Exploring Trends and Research Focus of Artificial Intelligence and Digital Economy: A Bibliometric Approach

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Abstract

This study aims to analyze publication trends and the impact of artificial intelligence (AI) and the digital economy across different institutions and countries, based on bibliometric data. Through the use of citation analysis and keyword mapping methods, the study found that Russia and China dominate publications in this field, with AI and digitalization as the main focus. In addition, the research identified a large number of citations that demonstrated the significant influence of AI-related works in social and economic contexts. The findings illustrate the importance of international collaboration in sustainable technology development and provide recommendations for future research to include more perspectives from developing countries and broader social aspects.

Keywords: Artificial Intelligence, Bibliometric, Digital Economy

1. Introduction

The rapid development of digital technology has brought significant impacts in various aspects of life, including the global economy (Li et al., 2020; Shahbaz et al., 2022). Artificial intelligence (AI) is now not only an important topic in the field of technology, but has also penetrated into the realm of economics, creating a new synergy known as the digital economy (Zekos 2021; Nguyen et al., 2023). This phenomenon has triggered intensified research on how artificial intelligence can drive economic growth through various digital technology innovations and applications.

The digital economy is a concept that encompasses all economic activities based on information and communication technology (ICT) (Wu et al. 2022; Wang et al. 2024). Artificial intelligence acts as a catalyst that allows various business processes to be more efficient, fast, and accurate in the world of digital economy. Artificial intelligence also facilitates the creation of new business models based on data and analytics, which are at the core of digital transformation in the current era. The merging of AI and the digital economy has attracted the interest of researchers to understand how this technology can be used to improve productivity and create new economic value.

Globally, the research focus on artificial intelligence and the digital economy is growing, fueled by increased investment in these technologies (Lyu & Liu 2021; Johnson et al., 2021). Many countries and

companies are beginning to realize the huge potential of artificial intelligence in optimizing industrial processes, improving market competitiveness, and creating new product and service innovations. This trend is also supported by advances in digital infrastructure and the availability of big data that is increasingly accessible. Therefore, the role of AI in the digital economy is becoming increasingly relevant, especially in driving operational efficiency, data-driven decision-making, and automation of various economic sectors. In view of this, it is important to conduct a comprehensive and thorough study of artificial intelligence and the digital economy from different perspectives. One approach that can be used to obtain complex results can use a method that is currently being used by researchers, namely the bibliometric approach.

In the context of research, bibliometric methodology is an effective tool to understand the trends and focus of research in artificial intelligence and digital economy. Through this approach, researchers can analyze the development of research based on scientific publications, citations and collaborations between researchers. Bibliometric analysis also helps identify key themes that dominate academic discussions and technological trends in the field (Vinayavekhin et al. 2023; Hao et al., 2020). By mapping the existing research map, researchers can gain in-depth insights into issues that are prioritized among researchers and understand future challenges and opportunities.

It is important to understand that artificial intelligence and the digital economy are closely intertwined in terms of data utilisation and digital technologies (Vinayavekhin et al., 2023; Zhang 2023; Pigola et al., 2021). Research in these fields often focuses on using artificial intelligence to maximise the potential of data to support economic decision-making. Artificial intelligence can help analyze patterns in big data, identify market opportunities, and provide accurate predictions of economic developments. Artificial intelligence serves not only as a technological tool, but also as a driver of innovation in the digital economy.

In recent years, many studies have shown increasing attention to the role of artificial intelligence in sectors such as finance, manufacturing, commerce, and public services (Di Vaio et al. 2022; Sharma et al. 2022). Each sector has unique challenges and opportunities in adopting artificial intelligence technologies. Therefore, research on artificial intelligence in the context of the digital economy focuses on developing customized applications tailored to the needs of specific industries. This encourages collaboration between academia, industry and government to develop artificial intelligence solutions that can support inclusive and sustainable economic growth. There are significant challenges that need to be addressed such as data security, privacy, and regulations that are not yet fully prepared to keep pace with technological advancements. Therefore, studies that focus on the legal and ethical aspects of using artificial intelligence in the digital economy are also growing. Proper regulation is essential to ensure that these technological innovations can be applied responsibly without compromising individual rights or economic stability.

