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# Information Technology Governance Research in the Digital Era: A Scopus-Based Bibliometric Analysis

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**ABSTRACT**

This study aims to map and analyze the global research landscape of information technology (IT) governance in the digital era through a bibliometric approach. Data were retrieved from the Scopus database and analyzed using VOSviewer software to examine co-authorship patterns, institutional collaborations, country contributions, keyword co-occurrence structures, and citation impact. The co-authorship network reveals that this segment of the literature is dominated by a single, tightly interconnected research team rather than a broad community of independent contributors, while institutional collaboration remains sparse and is bridged only by a public-administration-affiliated unit connecting a geospatial land-governance research community with a cross-border, financial-technology-oriented data-governance community. At the country level, China, the United States, the United Kingdom, India, and Indonesia emerge as the principal hubs of international collaboration, supported by extensive participation from Europe, the Middle East, and Southeast Asia, indicating that IT governance research constitutes a genuinely global, multipolar undertaking. The keyword co-occurrence analysis shows that the field is organized around four interconnected clusters covering cybersecurity and blockchain-based governance, artificial intelligence and digital transformation, big data-driven decision-making, and e-government and ICT-based public governance, with digital governance and information management forming the field's conceptual core. The citation analysis further shows that the field's intellectual foundation is anchored in the digital-era governance model and its subsequent extension toward artificial intelligence, alongside diverse contributions from e-government adoption, geospatial data integration, and data-driven policymaking research. Taken together, these findings indicate that IT governance research has developed into a rapidly expanding, technology-driven field, with growing convergence toward artificial intelligence, cybersecurity, and data governance as its emerging frontiers.



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## 1. INTRODUCTION

Governments and organizations operating in an increasingly networked and technology-saturated environment have progressively turned to the concept of information technology (IT) governance as a mechanism for aligning digital investment with institutional objectives, accountability, and public value. Digital-era governance denotes a paradigm in which the fragmentation produced by earlier managerial reforms is reversed through the reintegration of public services, needs-based holism, and digitization, positioning information technology not merely as a support function but as the central organizing logic of contemporary public administration [1]. This paradigm was further elaborated as a comprehensive framework describing how IT corporations and the state jointly reshape public service delivery through e-government, illustrating that IT governance in the digital era is inseparable from broader questions of state capacity, corporate influence, and citizen-facing digital services [2].

Building on this conceptual foundation, subsequent scholarship has operationalized IT governance through structured maturity frameworks capable of assessing how effectively organizations manage, control, and derive value from their information technology resources. Empirical assessments using the COBIT framework, for instance, demonstrate that even well-established institutions frequently exhibit uneven maturity across governance domains such as risk management, resource optimization, and stakeholder value delivery [3]. Comparable capability-level assessments conducted within the banking sector further confirm that IT governance maturity is closely tied to an organization's ability to sustain digital transformation initiatives while managing operational and compliance risk [4]. These maturity-oriented studies collectively underscore the practical dimension of IT governance, translating abstract public-administration and corporate-governance principles into measurable organizational capabilities.

Parallel to this maturity-oriented literature, IT governance research has expanded substantially in the domain of e-government and digital public service delivery. Longitudinal assessments of government web presence have shown that the sophistication of digital governance evolves unevenly across jurisdictions, shaped by institutional capacity and political commitment [5]. More recent studies extend this line of inquiry by demonstrating that citizen satisfaction with e-government services, transparency, and accountability outcomes are strongly influenced by the quality of underlying digital governance arrangements [6], while cross-national evidence indicates that e-government development can meaningfully enhance public trust in government institutions [7]. Collectively, these findings illustrate that IT governance in the digital era functions simultaneously as a technical, institutional, and relational construct linking government capacity to citizen confidence.

