Artificial Intelligence and Trends in Use of Information Technology Governance: A Bibliometric Analysis

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Abstract

This study aims to provide an overview of the development of information technology governance (ITG) and Artificial Intelligence (AI) research published in the Scopus database to track the development of scientific activities that could pave the way for future studies by highlighting gaps in this field. Four hundred fifty-five studies were identified in this field, from 2007 to 2025. Our analysis focused on 233 research papers related to ITG and AI from 2015 to 2024. Based on bibliometric analysis using VOS viewer, this paper highlights the prevailing trend of current research in the field of AI and ITG by providing a detailed bibliometric analysis of the trend and development of research for the last ten years due to the increasing reliance on AI by banks, which was also accompanied by an increase in the number of banks sponsoring AI, including investigating countries, journals and keywords of research. The results indicate that researchers using AI and ITG have converged in using technology between developing and developed countries alike. We also found through the VOSviewer analysis that the decision-making process is the main reason for the ITG trend towards using AI. The countries with the most publications and the most common keywords were selected. This paper provides evidence of the lack of many banks in different countries resorting to AI. Finally, the data analysis identifies many potential research issues that need to be investigated regarding the relationship between ITG and AI, which serve as an area for future research. Again, this study also provides a framework for banks to pay attention to areas related to AI.

Keywords: ITG, Artificial intelligence, Bibliometric analysis, VOS viewer.

1. Introduction:

Today's business environment is characterized by acceleration and increasing innovations, which have become the main axis in achieving a competitive advantage among companies, and intangible assets are very important in this field, as companies interested in following digital transformation methods are done by integrating digital technology with methods of achieving competitive advantage, that ITG represents a set of processes, structures and policies that aim to achieve organizational goals, including improving operational efficiency and reducing risks associated with technology and enhancing transparency (Weill & Ross, 2004). The rapid development in the business environment has resulted in the integration of technology governance with AI methods, and many studies have investigated the role of ITG in enhancing financial performance (for example, the study… Kanza et al., 2024; Sirisomboonsuk, 2018; Daway et al., 2025). In contrast, the important role of AI methods in enhancing ITG has emerged through its role in many practices, including big data analysis, process automation, and increasing efficiency to assist corporate management in many topics related to it, including decision-making, and achieving a satisfactory level of performance for parties related to corporate activity (khan et al., 2021). Of course, the success of banks depends primarily on their financial performance, which is positively reflected in increasing their market value as well (Puni & Anlesinya, 2020; Hashim et al., 2024). AI is one of the important pillars for improving financial performance, which is defined as the ability to achieve returns, especially introducing these tools into financial operations to achieve a competitive advantage and provide added financial value, through analyzing big data and predicting future investment plans. Banks that apply AI tools in analyzing their financial operations provide operational savings by reducing costs and improving management. AI tools, including expert systems, neural networks, data analysis, algorithms, data modeling, and data

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technology in various specializations and fields, have significantly improved financial analysis. Performance is used to analyze and evaluate the status of companies, and to raise their efficiency and improve their future expectations. Financial performance is one of the indicators available to measure the success of banks (Al-Saudi & Flayyih, 2024; Mutashar & Flayyih, 2024). It is often used by investors as an essential criterion for evaluating investments, in addition to the role that technology plays in providing information that meets the needs and expectations of users and improving the efficiency of operations by the ability to analyze data and compare it between investment alternatives and available opportunities (Tawfiq and Muhammad, 2023: 236). Moreover, processing automated payment methods that provide historical data analyses, accurate statistics, and reports, showing trends in stock market indicators in a way that supports the decision-making process, achieving a better understanding of the market, and making sound decisions (Ghawanmeh et al., 2023). Accordingly, performance can be improved through ITG, especially when integrated with AI tools, which we can say has become one of the modern, advanced administrative methods to confront complexity in the business environment.

