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MODERN PROBLEMS OF IMPLEMENTATION OF INFORMATION SYSTEMS IN BUDGETARY INSTITUTIONS

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budget, budget system, budgetary institution, information, information system, information and analytical system, information technologies, automated system of financial settlements.

The article examines the factors that contribute to the automation of budgetary institutions, including the accelerated computerization of society, the development of new information technologies, and scientific approaches to labor organization. The essence of an information system is analyzed from technical, business, and semantic perspectives. Conditions under which automated information systems in budgetary institutions should enhance the quality of accounting information are outlined. It has been established that two approaches are employed globally for the creation and development of public finance management information systems: centralized and decentralized, with their respective advantages and limitations identified. The article highlights the features of implementing an automated financial settlement system as a territorially distributed system. The role and significance of an automated financial settlement system as a distributed system are defined. Additionally, the purpose and main objectives of the integrated information-analytical system «Transparent Budget» are specified.

СУЧАСНІ ПРОБЛЕМИ ВПРОВАДЖЕННЯ ІНФОРМАЦІЙНИХ СИСТЕМ В БЮДЖЕТНИХ УСТАНОВАХ

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Ключові слова:
бюджет, бюджетна система, бюджетна установа, інформація, інформаційна система, інформаційно-аналітична система, інформаційні технології, автоматизована система фінансових розрахунків.

У статті досліджені фактори, що сприяють автоматизації бюджетних установ зокрема, такі, як прискорена комп'ютеризація суспільства, розвиток нових інформаційних технологій, наукові підходи щодо організації праці. Досліджено сутність інформаційної системи з технічного погляду, ділового та семантичного. Зазначено умови, при виконанні яких автоматизовані інформаційні системи бюджетної установи повинні сприяти підвищенню якості облікової інформації. Встановлено, що у світовій практиці застосовуються два підходи до створення і розвитку інформаційних систем управління суспільними фінансами – централізований та децентралізований, визначені їх переваги та обмеження. Зазначено особливості впровадження автоматизованої система фінансових розрахунків як територіально розподіленої системи. Визначено роль та значення автоматизованої системи фінансових розрахунків як територіально розподіленої системи. Визначено призначення та основні завдання інтегрованої інформаційно-аналітичної системи «Прозорий бюджет».

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Problem statement

The market transformation of the economy requires a theoretical reevaluation and practical improvement of the forms and methods of financial support for the development of the state's economic system. It is widely accepted that the state plays a key role not only in the financial provision of budgetary processes but also in actively regulating the mechanism for delivering services to optimize various sources of funding. The issue of the effective use of financial resources is highly relevant to budgetary institutions. When developing mechanisms for modern financial and economic relations within budgetary institutions, the critical focus is on the formation, distribution, and utilization of financial resources.

Budgetary institutions and organizations are a key part of this system and occupy a significant share of the expenditure part of the budget. Therefore, the study of issues related to the improvement of information systems aimed at increasing the efficiency of the use of budget funds is of great practical importance.

The relevance of informatization in the socio-economic sphere is quite evident. The need for the development and application of effective and adequate computer programs and technologies is increasing today. Currently, there is a pressing need in budgetary institutions to expand analytical work. In this regard, the automation of budgetary institutions, taking into account modern requirements, becomes an objective necessity.

Analysis of recent research

Such scientists-economists as Yu. V. Volosiuk [13], L. Hutsayliuk [1], T. S. Kuchmiiova [13], S.M. Romashko [5], S.V. Syrtseva [13], O. O. Skoryk [7], O. L. Totska [10], N. Khorunzhak [1] and others. However, even today the functioning and implementation of computer information systems of budgetary institutions are characterized by the presence of a number of problems not only of an economic, but also of an informational nature.

Goal formation

The article is aimed is to explore the objective necessity and the specific features of implementing information-analytical systems in the operations of budgetary institutions.

Summary of the main material

One of the components of the global computer system in the public sector is an automated accounting system. Since it is the basis for the formation of information support for activities and is characterized by the presence of large arrays of various information, this, in turn, requires the widespread application of the achievements of technical progress in the field of creating information automated systems [1].