More recently, the rapid diffusion of artificial intelligence and data-driven technologies has prompted scholars to characterize a distinct “third wave” of digital-era governance, in which algorithmic decision-making, automation, and large-scale data analytics increasingly substitute for or augment traditional bureaucratic processes [8]. This technological escalation, however, introduces new governance challenges, particularly concerning the preservation of the rule of law, accountability, and fairness when artificial intelligence systems are embedded within public and corporate decision structures [9]. As IT governance research increasingly grapples with these AI-driven complexities, it becomes progressively more difficult to maintain a coherent overview of the field's intellectual structure, its leading contributors, and the collaborative networks through which knowledge on the topic is produced.

Bibliometric analysis offers a systematic and reproducible framework for addressing this challenge, enabling scholars

to examine not only the thematic evolution of a research field but also its underlying social and institutional architecture. A prior bibliometric review of digital-era governance research over its first two decades has usefully mapped the field's overall growth trajectory and its concentration within Anglo-Saxon public administration scholarship [10], while a parallel bibliometric investigation of interoperability and data linkage in health information management illustrates how comparable network-based methods can reveal discipline-specific governance structures [11]. Nonetheless, comprehensive bibliometric investigations that jointly examine the collaborative networks, geographic distribution, and intellectual structure of contemporary IT governance research, particularly as it intersects with artificial intelligence, cybersecurity, and big data, remain relatively limited.

The present study addresses this gap by conducting a comprehensive bibliometric analysis of global research on IT governance in the digital era, drawing on publication data extracted from the Scopus database. VOSviewer is employed to construct co-authorship, institutional, and country collaboration networks, alongside keyword co-occurrence, overlay, and density visualizations, together providing a multi-dimensional view of the field's social and intellectual structure. In doing so, the study aims to identify leading collaborative clusters, examine the geographic distribution of research contributions, trace the temporal evolution of key research themes, and highlight the most influential publications shaping the field. By systematically mapping this research landscape, the study seeks to provide scholars and policymakers with actionable insight into the current state and emerging trajectories of IT governance research in the digital era.

## 2. METHOD

This study adopts a bibliometric methodology to systematically examine the global research landscape of information technology governance in the digital era. Bibliometric analysis is a well-established quantitative approach that enables researchers to evaluate the scientific output and intellectual structure of a research field by analyzing patterns in publication volumes, citation relationships, collaboration networks, and keyword co-occurrence. Such a methodological framework is particularly well suited to the objectives of the present study, as it allows for the systematic mapping of a large and disciplinarily diverse body of literature spanning public administration, computer science, and information systems in an objective and reproducible manner. Accordingly, the methodological design of this study encompasses three primary stages: data collection, data preparation, and bibliometric visualization and analysis.

Data for this study were sourced from the Scopus database, chosen for its broad and comprehensive coverage of peer-reviewed academic literature across disciplines including public administration, information systems, computer science, and business management. The search was structured using keyword queries centered on the construct of information technology governance and its key conceptual derivatives, including digital era governance, digital governance, e-government, and ICT governance. In order to ensure analytical consistency and comparability across records, the search was limited to journal articles, conference papers, and review articles written in English, while documents lacking sufficient bibliographic information for network construction were excluded during data preparation.

The analysis itself was carried out using VOSviewer, a software application developed specifically for constructing and visualizing bibliometric networks. VOSviewer was applied to construct co-authorship networks at the author, institutional, and country levels in order to reveal the collaborative structure underlying IT governance research, using fractional counting and association-strength normalization to ensure an accurate representation of relational strength among bibliographic items. In parallel, keyword co-

occurrence analysis was performed with a minimum occurrence threshold applied to retain only statistically meaningful associations, and the resulting network was examined across three complementary visualization modes: the network map, illustrating thematic clustering; the overlay map, depicting the temporal evolution of themes based on average publication year; and the density map, representing the relative concentration of research intensity around each keyword node [10], [11]. In addition, citation analysis was conducted to identify the most influential publications, ranked by total citation count as reported in Scopus, so as to complement the network-based findings with an assessment of the field's most consequential intellectual contributions.

## 3. RESULT AND DISCUSSION

### *3.1 Result*

#### a. Co-Authorship Analysis

The following figure presents a VOSviewer co-authorship network visualization illustrating the collaborative structure among leading authors in the global research field of IT governance in the digital era.

