

Mapping the Landscape of Digital Government Transformation: A Bibliometric Analysis

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Abstract. This study used a hybrid methodology that combines bibliometric analysis and literature reviews to investigate the characteristics of digital government trends and research data gathered from the Scopus database. The findings of this investigation are presented in this paper. Bibliometric analysis and literature reviews were the two types of research methods that were utilized in this study. The literature review makes use of citation analysis to detect patterns in the relationship between scientific papers, whereas the bibliometric analysis employs quantitative tools to evaluate published physical units. Citespace Software can be used to map and analyze social networks, assess the quality and impact of scientific publications, visualize the structure and evolution of scientific fields, identify research centers, trends, and essential topics in a particular area, and identify new trends and topics in a specific field of science. The most significant research on the subject of digital government transformation development has been done in Russia, which is the country in question.

1 INTRODUCTION

The presence of Information and Communication Technology (ICT), which is growing rapidly and influencing various sectors, including government and public services, is known as digital governance. Changes in governance have undergone several paradigm

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shifts, starting with the analogy of closed government and only focusing on internal sector procedures (Afriyani et al., 2022). The impact of digital technology via the internet and cloud brings a new paradigm in all industries. The Internet created a borderless economy and a whole new world of ideas, leading to the information age becoming a conceptual age. In the Industrial 4.0 era, the digital era that focuses on mastering the latest technology and globalization and increasingly eliminating boundaries between countries and other economic boundaries, it is necessary to prepare state resources. Digital transformation occurs not only at the level of private organizations but also at the level of individuals and public organizations. Digitization, digitization, and digital transformation use the consumption of technology products and make homework the best alternative for organizational work design. (Tulungen et al., 2022) Community digital governance increases the need for governments to change how they work urgently. As e-government's old goal of providing services and data online fades, a new strategic direction is emerging around an open and collaborative governance model based on the principles of efficiency, effectiveness, collaboration, transparency, participation, and sustainability. We live on the threshold of a new revolution driven by Information and Communication Technology (ICT), and there is hope that private and government digital data can derive economic value through the use of system analytics. "Power of data" is also expected to promote more transparent governance processes and increase citizen participation in decision-making, change decision-making methods, and enable new forms of digital democracy. (Kurnia et al., 2018)

With the wealth of information and services available on the Internet, the current generation has greater freedom to obtain information and use these services. In the 21st century, the closer connections of people in various parts of the world affect the rapid development of information. (Nurwidasa Prihatin, 2022) Innovation is seen as essential and necessary because it can overcome various pathological bureaucratic problems, improve the quality of public services, maximize the potential of machines, and restore public trust. The rapid development of information technology also influences innovation. Changes to public services that were initially provided online allow the public to access them anytime and anywhere. In addition, as users, the public has open access to procedures and changes to user-oriented service operations called digital governance. The process of changing digital governance requires an organized approach, solid planning, and the involvement of all stakeholders, including within the organization. Digitalization of public services aims to meet the demands of society for users of public services that are faster, safer, and more comfortable. Several governments and private bodies have adopted digital public services, which are a form of public service reform and innovation (Afriyani et al., 2022).

2 LITERATURE REVIEW

Digital transformation consists of the combined effect of various digital innovations and technologies that introduce new structures, practices, values, conventions, and beliefs that change, replace, or complement existing rules in organizations, ecosystems, and industries. Digital transformation is essential for all industrial companies and areas of public administration that rely heavily on systems, IT, strategy, and human resources. Digital transformation is about extracting value from business processes, returning it to customers, and using data and analytics to create new and innovative experiences. Digital transformation is a radical evolution involving available resources, including utilizing existing digital technology. When the situation changes to one that focuses more on digital technology, digital transformation (DT) is a phenomenon that cannot be avoided. Ready or not, organizations must face digital transformation well in order to survive and compete. Digital transformation is the in-depth transformation of business and organizational

activities, processes, competencies, and models for the maximum transformation of technology's change and opportunity mix and its accelerated impact on society in a strategic and prioritized manner. With digital transformation requiring infrastructure and technology, it is clear that any technology-enhanced learning method requires the correct information technology infrastructure and platform to implement. Digital transformation can be interpreted as a process of using digital technology that is already available, such as virtualization technology, mobile computers, and clouds that are integrated with other media. In addition, digital transformation is a process that aims to improve an entity by triggering significant changes in its properties through a combination of information technology, computing, communication, and connectivity.