The bibliometric approach applied in this article aims to comprehensively describe the research trends and key foci in the field of artificial intelligence and digital economy (Vinayavekhin et al. 2023; Hao et al., 2020). Through this analysis, it is expected to identify the most developed research areas and those that still require further exploration. This article will make an important contribution to understanding the research landscape at the intersection of artificial intelligence technologies and the digital economy and the future implications of existing trends.

2.Method

This research uses a bibliometric approach to analyze the trends and focus of research on the topics of ‘Artificial Intelligence’ and ‘Digital Economy’. Bibliometrics is a commonly used technique in measuring scientific impact, mapping research trends, and identifying the focus of studies in various fields of science Muhammad & Triansyah (2023), Triansyah et al. (2023a), Jäntti & Triansyah (2024), (Jäntti & Triansyah 2024; Xiong & Zhao 2020). Bibliometric data was obtained from the Scopus database, one of the main sources of international academic and research references, accessed on 5 October 2024. The use of Scopus

was chosen due to its wide coverage and globally recognized data quality, thus providing representative results for this study.

The data retrieval process began with a search for relevant scientific documents using the keywords 'Digital Economy' AND 'Artificial Intelligence'. These keywords were chosen to capture research that focuses on the relationship between the two topics, both in terms of concepts and practical applications. In the initial search, 880 documents were found that contained both terms in the title, abstract or keywords. The next step was filtering to ensure that only scientific articles were included in the analysis, as scientific articles are more relevant for describing scientific contributions than other types of publications such as proceedings or short reviews.

After filtering the document type, only scientific articles were retained with a result of 332 documents. The next step was to apply a language filter, where only articles written in English were included. This filter was applied to maintain consistency and ensure the analyzed documents could be understood globally by the scientific community. After the language filter, the remaining number of articles was 278 documents. These documents form the basis of the analysis in this study.

In the bibliometric analysis, various indicators are used such as the number of publications per year, research topic distribution, citation patterns, and collaboration between researchers or institutions. In addition, bibliometric analysis software such as VOSviewer and Biblioshiny were used to visualise research thematic maps, global collaboration trends, and citation networks. This approach helps identify key emerging themes in AI and digital economy studies, as well as map the scholarly influence of specific researchers or institutions in the field. Armed with data that has been screened and analysed bibliometrically, this study aims to provide a comprehensive overview of the direction and focus of research at the intersection of AI and the digital economy. The results of this analysis are expected to provide insight into the dynamics of topic development, identify research trends, and provide recommendations for future research.

3. RESULTS AND DISCUSSION

3.1 Trends by Year

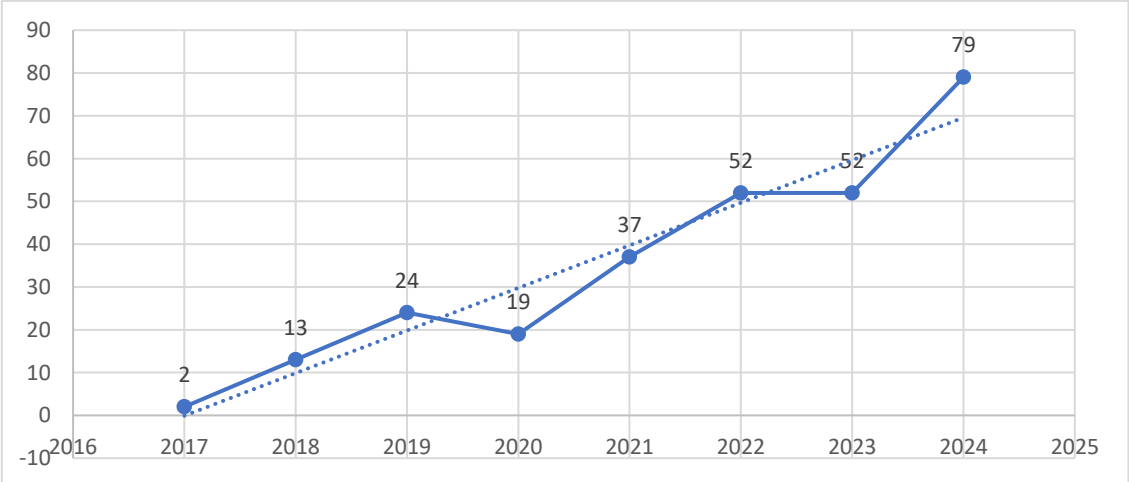

Figure 1: Trends Documents by Year

Source: World Bank (2024).

