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INTERNAL AND EXTERNAL CONTROL IN THE COMPUTER ENVIRONMENT: SOFTWARE AND THE COMPONENT APPROACH

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Annotation. The purpose *of the article is examines internal and external control in a computer environment with an emphasis on software and a component approach.* ***Methodology of research.*** *The control system is considered as an important tool for ensuring the stability of the functioning of the public sector and business entities. Special attention is paid to the need to modernize control methods in connection with the development of information technologies.* ***Findings****. It was determined that modern software should ensure the protection of information resources and control over compliance with legal norms. The article substantiates the advantages of implementing a component approach for creating flexible, scalable and effective control systems.* ***Practical value.*** *The interaction between state and private business entities in the process of control, the importance of coordination and information exchange for timely identification of potential threats is considered.*

Keywords: *control, audit, finance, financial reporting, information technology, software, component approach.*

General statement of the problem and its connection with the most important scientific or practical tasks. The control system in Ukraine is an important tool for ensuring the stability of the functioning of the public sector, including the state administration and other business entities belonging to various sectors of the economy. With the development of information technologies, the need to modernize existing control methods and tools and introduce new approaches to the control system is growing. The creation of effective control systems in the computer environment, which ensure the protection of information resources, control over compliance with legal norms, and prompt response to potential threats, is gaining special relevance.

The control system includes both public and private initiatives aimed at ensuring cyber security, data protection and information flow management. One of the key tasks is the development of modern software that can integrate with existing systems and adapt to the specific needs of the national infrastructure. Implementation of a component approach to the creation of such systems will ensure their flexibility, scalability and efficiency in the use of resources.

Particular attention should be paid to issues of interaction between various subjects of the control system, including state institutions, private economic entities, institutions belonging to different industries (education, health care, etc.). That is why it is important to ensure the appropriate level of coordination and information exchange for timely identification of potential threats.

Analysis of recent research and publications. The significant interest of scientists and practitioners in the chosen subject matter among most researchers is focused on the analysis of software (software products) that is actively used for internal and external control. Such scientists as Borovkova T. [1], Burak M.P. [2], Butynets T.A. [3], Ivakhnenkov S.V. [4], Kovtun T.V. [5], Purii H.M. [6], Khorunzhak N.M. [7], Yaremko I.Y. [2] etc. In their research, they draw attention to the importance of automation of management in the conditions of modern challenges, especially in crisis periods, for example during war. Recent studies of control in the computer environment indicate a significant increase in attention to the development of software for the effective control of financial and management processes [1–7].

In our opinion, one of the main ways of solving control problems is the use of a component approach, which allows to increase the flexibility and adaptability of the computerized systems used for its implementation, and to significantly increase the effectiveness and quality of control actions.

Formation of the objectives of the article is to justify the feasibility of using a component approach to overcome the shortcomings of traditional control software and to develop recommendations for its

implementation. The realization of this goal involves the study of the basic principles of the component approach, the analysis of existing solutions and practices in the field of control software.

Presentation of the main research material with full justification of the scientific results obtained. The process of computerization of control is an important component of the management of any economic entity, as it allows to increase the accuracy, transparency and efficiency of operations carried out in the course of activity. The choice of software for these tasks depends on several factors, such as company size, industry affiliation, and acquisition costs. Large enterprises often use complex systems such as SAP ERP or Oracle Financials, which provide a high level of automation and extensive analytical capabilities. At the same time, small and medium-sized enterprises prefer more affordable and flexible solutions, such as QuickBooks, Xero or Zoho Books, which are adapted to their needs and financial capabilities.

In addition to internal financial control, external control by state bodies and auditing companies is gaining special importance. For its effective implementation, specialized software solutions are used that automate the processes of verification, audits and analysis of financial statements. Software products such as ACL Analytics, IDEA, CaseWare IDEA, TeamMate, CCH Audit Automation, and ProAudit offer powerful tools regulatory agencies to effectively perform their functions and detect violations [8].

The use of modern software for financial control helps to reduce risks, increase the transparency of financial transactions and ensure the proper level of financial discipline at enterprises.

Regardless of the chosen system, it is important to ensure that it meets the needs of the business and the ability to integrate with existing processes and systems. Therefore, the choice of software depends on the specific needs of the regulatory body, the scope of inspections and other important indicators.

For visualization and better visualization, all software products are described in Table 1.

