

## **Digital Tax Systems as Socio-Technical Financial Information Infrastructures: A Global Bibliometric Analysis (2010–2025)**

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### **ABSTRACT**

The digitalization of taxation has transformed digital tax systems into critical socio-technical financial information infrastructures that integrate information systems, fiscal governance, and regulatory frameworks. While artificial intelligence (AI), big data analytics, and real-time reporting technologies are increasingly embedded in tax administration, existing academic research remains fragmented across technological, legal, and economic perspectives. This study addresses this gap by providing a comprehensive bibliometric analysis of global research on digital tax systems published between 2010 and 2025.

Using Scopus-indexed publications and applying a PRISMA-guided screening process combined with VOSviewer-based bibliometric techniques, this study examines publication and citation trends, leading countries and institutions, collaboration patterns, and dominant thematic clusters. The findings reveal a substantial increase in research activity after 2019, reflecting the intensified adoption of AI-supported compliance mechanisms, real-time data integration, and digital tax governance reforms. Keyword co-occurrence analysis identifies five core thematic pillars: regulatory and governance frameworks, digital infrastructure and system implementation, economic and public governance impacts, digital finance and structural transformation, and analytical and methodological perspectives.

The results demonstrate a clear shift from traditional administrative tax studies toward integrated, data-driven digital tax systems that function as strategic fiscal information infrastructures. However, the limited presence of evaluation-oriented research highlights a persistent gap between rapid technological implementation and empirical assessment of system performance, governance quality, and fiscal outcomes. This study contributes to the information systems and finance literature by conceptualizing digital tax systems within a socio-technical and governance framework and by offering a structured research map to inform future academic inquiry and policy development. The findings provide relevant insights for researchers and policymakers seeking to design transparent, accountable, and sustainable digital tax systems in the digital economy.



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## **1. INTRODUCTION**

Digital tax systems have become a central instrument of contemporary public financial governance, playing a critical role in national governance quality, economic stability, taxpayer compliance, and long-term revenue sustainability amid rapid global economic and technological transformation (Kuzior *et al.*, 2023). Intensifying globalization, the expansion of digital commerce, and the growing volume of cross-border financial flows have fundamentally increased the complexity of taxation, exposing structural weaknesses that enable tax avoidance and base erosion, and posing challenges of declining fiscal capacity that are particularly acute in emerging and developing economies (Sukma *et al.*, 2025). In this context, the modernization of tax administration through digital tax systems is no longer merely a technical option but a strategic necessity embedded within national development agendas to strengthen fiscal resilience, transparency, and public trust (Chen *et al.*, 2020).

The urgency of digital tax system transformation is further reinforced by the rapid expansion of the digital economy, which disrupts conventional business models, production chains, and tax jurisdiction boundaries (Souguir *et al.*, 2025). Platform-based transactions, intangible value creation, and real-time digital exchanges facilitate aggressive tax planning and regulatory arbitrage while

simultaneously overwhelming the enforcement capacity of traditional, paper-based tax administrations (Liepert, 2024). Consequently, governments worldwide have shifted from ex-post, audit-based systems toward digital tax systems that rely on e-invoicing, real-time reporting, and data-driven compliance monitoring to safeguard revenue and enhance enforcement effectiveness.

A growing body of empirical evidence supports the effectiveness of digital tax systems in improving administrative efficiency and compliance outcomes. Hesami *et al.*, (2024) demonstrate that e-invoicing and pre-filled tax return mechanisms significantly reduce administrative costs, accelerate compliance processes, and enable continuous transaction monitoring, thereby narrowing compliance gaps. These findings are consistent with OECD policy evidence (2023; 2025), which indicates that nearly 95% of tax authorities globally employ data analytics, while more than 80% have implemented or are actively exploring artificial intelligence (AI) to support automation, risk management, and compliance enforcement within digital tax systems.

Beyond automation, AI and big data analytics represent transformative pillars of contemporary digital tax systems. From an information systems perspective, AI-driven analytics enhance audit selection accuracy, anomaly detection, and predictive compliance modeling. Corly *et al.*, (2024) finds that AI-based systems significantly improve revenue collection and audit efficiency, particularly in jurisdictions with higher levels of digital maturity. Complementing this, Arzayeva *et al.*, (2025) highlights the increasing role of cross-sectoral data integration, where big data, AI, and inter-agency information sharing expand supervisory capacity, improve transparency, and broaden taxpayer coverage. Together, these developments signal a paradigm shift from the mere digitization of manual processes toward integrated digital tax ecosystems characterized by real-time data flows, predictive analytics, and automated decision support (OECD, 2025)

From a public finance perspective, the diffusion of digital tax systems has been accelerated by a wave of global policy initiatives following 2018–2019, including OECD-led reforms on the taxation of the digital economy, the implementation of BEPS 2.0, and the adoption of real-time reporting mandates. These reforms have positioned digital tax systems as key instruments for addressing base erosion, restoring fiscal capacity, and enhancing tax fairness in an increasingly digitalized global economy. Correspondingly, academic interest in digital tax systems has expanded rapidly. Global research output increased from fewer than 35 publications in 2010 to more than 170 documents in 2023, reflecting heightened scholarly and policy attention driven by fiscal pressures, technological disruption, and sustainability objectives.