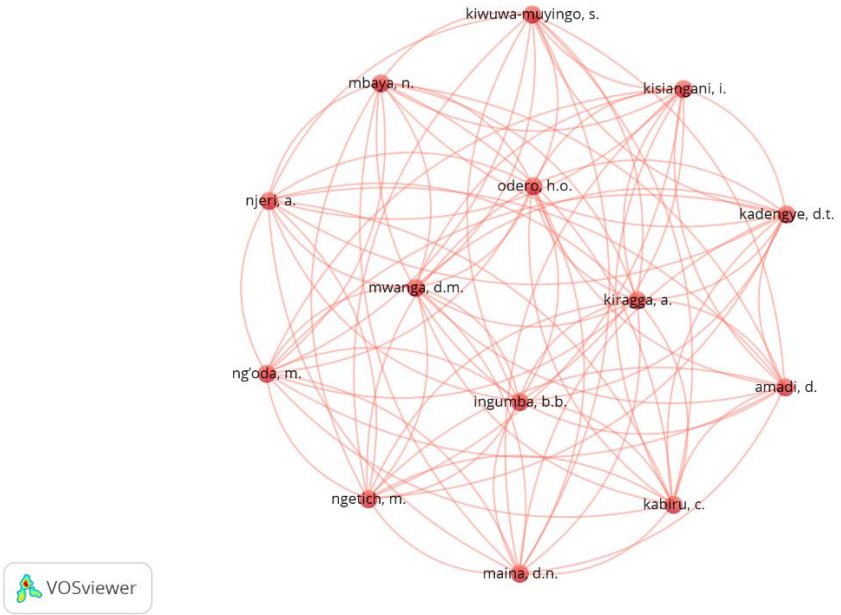


Figure 1. Author Visualization
*Source: Data Analysis, 2026*

Unlike research fields organized around several competing or complementary teams, the author-level network in this segment of IT governance literature is structured as a single, fully interconnected clique comprising fourteen authors, including Mwanga, Ng'oda, Ingumba, Mbaya, Kisiangani, Njeri, Maina, Odero, Ngetich, Amadi, Kabiru, Kadengye, Kiwuwa-Muyingo, and Kiragga. This configuration corresponds to a single large multi-author publication examining how population and public-health data governance can be strengthened amid the diffusion of digital technology across Africa [12]. The absence of any secondary cluster or bridging author indicates that, at least within this segment of the network, knowledge production on IT governance is concentrated within a single dedicated research consortium rather than distributed across multiple independent teams, a pattern consistent with large, cross-institutional public-health governance partnerships in which broad co-authorship reflects joint

multi-country data ownership rather than fragmented specialization.

The following figure illustrates a VOSviewer network of institutional co-authorship relations in the field of IT governance in the digital era, highlighting collaboration patterns among research institutions.

