Internal Audit in ERP Systems Context

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Abstract

Through this paper, the authors wanted to highlight how important and useful are ERP systems for any company that requires internal auditing. ERP - Enterprise Resource Planning systems are intelligent software that can be adapted to the needs of each company allowing the combination of all business processes in a single database. They are also a way of internal control over the data entered and employees. From an internal audit perspective, these systems can be considered an appropriate solution because they provide an opportunity to more effectively manage internal and external audit risks. The main objective of this paper is to demonstrate the satisfaction of internal audit needs with the help of integrated systems. These systems facilitate the operation of data and their security. Another objective was to analyse how much these systems can reduce certain risks. The risks of significant misstatement may be mitigated by these systems, and any operation introduced may be analysed, verified and approved / disapproved. Therefore, a quantitative research was conducted, using the questionnaire as an analysis tool. Based on the answers received, the profile of the respondents was outlined and at the same time a statistical analysis was performed. The results obtained demonstrate that respondents appreciate ERP systems' utility. They perceive a reduction in financial and operational risk but also an increase in technical risk. Of course, these technical risk issues can be mitigated by the internal audit department's ability to assess and manage any issues that may arise. However, respondents also emphasize the need of training employees in using the system and understanding the data generated by it. Without well-trained employees, performance at the company level, as well as at the internal audit level would not be achieved. It is essential to have training at employees' level who manage data in an ERP system. This training is also valid for internal auditors who can recommend this system to reduce audit risks.

Key words: *ERP Systems – Enterprise Resource Planning; internal audit; internal control; audit risks;*

JEL Classification: *A19, M40, M42, P00, P42*

Introduction

This research started from the idea of demonstrating how effective ERP systems are for any company that is operating on the market. They offer multiple benefits for any organization. These systems are also considered data integration software packages and are composed of several modules, such as financial, human resources, procurement, logistics, sales, and production (Eslam Nazemi et al., 2012).

In addition, these systems can be adapted to the needs of a company according to the specifics features. They also perform integrated management of the business components through access to a single and unique database.

ERP are based on client/server architecture and can integrate all economic processes by optimizing available resources. The architecture of these systems leads to a transparent integration of modules. This ensures the transverse data flow between all functions of a company. Systems can be defined as functionality and integration. ERPs are integrated systems that ensure connectivity and communication between flows of economic functional processes (Fotache et al, 2013).

Moreover, the system offers data security, because it automates and standardizes all operational processes. With the help of the ERP system, managers can have total control over the employees as well as the operations they carry out in the system. In some cases, it is possible for managers to approve transactions/transfers. ERP eliminates the need to manage manually the information flows and provides an update of all operations entered into the database. The system provides accessibility, and any information can be accessed in real time. ERP also incorporates local legislation, country-specific standards of co-ability, and labour legislation.

Of course, all these mentioned benefits can be achieved only if, ERP system is implemented correctly. In many cases, the implementation of an ERP system entails significant technical and organizational challenges. From an organizational point of view, it is very important that users of this system also receive full training in order to understand precisely its functions and what it can do.

From an internal audit perspective, ERP systems have created new opportunities as well as new challenges (Debreceny et al., 2005).

On the one hand, the use of an integrated system increases transparency in business processes and eliminates the need for controls ensuring the data consistency and accuracy as information is embedded in the system.

In Romania the most popular ERP systems are those with an impressive number of users, such as SAP, Oracle, CIEL, and Charisma. But there are many other recognized names, such as WinMentor, Navision, DAX, CDMS etc.

Literature review

The ERP concept can be viewed from a variety of perspectives. First, and most obviously, ERP is a smart software that can be operated on multiple devices, in real time, from different locations. Secondly, and fundamentally, ERP can be seen as an objective of developing all the processes and data of an organization in a comprehensive integrative structure. Thirdly, ERP can be seen as a key element of an infrastructure providing a business solution (Klaus et al., 2000).

Similarly, Nah et. al., (2001) and Stemberger and Kovacic (2008) define the ERP system as advanced software that enables companies to manage resources (material, human, financial) efficiently and effectively, integrating all information to meet the needs of organizations/companies.

