



Issues of methodological improvement of tax collection in the tax system through electronic information systems

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ABSTRACT

This scientific work analyzes methodological problems encountered in tax collection through improving digitalization processes in the tax system. The possibilities of introducing digital technologies in tax administration, increasing transparency in relations with taxpayers, and expanding the tax base are highlighted. The need for integration of existing information systems, processing of large amounts of data, and the introduction of artificial intelligence and blockchain technologies is also substantiated. The study separately considers problems in increasing the efficiency of tax collection - insufficient development of methodological approaches, shortcomings in standardization, and issues related to data security.

Keywords:

tax system, digitalization, tax administration, tax collection, methodological problems, digital technologies, integration of information systems, artificial intelligence, blockchain, data security, transparency, efficiency of tax revenues.

Introduction: Currently, digitalization processes are gaining particular importance in the effective management of the tax system and improving tax collection mechanisms. World experience shows that the use of digital technologies in tax administration not only ensures full and timely collection of taxes, but also increases transparency and openness in relations between taxpayers and the state. In the Republic of Uzbekistan, within the framework of the "Digital Uzbekistan - 2030" strategy, a number of reforms are being implemented to modernize the tax system, process tax information electronically, create and integrate unified databases, as well as implement advanced technologies such as artificial intelligence and blockchain.

Analysis of literature on the topic. We present a brief review of literature on the topic of ways to improve the tax collection mechanism

currently implemented in the tax administration of the Republic of Uzbekistan.

Tax liability is the total amount of tax owed by an individual, corporation, or other legal entity to the government. Income tax, sales tax, and capital gains tax are all forms of tax liability (Johnson, 2022) [1].

The definition of tax liability is the amount of money or debt that an individual or legal entity owes to the government in taxes (Jozepson, 2022). Thus, it is understood that tax liabilities are leading to tax evasion. That is, within the framework of this study, we will try to reveal the economic essence of the concept of tax evasion. Tax evasion is understood as a large-scale activity carried out with the aim of illegally reducing the tax liabilities of individuals or legal entities. Tax obligations are a standard and legal aspect of tax systems, and tax evasion is the criminal act of fraudulently avoiding or reducing these obligations.[2]

Tax evasion has been prevalent throughout history. The term “tax evasion” encompasses a wide range of activities by those who do not want to pay their fair share of taxes (Ovusu et al., 2019). Underreporting income, overstating deductions, and manipulating financial documents are examples of tax evasion strategies (Ozili, 2020). However, the amount of revenue lost through tax evasion can be significant in any country. [3]

Most tax evasion studies examine individual behavior in a specific context (Alm et al., 2019). Individual factors such as morality, beliefs, attitudes, perceptions, intentions, awareness, culture, religiosity, knowledge, and education are important. Personal income tax is the most common lens through which these behaviors are examined, and most theoretical and empirical work on tax evasion has focused on personal income tax (Efeeloo and Dick, 2018). Individuals can avoid paying income taxes by underreporting their income, overstating deductions, allowances, or credits, neglecting to file their tax returns on time, or even engaging in tax avoidance schemes. On the other hand, such behaviors can, of course, be captured in different taxes. Meanwhile, firms may underreport income, overstate deductions, or fail to file corporate income tax returns, for example, as individuals do in their personal income tax returns.[4]

In the literature, economic factors include tax rates, fiscal constraints, income levels, tax burdens, corruption, economic structure, audits, fines, and unemployment. Richardson (2016) argues that non-economic factors are more influential than economic factors in tax evasion. Corruption and tax evasion are subsequently described as widespread problems. Corruption is a dishonest or criminal act committed by a government or an official or corporation to obtain an illegal advantage or to abuse power for personal gain (Khlif and Amara, 2019). Finally, unemployment is defined as those over a certain age who are not in paid employment or self-employment but are currently looking for work (Tabandeh and Tamadonnejad, 2015). According to research, unemployment is a major source of the shadow economy. [5]

In addition to the economic and non-economic factors mentioned above, recent studies on tax evasion also use other factors. A literature review suggests some variables such as the digitalization of government services, corporate social responsibility, and the impact of information dissemination. First, governments around the world have followed the private sector in using the internet to communicate with their citizens in recent decades, realizing that internet technology can simplify government services and increase their efficiency (Uyar et al., 2021). (Montenegro, 2021). Finally, a whistleblower is someone who discloses knowledge or conduct that is illegal, unethical, illegal, dangerous, fraudulent, or misuses public funds within a private, public, or governmental organization. The introduction of whistleblowing systems increases the likelihood of detection by adding uncertainty to the probability of passing an audit (Masslet et al., 2019). [6].

