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**DIGITAL TRANSFORMATION AND REFORM
OF PUBLIC FINANCE MANAGEMENT
IN THE CONDITIONS OF FULL-SCALE WAR IN UKRAINE**

**ЦИФРОВІ ТРАНСФОРМАЦІЇ ТА РЕФОРМУВАННЯ
УПРАВЛІННЯ ДЕРЖАВНИМИ ФІНАНСАМИ
В УМОВАХ ПОВНОМАСШТАБНОЇ ВІЙНИ В УКРАЇНІ**

Summary. In recent years, the processes of digitalization of public services and business processes in public institutions in Ukraine have been developing at an accelerated pace, which contributes to the implementation of reforms that are due to Ukraine's desire to join the European Union. The EU provides comprehensive assistance, support in expanding infrastructure, and developing new software solutions for public institutions in order to strengthen their potential in preparation for digital transformation. However, the full-scale war of the Russian Federation against Ukraine, which was launched by the aggressor country in February 2022, creates many obstacles in the processes of consolidating efforts to modernize the public finance management sector. Such obstacles include: lack of sufficient influence and control from line ministries; full automation of business processes; insufficient level of integration and interaction between structures; incoherence in the development of information technologies in departments; lack of comprehensive policies for information protection and countering cyber threats, which is especially relevant in conditions of full-scale war; lack of consolidated data for prompt and effective decision-making, etc. To solve the outlined problems during the war, we have generalized approaches to the digital transformation of public services taking into account world experience and substantiated the feasibility of its use in domestic practice, in particular in the budget process, in the social sphere. Particular attention is paid to reforming approaches to budget planning, which is aimed at ensuring macroeconomic balance in the state. It is proven that digital transformations as innovative reform processes will increase the efficiency of interaction between state administration and local self-government bodies, with business structures and active members of civil society, and increase the openness and transparency of the activities of government representatives.

Keywords: digital transformation, public finances, cyber threats, public services, budget process, local government.

Анотація. В останні роки в Україні процеси цифровізації державних послуг і бізнес-процесів у державних установах розвиваються випереджуваними темпами, що сприяє впровадженню реформ, які зумовлені прагненням України приєднатися до Європейського Союзу. ЄС надає всебічну допомогу, підтримку у розширенні інфраструктури, розробці нових програмних рішень для державних установ з метою посилення їхнього потенціалу у підготовці до цифрової трансформації. Однак, повномасштабна війна рф проти України, яку розв'язала країна-агресор в лютому 2022 р., створює безліч перешкод у процесах консолідації зусиль для модернізації сектору управління державними фінансами. До таких перешкод слід віднести: відсутність достатнього рівня впливу та контролю з боку профільних міністерств; повноцінна автоматизація бізнес-процесів; недостатній рівень інтеграції та взаємодії між структурами; неузгодженості розвитку інформаційних технологій у відомствах; відсутність комплексних політик захисту інформації та протидії кіберзагрозам, що є особливо актуальним в умовах повномасштабної війни; відсутність консолідованих даних для оперативного та ефективного прийняття рішень тощо. Для вирішення окреслених проблем під час війни, нами узагальнено підходи до цифрової трансформації державних послуг з урахуванням світового досвіду та обґрунтовано доцільність його використання у вітчизняній практиці, зокрема в бюджетному процесі, в соціальній сфері. Особливу увагу приділено реформуванню підходів до бюджетного планування, яке спрямоване на забезпечення макроекономічної рівноваги в державі. Доведено, що цифрові трансформації як інноваційні процеси реформування, дозволять підвищити ефективність взаємодії органів державного управління та місцевого самоврядування, із структурами бізнесу та активними членами громадянського суспільства, посилювати відкритість і прозорість діяльності представників влади.

Ключові слова: цифрова трансформація, державні фінанси, кіберзагрози, державні послуги, бюджетний процес, органи місцевого самоврядування.