The trend in the number of documents published on 'Artificial Intelligence' and 'Digital Economy' from 2017 to 2024 shows a significant increase. In 2017, the topic was still relatively new with only two documents published. This may reflect the early stage of integration between AI and the digital economy, where research in both fields has not been explicitly brought together. However, the trend began to pick up in 2018 with 13 publications, indicating a growing interest from the scientific community to explore the relationship between these two concepts.

In 2019, the number of documents increased to 24, and continued to grow until it peaked in 2024 with 79 documents. This increase shows that 'Artificial Intelligence' and 'Digital Economy' are becoming increasingly relevant and important topics, especially in the era of accelerating digital transformation. In 2020, although there was a decrease in the number of publications to 19 documents, this is likely due to the impact of the COVID-19 global pandemic which disrupted the research and publication process. However, in the following years, namely 2021 to 2024, the number of documents continued to increase significantly, with the most striking growth occurring in 2024.

The peak in document issuance in 2024, which reached 79 articles, shows that research on AI and the digital economy has become a top priority in the global scientific discourse. This steady growth reflects the importance of AI's role in driving the digital economy, especially with the increasing adoption of digital technologies in various industry sectors. It also shows increased collaboration between researchers, institutions, and countries highlighting the importance of AI integration in technology-driven global economic strategies.

3.2 Trends by Source

Table 1: Top 10 Trends by Source

Source	Documents
Sustainability switzerland	12
Plos one	7
Economic annals xxi	6
Mathematical problems in engineering	5
Ieee access	4
Computational intelligence and neuroscience	3
Engineering applications of artificial intelligence	3
Humanities and social sciences communications	3
Intertax	3
Journal of business research	3

Source: World Bank (2025).

Based on the data regarding the distribution of documents from various sources, it can be seen that the Sustainability Switzerland journal is the main source with 12 documents related to the topics of 'Artificial Intelligence' and 'Digital Economy'. This shows that the topics of AI and digital economy have strong relevance in the context of sustainability and resource management, in line with the journal's focus. Other journals that also contributed significantly were Plos One with 7 documents, and Economic Annals XXI which contributed 6 documents. Both journals are recognised as sources that include interdisciplinary research and focus on global economic issues, signalling that the discourse around AI and the digital economy extends across disciplines.

A smaller distribution of documents was also seen in other journals, such as Mathematical Problems in Engineering (5 documents) and IEEE Access (4 documents), indicating more in-depth attention to the technical and engineering aspects of applying AI in the context of the digital economy. Contributions from engineering journals highlight the importance of AI technologies in addressing technical and operational challenges in the digital economy, including in the areas of automation, data analytics, and industrial process optimisation. In addition, journals such as Computational Intelligence and Neuroscience and Humanities and Social Sciences Communications with 3 documents each, show that the application of AI is not only limited to the hard technology sector but also extends to interdisciplinary studies, including social sciences and humanities.

This data shows the diversity in publications, with more than 100 journals contributing one to two documents each. This diversity shows that research into AI and the digital economy crosses disciplinary boundaries, covering fields ranging from law, business, education, to healthcare. Journals such as Journal of Business Research, Journal of Cloud Computing, and Technological Forecasting and Social Change each contributed 3 documents, confirming that AI adoption in the digital economy is studied across a wide range of sectors and institutions. The involvement of these journals indicates that the topic is broad and relevant in many contexts, with applications ranging from business management, technological innovation, to socio-economic impact.

3.3 Trends by Country

Table 3: Top 15 Trends by Country

Country/Territory	Documents
China	94
Russian Federation	55
United States	22
United Kingdom	13
Ukraine	12
Germany	11
Italy	10
Poland	8
Australia	6
Canada	6
Spain	6
France	5
Malaysia	5
India	4
Jordan	4

Source: World Bank (2025).

Based on document distribution data by country, China tops the list with 94 documents, followed by the Russian Federation with 55 documents. China's dominance in research related to Artificial Intelligence and Digital Economy reflects the country's national policy of aggressively supporting

technological innovation and the development of the digital economy. China has invested heavily in AI research and applications, making it a global leader in this field. Meanwhile, the Russian Federation also had a significant contribution with 55 documents, signalling a strong focus on AI and digital economy research, driven by the country's top research institutions.