Despite this rapid growth, the existing literature on digital tax systems remains thematically fragmented. Prior studies predominantly focus on isolated dimensions such as carbon taxation, environmental and energy taxes (Kuzior *et al.*, 2023)(Corly *et al.*, 2024) or specific digital instruments, including e-filing and e-invoicing, without sufficiently integrating technological innovation with governance structures, regulatory design, and policy effectiveness. Moreover, while empirical and conceptual contributions are abundant, meta-scientific research that systematically maps the intellectual structure, thematic evolution, and global knowledge networks of digital tax system scholarship remains limited.

This fragmentation constrains cumulative knowledge development and obscures how critical research themes, such as digital compliance mechanisms, governance reform, AI-enabled enforcement, and revenue sustainability, interact and evolve across countries, institutions, and academic outlets. As a result, policymakers and scholars lack a comprehensive, evidence-based understanding of where dominant research clusters are concentrated, how socio-technical and governance dimensions intersect, and which research trajectories are most relevant for future fiscal governance reform.

Addressing this gap, the present study conducts a comprehensive bibliometric analysis of global research on the digital tax system covering the period 2010–2025. Drawing on Scopus-indexed publications and employing VOSviewer-based bibliometric techniques, this study advances beyond descriptive mapping by constructing an integrated state-of-the-art (SoTA) framework that synthesizes the technological, governance, and policy dimensions of the literature. Specifically, it maps the evolution and global distribution of research on digital tax systems, identifies the most influential countries, institutions, authors, and journals, analyzes keyword co-occurrence networks to reveal major thematic clusters, and formulates forward-looking research agendas addressing digital taxation, governance reform, compliance mechanisms, and sustainable fiscal systems.

The core novelty of this study lies in its explicit integration of socio-technical and public governance perspectives within a single bibliometric framework. By linking thematic research clusters to real-world fiscal and governance implications, this study provides a structured analytical bridge between academic scholarship and policy-oriented digital tax system reform. In doing so, it contributes not only to the academic understanding of digital tax system evolution but also offers practical insights for policymakers seeking to design resilient, transparent, and sustainable tax administrations in the digital era.

## 2. THEORETICAL FRAMEWORK: SOCIO-TECHNICAL DIGITAL TAX SYSTEMS

### 2.1 Socio-Technical Systems Theory in Digital Tax System Reform

An effective digital tax system plays a fundamental role in national governance and fiscal sustainability because it determines the capacity of governments to mobilize revenue and finance essential public services (Sukma *et al.*, 2025). A strong tax system is closely associated with economic development, institutional trust, and taxpayer compliance behavior, making it a critical component of public financial management (Darmayasa & Hardika, 2024a). The quality of tax administration significantly influences compliance outcomes, as improvements in administrative processes directly affect taxpayers' willingness to fulfill their fiscal obligations (Ndahangwapo *et al.*, 2024).

In this context, the transformation of tax administration through digital tax systems can be most effectively understood through the lens of Socio-Technical Systems (STS) Theory, which conceptualizes organizational systems as the interaction between technological components, institutional structures, and human behavior (Trist & Bamforth, 1951; Cherns, 1976). Originating from organizational theory and information systems scholarship, STS theory emphasizes that technological effectiveness is not determined solely by system design, but by its alignment with social arrangements, regulatory frameworks, and behavioral contexts within which technology is embedded (Bostrom & Heinen, 1977; Baxter & Sommerville, 2011).

Recent literature highlights digital transformation as an essential strategy for modernizing tax administration, enhancing transparency, strengthening monitoring capabilities, and increasing operational efficiency (Wala & Tesalonika, 2024). The implementation of Core Tax Administration Systems (CTAS) represents a major reform initiative to integrate tax data, automate administrative processes, and reduce compliance and administrative burdens for both tax authorities and taxpayers (Wala & Tesalonika, 2024). Empirical evidence indicates that adopting CoreTax technologies improves service accuracy, accelerates transaction processing, and supports compliance management through real-time data validation (Darmayasa & Hardika, 2024a). Furthermore, digital tax reforms have been shown to increase taxpayer compliance and improve revenue performance (Teküfekçi *et al.*, 2019).

Within the STS framework, digital tax systems are not merely technological infrastructures, but complex socio-technical configurations in which digital tools such as e-invoicing, real-time reporting, big data analytics, and artificial intelligence interact dynamically with tax institutions, legal frameworks, and taxpayer behavior (OECD, 2025; Chen *et al.*, 2024). Technological innovations, including AI-driven risk analytics and automated compliance mechanisms, can achieve their intended outcomes only when embedded within coherent institutional arrangements, clearly articulated regulatory mandates, and governance mechanisms that foster legitimacy, accountability, and trust (Hesami, 2024)).

From an institutional perspective, the effectiveness of digital tax systems depends heavily on the coherence of legal frameworks, administrative capacity, and enforcement mechanisms (North, 1990; OECD, 2025). Regulatory clarity determines the scope, enforceability, and standardization of digital reporting obligations, while governance structures shape accountability, data stewardship, and inter-agency coordination. Where institutional alignment is weak, advanced digital technologies risk being underutilized, leading to fragmented data ecosystems, inconsistent enforcement, or resistance from both tax administrators and taxpayers (Catherine & Sulistiawan, 2025)

The behavioral dimension is equally critical in socio-technical tax systems. Theoretical and empirical studies emphasize that taxpayer compliance in digital environments is influenced not only by enforcement intensity, but also by perceptions of procedural fairness, transparency, and trust in tax authorities (Feng *et al.*, 2022). This perspective is reinforced by the Slippery Slope Framework, which explains that tax compliance emerges from the interaction between the power of authorities and public

trust in tax institutions (Voronkova & Sitnov, 2019). Strong enforcement mechanisms promote compliance through deterrence, while trust-based governance enhances voluntary compliance, implying that digital tax system reform must balance administrative control with service quality, fairness, and accountability (Darmayasa & Hardika, 2024; Kuzior *et al.*, 2023).

