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Prospects for Improving Treasury Execution of the State Budget in the Digital Economy

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Abstract: The article researches the possibilities for improving the treasury implementation of public financial management in accounting systems of the state capital in the new economic relations in the conditions of the shadow economy and global processes of the digital economy. It examines main vectors of the digital transformation of treasury functions such as the application of integrated public financial management information systems, automation of cash execution, the construction of the Treasury Single Account and digital instruments of financial control. By comparing treasury tools used before and after digitalization, the paper delivers the key impact areas of digital transformation: preserving transparency of budget operations and improving the operational cost and budget flows management. The conclusion of the study is that digital technologies adoption should be comprehensive and multi-phase to realize the expected gains in efficiency in public financial management.

Keywords: State Budget, Treasury Execution, Digital Economy, Digitalization, Public Financial Management, Budget Control, Financial Technologies

1. Introduction

The development of the digital economy is having a significant impact on the public finance system, transforming approaches to budget resource management and increasing demands for the efficiency, transparency, and effectiveness of the budget process. In this context, improving treasury execution of the state budget as a key element of the public finance management system is particularly urgent.

Treasury budget execution traditionally serves as cash management for budgets, oversees the targeted use of budget funds, and ensures the timeliness of budget payments. But with the increase in the number of transactions in the budget, the growing complexity of financial flows, the development of electronic forms of interaction between participants in the budget process, traditional treasury execution mechanisms are becoming too rigid and are in need of digital modernization.

Digital technology — to the extent implemented in the country (electronic payment systems, automated information systems, big data, digital platforms and others) — opens up new possibilities to improve the efficiency of treasury budget execution. This also speeds up the handling of budget transactions, reduces significant potential for human error, increases financial oversight, and makes for higher transparency of public fund use. Accordingly, the treasury is evolving from a predominantly control body into an active tool for liquidity and budget flow management.

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Digitalisation of treasury budget execution is also significant for the Republic of Uzbekistan in the context of ongoing public finance reforms and the introduction of modern budget management mechanism.

The consistent development of the treasury's digital infrastructure is seen as an important prerequisite for enhancing the sustainability of the budget system, the efficiency of public spending, and trust in public finance institutions.

At the same time, the digital transformation of treasury budget execution is accompanied by a number of problems and challenges, including the need to adapt the regulatory framework, ensure information security, integrate disparate information systems, and train qualified personnel. This necessitates a scientific understanding of the prospects and areas for improving treasury execution of the state budget in the context of the digital economy.

The purpose of this article is to analyze the prospects for improving treasury execution of the state budget in the context of the digital economy, as well as to identify key areas and tools for digitalization that contribute to increased efficiency in budget resource management.

Literature Review

In modern scientific and practical literature, the digital transformation of treasury budget execution is considered a key driver for improving the efficiency of public financial management. The IMF technical recommendations Rivero del Paso, Pattanayak, Uña, and Tourpe interpret digital solutions for PFM (including treasury functions) as a comprehensive architecture that ensures the automation of budget operations, control, data manageability, and the integration of planning-execution-reporting processes, while emphasizing the need for a phased digitalization and managed implementation (governance) of digital reforms [1].

A separate block of research is devoted to digital financial management information systems (FMIS) as the technological basis for treasury execution. The OECD review (2024) describes FMIS as the core of the digital infrastructure of public financial management, including modules for budget accounting, cash execution, commitment management, and reporting; It is noted that the degree of module integration and data quality directly impact the transparency and efficiency of budget execution [2]. Complementing this approach, World Bank PFM development materials view digitalization as a cross-cutting factor in improving the effectiveness of the entire financial management chain – from revenue administration to expenditure execution and reporting [3].

The literature emphasizes the role of the Treasury Single Account (TSA) and the digitalization of government payments as a tool for liquidity management and budget execution discipline. According to World Bank analytical materials (2024), the development of TSA and digital centralization of accounts improve the efficiency of cash balance management and strengthen control over budget flows; the effect of payment automation and process integration based on digital solutions is highlighted separately [4]. These findings are consistent with international practice in PFM programs, where automated payment circuits and strengthened TSA are considered key results of treasury operations modernization [5].