2. Literature Review:

Many scholars have presented the idea of the so-called AI in ITG in their literary studies. The study (Lunardi et al., 2014) aimed to know which banks adopting ITG mechanisms may improve their financial performance. This study concluded that companies that adopt ITG practices may improve their financial performance, especially regarding the profitability index. The study (Ghanimi, 2016) aimed to activate ITG mechanisms to reduce the risks associated with its use in companies in general and banks in particular. It also focused primarily on implementing activities and providing banking services to customers and beneficiaries through websites in all business companies. The study concluded that the application of ITG, to a large extent, reduces the risks associated with its use, and supports both improving financial performance and increasing the competitiveness of banks. The study (Ako-Nai & Singh, 2019) aimed to identify and evaluate aspects of ITG that companies' boards of directors of in South Africa implemented. The study concluded that boards of directors and the effectiveness of IT investments in financial statements are key factors influencing IT control. Companies often use information technology from external sources that are ineffective in managing their information technology, especially the use of this technology in designing organizational sustainability that returns intangible returns to companies on their investments. In addition, financial companies can obtain high-quality information that helps them make effective decisions, and improve information security, and maintain the brand of financial companies. The study also reached the factors related to ITG that fundamentally affect the performance of financial companies. Study (Hamoum et al., 2022) This study aimed to know the impact of information technology on the financial performance of the Algerian Commercial Bank, as information technology has become a matter of interest to all commercial banks due to its impact on their financial performance and various activities. The study concluded that information technology significantly improved the bank's financial position and performance. The study (Boukfos et al., 2023) aimed to demonstrate the impact of ITG in enhancing the financial performance of the National Social Security Fund for the Non-Employees. The study concluded that the dimensions of ITG positively affect financial performance. The study (Raghib, & Flayyih, 2023) aimed to show the impact of financial information technology on financial performance, which boards of directors implement to improve their financial performance. The study concluded that credit card balances positively impact on the rate of return on investment. The study (Kanza et al., 2024) aimed to know information technology and its impact on financial performance, and the impact of information technology was measured through its dimensions, which are service quality, human resources, database, programming basics, and communications and networks. The study concluded that information technology significantly impacts financial performance. The study (Naguib et al., 2024) aimed to know the impact of both

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The Fifth Scientific Conference for Graduate Student (٢٠٢٥) المؤتمر العلمي الخامس لطلبة الدراسات العليا
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P-ISSN: 1818-9431, E-ISSN: 2617-9849   Special Issue عدد خاص

ITG (ITG) and data governance on information technology (IT) performance in the telecommunications industry. The data was analyzed using partial smart squares (PLS). The study achieved several results, including that information technology and data governance significantly impact on financial and non-financial performance. However, each has a different impact on the dimensions of information technology performance. The financial performance of the IT department is affected by ITG more than data governance. Innovation and flexibility are also affected by ITG more than others. On the other hand, data governance affects business processes and ethical compliance more than ITG. The study (Amimakmur et al., 2024) aimed to know the effect of firm size on financial performance and firm value, with a special focus on the moderating role of IT innovation in the Indonesian commercial banking sector, the study reached results including that firm size significantly enhances financial performance and firm value, in addition, it was found that IT innovation significantly mitigates these effects, which amplifies the positive effects on firm value in particular, and IT innovation also enhances the relationship between financial performance and firm value, reflecting its critical role in modern banking operations, the study (de Almeida., 2021) The study aimed to develop a conceptual framework for regulating AI (AI), and the study reached knowledge of foundations based on contemporary governance techniques and social values that are legitimized through dialogue and scientific research, the study (Razzaque., 2021) This study aimed to integrate two intellectual variables: AI and ITG to understand the role of one on the other, these two research areas have been rarely addressed in previous literature despite being an important area for discussion, the study reached the implementation of AI in ITG in order to improve the quality of human life and the efficiency of governance Any bank, a study (Ottosson et al., 2020) aimed to identify the links between the use of AI and economic benefits, such as increased efficiency and reduced costs. The study concluded that the economic benefits of AI lead to higher financial performance. However, since AI is witnessing a recent boom, it may bear financial fruit in the long run. The study (Shiyyab et al., 2023) aimed to determine the extent to which Jordanian banks are affected by AI technologies and their use in their operational processes and to examine the impact of disclosing terms related to AI on financial performance. The study concluded that disclosing keywords related to AI impacts the banks' financial performance. AI positively impacts accounting performance regarding return on assets and equity. It has a negative impact on total expenses, which supports the prevailing view that AI improves revenues and reduces costs. It is also consistent with the results of previous literature. The study (Shukr, 2024) aimed to identify the uses of AI as one of the modern methods that enhances financial performance in the banking sectors, and to clarify the effective role of AI applications in managing regulatory activities, which enhances financial performance. The study concluded that AI has a significant effect in enhancing the COSO framework for internal control and risk management, which contributes to enhancing the financial performance of banks. (Emmanuel et al., 2024) The study aimed to clarify the dynamic relationship between the innovation of AI technology in banking services and the financial performance of banks. The study's results indicated that the innovation of AI technology in banking and financial services positively affects banks' return on assets, focusing on its role in enhancing financial performance. The study (Abu Bakr et al., 2024) aimed to clarify the role AI technology can be employed in the banking sector, in addition to emphasizing the need to know the economic and technological factors of AI to maximize its benefits in enhancing financial performance. The study reached a conclusion indicating the enhancement of AI tools and their adaptation to regulatory frameworks in achieving financial performance. The study (Bayoumi, 2024) aimed to analyze the concepts of financial performance and know its measurement indicators, including liquidity ratios, profitability ratios, and return on investment ratios. The study's results contributed to the applications of emerging AI in 2024 in improving the financial performance of banks by calculating the return on investment rates.