Accordingly, from a socio-technical perspective, digital tax systems must be evaluated as integrated configurations of technology, institutions, and human behavior, rather than as standalone digital solutions. Differences in governance quality, institutional maturity, regulatory capacity, and socio-economic context help explain why similar digital tax technologies may produce divergent outcomes across jurisdictions (OECD, 2025).

Although research on tax systems and digital transformation continues to expand, existing studies remain fragmented and tend to address isolated issues such as tax avoidance, compliance behavior, or specific policy reforms, rather than examining the development of the field as a whole (Sukma *et al.*, 2025). Previous research rarely maps global publication trends, keyword structures, and thematic clusters, providing limited insight into how the scientific discourse on digital tax systems has evolved over time (Werlang *et al.*, 2021). Therefore, a bibliometric review is necessary to systematically identify research dynamics, influential sources, and future research directions related to digital tax system modernization (Kraus *et al.*, 2024).

## 2.2 Digital Transformation and Tax Governance Perspective

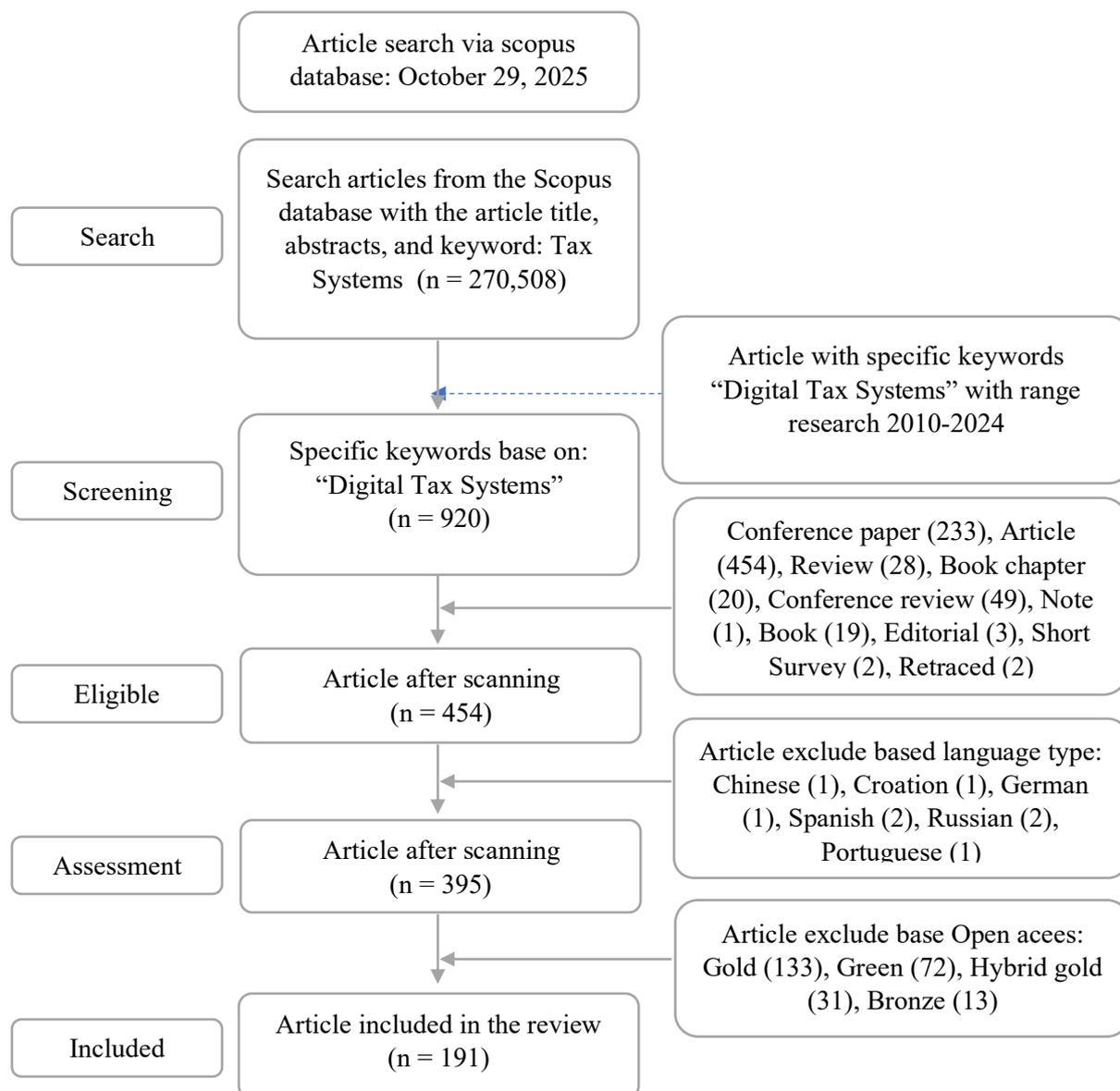
Complementing the socio-technical framework, the digital transformation and tax governance perspective views digital tax systems as core infrastructures of public sector digitalization that redesign tax administration processes and reshape governance mechanisms (Chen *et al.*, 2024). Through automation, real-time reporting, and data integration, digital tax systems enable end-to-end digital processes, reduce administrative fragmentation, and enhance the capacity of tax authorities to utilize fiscal data for compliance management (OECD, 2025).

