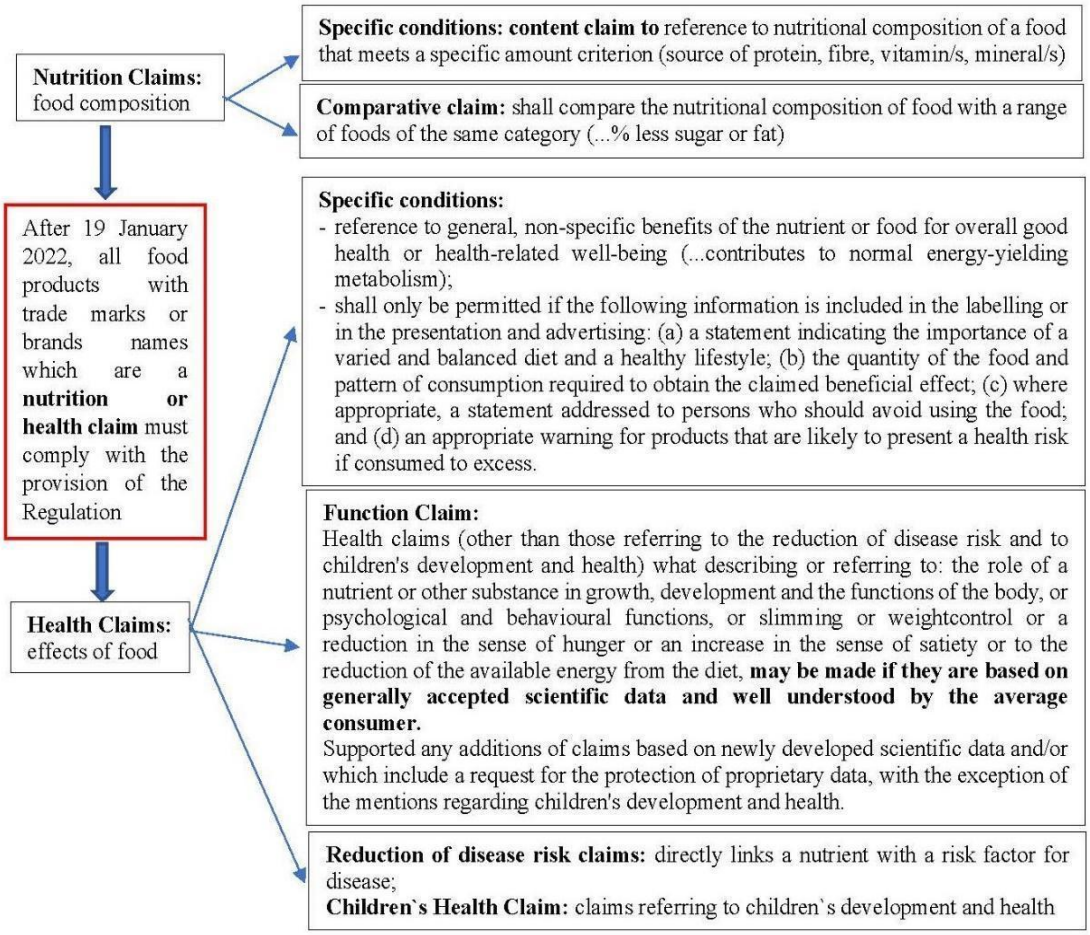


Figure no. 1. Nutrition and health claims in the EU

Source: adaptation after Collins and Verhagen, 2022 and EC, 2006

The review of the specialized literature highlights that the regulations have led to an increase in the accuracy and consistency of these mentions, and the studies presented have demonstrated the importance of knowing the nutritional profile of foods for better consumer protection and healthier food choices.

2. Research methodology

Highlighting the relevance and pragmatic implications of nutrition and health claims that modulate food consumption decisions must start from identifying the level of knowledge and understanding of them (Safefood, 2019; Hughes, 2023) by Romanian consumers. Implicitly, we express the view that these mentions can contribute to capitalizing on purchasing opportunities and to selecting healthier foods on the shelf in a diverse and changing socio-economic environment. In this framework, establishing the influence of nutrition and health claims on healthier food choices and the comprehensiveness of these claims is the aim of our research, which has two main objectives:

O1: identifying the factors that influence the decision to consume a food product and establishing the preferred place to purchase food products;

O2: determining the importance given to nutrition and health claims, highlighting the level of understanding of these mentions and linking the relevance of education level to the accuracy of interpretation.

The statistical survey method was used as a method of collecting information, with a quantitative and exploratory approach, the sources of primary information being obtained directly from various categories of consumers (Cătoiu et al., 2007; Filip, 2020).

The data were collected using a questionnaire, developed and distributed online, and the data analysis was carried out using the Microsoft Excel program. The sample, made randomly, consists of 200 respondents and can be structured according to socio-demographic criteria:

- gender - the majority is represented by women, so of the total number of participants, 132 are women (66%) and 68 are men (34%);
- age - the respondents are distributed according to the five age ranges, namely: most of the respondents are between 18 and 25 years old (respectively 57%, so 114 respondents), 19% are between 26 and 35 years old (38 respondents), 15% (30 respondents) fall between the ages of 36 and 50, and over 50 only 9% (18 respondents);
- area of origin - there is a high share of people living in the urban environment (81%), compared to people from the rural area (19%);
- level of education - 14% (28 respondents) attended a professional school, 24% have high- school education (48 respondents), 33% have university studies (66 respondents), 22% have a master's degree (44 respondents), and 7% have a PhD (14 respondents);
- income - 2% of respondents do not have a monthly income, while the rest are divided into the following categories: 9% have a monthly income below 1000 lei, 7% between 1000 lei and 2499 lei, most of the respondents (25 %) have a monthly income between 2500 lei and 3999 lei, 31% between 4000 lei and 5500 lei and 26% over 5500 lei.

The authors' assumptions regarding the foreseeable results of the research are embodied in the following hypotheses related to nutrition and health claims (NHC), as an anticipation of the respondents' answers that guide the data collection, analysis and interpretation of the data:

H1a: more than half of the respondents are aware of the influence that food consumption has on health;

H1b: the choice of food products is primarily based on their nutritional profile;

H2a: most of the Romanian consumers feel the need to be informed about the nutritional profile of the food they buy, reading the NHC on the labels, therefore more than 75% of the respondents buy their food products from supermarkets and hypermarkets;

H2b: most consumers consider NHC to be accurate and facile to understand, not ambiguous or exaggerated;

H3: consumers who attach importance to NHC better understand the benefits and risks of food consumption and make healthier purchases, so the influence is beneficial and positive;

H4: Romanian consumers are more open to buy food products that have NHC, but their importance in the purchase decision differs according to the level of education.

3. Results and discussion

In order to verify the first hypothesis, the identification of the factors that influence the decision to consume a food product was sought, the answers of the participants being analyzed (Table no. 1).