The digital transformation journey is making analytics-driven organizations and embedding artificial intelligence technologies a habit. Digital transformation is widely seen as a force of change in all contexts, especially in business, which affects all aspects of human life based on the use of technology and digitalization. Digital technologies have changed the public sector, affecting civil servants' applications, processes, culture, structures, responsibilities, and duties. Digital transformation can be defined as a change (or adaptation) to business models resulting from the dynamic pace of technological development and innovation, which triggers changes in consumer and social behavior (Kotarba, 2018). Digital transformation has become a popular topic recognized and cared for by the Vietnamese government. The government is also encouraging administrative authorities to implement digital transformation strategies. Especially in the context of social distancing, the relationship between the community and government agencies, as well as the police and public service agencies and apparatus, takes work to do. Entering the second half of 2021, when the COVID-19 pandemic was rampant, the effectiveness of administrative reform changes became more critical. Digital transformation is an unstoppable trend, so Vietnamese provincial government agencies have taken positive steps to implement digital transformation. Digital transformation has been leveraged in the delivery of public services and has produced many positive results. Digital leadership is a combination of digital culture and digital competence. Study Digital leadership is part of the study of leadership discourse based on upper echelon theory developed by Hambrick and Mason, where manager character can predict the results. Digital leadership is a leadership style focused on implementing digital transformation in an organization. This leadership model allows companies and organizations to digitize their work environment and culture; digital leaders are visionaries and change motivators, able to incorporate ideas in business for projects and build connections by creating new opportunities for partnerships/joint ventures/outsourcing and other forms of collaboration.

Utilization of information technology in various fields is, of course, beneficial for organizations to obtain the expected goals. Along with the development of the 4.0 industrial revolution and the 4.0 government revolution, it became fundamental in the transformation of government in adopting the use of technology. It is hoped that with the help of information technology, the delivery of services will be simplified and sped up. Industrial Revolution 4.0 encourages an automation system at all stages of public services through an information system that combines resources, information technology, and information relations (Rochmansjah & Karno, 2020). These reforms resulted in the successful installation of a relatively advanced digital government infrastructure. It is universally accepted that digital technologies increase administrative accountability, efficiency, and transparency, help reduce expenses, and lead to better governance.

Digital governance is based on technology that enhances democracy, transparency, and accountability by making it easier for individuals to interact with the government (Henman, 2019). Digital governance is needed to facilitate the delivery of government services through information technology and engage citizens (Scholl, 2020). In addition, digital

governance can help advance human rights, open government institutions, reduce nepotism and corruption, and transition political decision-making processes from analog to digital (Erkut, 2020). The Digital Local Government System is closely related to government transparency as one of the characteristics of good governance, as the concept offered by the United Nations Development Program (UNDP). This system must be able to encourage the establishment of government transparency, bearing in mind that transparency is one of the aspects that became the demands of reform in Indonesia in 1998. During the New Order, government transparency was necessary because Indonesia was under the shadow of authoritarianism that shackled Indonesia for 32 (thirty-two) years. Significant breakthroughs in the literature have addressed digital governance from multiple perspectives. Robertson et al. (2013) explored political discourse using digital government social media. From the public administration and bureaucracy perspective, we assess the e-government framework of several local government websites. Luna et al. (2013) analyzed the performance appraisal of government web portals. Continentally, Luna-Reyes and Gil-Garcia (2014) also examine digital governance transformation in technological, organizational, and institutional aspects. Marienfeldt (2021) explores the institutional and organizational conditions for the availability of e-government e-services. Other researchers have analyzed public service problems. Yavuz (2022) studies gender perceptions and their implications for the government's use of digital technology in public transportation services. The government must respond to people's expectations and global challenges triggered by change and progress, especially in technology. The world has changed where activity is carried out by utilizing digital technology (Eprilianto et al., 2019; Nugroho, 2018). The community is getting smarter and more well-informed, so society tends to "demand more" for public services (Kumar, 2018).