From a tax governance perspective, digital transformation supports a shift from reactive enforcement toward risk-based and preventive compliance models using big data analytics and AI (Hesami *et al.*, 2024). However, digital tax systems are not value-neutral; their effectiveness depends on data governance, transparency, and accountability. When aligned with sound governance principles, digitalization strengthens fiscal legitimacy and voluntary compliance, whereas insufficient institutional readiness may generate new compliance risks (Bannister & Connolly, 2014; Darmayasa & Hardika, 2024).

## 3. RESEARCH METHODOLOGY

This study adopts a bibliometric analysis methodology to systematically examine global research trends on digital tax systems between 2010 and 2025. Bibliometric approaches are increasingly recognized as essential for mapping the scientific development and intellectual structure of emerging research areas in taxation and digital governance. Prior research emphasizes that digital transformation has become a central force reshaping public administration, governance models, and fiscal systems worldwide (Feng., *et al.*, 2022; Gkoni., *et al.* 2024). Digital technologies including big data analytics, artificial intelligence, blockchain, cloud-based automation, and intelligent data infrastructures are transforming both enterprise operations and state-level fiscal processes (Ktit *et al.*, 2025). In the context of taxation, digital transformation is crucial for modernizing tax collection, increasing transparency, and minimizing tax evasion and fraud—an imperative strongly highlighted in research on digital tax security within BRICS countries (Ponomareva, 2023) and on electronic tax documentation systems implemented in Latin America.

The data used in this study were sourced exclusively from the Scopus database, selected for its extensive coverage of peer reviewed international publications, structured metadata, and suitability for scientometric analysis tools such as VOSviewer and the Bibliometrix. Boolean keyword combinations such as “digital tax system,” “digital taxation,” “digital tax administration,” “tax digitalization,” “e-tax,” and “e-invoicing” were applied, limiting results to English-language journal articles and review papers published between 2010 and 2025. The initial search generated 920 publications, forming the primary dataset for screening.



**Figure 1** Prisma Flow Diagram for document collection and analysis

The article selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework, ensuring methodological transparency and replicability. The progressive reduction process is illustrated in **Figure 1** (PRISMA Flow Diagram). Initial title and abstract screening yielded 454 relevant publications, which were further examined through full-text assessment. A total of 315 articles were excluded due to thematic misalignment or classification as conference papers, book chapters, or editorials, leaving 191 final articles included in the bibliometric analysis. The methodological rigor of this selection model is consistent with systematic reviews applied in digital transformation research associated with national financial security frameworks and with digital tax system modernization strategies linked to tax security and risk mitigation.

The bibliometric analysis consisted of descriptive performance assessment and scientific mapping. VOSviewer was used to visualize co-authorship relationships, keyword co-occurrence maps, and cluster networks. Bibliometrix provided additional scientometric outputs, including annual publication growth, citation analysis, and the geographic distribution of research productivity. This approach aligns with methodological standards in digital transformation research, which emphasize quantitative mapping to identify structural shifts and research frontiers (Feng, 2022); (Ktit & Abu Khalaf, 2025). These tools collectively enabled identification of conceptual clusters and emerging

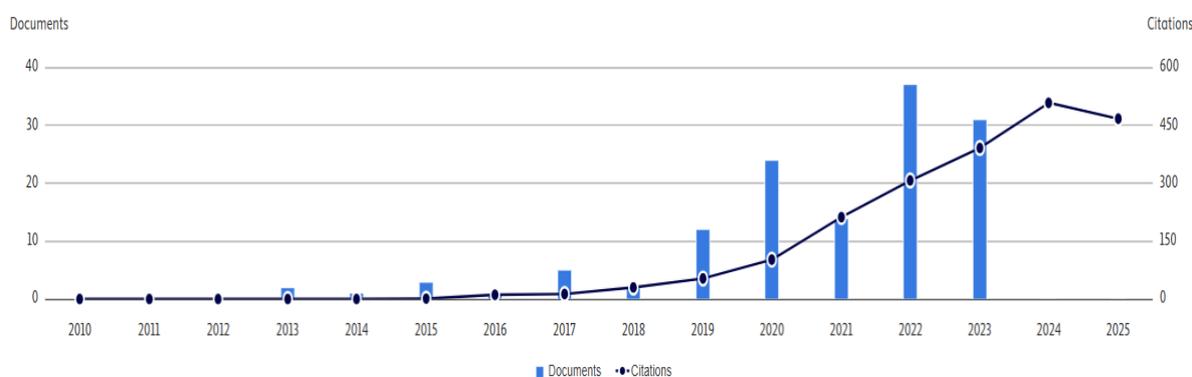
directions within the digital tax systems literature, including automation of compliance, digital fiscal governance, cybersecurity of tax infrastructure, and artificial intelligence-enabled auditing.

Overall, the selected methodology provides a rigorous foundation for analyzing the evolution of scholarly discourse on digital taxation and offers a structured pathway for identifying future research challenges, policy reform opportunities, and international collaboration patterns. Since the study relies solely on publicly accessible secondary data, no ethical approval was necessary.

## 4. RESULT STRUCTURE AND EVOLUTION OF DIGITAL TAX RESEARCH

### 4.1 Citation and Publication Growth Trends

The analysis of annual scientific production and citation growth reveals a significant increase in global research activity related to digital tax systems over the past fifteen years. As illustrated in **Figure 2**, the number of publications and citations remained relatively low and stable during the initial period from 2010 to 2016, with fewer than two documents published annually during those years. This early phase reflects the embryonic development of digital taxation themes, indicating that the topic had not yet gained substantial scholarly attention or policy relevance in the global research community.



