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Fundamental Problems of Cash Management Development in the Public Sector

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ABSTRACT

The aim of this study is to develop a conceptual model for treasury cash management in the public sector. The model is based on a centralized approach integrating digital management tools and predictive analytics within the framework of a single treasury window paradigm. Research Methodology: A combination of theoretical and empirical methods was used to achieve the research goal. The theoretical part includes analysis and synthesis, induction and deduction, modeling and abstraction. Empirical research is conducted through observation. This combination allowed for a retrospective analysis, identifying current issues and systemic trends in the evolution of treasury cash management in the Russian Federation over the entire period of its institutionalization (2008–2025). Interpretive (generalization and structural) research methods were used to develop the conceptual model. Conclusions: The prerequisites for effective cash management have been substantiated and the problems of managing cash have been systematized. This has revealed the internal structure of the current state of the public financial management system as well as providing a theoretical and methodological platform for further development. A new model for public cash management has been developed, which aims to improve the adaptability, sustainability, and effectiveness of budgetary regulation through the use of digital technology.

Keywords: cash management; public sector; cash management of the Unified State Register of Cash; elements of cash management; cash management concept

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INTRODUCTION

In today's economic climate, the public sector faces the challenge of ensuring high financial efficiency when managing budget funds. With limited financial resources and increasing government obligations, it is more important than ever to effectively manage liquidity at the treasury level. Treasury financial management, or cash management, is a key tool to address this challenge. It is a system that monitors the flow of budget funds and helps to optimize financial flows. This ensures maximum transparency in operations and reduces the risk of cash shortages [1].

Despite the relatively short period of time that cash management has been developed in the public sector (since 2008), Russian practice in managing free budget balances has been recognized as one of the best in the world [2]. However, the rapid development of this practice has revealed a lack of fundamental research on the theory and methodology of state cash management. Established corporate methodologies have limited applicability in the public sector and require significant adaptation, taking into account its institutional features. The key factors that determine the specifics of cash management in the public sector include:

1. The need for guaranteed and uninterrupted fulfillment of government spending obligations. This is associated with minimizing the time lag between cash receipts and payments (cash gaps).

2. The dominance of the principles of reliability and risk-orientation in managing remaining liquidity, while also considering the task of extracting additional investment income.

3. The direct dependence of additional budget revenues on financial market conditions. Additionally, budget liquidity operations have a much greater impact on the financial sector compared to the activities of a single corporation.

4. The objective need to maintain macroeconomic balance between public and financial liquidity by coordinating fiscal and monetary policies.

The starting point for the formation of modern cash management was the fundamental reform of the cash management budget in the early 2000s. Prior to its implementation, there was a cumbersome and inefficient decentralized system in which thousands of income and expense accounts of the Federal Treasury were dispersed across the institutions of the Bank of Russia and commercial banks. This led to low transparency, slow movement of funds and uncontrolled balances.

The beginning of the processes of centralization and consolidation of budget funds on a single account was the Concept of the functioning of a single account of the Federal Treasury for accounting for federal budget revenues and funds (hereinafter referred to as the Concept),[1] which became a key factor in creating an effective model of budget liquidity management. In order to implement the concept, in the period from 2000 to 2004, all budget flows were transferred to a single federal budget account (hereinafter referred to as SFBA), opened to the Main Directorate of the Federal Treasury at the Bank of Russia [3]. The implementation of the Concept has created prerequisites for the future implementation of elements of the SFBA liquidity management: increasing the speed of access to information on budget revenues, more efficient cash execution, as well as improving the quality of cash planning.

The global crisis of 2008, which provoked an acute shortage of liquidity in the banking sector, formed the macroeconomic prerequisites for the development of state cash management. As a solution to the problem of bank liquidity, a mechanism was

[1] The concept of functioning of the unified account of the Federal Treasury for accounting of federal budget revenues and funds: Decree of the Government of the Russian Federation dated 23.01.2000 No. 107-p.

proposed for providing unclaimed public sector funds to credit institutions in the form of market deposits placed on strictly regulated terms. This initiative was supported by the Ministry of Finance of the Russian Federation and was consolidated by Decree of the Government of the Russian Federation No. 227 dated 29.03.2008 "On the Procedure for Placing Federal Budget Funds on Bank Deposits" and, since June 2012, by Decree of the Government of the Russian Federation No. 1121 dated 24.12.2011.[2] At the initial stage, this mechanism had as its key goal not maximizing investment income (which, nevertheless, amounted to about 16.2 billion rubles), but providing an additional liquidity tool to stabilize the monetary system and support the banking sector in overcoming the acute phase of the financial crisis. It was from this period that the practice of active SFBA liquidity management began. For a long time, the placement of free balances of the SFBA on bank deposits remained the only financial instrument. The turning point was the adoption in August 2013 of the Concept of Reforming the budget payment system for the period up to 2017[3] as part of the implementation of the state program of the Russian Federation "Public Finance Management",[4] which marked the beginning of a gradual expansion of the tools for managing the balances of the SFBA.

Currently, the portfolio of financial instruments for liquidity management in the public sector has been significantly expanded (*Fig. 1*).

Adoption in December 2019 Federal Law No. 479-FZ "On Amendments to the Budget Code of the Russian Federation regarding Treasury Services and the Treasury Payment System", which laid the foundations for the organization and functioning of the treasury payment system (hereinafter referred to as the TPS), implemented in full from January 1, 2021, marked the transition to a new stage in the development of the budget liquidity management system. The final transition has also been made to a fundamentally new system of federal budget execution — the treasury payment system, based on the principles of the Single Treasury Account, one of the central parts of the country's payment system. The unified federal budget account became a treasury account, and the unified treasury account became a bank account opened to the Federal Treasury at the Bank of Russia. The "large" single Treasury account (hereinafter referred to as the STA) has become a key tool for concentrating all cash flows.

The STA accumulates funds from the budgets of the budgetary system of the Russian Federation, as well as funds from other participants who have opened accounts with the Federal Treasury and its territorial bodies.

Note that the Russian Treasury is the largest investor in the Russian money market. Only 14 of the 89 constituent entities of the Russian Federation independently manage the balances of funds on single budget accounts,[5] 75 constituent entities of the Russian Federation have fully entrusted the management of liquidity to the Federal Treasury. Profitability of liquidity management operations shows steady growth: in 2008–2024. They increased by

[2] Resolution of the Government of the Russian Federation dated December 24, 2011 No. 1121 "On the Procedure for Placing Federal Budget Funds on Bank Deposits".

[3] On approval of the Concept of Reforming the budget payment system for the period up to 2017: Order of the Ministry of Finance of the Russian Federation dated 29.08.2013 № 227.

[4] On the approval of the State Program of the Russian Federation "Public Finance Management". Decree of the Government of the Russian Federation dated 04.03.2013 No. 293-p.

[5] In accordance with Article 236.1 of the Tax Code of the Russian Federation, subjects of the Russian Federation have the right to independently manage balances on a single budget account of a subject of the Russian Federation, provided that the estimated share of inter-budget transfers from the federal budget (excluding subventions) in the budget of a subject of the Russian Federation during two of the last three reporting financial years did not exceed 20%. the volume of own revenues of the consolidated budget of the subject of the Russian Federation).

