

**PROBLEMS AND SOLUTIONS FOR MODERNIZING THE TAX SYSTEM IN THE
CONTEXT OF THE DIGITAL ECONOMY**

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Abstract

This article examines the problems and solutions involved in modernizing the tax system under the conditions of the digital economy. The study is based on a narrative review of recent institutional and analytical literature on digital taxation, e-commerce taxation, tax administration digitalization, and data-driven tax reform. The analysis shows that the digital economy challenges traditional tax systems because value creation is increasingly intangible, cross-border, and platform-based, while conventional tax rules were largely designed for physical presence and delayed reporting. At the same time, digital technologies such as e-filing, e-invoicing, integrated data systems, automated risk analysis, and real-time reporting create important opportunities for improving compliance, transparency, and revenue collection. The findings indicate that successful tax modernization depends not only on technological tools, but also on legal adaptation, institutional readiness, administrative coordination, digital infrastructure, and taxpayer trust. The article concludes that the modernization of the tax system in the digital economy should be understood as a comprehensive reform process aimed at building a more adaptive, efficient, fair, and sustainable fiscal system.

Keywords

digital economy; tax system modernization; tax administration; digital taxation; e-commerce taxation; tax compliance; e-filing; e-invoicing; digital transformation; fiscal reform

Introduction

The rapid expansion of the digital economy has fundamentally changed the way value is created, transactions are conducted, and taxpayers interact with the state. Digital platforms, e-commerce, cloud services, data-driven business models, and cross-border digital transactions have increased the speed and scale of economic activity, but they have also exposed important weaknesses in traditional tax systems. As a result, the modernization of tax administration and tax policy has become a central issue in public finance, especially in countries seeking to improve compliance, reduce administrative costs, and protect the tax base in a digital environment. [1], [2]

In the digital economy, many conventional tax mechanisms face growing pressure because economic activity is increasingly intangible, mobile, and platform-based. Traditional tax systems were largely designed for physical presence, paper-based reporting, and relatively stable business models, whereas today's digital firms may generate substantial income in a market without a significant physical footprint. This creates challenges in identifying taxable activities, tracing digital transactions, defining nexus, and ensuring fair taxation across jurisdictions. In addition, the growth of e-commerce and digital trade has increased the complexity of indirect taxation, especially in relation to VAT collection, platform liability, and cross-border low-value imports. [2], [3] At the same time, digitalization also creates major opportunities for tax modernization. OECD and IMF materials show that digital tax administration can improve taxpayer services,

automate core processes, strengthen audit capacity, enhance risk analysis, and support more accurate revenue collection through e-filing, e-invoicing, data integration, and advanced analytics. Recent IMF evidence further suggests that stronger digitalization in the corporate sector can be associated with higher tax revenues, especially when tax administration itself is digitally capable. Therefore, digital transformation is not only a source of tax challenges but also a potential solution to long-standing weaknesses in tax compliance and enforcement. [5]

However, the modernization of the tax system under digital-economy conditions is often slowed by serious institutional, technical, and legal barriers. Many tax administrations still face fragmented databases, insufficient interoperability, weak digital infrastructure, limited staff capacity, cybersecurity risks, and outdated legal frameworks. OECD work on the digitalization of developing country tax administrations emphasizes that successful modernization depends not only on technology adoption, but also on governance, sequencing, organizational reform, and sustainable implementation capacity. In other words, digital tax reform is not merely a technical upgrade; it is a broader institutional transformation. [1], [6] The relevance of this topic is further strengthened by the growing importance of fairness, efficiency, and trust in taxation. If tax systems fail to adapt to digital business models, governments may lose revenue, compliant taxpayers may face unequal treatment, and public confidence in fiscal institutions may weaken. Conversely, well-designed modernization measures can reduce compliance burdens, improve transparency, and make taxation more seamless for both businesses and individuals. OECD's Tax Administration 3.0 vision reflects this shift by proposing a future in which taxation becomes increasingly embedded in digital systems and business processes rather than relying solely on after-the-fact reporting. [5], [7]

Therefore, this article examines the problems and solutions involved in modernizing the tax system under conditions of the digital economy. It aims to analyze the main challenges created by digitalization for tax policy and administration, identify institutional and technological barriers to reform, and discuss the directions through which tax systems can become more adaptive, efficient, and sustainable in a rapidly changing economic environment.