Introduction. In the modern world of information and digital technologies, constant changes and improvements are taking place, which is why state policy regarding changes and improvements in the processes of formation and implementation of functions by government bodies requires constant attention from scientists and practitioners. Digital transformation and reform of public finance management in the context of a full-scale war, which has been ongoing since February 24, 2022, primarily concerns the creation of an appropriate regulatory framework focused on the requirements for the budget systems of developed countries, mainly member states. Organization for Economic Cooperation and Development (OECD), which successfully implement public administration policy, and to the requirements of the European Union. Digitalization of public authorities involves the introduction of digital technologies into all areas of public administration, from electronic document management and electronic services for citizens to the use of artificial intelligence to optimize management processes. Therefore, understanding the challenges that Ukraine faces in wartime, the problems of forming the state budget, and budget financing of economic development is an urgent task for the domestic scientific community in the context of developing scientifically based approaches to ensuring high efficiency in public finance management in wartime and post-war recovery.

Analysis of recent research and publications. The topic of the impact of war on public finances, the digitalization of public services in the face of the challenges and information threats of war, are fairly new topics for Ukrainian researchers, however, the long-term and destructive nature of the war led to the emergence of thorough research in the areas

of transformation of the budget system and budget policy, the budget process, and the digitalization of public services, in particular, these are the works of such scientists: Yu. Kasperovych, H. Vyshlinskoho, Yu. Markuts, Yu. Buhel, T. Yefymenko, V. Demianyshyna, M. Tymoshenko, S. Krynysia, D. Popova, O. Prutskoi, L. Martynova, L. Marshuk, Yu. Radionova, H. Zhekalo ta in.

The research task and objective. The purpose of the study is to generalize approaches to digital transformation and reform of public finance management in the context of a full-scale war in Ukraine.

The statement of basic material. In 2022, the budget system of Ukraine experienced a significant shock, as did the economy and society as a whole. The main consequences for the budget system after the large-scale invasion of the Russian Federation were a decrease in budget revenues, a deepening of its deficit, a significant increase in the dependence of the budget's functioning on foreign aid and credit relations with partners, a structural restructuring of budget expenditures, an unprecedented increase in defense and security spending, support for ensuring budget expenditures through new debt instruments, an increase in the burden on local budgets and the implementation of measures to support them. All these challenges required the development of new approaches to public finance management with the further application of digitalization technologies. In the modern world of information and digital technologies, constant changes and improvements are taking place, which is why state policy regarding changes and improvements in the processes of forming and implementing functions by state authorities requires constant attention from scientists and practitioners.

The introduction of the latest digital technologies allows today to implement new e-government processes; the development of e-government contributes to the implementation of Ukraine's European integration aspirations. E-government is the use of information and communication technologies (ICT) to ensure and optimize the work of state structures, in particular, ensuring citizens' access to public services and information, electronic document management, automation of management processes and communication between state bodies. E-government helps to increase the efficiency and transparency of management, facilitates interaction between authorities and citizens, as well as between state bodies. To overcome the challenges of war, it is necessary to constantly improve the technological infrastructure, develop training programs for civil servants and strengthen the legal framework regulating e-government. Digitalization of public authorities involves the introduction of digital technologies into all areas of public administration, from electronic document management and electronic services for citizens to the use of artificial intelligence to optimize management processes. E-government provides a platform for the implementation of these digital initiatives, providing a technical and organizational basis for the implementation of digital solutions in public institutions. Digital technologies are designed to minimize the stage of transmitting information messages from state authorities and local governments to the end user through the effective use of digital space [1].

The information policy of public authorities is multifaceted and includes several key components that determine its effectiveness and impact on society. Digitalization transforms traditional approaches to the provision of public services, using information and communication technologies to automate processes, reduce bureaucracy and ensure greater transparency in the activities of state bodies. One of the key aspects of digitalization is the creation of single digital portals that provide access to a wide range of public services online. This allows citizens to submit applications, obtain permits, register businesses, pay taxes and perform many other operations electronically without the need to visit state institutions in person. Such an approach not only saves citizens' time and resources, but also helps reduce corruption and increase overall satisfaction with the quality of public services.