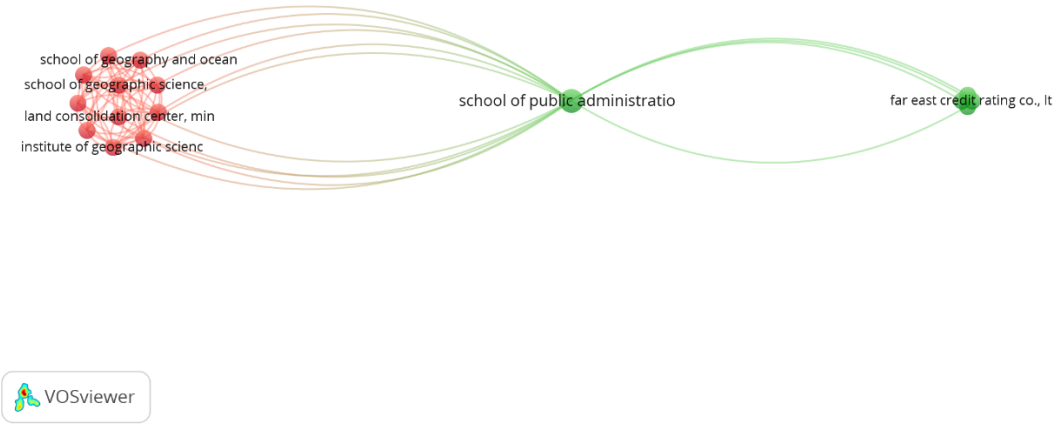


Figure 2. Institution Visualization
*Source: Data Analysis, 2026*

The institutional collaboration network is considerably sparse, comprising only two loosely connected components rather than a dense, interconnected hub. On one side, a tightly clustered group of Chinese geography- and land-related institutions, comprising the School of Geography and Ocean Science at Nanjing University, the School of Geographic Science at Hunan Normal University, the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences, and the Land Consolidation Center under the Ministry of Natural Resources, jointly authored a large expert-interview study on rural governance and land-system reform in the digital era [13]. This cluster connects to the remainder of the network solely through the School of Public Administration at Guangxi University, which also co-authored a separate study on constructing a cross-border data governance paradigm for international artificial-intelligence cooperation together with Far East Credit Rating Co., Ltd. and two digital-technology enterprises [14]. Because the same public-administration affiliation participated in both studies, it functions as the sole bridging node linking a land- and geography-oriented governance research community with a financial-technology and cross-border data-governance research community. This chain-like configuration indicates that institutional collaboration in IT governance research remains largely confined to discipline-specific project teams, with public-administration units occasionally serving as rare but important connectors between technical and economic-governance domains.

The following figure presents a VOSviewer country co-authorship network illustrating international collaboration patterns in research on IT governance in the digital era.

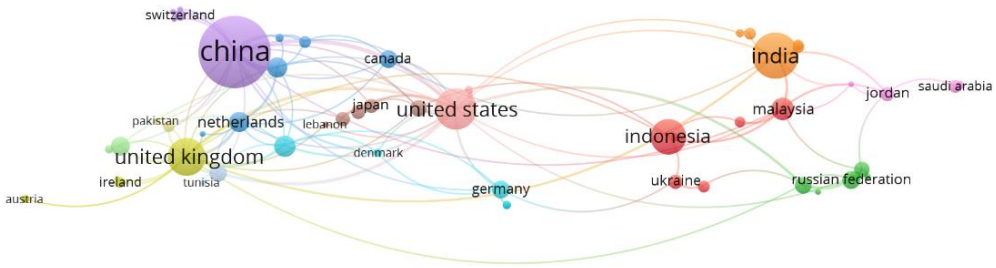


Figure 3. Country Visualization
*Source: Data Analysis, 2026*

The country-level network reveals a genuinely multipolar collaboration structure anchored by five principal hubs. China occupies the most prominent position, evidenced by its large node size and extensive ties to Japan, the Netherlands, Canada, Switzerland, and the United Kingdom, reflecting the scale of Chinese contributions to digital governance and e-government scholarship. The United States forms a second major hub bridging Western and Asian clusters through connections with Germany, Denmark, Lebanon, Indonesia, and Malaysia, while the United Kingdom anchors a distinct cluster together with Ireland, Pakistan, Tunisia, and Austria, indicating a historically strong European tradition of digital-governance research. India and Indonesia further extend the network's reach into South and Southeast Asia, with India connecting to Malaysia, Jordan, Saudi Arabia, and the Russian Federation, and Indonesia linking to Ukraine and Malaysia. The presence of additional participating countries, including the Russian Federation, Ukraine, Saudi Arabia, and Jordan, confirms that IT governance research resonates across both established digital-governance leaders and emerging digital economies, underscoring the field's status as a genuinely global undertaking spanning developed and developing regions alike.

**b. Citation Analysis**

The following table presents the most cited publications in the broader literature connected to IT governance in the digital era.