Methods

This article was prepared as a **narrative literature review** focusing on the problems and solutions related to the modernization of the tax system under conditions of the digital economy. The purpose of the study was to identify the major structural, legal, administrative, and technological challenges affecting tax systems in a digital environment, and to analyze the directions through which tax modernization can be improved. A narrative review design was chosen because it allows the integration of tax policy literature, tax administration reports, and digital economy studies into one analytical framework.[4] The literature considered in this article included international policy reports, analytical studies, and institutional publications related to three main thematic areas: **digital economy development, tax administration modernization, and digital transformation in tax collection and compliance systems**. Priority was given to recent sources from recognized international organizations, especially the OECD, IMF, and UNCTAD, because these institutions provide up-to-date conceptual and practical guidance on digital taxation, e-commerce taxation, digital public administration, and tax reform in both developed and developing economies.[6]

The materials were analyzed using a **thematic approach**. First, the selected sources were grouped into key problem areas, including taxation of digital business models, indirect taxation

of e-commerce, digital compliance systems, interoperability of tax databases, institutional readiness, and taxpayer service digitalization. Second, the identified challenges were compared with the solutions proposed in the literature, such as e-filing systems, e-invoicing, real-time reporting, risk-based audit technologies, platform-based tax collection mechanisms, and integrated digital tax administration models. This structure made it possible to examine modernization not only as a policy objective, but also as an operational and institutional process. [5] In addition, the review considered the **governance and implementation dimensions** of tax modernization. Particular attention was given to issues such as legal adaptation, sequencing of reform, organizational capacity, digital infrastructure, cybersecurity, and the need to balance efficiency with fairness and taxpayer trust. This was important because the available literature consistently shows that digital tax reform cannot succeed through technology adoption alone; it also depends on administrative capability, regulatory clarity, and public confidence in digital systems.[7]

Thus, the Methods section is based on the structured review and interpretation of existing analytical and institutional literature rather than on direct empirical data collection. This approach is appropriate for an IMRAD-style theoretical article because it provides a clear basis for identifying the main modernization problems in tax systems and for discussing evidence-based solutions in the context of the digital economy.

Results

The reviewed literature shows that the modernization of the tax system in the digital economy is shaped by a combination of **structural challenges** and **technology-driven opportunities**. Across the analyzed sources, the most frequently identified problems were the mismatch between traditional tax rules and digital business models, the difficulty of taxing cross-border digital transactions, fragmented tax data systems, weak administrative interoperability, and limited institutional capacity for digital transformation. At the same time, the literature consistently indicates that digital tools such as e-filing, e-invoicing, integrated data systems, platform-based reporting, and automated risk analysis can significantly improve tax compliance and administrative efficiency when they are implemented within a coherent reform framework. [4] One major result is that **digital business models challenge the foundations of traditional taxation**. The sources show that digital firms can generate value through intangible assets, data, online platforms, and remote service delivery without maintaining a significant physical presence in the taxing jurisdiction. This makes it more difficult for tax authorities to define taxable presence, identify profit allocation, and ensure equitable taxation across jurisdictions. The rise of e-commerce and platform-based trade also complicates indirect taxation, especially in relation to VAT collection, low-value imports, and the role of intermediaries in tax reporting and remittance. [2], [3]