ERP systems have been in place since the 1960s, being referred to at the time as electronic computing systems, under the abbreviation of MRP, and later becoming MRP II. In the 1990s an American company Garther Group proposed the name ERP to designate the next generation of MRP II systems (Fotache et al, 2013).

Klaus et al., (2002) define the ERP system as a complete software package, which on an organizational level aims to integrate all business processes and functions in order to present an overview of the organization with a single IT architecture.

An ERP system is considered a business management software that manages and integrates all business processes and functions within an organization (Shehab et al., 2004).

ERP systems are based on a client/server architecture and are developed for transaction processing. Facilitates the integration of all processes, from the planning phase to the development of production, by facilitating the relationship with business partners, customers or

suppliers. They can also be rated as the most accurate expression of economic interdependence and information technology (Fotache and Hudrean, 2004).

The ERP system includes a standard software package. All standard packages during the system implementation process must be adapted to the specific and individual requirements of the company. This process of individualizing the software is called customization. There are additional deployment tools, remote checks, and other useful materials (e.g., generic presentations, and videos). The rich configuration potential of the ERP software derives from the range of pre-configured alternatives (e.g., number and variety of accounts chart) and the number of alternatives, processes and transactions (Klaus et al., 2002).

Among the most important features of the ERP system that can bring global benefits are its ability to automate and integrate business processes based on functions in certain organizational locations. The system enables the implementation of all variants and best business practices, providing real-time data throughout the organization (Soh et al., 2000).

The system includes a set of applications and business tools for financial and management accounting, sales and distribution, material and human resources management, production planning, supply chain and customer-related information (Boykin, 2001).

Over time this system has been expanded beyond production and introduced into companies dealing with services, finance, healthcare, hotel chains, education, insurance, retail and telecommunications sectors (Chen, 2001).

As a commercial product, ERP software is offered by a range of suppliers specializing in this market segment. This ERP market is significant. ERP software is extremely comfortable to meet the users' different needs in most economic sectors (Klaus et al., 2000).

ERP systems must be used to ensure access to an efficient and highly reliable information infrastructure. These technologies must be used in an integrated manner, using information engineering methodologies ensuring the correct processing of data, integrity, consistency, reliability and usability for a company (Murray and Coffin, 2001).

Traders of ERP systems often come with the promise to improve processes and reduce costs. Moreover, the system offers the possibility of creating an electronic

business and improving supply chain management (Wang et al., 2001).

The ERP system is also considered a centralized data repository, which can provide essential controls on reporting standards (Sia et al., 2002; Ignatiadis and Nandhakumar, 2009).

Managers, accountants and internal auditors have a responsibility to develop and improve internal control systems. More specifically, these responsibilities include preventing, detecting and correcting control weaknesses and risks that may cause failure to achieve operational and information processing objectives (Turner and Turner Ohorso, 2009).

Implementing an ERP system can reduce barriers to the use of audit programmers. In Romania, the problem of auditing information systems appeared in the middle of 2003. In 2004 a normative act was drawn up approving the payment instruments with remote access. In 2015 companies operating in the European Union were obliged to prepare financial reports in accordance with the provisions of the IAS. The audit took into account the modules of the ERP packages, such as the structure of the system and its operation. The integrity of the system processes is also very important (Fotache and Munteanu, 2006).

The information can be provided and used much more precisely to change and improve the quality of audit tasks. In the context of ERP systems, the use of audit software may allow the internal auditor to easily use a common database. It can also have access to technology for audit tasks such as process monitoring or business monitoring, fraud analysis and transaction integrity constraints testing (Debreceny et al., 2005).

Weidenmier and Ramamoorti (2006) said that internal auditors should be careful when examining the risks that may be associated with the ERP system.

An efficient internal system is a strategic audit function. Internal audit has become a powerful force in promoting effective controls, management and governance risks (Hermanson, et al., 2008). The work of internal auditors is very relevant for the financial reporting of companies (Prawitt et al., 2009). The audit reports shall present the formal opinions and responses of the auditors. They are based on their perceptions of an organizational system (Schick and Ponemon, 1993).