**Figure 2** Number of publications and frequency citations per year

As illustrated in Figure 2, the post-2019 surge in digital tax systems research reflects a structural reorientation of the field, rather than a temporary fluctuation in publication activity. This period marks a turning point in which digital tax systems shifted from being perceived primarily as technical administrative tools to strategic instruments of fiscal governance, driven by economic digitalization, heightened risks of base erosion, and the increasing complexity of cross-border transactions (Kowal-Pawul *et al.*, 2021; Liepert *et al.*, 2024).

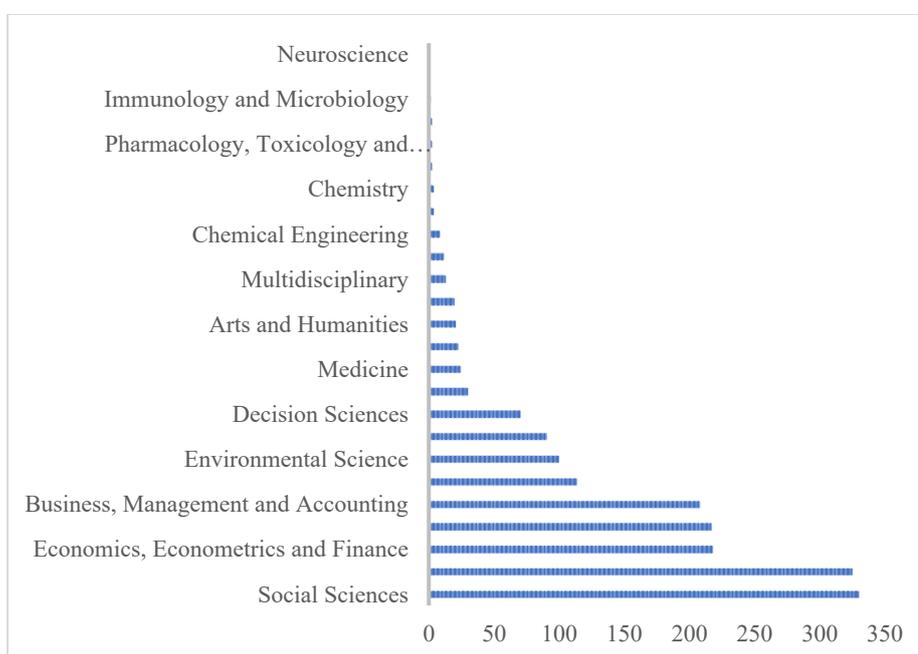
From a research perspective, the pattern observed in Figure 2 indicates a transition from instrument-specific studies toward system-level and governance-oriented analyses of digital tax systems. Recent literature increasingly conceptualizes digital tax systems as data-driven institutional infrastructures that integrate technology, regulatory design, and taxpayer behavior. This shift has broadened the research agenda to include risk-based compliance management, the application of big data and artificial intelligence (AI), and the governance implications of algorithmic decision-making in tax administration (Dmytryk *et al.*, 2022 ;Kuzior *et al.*, 2023).

From a policy perspective, the acceleration depicted in Figure 2 closely aligns with global digital tax reforms following the OECD/G20 BEPS 2.0 initiatives and intensified debates on the taxation of the digital economy. Digital tax systems are increasingly regarded as prerequisites for effective policy implementation, as they enable real-time transaction visibility, cross-jurisdictional data exchange, and proactive compliance monitoring (OECD, 2025). The parallel evolution of academic research and regulatory reform suggests a mutually reinforcing relationship, in which policy experimentation stimulates scholarly inquiry, while research provides conceptual grounding and empirical support for reform design.

Overall, the trend shown in Figure 2 signals a paradigm shift in tax governance, in which digital tax systems underpin a move away from reactive, ex-post enforcement toward proactive and data-driven models of fiscal administration. This evolution underscores that the effectiveness of digital tax reform depends not only on technological adoption, but on the alignment of digital tax system design with institutional capacity, governance quality, and public trust (Liepert *et al.*, 2024)

#### 4.2 Analysis of the Subject Area

The analysis of subject area distribution reveals that research on digital tax systems is inherently multidisciplinary, spanning a broad range of academic fields. However, as illustrated in **Figure 3**, the majority of publications are concentrated within the social sciences, business, economics, and related public policy and governance domains. The Social Sciences category represents the largest proportion of publications, exceeding 330 documents, indicating that digital taxation is predominantly approached from perspectives related to public administration, regulatory structures, and social implications of digital governance. This dominant representation reflects the central role of tax digitalization in shaping modern state capacity, public sector digital transformation, and citizen–government fiscal interactions.



**Figure 3** Digital tax systems research topic subject areas

As shown in Figure 3, research on digital tax systems is inherently multidisciplinary, yet strongly concentrated in the Social Sciences, Economics, Econometrics and Finance, and Business, Management and Accounting. The dominance of the Social Sciences indicates that digital tax systems are primarily examined as issues of governance, public administration, and institutional reform. Analytically, this concentration reflects the alignment of academic research with OECD-led policy agendas that frame digital tax systems as instruments for strengthening state capacity, transparency, and compliance within digital government and BEPS reform initiatives.

The strong representation of Economics, Econometrics, and Finance highlights the central role of digital tax systems in debates on fiscal sustainability, revenue mobilization, and tax compliance in a digitalized economy. This trend mirrors intensified global policy discussions on digital services taxation, base erosion, and international tax coordination following the OECD Pillar One and Pillar Two frameworks, positioning digital tax systems as key enablers of modern fiscal policy.