Table 1. Most Cited Article

| Citations | Author and Year | Title | Publication |
|---|---|---|---|
| 1883 | P. Dunleavy, H. Margetts, S. Bastow, J. Tinkler [1] | New public management is dead - Long live digital-era governance | Journal of Public Administration Research and Theory |
| 550 | P. Dunleavy, H. Margetts, S. Bastow, J. Tinkler [2] | Digital Era Governance: IT Corporations, the State, and e-Government | Digital Era Governance: IT Corporations, the State, and e-Government |
| 523 | J.C. Thomas, G. Streib [15] | The New Face of Government: Citizen-Initiated Contacts in the Era of E-Government | Journal of Public Administration Research and Theory |

| Citations | Author and Year | Title | Publication |
|---|---|---|---|
| 343 | H. Wang, Y. Pan, X. Luo [16] | Integration of BIM and GIS in sustainable built environment: A review and bibliometric analysis | Automation in Construction |
| 204 | B.A. Allen, L. Juillet, G. Paquet, J. Roy [17] | E-governance & government on-line in Canada: Partnerships, people & prospects | Government Information Quarterly |
| 196 | S. Giest [18] | Big data for policymaking: fad or fasttrack? | Policy Sciences |
| 181 | S. Ribeiro-Navarrete, J.R. Saura, D. Palacios-MarquÃ©s [19] | Towards a new era of mass data collection: Assessing pandemic surveillance technologies to preserve user privacy | Technological Forecasting and Social Change |
| 170 | M.-H. Ehlers, R. Huber, R. Finger [20] | Agricultural policy in the era of digitalisation | Food Policy |
| 140 | P. Dunleavy, H. Margetts [8] | Data science, artificial intelligence and the third wave of digital era governance | Public Policy and Administration |
| 139 | S. Greenstein [9] | Preserving the rule of law in the era of artificial intelligence (AI) | Artificial Intelligence and Law |

Source: Scopus, 2026

The citation landscape is heavily anchored around the foundational digital-era governance model. The most cited work, "New public management is dead long live digital-era governance" [1], together with its companion volume "Digital Era Governance: IT Corporations, the State, and e-Government" [6], establishes the theoretical vocabulary that much of the subsequent IT governance literature continues to build upon. The third most cited contribution extends this foundation into citizen-facing e-government research by examining how digital channels reshape citizen-initiated contact with government [15], while a highly cited study on integrating building information modeling and geographic information systems illustrates how IT governance concerns extend into the built-environment and geospatial-data domains [16]. Several additional highly cited works demonstrate the breadth of the field beyond its conceptual core, including early empirical work on e-governance partnerships in Canada [17], policy-oriented research on the use of big data in public decision-making [18], and privacy-focused analysis of pandemic-era data-surveillance technologies [19]. The presence of agricultural-policy digitalization research among the most cited works [20] further confirms that IT governance functions as an integrative concept linking public administration, geospatial science, and sector-specific digital policy, while the two most recent highly cited contributions, addressing the third wave of artificial-intelligence-driven digital-era governance [8] and the preservation of the rule of law amid AI adoption [9], indicate that the field's intellectual frontier is rapidly shifting toward artificial-intelligence governance.

**c. Keyword Co-Occurrence Analysis**

The following figure presents a VOSviewer keyword co-occurrence network illustrating the thematic structure and intellectual relationships in the global literature on IT governance in the digital era.