The quality of an audit report is always based on auditors' perceptions (Sundgren, 2009).

Since the auditor's formal opinion is influenced by his perceptions, changes in the ERP system and their impact on the perception of quality of service become essential for an audit commitment (Brazel, 2005).

The quality of the audit is a subjective assessment of the likelihood that the auditor discovers and report a legal violation of the financial-accounting part of the client (Deis and Giroux, 1992). As it is set out in the audit report, in accordance with the standards, auditors must plan and carry out the audit in order to achieve sufficient audit quality. The audit risk should be limited in terms of appropriate professional judgment for expressing an opinion on financial operations. The perceived quality of an audit focuses on providing reasonable assurance that financial transactions are not materially distorting (whether caused by errors or fraud). Neither absolute assurance nor quality are achievable because of the subjective nature of the audit evidence and the fraud characteristics. Therefore, an audit carried out in accordance with generally accepted audit standards cannot detect a significant distortion (Nwankpa and Datta, 2012).

Research hypotheses

The current hypothesis refers to those companies that, although they currently use an integrated system, do not take advantage of all the benefits that an ERP system can offer. At the same time, this research started with the idea of demonstrating and making known the importance of an ERP system in any organization. A first achievement of its fruition would be the correct implementation according to the specifics of the company. In addition, it is very important that both employees and managers understand how to accurately use the system at full capacity. If they do not know or do not understand exactly the functions of the system, the implementation of such a system can be a failure, and the working time for the performance of certain tasks would increase. However, ERP system traders have often offered advice to companies that want to implement such a system. A first question of the research was: *How effective is an ERP system for any organization to meet its needs, marking performance and increased data security?* This question highlighted the usefulness of ERP systems for sustainable performance and at the same time analysed the

perspective of Romanian respondents on this subject.

The system offers more efficient data management, centralizing it according to the criteria chosen by a user, and ensures increased data security. This high level of security that the system benefits from is an important factor for companies that organize internal audit. ERP provides a centrally secure database, and privacy breaches risks can be more easily identified.

Another question was: *How much can an ERP meet the needs of an internal audit?* It was also intended to demonstrate that this system is useful for any control as well as for internal audit.

An integrated and well-controlled system helps to improve audit planning and execution. If transaction control procedures are well defined and managers have control over the operations performed by their employees, audit risks are mitigated.

One last question of the research was: *How much can an ERP system reduce audit risks?* It was also shown that the effectiveness of this system was also in reducing financial and operational risks.

This category includes, in particular, operational risks, employees no longer work manually, most tasks are automated, and the risk in terms of operational activity is much lower with such a system. The large flow of documents is taken by the system, and it can centralize them into categories, thus eliminating the human risks of omitting certain documents.

Financial risks are also mitigated, because the most transactions are processed by the system. And this eliminates the human error of entering certain financially wrong transactions. If the system is configured in accordance with the legal provisions and actual standards, all transactions and operations entered should be compliant. Of course, that's where the technical risk comes in, which is very high. This risk can occur very often, and requires a rigorous configuration as well as an update of the periodic system according to all rules, decisions and standards that have recently emerged, or promulgated by the country authorities. The system must take over all legislative developments in such a way that, from a financial point of view, all existing operations are

correct and compliant. It is very important the ERP system merchant and the package of benefits that it can offer. In addition, a help-desk package from the trader is also recommended. There are quite a few operations that require support from them. It can be connected to both the financial-accounting, management, logistics, or even production part. In addition to the training they provide, after-system implementation services are also recommended for optimal performance. These consultancy services may be helpful in reducing technical risk.

It is recommended that for any audit process, the auditor investigate the data accuracy processed by the system. Auditors often identify ways to strengthen and improve policies and operational-technical procedures. Auditors always analyse, evaluate and manage any technical problems. They are thoroughly investigated, so that the auditors should give an accurate opinion on possible irregularities that may affect the company in the future. At the same time their opinion is a certification on the real company situation and greatly influences the future perspective of managers and what they would have to improve. The company that benefits from a well-implemented integrated system, trained employees, and an internal audit department/service can achieve sustainable overall performance.