A second major finding is that **tax administration digitalization can directly strengthen revenue performance and compliance management**. OECD and IMF materials indicate that digital technologies improve tax collection by simplifying filing procedures, increasing the availability of real-time or near-real-time transaction data, supporting automated verification, and enabling more targeted risk-based audits. The reviewed literature further suggests that digitalization can reduce administrative costs for both tax authorities and taxpayers while improving service quality and transparency. These findings imply that digital transformation is not only a defensive response to digital-economy challenges, but also an active instrument for making tax systems more effective. [1], [4], [5] The review also found that **institutional**

readiness is one of the most decisive factors in successful tax modernization. Many sources emphasize that fragmented databases, poor interoperability, limited staff skills, cybersecurity vulnerabilities, and outdated legal frameworks slow down reform even where digital tools are available. In developing-country contexts in particular, OECD evidence shows that successful digital tax reform depends on sequencing, governance capacity, reform coordination, and long-term administrative commitment. This means that modernization cannot be reduced to software adoption alone; it requires organizational transformation and regulatory adaptation. [1], [6], [7]

Another important result is that **modern tax systems increasingly move toward embedded and data-driven administration**. The Tax Administration 3.0 approach described in OECD materials suggests a shift from after-the-fact reporting toward taxation that is increasingly integrated into taxpayers' natural digital systems and business processes. In this model, tax obligations can be handled more seamlessly through automated data flows, standardized digital records, and real-time system interaction. The literature presents this as a long-term solution to both compliance burdens and enforcement gaps, although it requires high levels of trust, interoperability, and legal clarity. [5], [7] The analysis further indicates that **the main solutions are interconnected rather than isolated**. E-filing alone cannot solve tax modernization problems if legal definitions remain outdated; e-invoicing is less effective when data systems do not communicate; and platform reporting rules are limited if enforcement capacity is weak. Therefore, the most consistent finding across the reviewed sources is that successful modernization depends on combining legal reform, administrative digitalization, institutional strengthening, and taxpayer-oriented service redesign in a single strategic framework. [1], [4], [6]

Table 1. Main problems and solutions in modernizing the tax system under digital-economy conditions

Problem area	Main manifestation	Modernization solution
Taxation of digital business models	Income generated without significant physical presence	Updated nexus rules, international coordination, digital tax policy reform
Indirect taxation of e-commerce	VAT collection difficulties, low-value imports, platform complexity	Platform liability rules, digital VAT systems, simplified cross-border collection
Fragmented tax administration systems	Disconnected databases, weak interoperability	Integrated tax data systems, real-time data exchange, administrative digital platforms
Low compliance efficiency	Delayed reporting, limited audit capacity, high administrative burden	E-filing, e-invoicing, automated verification, risk-based digital audit tools
Weak institutional capacity	Limited staff skills, outdated procedures, poor reform sequencing	Capacity building, legal modernization, phased implementation, governance reform
Limited taxpayer trust	Complex procedures, low	Taxpayer-centered digital services,

Problem area	Main manifestation	Modernization solution
and service quality	transparency, compliance burdens	embedded administration, transparent digital interaction

Overall, the results demonstrate that tax modernization in the digital economy is both necessary and feasible, but only when it is approached as a systemic reform process. The evidence suggests that digital technologies can substantially improve compliance, revenue administration, and service delivery, yet these gains depend on legal adaptation, administrative coordination, institutional capacity, and long-term strategic implementation. In this sense, the digital economy creates pressure for tax reform, but it also provides the tools through which tax systems can become more adaptive, efficient, and resilient.

Discussion

The findings of this review indicate that the modernization of the tax system in the digital economy should be understood as a broad institutional transformation rather than a narrow technical reform. The reviewed evidence shows that digitalization changes not only the form of economic activity, but also the basic conditions under which taxation operates. As a result, tax systems that were designed for physical presence, delayed reporting, and paper-based administration are increasingly under pressure to adapt to platform-based business, cross-border digital transactions, and data-driven value creation. This confirms that the digital economy is not simply creating new tax issues; it is redefining the environment in which tax policy and administration must function. [3] One of the most important implications of the results is that the weaknesses of traditional tax systems are especially visible in the treatment of digital business models. The difficulty of identifying taxable presence, allocating profits, and applying indirect taxes fairly across jurisdictions shows that conventional tax concepts are no longer fully sufficient in a digitalized economy. This problem is particularly significant for countries with rapidly growing e-commerce sectors, where tax rules may lag behind market developments. Therefore, modernization requires not only better administration, but also legal and conceptual adaptation so that taxation remains effective, fair, and enforceable under new economic realities. [2], [3]