The United States with 22 documents ranks third, indicating that while the US is known as a global centre of technological innovation, its contribution to research related to AI and the digital economy is slightly smaller than China and Russia. This may be due to the different focus between academia and the tech sector in the US, which is more segmented in specific subfields of AI. In Europe, contributions from the UK (13 documents), Germany (11 documents) and Italy (10 documents) show that the region is also active in AI and digital economy research, although the volume is not as large as China and Russia. Countries such as Ukraine (12 documents) and Poland (8 documents) also show that the Eastern European region plays an important role in this research.

Contributions from other countries, such as Australia, Canada and Spain, with 6 documents each, highlight the global interest in this topic beyond the dominant regions. Countries such as France, Malaysia, India, and Jordan with 4-5 documents each were also involved in the research, signalling that research related to AI and the digital economy has reached out to countries with different economic conditions. Countries from Asia, such as Vietnam, Taiwan, and Malaysia, show active involvement from Asia other than China. This reflects the global influence of AI and the digital economy covering a wide range of sectors and regions, not limited to the largest economies.

In addition, countries such as Finland, Greece, Indonesia, Japan, and Singapore, each contributing 3 documents, show that the topic of AI and the digital economy is not only of interest to countries with large economies, but also to emerging countries and new markets looking to adopt these technologies. Indonesia's involvement with 3 documents shows that developing countries in Southeast Asia are also starting to pay serious attention to AI research and its application in the digital economy. Other countries such as Brazil, Turkey, and South Africa, despite their smaller contributions, still play a role in the global development of this field. This broad engagement reflects the cross-border nature of research in AI and the digital economy, with potential impacts around the world.

3.4 Trends by Subject Area

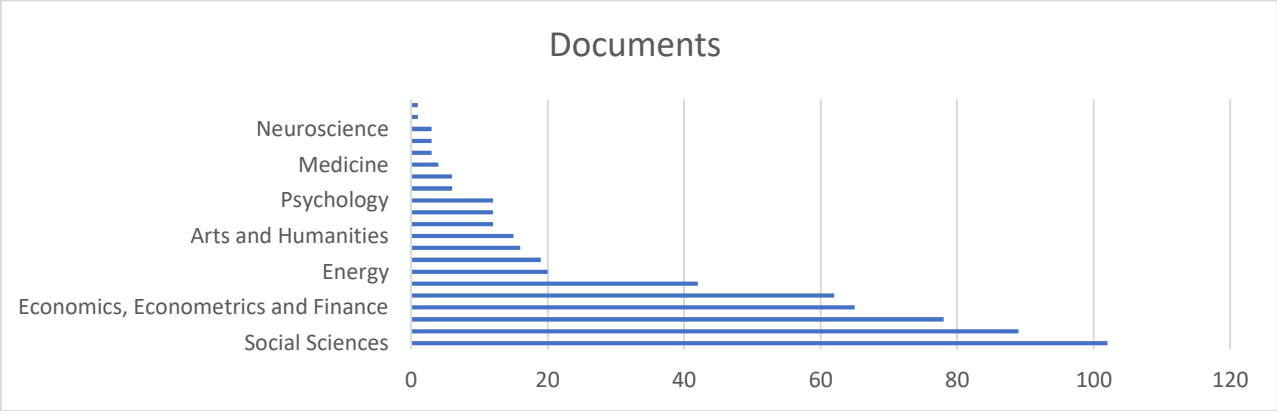

Figure 3: Trends Documents by Subject Area

Source: World Bank (2025).

Based on document trends by subject area, Social Sciences took the top spot with 102 documents. This shows that research related to Artificial Intelligence (AI) and Digital Economy does not only focus on technical aspects, but is also strongly related to its social impact. Research in this area includes studies on how AI and the digital economy affect society, employment, education and public policy. This signifies a great deal of attention to the social implications of these technologies, including the distribution of economic justice, influence on social inequality, and ethical and regulatory challenges.

Computer Science with 89 documents and Business, Management and Accounting with 78 documents came second and third. This underlines that AI and the digital economy are highly relevant to the development of new technologies as well as how these technologies are applied in a business context. In Computer Science, the focus may be on algorithms, data processing and AI applications. Meanwhile, in Business, Management and Accounting, research may be more related to digital transformation in corporate management, the application of AI for business efficiency, and digitalisation strategies. The Economics, Econometrics and Finance subject with 65 documents also shows that AI and the digital economy have a great influence on the way the economy functions, especially in the aspects of forecasting, data analysis, and financial management.