Digital budget reporting and fiscal transparency platforms occupy a significant place in research. The OECD (2024) report notes that digital and interactive fiscal reporting platforms expand access to data, improve the comparability of indicators, and create the preconditions for the use of analytics and AI elements in budget execution monitoring [6]. In a more practical dimension, the OECD also points to the need for institutional conditions for the implementation of AI in PFM: the availability of high-quality data sets, clear rules for data management, and accountability mechanisms for the use of algorithmic tools [7].

For Uzbekistan, specialized sources emphasize the development of government information systems and digital services in the field of budget and public finance management. Materials from the Ministry of Economy and Finance of the Republic of Uzbekistan (gov.uz) emphasize the implementation and development of information systems and digital platforms (including budget accounting solutions and open portals), which form the infrastructural basis for further improvement of treasury budget execution and the transparency of budget processes [8].

Overall, an analysis of the literature indicates that the prospects for better treasury execution of the state budget in a digital economy context are linked to (a) building integrated FMIS/treasury like systems, (b) strengthening TSA and digitalization of payments (c) moving in the direction of digital reporting and near “real-time” data, (d) expanding the analytics and series of targeted application of AI providing that data quality is good and the legal/institutional context is appropriate.

2. Methodology

The study utilized systemic and structural-functional approaches to analyze state budget treasury execution processes in the digital economy. The theoretical framework was formed by analyzing and summarizing scientific publications and analytical materials from international organizations [9]. The empirical portion of the study relies on a comparative analysis of treasury execution instruments before and after digitalization. A spreadsheet approach was used to systematize the results and identify key areas for improving treasury processes.

3. Results and Discussion

An analysis of the current state of treasury execution of the state budget shows that digital transformation is becoming a determining factor in improving the efficiency of budget resource management [10]. In the digital economy, the need for efficient budget transactions, transparent public fund flows, and strengthened financial control is growing, necessitating the modernization of treasury mechanisms using digital technologies.

The preliminary analysis of the international practices and scientific approaches to the improvement of treasury budget execution has shown that the significant space for improvement is basically the implementation of integrated financial management information systems (FMIS), which would have covered all budget process phases including planning, commitment, cash execution and reporting [11]. The use of such systems ensures data consistency, reduces duplication of functions, and improves coordination among budget process participants.

This kind of systems assure effective data consistency, lowers redundancy in functions and enhances coordination among participants of budget process.

One of the key impacts of treasury digitalization is the enhanced position of the Treasury Single Account (TSA) in budget liquidity management. Access to digital payment solutions and automated cash transactions facilitate cash flow centralization, minimize idle balances, and enhance budget execution discipline [12]. The analysis revealed that digital connection of TSA with banks as well as budgeting systems enables more efficient overseeing of public funds.

In the digital economy, automation of budget execution control and monitoring processes is becoming increasingly important. The use of electronic commitment registers, digital payment orders, and online reporting enables monitoring of the targeted use of budget funds in near real time [13]. This increases the transparency of budget operations and reduces the risk of misuse of funds.

The analysis also shows that digital technologies expand the analytical capabilities of treasury bodies. The accumulation and processing of large amounts of budget data creates the preconditions for the use of analytical and forecasting tools in managing cash

gaps, planning payments, and assessing the effectiveness of public expenditures [14]. This transforms the treasury from a primarily accounting and control agency into an active element of the strategic public finance management system.

In the context of the Republic of Uzbekistan, the analysis reveals significant potential for further improvement of treasury budget execution through deeper digitalization [15]. The development of government information systems, expanded electronic interaction between government agencies and financial institutions, and the introduction of digital budget reporting platforms create the foundation for increased efficiency and sustainability of the budget system.

At the same time, certain limitations to the digital transformation of the treasury have been identified. These include the need to adapt the regulatory framework to digital processes, ensure the information security of budget data, and a shortage of qualified personnel in the field of digital financial technologies [16]. These factors require a comprehensive approach to further improving treasury budget execution.

To assess the impact of digital technologies on the effectiveness of treasury budget execution, it is advisable to compare traditional and digital tools used at various stages of the budget process [17]. This approach allows us to identify qualitative changes in the organization of treasury operations, the level of transparency, and the manageability of budget flows.