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3. Methodology

This study uses bibliometric methods to analyze ITG and AI literature. We applied bibliographic methods as quantitative tools to the bibliographic data. This method originated as a tool for analyzing previous studies (Broadus, 1987). 1.1 Data Source and Search Strategy Journal articles on ITG and AI were retrieved on March 22, 2024, TITLE-ABS-KEY (artificial AND intelligence AND it governance) AND (LIMIT-TO SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON" AND (LIMIT-TO (EXACTKEYWORD "AI") OR LIMIT-TO (EXACTKEYWORD, "IT Governance) OR LIMIT-TO (EXACTKEYWORD, "Artificial Intelligence (AI)". It is an important data source for obtaining scientific articles for literature reviews. Based on the keywords of the published articles, the bibliometric study revealed the most important published topics, which amounted to 455 articles that investigated this topic within specific places in the article, including "Article title, abstract, and keywords." Figure 1 shows the roadmap for the analysis of Bibliometrics.

CFigure 1. Workflow of bibliometric analysis
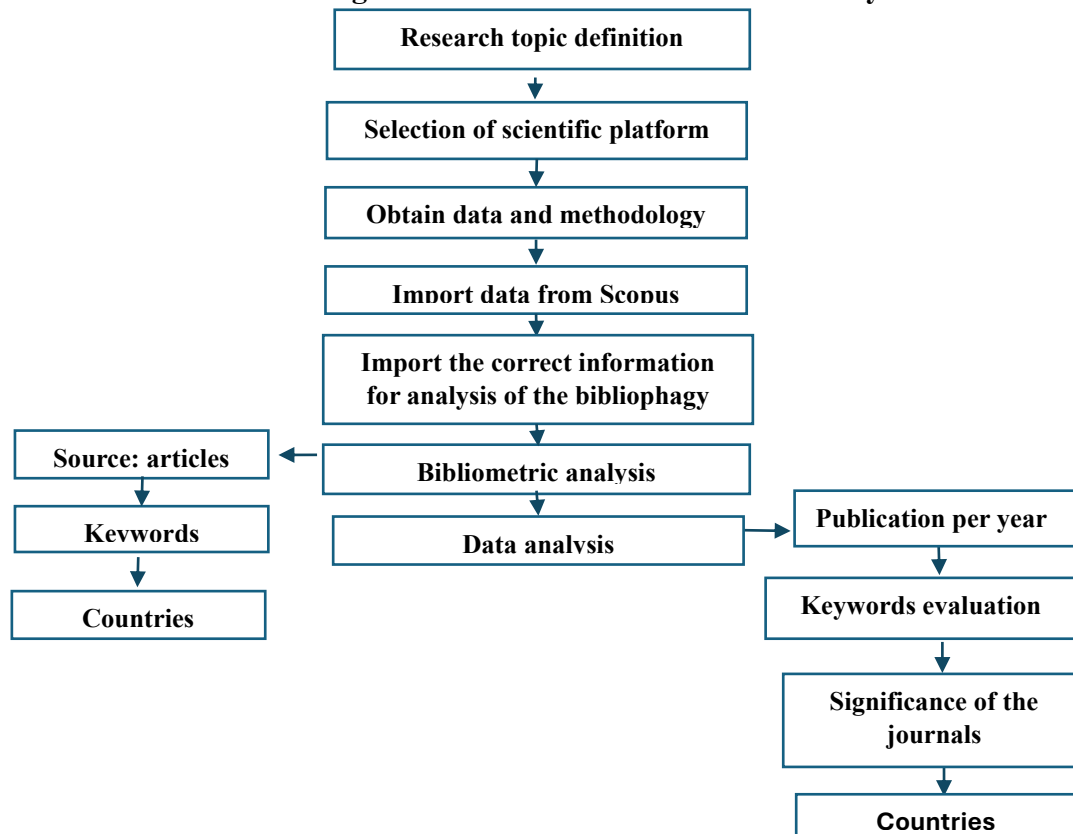
VOS viewer was used to explore the bibliographic keywords found in 233 articles. One element of interest in the study is the country or author keywords. A strong connection can occur between any two elements. Each link has a strength, represented by a positive numerical value – the higher this value, the stronger the connection. We ignored co-authorship links of a particular country with other countries.

4. Results:

4.1 Publication Output and Growth of Research Interest

Over the 48 years, 455 research articles were published (see Figure 2) starting in 1976 (Clark, 1976), the earliest known publication date. No further publications were observed until 2015. From 2018 to 2024, interest in the relationship between AI and ITG became an important topic. The total number of publications increased from six in 2018 to 21 articles, while the number of articles jumped to 127

in 2023. As of the study's preparation date, the number of indexed articles reached 38 for 2024. Although the annual growth rate increased by 90% in 2023, it more than doubled by 84% between 2014 and 2024. Therefore, the annual number is expected to continue to increase. However, most publications were closed access and unavailable to anyone in the Scopus database. As of 2020, only 38% (207 articles) were published as open access. Therefore, the degree of citation will automatically increase once access to the journals is opened. The results also showed that the articles used in this study were published in 6 different languages. The current research limited its search to articles published in English, the most widely used language, which amounted to 455 articles. Figure 2. Annual and cumulative number of research articles on AI and ITG indexed in Scopus from 2007 to 2025.