Research methodology

The used method was a case study based on quantitative research. The questionnaire was used as a measurement tool and analysis study to outline the profile of respondents. A free platform (Survio) was used to carry out this questionnaire. The questionnaire focused on the current theme, namely how useful an ERP system is for a company and for internal auditing.

Thus, based on the answers obtained, statistical research was conducted to achieve the objectives. The questionnaire had 23 questions. There were 3 questions about identifying the profile of respondents and 20 that could be subject to statistical analysis. These general questions were intended to accurately outline the profile of information users.

The total number of respondents who completed this questionnaire was 108 people. The profile of respondents is represented by people with higher education, and the most of them work in the economic field. They are between 18 and 60 years old, so the perceptions of the proposed questions are different and concern their opinion on the current topic.

The people who complete our questionnaire are of Romanian nationality, Chinese, Greek, French and operate or work in Romanian market. They hold either a management or an execution function. The questionnaire was sent to respondents from January to May 2021. With different experiences in the field in which they operate, respondents come from both private and public sector, but mainly from the private sector. Thus, with the help of the Survio research platform, 20 numerical answers were obtained for statistical analysis.

Results and discussions

Based on the responses received, statistical research was carried out, and the profile of the respondents was also presented. The questions were chosen strategically to analyse the population's perception of the current theme. They also achieved all of those objectives. In the first part of the study, the profile of respondents was sketched with three graphs that analyse their identity and their seniority in the field. In order to identify as accurately as possible, the profile of the respondents who completed this questionnaire, the age category in which they fall was presented.

How it is presented in *Figure no. 1*, the highest percentage of 57% is represented by the adult population over 40 years. It is followed by the average population aged between 25-40, 26%. This demonstrates that respondents who have completed have the necessary experience, so that they can correctly assess the objectives of the study represented by the questions.

Figure no. 1. Age of respondents
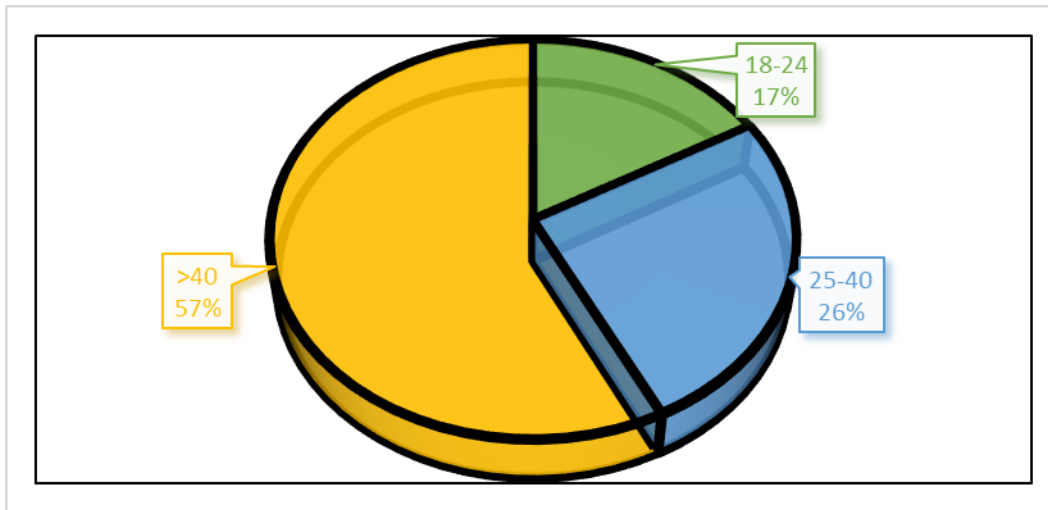
Source: Author research. Results of the questionnaire

For an even more detailed analysis of respondents it was mentioned, whether they hold an execution or management position. As expected, according to *Figure no. 2*, people holding an execution function represent the majority of 91%. It can be appreciated that 10 people who have completed the questionnaire, hold a management position (9%). Thus, the topic of the questionnaire could be analysed from the perspective of the persons who is performing the activity as well as by those who is managing it.