In Table 2, we will conduct a study of audit software products regarding the presence of the most necessary functions in them, since, unfortunately, we did not find specific control computerization programs in the available information resources. Considering the significant similarity of control and audit methodology, we consider it possible to carry out appropriate adaptive design changes to bring such products into full compliance for control purposes.

As for Ukrainian computer programs for conducting audits, there are practically none of them in the Internet search. An exception is the product "Ivakhnenkov and Kateniov Audit", which provides a quick

Table 1

The most popular software products for the computerization of internal and external control and their features

Product name / Features	Integration	Modularity	Analytics	Scalability	Automation	Reports	Cloud solutions	Friendly interface	Analysis of large volumes of data	Data analysis and audit	Management of audits	Documentation	Compliance	Audit process	Number of secured options	The need for new options
Internal control																
SAP ERP	+	+	+	+											4	+
Oracle Financials	+		+		+	+									4	+
Microsoft Dynamics 365	+	+	+				+								4	-
QuickBooks	+				+	+		+							4	+
Xero	+				+	+	+								4	-
Zoho Books	+				+	+	+								4	-
External control																
ACL Analytics (Galvanize)	+				+	+			+						4	+
IDEA Data Analysis Software	+				+	+				+					4	+
CaseWare IDEA	+				+	+			+						4	+
TeamMate Audit Management System	+					+					+	+			4	+
CCH Audit Automation	+				+	+							+		4	+
ProAudit	+				+	+								+	4	+

Source: author's generalization based on data [8–9]

Table 2

Characterization of the functions of popular software products regarding the audit of the business entity

№	The name of the software product	Functions of computer programs								
		1	2	3	4	5	6	7	8	9
Software products for audit purposes										
1	Asset Panda	+	+	–	+	+	–	–	+	–
2	Suralink	+	–	–	+	+	–	–	+	–
3	AuditBoard	+	+	+	+	–	+	–	+	+
4	KAWAK	+	+	+	+	+	+	+	–	+
5	SafetyCulture (iAuditor)	+	+	+	+	–	+	+	+	+
6	Netwrix Auditor	+	+	–	–	–	+	–	–	+
7	Ncontracts	+	–	–	+	+	+	–	–	+

Note:* 1 – notification, 2 – compliance management, 3 – corrective and preventive actions, 4 – document management, 5 – document storage, 6 – incident management, 7 – inspection management, 8 – mobile access, 9 – risk assessment.

Source: compiled by author based on [9]

"express audit", identification of problem areas, speeds up the process of familiarizing the auditor with the specifics of accounting and internal control of the business entity) [4, p. 40], practically absent.

However, such computer firms as Zfort Group, N-iX, Vakoms, SoftElegance and others offer custom development of any analytical direction programs, as well as audit computerization programs.

Software products of Ukrainian production are oriented to the needs of domestic enterprises and develop computer systems taking into account the modern challenges of society. Despite this, as evidenced by our research and the research of a number of Ukrainian scientists: «it should be noted that today there is no powerful tool that would allow fully automating the audit. This is explained by a number of shortcomings of audit automation» [2, p. 6].

Agreeing with this position, we note that in terms of control, those software products that are intended for auditing have a drawback related to the formulation of the final document – the audit report. Other shortcomings that we discovered in the process of studying the special literature and characteristics of software products include: the lack of a unified approach to the performance of control tasks and communication problems with access to the regulatory base (except for the base of the League. Law). In our opinion, it is advisable to create separate similar platforms under the headings: external control; internal control. It is also necessary to create a synergistic complex system of information and data exchange with access to it by all specialists who carry out control.

An equally important drawback is that control computerization programs are unified, and therefore do not take into account the specifics and features of a business entity, which are important in control.

In our opinion, overcoming the shortcomings is possible thanks to the use of a component approach.

The advantage of the component approach is that unified products can be optimally equipped with the appropriate application and adapted to the control object.

Therefore, the rational position of scientists, in particular such as Burak M. P., Yaremko I. Y., who believe that such a "product should be flexible, have advanced means of controlling operations and connection at the level of databases with accounting programs ... and be easy to use" [2, p. 2].

In general, each of the software products studied above has its own features and capabilities, but they also have many common characteristics.

Thanks to this, ensuring the implementation of the component approach enables the formation of a complex system that will have better characteristics and compositional relationships for control.

By the way, the component approach, in the historical aspect, is the most modern approach to the construction and development of software (emerged after the mid-90s of the last century), which involves the construction of programs in the form of separate components. The latter can exist separately, but interacting with each other through standard binary interfaces, implement the assigned tasks (in our case, control) of different users. The same component can be used for different interfaces. In view of this, there is a real basis for supporting the necessary control functions through the use of appropriate instructions.

