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Application of Digital Tools Assessing Information Risk in the Control Activity

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Abstract

The paper discusses digitising the leading information flows in control activities. The focus is on applying technology and its integration in implementing forms of control. The aim is to argue for practical approaches to minimise information risk in pre-ongoing and post-control to ensure the accuracy and veracity of financial and non-financial information. Evaluating the effectiveness of data ensures integrity, consistency, validity, completeness and timeliness - applying digital risk assessment tools to control activities. To prove the hypotheses, the cross-tabulation method is applied, focusing on the relationship between the use of verification, inspection, audit, revision and supervision, and the digital tools applied in the control institutions implementing financial control in the public sector of the Republic of Bulgaria. The study evaluates the effectiveness of data management practices, emphasizing the importance of maintaining integrity, consistency, validity, completeness, and timeliness. The study acknowledges that the use of advanced digital risk assessment tools could improve the effectiveness of control activities in various areas. The approach supports the sustainability of financial control and is in line with modern management standards, promoting a culture of accountability and precision in the management of public finances.

Introduction

The paper examines the impact of digital tools on the assessment of information risk in control activities by analyzing and evaluating their role in implementing forms of control. Risk assessment is part of the overall process related to organisations' integrated risk management framework (Kostova, Krumov, & Vatkova-Milusheva, 2020). The framework comprises a set of policies and procedures through which senior management controls the compliance of activities and operations with regulatory requirements at different hierarchical levels. The risk assessment identifies the key and "critical points" in the

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processes subject to control. Developing an adequate risk assessment requires that external and internal risks are examined, identified, and ranked in terms of their impact and effect to mitigate them adequately to an acceptable level (Eliana, Astuti, Ivana, Suryafatma, & Juned, 2023).

The leading resource used in a control system is information; therefore, control bodies should apply tools for identifying and assessing information risk. Risk assessment methods and their impact on the information flow feeding the companies' business processes are examined (Eboigbe, Farayola, Olatoye, Nnabugwu, & Daraojimba, 2023).

The article is focused on financial control and auditing, as the goal is to analyze the application of digital tools in the control process to reduce information risk. The authors achieve the goal by setting the following two hypotheses:

H1: To reduce information risk to an acceptably low level, digitization in control activities must be consistent with the pace of digitization in business organizations.

H2: Financial control and audit institutions in the public sector have various digital tools which need to be optimally used when implementing specific forms of control.

The paper is organized as follows: Section 2 reviews the academic literature on information risk assessment and the adaptation of control actions for information collection, selection and processing. Section 3 describes the methodology used in the research paper to find the relationships between different indicators characterizing the degree of digitization of processes in control institutions. Section 4 contains a cross-analysis of the relationship between forms of control and the digital tools used. Finally, the conclusions are summarised in Section 6.

Literature Review

Assessing information risk

The development of the control system is directly linked to the state and level of information security. Due to the ongoing and increasing number of threats to information security, the requirements on control institutions are aimed at continuously improving their system (Berdyugin, 2018). Managing control processes requires accuracy, reliability and effectiveness of the information they use to substantiate their findings. It makes it

possible to set up a system for continuously identifying, assessing and developing options for countering risks of misconduct (Zhelev, 2022). On the one hand, mistakes in risk identification can lead to correct assessments and, consequently, to appropriate conclusions and recommendations for the undertakings audited. On the other hand, having a properly functioning information risk management and assessment system at the audited establishments is also necessary. The relationship between these is one of the essential elements for improving the effectiveness of control processes (Shevchenko, H., 2021).

Mayer et al.] (2018) accept that business process optimization lies in the practical assessment of information risk. Lei (2011) views information risk assessment as a set of actions taken and implemented to minimize risk costs and thereby optimize processes. Also, Zhang (2009) reasons the fact that process optimization should consider the criterion that characterizes the balance between the costs of information risk management and the losses from its possible application. Therefore, to assist control bodies in assessing information risk, it is necessary to implement digital tools in their information systems adapted to the specificity of their processes.

Digital tools in control activity

The application of digital tools in financial control directly relates to companies' financial and non-financial information (Zhelev & Kostova, 2024). Minimising information risk and reducing factors that threaten financial stability is essential. It is necessary to apply digital tools adequately, on the one hand, to the nature of financial relations aspects of economic activity and, on the other, to the specific nature of the control activity carried out (Manita, Elommal, Baudier, & Hikkerova, 2020).