Analysis and clarification of the concept of digital transformation build a shared understanding of digital transformation as a driving force for introducing changes beneficial to strategies in administrative institutions, administrative reform, and the relationship between digital transformation and administrative reform. The government also urges administrative institutions to implement digital transformation strategies. Especially in the context of social distancing, the relationship between the people and government agencies, as well as between administrative agencies and civil servants in law enforcement activities and public services, takes work to do. In the second half of 2021, the effectiveness of the transformation becomes increasingly urgent for administrative reform. Digital transformation is an irresistible trend, so Vietnam's provincial government agencies have taken positive steps to realize digital transformation. Digital transformation has been used in implementing public services and has delivered many positive results. The role of information and communication technology in supporting operational and managerial systems in government agencies today is felt to be increasingly important. Given the importance of the function of data and information management, primarily to support activities in government agencies, it is only natural that the government seeks to place this data and information management in an equal and equally important place with the management of other resources, such as human, financial, time resources. And others. Information and communication technology has become the basic framework for all government activities and allows managerial functions to manage resources more efficiently and effectively (Amri, 2016). The concept of good governance arises because of dissatisfaction with the government's performance, which has been believed to be the organizer of public affairs. The good governance practice model can be carried out in stages according to the government's capacity, civil society, and market mechanisms. One of the strategic options for implementing good governance in Indonesia is providing public services. The primary key to the success of governance is good governance, namely the paradigm, system, and process of governance and development that respects the principles

of the rule of law, humanity, justice, democracy, participatory, transparency, professionalism, and accountability coupled with a commitment to upholding values and principles—distribution”, efficiency, efficiency, clean, responsible and competitive government (Amri, 2016).

In the current era of globalization, it is no wonder that advances in information and communication technology can promise efficiency, speed of information delivery, affordability, and transparency, and the government is no exception. Moreover, in this era of autonomy, it is necessary to realize good governance. E-Government is an effort by the government to develop electronic-based administration of government services by utilizing information technology. In e-government, an increase in public services is also realized. In more depth, in preparing the vision and mission of information technology policies, the government looks more at the equity factor (making information technology improve the quality of service for public use). To effectively implement information technology, it is necessary to carry out computerized government or e-government and increase human and educational resources in information technology. The reason is that the application of information technology will be optimal if the knowledge of users or users of technology services truly understand technology so that the target of implementing information technology is achieved. E-Government is the government's use of technology, mainly web-based internet applications, to improve access to and delivery of government information and services to citizens, business partners, employees, other institutions, and government entities. E-Government has the potential to help build better relations between the government and the public by making interactions with citizens smoother, easier, and more efficient. E-Government is a way for the government to use innovative information and communication technologies, especially web-based internet applications, to provide citizens with easier access to government information and services. This is done to improve the quality of services and provide more significant opportunities for the public to participate in developing government institutions and the democratic process. Advances in information and communication technology greatly encourage the creation of speed of information delivery, affordability, effectiveness, and efficiency in the industrial world (private sector) and government. The use of information and communication technology, or so-called e-government, can create good governance. In addition, implementing e-government can improve public services, facilitate interaction with the public, and promote accountability and transparency of public service providers.

In the era of globalization, it is not surprising that advances in information and communication technology promise efficiency, speed, accessibility, transparency, and governance. In addition, in the era of cooperation, information and communication technology (commonly called e-government) must be used to occupy the presidency of the Council of Ministers. Improving public services can also be done through e-government. For example, government officials carry out government activities, encourage accountability to the public, the community, and public service providers, and promote telecommunications. Based on this, it can be understood that establishing an e-government creates favorable conditions to facilitate the establishment of public services. In addition, civil servant inspectors and their representatives, such as the ombudsman of the unitary state of the Republic of Indonesia, are easy to regulate. For example, they manage complaints online to facilitate public access and enable the Indonesian Ombudsman to monitor them. Establish an e-Government Development Strategy to support good governance, including public transparency and accountability, and to promote democratic processes. The law of large numbers also explains this. Therefore, it is clear that e-government has become an essential application in various fields of governance. The benefits of e-government are primarily cost savings such as management fees. This is reduced thanks to the online system. Second, increase transparency and accountability by

making it easier for the public to access government activities and see how they are carried out. Third, improving public services makes it easier to access (publish and participate) public services without going to a government office.