Digitalization (digital transformation) of public services is becoming relevant for almost all countries in the world, but currently the most active in this issue are 15 countries that are implementing national digitalization programs. Among the leading countries in this area is Denmark, which focuses on the digitalization of the public sector. In addition, Singapore, South Korea, New Zealand and China, using the Internet Plus program, are actively integrating

digital industries with traditional ones. In particular, South Korea, within the framework of the Creative Economy program, focuses on the development of entrepreneurship and human capital, and Singapore is developing the Smart Economy program, where the main goal is the use of communication and information technologies. In this country, back in 2014, the implementation of the *Smart Nation* initiative began with the aim of improving the quality of life of citizens through digitalization in everyday life [2]. Foreign experience in the digitalization of public services and the activities of public authorities is assessed through international rating systems, such as the EGovernment Survey: E-Government for the People (EGDI) and the Digital Economy and Society Index (DESI). The DESI rating, for example, compares the principles of providing digital public services by European governments. Thus, last year, according to the UN, the index of citizens' interaction with public authorities online increased [3]. Countries such as the Netherlands, Finland and Denmark performed well on this indicator, with over 90% of Internet users aged 16 to 74 interacting with government authorities through public service portals. While Italy, Bulgaria and Romania lag behind in providing public services electronically. Luxembourg, Estonia and Malta scored over 90 points, showing the best results on this indicator. A total of 12 countries scored over 80% (Spain, Denmark, Portugal, Ireland, the Netherlands, Finland, Latvia, Austria, Sweden, Luxembourg, Estonia and Malta), while Bulgaria, Hungary, Greece and Romania scored less than 60% on this indicator [4]. As for the EGDI ranking, Denmark leads the way, with all residents and businesses having a personal account to communicate with government agencies in real time. Since 2015, all Danish citizens have been required to interact with government agencies online. Now 95% of households have access to the Internet, and every citizen has a digital passport (digital ID). All government agencies and municipalities are connected to a single network, which facilitates interaction with all government and municipal institutions through a single personal account [5].

Businesses can not only communicate, but also send reports, calculate taxes, receive statements and conduct transactions via the Internet. Sending and receiving documents electronically takes only a few minutes, and this system, in general, allows for annual savings of 10–20% of the budget in favor of financing the needs of public administration [6]. Denmark is actively implementing proactive services, such as offers of further educational programs for citizens after graduation.

When introducing innovative technologies, it should be noted that their effective implementation occurs in three stages: institutionalization, when changes become a stable part of the behavior of the majority; acceptance, which involves changing

attitudes and behavior to meet expectations; readiness, which determines the level of readiness to perform the desired action or achieve the set goal, as well as further development of the process. It is the foundation of future changes and transformations. The global trend, without a doubt, is the digitalization of the state, which includes the digitalization of operations of state-owned companies and the state as a whole. This digitalization is aimed at improving the standard of living, increasing well-being and maximizing value creation in the economy. This task involves two main areas: the digitalization of public administration, which includes digital document management, as well as the principles of “digital by default” and “digital first”, as well as the revision of inefficient processes [7]. In general, the digitalization of public services covers the entire range of services: – government-to-business interaction – G2B; – government-to-citizen interaction – G2C; – internal interaction of state structures – G2G. Therefore, the experience of the European Union countries in the field of digitalization of public services is of great importance for fulfilling the requirements of the Association Agreement between Ukraine and the European Union.

The effectiveness of this process depends on the legal regulation of such aspects as the use of electronic signatures, the functioning of the infrastructure for information and technological interaction of information systems; standardization of the provision of public services and regulation of procedures in electronic form; accessibility of electronic public services for government bodies and legal and natural persons; protection of personal data of recipients of public services and the legal significance of electronic document flow.