Figure 2. Annual and cumulative number of research articles on AI and ITG from 2007-2025.
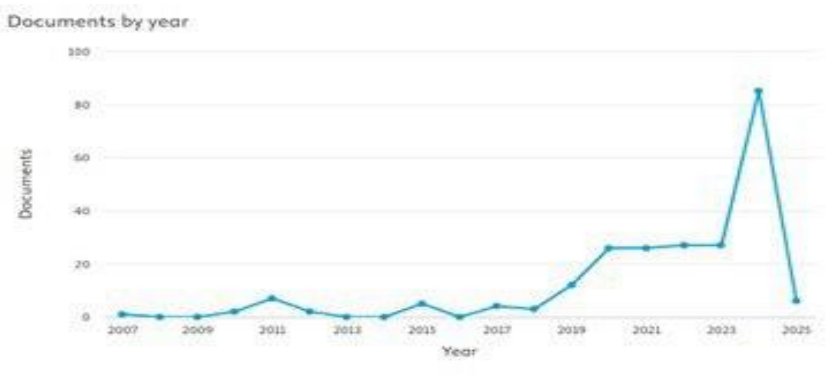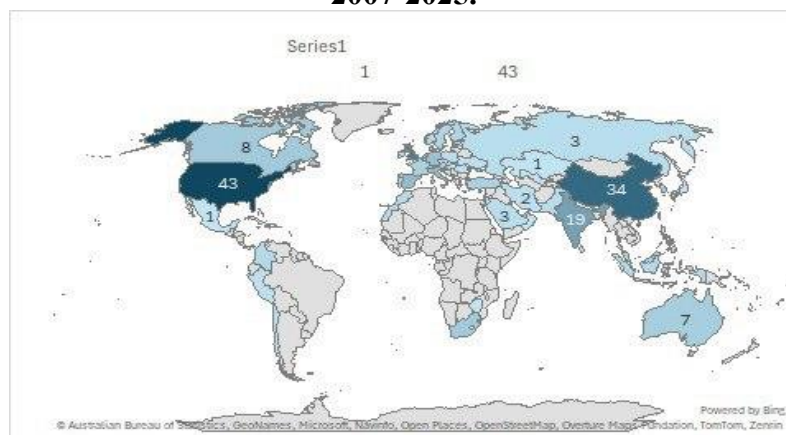

Table 1 shows the research contributions of the top ten countries worldwide from 2007-2025. It is noted that the United States of America ranks first in terms of the number of research contributions, with a percentage of 30.27% of the total number of studies, followed by the People's Republic of China, with a percentage of 14.41%. In comparison, Australia ranked tenth with a percentage of 4.5%

Table 1. the research on AI and ITG for the ten most published countries from 2007-2025.

No.	Country	Number	Percentage
1	United States	145	30.27%
2	China	69	14.41%
3	India	53	11.06%
4	United Kingdom	50	10.44%
5	Undefined	34	7.10%
6	Germany	33	6.89%
7	Spain	25	5.22%
8	Canada	25	5.22%
9	Italy	23	4.80%
10	Australia	22	4.59%

Figure 3. Distribution of research articles on AI and ITG for the ten most countries from 2007-2025.

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4.2 Research interest in the relationship between AI and ITG