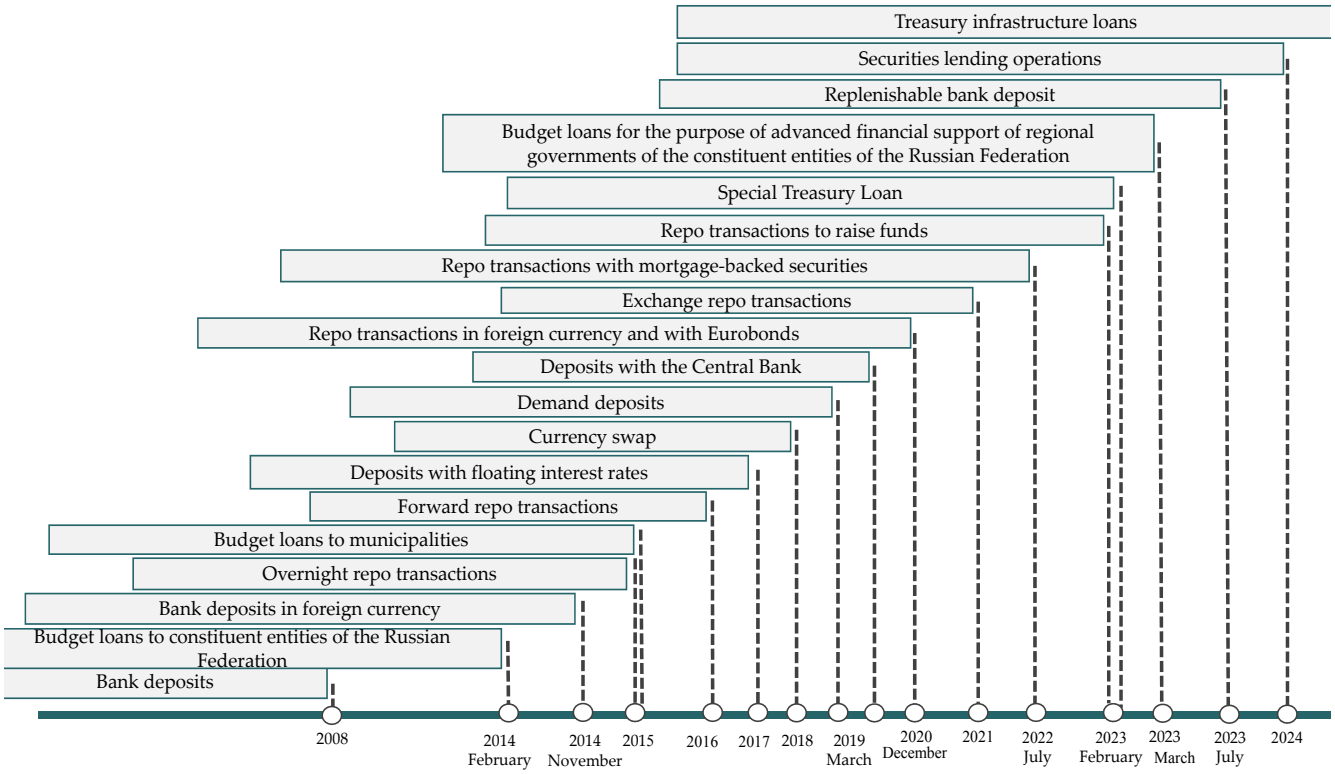

Fig. 1. **Dynamics of Expansion of the Financial Instruments Portfolio**

Source: Compiled by the authors.

more than 70 times (from 16.2 billion to 1.147 trillion rubles), and as of December 01, 2025, they amounted to 1 trillion 110 billion rubles,[6] which confirms the high efficiency in the field of managing temporarily free STA balances.

Thus, the success of the Federal Treasury in managing the free balances of budget funds is beyond doubt. Nevertheless, the further development of cash management in the public sector is hindered by insufficient knowledge of the fundamental principles in relation to public finance management. There is an increase in methodological contradictions and a lack of consensus in the interpretation of key conceptual provisions, which is manifested in the following aspects: lack of clearly defined goals and objectives; confusion of the concepts of "liquidity management" and "cash management"; formation of the composition of functional characteristics and a set of elements by "blind" copying of the corporate sector without taking into account the specifics of the functioning and goal-setting of public finance management.

These factors have a constraining effect on development and do not fully reveal the potential of cash management in the public sector. The lack of a generally accepted theoretical framework leads to confusion in terminology and difficulties in consolidating information about the cash flows of the entire public sector in a mode close to the real one. The lack of fundamental foundations does not contribute to the construction of complex but effective budget balance management systems, which leads to losses of potential income, high operating costs of the treasury system and suboptimal borrowing by the state or the region in the presence of unused balances. In addition, unsystematic management can cause hidden risks for the entire financial system (for example, the risk

[6] According to the Federal Treasury.

of critical cash gaps, reduced transparency of public finances, and misuse of budget funds). Insufficient knowledge of the patterns of cash flows reduces the effectiveness of cash forecasting. In this regard, one of the most important tasks of the current period remains the need to improve the forecasting system and target budget balances for the STA.

The purpose of this study is to study the fundamental foundations and develop a conceptual model of cash management in the public sector that meets modern requirements and trends in the development of public administration.

RESEARCH METHODOLOGY

Considering the fundamental nature of the research, the theoretical and methodological framework integrates the provisions of financial management, the principles of organizing and operating the cash management system in the public sector, an analysis of current issues and development trends, as well as a study of opportunities to adapt relevant banking and corporate money management practices to the specifics of public finances. General scientific methods, such as analysis, synthesis, forecasting, and modeling, were used as tools for the research. Additionally, applied economic research methods, including classification and grouping, were employed.

As part of the development of a conceptual model for cash management in the public sector, a historical and logical analysis was conducted of its development in international and Russian practices. It was found that the current model of treasury services in the Russian Federation is based on the classic principle of the unity of the cash book, which was formalized at the end of the 19th century. This principle is implemented through the consolidation of financial flows into a single federal account, or treasury account, which ensures centralized control over government liquidity.

In the study of the theoretical foundations of the development of cash management, the approaches of various Russian management schools to the definition and essence of liquidity management in the public and corporate sectors have been studied. In particular, the approaches of the scientific schools of Moscow State University (A.D. Sheremet), the Department of Economics and Production Organization of the Belgorod State Technological Academy of Building Materials (M.S. Chizhov), the Kiev National University of Commerce and Economics (I.A. Blank), St. Petersburg State University of Economics (V.V. Kovalev), the Southern Institute of Management (V.P. Zaikov), the Financial University under the Government of the Russian Federation (M.A. Abramova, V.Y. Didenko, S.E. Dubova, A.P. Zhantimirov, O.I. Lavrushin, I.V. Larionova, N.I. Morozko, S.E. Prokofiev, V.M. Solodkov, S.P. Solyannikova, L.V. Shubina, etc.). The analytical review allowed us to draw the following conclusions.

When determining the essential characteristics of liquidity management, scientific schools use both general scientific methods and methods of system analysis and mathematical data processing, depending on the subject area under consideration. Representatives of scientific schools considering management in the paradigm of corporate finance are distinguished by the widest possible coverage of approaches and management tools used. A different understanding between scientific schools is observed in the definition of liquidity management: either as "a set of methods for organizing business processes" or as "a single integrated process in relation to the subjects of corporate sector management". Scientific schools that have identified narrower areas as the subject of study (for example, banking) prefer an integrated approach in the form of a modern ALM system.[7]

[7] ALM (from English Asset liability management — ALM) is a modern liquidity management system that includes the functions of active management of not only cash balances on the account, but also cash flows — assets (outgoing flow, placement of funds) and liabilities (incoming flow, receipt of funds, including their attraction in the loan capital market).

In the field of public finance management, system-oriented and system-process approaches have been implemented. The differences between scientific schools are observed in the details of the organization of the management process and the breadth of coverage. In the public sector, the definition of liquidity management ranges from its limitation by cash management [4] to the extension "budget management" [5]. Researchers recognize the need to synchronize cash flows in public finances in order to minimize borrowing and reduce the cost of servicing public debt, and also emphasize the role of treasury agencies providing budget liquidity [6].

The fundamental difference in the definition of liquidity management in the public and corporate sectors is the inclusion in the management perimeter of not only monetary funds, but also securities, as well as corporate assets (inventories and other assets accounted for on the balance sheet). In the public sector, liquidity management is mainly limited to managing the monetary position.

