ERP Systems: A Solution for Sustainable Business Development

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Abstract
The purpose of this paper is to highlight that integrated ERP (Enterprise Resource Planning) systems can be a solution to ensure the sustainable development of a company. As the economic and technological environment has constantly evolved, companies have felt the need to automate most of their daily activities and to maintain their competitiveness to companies in the same sector of activity. If a company has planned actions for sustainable development and implements these sustainable development plans, then it can obtain various benefits based on these plans (financing activities, growth, innovation and other benefits).

In the article, we used the questionnaire to see how ERP systems are a solution for sustainable development of the company. On analyzing the obtained data, we made a regression model using Microsoft Excel. Quantitative research methodology can have practical implications, as many companies can take this information into account to improve their social and environmental performance and to develop sustainably. The results of this questionnaire showed that ERP systems support the sustainable development of the company, because they reduce the inefficient consumption of resources (electricity, paper) and provide clear and quality information useful in preparing company reports. Also, the business structure is well defined.

We believe that ERP systems can offer a company the opportunity to grow sustainably only if it establishes a good strategy and periodically modernizes existing IT systems implemented and used within the company.

Keywords: ERP systems, business, sustainable development, evolution, automation, benefits**.**
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Introduction

Information technology has undergone a series of major transformations, these having an impact on the way people carry out their daily activities. Technological progress has influenced coordination and management mechanisms, with an emphasis on creating people's competencies. To ensure quality work within the company, it must employ people with high digital skills or provide training programs for employee training. Also, technological progress has been the basis of the evolution of the business environment and the process of globalization (sectors of activity that were visible only at the national level, have become visible at the global level).

Due to the technological progress, the information systems used within the company have evolved, the companies being forced to keep up with the changes in the technology field by investing in information systems as efficient as possible in order to fulfill their established objectives and to develop sustainably. Thus, the implemented IT systems must integrate all the processes within the company in order to ensure a clearer picture of the company's situation.

The most appropriate solution to incorporate and ensure the sustainable development of the company is the implementation of an ERP system, because all information collected and processed are stored in a common database for several departments, ensuring a correct and efficient flow of information between all company departments. According to Kandananond (2014), ERP systems have the role of *automating and integrating business processes* throughout the company.

ERP systems have a modular appearance, because each module has the role of providing "the necessary support to carry out a certain business process" (Koh, et al., 2011, quoted by Maliszewska and Klos, 2019) or on a certain functionality. The main modules of ERP systems are: financial, accounting, supply, production, sales, human resources (Weinrich and Ahmad, 2009 cited by Rajal and Baral, 2015). Depending on the specifics of the company, other specific modules can be implemented. Currently, these systems offer a clearest flow of information and support in implementing the company's strategy.

Even if the process of implementing ERP systems within the company is quite complicated and takes a long time, a company must be aware that ERP systems provide many benefits to the company (process automation, clear information, correct decisions, business efficiency, processing a large volume of information) (Niu, et al., 2017).

Danciu (2013) considers that the existence of plans for sustainable development ensures the future of the company. The reasons why a company decides to "pencil" a strategy for sustainable development can be: competition with other companies and pressure from government or banks (Hasan, et al., 2019).

Our paper presents the following structure: a section specific to literature review, a section where we presented the research method used, a section where we analyzed the main results specific to the subject of the article using a regression model and finally the paper ends with the main conclusions of the paper.

Review of the scientific literature

Sustainable development has the role of improving the activity and ensuring the future of the company. Even if the implementation of ERP systems is quite difficult, these systems provide a series of benefits. To ensure implementation in the most reasonable time possible, the company must create a strategic plan to ensure a holistic view of the entire company (Chofreh, Goni and Klemes, 2018).

According to Koh, et al. (2011, quoted by Maliszewska and Klos, 2019) considers that ERP systems in modular format ensure the fulfillment of business processes in different departments of the company. Zeng, Chiang and Yen (2003) and Rodriguez, et al. (2019), considers that ERP systems represent "an advanced software solution" that aims to collect and process all company data, as well as to integrate a multitude of functionalities for different departments.

In figure 1, the main features of ERP systems are:

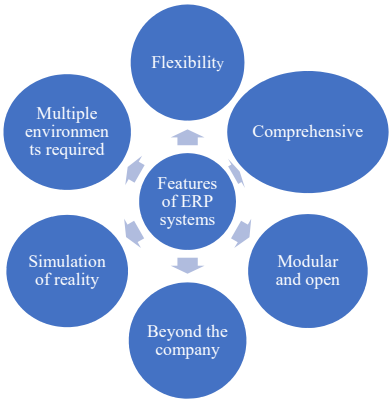

Figure no 1. Features of ERP systems
Source: Author's own creation adapted after Zeng, Chiang and Yen, 2003

The flexibility of the ERP system ensures the correct response to the company's requirements and comprehensively provides support for a number of functions of the organization. The modular architecture allows the customization of ERP systems according to the company's requirements. ERP systems also offer the user the possibility to simulate real business processes. Multiple environments required need different interfaces for implementation, testing, production and disaster recovery.