The discussion also shows that digital technologies offer genuine solutions to many long-standing tax administration problems. E-filing, e-invoicing, real-time reporting, platform-based information flows, and automated analytics can reduce compliance costs, improve transparency, and strengthen enforcement. IMF and OECD materials suggest that these tools can improve tax collection not merely by increasing control, but by making compliance more seamless and data-driven. This is an important point, because it means that modernization should not be seen only as a response to risk, but also as an opportunity to build a more efficient and service-oriented tax system. [1], [4], [5] At the same time, the review makes clear that technology alone does not guarantee successful modernization. Many tax administrations continue to face fragmented digital systems, weak interoperability, insufficient staff capacity, cybersecurity concerns, and outdated legal frameworks. These barriers reduce the effectiveness of otherwise promising digital tools. The OECD's work on developing-country tax administrations is especially important here, because it shows that modernization depends heavily on sequencing, governance, reform management, and institutional capability. In other words, the success of digital tax reform is determined as much by organizational readiness as by technological availability.[7]

Another important point emerging from the discussion is the growing relevance of **Tax Administration 3.0** as a strategic direction. The literature suggests a shift from traditional after-the-fact compliance toward taxation embedded directly into natural business systems and digital processes. This approach has the potential to reduce reporting burdens, improve the accuracy of tax data, and increase real-time responsiveness. However, such a transformation also requires high trust in digital systems, strong legal safeguards, consistent standards, and reliable institutional coordination. Therefore, the long-term success of Tax Administration 3.0 depends not only on innovation, but also on governance quality and taxpayer confidence. [5], [7] The discussion further suggests that fairness and trust are central to modernization in the digital economy. If tax systems do not adapt to digital business activity, compliant taxpayers may face unequal treatment, governments may lose revenue, and public trust in tax institutions may weaken. By contrast, transparent and well-designed digital reforms can improve the taxpayer experience and make taxation feel more predictable, efficient, and legitimate. This means that modernization should be guided not only by administrative efficiency, but also by principles of equity, accountability, and public confidence. [5] Overall, this discussion confirms that the problems and solutions of tax modernization in the digital economy are deeply interconnected. The main challenges — legal mismatch, administrative fragmentation, weak capacity, and digital complexity — cannot be solved in isolation. Likewise, the main solutions — digital tools, institutional reform, legal adaptation, and taxpayer-centered design — are most effective when pursued together as part of a unified strategy. Thus, the modernization of the tax system in the digital economy should be understood as a comprehensive reform agenda aimed at creating a more adaptive, efficient, and sustainable fiscal system. [1], [4], [6]

Conclusion

In conclusion, the modernization of the tax system under conditions of the digital economy has become a necessary and strategic task for contemporary fiscal policy. The reviewed literature shows that digitalization creates both serious challenges and important opportunities for taxation. On the one hand, digital business models, cross-border transactions, e-commerce expansion, and platform-based economic activity expose the limitations of traditional tax rules and administrative methods. On the other hand, digital tools such as e-filing, e-invoicing, automated risk analysis, and integrated tax data systems offer effective ways to improve compliance, transparency, and revenue collection. The findings also indicate that successful tax modernization cannot be achieved through technology alone. Its effectiveness depends on a broader combination of legal reform, institutional readiness, administrative coordination, digital infrastructure, staff capacity, and taxpayer trust. In this sense, modernization should be understood as a comprehensive transformation of tax policy and tax administration rather than as a simple technical upgrade. Furthermore, the article confirms that a modern tax system in the digital economy must be adaptive, fair, efficient, and data-driven. This requires the integration of digital technologies into core tax processes, the redesign of legal and administrative frameworks, and the development of taxpayer-centered digital services. Therefore, the long-term solution to the problems of tax modernization lies in a systemic and coordinated approach that combines innovation with governance, fairness, and sustainability.

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