Figure no. 2. Function of respondents
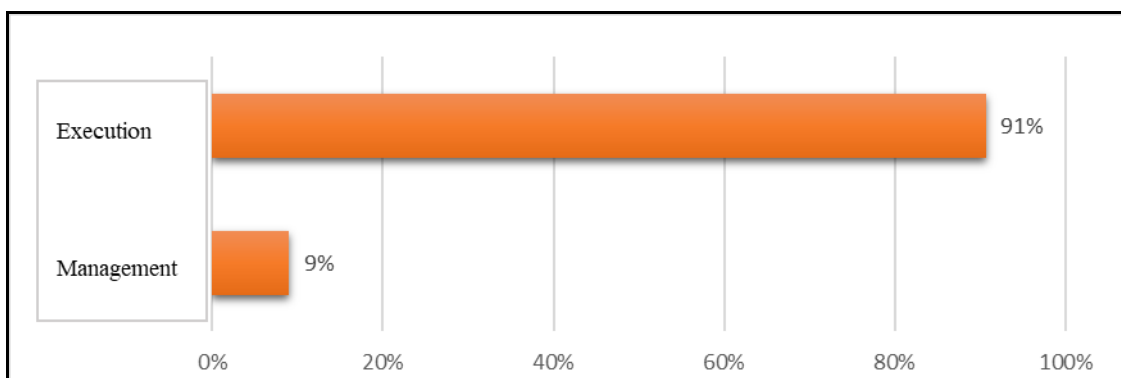
Source: Author research. Results of the questionnaire

The third question that concerned the profile of respondents referred to their experience in the field in which they operate. Experience is an important factor in the labour market. Thus, the persons who completed this questionnaire have an overview and can assess exactly the hypothesis in question. Their experience has been classified into 3 categories: up to 2 years, between 2 and 10 years and over 10 years. As can be seen in *Figure no. 3*, the highest percentage of 58,3% is recorded by respondents who have more than 10 years of experience in the labour market. Then another significant percent 31.5% is recorded by respondents with average experience.

Figure no. 3. Experience of respondents
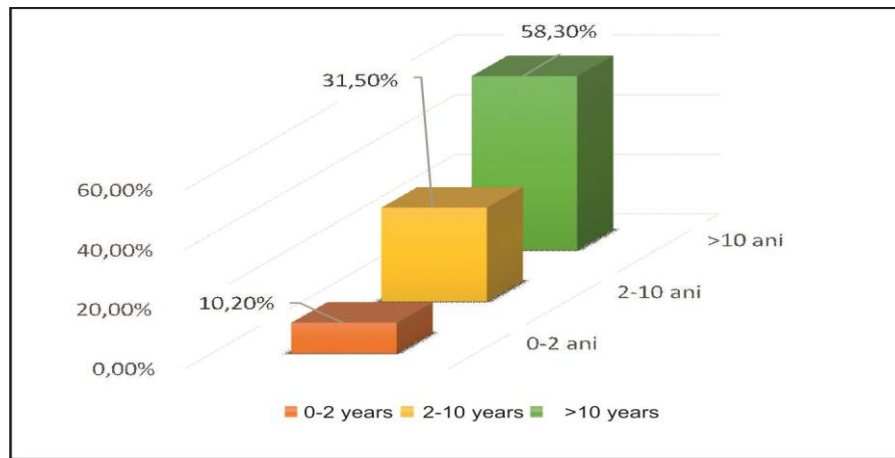
Source: Author research. Results of the questionnaire

Thus, in order to better analyse the subject, 20 numerical questions were made.

Respondents had to choose only one option from 1 to 5. Option 1 means the least and option 5 the most. The questions could be assessed

quantitatively. Of course, in order for any reader to have a fair and transparent overview of the data mentioned, all the questions and answers received were highlighted. The results were summarized in **Table no.1**.