Table no. 1. Determinants of the consumption decision

Factors	Very important	Important	Little important	Not important at all
Nutritional profile	64	78	52	6
Brand	12	88	82	18
Taste	162	33	5	0
Price	140	35	17	8
Alimentary style/diet	62	96	42	0

Source: Authors' own research results

Respondents indicated the extent to which the five individual and environmental factors – nutritional profile, brand, taste, price and alimentary style/diet – influence the food consumption decision. To rank the decision-making factors, an importance scale was built, from 4 (very important) to 1 (not at all important), calculating a weighted average of the respondents' assessments with the importance given to the factors that influence the consumption decision. Thus, taste ranks first with an average of 3.78, followed by price (3.53), alimentary style/diet (3.10), nutritional profile (3.00) and brand (2.47).

Although the majority of respondents (91%) are aware of the influence of food products on health, they choose to consume food because of the taste in proportion to 81%, leaving the nutritional profile in the background, which proves that consumer choices are subjective and influenced by the hedonic character of food. These results lead to the validation of hypothesis H1a, but to the invalidation of hypothesis H1b.

Most Romanian consumers want to be informed about the nutritional profile of food, 71% of respondents always or often read nutrition and health claims. A quarter of them rarely consult those (25%), and 4% never read them. Those in the last category are between 18 and 25 years old, have finished high school and believe that the information mentioned on the label is false and unintelligible, the choice of food consumption being categorically influenced by their taste or price.

The possibility of allocating the necessary time to read the nutrition and health claims of food products makes supermarkets and hypermarkets the main place for purchasing food (78%), this choice being also justified by the diversity of the food offer, direct access to it, the preponderance of packaged food. Thus, it can be seen that the respondents devote a long time to reading the food label precisely to make the most appropriate decision that fully satisfies their needs, which validates hypothesis H2a.

Romanian consumers who rarely read the label do not understand the information, do not trust it, so the frequency of reading the nutrition and health claims of foods is influenced by the perception of the correctness of the information and the low level of their understanding. These mentions are understandable and true only for 42% of the sample, and 58% of respondents consider them exaggerated and ambiguous, which invalidates hypothesis H2b. For example, the term "'naturally/natural'" on food labels is not clearly regulated and can be interpreted in several ways by consumers. Furthermore, in some cases, manufacturers may use words such as "gluten-free" or "trans fat-free" to make a product appear healthier, even if these claims are not relevant to that particular product (Hartmann et al, 2018).

It is important to consider that nutrition and health claims can be influenced by commercial interests, too. For example, some companies may make exaggerated or misleading claims on food labels to make their products appear healthier than they actually are. In addition, certain claims may be legal even if they are not supported by sound scientific evidence, so it is important to seek additional reliable sources of information: scientific research papers, official government dietary guidelines and of the professional organizations (Hawkes, 2004; WHO, 2018).

Almost all respondents (97%) of the 42% who understand nutrition and health claims consider them very useful, being an additional way of informing about the nutritional profile of the food product, respectively about the level or proportion of nutrients and other substances in its composition; consumers are aware of the benefits or risks of food consumption for health, and these mentions allow the evaluation of the health of the food, but also of the degree of satisfaction of specific individual requirements, which validates hypothesis H3.

For example, claims highlighting fiber, protein, vitamin and mineral content can help consumers choose foods that provide a wide range of nutrients and provide a healthy diet. Nutrition and health claims can help reduce the risk of chronic diseases by promoting healthy eating habits, being also important for people who have a special diet (for diabetes, allergies or food intolerances) for improving the health-related quality of life (Gov.UK, 2021; Lee, 2023). In terms of establishing the influence of nutrition and health claims on purchase intention, the results show that almost all respondents (98%) are willing to buy products that have such claims compared to those without.

Among the nutrition claims most known by the respondents and which determine the choice of food, are: "LIGHT/LITE" (21%), "SOURCE OF PROTEIN" (19%) "SOURCE OF FIBRE" 17%, "SOURCE OF [NAME OF VITAMIN/S] AND/OR [NAME OF MINERAL/S]" (12%), "SUGARS-FREE" (11%), "SODIUM-FREE or SALT-FREE" (10%), "SOURCE OF OMEGA 3 FATTY ACIDS" (8%) "LOW SATURATED FAT" (2%). The results can be interpreted taking into account the structure of the sample

and illustrate the interest in maintaining a normal body weight, especially among women (66% of the sample); the importance given by men to proteins, perceived as an adjunct to muscle mass growth; interest in increasing immunity and a healthy eating style. The influence of the level of education on the importance of these mentions in the purchase decision is shown in Table no. 2.

Table no. 2. Importance of nutrition and health claims in the purchase decision according to the level of education

Level of education / Scale of importance	professional school	high-school studies	university studies	master	PhD	
1- Not at all important	0 0,00%	0 0,00%	2 3,03%	2 4,55%	2 14,29%	6 3,00%
2- Slightly Important	14 50,00%	6 12,50%	8 12,12	10 22,73%	0 0,00%	38 19,00%
3- Important	4 14,29%	14 29,17%	22 33,33%	10 22,73%	2 14,29%	52 26,00%
4- Fairly Important	8 28,57%	12 27,27	24 36,36%	16 33,33%	6 42,86%	66 33,00%
5- Very Important	2 7,14%	10 %22,73%	10 15,15%	12 25,00%	4 28,57%	38 19,00%
	28 14,00%	42 24,00%	66 33,00%	50 22,00%	14 7,00%	200 100%

Source: Authors' own research results

It is observed that for respondents with PhD and master's degree, these mentions are fairly important and very important in the purchase decision (71,43% and 58,33%, respectively), and for half of those with professional school (50%) they are slightly important. Attempts and efforts to improve nutrition knowledge are essential both for the accuracy of their interpretation and for protecting the health of consumers by increasing the ability to choose healthier products that suit their needs. According to the results presented above, hypothesis H4 is validated.

The low importance given to nutritional and health claims by Romanian consumers is not exclusively related to the level of education, but to a complex of factors, difficult to distinguish. In order to improve the comprehensiveness of nutritional and health claims, individual factors related to the consumer, but also those related to the socio-economic environment, must be identified and taken into account in the evaluation process, especially since EU legislation specifies that they must be understood by an ”average consumer” (EC, 2006).

Conclusions

Our paper explores the opportunity and relevance of nutrition and health claims to better guide consumers towards balanced eating behavior and healthier choices. The results of the research show, however, that for Romanian consumers, taste and price are the priority factors of choice, to the detriment of the nutritional profile of the food. However, Romanian consumers want food products to have such mentions, because it encourages them to choose healthy foods and avoid nutritionally unbalanced ones.

These mentions are a valuable resource for Romanian consumers provided they are carefully read, interpreted and understood correctly, which forces, in the future, to find effective nutritional education solutions. In addition, their efficiency and comprehensiveness can be increased by also taking into account mandatory nutritional information, such as energy value, carbohydrate, fat and protein content, before making a decision on the purchase of a food product. It is important to consider that some claims may be exaggerated or ambiguously defined and to pay attention to the scientific research that supports these

claims. Misunderstanding them can create confusion and reluctance among consumers, which negatively affects retailers and manufacturers. The current requirements imposed by EU legislation regarding nutritional and health claims motivate producers to inform consumers (Nocella and Kennedy, 2012) in an ethical and responsible way, a concern that aligns with the new labeling rules to promote sustainable consumption (Georgescu et al., 2022).