Table 1 presents a comparative analysis of the main treasury budget execution tools before and after digitalization.

Table 1. Digital instruments for treasury execution of the state budget: before and after digitalization.

Direction of treasury execution	Before digitalization	After digitalization
Accounting and registration of budgetary obligations	Paper registers, manual data entry	Electronic registers of obligations in FMIS
Cash execution of the budget	Manual processing of payment documents	Automated electronic payments
Treasury Single Account (TSA) Management	Partial centralization of accounts	Full digital integration of TSA
Budget reporting	Periodic, with a time lag	Online reporting and data updating
Financial control	Post-factum control	Preliminary and current digital control
Exchange of information between participants	Fragmented, offline	Integrated digital platforms
Analysis and forecasting	Limited analytical tools	Data analytics and forecasting
Transparency of budget operations	Limited availability of information	Open budget data platforms

Source: compiled by the author based on materials from the OECD, IMF, World Bank and national practices in public finance management.

The data in Table 1 clearly demonstrate that the digitalization of treasury budget execution is leading to a transition from fragmented and predominantly manual procedures to an integrated digital model for managing budget flows [18]. The most significant changes are observed in the area of budget commitment accounting and cash execution, where electronic ledgers and automated payments significantly reduce time and transaction costs.

The digital integration of the Single Treasury Account enhances budget liquidity management capabilities, enabling more efficient redistribution of temporarily available funds and reducing cash gaps [19]. At the same time, the introduction of online reporting and digital control tools ensures increased transparency of budget operations and the efficiency of management decision-making.

The transformation of financial control is particularly important: the transition from ex-post control to preliminary and ongoing digital control reduces the risk of misuse of budget funds and improves budget discipline. The expansion of analytical and predictive tools based on digital data creates the preconditions for improving the effectiveness of public spending and strategic budget management. Overall, the comparative analysis shows that digital treasury execution tools are creating a fundamentally new model of public finance management, focused on transparency, efficiency, and effectiveness [20]. This confirms the feasibility of further deepening the digitalization of treasury budget execution in the context of the digital economy.

4. Conclusion

The analysis revealed that, in the context of the digital economy, improving treasury execution of the state budget is a key area for modernizing the public finance management system. Digitalization of treasury processes contributes to increased efficiency in the use of budget funds, strengthens financial discipline, and increases the transparency of budget operations.

The results of a comparative analysis of treasury budget execution tools before and after digitalization confirm that the introduction of integrated public finance management information systems, electronic liability registries, and automated payment mechanisms leads to a significant reduction in operating costs and accelerates budget procedures. Digital integration of the Single Treasury Account improves liquidity management features, and shrinks the possibility of cash flow deficits.

Specifically, we see that the financial control system transformation. Shifting from a post facto to a preliminary and continuous digital control leads to a better targeting of budgetary spending while at the same time lowering the risks of inefficient use of public money. In parallel, digital budget reporting and open data platforms help build fiscal transparency and increased confidence in the public finance system. At the same time, the study findings indicate that further enhancement of treasury budget implementation requires an integrated line of attack which involves institutional, technological, and human shifts. Drawing upon those findings, some practical recommendations should be articulated.

First, it is recommended to continue the development and integration of public finance management information systems with the aim of creating a unified digital space for treasury budget execution.

Second, it is necessary to expand the use of electronic payment instruments and automated cash execution procedures, which will improve the efficiency of budget payments and reduce administrative costs.

Third, it is advisable to strengthen the treasury's analytical functions by implementing big data processing and forecasting tools focused on liquidity management and assessing the effectiveness of public spending.

Fourth, it is necessary to improve the regulatory framework to ensure the legal recognition of digital budget documents and regulate electronic interactions between budget process participants.

Fifth, special attention should be paid to information security and human resource development, including enhancing the digital competencies of treasury employees. Overall, the implementation of the proposed recommendations will enable the creation of

a sustainable and effective system of treasury execution of the state budget, compliant with the requirements of the digital economy and focused on the effective management of public financial resources.

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