Digital tools contribute significantly to increasing the efficiency, accuracy and speed of the control process. Technologies such as specialised software, analytical tools, and cloud platforms provide convenient access to a large amount of data and facilitate financial information collection, processing, and analysis. According to Bierstaker et al. (2014) digital technologies are essential in implementing control procedures, especially in big data environments. Overall, computer technology dramatically facilitates and improves processes, allowing auditors to focus on risk analysis and detection, increasing the accuracy and efficiency of audits. The collection, processing, transfer and

interpretation of information in specialised software and tools should be subject to different selection criteria to systematise financial and non-financial information (Cristea, 2020).

Procedures that can be performed using digital tools in financial control include comparisons, horizontal, vertical, trend, factor analysis, etc (Ionin & Prylutskiy, 2023). To carry out control procedures, it is necessary to calculate financial ratios based on which it is possible to derive the relationships between the various indicators of financial reporting and financial and non-financial information (Kostova, 2022). Famous foreign financial researchers (Thottoli & Thomas, 2020; Qasim, Khan, & Majeed, 2021) emphasize the importance of financial ratios while pointing out their limitations and scope of use, referring to their overestimation, misuse, danger of mechanical analysis, etc. The simplicity and logic of their calculation make them popular and widely available for practical use.

The widespread use of financial analysis in analytical practice, audit, financial management, and the formation of a mandatory standard set of information, especially at the corporate level, cannot but affect the issue of unification (typification) of analytical indicators and their alignment to a single form of comparability. On the one hand, there is very often no uniform terminology and, on the other hand, analytical indicators with the same name are calculated in different ways, which affects their content and, consequently, the field of application.

Using digital tools to work with data, analyse financial information, and perform analytical procedures has a significant impact on the control process. Such procedures are mainly applied to check at the beginning and end of the reporting period, to identify unusual or atypical transactions with assets and liabilities, to check the existence of transactions related to the depreciation of fixed assets in the accounts, and additional procedures. The control activities provide for the application of complex analysis using statistical methods that enable the implementation of optimisation, statistical methods and risk assessment models. Control bodies use these tools to assess financial and non-financial data objectively, ensuring a high level of reliability and accuracy in implementing financial controls.

Methodology

Descriptive statistics and cross-tabulation methods are applied on the basis of a survey conducted by the authors. The respondents are part of the control institutions that carry out financial control in the public sector of the Republic of Bulgaria. In Tables 1 and 2, the interrelation between two survey questions is partially examined by connecting the respondents' answers about the applied form of control to their answers about the digital applications used.

The survey was distributed among over 453 specialists working in financial control institutions at the national level: the National Revenue Agency, the Customs Agency, the State Audit Chamber, and the State Financial Inspection Agency. Cochran's method was used to determine the sample size (Cochran, 1977), considering the data for the confidence interval ($Z = 2$), the selected percentage (0.5) and the mean error rate ($c = 21$). The obtained results are based on a guaranteed probability equal to 95% and a guaranteed factor of $Z = 2$, which requires a minimum of 437 respondents for the representativeness of the sample. The first two are the primary revenue administrations, collecting 80% of the total revenue in the state budget. The State Audit Office and the State Financial Inspection Agency inspect 90% of organizations that dispose of budget funds. The aim is to get an idea of the current state of the technological integration of digital tools for implementing control procedures. The questions are formulated to reveal how digital tools support the stages of information collection, processing, and protection and how they affect the overall effectiveness of financial controls. In the study, we investigated three groups of nominal variables: digital tools, elements of the information management process, and forms of control.

The analysis aims to provide an objective overview and comparison of different digital tools and forms of control. Using cross-tabulations, a systematic method of comparing the key features, functionalities and benefits of technologies is provided. The analysis includes examining the characteristics of the forms of control and the features of the tools applied to collect and process information. Each of these categories is evaluated and compared through the lens of different digital tools. The aim is to clearly and objectively identify the most appropriate digital tools versus forms of control to

reduce information risk. The analysis will be helpful for organizations and institutions to make effective decisions for their tasks and challenges and to determine whether observed differences between groups are statistically significant or simply the result of chance.