The Russian Federation's armed aggression has seriously harmed Ukraine's economy as well as every other aspect of its social fabric. In spite of this, our state is working to maintain an ideal budget policy, which is a crucial part of economic policy, while taking into consideration the positive experiences of other nations worldwide and the unique characteristics of martial law in the nation. After all, the unique characteristics of each nation's budget process, including those at the local level, determine how effective its budget policy is.

At each stage of the budget process, issues are resolved that cannot be considered at another time. For example, issues of providing inter-budgetary transfers, fixing interest deductions from national taxes and fees are resolved at the stage of budget preparation, and are finally approved at the stage of adopting the law on the State Budget of Ukraine. The opening and implementation of budget appropriations is carried out at the stage of budget execution and only after its approval, etc. [8, p. 179]. The low quality of the budget process in Ukraine is due to a number of reasons, in particular, the established

budget planning procedure. In Ukraine, the budget planning procedure is implemented according to the “top-down” scheme, that is, first the state budget is approved, which determines the main revenue sources of local budgets, and then local budgets are planned. This procedure is not entirely optimal, because in conditions of a sufficient level of autonomy of local budgets, approval of the state budget and approval of local budgets are components of two independent budget processes. This is one of the reasons that leads to an imbalance in revenues and expenditures of the state and local budgets, which in Ukraine takes the form of a budget deficit [9]. If we pay attention to the main components of the budget process in the European Monetary Union, then when determining it, an indicator such as long-term stability is taken into account, which is understood as a key factor in infrastructure issues for implementing effective fiscal and budgetary policies [10, p. 288].

Taking into account this indicator, the main components of the budget process in developed countries of the world are determined. After all, in emerging markets, confidence in the stability of budget policy has a direct impact on interest rates and key macroeconomic indicators. It is worth noting that currently leading European countries grant local authorities a very high level of financial autonomy, which allows the latter to practically not depend or to depend weakly (insignificantly) on the budgets of the central administration [11, p. 69]. At the same time, for all developed foreign countries, it is natural to divide local budgets into two independent functional types of local budgets, each of which has its own revenues. One of the types of local budgets is the local current (administrative) budget, the revenues of which are formed at the expense of local taxes and fees, payments, general subsidies provided by state authorities, and other revenues. Another type of local budgets is the local development budget (investment budget). Unlike the first type of local budgets, the revenues of the second are formed at the expense of bank loans, municipal (communal) loans, investment subsidies provided by state authorities, and other sources. At the same time, the level of investment should correspond to the marginal product of private consumption. If the national economy cannot support the full use of its productive resources, it is advisable to apply fiscal and tax policy with Keynesian effects. If budget expenditures are the only available tool, then increasing their level to stimulate demand for idle productive resources is the optimal tool, even if the marginal cost of public goods is low [12, p. 30–31].

Analyzing the experience of other countries in building the budget process, we emphasize that in the vast majority of Western European countries, the budget process begins in central ministries well in advance of the beginning of the budget period – 11–13 months before its onset, that is, work begins in

the first month of the year preceding the planned one. And the draft budget is submitted to the parliament 3–4 months before the beginning of the planned year. Therefore, the formation of the draft budget takes at least 10 months. This approach allows taking into account the proposals of all local budgets, calculating the forecast indicators and making a balanced decision. In order to unify the budgetary process in European countries, the Stability and Growth Pact (Pact) [13] was adopted, which contained a resolution of the Council of Europe and two resolutions of the Council of Ministers of the European Union from 1997. The specified document was intended to ensure the implementation of the Maastricht Treaty in the field of multilateral budgetary surveillance and coordination, for the observance of budgetary discipline by the member states of the Economic and Monetary Union after the introduction of the single currency [14, p. 2]. The Pact detailed the rules and procedures for ensuring the budget process, budget discipline and its observance. It envisaged the creation of a mechanism for early warning of destructive processes in budget policy and emphasized medium-term budget plans [10, p. 294]. The purpose of such a mechanism was to strengthen budget supervision and coordinate economic policies between individual states.