Thus, the use of mentions can substantially increase awareness of nutritional health benefits/risks derived from the composition of food products. Food manufacturers are guided by regulations to provide correct and complete claims, but this approach involves considerable human and material efforts. However, they should be interpreted with caution by consumers as they can sometimes be unsupported by scientific evidence, incomplete or misleading.

In the face of these arguments, the Romanian consumers should be educated on how to interpret these claims and always consider all available food information before making important dietary decisions. Future studies need to identify new ways to improve consumers' nutritional knowledge to increase the accuracy of the interpretation of nutrition and health claims on the one hand. On the other hand, governments and professional associations must encourage research in the food field to be able to provide substantiated and solid scientific results to support these claims.

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A SWOT Analysis of the Romanian Food Industry's Approach to Innovation

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Abstract

Innovation, the engine of well-developed economies, is crucial worldwide. Even in times of disruption, as the last years confirmed, the companies that continued to have innovation in the focus were better prepared for facing challenges and identifying new opportunities for future positive development. Innovation can make the difference between a well-run business and one that is driven by inertia. It is obvious that innovative activities can improve business development, but it is unclear how to build an efficient innovation system or strategy.

In order to study the way innovation is approached in food organizations, in Romania, we have conducted an exploratory research, structured on 5 important topics: how organizations are defining innovations, what kind of innovations are developed, how innovation is implemented and managed, what measurement methods are used, and which is the strategy for innovation management. An additional topic was focused on companies' concerns towards sustainability.

After conducting the exploratory empirical research, a SWOT analysis was developed, to uncover the strengths, weaknesses, opportunities, and threats in the Romanian food industry's approach to innovation.

The aim of the paper is to point out the opportunities and beneficial elements of innovation management in Romania's food sector, but also the weaknesses and threats in order to identify ways of surpassing them. The purpose of the research is answering the following questions: What is the importance of innovation management, sustainability, and quality management in the Romanian food companies? Is there a common definition and a common approach for innovation management in food industry? What measurement methods are used for measuring the impact of innovation? Which is the strategy for innovation management? The structure of the research, with practical implications, offers an additional novelty and originality approach for studying the innovation management in Romania's food sector.

According to National Statistical Institute Innovation data, big organizations are driving the most consistent part of the economic growth, therefore, in the present paper, the authors could reveal important aspects to be considered for an Innovation Management Model which could fit all food companies, no matter the size.

Keywords

Innovation management, SWOT analysis, product innovation, process innovations, business development

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Introduction

Romania is a moderate innovator, with an immature National Innovation System and a low proportion of innovative businesses (Adams, 2014). Still, according to the published data of Romanian Statistical Institute, regarding innovation in enterprises, during 2016-2018, after analyzing the existing databases, the innovative companies hold a consistent share of 82%, in total companies' turnover increase in 2018 (Iacobescu, 2021). At country level, more businesses may benefit from successful innovations, whether they are products, processes, or products and processes, if an innovation management model is developed.

This should take into consideration the unique characteristics of each nation and coordinated with the key country innovators.

Innovation is a mandatory activity for companies' positive development. As stated in the Information Technology and Innovation Foundation (McKinsey, 2015), the companies must move forward from the industrial age to the information age by embracing a management based on strategic innovation. This will generate longer-term development, if the management will adopt measures for developing strategic innovation management, even this will require additional capital allocation.

According to the company profile, each organization can use and choose from a variety of development models. Corporations are very interested in implementing models that can foster creativity and a motivational orientation to succeed through innovation, even though innovation management and strategic management procedures can be defined through organizational change (Wrigley and Straker, 2016).

In terms of definition, international standard ISO 56000:2021 *Innovation management - Fundamentals and vocabulary* refers to innovation as new or changed entity or realizing or redistributing value. While national standard SR 13547-1:2012 *Model of business development by means of innovation* defines innovation as an activity resulting in obtaining of a new product/service/process, or a new marketing method or a new method of business organization, including significant improving of the existing ones.

In the present paper, the authors intend to deep dive into the management of innovation in Romanian food companies and for that, a complex questionnaire was developed. It was addressed to all size food companies pursuing whether there are differences in innovation approach in different organization. Was tracked the level of understanding of innovation definition in companies, the implementation in the market, the strategy for innovation management and measurement in post-launch.

The paper is structured into three sections. We start with the details of the research and the literature review. In the second part, we detail the findings with important aspects for defining, managing, and measuring innovation in food businesses and develop a SWOT analysis about the way Romanian food companies are approaching innovation, implement and measure it. Finally, we conclude in the last section with the main findings, important outlooks to be considered for a Model of Innovation Management.

1. Review of the scientific literature

Innovation in the food sector is a complex process that requires employee empowerment, interaction between firm units, and a high level of involvement from senior management. Along with a clear strategy, a tracking system of key performance indicators (KPIs) for continuous improvement, could pave the path for an effective journey (Becheikh, et al., 2006). According to some authors (Takács, 2018; Koc 2007), a successful innovation management should invest in strategic thinking techniques and support diverse cultures to bring together individuals with various points of view to share ideas and strategies while combining entrepreneurial mindsets with functional expertise. Forsman, another important author that studied innovation, also mentioned internal resources, research and development expenditures, the ability to use dynamic knowledge and skills, to engage with others, to take risks, to be customer- and market-oriented, and to have management abilities to act quickly for achieving change (Forsman, 2011). Deeper in the management of innovation we could also consider the following components: project management for design, integrated approach, portfolio management for projects, suitable description of the organization, management of competence, morale support, knowledge management, technical intelligence, network administration, collective education, innovation and creativity and the management of customer relationships (Boly et al. 2014).

In society, innovation takes the form of new approaches and initiatives that address a variety of social needs, from the labor market and working conditions to education, health, and community development. By concentrating on capitalizing on external innovation resources and implementing innovation principles, organizations can improve the performance of their innovation processes (Olaru et al., 2015). In contrast to the usual revenue growth rates of between 5% and 10%, innovation initiatives contribute between 6 and 30% of additional revenue, on average close to 20%. This is an important benefit offered by good innovation management (Maier, et al., 2019).

By distinguishing its production and enhancing the quality and diversity of its products through product innovation, the business can gain a competitive advantage, increase demand, and create opportunities for further development. (Suzianti, 2005; Brad, 2010; Camisón et López, 2010).

We are in a period of accelerated transition, one that is characterized by significant and complicated changes across many areas of activity. The importance of innovation is demonstrated by the rapid development of new products and technology, but the changes go beyond material goods (Pamfilie and Croitoru, 2018). By

streamlining processes, lowering production costs, and producing goods with high quality and reasonable prices, the philosophy of "high class with low cost" could be promoted. Keeping in mind that execution is the most important factor, this might be a useful strategy for securing local enterprises and innovations (Doerr, 2018).

In the present research, for the definition of innovations, in the following empirical research was used, the OSLO Manual definition, which after 2018, divided innovation into two categories: 1) Innovation in products; 2) Innovation in processes (OECD, 2018). Process innovations includes organizational, marketing, and process innovation from the previous guidebook. Before 2018, according to OSLO Manual innovations were classified into four categories: 1) product innovation, 2) process innovation, 3) marketing innovation, and 4) organizational innovation (OECD, 2005).