Despite some differences in approaches to the definition of liquidity management, the theoretical basis, basic elements and management tools largely coincide. The most significant differences are related to the form of ownership of an economic entity and its powers.

A significant contribution to the development of the theory of budget liquidity management was revealed by representatives of the Financial University under the Government of the Russian Federation, who actually formed their own scientific school in this area. For example, the research of M.A. Abramova and S.E. Dubova [7], N.I. Morozko and V. Yu. Didenko [8] focuses on the development of a modern theory of money in the concept of Russia's financial policy in the interests of economic growth. The factors of financial imbalance of public finances are analyzed by A.L. Safonov and Yu.V. Dolzhenkova [9]. The necessity and possibility of implementing a systematic approach to public finance management is noted by S.P. Solyannikova [10, 11], ensuring continuity and logical connection of the theoretical provisions of the theory of system analysis with a narrower sphere — public finance [12]. The key role of high-quality budget management in achieving the goals of state financial policy is noted by N.D. Magnitsky and Yu.G. Tyurina [13]. The issues of improving the accuracy of forecasting daily balances on a single treasury account are considered by M.L. Vasyunina, O.S. Gorlova, M.L. Sedova, and others. [14]. We agree with the authors' position that solving the problem of increasing the accuracy of forecasting cash flows in the STA is the key to fulfilling government payment obligations, minimizing the cost of maintaining the monetary reserve, ensuring that there is no accumulation of outstanding debt and ensuring investments in financial instruments to generate additional income.

Other representatives of the scientific school of the University of Finance (S.E. Prokofiev [15] and L.V. Shubina [16]) study budget management in the paradigm proposed by R. Musgrave [17], defining budget revenues and expenditures as a continuous flow and exploring the possibilities of optimizing its parameters not only from the perspective of increasing investment income, but also from the standpoint of increasing the stability of the "flow", i.e. reducing cash gaps. B.I. holds a similar position. Alekhine [18], who was one of the first Russian researchers to apply methods of mathematical and statistical information processing, investigating the centralization and decentralization of cash flows in the public sector. In addition, the possibilities of creating a budget liquidity management system at the sub-federal level are considered in the scientific works of N.S. Sergienko [4]. Thus, representatives of the scientific

school of the Financial University have made a significant contribution both to the development of the theory and methodology of cash management in the public sector.

Continuing our research in this area, we have proposed an integrated "single treasury window model", the theoretical basis of which is a modified Baumol-Tobin[8] concept adapted to the conditions of the public sector, taking into account the specifics of inter-budgetary relations. The model is based on the digital treasury paradigm, which involves the creation of a single information space for managing budget flows. Special attention is given to minimizing transaction costs and optimizing delays in the budgeting process.

THE RESULTS OF THE STUDY

PREREQUISITES AND KEY PROBLEMS OF THE DEVELOPMENT OF STATE CASH MANAGEMENT IN THE RUSSIAN FEDERATION

The development of the methodology of Treasury money management (cash management) is largely associated with increased macroeconomic instability [19] The high volatility of key economic indicators (such as the exchange rate, inflation, fiscal revenues, and the external economic situation) exacerbates budget risks. Among them are the risks of loss of liquidity, cash gaps, disruption of the approved payment schedule and irrational distribution of financial flows. Under these conditions, cash management evolves, turning into an adaptive regulatory mechanism that allows you to quickly mobilize financial resources, redistribute cash balances and neutralize temporary imbalances between budget revenues and expenditures.

An additional factor in updating the methodology under consideration is program-oriented budgeting. Its principle, based on linking financing with the effectiveness of government programs, imposes new requirements on the budget process [20]. Synchronizing liquidity management with project life cycles is becoming critical, as well as providing flexibility to quickly reallocate funds between changing priorities. In this regard, the requirements for the accuracy of financial forecasting and monitoring of the execution of cash plans, which form the substantial basis of modern cash management, are increasing. Digitalization and the introduction of automated public finance management platforms are significant drivers of the transformation of liquidity management models. The development of electronic document management systems, integration with banking systems through the API,[9] the introduction of analytical dashboards, big data technologies and artificial intelligence create the technological foundation for the transition to proactive budget liquidity management. They provide the necessary conditions for accurate forecasting of cash flows, preventive identification of cash gaps and multifactorial scenario analysis, close to real time. The result of the evolution of the liquidity management model is an increase in the stability of the budget system to the effects of external and internal destabilizing factors [21].

The institutional background conducive to the development of cash management is the reform of public administration aimed at improving efficiency, accountability and transparency [22, 23]. This approach creates the basis for two interrelated results: the unification of budget service standards and the centralization of management platforms. The key role in this process is played by cash management, which, acting as an integration tool, overcomes the initial disconnection of information systems at different budget

[8] The Baumol-Tobin concept is an economic model of transactional demand for money developed independently by William Baumol (1952) and James Tobin (1956).

[9] An API (English application programming interface) is the process of connecting business systems to banking services for data exchange and automation of operations.

levels. The synergetic effect is achieved by consolidating financial data on a single platform and consistently standardizing all transactions, as well as reengineering payment processes with the removal of duplicate stages.

At the same time, the key system limitation of the development of cache management remains the fragmentation of the information infrastructure and the low level of their integration. The main problem lies in technological disconnection, manifested in the independent use of various platforms by departments and levels of government (including at the regional level) (for example, ACC–Finance, BARS, 1C-based solutions, etc.), which serves as a key obstacle to obtaining a holistic picture of cash flows and operational liquidity management. The lack of metadata synchronization mechanisms and integration regulations makes it difficult to form a single treasury window and prevents operational liquidity management in an inter-level interaction format. This challenge is compounded by the lack of a unified integration architecture, consistent metadata formats, and unified information exchange regulations [24]. As a result, an insurmountable obstacle is formed for building a consolidated cash management model, which destabilizes the liquidity management processes within the entire budget structure.

Another significant problem is the lack of accuracy in forecasting cash flows. Liquidity planning and balance targeting is a key element of STA's cash flow management. The concept of *"targeting"* is associated with the establishment of targets in the economic, tax and monetary policy of the state for the management of key economic indicators.[10] In relation to government cash management, STA targeting should be understood as setting a target for STA balances. In accordance with the Federal Treasury's Action Plan for 2024 and the planning period 2025–2029, the following average annual limits have been set for the balance of funds on the STA in the currency of the Russian Federation: for 2026 — no more than 450 billion rubles, and in subsequent years — 0 rubles.[11] Thus, by 2027, the Federal Treasury has been tasked with maximizing the allocation of STA's remaining funds on the financial market.

In this regard, the issues of quality planning and forecasting of STA balances come to the fore. In world practice, the Pareto principle (80–20) is used for these purposes, when cash forecasts are based on 20% of the SFBA, which account for 80% of the total state budget expenditures. However, for Russia, this approach is already a passed stage, since the possibilities of integrating information flows into the SIIS "Electronic Budget" make it possible to cover all the country's SFBA in an automated mode. Currently, the Federal Treasury is faced with the task of so-called "fine-tuning" the forecasting system, i.e. using a wide range of tools or organizational solutions in order to smooth out short-term changes in the balance of funds in the STA.

However, the lack of modern analytical tools, the use of outdated forecasting techniques and shallow data analysis are still the reason for the persistent deviations of the actual budget execution from the planned parameters. As a result, there are cash gaps, more complicated control over the balance of budget recipients' funds and the need for constant adjustments to budget execution. The poor quality of forecasts also blocks the possibility of implementing advanced liquidity management mechanisms, including domestic treasury borrowings and operational liquidity redistribution [20].

[10] The encyclopedia of an investor. URL: https://investments.academic.ru/1436/Таргетирование (accessed on 22.03.2025).

[11] The Federal Treasury's activity plan for 2024 and the planning period 2025–2029 (approved by the Ministry of Finance of Russia)>The plan>Performance indicators of the Federal Treasury for 2024 and the planned period of 2025–2029. URL: https://sudact.ru/law/plan-deiatelnosti-federalnogo-kaznacheistva-na-2024-god/plan/pokazateli-deiatelnosti-federalnogo-kaznacheistva-na/ (accessed on 22.03.2025).