It should be noted that several factors contribute to the automation of budgetary institutions, including accelerated computerization of society, the development of new information technologies, and scientific approaches to labor organization. All of these factors form the foundation for the development and implementation of both relatively simple automated workstations aimed at solving specific local tasks and complex automated management systems, which operate in large departments of institutions, organizations, and entities in the budget sector, addressing a variety of tasks.

Budgetary institutions include organizations and institutions whose activities are fully or partially financed from the budget (state or local). These include, in particular, institutions of healthcare, culture and art, physical culture and sports, educational institutions, as well as other institutions created to meet the socio-economic, educational, cultural, educational and other needs of the population.

According to the Budget Code of Ukraine, budgetary institutions are state authorities, local self-government bodies, as well as organizations established by them in accordance with the established procedure, which are fully maintained at the expense of the state budget or local budget, respectively. Budgetary institutions are non-profit [2].

Based on this definition, ensuring the activities of budgetary institutions requires appropriate prerequisites for the organization of their information systems. The Law of Ukraine «On Information Protection in Information and Telecommunication Systems» defines an information (automated) system as an organizational and technical system in which the technology of information processing using hardware and software is implemented [3].

According to the National Standard ISO/IEC 2382:2017, an information system is an information processing system that works in conjunction with organizational resources, such as people, technical means and financial resources, which provide and distribute information [4]. Another definition, an information system is a set of hardware, software and organizational tools for storing and processing information in order to meet the information needs of users. The essence of the information system can be investigated in three directions (Table 1).

From the above definitions and outline of the essence of the information system, its main purpose follows – the preparation and provision of information necessary to

Table 1 – The essence of the information system from different points of view [5]

From a technical point of view	From a business point of view	From a semantic point of view
A set of interdependent components that collect, store, process and distribute information in order to ensure the management of the organization and support managerial decision-making	A set of information, hardware, software and technological means, means of communication, methods and procedures for data processing and personnel that organize the collection, storage, processing and distribution of information for the preparation and adoption of managerial decisions	A set of various interrelated or interdependent information about the state of the object of management and the processes that occur in it. This information is expressed in indicators and other information aggregates collected and processed with the help of information technologies according to a certain methodology and according to a given algorithm

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ensure the management of all resources of an enterprise or organization, the creation of an information and technical environment for the management of an economic entity.

Automated information systems in a budgetary institution should contribute to improving the quality of accounting information, which is possible under certain conditions [6]:

– development of accounting automation software;

– the ability to improve software products in case of changes in accounting methodology and techniques, as well as to respond promptly to legislative changes;

– availability and unrestricted access to an up-to-date database;

– a unified approach to processing and systematizing primary documents, generating consolidated documentation, and managing internal documentation systems, etc.;

– creation of databases for the prompt retrieval of information in electronic form for accounting, analysis, and control of the institution's activities;

– the ability to submit electronic reporting forms within the treasury service system and data exchange;

– the ability to use external documents;

– the ability to adjust the software system to fit the specific needs of the institution, meaning it should be based on a configurator.

The implementation of these conditions will not only improve accounting practices and enhance the quality of work within the budgetary institution but also create a comprehensive system that will address a range of practical and managerial tasks, including monitoring the availability and use of budget funds. Secondly, it will rationalize the accounting process in terms of executing accounting operations, improving the quality and reliability of the information received about the institution's economic activities.

In world practice, two approaches to the creation and development of information systems for public finance management can be distinguished – the construction of information systems on the principle of the maximum possible unification and integration of functional areas of management (centralized approach) and the use of local systems (decentralized approach) [7].

The advantages of building information systems on the principle of the maximum possible integration and unification of functional areas of management include the use of uniform requirements for public finance management, the development of interagency cooperation, optimization of costs for information, telecommunication and transport infrastructure, energy and other resources. At the same time, these systems are less adaptive to external changes and user requests, require significant costs to ensure the reliability of functioning and preservation of information resources, as well as compliance with formal procedures for their application.