The concept of sustainable development of business processes in a company was researched by the authors Nosratabadi, et al. (2019) who noted that in order to ensure the sustainable development of the company, we must take into account "the reasoning that creates, provides and captures value in the economic environment."

According to Schaltegger, Freund and Hansen (2016), companies have a "crucial role in transforming the market and society", because business activities can in some cases cause social and environmental problems. Thus, companies should establish a strategic plan for sustainable development so as to minimize the adverse effects on the environment. Drafting a business model to ensure the sustainable development of a company can be defined as a model that "describes, analyzes and communicates" (Schaltegger, Freund and Hansen, 2016) how to ensure a sustainable business, how to reduce the negative effects on the environment and how to regenerate or replace the natural resources used within the company.

According to Tunn, et al. (2019), the rational consumption of resources by a company allows it to grow sustainably.

Ursacescu, et al. (2019) considers that the main criteria on which ERP systems are chosen to ensure the sustainable development of the company are: energy efficiency, portability, flexibility and the server on which it operates (recommended Service as a Software - SaaS, because it consumes less electricity and reduces the consumption of printed paper because the database allows the storage of a large volume of data).

Research methodology

The research method used in our article was quantitative, based on the questionnaire. The questionnaire was published between November 12, 2020 - November 30, 2020 and was structured as follows: a section containing questions about the profile of respondents, and the second section contains questions through which we researched whether ERP systems have any impact. on the sustainable development of the company. The sample of respondents consisted of undergraduate, master's, doctoral students from Bucharest University of Economic Studies and employees in the economic field aged between 20 and 50 years.

To investigate whether ERP systems are a solution for the sustainable development of the company (dependent variable y = SOL), we used a regression model consisting of the following factors (independent variables) presented in Table no. 1:

Table no. 1. Factors of the multiple regression model

Factors	Code
Respondents' experience in using ERP systems	EXP
"Green measures" adopted for sustainable development	GREEN
The quality of decisions following data processed and generated using ERP systems	QLTY
Labor productivity	PRODM
Production and services	SERV
Business infrastructure	INFRA
The volume of data processed with ERP systems	VOL

Source: Author's own creation

Multiple regression model has the following structure:

$$y = \alpha_0 + \alpha_1 * EXP + \alpha_2 * GREEN + \alpha_3 * QLTY + \alpha_4 * PRODM + \alpha_5 * SERV + \alpha_6 * INFRA + \alpha_7 * VOL + e$$

The main hypotheses formulated were:

H_1: ERP systems are a solution for the sustainable development of the company

H_2: There is a strong relationship between the dependent variable SOL and the independent variable EXP

H_3: There is a strong relationship between the dependent variable SOL and the independent variable GREEN

H_4: There is a strong relationship between the dependent variable SOL and the independent variable QLTY

H_5: There is a strong relationship between the dependent variable SOL and the independent variable PRODM

H_6: There is a strong relationship between the dependent variable SOL and the independent variable SERV

H_7: There is a strong relationship between the dependent variable SOL and the independent variable INFRA

H_8: There is a strong relationship between the dependent variable SOL and the independent variable VOL

To analyze the data collected for the regression model we used Microsoft Excel as a tool. The data obtained will be presented in the next section.

Results and discussion

As we presented in the previous section, the sample consisted of undergraduate, master's and doctoral students from Bucharest University of Economic Studies and employees in the economic field. The questionnaire was answered by 77 women and 11 men residing in urban areas and 15 women and 9 men residing in rural areas (figure no. 2)

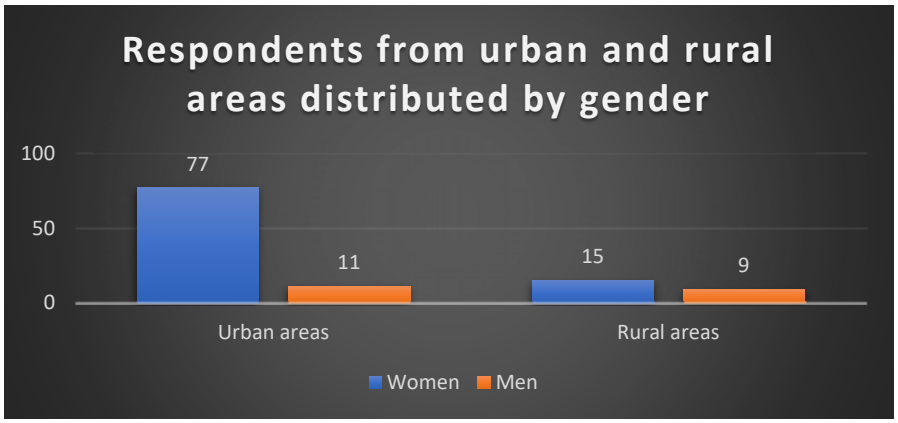

Figure no. 2. Respondents from urban and rural areas distributed by gender
Source: Author's own creation

Given the results obtained on the basis of the questionnaire, we can see that women predominate the most in our sample. This was also confirmed by the study conducted by ANS (2020), through which

the number of women students and annual graduates represents the largest share of the total number of students and graduates.