Analysis and discussion of results.

Methodological problems in the process of digitizing the tax system in Uzbekistan. In recent years, digital technologies have been widely introduced in the Republic of Uzbekistan to improve tax administration and increase tax collection. In particular, within the framework of the “Digital Uzbekistan - 2030” strategy, tax administration automation, the establishment of electronic reporting systems, an electronic tax system (E-Tax) and unified information platforms are being developed. At the same time, despite the ongoing reforms, a number of methodological problems are observed in this area.

Firstly, the methodological foundations that scientifically and theoretically support the processes of digitizing the tax system have not been sufficiently developed. In particular, there are no unified methodological approaches to introducing advanced technologies such as “Big Data”, artificial intelligence and blockchain into tax administration.

Secondly, the problems of integration and standardization between information systems of state agencies have not been resolved. Due to the incomplete harmonization of the databases of tax authorities, customs, financial, banking

and cadastral systems, there are gaps in the full coverage of information that is the object of taxation.

Thirdly, limitations in organizational and technological infrastructure undermine the ability to effectively collect taxes digitally. In some regions, the poor quality of Internet networks, insufficient technical support, and varying digital competencies of tax authorities reduce the efficiency of tax administration.

Fourthly, information security and data protection remain an urgent issue. Information about taxpayers' personal data and financial transactions is not fully protected from a cybersecurity perspective. This can lead to distrust in the digitalization process.

Fifthly, despite the introduction of digital platforms into practice, their effectiveness in collecting taxes is not high enough. The emergence of excessive bureaucratic obstacles through electronic reporting systems and the incomplete functioning of monitoring and control mechanisms are among the problems.

Although the processes of digitization of the tax system in Uzbekistan are developing rapidly, in order to increase its efficiency, a comprehensive solution of methodological, organizational and technological problems on a scientific and theoretical basis is required. Improving tax obligations and developing a mechanism for collecting tax debts through the use of modern information systems is an important step in ensuring the efficiency and transparency of tax collection processes. The introduction of advanced technologies, such as data analysis and automation, will increase the opportunities to identify inconsistencies in tax authorities, identify tax evasion and simplify the collection of overdue tax payments. Cybersecurity information systems provide law enforcement agencies with the ability to centralize and analyze large amounts of data, which allows them to identify patterns of crime and redirect high-risk offenders more effectively.

International Experience in Methodological Improvement of Tax Collection via Electronic Systems

Methodology Pillar / Country	Core Methodological Approach	Application in Tax Collection Methodology	Methodological Outcome on the Tax System
USA	Market-Driven Innovation and Digital Services (Bottom-up)	1. Automated Data Exchange: (Application Programming Interfaces) to facilitate seamless, automated transfer of financial data between private platforms (banks, FinTech) and the IRS (Internal Revenue Service).	Reduces Compliance Cost and encourages Voluntary Compliance . Focus shifts from strict auditing to Service Provision and simplification.
China	Centralized Strategy and Big Data Control (Top-down)	1. Unified Social Credit System Integration: Leveraging mass data, including the social credit system, to assess the risk profile and compliance behavior of corporate taxpayers in real-time.	Enforces Tax Discipline and Transparency . Methodology focuses on predictive risk analysis and exposing hidden transaction cycles.
Russia	Technological Sovereignty and State Oversight	1. Real-Time Fiscal Monitoring (Online Kassa): Mandating the connection of all retail cash	Maximizes Tax Base Visibility and Control . Methodology reduces the shadow

		registers to a unified electronic fiscal data operator. The tax authority monitors all sales transactions in real-time .	economy by eliminating opportunities for hiding cash revenue.
Kazakhstan	Digital Sovereignty and Human Capital Investment	1. Mandatory Electronic Documentation: Full transition to mandatory Electronic Invoices (ESF) and electronic consignment notes (ETTN) for all business entities.	Enhances Administrative Efficiency and Speed. The methodology ensures data integrity and accelerates VAT administration and refund processes.

The table below provides a comparative analysis of how four major global economies approach the methodological enhancement of tax collection through digital and AI-powered systems. Improving the Methodology of Tax Collection in Uzbekistan

1. Deepening the Digitalization of Tax Administration. Fully transition taxpayer operations to electronic control systems (such as e-Tax, e-Reporting, and e-Check). Introduce Artificial Intelligence (AI), Big Data, and blockchain technologies to automatically analyze tax data and detect fraudulent activities. Integrate all tax-related data into a unified digital platform to ensure real-time data exchange between government institutions.

