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THE IMPACT OF IMPLEMENTING DIGITALIZATION IN THE FIELD OF INTERNAL AUDIT IN THE CONTEXT OF THE INCREASING COMPLEXITY OF THE SOCIO-ECONOMIC ENVIRONMENT IN THE AGRICULTURAL FIELD

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Abstract

The article analyzes how the use of information technologies to analyze internal audit information can generate added value for agricultural companies. With the help of audit tests performed using audit applications (risk alerts, support for different data formats, customized forms, verification of quantitative or qualitative elements), audit specialists will contribute to the development of governance systems of agricultural companies in the sense that, by digitizing reports, they will have the possibility to analyze recommendations, track the flow of documents and the tools used by the audit team. The research method chosen was the use of a questionnaire consisting of 12 questions/items, addressed to internal auditors working the level of companies whose main activity is agriculture. Through the research activity undertaken, the need for internal audit to become a digitalized work tool was emphasized, which would provide stakeholders with documents in the form of reports that converge with the principles of participatory management, risk management, and governance, which would constitute the premises for an investigative audit.

Key words**:** *risk, performance, audit, control, management*

INTRODUCTION

The acceleration of the development of new information technologies in recent years has exceeded, in some areas, even the most optimistic forecasts. The analysis of articles and specialized publications on internal audit shows a weak connection with the technological component specialized in software programs specific to audit and internal control applicable to companies in the agricultural field [15] [3] [5] [6].
We believe that information technologies contribute greatly to increasing the reliability of the audit in the performance management of companies operating in the agricultural field, which requires better professional training of auditors in increasing digital skills and the use of software packages [14]. At the same time, the use of artificial intelligence supports agricultural companies in providing agricultural economic goods to support citizens and increase their level of well-being following consumption. Machine learning empowers current tools to learn from past experiences, analyze patterns and provide assistance in obtaining maximum performance under given resource conditions. Also, digitalized audit systems have the role of reducing systemic risks that can be generated by redundancy, but also by errors in agricultural company reporting in areas such as accounting, budgeting, human resources or internal managerial control [10].
Most studies based on the digitalization of audit techniques and tools have identified the primary purpose of using new technologies as risk reduction [7] [13].
However, it has not been possible to outline an audit model that uses exclusively digital

means and whose application would provide auditors with adequate digital tools in formulating audit conclusions that would incorporate recommendations by fulfilling the specific factors of agricultural company management.

The purpose of the article is to emphasize the need for resource management using automated means of attracting and analyzing audit data within the audit trail, in order to achieve the main objectives of the company in the agricultural field, in conditions of efficiency, effectiveness and economy, principles that are convergent with the philosophy of public internal audit.

MATERIALS AND METHODS

In order to highlight the positive effects of the internal audit digitalization process [1] in agricultural companies, the research is based on three aspects relevant to the research result, such as: governance of agricultural companies, information technology for structuring the elements analyzed in audit reports in the form of recommendations that exclusively target the process of making own economic resources more efficient and attracted to agricultural management, the risks associated with the internal audit system [9].

Within the proposed purpose, the following research objectives were established:

-identifying auditable areas exposed to a high degree of risk;

-determining the impact of information technology in the agricultural sector;

-identification of weaknesses within the audit activity and highlighted in the audit reports;

-emphasizing the need for training internal auditors in the field of information technology and digitalization.

The research aims to find a way to formulate audit recommendations from an informational perspective, which would allow for the interoperability of data and accounting, budgetary, and managerial systems to facilitate the managerial decision-making process under minimal risk conditions. [4].

At the same time, the research focuses on the use of digital technologies [8] in order to better utilize resources and increase the economy, efficiency and effectiveness of the use of public funds within agricultural companies.

Within the research, the objectives aim to develop and build a statistical model whose variables establish a coherence of deterministic relationships between the agricultural company, the legislation and good practices specific to the audit field and the principles of internal audit, using a statistical population of 230 people who hold the position of internal auditor within agricultural companies.

A market research on the digitalization of internal audit was carried out using the questionnaire as a working tool. The general purpose of the questionnaire was to disseminate opinions and to know the possible reactions of internal auditors regarding the digitalization of internal audit at the level of companies in the agricultural field.