Analyzing the multiple regression model presented in the previous section, we obtained the following results of summary output:

Table no. 2. Summary output

Multiple R	0,9645
R Square	0,9302
Adjusted R Square	0,9167
Standard Error	0,9881
Observations	112

Source: Author's own creation

From table no. 2, the value of the regression coefficient (R) is 0,9645 which is close to the value 1 and represent a strong relationship between the dependent variable (SOL = ERP systems are a solution for the sustainable development of the company) and the 7 independent variables (EXP = Respondents' experience in using ERP systems, GREEN = "Green measures" adopted for sustainable development, QLTY = The quality of decisions following data processed and generated using ERP systems, PRODM = Labor productivity, SERV = Production and services, INFRA = Business infrastructure, VOL = The volume of data processed with ERP systems).

The coefficient of determination has a value of 93.02% close to 100% demonstrating that the dependent variable SOL is explained through the 7 independent variables (EXP, GREEN, QLTY, PRODM, SERV, INFRA, VOL).

In table no. 3, we identified that the chosen multiple regression model is valid because Significance F <0.05.

Table no. 3. ANOVA

	df	**SS**	**MS**	**F**	**Significance F**
Regression	7	1368,47	195,49	200,20	0
Residual	105	102,53	0,97		
Total	112	1471			

Source: Author's own creation

In table no. 4, we identified the coefficient of the multiple regression model:

Table no. 4. Coefficient of the multiple regression model

	Coefficients	**Standard Error**	**t Stat**	**P-value**	**Lower 95%**	**Upper 95%**	**Lower 95%**	**Upper 95%**
Intercept	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
X_1 - *EXP*	0,017	0,093	0,192	0,847	-0,167	0,202	-0,167	0,202
X_2 - *GREEN*	0,021	0,125	0,173	0,863	-0,225	0,268	-0,225	0,268
X_3 - *QLTY*	0,186	0,150	1,245	0,215	-0,110	0,484	-0,110	0,484
X_4 - *PRODM*	0,136	0,174	0,781	0,436	-0,209	0,481	-0,209	0,481
X_5 - *SERV*	-0,169	0,189	-0,896	0,372	-0,545	0,205	-0,545	0,205
X_6 - INFRA	0,475	0,153	3,105	0,0024	0,171	0,778	0,171	0,778
X_7 - VOL	0,254	0,081	3,129	0,0022	0,093	0,415	0,093	0,415

Source: Author's own creation

After obtaining the data from table no. 4, we verified the significance of the regression model coefficients:

Table no. 5. Significance of regression model coefficients

Independent variable	Variable significance calculation 100% - (p-value * 100)	Significant / Insignificant
X_1 - EXP	15,20% < 95%	Insignificant
X_2 - GREEN	13,69% < 95%	Insignificant
X_3 - QLTY	78,43% < 95%	Insignificant
X_4 - PRODM	56,33% < 95%	Insignificant
X_5 - SERV	62,80% < 95%	Insignificant
X_6 - INFRA	99,75% > 95%	Significant
X_7 - VOL	99,77% > 95%	Significant

Source: Author's own creation

According to the data obtained in table no. 5, the regression model remained structured only in 2 independent variables (INFRA and VOL), so hypotheses H_7 and H_8 are confirmed and hypothesis H_1 only partially confirmed. The rest of the formulated hypotheses were infirmed, because the coefficients in the regression model are insignificant.

$$y = 0,475 * INFRA + 0,254 * VOL + e$$

Where:

INFRA = Business infrastructure

VOL = The volume of data processed with ERP systems

Conclusions

The evolution of technology can have both ups and downs for business, all depending on how a company establishes its strategy and how it perceives the market.

The role of ERP systems is to ensure the most efficient use of the company's resources, so that they can develop sustainably. Sustainable development has the role of improving the activity and ensuring the future of the company, thus creating a holistic view of the company.

Even if ERP systems have a modular appearance, it offers suitable solutions for different departments of the company. Following the research, the authors concluded that ERP systems have a significant impact on the business infrastructure and the volume of data that can be processed using ERP systems by the users of these systems, but also the decrease of the inefficient consumption of resources, offering clear and quality information. If ERP systems provide complete and accurate information about the company's situation, managers will be able to analyze and to take the most important decisions for the company. The analysis presented in this article is useful both for research interested in sustainable development and for companies that want to develop sustainably using ERP systems.

The implementation of these ERP systems offers numerous benefits both in terms of sustainable development and the financial and non-financial performance of a company (operational, managerial benefits, cost reduction, activity planning).

In conclusion, ERP systems can be a solution for the sustainable development of a company if it has a strong business infrastructure and a well-defined strategy.

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