3 RESEARCH METHOD

The research type used is descriptive quantitative with a bibliometric analysis approach. Data sources were obtained from the Scopus database with restrictions on articles published in the last ten years. The data sources, data collection techniques, and data analysis techniques of this research are articles and conference articles taken from the Scopus database. The definition of bibliometrics is a study that applies mathematical and statistical methods to measure a change, both quantitatively and qualitatively, in a set of documents and other media. Bibliometric analysis is carried out with data from the database obtained from Scopus. The parameters used a scale from the micro level (authors, themes, and journals) to the macro level (subject areas, countries, and the world). The bibliometric analysis provides an accurate and objective method for measuring the contribution of an article to the advancement of knowledge. It is often used to analyze trends and performance on a particular subject (Yang et al., 2013). This research refers to research conducted by Azzahiroh et al. (2021), which uses the same method with the theme of local government on development planning. The study used 72 articles published from 2019 to mid-2021 as study material. However, this research was conducted by analyzing 40 articles in the Scopus database with digital government transformation published between 2013 and 2023. This research also uses the VOSviewer application to help map and see the relationship between research from the article's keywords and the research article's author. After that, an analysis is carried out according to the mapping results of the application, and then an explanation of the relevant themes in digital government transformation research in the future will be produced—research themes related to digital government transformation by entering 40 articles in the data processing application VOSviewer.

There are four steps in the data mining process with Scopus. In the first step, we categorized the search using the keywords "smart city" and "blockchain technology" identified by category title, abstract, or keywords, resulting in 73 documents. In the second step, the authors limited the time by searching the database to 6 years from 2016 to 2022. This period was chosen to provide references related to current conflict resolution strategies. This stage produced documents as a result of the survey. Then, in the third step, the author only classified the documents based on English to avoid language bias in data processing, resulting in 466 documents. In the last step, the author determined the focus of document types to be analyzed, i.e., article types and conference papers, resulting in a total of 73 documents. Based on more sophisticated queries, it returned the following information:

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(TITLE-ABS-KEY ("kota pintar") AND TITLE-ABS-KEY ("teknologi blockchain")) AND PUBYEAR > 2011 AND PUBYEAR andlt; 2023 AND (LIMIT-TO (LANGUAGE, "english")) AND (LIMIT-TO (DOKTYPE, "cp") ATAU UNION (DOKTYPE, "ar"))
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4 RESULTS AND DISCUSSION

4.1 Publications by Year

In 2016-2022, research on this topic developed very rapidly. Based on the results of the article search using the Scopus database, the authors found 73 articles related to the

keywords and search strategies used. The years 2016 to 2017 were the years to explore the use of Blockchain technology in Smart Cities, with only one research publication appearing that year. The following year, the number of publications increased to 11. From 2020 to 2021, the growth was relatively rapid, with 16 publications. In 2022, there was an increase of 18 publications, which means the most significant increase this year compared to the previous year; the following year, there was a decrease of 3 publications.