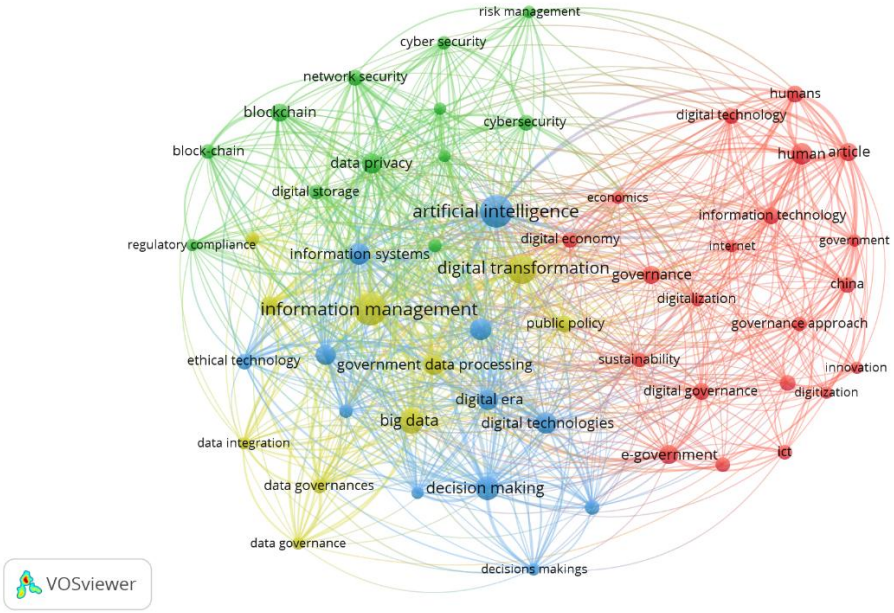


Figure 4. Network Visualization
*Source: Data Analysis, 2026*

As shown in the network, the visualization displays a densely interconnected knowledge structure organized into four distinct thematic clusters. The red cluster, the largest and most densely connected component of the network, encompasses humans, human article, digital technology, information technology, internet, government, china, governance approach, digitalization, digitization, innovation, ict, e-government, digital governance, governance, digital economy, economics, and sustainability, representing the public-sector and ICT-based governance dimension of the field. The green cluster, positioned toward the upper-left of the network, groups risk management, cyber security, network security, blockchain, block-chain, data privacy, digital storage, regulatory compliance, and cybersecurity, reflecting a distinct research stream concerned with securing digital infrastructure and ensuring regulatory compliance within governance systems. The yellow cluster, centrally positioned and containing the network's largest nodes, encompasses artificial intelligence, information management, digital transformation, information systems, public policy, data governance, data governances, decisions makings, ethical technology, and data integration, capturing the field's rapidly expanding engagement with AI-enabled organizational and data-governance transformation. The blue cluster, positioned toward the bottom of the network, comprises big data, digital technologies, digital era, decision making, government data processing, and sustainability, reflecting a data-driven decision-support dimension closely linked to, yet analytically distinct from, the AI-governance cluster.

The following figure shows an overlay of keywords used in studying IT governance in the digital era using VOSviewer, wherein the nodes are colored according to the temporal evolution of themes from earlier years (purple-blue, around 2018) to more recent years (yellow, around 2024).