Publications in Business, Management, and Accounting emphasize the growing interaction between digital tax systems, corporate governance, and financial reporting practices. This reflects the expanding influence of fintech and regtech solutions such as e-invoicing, real-time reporting, and AI-supported audits on firm-level compliance behavior and corporate tax transparency.

Smaller but emerging contributions from Decision Sciences and Environmental Science signal new research directions. Decision Sciences research points to the increasing use of AI, optimization models, and risk analytics in tax compliance management, consistent with the global shift toward predictive and risk-based enforcement. Environmental Science contributions, though limited, indicate the integration of digital tax systems into sustainability and climate-related tax policies, particularly carbon taxation and green fiscal instruments.

Overall, the distribution of subject areas in Figure 3 confirms that digital tax system research has evolved into a broad, interdisciplinary field at the intersection of governance, economics, technology, and sustainability. This pattern underscores the strategic role of digital tax systems in supporting global tax reform, fintech-driven compliance innovation, and long-term fiscal resilience.

### 4.3 Analysis of Countries and Institutional Collaboration

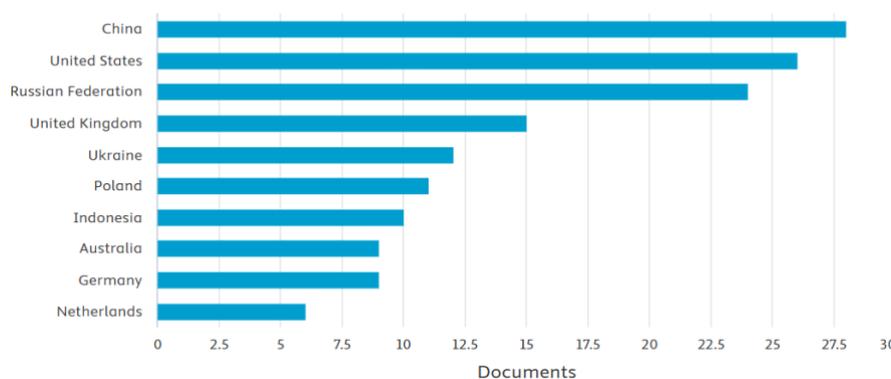
The table below shows the involvement of countries that publish on this topic.

Country	Docs	Funding Sponsor / Organization	Docs
China	29	Financial University under the Government of the Russian Federation	7
United States	26	Széchenyi István University	3
Russian Federation	24	Russian Presidential Academy of National Economy and Public Administration	3
United Kingdom	15	Ministry of Finance	2
Ukraine	12	Gaidar Institute for Economic Policy	2
Poland	11	London School of Economics and Political Science	2
Indonesia	10	Universiti Teknologi MARA	2
Australia	9	University of Northumbria	2
Germany	9	CNRS Centre National de la Recherche Scientifique	2
Netherlands	6	The University of Vermont	2

**Tabel 1.** Number of documents per country and Leading affiliations on Digital tax systems (Top 10)

#### 4.3.1 Analysis of Countries

The geographic distribution of scholarly publications demonstrates clear disparities in global participation in research related to digital tax systems. As shown in **Figure 4**, China is the leading contributor, producing approximately 29 documents, reflecting its strategic prioritization of national digital transformation, public sector automation, and fiscal technology innovation. China's dominance aligns with its large-scale government initiatives supporting artificial intelligence, big data tax administration, and real-time invoice reporting, positioning the country as a central driver in digital fiscal reform.



**Figure 4** Number of documents per country on Digital tax systems (Top 10)

The United States, with 26 publications, represents the second-highest contributor. This is largely attributable to its advanced digital governance infrastructure and the role of high-capacity research institutions that lead global academic discourse in taxation, financial technology, and regulatory systems. Research from the United States frequently explores the implications of digital taxation on international commerce, corporate reporting standards, and automated auditing technologies.

The Russian Federation ranks third with 24 publications, highlighting significant academic engagement in the context of digital tax security and computational support systems for fiscal control. Studies from Russia frequently emphasize digital technologies as tools to strengthen national financial sovereignty, particularly in response to geopolitical instability and cybersecurity risks. Meanwhile, the United Kingdom contributes 15 documents, reflecting active research funding from European collaborative frameworks and strong academic debate around digital services taxes and OECD taxation reforms.

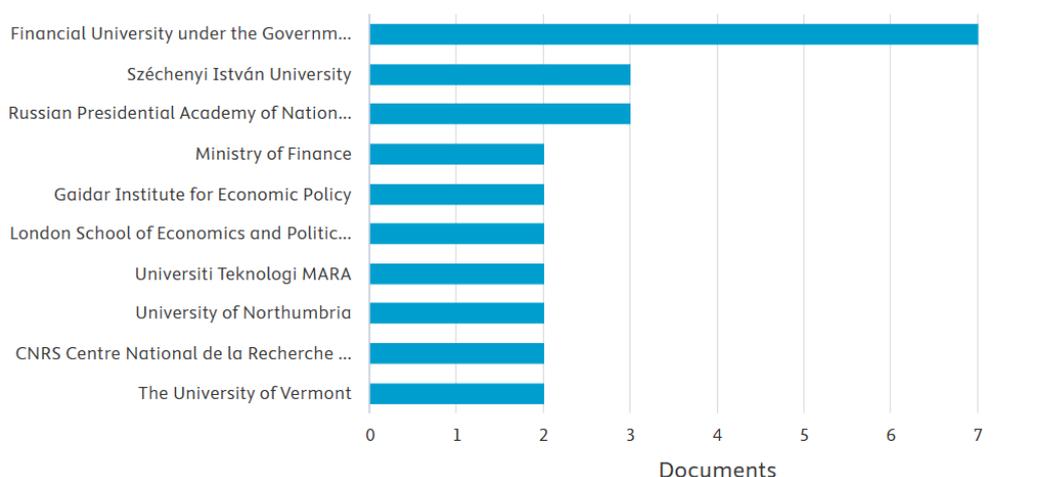
European emerging economies such as Ukraine (12 documents) and Poland (11 documents) show measurable publication growth, suggesting increasing research interest in digital tax systems as part of broader fiscal modernization agendas. Indonesia, with 10 documents, shows rapid research development driven by public sector digitalization efforts and recent national tax reform initiatives, including e-VAT implementation and national identity integration.