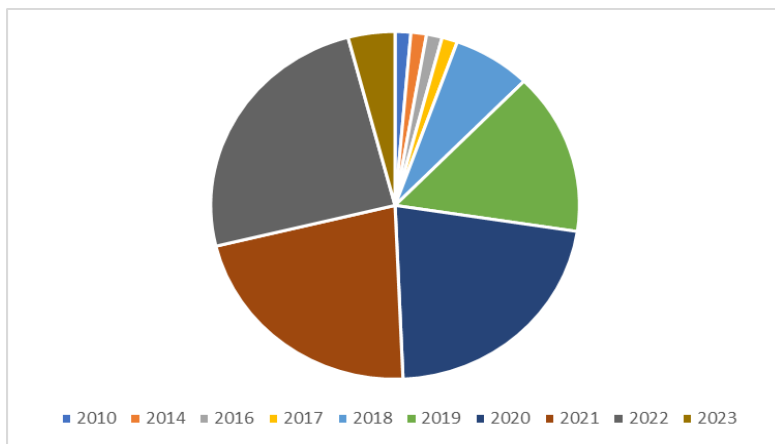


Figure 1: Documents by Years – Source Scopus

4.2 Publication by Subject

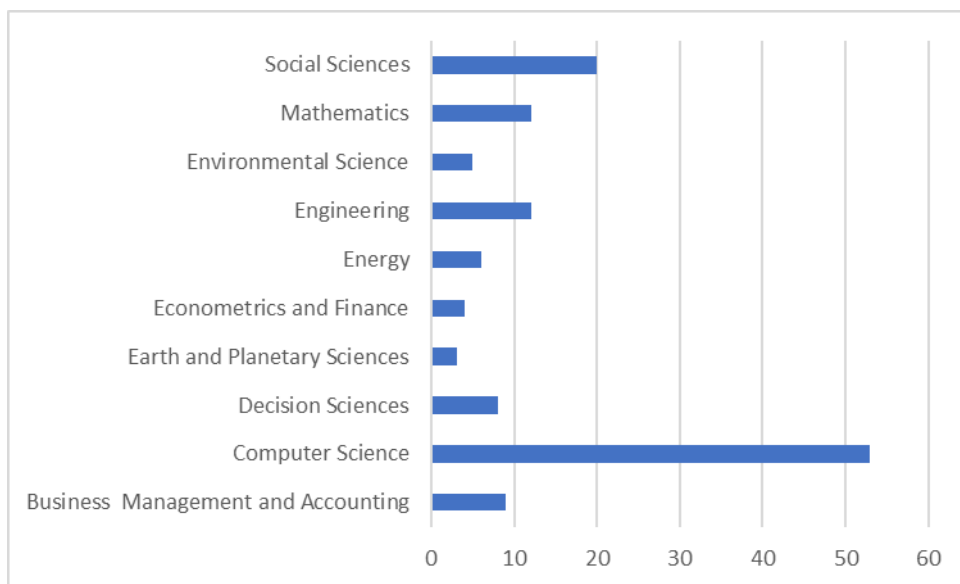


Figure 2: Documents by Subject – Source Scopus

Based on the picture above, the most critical majors are First Computer Science with 53%; Social Sciences comes second with 20%; The third and fourth order, namely Mathematics and Engineering, is 12%. In fifth place is Business Management and Accounting with 9%. While the sixth to tenth positions are occupied by Decision Sciences

(8%), Energy (6%), Environmental Sciences (5%), Econometrics and Finance (4%), and Earth Planetary Sciences (3%).