2. Simplifying and Stabilizing Tax Policy. Optimize tax types and rates, establishing progressive but stable tax burdens for small and medium-sized enterprises. Simplify the Tax Code to make it clear, consistent, and predictable for taxpayers. Implement a “one-stop” digital platform for all tax operations to reduce administrative barriers.

3. Strengthening Incentive Systems for Taxpayers. Introduce tax bonuses, simplified reporting, and preferential loans for honest taxpayers. Promote tax culture programs to raise public awareness about the social importance of paying taxes.

4. Modernizing the Functioning of Tax Authorities. Develop modern training programs for tax officials, focusing on digital skills and analytical thinking. Strengthen internal anti-corruption mechanisms and ensure full transparency of tax authority activities.

5. Implementing Data-Driven Tax Management. Use tax data for economic analysis and forecasting, enabling real-time prediction of tax revenues. Develop analytical models to measure tax burden across sectors and use these models for evidence-based policy design.

6. Adopting International Best Practices. Study the experiences of advanced countries such as OECD members, South Korea, Singapore, and Estonia, adapting their digital tax administration models to Uzbekistan’s context. Collaborate with international institutions (World Bank, IMF, etc.) to implement projects aimed at modernizing the tax administration system.

Improving the methodology of tax collection is a key factor in ensuring economic stability, increasing budget revenues, and enhancing the business environment. For Uzbekistan, success in this direction requires a strong focus on digitalization, data-driven management, the development of tax culture, and adaptation of international best practices.

Tasks for Improving the Methodology of Tax Collection through Modern Information Systems

Expand the digitalization of tax administration.

— Transition all tax collection, accounting, and control processes to fully digital platforms.

Develop electronic services for taxpayers

— Simplify tax obligations through systems such as e-Tax, e-Reporting, and e-Payment.

Integrate inter-agency information exchange systems

— Establish a unified information database among the Tax Committee, customs, banks, statistics agencies, and other public institutions.

Introduce Artificial Intelligence (AI) and Big Data technologies

— Automate data analysis to detect tax risks, identify hidden economic activities, and improve forecasting accuracy.

Implement automated tax control mechanisms

— Conduct monitoring and auditing processes electronically, minimizing human intervention.

Enhance the digital identification system for taxpayers

— Create a unified digital ID to track each taxpayer's financial and economic activity.

Ensure cybersecurity and data protection

— Strengthen information security to guarantee confidentiality, integrity, and protection of tax data.

Develop human resource capacity

— Train tax officials in modern IT tools, data analytics, and digital management methods.

Functions of Modern Information Systems in Tax Collection

Information collection and processing function

— Automatically collect, analyze, and process taxpayer data in real time.

Forecasting and analytical function

— Use AI-based models to forecast tax revenues and assess potential risks.

Monitoring and control function

— Continuously monitor taxpayer activities and establish automated alert mechanisms.

Integration and coordination function

— Ensure smooth interaction between the tax system and other governmental information systems.

Analytical decision-making function

— Support evidence-based policy decisions through data-driven insights and economic modeling.

Transparency and accountability function

— Promote openness in the tax system to increase taxpayer trust and reduce corruption risks.

Service provision function

— Provide convenient, accessible, and efficient electronic tax services to reduce administrative costs and time for taxpayers.

Models for Improving the Methodology of Tax Collection through Modern Information Systems — written in a clear, academic style.

1. Integrated Digital Tax Management Model

All tax processes — from taxpayer registration to accounting, payment, monitoring, and analysis — are managed through a single digital platform.

Data are entered once and automatically shared across all government institutions. Reduces human errors and manual interventions. Increases transparency and efficiency. Example: Implemented successfully in Estonia and Singapore, where all tax procedures are digitalized.

2. AI-Based Tax Analytics Model. This model uses Artificial Intelligence (AI) and Big Data technologies to automatically analyze taxpayers' financial activities and identify potential risks or hidden economic activities.

Advantages. Detects tax evasion and shadow economy activities. Improves the accuracy of tax revenue forecasting. Enables data-driven decision-making in tax policy. Used by the U.S. Internal Revenue Service (IRS) and South Korea's Hometax system.

3. Blockchain-Based Tax Reporting Model. Ensures full transparency of tax payments by recording all financial transactions through blockchain technology. Eliminates data tampering and fraud. Allows real-time monitoring of transactions by tax authorities. Builds trust between taxpayers and the government. Example: Applied experimentally in Japan and Australia's tax administration systems.

4. Interagency Data Exchange Model. Facilitates automatic data exchange among tax,

customs, banking, statistical, and social protection agencies to enhance tax control.

Reduces data duplication. Simplifies detection of fake companies. Provides a comprehensive view of taxpayer activities. Practiced in Germany and Norway, where tax authorities operate within an integrated national data network.