The research method chosen was the use of a questionnaire consisting of 12 questions, addressed to internal auditors working at the level of companies in the agricultural field.

The administration method used was a field survey, and the technique applied was the structured interview. The questionnaire was sent out and the information was collected during the period October - November 2024. The analyzed data are both quantitative and qualitative.

Summary of the results recorded:

-138 internal auditors responded affirmatively to the invitation to complete the Questionnaire on the impact of implementing digitalization in internal audit sphere;

-84% of respondents believe that the budgetary area is among the significant risk factors in agricultural companies;

-92% of respondents believe that the digitalization of economic processes, and implicitly of internal audit, would reduce risk at the level of an agricultural entity, a fact associated with the reduction of the general level of unitary expenses;

-70% of respondents believe that legislative predictability in the field of agriculture, especially the fiscal sphere, constitutes an essential factor in exploiting market opportunities;

-80% of internal auditors believe that a set of tools would be beneficial to support the audit activity of sensitive areas (example: additional resources in the form of a guide to good practices in the field).

RESULTS AND DISCUSSIONS

Based on the documented analysis, 12 questions were proposed for interviewing, which were answered by 230 people.
The study establishes an association between a continuous variable (dependent variable) identified as "knowledge in implementing the concept of digitalization of internal audit in Romania" and discrete variables (independent variables, factors) identified as behavior regarding the attitude towards the principles of internal audit (attitude towards risk, transparency of information, internal audit methods, efficiency, and effectiveness).
In the 12 questions presented in Table 1, question 1 was considered the dependent variable.

Table 1. Centralizer of questions for validating research objectives

Items/ Variables	**Statistical results**
1. Do you have knowledge about the implementation of the digitalization concept of internal audit in Romania?	Mean: 1.6304Median: 2.00 Mode: 2.00 Sample Variance: 0.234 Standard Error: 0.03190 Skewness: -0.544 Kurtosis:-0.544
2. Do you believe that the implementation of digitalization in certain fields of activity could lead to the efficiency, effectiveness, and transparency of the expenses of public entities?	Mean: 1.2739Median: 1.00 Mode: 1.00 Sample Variance: 0.2 Standard Error: 0.44694 Skewness: 1.021 Kurtosis:- 0.976
3. Select the first three auditable areas for which you consider that the risk factor often reaches a significant level	Mean: 4.1739Median: 4.00 Mode: 7.00 Sample Variance: 4.948 Standard Error: 0.146767 Skewness: 0.021 Kurtosis:- 1.309
4. Do you believe that digitalization could lead to efficiency, effectiveness, and transparency of public entity spending?	Mean: 1.2957Median: 1.00 Mode: 1.00 Sample Variance: 0.209 Standard Error: 0.03016 Skewness: 1.021 Kurtosis:- 1.198
5. To what extent do you believe that the implementation of an information technology system could influence the activity of the entity in which you operate, based on a scale from 1 to 5 (1 – low impact, 5 – high impact)?	Mean: 2.5304 Median: 3.00 Mode: 1.00 Sample Variance: 0.966 Standard Error: 0.06482 Skewness: 0.554 Kurtosis: 0.535
6. Do you find a set of digital tools useful to support your audit work?	Mean: 1.5391 Median: 2.00Mode: 2.00 Sample Variance: 0.250 Standard Error: 0.03294 Skewness: -0.158 Kurtosis:- 1.992
7. Documentation and record keeping is an essential step in the audit process. Do you consider that the use of digital technologies in audit techniques and tools could generate transparency in the audit process?	Mean: 1.4609 Median: 1.00Mode: 1.00 Sample Variance: 0.250 Standard Error: 0.03294 Skewness: 0.158 Kurtosis:- 1.992
8. Can internal audit activity be made more efficient through cooperation with other institutions with a control role?	Mean: 1.1565 Median: 1.00 Mode: 1.00 Sample Variance: 0.133 Standard Error: 0.02401 Skewness: 1.903 Kurtosis:- 1.636
9. The institution in which you undertake your activity falls into the category	Mean: 1.2348 Median: 1.00 Mode: 1.00 Sample Variance: 0.180 Standard Error: 0.44694 Skewness: 1.260 Kurtosis:- 0.417
10. The internal public audit structure within your institution is defined as:	Mean: 1.1043 Median: 1.00 Mode: 1.00 Sample Variance: 0.094 Standard Error: 0.02020 Skewness: 2.605 Kurtosis: 4.830
11. In which auditable areas did you undertake assurance missions during 2024?	Mean: 1.5609 Median: 1.00Mode: 1.00 Sample Variance: 0.579 Standard Error: 0.05018 Skewness: 0.932 Kurtosis:- 0.652
12. What is the degree of implementation of the recommendations made during the audit mission within your entity?	Mean: 3.3391 Median: 1.00Mode: 1.00 Sample Variance: 7.692 Standard Error: 0.18288 Skewness: 0.495 Kurtosis:- 1.659