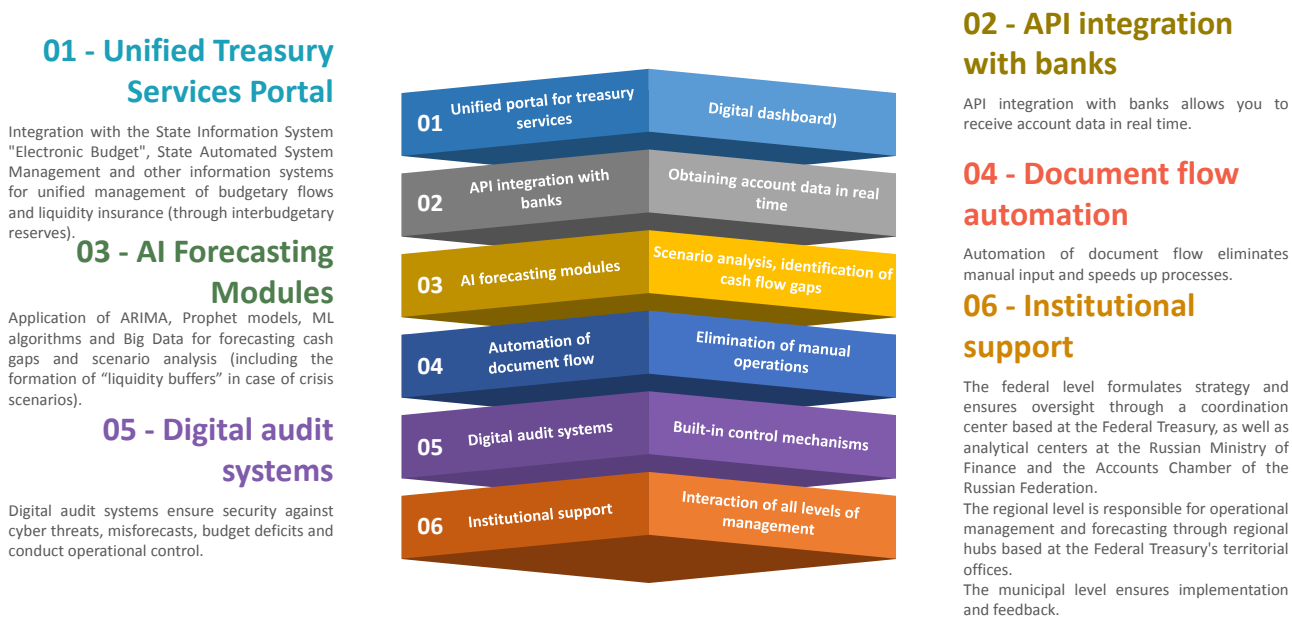

Fig. 2. **Single Treasury Window Model**

Source: Compiled by the authors.

The financial and administrative structure of public funds management in Russia still demonstrates a high level of rigidity and insufficient adaptability to the changing macroeconomic environment. The current treasury service regulations, including budget limits and allocation mechanisms, are not flexible enough to respond promptly to fluctuations in liquidity.

Technological limitations remain a critical factor constraining the implementation of progressive cash management methodologies. The created infrastructure of electronic document management and digital platforms has not ensured a qualitative transition from automation of individual processes to integrated online liquidity management. The limited, pilot application of artificial intelligence (AI) technologies and big data analysis for predictive analytics indicates the incompleteness of the digital transformation process and does not allow for the full potential of optimizing cash flows to be realized. Additionally, a significant challenge remains in the area of public cash management, where transparency and accountability are low. Although significant measures have been taken in recent years to increase the transparency of the budget process, including through the development of the state integrated information system for public finance management "Electronic Budget", open data mechanisms and digital reporting, gaps still remain in the control over the targeted use of budget funds [25]. In some cases, public sector organizations demonstrate insufficient discipline in managing liquidity, which leads to irrational spending of funds, excessive redundancy or accumulation of unused balances.

In addition, in the context of accelerating digital transformation, the task of ensuring cybersecurity and protecting the financial and information infrastructure is coming to the fore. Consolidation of liquidity management on centralized digital platforms objectively increases the systemic risks associated with external cyber attacks and violations of technological stability. Insufficient development of backup systems, data protection, and incident response procedures threatens to disrupt the continuity of the budget process and may lead to a loss of confidence in public financial management institutions. The combined impact of these factors poses significant challenges to building an effective national system of state cash management in Russia. Therefore, in

Table 1

Modern Elemental Composition of Cash Management in the Russian Federation

Element	Characteristics
Single Treasury Account	It is the main account for accumulating funds in the public administration sector. It is opened by the Federal Treasury in the Bank of Russia. It is organized according to the principle of "one root account and 89 balance accounts of the territorial departments of the Federal Treasury", combined under a single balance sheet number 40102
Cash-concentration	Automatic consolidation of budget funds to the STA based on the payment system of the Bank of Russia, in which direct participation allows the Federal Treasury to form a "pool of liquidity" on a daily basis at the expense of funds held in bank accounts of the Federal Treasury and its territorial bodies" *
The system of "Electronic urgent bank payments" **	The Federal Treasury and its territorial bodies are direct participants in settlements (hereinafter referred to as DSP) of the payment system of the Bank of Russia***, so that all services of the Bank of Russia can be used for money transfers: urgent transfer; non-urgent transfer; fast payments. This allows you to manage the liquidity for settlements in the Bank of Russia's payment system in real time during the day, i.e. to increase or decrease the amount of funds in the account.; receive information on liquidity for settlements of all territorial bodies of the Federal Treasury (TBFT), as well as information on cash balances on correspondent subaccounts of TBFT
Liquidity planning and balance targeting	Targeting the balances of funds to the STA, a basic liquidity management tool, involves setting a target level of balances, determined based on forecasts of their dynamics. The strategic goal of this policy, in accordance with the Federal Treasury's Action Plan for 2024–2029, is to achieve a "conditional zero" free balance by 2027, in which all unused funds are subject to investment in financial instruments
Active and passive operations	Financial instruments used by the Federal Treasury to manage STA liquidity (see *Figure 1*)

Source: Compiled by the authors based on [27].

Notes: * Chapter 4. The procedure for making money transfers in the payment system of the Bank of Russia and the applicable forms of non-cash payments Regulations of the Bank of Russia dated 09/24/2020 No. 732-P "On the payment system of the Bank of Russia"; ** currently, the Bank of Russia's payment system provides services for urgent, non–urgent transfers, and fast payments. Position Pot Of Russia dated 09/24/2020 No. 732-P "On the payment system of the Bank of Russia"; *** About the payment system of the Bank of Russia: Regulation of the Bank of Russia dated 09/24/2020 No. 732-P.

order to overcome the identified structural and technological limitations, it is necessary to develop and implement a conceptually new paradigm of public finance liquidity management. A "single treasury window" model is proposed as a solution, integrating advanced technologies (AI, Big Data, API) with centralized financial flow management (*Fig. 2*).

It should be noted that the idea of a "Single Treasury Window" is not new in the practice of the Federal Treasury. Currently, the idea has been implemented in the SIIS "Electronic Budget", primarily as a single entry point for access and interaction of the chief administrators of budgetary funds (SFBA) with all control and financial authorities. The model presented by the authors in *Fig. 2* is based on existing ones (treasury payment system, electronic document management, API integration with bank payment systems) and promising ones (AI forecasting module for budget balances; digital audit and control system; gradual integration of all levels of the budget system of the Russian Federation on a single budget platform) technological capabilities.