Results

In today's environment, digital tools and forms of control play a crucial role in operating and managing various aspects of business and the public sector. With the

variety of technologies and software solutions available, the need arises for analysis and comparison to identify the most appropriate tools to achieve their specific objectives. The study of the digital tools used to carry out inspection, monitoring, supervision, audit, check, and revision found that the digitalization of the control processes primarily refers to their organization. The highest percentages are Microsoft Office Suite, Google Workspace, Video conferencing tools, and Specialized software, and they are strongly significant only in monitoring and checking (Table 1).

Table 1

The interrelationship between forms of control and applied digital tools (Part 1)

			Digital Instruments			
			Microsoft Office Suite	Google Workspace	Video conferencing tools	Specialized software/s
Forms of control procedures	Inspection	Count	78	60	69	60
		%	17.2%	13.2%	15.2%	13.2%
	Monitoring	Count	204	126	228	216
		%	45.0%	27.8%	50.3%	47.7%
	Supervision	Count	57	42	54	48
		%	12.6%	9.3%	11.9%	10.6%
	Audit	Count	33	18	48	42
		%	7.3%	4.0%	10.6%	9.3%
	Check	Count	198	126	186	180
		%	43.7%	28.5%	41.1%	39.7%
Revision	Count	27	18	24	18	
	%	6.0%	4.0%	5.3%	4.0%	
Total		Count	357	231	348	318
		%	78.8%	51.0%	76.8%	70.2%

Source: Author's work

From public data for research on the digitalization of business in the Republic of Bulgaria as of March 2023, dynamic development and implementation of digital tools to improve business processes, collection and protection of information is established (Bulgarian Industrial Association (BIA), 2023). The majority of surveyed enterprises indicate that the digital technologies they use are sensors for recording information (77%), enterprise resource planning systems - ERP (70%) and customer relationship management systems - CRM (69%). The percentage of those using mobile applications (65%), cloud computing (59%) and, digital connectivity and/or the Internet of Things (51%) is also relatively high. 42% of the respondents declared that they use software and systems for cyber security and 36% - cyber-physical systems.

ERP and CRM systems in inspection

From the study, it was found that there needs to be a higher adoption of ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management) systems (Table 2). When carrying out inspection activities, their use can assist inspection bodies in terms of more effective information management. ERP systems integrate an organisation's different functions and processes by collecting and processing data from different functional levels and systems. It allows control bodies to gain a holistic view of the activities of inspected entities by having access to up-to-date and accurate information on their operations, financial status, resource availability, etc. In terms of analysis and monitoring, ERP systems provide tools for data analysis

and tracking, allowing control bodies to detect anomalies, inconsistencies or risks in the activities of the audited entities. They create individual reports to perform trend analyses and monitor compliance with various regulatory requirements.

CRM systems allow control bodies to monitor relationships with inspected entities and to maintain effective communication with them. They can track the history of interactions and manage contacts with them, which can improve the quality of inspections and trust

between parties in the inspection process. The use of ERP and CRM systems can facilitate the process of collecting and providing information on the activities of inspection bodies, leading to greater transparency and accountability. They can provide stakeholders with easy access to data and reports on their activities, contributing to increased openness and trust in the work of inspectors. Therefore, using ERP and CRM systems can improve inspection bodies' efficiency, accuracy and transparency, helping them carry out their functions more effectively and efficiently.

Table 2

Interrelationship between forms of control and applied digital tools (Part 2)

			Digital Instruments				
			ERP systems	CRM systems	Artificial intelligence	Data encryption, hashing and caching technologies	Software for processing large databases
Forms of control procedures	Inspection	Count	3	3	6	9	12
		%	0.7%	0.7%	1.3%	2.0%	2.6%
	Monitoring	Count	24	12	27	57	75
		%	5.3%	2.6%	6.0%	12.6%	16.6%
	Supervision	Count	9	9	9	21	24
		%	2.0%	2.0%	2.0%	4.6%	5.3%
	Audit	Count	0	0	6	15	12
		%	0.0%	0.0%	1.3%	3.3%	2.6%
	Check	Count	9	6	12	24	45
		%	2.0%	1.3%	2.6%	5.3%	9.9%
Revision	Count	0	3	0	0	9	
	%	0.0%	0.7%	0.0%	0.0%	2.0%	
Total		Count	24	15	27	66	93
		%	5.3%	3.3%	6.0%	14.6%	20.5%