On the other hand, fields such as Engineering (62 documents), Environmental Science (42 documents), and Energy (20 documents) are also quite prominent, showing that AI and the digital economy play a role in the technology infrastructure and sustainability sectors. The application of AI in engineering, environmental solutions, and energy efficiency is gaining attention as the need for smarter and greener technologies increases. Other fields such as Arts and Humanities (15 documents) and Psychology (12 documents) also show that the research is not limited to the exact sciences and engineering, but also includes the impact of culture, human behaviour, and human values in the digital age.

3.5 Trends by Citation

Table 4: Top 10 of Citation

Cites	Authors	Title	Year
282	Z. Allam, A. Sharifi, S.E. Bibri, D.S. Jones, J. Krogstie	The Metaverse as a Virtual Form of Smart Cities: Opportunities and Challenges for Environmental, Economic, and Social Sustainability in Urban Futures	2022
276	J. Moll, O. Yigitbasioglu	The role of internet-related technologies in shaping the work of accountants: New directions for accounting research	2019
262	Q. Yang, Y. Zhao, H. Huang, Z. Xiong, J. Kang, Z. Zheng	Fusing Blockchain and AI With Metaverse: A Survey	2022
191	P.K. McClure	"You're Fired," says the Robot: The Rise of Automation in the Workplace, Technophobes, and Fears of Unemployment	2018
162	H.W. Volberda, S. Khanagha, C. Baden-Fuller, O.R. Mihalache, J. Birkinshaw	Strategizing in a digital world: Overcoming cognitive barriers, reconfiguring routines and introducing new organizational forms	2021
136	L. Caruso	Digital innovation and the fourth industrial revolution: epochal social changes?	2018
132	D. Ivanov	Digital Supply Chain Management and Technology to Enhance Resilience by Building and Using End-to-End Visibility During the COVID-19 Pandemic	2024

120	E. Ernst, R. Merola, D. Samaan	Economics of Artificial Intelligence: Implications for the Future of Work	2019
115	C. Watanabe, K. Naveed, Y. Tou, P. Neittaanmäki	Measuring GDP in the digital economy: Increasing dependence on uncaptured GDP	2018
109	W.D. Holford	The future of human creative knowledge work within the digital economy	2019

Based on the trend analysis of documents with the most citations, it can be seen that the most cited topics focus on how digital technologies, such as Metaverse, Blockchain, AI, and automation, affect various aspects of life, from work, to the economy, to smart cities. The most-cited article, written by Allam et al. (2022), explores the Metaverse as a form of virtual smart city. This shows that research related to the integration of new technologies in urban management and sustainability is in high demand, especially in the context of the role of digital technologies in shaping urban futures that are environmentally friendly, economically efficient and socially inclusive. Through 282 citations, this research provides an important foundation for understanding the future of urbanism in the digital age.

The second highest-cited study, by Moll & Yigitbasioglu (2019), discussed the impact of internet technologies on the work of accountants, with 276 citations. This signifies a great attention to the changing role of traditional jobs due to digital disruption. Jobs such as accounting are becoming increasingly digitalised with internet technology, demanding further research into how these jobs will change and what is needed to remain relevant. This research is relevant in an increasingly digitised and automated world of work, showing the importance of understanding the role of humans in increasingly complex digital systems.

Yang et al. (2022) with 262 citations reviewed the merging of Blockchain, AI, and Metaverse technologies, signalling that interdisciplinary studies between various advanced technologies are in high demand. The use of Blockchain for data security, AI for optimisation, and Metaverse as a virtual space shows how these technologies synergise to form a more secure and efficient digital ecosystem. The popularity of this research reflects that the development of cutting-edge technology-based solutions is becoming a highly dynamic and important research area for the future of the digital economy.

McClure's (2018) with 191 citation article highlights the fear of job loss due to automation and robotisation. It highlights the social concerns that arise from the adoption of technology in the workplace, where the advent of advanced technology fuels fears about mass unemployment. This research is crucial in the discussion about the social impact of technological development, especially how society deals with the disruption of traditional jobs due to automated technology.