Table 2

Subjects of Cash Management in the Public Sector in Accordance with Management Horizons

Subjects of management	The management horizon	Functions
Ministry of Finance of the Russian Federation, Bank of Russia, Accounts Chamber of the Russian Federation, Head of the Federal Treasury (his Deputy)	Strategic	It includes the development of a liquidity management concept, the establishment of strategic constraints and targets (profitability, risk, timing of placement), as well as the approval of the relevant departmental regulatory framework. The implementation of these powers is distributed between the Ministry of Finance of the Russian Federation, the Bank of Russia and the Federal Treasury. The Accounting Chamber of the Russian Federation performs the control function regarding the execution of the federal budget, including the activities of the Federal Treasury for managing balances on the Unified Treasury Account (STA)
The Head of IDFT LMS – a structural division of FT	Tactical	It includes a set of analytical procedures: assessment and forecasting of cash flows, analysis of risks and environmental factors, research and evaluation of financial instruments. In addition, it provides for the approval of a reporting system, as well as monitoring and analyzing the effectiveness of liquidity management
Structural divisions of IDFT LMS	Operational	It covers operational liquidity management, which includes: calculating daily budget requirements and balance planning; risk assessment when working with financial instruments; direct operations on the STA

Source: Compiled by the authors based on [27].

The model represents an integrated system and a holistic response to the challenge of digitalization, transferring disparate cash management processes (forecast, payment, control) into a single digital space controlled by data and algorithms. Blocks 01, 02, 04 are aimed at solving the problem of ensuring high synchronization of cash flows and forecasting accuracy, providing a single up-to-date picture of all transactions in close to real time, ensuring direct synchronization of data with banks, eliminating delays and manual entry, linking the cash request, its execution by the bank and accounting in a single unbroken digital circuit, providing accurate monitoring.

The "single treasury window" model includes six elements, each of which is aimed at the disclosure and effective execution of the functions of cash management. A single treasury service portal provides information consolidation, creating a digital entry point for participants in the budget process. API integration with banks closes the block of operational interaction with the financial infrastructure and guarantees real-time control of funds balances. AI forecasting modules enhance the analytical component, allowing you to build scenario models and improve the accuracy of liquidity forecasts. Document management automation — eliminates operational delays and manual

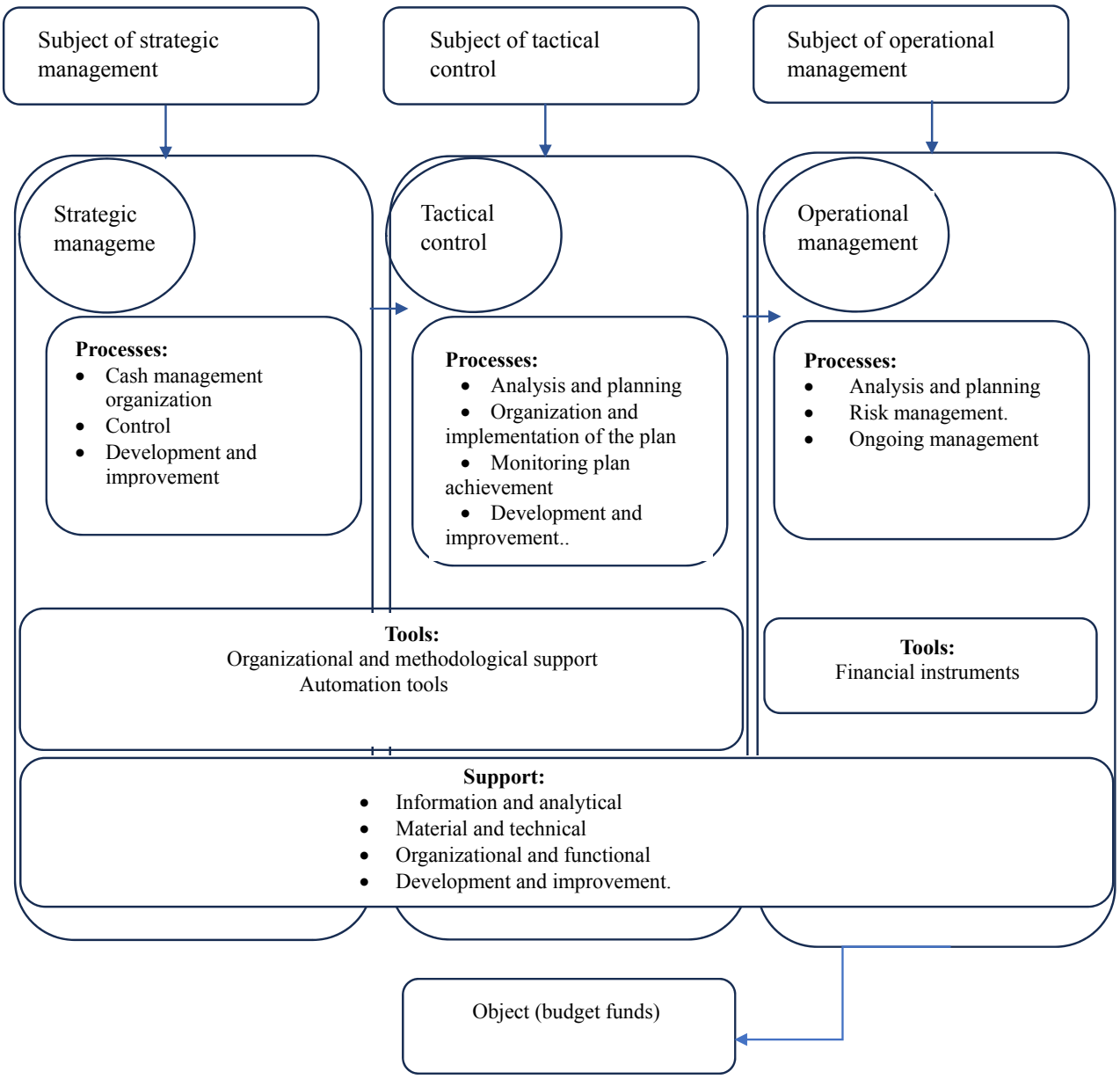

Fig. 3. **Elements of Cash Management Based on the Management Horizon**

Source: [27].

errors, creating a technological basis for the speed and transparency of processes. Digital audit systems are responsible for the integrated control and security of operations, minimizing the risks of violations. The final block, institutional support— reinforces the strategic and coordinating role of the state, integrating federal, regional and municipal levels of government.

These six elements reflect the necessary and balanced set of functions: information, operational, analytical, technological, control and institutional. The model aims to address key issues, including cash gaps, low transparency, and transaction costs, through the creation of a unified digital platform.

THE ELEMENTAL COMPOSITION OF CASH MANAGEMENT

It should be noted that there is no generally accepted element structure of cash management in the public sector. Global practice considers three main (basic) elements: a single treasury account;

Table 3

Distinctive Features of Liquidity Management and Cash Management in the Public Sector

Element	Liquidity Management	Cash management	Differences
Goals	Ensuring fiscal sustainability, timely fulfillment of obligations, minimizing deficit risks	Managing the remaining available budget funds, generating the highest possible income with minimal costs	Liquidity management is a strategic goal, cash management is an operational task
Management object	It covers the totality of budget cash flows, financial reserves, government debt, and inter-budget transfers	Operational (daily) cash flows and balances on a Single Treasury Account (STA)	Liquidity management covers the entire range of liquid assets (including debt and reserves in non-monetary form, such as gold or securities), while cash management is limited to managing only monetary positions
Functions	Forecasting of cash flows on various horizons, financial risk management, administration of public debt, formation of reserve funds	Short-term forecasting, balancing of cash flows, control of payment transactions	Liquidity — strategic planning, cash management — operational execution
Tools	Reserves (NWF, stabilization funds), government loans, inter-budget transfers, hedging, stress tests	Treasury plans, payment schedules, T-bills, deposits, "zero accounts"	Liquidity has strategic and debt instruments, cash management has cash and short–term instruments
The institutional level	Ministry of Finance, Central Bank, international organizations	Treasury (national/federal), Treasury departments	Liquidity is at the macro level, cash management is at the micro–operational level
Planning horizon	Medium- and long-term planning (one year, three to five years, MTEF)	Short-term (day, week, month)	The difference in time scale
Focus	Sustainability and trust in the system	Minimizing cash gaps and costs	Liquidity — strategic stability, cash management — technical efficiency

Source: Compiled by the authors based on [1, 32].

forecasting cash flow and active liquidity management through the use of short-term financial instruments of the money market.[12] Based on the universal (basic) elements of the liquidity management model, national treasuries form their own systems of state liquidity management adapted to local conditions.