With such an approach, the presence of interacting programs of arbitrary types (applications, operating system, etc.) allows you to use the functions provided by them and implement the necessary control processes even remotely. That is, in this case, it does not matter how specific parts of the program function: in one process or in different processes.

Also, thanks to the component approach, the functions of the programs can be used on one or on different computers. This approach enables multi-channel interaction using basic mechanisms, and the location of the controller itself (client) is not important here. In addition, its advantage is that the same component can be used in a new program without modification in applications, which simplifies programming and makes it cheaper, since already existing software elements are used.

Without going into the details of the technical side of the implementation of the component approach, we note that basic knowledge about it allows you to develop appropriate tasks and prescribe the stages that precede, in fact, the very process of compiling the program (programming).

Thus, even though most modern software products for control and auditing have advanced capabilities, their integration according to a component approach will allow increasing the efficiency of these systems. A component-based approach simplifies programming, reduces costs, and increases flexibility by allowing existing program components to be used for new tasks without modification. This makes the use of such an approach strategically important for ensuring effective control and auditing in various sectors of the economy.

Conclusions. Internal and external control in the digital economy is characterized using information technologies. They are an important tool for maintaining the stability, transparency and security of the public sector and private business entities. Since the computerization of control allows to increase its efficiency, there is an urgent need to modernize and adapt existing computer programs to new requirements. The main direction of improvement is the implementation of the component approach. It provides flexibility, scalability and performance of the software product. Using this approach allows you to effectively integrate the control system with the existing infrastructures of the enterprise, as well as adapt the software to the specific requirements of business entities.

In general, the key task is to create reliable software products that can integrate with existing systems and ensure constant control of activities and compliance by business entities with the requirements of legislation during their conduct. In addition, it is important to develop tools that allow you to quickly respond to potential threats and detect violations. In the future, the development and use of IT in the process of control and management depends on the improvement of methods of their design and implementation, as well as on the support of synergy between public and private initiatives to create a more secure and stable information (computer) environment.

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Лукановська І.Р., *Західноукраїнський національний університет.* ***Внутрішній та зовнішній контроль в комп'ютерному середовищі: програмне забезпечення та компонентний підхід.***

Анотація. ***Метою статті*** *є обґрунтування доцільності застосування компонентного підходу для подолання недоліків традиційного програмного забезпечення контролю й розробка рекомендацій щодо його впровадження. Реалізація цієї мети передбачає вивчення основних принципів компонентного підходу, аналіз існуючих рішень і практик у сфері програмного забезпечення контролю.* ***Методика дослідження****. Розглянуто систему контролю як важливий інструмент забезпечення стабільності функціонування державного сектору та суб'єктів господарювання. Особлива увага приділена необхідності модернізації методів контролю у зв'язку з розвитком інформаційних технологій.* ***Результати****. Визначено, що сучасне програмне забезпечення має забезпечувати захист інформаційних ресурсів та контроль за дотриманням законодавчих норм. У статті обґрунтовано переваги впровадження компонентного підходу для створення гнучких, масштабованих і ефективних систем контролю. На думку автора, подолання недоліків програмного забезпечення контролю можливе саме завдяки використанню компонентного підходу, який передбачає побудову програм у вигляді окремих компонентів.* ***Практична значущість результатів дослідження.*** *Розглянуто взаємодію між державними та приватними суб'єктами господарювання в процесі контролю, важливість координації та обміну інформацією для своєчасного виявлення потенційних загроз. Окрему увагу зосереджено на програмному забезпеченні для автоматизації контролю, серед яких популярні рішення для великих та середніх підприємств, такі як SAP ERP, Oracle Financials, QuickBooks, Xero, Zoho Books тощо. Автор також аналізує програмні продукти для зовнішнього контролю, такі як ACL Analytics, IDEA, TeamMate, що використовуються для автоматизації перевірок, аудитів та аналізу фінансової звітності. У статті акцентується увага на важливості адаптації програмного забезпечення до специфічних потреб суб'єктів господарювання, що дозволить підвищити ефективність контролю. Автором визначено, що ключове завдання полягає у створенні надійних програмних продуктів, які можуть інтегруватися з існуючими системами та забезпечувати безперервний контроль діяльності й дотриманням суб'єктами господарювання законодавчих вимог.*

Ключові слова: *контроль, аудит, фінанси, фінансова звітність, інформаційні технології, програмне забезпечення, компонентний підхід.*