Ivanov's (2024) with 132 citation research focuses on Digital Supply Chain Management and technology's ability to strengthen supply chain resilience, particularly during the COVID-19 pandemic. It shows that digital technologies, especially those that enable end-to-end visibility in the supply chain, are crucial in dealing with the global crisis. The pandemic has highlighted the importance of adaptability and resilience in businesses through digitalisation, and this research offers concrete solutions on how technology can be applied to address such challenges. Overall, this research provides important insights into future trends in the digital economy triggered by the pandemic.

3.6 Focus Study

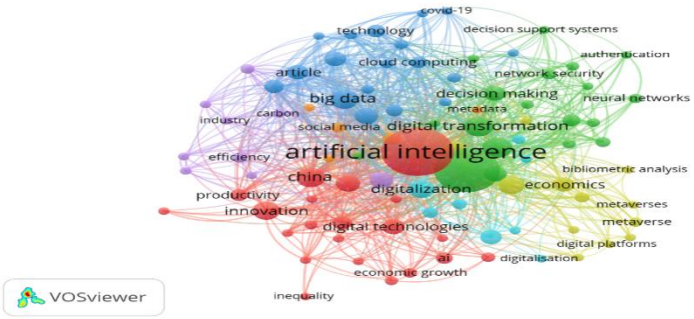

Figure 4: Network Visualization of Keywords

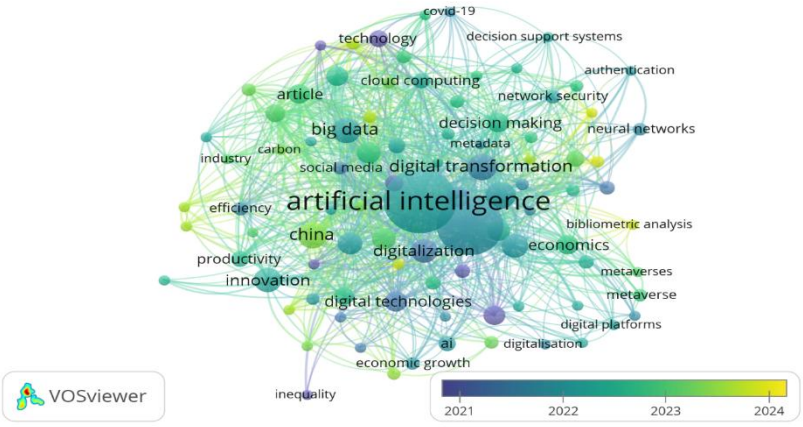

Figure 5: Overlay Visualization of Keywords

Source: World Bank (2025).

The frequently occurring keyword data in this study shows a range of important themes related to the digital economy and artificial intelligence (AI). The keyword 'artificial intelligence' dominated with 147 occurrences and a total relationship strength of 537, indicating a significant research focus on AI in various aspects of the digital economy. In addition, the keyword 'digital economy' appeared 121 times with a total relationship strength of 397, indicating that AI is often studied in the context of economic transformation driven by digital technology. Thus, it appears that many studies link the use of AI to the digital transformation of the economy.

'Machine learning' is one of the most important themes with 26 occurrences and a total relationship strength of 114. This suggests that machine learning is a frequently discussed sub-topic in the context of AI and the digital economy. In addition, 'big data' appeared 23 times with a relationship strength of 116, showing how big data and data analytics play an important role in the implementation of digital technologies and AI. The use of big data enables more accurate and efficient decision-making, especially in an increasingly digitally integrated economy.

In addition to these main themes, the aspect of ‘innovation’ was also an important part of the discussion, with 21 appearances and a relationship strength of 95. This innovation was often associated with ‘digital transformation’ which appeared 24 times, highlighting the importance of innovation in adopting digital technology in various sectors. Technological innovation drives progress in the field of ‘internet of things’ which appeared 20 times, with a relationship strength of 116, as well as in the application of ‘cloud computing’ which is closely related to data management and technological efficiency.

The keyword ‘blockchain’ appeared 15 times with a relationship strength of 72, indicating the importance of blockchain technology in supporting the digital economy, especially regarding transaction security and transparency. Blockchain was often used in various contexts such as ‘commerce’ and ‘automation’ which appeared 5 and 7 times respectively, illustrating how this technology helps strengthen automation processes and safer digital transactions. The topic of ‘cybersecurity’ was also an integral part of the discussion, appearing 4 times with a relationship strength of 21, underscoring the importance of data protection amid the massive adoption of digital technologies.