Next to the way innovations are defined in the food Romanian industry, another investigated aspect was related to the measurement of innovations impact in businesses. Measuring innovation impact requires a combination of quantitative and qualitative metrics that are tailored to the company's specific goals and objectives. Therefore, one of the innovation metrics used by academics, business managers, and innovation policy makers is measuring innovation capacity. Innovative performance is used to define innovative capacity. It is a current innovation process output that combines efficiency and resources (Vasin and Gamiduelleava, 2015). According to Solomon (2016), a suitable metric for quantifying innovation should also include the following characteristics: comparing, setting goals, identifying vulnerabilities, including existing data and current inputs, and measuring innovation across all dimensions.

By tracking these metrics over time, companies are able to determine the impact of their innovation initiatives and make informed decisions about future investments in innovation.

2. Research methodology

In order to study how innovation is approached in organizations in the food field in Romania, exploratory research was carried out, starting with December 2022. The data was collected during three months until March 2023, from 54 enterprises. The questionnaire was addressed to 320 enterprises from food industry, comprising 26 questions. The method used for sampling was by sending e-mails with the questionnaire link to 320 companies from food industry. The main purpose of the research was to address all company types, to better understand how innovation is understood and implemented in Romanian companies and explore the similarities and differences in innovation management approach between the large and small companies.

The purpose of the research was answering the following questions:

- **What is the importance of innovation management, sustainability, and quality management in the Romanian food companies?**
- **Is there a common definition and a common approach for innovation management in food industry?**
- **What measurement methods are used for measuring the impact of innovation?**
- **Which is the strategy for innovation management?**

The research was structured in 5 sections:
- Defining innovations: how innovation is defined in companies
- Types of innovations: what innovations have been implemented in organizations.
- Innovation management: how it is managed and implemented
- Measuring innovations: what measurement methods are used.
- The strategy used in innovation management.

Additional questions targeted the extent to which companies in Romanian food sector use standards in their activity and how sustainability is integrated in companies' strategies.

Greater importance was given to large companies, because in the previous study published in 2021, the important contribution of large innovative companies in the development of the total number of companies in Romania was highlighted (Popescu (Iacobescu), eds. 2021). Large companies are the most innovative and best use innovation management for their development.

3. Results and discussion

The study was based on the answers received from 54 enterprises out of which, 18,5% were micro enterprises (fewer than 10 employees), 22,2% were small enterprises (10-49 employes), 31,5% medium-sized enterprises (50-249 employes) and 27,8% large enterprises (more than 250 employes). Regarding turnover, 48% from the questioned companies have more than 2 mil. Euro and the rest of 52% have less than 2 mil. Euro.

The interest in sustainability, innovation, and quality management was reflected in the companies' answers: 85% of the interviewed companies consider themselves innovative, 69% have implemented a quality management system and 91% have sustainability integrated into their business strategy.

Definition of innovations/innovation

Out of all the respondents, 79% of the companies consider innovation to be new products launches, 55% consider innovation as new business divisions and 25% consider implementation of new processes as innovation. Going deeper into the definition of new products, the situation becomes rather fragmented: 32% consider innovation products launched in the last 2 years, 30% consider innovation products launched in the last year, 9% consider innovation products launched in the last 3 years, 4% consider innovation products launched in the last 4 years, 4% consider innovation products launched in the last 5 years.

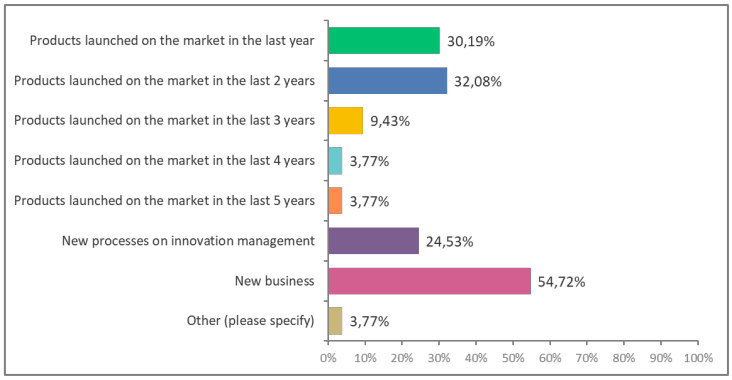
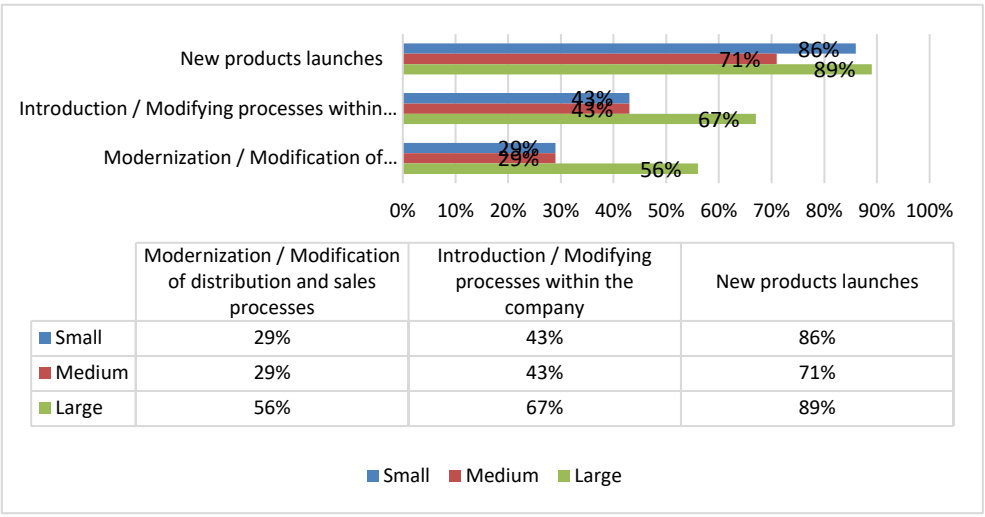


Fig. no. 1 Definition of innovations
Source: authors' data processing study

Types of innovative activities important for companies:

- The launch of new products - (86% of small companies, 71% of medium-sized companies, 89% of large companies)
- Introducing / Modifying processes within the company (43% of small companies, 43% of medium-sized companies, 67% of large companies)
- Modernization / Modification of distribution and sales processes (29% of small companies (29% of medium-sized companies, 56% of large companies)



	Modernization / Modification of distribution and sales processes	Introduction / Modifying processes within the company	New products launches
Small	29%	43%	86%
Medium	29%	43%	71%
Large	56%	67%	89%

Fig. no. 2 Innovative activities by type
Source: authors' data processing study

In terms of product types the companies developed in the last three years::

- 55% of the questioned companies offered standardized products, offered in the same way to different consumers (mass customization)
- 49% of the companies offered products created to meet the needs of certain consumers (personalization)
- 17% of the companies offered products co-created with the help of consumers.

According to companies' management, innovation is considered:

- Strategic, included in the planning activity, by 34% of the companies.
- A permanent activity, by 45% of the companies
- A sporadic activity /from time to time, without planning by 21% of the companies.