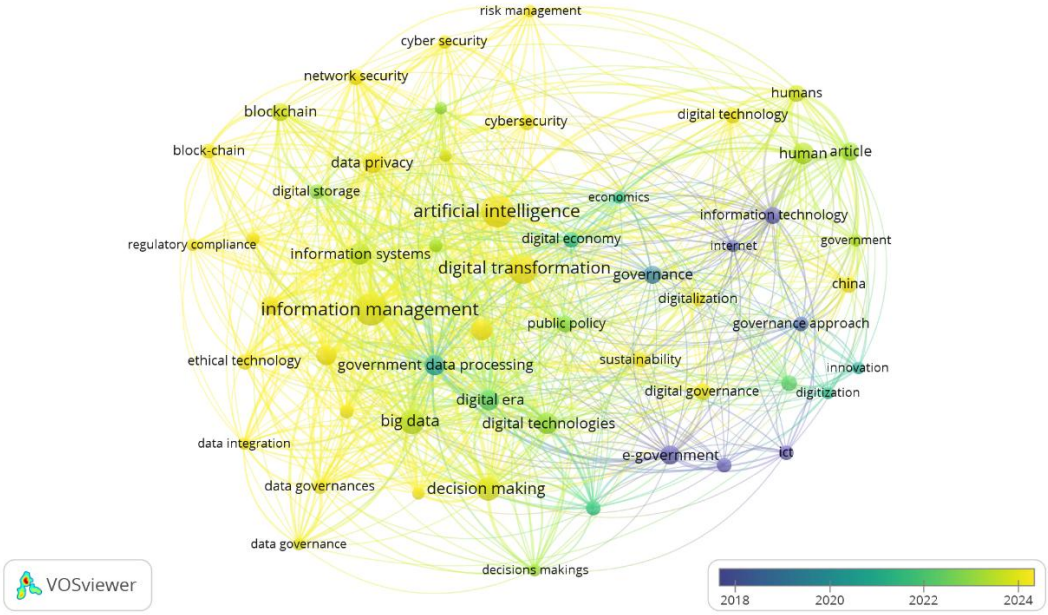


Figure 5. Overlay Visualization
*Source: Data Analysis, 2026*

The temporal distribution of the keyword network indicates that earlier research, denoted by blue and teal nodes, concentrated on e-government, ict, digitization, and governance approach, together with government data processing and economics, suggesting that scholarship from this period conceptualized IT governance primarily through conventional electronic-government service delivery and ICT-infrastructure framings. A subsequent phase, marked by green nodes, extends into digital governance, china, and human-subject terms such as humans and human article, reflecting a growing emphasis on country-specific governance practice and human-centered evaluation of digital services. The most recent phase, indicated by yellow nodes, is dominated by artificial intelligence, information management, digital transformation, information systems, big data, decision making, and the cybersecurity-oriented terms data privacy, network security, and regulatory compliance, demonstrating that contemporary IT governance research increasingly converges on AI-enabled transformation and data-security concerns. This progression indicates that the field's central organizing concern has shifted from electronic service delivery toward artificial intelligence, data governance, and cybersecurity as its emerging frontier.

The following figure presents a VOSviewer density visualization (heatmap) of keyword co-occurrence in the global research landscape of IT governance in the digital era, where brighter regions indicate higher term density and stronger conceptual concentration.