4.3 Publication by Source

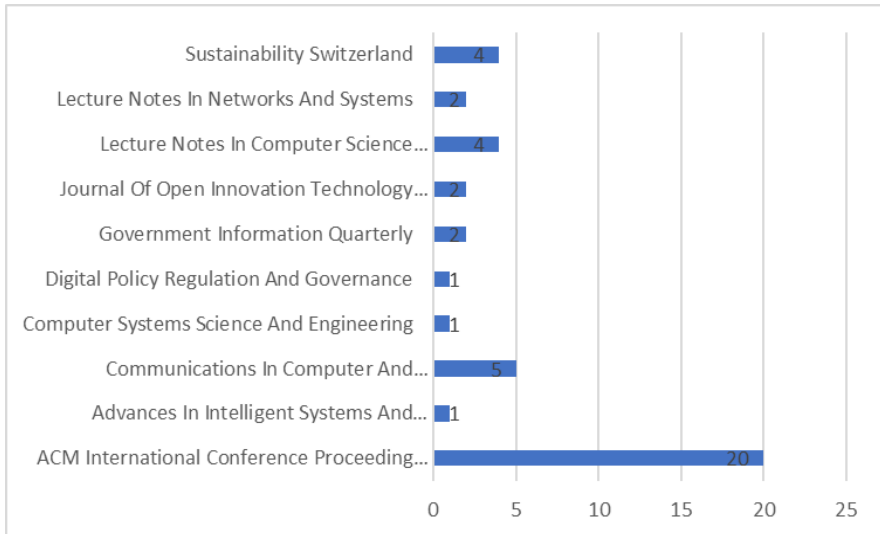


Figure 3: Documents by Source – Source Scopus

Based on the figure above, it is known that the ten most widely published sources of academic papers use blockchain as a source of smart city concepts, including First, the ACM International Conference Proceeding Series, which consists of 20 articles entirely; Both Communications In Computer And Information Science a total of 5 articles; Third and fourth Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics and Sustainability Switzerland with four articles. Fifth to seven, namely the Journal of Open Innovation Technology Market and Complexity, Government Information Quarterly, and Lecture Notes in Networks and Systems. Meanwhile, Advances in Intelligent Systems and Computing, Computer Systems Science and Engineering, and Digital Policy Regulation and Governance are the eighth through ten sources with 1 article.

4.4 Publication by Funding Sponsor

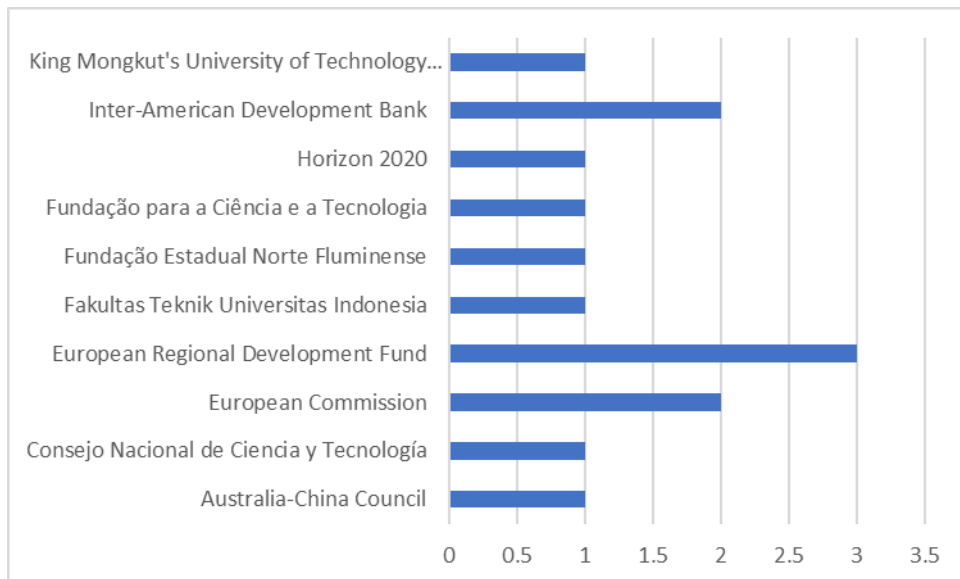


Figure 4: Documents by Funding Sponsor – Source Scopus

Institutions that provide research funding to authors as shown in the image above, namely, European Regional Development Fund (3), European Commission (2), Inter-American Development Bank (2), Australia-China Council, Consejo Nacional de Ciencia y Tecnología, Faculty of Engineering, University of Indonesia, Fundação Estadual Norte Fluminense, Fundação para a Ciência e a Tecnologia, Horizon 2020, and the King Mongkut's University of Technology North Bangkok all with (1) institutions.