Source: Author's work

ERP and CRM systems in Audit

ERP and CRM systems can benefit auditors, assisting the audit process and ensuring more efficient task performance. Regarding centralised access to data, ERP systems integrate different functions and data from different parts of the organisation into one aggregated system resource. It allows auditors to access a wide range of information, including financial data, operational processes, etc. They can easily retrieve and analyse the data needed to conduct an audit.

Because information is inextricably linked to risk management, ERP systems can help auditors identify and assess potential risks across an organisation's processes and functions. They can use the system to monitor and analyse these risks, helping them to focus on critical areas during audit activity. Using ERP systems

automates many of the organisation's operations and reduces manual data entry. It leads to greater accuracy and reliability of the data that auditors use. The systems can support the data verification process and provide easier access to historical financial information. The application of CRM systems can be helpful to auditors in managing client relationships, including with the organisations being audited. They can help track communication with clients, manage contracts and gather feedback from them, which can improve the audit process.

ERP and CRM systems under revision

The implementation of ERP and CRM systems is also low in revision activities. Incorporating these systems can be extremely useful for control authorities, helping them carry out their revision activities more effectively and

efficiently. ERP systems integrate various functions and data from different sites and processes of the organisation by making a logical link between the data of the past accounting period and the current year. The collected information is systematised into different cuts by dividing it into financial operations and operational processes. The auditors can extract information according to set criteria, both from documents processed in the past period and to project future trends through the extrapolation method.

As the revision covers historical information, identifying risks and weaknesses in management systems is essential. The ERP systems contain critical information about the internal controls and procedures in the organisation. Control authorities can use the information to identify potential risks and weaknesses in management systems and focus on critical areas during the audit. ERP systems offer tools to automate revision processes, which helps auditors perform their procedures faster and more efficiently. They can use the system to generate reports, run tests, and analyse data, reducing manual input of information and improving results' accuracy. Tracking communication with auditees, managing control procedures and collecting feedback can be enhanced, improving the revision process.

In terms of reducing information risk, using ERP and CRM systems can increase transparency and accountability of the organisation's processes, which is essential for control authorities. They can monitor and analyse transactions and operations in real time, providing greater visibility into the organisation's operations.

Artificial intelligence and its application in various forms of control

It is evident from Table 2 that artificial intelligence (AI) needs to be sufficiently used to implement various forms of control. It can be effectively applied in the analysis of large volumes of data. Through artificial intelligence, the processing of large databases has high speed and accuracy, which is essential for control bodies in the analysis of financial information and operational processes of the organisation. It can identify abnormalities, trends, and anomalies in the data, which helps the controlling authorities to perform more effective checks.

In predicting risks and adverse events associated with information, artificial intelligence can analyse historical data and build models to predict risks and anticipate

potential adverse events for control objects and entities. It allows control authorities to identify potential problems and take appropriate risk management measures. In optimising routine and repetitive inspections, AI can automate routine processes such as checking compliance with policies and procedures, producing reports, etc. It allows inspectors to focus on inspection activity's more strategic and analytical aspects.

A significant application of AI can also be sought to improve data accuracy and reliability. The AI can improve information by automating the processes of information verification and validation. It can detect and correct errors in data, resulting in better quality information for verifiers. Thus, artificial intelligence can speed up and optimise the verification process by reducing the time and resources required to conduct verifications. It allows more detailed inspection procedures to be performed in a shorter timeframe. Therefore, using artificial intelligence can assist control authorities by providing them with innovative tools and technologies that can improve their control activities' efficiency, accuracy, and reliability.

Control authorities can use data caching to speed up the process of retrieving and analyzing information during controlling activities. It will increase data security by preventing unauthorized access or manipulation of data. The digital tools can facilitate the process of verification and analysis of data by control bodies, ensuring its integrity, reliability and immutability.