The use of mainly local systems allows you to implement a more flexible approach to financial management and the possibility of step-by-step development of the existing infrastructure, but does not provide access to information in real time, requires significant costs for the acquisition, maintenance, revision and modernization of software. Such systems are quite material-intensive and lead to low labor productivity of employees engaged in accounting activities [7].

In Ukraine, the introduction of automated systems contributes to the creation of a single information space that covers all functional aspects of the budget sphere and unites all participants in the budget process. The basis of this information space is the full automation of the process of cash execution of the budget. It provides optimization of comprehensive budget accounting, strengthening of financial control and effective management of public financial resources.

Public finances occupy an important place in financial relations and include such components as the state budget, extra-budgetary funds and public credit. All calculations related to the state budget are carried out using an automated system of financial settlements. All calculations related to the state budget are carried out using an Automated Financial Settlement System (AFSS), which significantly reduces the number of errors associated with manual data entry and also shortens the time required for processing information, thereby improving the efficiency of the work process.

This system is a comprehensive tool that ensures the implementation of operations for the creation and implementation of the state budget of Ukraine, using economic and mathematical methods, computer technology and appropriately organized work processes.

Automated system of financial settlements is a geographically distributed system. There are three levels of the hierarchy, which are the objects of automation: national, regional, district, which are interconnected by a network. The budget is planned primarily at the district level, generalized at the regional and state levels.

The concept of functioning of an automated system of financial settlements assumes that at each level in each vertical, a local data processing system is created, which automates functions through automated workplaces. The automated system of financial settlements combines automated workplaces of specialists working in the central office and territorial bodies. An automated system of financial settlements is an integrated system (corporate), which should reflect a holistic picture of the financial situation in the country, provide its comprehensive analysis, help in forecasting and support collective and individual decision-making.

Functional subsystems of the automated system of financial calculations include: consolidated budget calculations; state revenues; finances of economic sectors; budget expenditures; planning and forecasting; changes in the plan; accounting and control; reporting and analysis.

An automated information system for online interaction with budget fund managers (AIS «GRK-WEB») is currently in the stage of experimental-industrial operation [8]. The AIS «GRK» system, based on available data from budget requests, budget program passports, and information on their execution, generates a structured report titled «Information on the achievement of planned goals, objectives, and performance indicators of budget programs, as well as the goals of state policy based on the results of the 202_ year».

Planning and forecasting processes are of particular importance. A long-term financial plan is formed on the basis of indicators of the forecast of economic and social

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development of the country. No less important is the subsystem of control over the implementation of the budget, which provides timely monitoring and analysis of the implementation of budget tasks. Here, cooperation with the automated information system of the Treasury and the Tax System is especially closely carried out, and the possibility of using funds by commercial banks is excluded.

The Ministry of Finance of Ukraine plans to develop a new IT system for budget planning and monitoring of budget execution to automate data exchange between all participants in the budget planning process, budget preparation, execution, and monitoring. The development of this software is part of the «Program for Supporting Public Financial Management in Ukraine» (EU4PFM) project. The new software will include analytical modules that provide decision-makers with quick access to requested data. Communication between participants in the budget process will occur in a digital format and in real-time. This will reduce the amount of manual data processing and the associated errors in calculations during the collection and processing of budget requests from the main budget fund managers [9].

The «Reporting and Analysis» subsystem allows you to strengthen control over the implementation in the regions in the context of budget classification indicators, loan managers and payers, and the implementation of budget discipline by all participants in the budget process.

Information support of the automated system of financial settlements consists of [10]:

– databases of normative, reference, planned and factual information (Ukrainian budget classification, budget revenues, staff, contingent of budgetary institutions, etc.);

– incoming messages (schedule of revenues by territories, schedule of expenditures, directories of subordinate financial bodies, indicators of income and expenditures);

– outgoing information messages (state budget, schedule of revenues and expenditures by territories and items, etc.);

– archival data.

The introduction of an automated system of financial settlements allows you to eliminate duplication of work in the departments of financial authorities, reduces the workload on employees, and increases the speed of data processing. The automated system of financial settlements organizes data exchange between all levels of the Ministry of Finance of Ukraine, as well as communicates with other users and providers of financial information.