Table no. 1. Theme of all questions

Question theme	The least	Little	Medium	Much	The most
Frequency of an integrated system use	5	3	10	16	74
System Accessibility	4	2	13	31	58
System Efficiency vs. Daily Tasks	3	2	13	24	66
Real-time information	3	6	13	26	60
System vs. working time	4	4	18	26	56
Complete task by the system	10	3	17	26	52
Data processing	8	8	31	26	35
Regulatory situations	3	2	16	20	67
Generating/reporting situations	3	5	26	28	46
Existing data security	4	4	28	18	54
Data security entered	6	5	32	28	37
Delimitation of employee access	6	4	20	25	53
Secure internal control	3	7	16	40	42
Risk management	7	8	26	25	42
Checking generated data	3	13	29	28	35
System vs. Internal Audit	4	5	29	24	46
Employee training	1	1	8	17	81
Data security training	1	1	5	10	91
Employee-system-performance	3	1	7	23	74
Employee contribution to data security	2	2	8	18	78

Source: Author research. Results of the questionnaire

To better analyse the responses received, the statistical analysis was applied. The model was based on a regression. The research presents the questionnaire aimed at a multifactorial model and includes the 5 types of responses received (responses ranged from 1 to 5). Variable Y was the questions asked. This variable addressed the theme of the efficiency of the ERP system use for internal audit. Variable X was the responses received. In our case, the dependent variable was represented by X (the answer depends only on the question), and the independent variable was represented by Y (the question asked).

With the help of statistical analysis, we wanted to demonstrate that respondents appreciate the subject, having a significant impact on them. Moreover, as Table 1 can be appreciated, the majority of respondents chose the variants with high and very high medium impact 3, 4 and 5. Most respondents turned to variant 5 and thus agreeing that ERP systems are frequently used and bring real benefits even for internal auditing. Strong dependencies demonstrate that respondents are aware of the topic and believe that internal audit needs can be met with an integrated system. This question has already been asked, and the majority of respondents have chosen variant 5 - the most.

The topic of internal control and audit risks was also addressed, and most respondents agreed that ERP software is most useful for internal control and is also the most effective type of security risk management system.

The response variants received materialized in percentages represent the statistical population.

The range of questions asked is the statistical sample. The linear statistical model is the results obtained.

Therefore, for a more precise understanding of dependent and independent variables, the following can be assessed: All questions asked (**Table no.1**) represent the independent variables and address the topic. Then, the full range of responses received (the least, less, medium, more and the most) with each number, represents the dependent variables. Any answer depends on the question asked and the subject it addresses (independent variable). The resulting regression is showed in **Table no. 2**.

Table no. 2. Summary output	
Regression Statistics	
Multiple R	0.9999
R Square	0.9999
Adjusted R Square	0.9333
Standard Error	0.0008
Observations	20

Source: Author research. Results of the questionnaire

Multiple R measures how a given variable can be predicted using a linear function of a set of other variables. It is the correlation between variable values and the best predictions that can be calculated linearly from predictive variables. Also, Multiple R is the correlation coefficient and in the current case, it has a value close to extreme amounting to 0.9999. It indicates a direct and strong connection between the question topic and the answers received. The subject has a strong impact on respondents.

R Square is a statistical measure in terms of the proximity of data to the regression line. It is also known as the coefficient of determination. The result for R Square is 0.9999, which shows that 99% of Y's variation is determined by the variables influence. The answers are strictly related to the subject matter.

Adjusted R Square represents 93% of y's variation, which is influenced by x. The remaining up to 100% is caused by residual components (deviation factor - 7% from the topic addressed by the questions).

Standard Error is the standard deviation of the statistical sampling distribution. Standard error is a statistical term that measures the accuracy of a sample representing a population. The result obtained in the current example is 0.08%, which indicates a stronger estimate of the average population. The results of ANOVA analysis are shown in **Table no. 3**.