After comparing the level of digitization of business and the study of the application of digital tools in the control institutions of the Republic of Bulgaria, it was established that business is ahead of financial control. It confirms the first hypothesis that control institutions should more actively adapt to the requirements of digitalization. As a result of the above and the results of the survey, it was found that control bodies need to sufficiently implement ERP and CRM systems and AI, which confirms a second hypothesis that control bodies do not optimally use a variety of digital tools. It leads to several difficulties related to inefficient use of financial, human and material resources and increased information risk.

Future research directions

The research will be a fulcrum for exploring in-depth digitisation of primary information flows in control activities. The focus will be on the correlations and

dispersion of the application of digital tools in the information-gathering and processing stage. The survey will target business organisations to compare the extent of digitisation of the control system and the business. Opportunities will be sought to apply different tools for processing and checking large databases. The authors will mainly focus on researching the possibilities of artificial intelligence and its integration into control activities. The aim is to argue for practical approaches to identify errors and fraud to ensure the accuracy and veracity of financial and non-financial information. Evaluating the effectiveness of data will ensure integrity, consistency, validity, completeness and timeliness.

Conclusion

The practical application of digital tools is essential to reduce information risk in the control activity. They help identify potential threats and reduce their negative impact on control procedures. Their implementation, in the form of control, should be carried out by building clear policies and procedures to secure control information. Digital tools are applicable in various aspects, such as access protection, data encryption, regular checks, etc. The dynamics of the digitalization of business and the optimization of business systems for collecting and analyzing financial and non-financial information require control institutions to implement

adequate digital tools promptly. Implementing digital tools requires regular updates to the software and systems that support the digital tools.

As a result of the data from the digitization of the business, it is necessary to pay special attention to the combination of ERP and CRM systems in implementing the forms of control, which will help increase its efficiency. The research established that these digital tools have the weakest manifestation in all forms of control, and they need to be applied in the audit. The control institutions should direct their attention to those digital tools through which transactions and operations can be monitored and analyzed in real time, providing greater visibility of the organization's operations. On the one hand, the combination of ERP and CRM systems can support the control bodies managing the audit by providing them with easier access to information, and on the other hand, it can increase the efficiency of the audit processes and increase the transparency of the organization's activities. It is essential to protect control procedures from potential loopholes. These activities can be optimized by implementing monitoring and rapid response systems that detect non-conformities at an earlier stage. Encryption can protect confidential information from unauthorized access during the audit. Combining the above measures can significantly reduce information risk in the control system.

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Uporaba digitalnih orodij za ocenjevanje informacijskega tveganja pri kontrolnih dejavnostih

Izvleček

Prispevek obravnava digitalizacijo vodilnih informacijskih tokov v kontrolnih dejavnostih. Osredotoča se na uporabo tehnologije in njeno integracijo pri izvajanju oblik nadzora. Namen prispevka je zagovarjati praktične pristope za zmanjšanje informacijskega tveganja pri predhodnem in naknadnem nadzoru, da se zagotovi točnost in resničnost finančnih in nefinančnih informacij. Ocena učinkovitosti podatkov zagotavlja integriteto, doslednost, veljavnost, popolnost in pravočasnost - z uporabo orodij za digitalno oceno tveganja pri kontrolnih dejavnostih. Za dokazovanje hipotez je uporabljena metoda navzkrižne tabele (angl. cross-tabulation method), ki se osredotoča na razmerje med uporabo preverjanja, inšpekcije, revizije, revizijskega pregleda in nadzora ter digitalnimi orodji, uporabljenimi v kontrolnih institucijah, ki izvajajo finančni nadzor v javnem sektorju Republike Bolgarije. Študija ocenjuje učinkovitost praks upravljanja podatkov, pri čemer poudarja pomen ohranjanja integritete, doslednosti, veljavnosti, popolnosti in pravočasnosti. Študija ugotavlja, da bi z uporabo naprednih orodij za digitalno oceno tveganja bilo mogoče izboljšati učinkovitost kontrolnih dejavnosti na različnih področjih. Pristop podpira trajnost finančnega nadzora in je v skladu z modernimi upravljavskimi standardi, s čimer spodbuja kulturo odgovornosti in natančnosti pri upravljanju javnih financ.

Ključne besede: Orodja za digitalno oceno tveganja, informacijska integriteta, upravljanje z javnimi financami, optimizacija, odgovornost