We can therefore say that the budget process of any nation is characterized by certain features that reflect the specifics of the national economy's regulation, the structure of domestic production, and the means of influencing the financial system's development and the procedures of public finance management by extrapolating foreign experience in the creation of the budget process at the local level. Furthermore, the circumstances and outcomes of this process vary depending on the national economy. Modern world trends are characterized by the increasing importance of decentralization in the organization of local financial systems and changes in budget processes at the local level. Every developed country in the world is trying to build a budget process that will be most effective for its national context and will not contradict international norms.

The main characteristics of Ukraine's budget policy in times of war are: increased military spending (during war, the government has to allocate additional funds to the army and other security services; this may include an increase in the defense budget, as well as investments in new equipment and technologies); increased tax revenues to the state budget (to help finance the military effort, governments may increase taxes or introduce new ones; these may include taxes on income, consumption, or property); borrowing (raising additional funds to finance the military effort; this may include issuing bonds or other forms of debt); reductions in non-defense spending (to free up resources for the military effort, it is necessary

to cut spending in other areas; this may include cuts in funding for social safety nets, infrastructure, or education) [15–18]. Budgetary policy during war is complex and responsible. The government needs to find a balance between the need to ensure national defense and the need to maintain economic stability and invest in other areas of the economy. Effective budget policy can help ensure the country's resilience and its ability to respond to the challenges of war. Budget planning is a component of budget management, which, together with other interrelated components, such as budget execution, budget accounting, budget reporting and budget execution control.

The efficiency of fiscal policy has a direct impact on the state budget deficit. When it comes to fiscal discipline, the budget deficit may serve as a gauge of how well fiscal policy is working. The government may be spending money for other reasons if there is a significant and ongoing budget deficit, which could be a sign of poor budget management. A modest or controllable budget deficit, on the other hand, indicates that the government is practicing fiscal restraint and matching its spending to its available funds. To ensure the sustainability of public finances, a well-designed budget policy should gradually reduce or eliminate the budget deficit.

The effectiveness of fiscal policy can be assessed on the basis of the extent to which it is consistent with the government's policy objectives and priorities. The budget deficit reflects the allocation of funds and the extent to which policy objectives are achieved. In addition, the state budget deficit has an impact on economic stability. A large budget deficit can put strain on government finances, leading to increased borrowing, higher interest payments, and potential risks to macroeconomic stability. An effective fiscal policy aims to keep the budget deficit within acceptable limits, taking into account the country's economic situation and debt sustainability. It is fundamentally important at the stage of budget planning to take into account possible risks, threats and dangers of various spheres of socio-economic development of the country. The main problems of Ukraine in recent years are temporarily occupied territories, high dependence on energy imports, inefficient export structure, reduction of labor resources due to labor migration, etc. [19]. These trends threaten financial security, affect the country's budget system and complicate budget planning in the medium term. On the other hand, based on clearly defined fiscal policy priorities, medium-term budget planning ensures the continuity of the budget process, strengthening the interdependence of financial security and maximum predictability and stability of budget execution.

When planning a long-term three-year budget, it is important to monitor and analyze how the previous year ended, how clearly the budget was implemented,

whether there are extraordinary and unforeseen expenses in the budget, whether the country is going beyond the planned financial framework, and only after that calculate the expenditures for the following years. Timely adoption of the budget before the beginning of the next budget year is a prerequisite for its high-quality implementation [20]. The main challenge for many countries is the desire to increase the budget by expanding the tax base. However, in conditions of slowing economic growth, such a fiscal policy leads to an imbalance in budget revenues and expenditures and makes it difficult to maintain the budget deficit within the legally established framework. The need for a balance of revenues and expenditures leads to borrowing by the state and the formation of public debt. The issues of budget balance and public debt formation have been debatable among researchers – representatives of different economic schools – from complete denial to the use of credit instruments to cover the budget deficit and stabilize the state economy.