A review of domestic practice allowed us to identify only the mention of representatives of the Federal Treasury about the elemental composition of cash management [26]. The following elements are emphasized (*Table 1*).

In our opinion, the current approaches to the elementary composition of cash management in the public sector are unstructured. For example, it is more appropriate to consider a single treasury account as a mechanism, and automated systems as a liquidity management tool. Liquidity planning and balance targeting are processes, while treasury obligations (letters of credit) are a tool. This leads to the hypothesis that the elemental composition should be based on basic concepts (processes, tools, etc.), rather than their specific application to the area under study. Another disadvantage of the current approach is the lack of consideration of the management horizon, which makes it impossible to identify subjects and objects of management, processes, tools and means of ensuring cache management. From this point of view, the approaches used in the banking sector, where liquidity management issues have received the most attention, may be of interest. Traditionally, three management horizons are distinguished: it is advisable to consider the operational management horizon as +7 days, tactical — +30 days, strategic — +365 days. We used this to clarify the composition of management entities and their functions (*Table 2*).

The proposed approach suggests an expanded framework for cash management in the public sector, encompassing various elements such as subjects and objects of management, key processes, management tools, and support (*Fig. 3*).

An organizational model has been proposed for cash management processes in the public sector, which includes five sequential and cyclical stages: 1) analysis and planning; 2) organization of execution; 3) operational (current) management and risk management; 4) control; 5) development and improvement of the system.

The cash management toolkit is represented by three groups: 1) organizational and methodological; 2) automation tools; 3) financial instruments. The supporting elements of cache management include: information and analytical; logistical, organizational and functional support. The developed element composition ensures the integration of targets and functional competencies of managing entities, which forms the methodological basis for designing targeted measures for the development and optimization of each element of the system, which together creates a closed management cycle and prerequisites for continuous improvement of state cash management.

CONTENT AND FUNCTIONAL FEATURES OF LIQUIDITY MANAGEMENT IN THE PUBLIC SECTOR

An analysis of the functional and substantive characteristics of the liquidity management system in the public sector allowed us to state the absence of a formulated conceptual framework. Thus, along with the term "cash management", the terms "liquidity", "liquidity management", "budget liquidity management", "STA liquidity management" and other related categories are used without commenting on the differences in their content and application. From this point of view, the definition of the boundaries of the concepts of "liquidity"

[12] Unified Treasury Account and Liquidity Management in PEMPAL countries: Report on the results of the 2021 Treasury Community Survey. URL: https://www.pempal.org/sites/pempal/files/2021_tsa_and_cm_in_pempal_countries_rus.pdf (accessed on 22.03.2025).

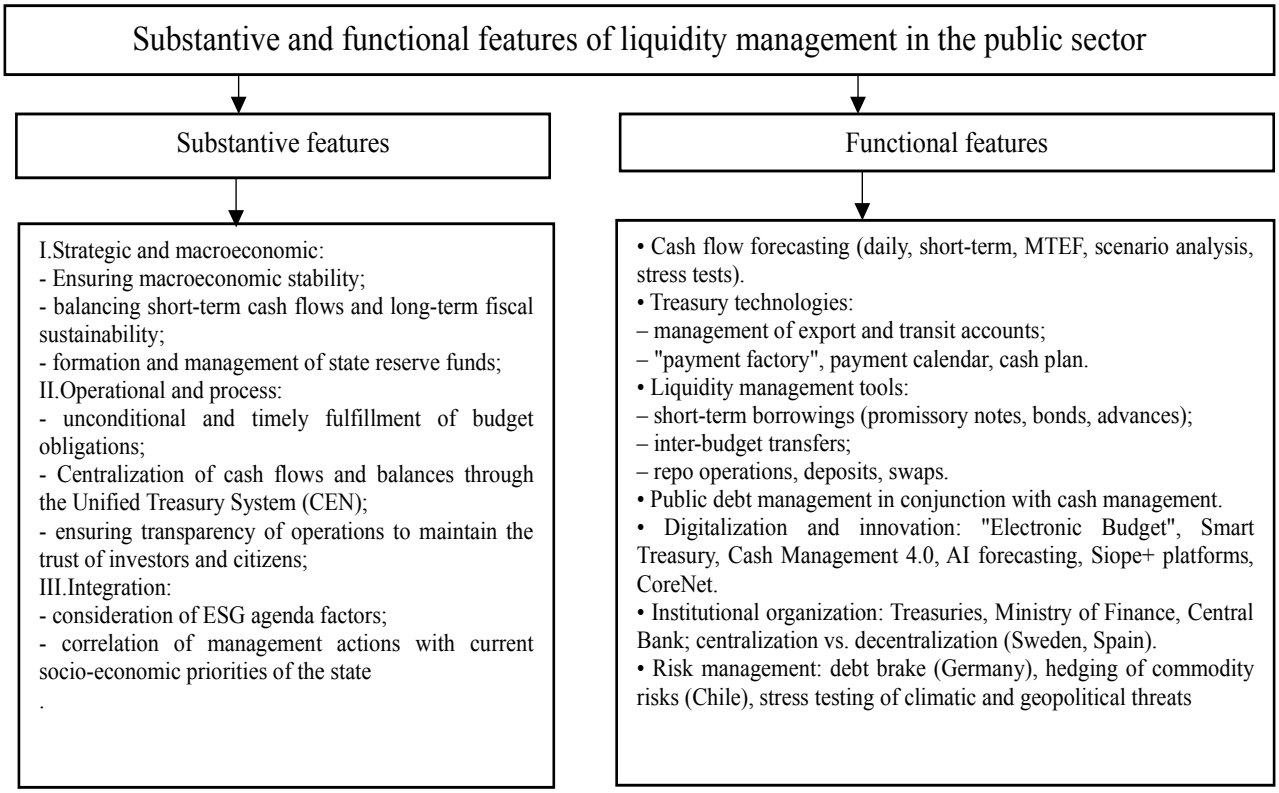

Fig. 4. **Structural and Functional Features of Liquidity Management in the State**

Source: Compiled by the authors.

and "cash management" in the public sector needs to be clarified.

The definition and scope of the term "liquidity", as well as related synonyms and well-established linguistic constructions, remain the subject of debate in the academic community. An analysis of the scientific literature has led to the conclusion that liquidity is a complex concept that characterizes the state of both the market (individual market segments) as a whole and its participants (entities with the legal capacity to conclude transactions). The concept is interpreted quite broadly, characterizing the conditions of both the subjects of transactions and the properties of individual financial instruments. In addition, the term "liquidity" or "liquid" is used to characterize the condition of both bank and balance sheet accounts, as well as balance sheets in general, the liquidity of which depends on the content of transactions and objects reflected on them [28–31].

Liquidity as a property of an object is manifested in commodity-money relations in the sphere of circulation. In the 1920s, the concept of liquidity in the Russian economy was close to the modern one, but in subsequent years, when analyzing economic activity and balance, the liquidity of enterprises and banks was not analyzed, since it was believed that this characteristic was inherent exclusively in capitalist relations.

In the commercial sector, liquidity is traditionally understood as the ability of an economic entity to quickly repay its obligations at the expense of the property at its disposal.

Thus, liquidity should be understood as a condition, while "liquidity management" is a condition management process. The analysis made it possible to identify the following distinctive features of liquidity management and cash management in the public sector (*Table 3*).