Source: Self-representation based on the 138 validated questionnaires.

The dependent variable results from the interpretation of statistical data and this

emerged that the hypothesis is validated; the digitalization of audit methods produces positive effects on the general management of the company in the agricultural field, with a significant impact on improving risk management within companies.

The study requires an analysis tool that identifies the interaction of the two factors: the dependent variable and the discrete, independent variables, based on a bifactorial analysis of variance by decomposing the total variation into residual variation.

The statistical interpretation of the results modeled using the SPSS program [17] is shown in Table 2a, 2b, 2c.

Table 2a Case processing summary

Case Processing Summary		
	N	Percent
Included	230	98.7%
Excluded	3	1.3%
Total	233	100.0%

Source: Self-representation based on Statistical Models

Table 2b. Target and dependent variable Q1/Item 1

Target	**Dependent Variable Q1/Item 1**
Automatic data preparation active	
Model selection method	Before starting a new model
New model knowledge criterion	-767.972

Source: Self-representation based on Statistical Models

The model considers statistics that are based on cases with valid data for all variables used, as presented in Table 3. The information criteria admit the complete probability function of the proposed model, with an accuracy of 86%. This aspect shows the fact that the digitalization of the audit is required, which could lead to the efficiency, effectiveness, and transparency of agricultural company expenses, and the current internal audit structure has the necessary resources to support the implementation of the activities due to be undertaken in this regard.

Table 2c. Goodness of Fit

Goodness of Fit[a]			
	Value	df	Value/df
Deviance	75.592	229	0.330
Scaled Deviance	230.000	229	
Pearson Chi-Square	75.592	229	0.330
Scaled Pearson Chi-Square	230.000	229	
Log Likelihood[b]	-105.301		
Akaike's Information Criterion (AIC)	214.603		
Finite Sample Corrected AIC (AICC)	214.656		
Bayesian Information Criterion (BIC)	221.479		
Consistent AIC (CAIC)	223.479		
Dependent Variable: Q1 Model: (Intercept)			
Information criteria in a smaller form are better.			
The full likelihood function is displayed and used in information criteria.			

Source: Self-representation based on Statistical Models

Tabel 3. Model checking

Tests of Model Effects			
	Type III		
Source	Wald Chi-Square	df	Sig.
(Intercept)	277.485	1	0.000
Dependent Variable: Q1 Model: (Intercept), offset = Q12			

Source: Self-representation based on Statistical Models

Tabel 3a Parameter estimates

Parameter Estimates										
			95% Wald Confidence Interval		Hypothesis Test			Exp	95% Wald Confidence Interval for Exp(B)	
Parameter	B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.	(B)	Lower	Upper
(Intercept)	-2.780	0.1669	-3.107	-2.453	277.485	1	0.000	0.062	0.045	0.086
(Scale)	9.998[a]	0.9323	8.328	12.003						
Dependent Variable: Q1 Model: (Intercept), offset = Q12										
a. Maximum likelihood estimate.										

Source: Self-representation based on Statistical Models.

Tabel 3b Model summary

Model Summary		
Target		Q1
Probability Distribution		Normal
Link Function		Identity
Information Criterion	Akaike Corrected	324.726
	Bayesian	328.142
Information criteria are based on the -2 log likelihood (322,709) and are used to compare models. Models with smaller information criterion values fit better.		

Source: Self-representation based on Statistical Models.

Tabel 3c Residual effect

Residual Effect						
					95% Confidence Interval	
Residual Effect	Estimate	Std. Error	Z	Sig.	Lower	Upper
Variance	0.234	0.022	10.700	0.000	0.195	0.281
Covariance Structure: Scaled Identity Subject Specification: (None)						

Source: Self-representation based on Statistical Models.