Modern concepts are based on the fact that public finances are aimed at ensuring macroeconomic equilibrium through budgetary regulation of the economy, i.e. a budget deficit is acceptable, can be an effective tool for regulating the economy, but requires constant monitoring and management. At the same time, the identified priorities of public debt policy must be justified, and public borrowing must be aimed at implementing the dominant directions of social development [21; 22].

The preservation of positive trends in the country's economy and the concentration of budgetary funds on addressing priority socio-economic development tasks require: balanced execution of all budgets; containment of public debt growth and maintaining it at a safe level; ensuring the stability of tax legislation; rejection of inefficient tax benefits; development of the administration of non-tax budget revenues; reduction of budget participation in all types of state support for the real sector of the economy; concentration of budgetary funds on areas that ensure the achievement of strategic socio-economic development goals; improvement of the program-targeted budgeting method; strengthening the social orientation of expenditures; taking measures to improve the quality of life and well-being of public sector employees; support for low-income citizens; improvement of the financial risk management system for enterprises with budgetary obligations; ensuring transparency and openness of the budget process. The utilization of allocated budgetary funds allows for an assessment of: the quality of budget planning and execution for the respective fiscal year; the volume of redistributed funds within the approved budget, along with the reasons and justifications for such redistribution; the absence of cost overruns in budgetary investment projects and the reasons for any increase in their

cost; the absence of accounts receivable and payable; the absence of violations of budget legislation; measures taken to eliminate the causes of budgetary law violations; the achievement of performance indicators for budget programs; the evaluation of the effectiveness of budget programs [23].

The maximum utilization of the potential of long-term budget planning and the application of the program-targeted method allow for budgeting with a focus on the efficient and effective use of public funds in the medium term. The advantage of results-oriented medium-term budget planning is the increased interest of government authorities and local self-government bodies not only in the targeted but also in the high-quality use of budgetary funds. Therefore, favorable conditions exist today for the rational and efficient use of budgetary resources to ensure the achievement of high-quality indicators in the provision of public services.

Nonetheless, there are instances in the budget process where decisions are impacted by political, personal, and other factors that make it harder for sound budget decisions to be adopted. This explains the interdependence, as state authorities, local governments, and other budget process participants rely on the quality of their own and delegated powers to determine how efficiently and effectively budget funds are used. [24]. Ensuring the principle of budget efficiency and effectiveness, it is necessary to modernize the process of state social support for citizens, which should be aimed at improving the quality of human capital, life and well-being of citizens through an effective system of social protection and social security. Important measures to increase the efficiency of budget planning aimed at improving the well-being of the population and strengthening the social orientation of the budget are to increase the share of social expenditures in total budget expenditures, comply with the minimum standards of budget security for social expenditures, and ensure the necessary budget financing.

Conclusions. Thus, the trends of modern socio-economic development of Ukraine are characterized by significant destructive changes and distortions in the economic, political, social and legal spheres, a number of destabilizing processes and phenomena in the financial system, the emergence of significant risks and threats to the economic security of the state. As a result, in recent years there has been a significant deterioration in the financial and economic condition of the country, which is expressed in a decline in GDP, rising inflation, maintaining a high level of budget deficit and public debt, instability of the national currency, banking imbalances, deepening imbalances in the monetary and fiscal spheres. Since the aforementioned issues are systemic and caused by ineffective fiscal and monetary policy models, uncertainty and imperfection of the institutional and

legal support of the financial sector, and inconsistent state regulation of financial and economic processes, state anti-crisis policy measures intended to ensure financial stability, increase the efficiency of the state's budget system, and counteract internal and external threats to economic security have not produced the desired results. The emergence of significant threats and risks laid the foundation for a steady decline in the level of national security of the state, which, in turn, led to increased instability of the socio-

economic system, a decrease in budget revenues due to a reduction in the tax base and a decrease in the standard of living of the population and its social security. During the war, the government prioritizes defense spending, while simultaneously considering the possibility of increasing taxes, borrowing and reducing non-defense spending. Ultimately, effective budget policy can help ensure the country's resilience and its ability to respond to various challenges, contributing to its long-term stability and prosperity.

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