On 11.02.2016, the Cabinet of Ministers of Ukraine adopted the Concept of Creating an Integrated Information and Analytical System «Transparent Budget» [11]. One of the main tasks of the Transparent Budget system is to automate the budget process and eradicate the corruption component in this process. The information and analytical system «Transparent Budget» ensures the transparency of budget processes and procedures at the state and local levels, and also allows citizens to control the use of funds by managers, recipients of budget funds, state-owned enterprises, the Pension Fund and the Social Insurance Fund.

The Transparent Budget system is part of the open government of Ukraine, responds to civil society's demand for transparency in the use of public funds and takes into account the recommendations of the World Bank, the International Monetary Fund and the International Budget Partnership on international transparency standards such as Open Budget, Open Spending, Open Contracting and Citizen Participation.

The «Transparent Budget» system provides citizens with access to information about public funds at all stages of planning and use, helps to increase the investment attractiveness of the country due to a more open government policy, reduces the likelihood of abuse and corruption at all stages of the budget process [12]. The «Transparent Budget» system publishes information about fiscal risks, specifically data on factors that could affect revenue shortfalls or increase state budget expenditures, information on quasi-fiscal operations, and financial statements of the largest state-owned enterprises [13].

At present, the issue of further active development of the «Transparent Budget» system is relevant, which provides for the disclosure of information on public funds and high-quality comprehensive information and analytical support for the work of the Ministry of Finance of Ukraine, including with central executive authorities, the activities of which are directed and coordinated by the Cabinet of Ministers of Ukraine through the Minister of Finance (in particular, the State Tax Service of Ukraine, the State Customs Service of Ukraine, Treasury, State Audit Service of Ukraine). The issue of determining national norms and mechanisms of public participation in the budget process remains relevant. It is necessary to create a platform to automate the process of concluding contracts with government agencies and reporting on them for the prompt and effective management of financial resources and liquidity.

The main purpose of the automated information system of the Treasury is to coordinate and ensure effective interaction of treasury bodies of all levels with each other and with other participants in the budget process. It provides prompt information service, automation of key processes, organization of communication and centralized data transfer.

In the process of cash execution of budgets of various levels, the automated information system of the treasury records real cash flows, reflecting income receipts and expenditures. All information on the movement of funds is sent to the relevant treasury authorities and transferred to other participants in the budget process to ensure transparency and coordination. In addition to cash flows, the automated information system of the treasury generates data on non-cash flows.

This includes proving planned indicators, justifying financial obligations, and creating and submitting reports on the implementation of budgets. All this information is formed in the form of reporting data and regulatory reference materials that ensure the completeness and accuracy of the budget process. Therefore, in the currently existing automated information systems of the Treasury, information related to the movement of cash and non-cash flows is separately formed. Reflection of these information flows in the information system of the Treasury, their automated processing is a decisive factor in increasing the efficiency, analyticality and reliability of information on the state and movement of budget resources [7].

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Conclusions

One of the key requirements for modern computer information systems is to ensure the unity of the information base, which is achieved through one-time data entry. Various computer programs are used to integrate the processing of primary accounting information and adapt the software to the needs of users. This approach is necessary for budgetary institutions, because it helps to increase the efficiency of budget resources management and strengthen control over their intended use. Computerization of accounting in budgetary institutions is also an important prerequisite for the creation of a single information base «State Treasury – Budgetary Institutions».

This will ensure effective management of budget resources for both the main managers and the managers of lower levels. New phenomena and processes in the economic life of budgetary institutions, particularly the active development of information technologies, automation, and digitalization of the budget process, require the adaptation of existing software. Traditional approaches to defining the types of activities and goals of these institutions in market conditions have undergone significant changes. Today, budgetary institutions are actively involved in market processes, developing activities related to the provision of paid services, which became possible due to the relevant regulatory frameworks. Improvement of computer information systems in such institutions contributes to the simplification of accounting procedures, increases the efficiency of access to data necessary for management, and ensures the rational use of budget resources.

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