4.5 Publication by Documents Type

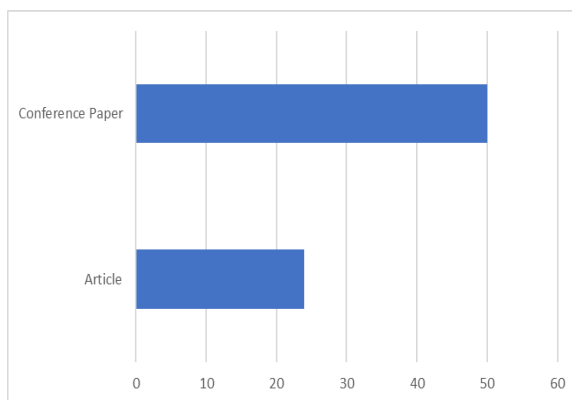


Figure 5: Documents by Documents Type – Source Scopus

Article 51 documents. There are two doctypes shown in the image above. The most common doctypes are Conference Papers with a total of 82 documents, and there are articles totaling 51 documents.

4.6 Publication by Country

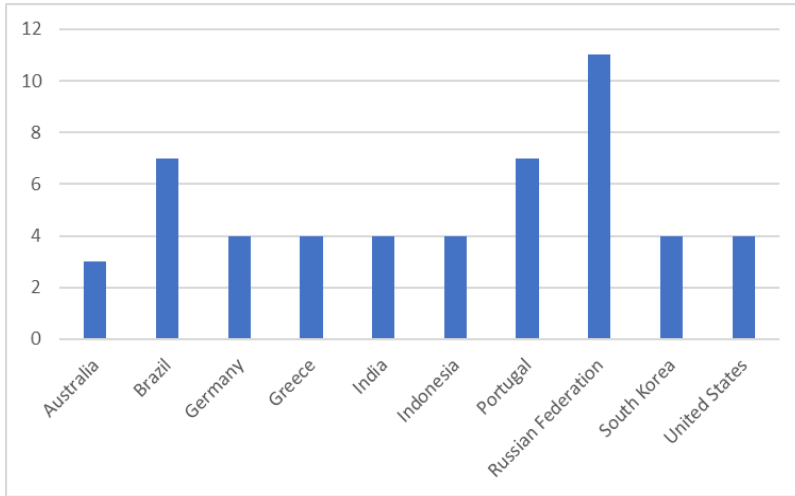


Figure 6: Documents by Country– Source Scopus

Of the 73 articles generated from the Scopus database, there are the top countries with the most publications including the Russian Federation (11), Brazil, Portugal (7), Germany, Greece, India, Indonesia, South Korea, and the United States (4), and Australia (3). Among the countries above, the Russian Federation is the continent with the most publications on the topic of using Blockchain in Smart Cities.

4.7 Publications by Author

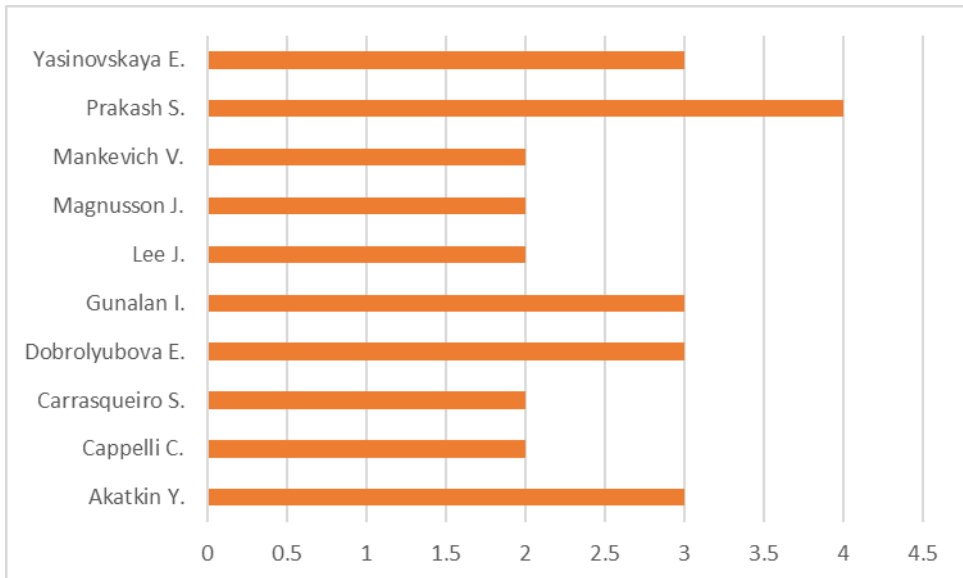


Figure 7: Documents by Authors – Source Scopus

The figure 7 above shows the author with the most significant number of documents on the use of blockchain in smart cities in 2016 – 2023, Prakash S., with a total of 4 documents.