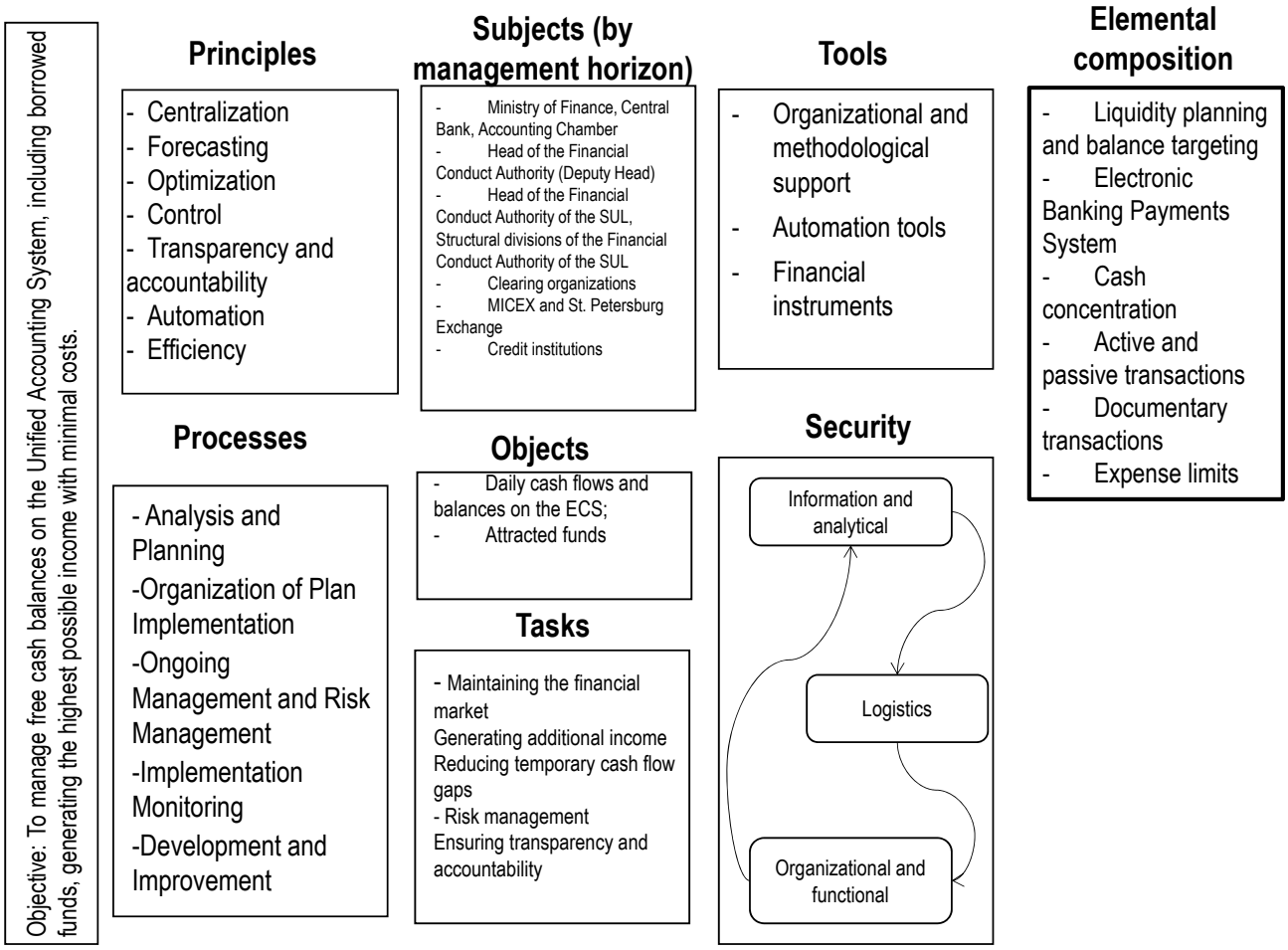

Fig. 5. **Cash Management System in the Public Sector**

Source: Compiled by the authors.

The analysis of the data presented in Table 3 allows us to identify several key differences between the concept of "cash management" and "liquidity" in the public sector.

First of all, it is the difference in the scale of the control object. State cash management is the operational management of a single treasury account (STA). Its goal is to ensure the daily availability of funds for budget execution, minimize temporarily available balances and optimize the placement of short–term liquidity in various financial instruments. The liquidity of the public sector, in turn, reflects the ability of the State as a whole to meet all its financial obligations on time. These obligations include not only current budget payments, but also repayment of government debt (internal and external), fulfillment of guarantees, support for backbone enterprises in a crisis situation, etc.

The next difference is in the sources and tools. Cash management operates with the revenue received in order to avoid cash gaps in the execution of the approved budget. Liquidity depends on fundamental, strategic factors: access to domestic and foreign capital markets; the level and structure of sovereign debt; the size and quality of the country's gold and foreign exchange reserves; credit ratings from international agencies; stability of the tax base and diversification of budget revenues. In other words, the Federal Treasury can manage its balances flawlessly, but if the country's external borrowing limit is exhausted and gold reserves are depleted, the state may face a liquidity crisis, and cash management may be powerless in this case.