Management of innovations/innovation

Following new products launches, the companies are tracking the performance of their new products implementation, using the following indicators: quantitative sales, information about the new products distribution, shelf rotation, the impact of marketing activities or financial impact. Out of these post-launch activities of new products, the most important one for the questioned companies were chosen: quantitative sales (64%), financial impact (42%) and distribution of new products (40%).

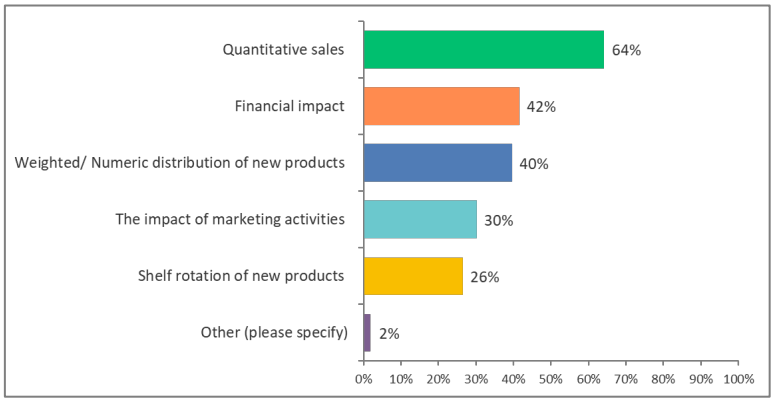


Fig. no. 3 Post-launch activities of new products
Source: authors' data processing study

Out of the responses received, 85% of the participating companies at the study, use to measure the innovations impact in their businesses. The key performance indicator preferred by 55% of the questioned companies is the share of value generated by the new products in total company turnover. This indicator is considered important by 92% from the questioned companies.

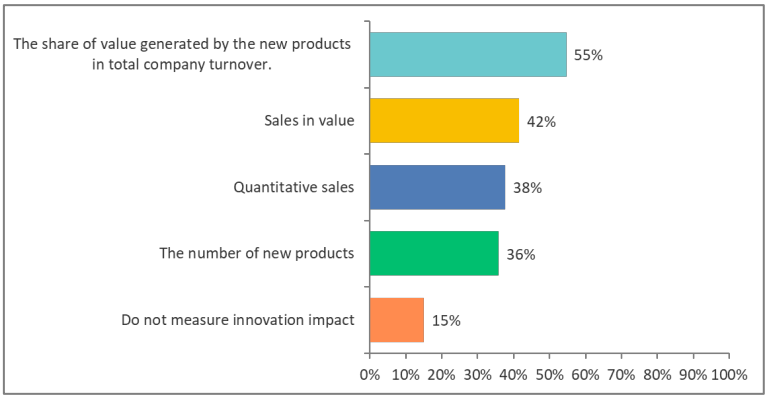


Fig. no. 4 KPI for the innovations impact in business
Source: authors' data processing study

The activities to measure the impact of innovation were carry out mainly annually, based on planning, by 43% of the questioned companies, 36% were tracking the impact of innovations monthly.

Regarding the benchmark against which the questioned companies measure innovation impact, the most used one is the value calculated in the previous period, used by 68% of the respondents. Another benchmark is the value calculated by a research organization for the share of innovation in the relevant market, used by 6% of the questioned companies. The rest of 28% did not report having any benchmark.

Strategies and business environments

Regarding the changes in strategy, about 74% from the questioned companies implemented changes related to innovation or sustainability in their strategy: 26% had strategy changes in the last year, 26% had strategy changes in the last 3 years, 11% from the questioned companies had strategy changes in the last 5 years and 11% in the last 10 years.

The most important types of strategies used in the last 3 years by the questioned companies were:
- Strategy aimed at improving existing products (43%)
- Strategy oriented to the introduction of new products (52%)
- Strategy focused on solutions specific to consumer needs (52%)

Regarding the preferred type of organization when it comes to innovation, the companies' choices were splitted between regular brainstorming sessions with the aim of generating improvements within the business (41%), multifunctional working groups or teams (56%) and the rest preferred the job rotation (3%).

In terms of mid-term plans, 74% of the companies questioned indicate they plan to invest in sustainable innovation during the next five years.

After analyzing all answers, we could develop a SWOT analysis on how the Romanian food companies tackle innovation in their business strategies:

Strengths
- Sustainability, quality management and innovations are integrated in the company's strategy
- New products launches are the most important activities related to innovation.
- Regarding the management of innovation, innovation is a permanent activity and for big companies it is strategic, included in the planning process.
- The measurement of the innovation impact in business is considered important by almost all companies.
- Almost all companies have a measurement system for innovation.
- Almost all medium and large companies are using the share of innovation in total turnover as a KPI for innovation measurement. Almost all companies have a benchmark when it comes to innovation measurement.
- The companies' development strategies are focused mainly on improving the existing product portfolio and launching new products.

Weaknesses
- New processes are considered important innovation activity mainly by the big companies.
- New businesses are considered innovation mainly by the big companies.
- The definition of products innovation in the market is not aligned. The period in which a product is considered new is different and varies from 1 to 5 year.
- The measurement of the innovation impact in business is done mainly by the measurement of sales generated by the new products. Only few companies are tracking the distribution, shelf rotation, the impact of marketing activities or the financial impact.

Opportunities
- To develop a common definition of innovation
- To track the results of innovation at a preestablished period with certain periodicity
- To develop a model for tracking the innovation implementation. To set more KPIs for innovation impact measurement
- All companies should use the share of innovation in total turnover as main KPI for innovation measurement.
- To create industry benchmark for main KPI for innovation measurement

Threats
- Difficult to implement an aligned system of innovations business impact measurement.
- Because of the different companies' goals it is difficult to track more KPIs for innovation, therefore the innovation implementation image is not clear

- Long-term business development is linked to innovation. If innovation is not prioritized, development may be slowed.

Conclusions

The main objective of the article is to investigate the innovation approach in Romanian food companies, beginning with how innovation is defined, managed, and measured, and then developing a SWOT analysis to identify the main strengths, weaknesses, opportunities, and threats to innovation.

From the analyzed data, we can conclude that innovation management, sustainability and quality management are integrated into the strategy of the Romanian food companies, that new product launches are the most important innovation activity and that measuring the impact of innovation in business is important to almost all companies.

The main weaknesses revealed after the analysis, are that there isn't a common understanding of innovation in the market, a relevant benchmark, or a common Innovation Management Model.

In order to improve the management of innovation in food industry in Romania, the following opportunities were identified: the creation of a common definition of innovation, finding a way to tracking the outcomes of innovations, over a predetermined period at a certain frequency, the development of a model for tracking innovation implementation, the development of additional KPIs for measuring the impact of innovation and establish an industry baseline for the primary KPIs for measuring innovation.

Long-term business development is linked to innovation, therefore if innovation is not prioritized in the business strategy and processes the development may be slowed. In the present paper the authors reveal important opportunities for the innovation management and pointed out important aspects to be considered for an Innovation Management Model which could fit all food companies, no matter the size.