Lower but notable contributions from Australia, Germany, and the Netherlands (6–9 documents each) indicate strong governmental implementation capabilities but comparatively smaller research productivity on the conceptual aspects of digital taxation.

Overall, global publication patterns reveal that research leadership is concentrated in technologically advanced and economically influential countries, while emerging economies are steadily increasing participation as digital taxation becomes a critical component of fiscal transformation.

#### 4.3.2 Analysis of Institutional and Funding Collaboration

The institutional collaboration analysis highlights the leading organizations contributing to research on digital tax systems, demonstrating a diverse yet uneven global distribution of academic and policy-focused involvement. As illustrated in **Figure 5**, the Financial University under the Government of the Russian Federation emerges as the most productive institution, with seven publications, significantly exceeding other organizations. This indicates a strategic research emphasis on digital taxation, fiscal security, and digital transformation within Russia’s public finance and governance ecosystem. The strong representation of Russian institutional output aligns with the country’s growing policy interest in strengthening digital fiscal infrastructures, cybersecurity protection, and automation of national tax administration.



**Figure 4** Number of Leading affiliations on Digital tax systems (Top 10)

The second-ranked contributor, Széchenyi István University (Hungary), alongside the Russian Presidential Academy of National Economy and Public Administration, each producing three publications, suggests regional academic engagement in digital governance reforms within post-transition economies. These institutions frequently examine digital tax policy as a key enabler of economic modernization and fiscal transparency.

Several organizations including the Ministry of Finance, the Gaidar Institute for Economic Policy, and the London School of Economics and Political Science (LSE) contribute two publications each, representing a combination of government research units and globally recognized academic institutions. The involvement of government research entities highlights the practical policy relevance of digital tax reforms, while participation from international universities such as LSE demonstrates growing theoretical and comparative interest in global digital taxation frameworks.

Institutions from outside Europe, such as Universiti Teknologi MARA (Malaysia) and University of Northumbria (United Kingdom), also contribute two publications, reflecting an increasing research footprint from developing economies and regional academic networks. Meanwhile, organizations including CNRS Centre National de la Recherche Scientifique (France) and The University of Vermont contribute at a similar level, signaling multidisciplinary interest with connections to economics, finance, and digital policy studies.

While institutional participation spans multiple regions, the overall collaboration network remains relatively fragmented, with limited evidence of large multi-institutional or cross-continental research clusters. This suggests that research on digital tax systems is predominantly driven by national agendas rather than coordinated international research coalitions. Strengthening collaborative research partnerships across leading institutions could facilitate greater policy standardization, promote knowledge exchange, and support alignment with global digital taxation frameworks such as the OECD Pillar One and Pillar Two agreements.

Overall, the institutional patterns identified in this bibliometric analysis indicate that research on digital tax systems is still largely shaped by national policy agendas, despite the global scope of OECD-led tax reforms. The dominance of institutions closely linked to ministries of finance and public administration reflects a strong focus on domestic implementation priorities, including AI-enabled compliance tools, core tax administration systems, and data-driven enforcement. This pattern is consistent with OECD recommendations that emphasize advanced analytics, artificial intelligence, and real-time data infrastructures as key pillars of modern tax administration.

However, the limited presence of dense cross-institutional and cross-continental research networks suggests a gap between the global coordination objectives of OECD frameworks such as BEPS Pillar One and Pillar Two, and the predominantly national orientation of academic research. Strengthening international research collaboration would support comparative learning, promote interoperable digital tax systems, and contribute to the development of shared standards for AI governance, data ethics, and fiscal transparency.

#### **4.4 Analysis of Keywords and Cluster Topics**

As illustrated in Figure 6, the five identified clusters collectively demonstrate that digital tax systems operate as socio-technical governance infrastructures, in which technology, institutional arrangements, and behavioral dynamics are deeply interconnected. This clustering structure aligns directly with the Socio-Technical Systems (STS) framework and the digital tax governance perspective, both of which conceptualize digital tax systems as integrated mechanisms for data-driven, risk-based, and accountable tax administration.



shape economic behavior, revenue performance, and state capacity, rather than as isolated administrative tools.

#### Cluster 4: Digital Finance and Structural Transformation

Cluster 4 further broadens the analytical scope by situating digital tax systems within wider processes of digital finance and structural economic transformation. Keywords such as digital finance and digital transformation indicate growing interdisciplinary interest in how fintech development, digital payment ecosystems, and platform-based transactions reshape tax bases and fiscal policy. The close clustering observed in Figure 6 suggests that research is increasingly linking tax digitalization with national development strategies and long-term fiscal transformation.