The implementation of digitalization would contribute decisively to reducing risk by spreading it across agricultural companies, in the sense of establishing risk factors and identifying activities, as can be seen from Table 3, 3a, 3b, 3c, which can generate behaviors that minimize the occurrence of the event that would produce the risk. The research result reveals that independent variables are a factor that influences the impact of risks associated with activities carried out at the company level. In this sense, the increase in the impact of independent variables determines a high level of risks associated with activities that are the subject of internal audit (by influencing the impact), which is why it is necessary to allocate a larger amount of time for the audit, since areas that present risks are usually audited annually. Therefore, as the impact of independent variables increases, the use of digital technologies to reduce the level of vulnerability should increase. This fact is decisive for achieving the dimensioning of the audit activity, implicitly the audit scope.

The research reveals the role of digitization and computerization of audit systems in formulating solutions for the management of agricultural companies regarding efficiency, economy and the harmonization of approaches for the purpose of formulating unitary recommendations, with a high level of traceability to the area of implementation of the recommendations. Thus, by auditing the agricultural sector, the aim is to identify the specificity, vulnerabilities and deficiencies of the system in order to remedy them by providing digitalized audit services, in order to identify, in the shortest possible time, vulnerabilities generated by factors such as regulation, market fluctuations, prices, competition, intrinsic factors such as soil, water, climate, pests. The questionnaire shows the impact of implementing digitalization in the field of internal audit within agricultural companies.

CONCLUSIONS

Following the digitalization of audit techniques, as well as the recommendations of audit missions, the management of agricultural companies will have various tools to maximize results, with an effect in terms of competitiveness and creation of added value, respectively well-being at the level of the branch of the economy.

By auditing organizational processes of strategic importance (e.g. financial-accounting, administrative, human resources) under an integrated vision with the managerial activity, a general picture, an overview of the institution can be formed. For these reasons, the internal audit must be a exclusive, complex and impersonal. In the opinion of the study, internal audit will be strongly

influenced by technology, identifying the premises for a methodological and approach change at the level of data collected and analyzed, identification of causes that may generate the problem, formulation of recommendations that will give companies in the agricultural field premises for implementing the principles of performance management. To increase the effectiveness of audit missions and performance within audit missions, it is necessary to use multi-device means complementary to artificial intelligence systems that generate rapid advantages for the exercise of audit missions.

Once implemented, this model facilitates the activity of internal public audit, streamlines the activities of internal auditors and saves resources of companies in the agricultural sector, using artificial intelligence systems. The role of artificial intelligence is to alleviate the burden of laborious manual processes and to significantly simplify work processes. The ability to quickly evaluate massive data sets not only frees professionals for more valuable tasks, but also allows them to perform their work better. The risk estimation process becomes much more accurate as the amount of data analyzed increases [2]. Larger data sets mean more discrepancies, and auditors must examine them to determine whether or not there are deficiencies in the audit system. While the manual burden on auditors can be reduced, audit professionals can focus on generating strategic insights at the management level. In the process, auditors move from a purely assurance-based role to one in which they become key consultants for the development of agricultural companies [11]. Agricultural companies must offer auditors the chance to work with advanced technologies, thus developing human capital and, at the same time, providing the chance to create complex consulting and management assistance services. Reducing the burden of manual processes and offering staff the opportunity to exercise strategic thinking and analysis will improve the audit process.

At the same time, by developing IT systems at the audit mission level, methods of interactivity can be generated in adjacent systems, such as the internal managerial control system. The use of IT systems provides the premises for performance through a common approach to procedures, standards, contractual clauses, attracting providers of complex integrated services for the professionalization of the system. As a result of the research, we can appreciate that internal public audit, through the specific activities and tools used in carrying out audit missions, creates a mechanism for evaluating all activities in an agricultural company, while also being a promoter of the quality of consulting services, included finance and structural funds [12], [16].

The digitalization/computerization of internal audit, as appreciated by over 80% of the auditors included in this study, will primarily impact on increasing the degree of efficiency and effectiveness, but also on the reliability of this process, in the context of technological development and the increasing complexity of organizational processes, in organizations' attempt to adapt to changes in the external environment.

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