In the future, in addition to measuring past innovation-related activities, projects for promoting the importance of innovation in businesses, as well as a model for innovation planning activity, should be considered. Furthermore, the study will explore and outline how management systems, standards implementation and sustainability are embedded in companies' strategies.

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Business Resilience and Concerns of Companies and SMEs for Internationalization in Times of Globalization and Risks

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Abstract

This paper investigates, describes and presents business resilience and concerns of companies and SMEs for internationalization in times of globalization and risks. Globalization has exposed them to risks and more attention. The used research method relied on a literature review, a quantitative and qualitative research using VOSviewer and data analysis. The research questions are "What the main risks that business and the process of Internationalization could face in times of Globalizations? "Is business resilience important for companies such as SMEs and business?" The results showed that Internationalizing a company, taking the example of SMEs is a process that relies on the one hand on the way products and services are well positioned and on the other hand on developing them to stay or enter other markets. Expending business overseas into other markets, countries and continents is not easy due to factors such as the ignorance of market with difficulties in accessing and finance, business operations and worrying about adverse scenarios like wars, recessions, the increase of inflation rate and other risks that affect business and internationalization . In conclusion, business resilience is a great option for companies and SMEs in particular to stay and adapt in international markets and once the business or company is internationalized in a resilient way it proves that its process of internationalization is resilient in times of risks and threats to its abilities. it could be possible that internationalization is not universal between allies since it can be affected by geopolitical instability, differences and conflicts. SMEs in particular and companies in general should rely on resilience as an important step while and before dealing with other markets that are exposed from time to time to risks in the process of internationalization and times of Globalization.

Keywords

Business resilience, internationalization, globalization, SMEs, companies, risk, impact

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Introduction

The process of Internationalization relies on the available resources in a strategic way to take advantage from the opportunities and offers of other markets. Internationalization has led business at the global level to more opportunities and competitiveness and since globalization itself globalized markets and societies, businesses, it has exposed them to risks and more attention. Internationalizing a company, taking the example of SMEs is a process that relies on the one hand on the way products and services are well positioned and on the other hand on developing them to stay or enter other markets. Small and medium sized enterprises (SMEs) are pushed towards following complex growth paths to bolster their competitiveness and to keep up with evolving technological and social scenarios (De Marco et al., 2020). The traditional SME model characterized by a relatively limited geographical span that is often represented by the domestic market (DM), by lower levels of digital advancement and of awareness towards sustainability, is no longer viable. Since there are risks and difficulties in times of globalization (environmental, social and economic), both internationalization and business require resilience and sustainability to resist and continue existing. Resilience could be considered somehow as sustainable path that make business or companies and their internationalization resilient in times of threats and risks.

1. Literature review

Companies, SMEs, Internationalization and business resilience

Resilience is built over time and can be lost. Everyone can name at least one powerful company that no longer exists where the shuttered company's once strong resilience crumbled. When attending to multiple capitals, the focus is often on preserving and enhancing capitals in the current situation and into the future (Berger-Schmitt and Noll, 2000). Small and medium sized enterprises (SMEs) are pushed towards following complex growth paths to bolster their competitiveness and to keep up with evolving technological and social scenarios (De Marco et al., 2020). The traditional SME model characterized by a relatively limited geographical span that is often represented by the domestic market (DM), by lower levels of digital advancement and of awareness towards sustainability, is no longer viable. SMEs based in the west advanced economies, like Europe, face a recession in domestic markets and they are thus encouraged to expand abroad and move ahead. The often frail domestic internal demand, calls them to internationalize to search for new clients on foreign markets. (ESPAS, 2019). Moreover, digitalization and digital revolution increasingly call SMEs to pursue and push technological innovation and advances like artificial intelligence (AI from now on) as well as to adhere to environmental sustainability goals (ESPAS, 2019). Since value chains become global and digital, readiness to implement and proceed with digital processes will be key for smaller firms in order to join global digitized value chains as suppliers (Chen, 2019), Rehm and Goel (2017) argue that connect in integrated business networks (Rehm and Goel, 2017), and target global customers with personalized offers (Torn and Vaneker, 2019).Furthermore, internationalization and technological progress are often considered potentially threatening for the environment, due to issues related to pollution or the excessive usage of planet's resources (Attig et al., 2016). These growth paths can drive progress and global prosperity, only if sustainable (Kusi-Sarpong et al., 2019). The fact that pressures for implementing sustainability practices emerge (Cantele and Zardini, 2020) as a result of new regulations (Gadenne et al., 2009) and strong stakeholders' pressures (Tomaževič et al., 2017).

Business resilience in communities

The ability to quickly make changes to business operations can be the differentiating factor across those affected by a crisis. For the hospitality industry especially, having an adequate supply of goods and services is crucial for the business's performance. Having a range of supply options for operations creates several pathways for revenue, preventing a total halt if supplies that are necessary for particular processes become extremely scarce. In addition to physical stock, social capital is also important and comprises of networks within the community, with the intention that strong community values have the potential to outweigh the consequences of disaster. (Sydnor-Bousso *et al*., 2023). According to (Esper, 2020) For example, agile manufacturing would allow businesses to pivot in times of crisis. Such flexible models, including Instacart and Amazon Flex Delivery, proved to be critical during the pandemic (Esper, 2020). COVID-19 has revealed that resources from businesses and supply chains may lack the flexibility, diversity, and slack to support resilience in the current crisis (Zhu et al., 2020). A diversity of resources can also be useful (Westley, 2013); for example, multiple suppliers can help organizations solve shortages in the face of a crisis. Slack resources (i.e., resources held in excess) can also be crucial in areas in which inventory, surplus labor, and cash-on-hand can help weather disturbances (Sharfman *et al*., 1988). A community is a complex set of relationships with a shared sense of mutual interest (Solomon, 1994) linked by shared locale, social interaction, and common ties (Bernard, 1973). Businesses can be viewed as communities themselves (Frederick, 1998) and also residing within wider communities.

2. Research method and research question

The used research method relied on a literature review, a quantitative and qualitative research using VOSviewer and data analysis. VOSviewer is a software for creating and visualizing maps of network data, it was suitable in this study, analysis and research to run a bibliometric analysis so the maps of common items and their co-occurrences could be successfully visualized using the relevant data. The research questions are "How connected are business resilience and internationalization?" and "what risks require a resilience and impact both business and the process of internationalization?"

3. Results and discussions

1) The importance of business resilience

There is always the ability of making steps towards being more resilient, business resilience is important because it means that the business is still able to operate in the event of a major disaster or risks (geopolitical, pandemic, cyber-attacks …etc.). So, obviously, prevention is the best cure as well as. Building resilience into business processes requires making sure that there is no single points of failure along the way, making sure that people are always trained in how they can do things without relying on just one process or one piece of equipment or network. The importance of a resilient business is that there is a possibility to work around all these with alternatives if something lacks or appears urgent, no matter the threat is to the business or what the impact of risks or disasters is to the business. This way, businesses can continue proving the services with also the ability to avoid and move from stress to resilience. (Figures no1,2 and 3)

2) What is more necessary in business resilience for companies and SMEs in particular?