#### Cluster 5: Analytical and Methodological Perspectives

In contrast to the substantive focus of the preceding clusters, Cluster 5—represented solely by the keyword analysis—reveals a notable methodological gap in the literature. Its isolated position in Figure 6 indicates that, despite extensive discussion of governance, technology, and impacts, systematic empirical evaluation of digital tax systems remains limited. This finding highlights the need for more robust analytical frameworks, performance indicators, and evidence-based assessment models to evaluate the effectiveness, governance quality, and policy impact of digital tax systems.

**Table 1.** Keywords by authors

Cluster	Keyword	Total link strength
1	Digital economy	972
	Digitalization	419
	Problem	864
	Regulation	800
	Tax	937
	Tax administration	12.092
	Tax systems	488
	Taxation	963
	Taxis	661
	Tax payer	297
2	Application	293
	Block-chain	348
	Challange	623
	Implementation	527
	Opportunity	336
	Systems	3.079
	Technology	1.184
3	Company	637
	Data	1.486
	Economy	1.236
	Government	867
	Information	473
4	Development	2.806
	Digital Finance	288

Cluster	Keyword	Total link strength
	Digital transformation	438
	Effect	696
5	Analysis	1.394

*Source: Output VOSviewer software*

Overall, the clustering results demonstrate that digital tax systems have developed as integrated socio-technical and governance infrastructures, rather than as isolated technological innovations. The predominance of governance- and technology-oriented clusters indicates that the effectiveness of digital tax systems is primarily determined by the alignment between regulatory frameworks, institutional capacity, and digital system architecture. Meanwhile, the emergence of clusters focusing on economic impacts and digital finance signals a gradual shift in the literature toward examining the broader fiscal and structural consequences of tax digitalization.

At the same time, the marginal position of the analytical and methodological cluster reveals a significant imbalance between rapid policy adoption and empirical evaluation. This finding suggests that, while digital tax systems are widely implemented as strategic reform instruments, systematic evidence on their performance, governance quality, and long-term policy outcomes remains limited. From both a socio-technical and digital tax governance perspective, this gap highlights the need for future research to integrate regulatory design, technological functionality, and behavioral responses within robust evaluative frameworks. Strengthening this analytical foundation is essential to ensure that digital tax systems contribute not only to administrative efficiency, but also to accountability, equity, and fiscal sustainability in the digital economy.

## 5. CONCLUSION

This study presents a comprehensive bibliometric analysis of global research on digital tax systems from 2010 to 2025, demonstrating sustained growth in scholarly attention, thematic diversification, and increasing analytical maturity. The findings confirm that digital tax systems have become a central research domain at the intersection of information systems and public finance, driven by large-scale digital transformation initiatives, advances in data analytics and artificial intelligence, and rising fiscal pressures following global economic disruption. The sharp increase in publications and citations after 2019 reflects accelerated digital tax reforms aimed at strengthening fiscal capacity, system resilience, and real-time revenue management in an increasingly digital economy.

From a geographic perspective, the results reveal uneven but evolving global participation. Leading contributions from China, the United States, and the Russian Federation reflect strong national investments in digital fiscal infrastructure and tax information systems. At the same time, growing research output from emerging economies indicates broader convergence toward digital tax modernization. However, fragmented international collaboration suggests that research on digital tax systems remains largely nationally oriented, highlighting the need for stronger cross-border cooperation in areas such as data interoperability, system standards, and OECD-aligned digital tax frameworks.

Keyword clustering identifies five core thematic pillars: regulatory governance, digital infrastructure and system implementation, economic and institutional impacts, digital finance integration, and analytical evaluation. Together, these themes illustrate a shift from traditional tax administration toward integrated digital tax information systems, where real-time data processing, automated compliance, and financial analytics support strategic fiscal decision-making.

### Theoretical Contributions

Theoretically, this study contributes to the information systems and finance literature by conceptualizing digital tax systems as socio-technical information infrastructures embedded within fiscal governance. By linking system architecture, regulatory design, and economic outcomes, the findings extend existing IS theories on digital platforms and data governance into the domain of public finance. This integrated perspective advances understanding of how digital tax systems function as

critical financial information systems that mediate compliance behavior, revenue flows, and institutional trust.

### Practical and Policy Implications

From a practical standpoint, the results underscore the importance of aligning tax information system design with fiscal policy objectives. Effective digital tax systems require interoperable architectures, secure data governance, and AI-supported analytics to enhance compliance monitoring and revenue forecasting. For policymakers, the findings highlight the need to integrate digital tax systems within broader financial management and digital government strategies, ensuring system reliability, transparency, and cross-agency data integration, particularly in the context of OECD-led digital tax reforms and international financial regulation.

### Future Research Agenda

This study also identifies key directions for future research in information systems and finance. Priority areas include AI-driven compliance analytics, cybersecurity and resilience of tax information systems, blockchain-based transaction verification, and the financial impact of real-time tax reporting on revenue stability. Further empirical and longitudinal research is needed to assess how digital tax systems affect tax gaps, voluntary compliance, and fiscal sustainability across different economic and institutional contexts. Advancing this agenda will require interdisciplinary collaboration between IS scholars, finance researchers, tax authorities, and technology developers.

In conclusion, this research provides a structured scientific mapping of digital tax system scholarship and offers a robust foundation for advancing theory and practice at the intersection of information systems and finance. As digital tax systems increasingly function as core fiscal information infrastructures, continued research and coordinated policy development will be essential to ensuring efficient, secure, and sustainable public financial management in the digital era.

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