It is noted that the cognitive contributions in this field were distributed across different disciplines, as the research included the words in the study title, abstract, and keywords. We conducted a further investigation of the specialized research contributions by conducting a comprehensive inventory, so the articles published in specialized journals were selected based on keywords and open-access journals from 2015 to 2024 through the following instructions:

The specialized journals in administrative, economic, accounting, and financial sciences were selected, as shown in Table 2. This shows that the vast majority of the articles published in economic, administrative, financial and accounting sciences amounted to 455 articles during the selected period, while the rest of the journals, which constitute a small percentage, were published in other journals, which numbered 233.

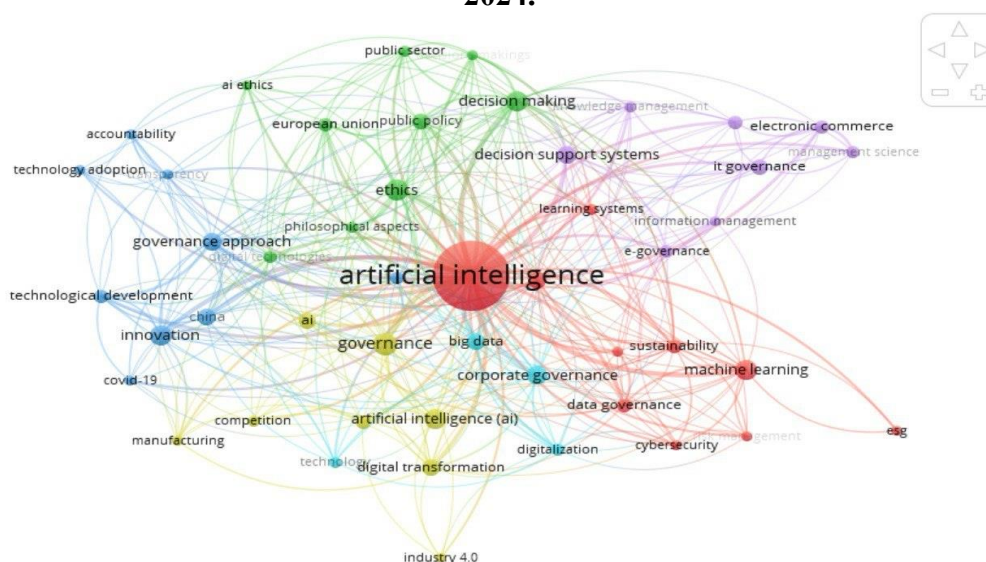**Figure 4. A Bibliometric network was created based on knowledge contributions from 2015-2024.**