Business resilience and continuity planning are the creation of processes and systems to ensure that a company or business can continue operations after a crisis scenario by creating a business resilience plan may help examine a range of disaster scenarios for potential failure points, focusing on details recovery plans, potential mitigations and alternatives with an interest to look at for opportunities for precautions and preventive steps. (See figure 1).

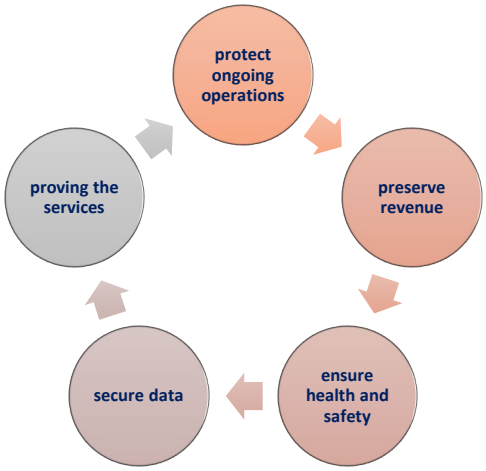


Figure no. 1. The goals of business resilience for companies and SMEs

Source: author's design and research, 2023

3) The process of internationalization and business resilience for companies and SMEs

Expending business overseas into other markets, countries and continents is not easy due to factors such as the ignorance of market with difficulties in accessing and finance, business operations and worrying about adverse scenarios like wars, recessions, inflation, etc. However, after the challenges and stagnation provoked by the health crisis (COVID-19) for example the interest of enterprises and companies has been enabled and reactivated in the post pandemic. Indeed, internationalization has been a challenge and such a paradigm shift for business and companies and due to market stagnation, recession and health. Crisis many of them have been pushed to undertake their path again. The great adventure is the risk towards internationalization that presents competitive pressure in different ways and markets, digitalization and digital transformation, innovation, sustainability and protectionism, business resilience of its possibilities. Boosting economic and commercial relationships is very important for companies to process internationalization globally, especially with countries that have a negative trade balance. In other words, the countries and sides that import more that export to cover internal needs if internal production is not enough for market diversity and satisfaction that population and customers require. SMEs and companies should identify key contributors, stakeholders and the roles they will fulfill during a disruption. It is important for SMEs also to identify any equipment and location including offices that may be impacted. Moreover, focusing on suppliers, vendors, partners and customer data are also important. Companies have identify and to deal with potential threats that may impact business and also the process for reviewing and testing. Companies and in particular SMEs should focus on the multiple overlapping threats and how to evolve recovery actions. (See figures no. 1, 2 and 3)

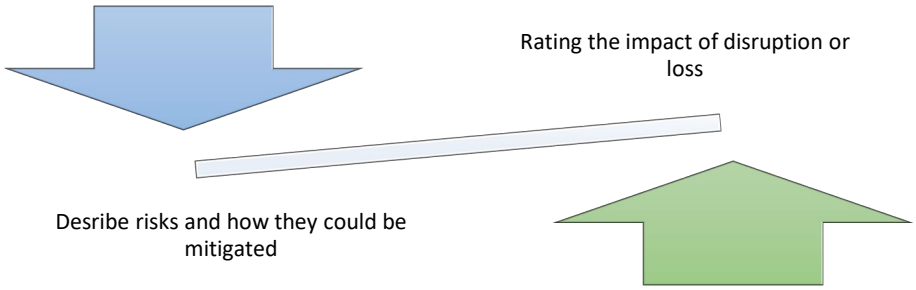


Figure no. 2. Main focus to balance business resilience in SMEs and companies

Source: author's design and research, 2023

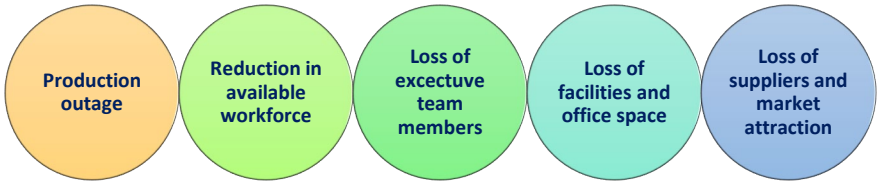


Figure no. 3. Risks and impact functions to business that require resilience

Source: author's design and research, 2023

4) Geopolitical risks, Business and internationalization

Indeed, the serious escalation is offering the chance to focus on business resilience and seek opportunities to boost it or save it in times of geopolitical tensions by concerning major trends experienced in international trade such as

- The rising influence of geopolitics on international business.
- The acceleration of challenges and changes that motivate volatility in quotations and prices.
- The impact on quality standards and the rising appearance of inflation that concern both supply and demand.
- New production parameters and companies' leaderships.
- The consolidation of the global economy and technological advances.
- The speed to sustainability and renewables that still are not still enough to satisfy to be considered as alternatives internationally.

Consequently, it could be possible that internationalization is not universal between allies since it can be affected by geopolitical instability, differences and conflicts. In fact, progressive geopolitical risks, regional and global economic instability are considered major threats to the growth of both domestic and foreign business possibilities and operations. Therefore, geopolitical risk management should be considered in business plans. Nowadays, geopolitical risks are facing both developed and developing countries and increasing risk factor are important for entrepreneurs. Obviously, geopolitical risks, conflicts or threats appear in a variety of ways and they are often unpredictable. Fluctuation in business relationships, changing negotiations, new legislations mark a change in the economic and political landscape that can alter directly business opportunities and economic growth. It is not always easy to translate these circumstances into tangible indicators. In order, to mitigate the impact of adverse scenarios, such an awareness of underlying trends in global risks can lead companies to take measures and generate opportunities for growth during the evolution of some global risks, the perception of geopolitical instability is a major factor that increasingly worries companies since geopolitical, political and macroeconomic insecurity negatively affect business profits. Therefore, geopolitical risk management play such a role in the progress of company. However, the rapid changing risk landscape depends on how business leaders assess the impact of contingencies on business. Undoubtedly, due to volatility businesses see disruption to the global economy. In globalization, expecting potential shocks and recessions to the economy can be serious and lead even to a crisis due to the emergence of a multipolar world like the one ahead. Basically, companies' concerns regarding geopolitical risks include an uncertain or clearly restrictive regulatory environment for high technology and telecommunications financial services, then, social and political instability is the second most pressing concern. By contrast, data-driven management techniques and big data present somehow a clearer opportunity for companies and businesses across all regions and industries to counter announced risks. Business resilience is the capacity to withstand or recover, if a business is resilient, it is

able to snap back quickly. A business resilience is the ability to get back to its path when something goes wrong and the ability to stay on the path even though times are tough. Business resilience is something possible to be built with the ability of improving the elasticity of the elastic band. Therefore, it gets better at staying on the path. (See table 1 and figure 3).

Main risk characteristics to Business, companies, and SMEs

The main risk characteristic to business, companies and SMEs as particular example are figured in the pandemic outbreak, critical infrastructure blackouts such as power disruption, market developments, political risks and violence like geopolitical conflicts and political instability, shortage skilled workforce, fire and explosions, climate change and natural disasters, macroeconomic effects such as energy crisis, recessions and inflation, changes in legislations and regulations at the national or global level and cyber incidents. (See figure 3).