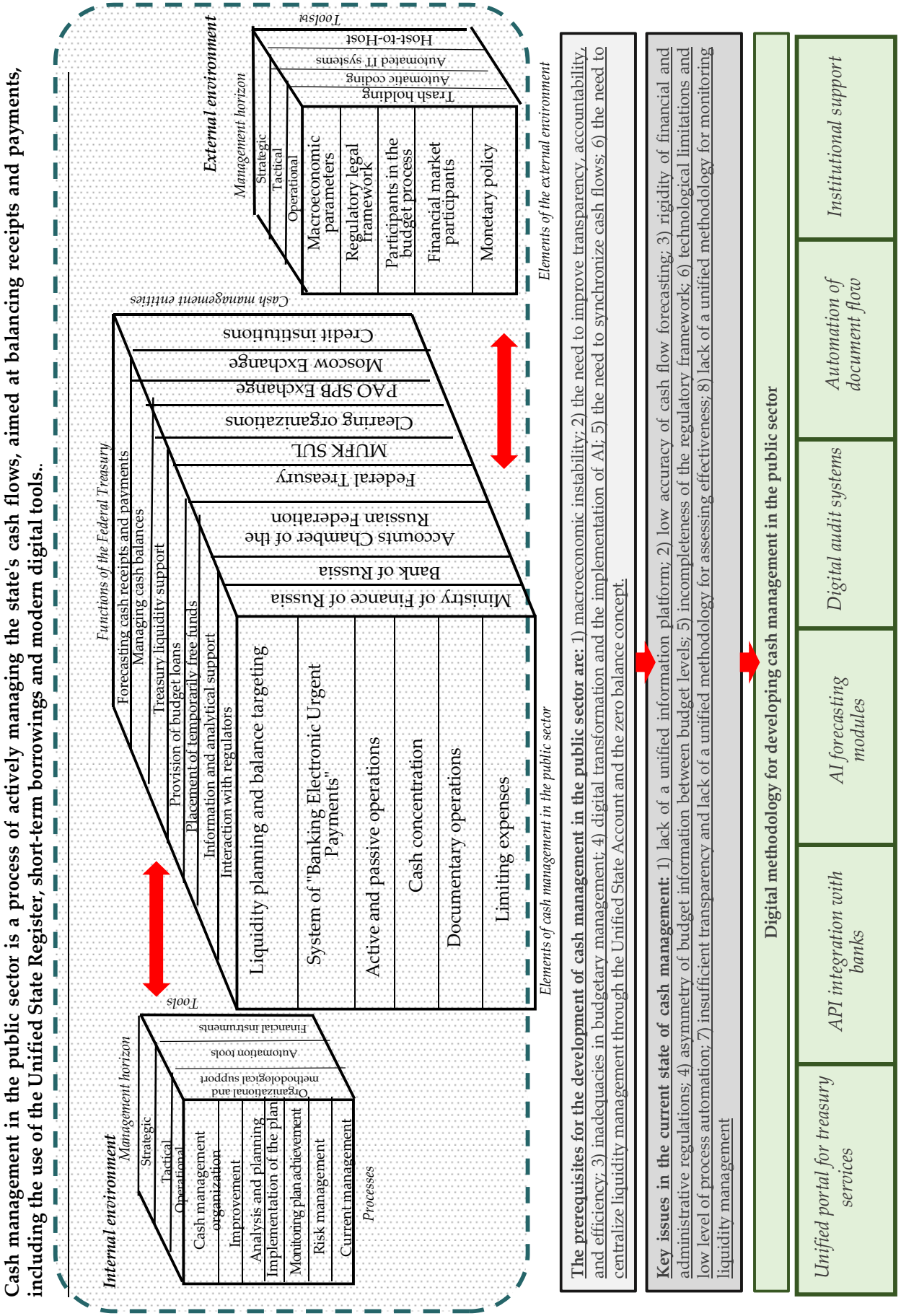

Fig. 6. **Conceptual Model of Cash Management in the Public Sector**

Source: Compiled by the authors.

Conversely, the high liquidity of the state (with large reserves) can afford less optimal cash management without catastrophic consequences.

Finally, the difference lies in the responsible actors and goals. Cash management is the prerogative of the Federal Treasury in order to ensure the technical continuity of payments and minimize the cost of servicing temporary balances. Liquidity management is the responsibility of the Ministry of Finance, the Central Bank and the country's top political leadership in order to maintain investor confidence, macroeconomic stability and a sovereign credit rating. To do this, the government uses such tools as debt policy, gold reserves policy, negotiations with international financial institutions and other creditors.

So, cash management in the public sector is an important, but purely operational and auxiliary function in the public finance system. It is responsible for budget execution, but does not create liquidity, but only distributes it. Public sector liquidity is a macroeconomic and strategic category that determines a country's financial sovereignty and sustainability. It has been shaped by decades of fiscal, debt, and monetary policy.

Thus, liquidity management is a broader concept, while cash management should be considered as a functional component of liquidity management, ensuring its practical implementation in both the short and long term [33]. In this regard, *cash management in the public sector should be defined as a process of active management of the state's cash flows aimed at balancing receipts and payments, including the use of STA, short-term borrowings and modern digital tools*.

A modern liquidity management system involves managing the placement of funds and their attraction. The operating environment and liquidity management tools generally coincide in the public and corporate sectors. A functional feature of the public sector is the dominance of cash receipts, which makes cash flow management the basis of the liquidity management system. The functional features of STA's liquidity management are determined by the role of the Federal Treasury in the system of financial institutions and its powers and implemented in the cash management system.

In practice, this is reflected in the limitations of choice when concluding transactions: subjects of transactions, counterparties, and places of conclusion of transactions. *Figure 4* visualizes the essential characteristics and functional architecture of the liquidity management model in the public sector.

Functional features are related to practical tools for achieving financial goals, such as forecasting cash flows over different time horizons, using treasury technologies, managing public debt, short-term borrowing and inter-budget transfers. They also include digitalization of processes and the introduction of innovative solutions, as well as systematic risk management, which helps to balance short-term liquidity and long-term stability in the budget system.

A CONCEPTUAL MODEL OF CASH MANAGEMENT IN THE PUBLIC SECTOR

A systematic approach to cache management involves the establishment of: goals, objectives, principles, processes, subjects and objects of management, tools, support and elements (*Fig. 5*).

The systematic approach presented in *Figure 5* is based on the results of the studies conducted in the previous sections of this study. The purpose, objectives and objects are formulated based on conclusions about the functional features of cash management in the public sector (*Table 3, Fig. 4*). Management entities, elements, tools and support were the result of a study of approaches to cash management in the public sector in terms of the implementation of modern management

systems from the banking and corporate sectors (*Table 2, Fig. 3*). For successful operation, the cache management system is proposed to be built in accordance with generally accepted principles of the public sector and to follow them in the process of carrying out activities.

The proposed fundamental principles of cash management are taken into account in the formation of a conceptual model of cash management in the public sector, taking into account the specifics of the functioning of the Russian budget system and the state treasury (*Fig. 6*).

The foundation of the proposed transformational model is a systematic approach with digital management tools and predictive analytics based on the principles of a single treasury window and modified models of cash regulation. The conceptual model is formed taking into account the external and internal environment of cash management in the public sector, each of which includes its own set of elements and tools, taking into account the management horizon.

The presented conceptual model takes into account the current state of public financial institutions and the liquidity management system of STA, and uses best practices from corporate and bank financial institutions to enhance the efficiency of public financial management. It serves as a methodological foundation for the creation of detailed plans and programs for developing the cash management system in the public sector. The model has an adaptive architecture that allows it to accommodate specific circumstances and challenges arising from both external factors, such as geopolitical and foreign economic situations, and internal socio-economic dynamics.

CONCLUSIONS

Modern cash management in the public sector has evolved from the 19th-century principle of a unified cash register to the formation of a treasury payment system and the use of digital tools. This change has been driven by a set of interconnected factors, including macroeconomic volatility, institutional reforms, the digitalization of budget processes, increasing fiscal burdens, and demographic changes. These factors have made the development of efficient cash management in public institutions an urgent and inevitable necessity.

It has been determined that the current cash management system in the public sector relies on STA and incorporates a wide range of tools for managing liquidity, which are integrated into the treasury payment system. This system is characterized by an expansion of the variety of financial instruments, as well as integration with the banking infrastructure and active digitization.

However, several key challenges have been identified, including the fragmentation of information systems, the lack of accuracy in forecasting cash flows, and the absence of modern analytical tools. Additionally, there are institutional and personnel obstacles that need to be addressed.

The analysis of the cash management system allowed us to identify the main elements: STA, cash flow forecasting, and active liquidity management. At the same time, the study suggested the need to create a basic structure based on fundamental management categories (processes, tools, subjects, objects) rather than through their specific reflection in a particular subject area. This approach confirmed the usefulness of clarifying existing models of state cash management.

An analysis of the essential and functional aspects of cash management in the public sector has led to the conclusion that liquidity management is a broader concept, while cash management should be viewed as a functional component of liquidity management, ensuring its practical implementation in the short term.

Functional features include practical tools for achieving goals, such as forecasting cash

flows over different time horizons, utilizing treasury technologies, managing public debt, short-term borrowing, and inter-budget transfers. Additionally, digitalization of processes, the introduction of innovative solutions, and systemic risk management are all crucial components that contribute to balancing the short-term solvency and long-term stability of the budget system.

The theoretical significance of this research lies in its contribution to the expansion of the elemental composition of cash management in the public sector. This, in turn, determines the trends in its development. The study also clarifies the content and functional features of liquidity management. These findings can be used to create a unified conceptual framework that presents the goals, objectives, and functions of cash management as outlined in the regulatory documents of the Federal Treasury, Ministry of Finance, and Central Bank of Russia.

The practical significance of this research lies in the proposal of a fundamentally new conceptual model for cash management in the public sector. This model is considered in relation to both the internal and external environments of cash management, and it can serve as the basis for creating a roadmap for establishing an integrated public cash management platform that utilizes predictive analytics and artificial intelligence. This represents a qualitatively new step in the development of budget liquidity management mechanisms.

The findings of this study can also provide a foundation for further fundamental and applied research in the field of public administration.

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E. A. Isaev — statement of the problem, development of the concept of the article, a retrospective analysis of the development and problems of cash management in the public sector.
L. V. Gusarova — critical analysis of literature, collection of statistical data, tabular and graphical presentation of results.
E. A. Fedchenko — description of the results and formation of conclusions of the study.

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