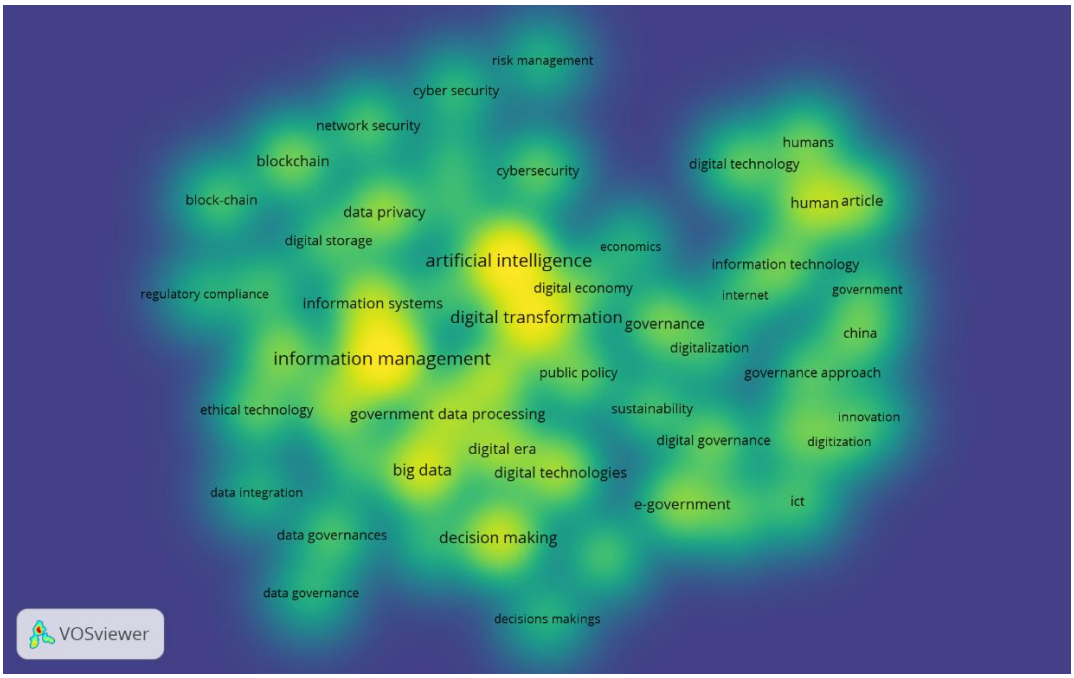


Figure 6. Network Visualization
*Source: Data Analysis, 2026*

The density visualization reveals a clearly defined intellectual core surrounded by a comparatively diffuse periphery. Artificial intelligence, information management, digital transformation, decision making, and big data emerge as the brightest and most centrally positioned hotspots in the map, indicating that these constructs function as the primary points of conceptual integration across the field. Surrounding this core, terms such as government data processing, digital era, digital technologies, governance, and information technology display moderate density, suggesting that these themes constitute well-developed secondary lines of inquiry. By contrast, terms located toward the periphery of the map, including risk management, cyber security, network security, block-chain, regulatory compliance, china, ict, innovation, digitization, and decisions makings, exhibit noticeably lower density, indicating that these represent emerging or more specialized directions of inquiry rather than well-established components of the field's core structure.

### 3.2 *Discussion*

This bibliometric analysis offers a systematic account of the collaborative structure, intellectual development, and thematic composition of IT governance research in the digital era. Overall, the results indicate that knowledge production at the author level is concentrated within a single large, cross-institutional research consortium rather than distributed across multiple competing teams [12], while institutional collaboration remains sparse and is bridged only occasionally, in this case by a shared public-administration affiliation connecting a geospatial land-governance research community with a cross-border AI data-governance and financial-technology community [13], [14]. This pattern suggests that formal institutional partnership in IT governance research continues to lag behind individual and country-level engagement, with much of the field's collaborative activity organized around discrete, project-specific teams

rather than sustained multi-institutional alliances.

At the country level, the analysis confirms that IT governance research constitutes a genuinely global and multipolar undertaking, anchored by China, the United States, the United Kingdom, India, and Indonesia, each of which functions as a regional hub connecting neighboring and cross-continental collaborators. This distribution is broadly consistent with the historical Anglo-Saxon concentration identified in earlier bibliometric reviews of digital-era governance research [10], while also confirming that the field's geographic center of gravity is increasingly shifting toward Asia, in parallel with the rapid digitalization of public administration in China, India, and Indonesia [7].

In terms of conceptual content, the keyword co-occurrence analysis shows that IT governance research remains firmly anchored in ICT-based public governance and e-government service delivery [5], [6] while simultaneously expanding into cybersecurity, data privacy, and regulatory compliance as digital infrastructures become more complex and vulnerable [3], [4]. The most striking development, however, is the field's rapid convergence toward artificial intelligence, digital transformation, and big data-driven decision-making, a trend that is consistent with the citation analysis' identification of AI-oriented digital-era governance research as its most contemporary frontier [8], [9]. Taken together, these findings indicate that IT governance is progressively being redefined from a primarily administrative and service-delivery concern into a technologically driven governance challenge encompassing artificial intelligence, cybersecurity, and data governance.

## 4. CONCLUSION

This study offers a comprehensive bibliometric mapping of the global research network on information technology governance in the digital era by employing the Scopus database and VOSviewer techniques. As shown by the co-authorship and institutional analyses, the field is currently characterized by concentrated, project-specific research teams rather than a broadly integrated global community, whereas the country-level analysis confirms a genuinely multipolar collaboration structure centered on China, the United States, the United Kingdom, India, and Indonesia. The keyword co-occurrence, overlay, and density analyses confirm that digital governance, e-government, and ICT-based public administration form the historical core of the field, while artificial intelligence, digital transformation, big data-driven decision-making, and cybersecurity constitute rapidly expanding and increasingly central research frontiers. The citation analysis further demonstrates that the field's theoretical foundations remain anchored in the digital-era governance model, with intellectual authority increasingly extending toward AI-driven governance research. Taken together, these findings indicate that IT governance research has evolved from a primarily electronic-service-delivery-oriented field into an increasingly technology-intensive and globally distributed discipline, with clear potential for future growth at the intersection of artificial intelligence, cybersecurity, and data governance.

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