Furthermore, Akat Kin Y., Dobrolyubova E., Gunalan I., and Yasinovskaya E. have a total of 3 documents. Cappelli C., Carrasqueiro S., Lee J., Magnusson J., and Mankevich V. with two documents.

4.8 Publication by Affiliation

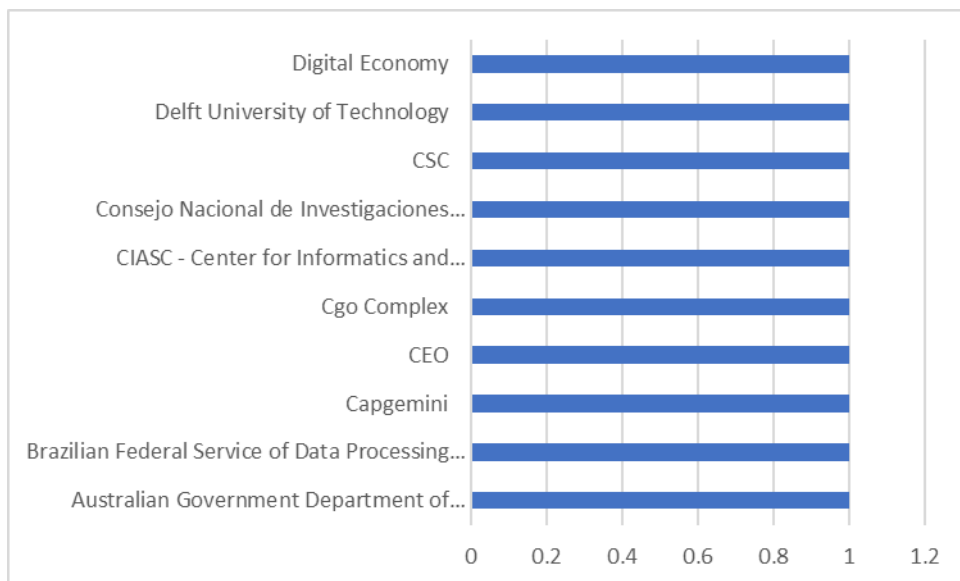


Figure 8: Documents by Affiliation – Source Scopus

The figure 8 above shows ten affiliations or institutions from which researchers are shown. These researchers all contributed to 1 institution, namely the Australian Government Department of Defense, Brazilian Federal Service of Data Processing – SERPRO, Capgemini, CEO, Cgo Complex, CIASC - Center for Informatics and Automation of the State of Santa Catarina, Consejo Nacional de Investigaciones Cientificas y Técnicas, CSC, Delft University of Technology, and Digital Economy.

5 CONCLUSION

Many scholars in social science have previously explored digital governance. This research contributes to expanding the arguments and viewpoints of those social science scholars. Consequently, the core of this study is to discover the state of scientific output and intellectual structure of digital governance to determine trends and provide helpful information for scholars working in related fields. The study examined 73 journal articles from the Scopus database. The research found trends in reported issues, such as e-government and technology adoption. These issues are significant occurrences along with digital governance. Another point noted that there are eight main concerns of digital governance. The practical relevance of this research is that improving adaptable and representative government, public organizational capabilities, and supporting political engagement in policy-making and implementation are the only ways to achieve global digital governance at all levels of government. The science studied needs to be more comprehensive so it cannot uncover more specialized difficulties. As the number of

publications assessed is small, it is possible that they need to represent the current state of the art. This study offers some suggestions for future investigation. To uncover specific issues, future research should examine digital governance in different disciplines, including politics, public administration, and sociology. Furthermore, future research should include more publications from various sources to evaluate the stability of their difficulties. Finally, longitudinal research could be used in future studies to validate the newly presented theoretical model.

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