Other themes that emerged in the context of the digital economy included ‘economic development’ and ‘sustainable development’, which appeared 16 times each. This shows the attention to the economic impact of digital technology and how it can be sustained. In addition, ‘economic growth’ (6 occurrences) and ‘industrial economics’ (4 occurrences) highlight the important role of industrial economics in integrating AI and digital technologies to accelerate economic growth.

Keywords such as ‘e-commerce’ (5 occurrences) and ‘productivity’ (9 occurrences) highlight the transformation of commerce and productivity sectors through digital technologies. Together with ‘virtual reality’ and ‘smart cities,’ this data indicates that research in the digital economy and AI is not only limited to core technologies, but also to how these technologies affect the way people live and change urban environments and social interactions as a whole.

3.7. Discussion

The results of the analysis of publication trends related to artificial intelligence (AI) and the digital economy show very significant patterns in several aspects. From the data on publication trends based on institutional affiliation, it can be seen that institutions from Russia and China dominate the number of publications. Institutions such as the Russian Academy of Sciences and Huaqiao University, as well as Peter the Great St. Petersburg Polytechnic University, play an important role in advancing research related to AI and the digital economy. This dominance reflects their heavy investment in AI-based economics and technology research. In addition, the United States and some European countries such as the United Kingdom and Italy also have significant contributions, although not as intensively as Russia and China, indicating a geographical balance in the development of this science.

Meanwhile, from a national perspective, China is the clear leader with the largest number of publications, followed by the Russian Federation, the United States, and several European countries. These results show that large economically and technologically powerful countries dominate research related to AI and the digital economy. China, for example, is very active in publishing research that focuses on digital technologies, AI, and their impact on the global economy. Russia also shows strong influence, which can be interpreted as the country's efforts to compete in global technological innovation. Countries outside of Asia and Europe, such as the United States and Canada, show a strong focus in the same areas, albeit with fewer publications than China.

In terms of citations, the most-cited AI and digital economy-related publications show strong links to topics such as the metaverse, blockchain, and the impact of AI on the future of work and industrial

innovation. The most cited articles, such as those on the metaverse in the context of smart cities and sustainability, show that the concept of AI is not only being studied in terms of its technology, but also in terms of its impact on various aspects of social and economic life. High citations on publications examining digital transformation during the COVID-19 pandemic also signalled that the global crisis accelerated AI research and applications on a larger scale.

The recurring occurrence of buzzwords such as 'artificial intelligence,' 'digital economy,' 'machine learning,' and 'blockchain' in many studies emphasises the importance of these concepts in global scientific discussions. These buzzwords describe not only the key technologies in focus, but also their implications on the economy, such as increased productivity, big data management, and how AI aids in better decision-making. In addition, keywords such as 'sustainable development' and 'economic growth' show that the discussion on technology is not only technical, but also relates to the broader impact on economic growth and sustainability.

Overall, research into AI and the digital economy focuses on how these technologies can be applied to accelerate social, economic and industrial transformation. In both developed and developing countries, AI is seen as a key pillar for building a more efficient and sustainable future economy. This is also evident from the attention given to aspects such as 'smart cities,' 'sustainability,' and 'green innovation,' which highlight the importance of technology in creating environmentally friendly and sustainable solutions to global economic and social challenges. These discussions show that AI and the digital economy have been, and will continue to be, key topics in future scientific and industrial development.

4.Conclusion

The conclusions of this study show that artificial intelligence (AI) and the digital economy are rapidly growing research areas, with significant contributions from institutions in Russia and China. Through their dominance in number of publications and citations, these two countries lead the development of science related to digital technologies, while other countries, such as the United States and the United Kingdom, also show an important presence. The findings illustrate the relevance of AI and digital technologies in supporting economic and social sustainability in various sectors, as well as creating innovations that can respond to current global challenges.

The implications of this research highlight the need for greater international collaboration in AI and the digital economy to foster more effective innovation and sustainability. However, this study has limitations in terms of data coverage and possible bias in the selection of publications analysed. Therefore, for future research, it is recommended that more data from developing countries be taken into account and consider various methodological approaches that can provide a more comprehensive perspective on AI development. In addition, further studies are needed to explore the specific impacts of this new technology on various social and economic aspects in more depth. The next subsections provide instructions on how to insert figures, tables, and equations in your document.

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