Figure 4. Designed by VOSviewer, we relied on the knowledge contributions from 2015 to 2024 to prepare this network, relying mainly on the keywords of the selected studies, which numbered 233 main words. After considering the data determinants, we rely on the keywords of the knowledge contributions. It became clear to us that there are four networks in red, which is the main network, and in blue and green, and a clear link is observed for AI, ITG and machine learning in first place, ITG in second place and decision-making in third place. It is clear that decision-making in ITG depends primarily on automation and, governance mechanisms, and machine learning, and there is a path for ITG that links governance and machine learning. As for AI, it was the main axis in the network, which highlights the main feature of adopting AI in technology governance and the decision-making process.

5. Discussions:

Many interconnected processes characterize the accounting cycle in the business world. However, despite the invention of new information technologies that are useful in every step of the process, their integration still seems limited, and their potential remains little exploited (Faccia et al., 2019). This study examined literature related to technology governance and AI, and by using a comprehensive search approach, we can expand our knowledge across previous contributions to AI. According to the results, published field research on using AI in technology governance began with the introduction of technology in data analysis. However, the beginning was modest despite the use of automation in financial operations since the 1990s. Recently, with the peak of the use of AI, the

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	The Fifth Scientific Conference for Graduate Student (٢٠٢٥) المؤتمر العلمي الخامس لطبة الدراسات العليا	

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focus has become on providing accurate solutions for the investment decision-making process. Over the past five years, research has witnessed a significant growth in the number of publications, although it cannot be claimed that this increase is at its peak. However, the coming years will witness a significant increase in the use of AI in ITG, and this can be attributed to the increase in AI banks and the increase in the number of banks interested in this technology. Therefore, this future development of research in this field may be due to the prevailing view of banks that the goal of adopting AI is to generate value for banks. The public sees banks that recognize the importance of AI as participating in competitive advantage and aiming to achieve future financial savings. This paper provides evidence of the weak adoption of banks in different countries that are resorting to AI.

6. Conclusion:

The current paper summarized the trend and development of studies on using AI in ITG. Based on 233 articles in the Scopus database, the study provided an overview of most countries, and the current paper also discussed specific aspects limited to the author's keywords. This study used bibliometric analysis to examine scientific publications related to the research variables from 2015-2024, using a large-scale data analysis. We noticed that since 2015, research on this topic has increased at a rapid rate, according to this study. The statistical results of the data sets showed that the United States ranked first, followed by the United Kingdom, China, and Taiwan ranked third, and the third group included several Arab countries, namely the Sultanate of Oman and the Kingdom of Saudi Arabia, among the top ten countries worldwide. Through the network relationships via VOSviewer, we observed a clear relationship between AI, technology, and machine learning, followed by AI and ITG in second place, and decision-making in third place, highlighting decision-making, is the main objective of using AI in ITG, which is based primarily on process automation. We observed that AI is the main focus of the analysis, which highlights that the main feature of adopting AI in ITG and decision-making. Finally, the data analysis identifies some potential research issues regarding the relationship between disclosure level and AI, which serves as an area for future research. Again, this study also provides a framework for banks to pay attention to AI- related areas.

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The Fifth Scientific Conference for Graduate Student   (٢٠٢٥)   المؤتمر العلمي الخامس لطلبة الدراسات العليا
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