Figure no. 3. ***Main risk characteristics to Business, companies and SMEs***

Source: Author's contribution 2023, Statista data 2023

4. Case study

27 bibliographic data (documents) were successfully extracted that contain business, resilience and internationalization from Scopus, then technically using VOSviewer a map based on text data by choosing the option to create a term co-occurrence map that represents and visualize the common items and connection between business, resilience and internationalization. The study relied on fields from which terms were extracted are abstracts and some papers by ignoring the structured abstract labels and copyright statements to proceed with the research and the counting method "full counting". Definitely, the minimum number of occurrences of a term was just 1 and from 1297 matching terms, 1297 met the threshold. For each of 1297 terms, the relevance score was based on most relevant items. The default choice was to select 60% relevant terms. As a result, the number of final selected terms was 778 that represents the connection

and common concept of "business, resilience and internationalization" by relevance, the list was filtered to 626 and clustered in 16 clusters successfully. (See figure no. 4, tables no. 1 and 2).

Table no. 1. Bibliographic data common items between "Business, resilience, internationalization"

Number of relevant bibliographic data (documents)	27
Supported file types	Scopus
Fields from which terms where extracted	Abstracts/papers
Minimum number of occurrences of an item (chosen)	1
Total reached items	1297
Counting method	Full counting
Relevance score (%)	60%
Final reached items by relevance score	778
Final filtered items by relevance	626
Number of clusters	15

Source: author's elaboration and research, 2023

As explained in the research method, tables 1 and 2 after all the study figure 4 the map of items connection and co-occurrences between Business, resilience and internationalization show and visualizes that SMEs interestingly appear important in the process of business resilience and internationalization and the connection requires technical solutions, crisis team, business association, resilient performance and focus on export while dealing with international trade using innovation. Capitalism accounting, integration and governance have an input on international trade and SMEs. (See figure no. 4).

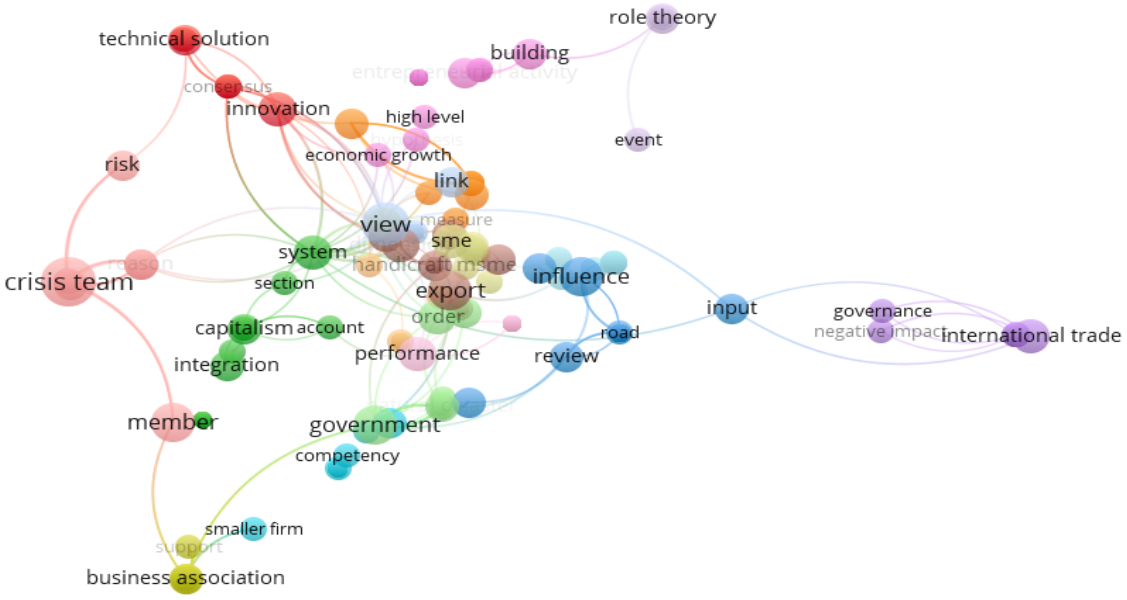


Figure no. 4. Map of some common word between Business, resilience and internationalization

Source: Author's elaboration, 2023

The clusters are mentioned and visualized in various colours on the map of co-occurrences and they represent that prove the common connection between artificial intelligence and energy and business. (See figure no.4 and table no. 1). VOSviewer is a software for creating and visualizing maps of network data, it was suitable in this study, analysis and research to run a bibliometric analysis so the maps of common items and their co-occurrences could be successfully visualized using the relevant data. According to the creators of VOSviewer "Nees Jan van Eck and Ludo Waltman", VOSviewer is a software tool for creating maps based on network data. The functionality of VOSviewer can be summarized between visualizing and exploring maps and creating maps based on network data. (Van Eck and Waltman, 2020)

Table no. 2 Number of clusters and final filtered items by relevance and co-occurrences

Clusters	Number of final filtered items
Cluster 1	72
Cluster 2	65
Cluster 3	48
Cluster 4	45
Cluster 5	45
Cluster 6	43
Cluster 7	43
Cluster 8	42
Cluster 9	41
Cluster 10	41
Cluster 11	41
Cluster 12	36
Cluster 13	34
Cluster 14	16
Cluster 15	14
Total: 15	Total: 626 (relevance score 60 %)

Source: author's elaboration and research, 2023

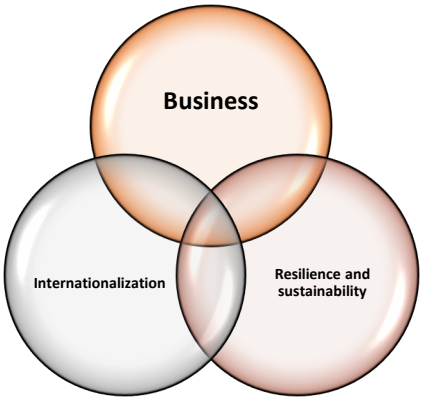


Figure no. 5. The connection between Business, resilience and sustainability and Internationalization

Source: author's elaboration and research, 2023

Conclusions

To sum up, it could be possible that internationalization is not universal between allies since it can be affected by geopolitical instability, differences and instability. In fact, progressive geopolitical risks, regional and global economic instability are considered major threats to the growth of both domestic and foreign business possibilities and operations. Therefore, geopolitical risk management should be considered in business plans serious escalation is offering the chance to focus on business resilience and seek opportunities to boost it or save it in times of geopolitical tensions by concerning major trends experienced in international trade Expending business overseas into other markets, countries and continents is not easy due to factors such as the ignorance of market with difficulties in accessing and finance, business operations and worrying about adverse scenarios like wars, recessions, inflation,…etc. Business resilience is a great option for companies and SMEs in particular to stay and adapt in international markets and once the business or company is internationalized in a resilient way it proves that its process of internationalization is resilient in times of risks and threats to its abilities. (See figure no. 5). The main risks that business and the process of Internationalization could face in times of Globalizations need to be prevented before they happen by focusing on a resilience plan that could include the possible ways to mitigate the risks that could happen, business resilience is important for companies such as SMEs in particular and business in general.

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