Table no. 3. ANOVA					
	Df	*Ss*	*Ms*	*F*	*Significance F*
Regression	5	19.9999	3.9999	6236143.651	6.5499
Residual	15	9.6213	6.4142		
total	20	20			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
The least	1.0068	0.0102	99.1516	1.5072	0.9852	1.0284	0.9852	1.0284
Little bit	1.0059	0.0103	97.6707	1.8883	0.9839	1.0279	0.9839	1.0279
Medium	0.9981	0.0034	293,6806	1.2844	0.9908	1.0053	0.9908	1.0053
Much	0.9988	0.0031	320.4336	3.474	0.9922	1,0055	0.9922	1,0055
The most	1.0007	0.0008	1311.6167	2.2921	0.9991	1.0024	0.999	1.0024

Source: Author research. Results of the questionnaire

The sum of the variation is due to the regression that sums the value 5 as well as the residual one in number of 15, on a total of 20 questions. The sum of the squares of the regression amounts to 19.9999, and the sum of the squares of the residual value is represented by the value of 9.6213.

MS - the mean of the squares or the *corrected dispersion* represent the values of 3.9999 for regression having degree of freedom k and respectively 6.4142 for the residual value with degree of freedom of n-k-1, from the total degree of freedom, n-1.

Significance F is the test F for table ANOVA, more precisely the set of hypotheses. Null hypothesis: The model is not statistically valid; and the alternative hypothesis: the model is statistically valid.

Critical region F calculated> F; k; n-1-k, represents the value of 6.5499, which confirms that x is valid as a significant factor. If Significance F is less than 0.05 (5%), there is no significant correlation. In the current case, these conditions met, the value obtained being 6,5499, the multifactorial regression model being valid (statistically significant).

The questions represent the free term, and the answers received are the chosen variable. The coefficients represent the values of the variable -Y of 1.0068, 1.0059, 0.9981, 0.9988, 1.0007, for X. Test statistics represent the tests of significance for parameters.

According to all data presented, the subject had a significant influence on respondents. Questions related to the use of the ERP system to facilitate internal auditing had a strong impact on the answers. It directly and strongly influenced the response options chosen by the respondents. They appreciated the questions asked, and largely agreed that the ERP system is an effective solution for internal audit, due to the fact that it is considered an intelligent software in terms of risk management. The majority of them chose the most influential response options, thus confirming that ERP system is also useful in internal auditing because it provides increased data security.

Conclusions

To conclude, this research validated the ERP systems usefulness for any company that requires internal auditing. Starting from the objective of meeting internal audit needs with the help of an ERP system, a statistical test was carried out which validated this hypothesis. Through the variable proposed by authors to reduce audit risks with the integrated system, the elements that had the greatest and most important influences were established. The topic addressed had a high impact on respondents, and according to the statistics applied, a strong relationship was obtained between the subject and the answers received. In addition, their responses vary to 5- the most, indicating that respondents are familiar with the topic and fully agree with the general idea of meeting internal audit needs with an ERP system. Even if a minority of them was skeptical about management risk, overall, the ERP system is considered useful for any company operating in the market, in terms of general performance, and in terms of internal control over the business. Most respondents considered data security training essential for all existing personnel in a company. Employees must accurately understand the functionality of the system, the dangerous attempts that may endanger the proper functioning of the activity and risk generation It can also be said that the training of company managers is important. Any manager or administrator must have full control over the activities, employees and they have to eliminate data security risks. If this training is not applied, performance cannot be performed at the company or internal audit level.

This mention can also answer the research questions, which were also included in the questionnaire. According to the answers received, the ERP system is efficient for any organization (74 respondents considered that the system together with the efficient activity of employees can lead to a sustainable performance at the company level). The system can also meet the needs of the internal audit, as it participates in risk mitigation (46 respondents considered that the ERP system adds

value and meets the needs of the internal audit). In terms of risk management, the ERP system can reduce some audit risks, but not completely. Therefore, the ability of the internal audit department to assess, analyse and manage issues that may arise is further tested. However, the paper has some limitations, as the number of respondents who completed the

questionnaire is not very large. Respondents were selected based on their knowledge of internal audit and integrated ERP systems. Therefore, further research can be done in this regard. In the future, we will do even more detailed research on the experience and adaptability of these systems in daily tasks of internal audit.

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