5. Data-Driven Tax Policy Model. This model focuses on designing and adjusting tax policies based on analytical data and predictive models. Helps assess the tax burden across different sectors. Supports the creation of effective tax incentives. Improves budget planning and forecasting accuracy. Example: Adopted in the United Kingdom and Canada to enhance fiscal policy effectiveness.

Problems in Improving the Methodology of Tax Collection through Modern Information Systems

1. Underdeveloped Digital Infrastructure. In many regions, internet connectivity, server capacity, and data storage systems remain insufficient. This slows down the full digitalization of tax administration and limits the efficiency of online tax services.

2. Low Level of Data Integration Between Institutions. Information exchange between the Tax Committee, customs, banks, statistical agencies, and other government institutions is not fully automated. As a result, data are often duplicated or outdated, reducing the reliability of analytical reports.

3. Insufficient Human Resource Capacity. A significant portion of tax officials lack adequate knowledge and practical skills in using modern information and analytical technologies. This hinders the effective implementation of digital systems in tax administration.

4. Cybersecurity and Data Protection Challenges. Large volumes of tax-related data are stored within digital systems, yet data protection mechanisms are still underdeveloped. This creates risks of data leaks, unauthorized access, and cyberattacks.

5. Slow Adoption of AI and Analytical Technologies. Although Artificial Intelligence (AI) and Big Data offer significant potential for automating tax analysis and control, their

implementation in Uzbekistan remains limited due to a lack of software solutions and skilled specialists.

6. Low Digital Literacy Among Taxpayers. Some entrepreneurs and individuals have limited experience using electronic tax services, which leads to errors, delays, or incorrect payments.

7. Weak Legal and Regulatory Framework. The legal framework governing the use of modern information systems, data exchange, cybersecurity, and AI technologies in taxation is still incomplete and requires further development.

8. Insufficient Funding and Technical Support. The digital transformation of the tax system requires substantial financial resources. However, stable sources of funding and long-term technical support for these projects remain inadequate.

9. Lack of Compatibility Among Information Systems. Different government agencies use software products that are not technically compatible or integrated. This creates delays and inefficiencies in the exchange and processing of tax-related data.

10. Limited Transparency in Tax Information Systems. Despite the introduction of digital tools, some tax processes and their outcomes are not fully transparent to the public, which can lead to mistrust among taxpayers.

The introduction of modern information systems into Uzbekistan's tax administration represents a crucial step toward ensuring economic transparency, improving fiscal efficiency, and expanding the tax base. However, the process of digital transformation in the tax system still faces challenges such as insufficient infrastructure, limited integration between institutions, and a shortage of skilled personnel. To achieve a fully digital and efficient tax management system, Uzbekistan must adopt a comprehensive approach that combines technological innovation, institutional reform, and capacity building. Digital transformation should not only automate tax collection but also enhance analytical capabilities, risk management, and taxpayer services. In summary, strengthening the methodology of tax collection through digitalization will contribute

directly to increased state revenue, reduced administrative costs, and a higher level of trust between the government and taxpayers.

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1. Develop a Unified Digital Tax Platform. Integrate all tax processes—registration, payment, control, and reporting—into a single national digital platform to ensure transparency and data accuracy.

2. Expand the Use of Artificial Intelligence and Big Data. Introduce AI-driven risk assessment systems to detect hidden economic activities and improve the accuracy of tax revenue forecasting.

3. Strengthen Interagency Data Exchange. Ensure full integration and automatic data sharing between the Tax Committee, customs, banks, and statistical institutions to eliminate duplication and delays.

4. Enhance Cybersecurity Infrastructure. Adopt advanced cybersecurity standards and encryption technologies to protect taxpayer data and maintain public trust.

5. Improve Human Resource Capacity. Regularly train tax officials in digital technologies, data analytics, and system management to ensure efficient operation of modern information systems.

6. Increase Digital Literacy Among Taxpayers. Conduct awareness campaigns and provide online training programs to help taxpayers effectively use electronic tax services.

7. Strengthen the Legal and Regulatory Framework. Update and expand legislation to support data protection, AI integration, and cross-agency information exchange within the tax administration.

8. Ensure Stable Funding and Technical Support. Allocate consistent financial resources and establish public-private partnerships to sustain digital infrastructure and software maintenance.

9. Foster Transparency and Accountability. Make tax-related information systems more open to public oversight, ensuring citizens can track and verify tax expenditures and results.

10. Adopt International Best Practices. Study and adapt successful digital tax administration models from countries such as

Estonia, South Korea, and Singapore to the local context of Uzbekistan.

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