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Unveiling the Research Void: A Bibliometric Study on Digital Leadership in Immigration

Agus Widodo[1], Sudarmo[2], Rutiana Dwi Wahyunengseh[3].
[1]Fakultas Ilmu Sosial dan Politik, Universitas Sebelas Maret, Surakarta, Indonesia, aguswidodo@student.uns.ac.id.
[2]Fakultas Ilmu Sosial dan Politik, Universitas Sebelas Maret, Surakarta, Indonesia, sudarmo@staff.uns.ac.id.
[3]Fakultas Ilmu Sosial dan Politik, Universitas Sebelas Maret, Surakarta, Indonesia, rutianadwi@staff.uns.ac.id.

Corresponding Author: rutianadwi@staff.uns.ac.id[1]

Abstract: Digital leadership is growing as technological advancements equip leaders with new features to tackle challenges in the digital era. This study aims to analyze the research trend of digital leadership to discover opportunities for future research in government organizations, especially in the context of the immigration sector, due to technology adoption to carry out its functions. This study utilized bibliometric analysis to analyze research publications from the Scopus database and create as well as visualize maps based on network data using VOSviewer software. Three hundred and sixty-six (366) documents were taken with the keyword "digital leadership". The results showed that the early discussion of digital leadership started in 2015 and significantly increased in 2024. Indonesia contributed the most research compared to other countries. This study was mostly affiliated with Bina Nusantara University and mainly written by Abbu, H. The visualization result showed this study connected to five clusters focusing on gendered leadership, e-leadership in education, digital innovations and sustainability, artificial intelligence (AI) and digital learning, and digital transformation and capabilities. The absence of public organization cluster, especially in the immigration sector, implies that this study gives opportunities to guide future research among scholars and practitioners.

Keyword: Bibliometric Analysis, Digital Leadership, Immigration.

INTRODUCTION

Digital era is marked by the massive use and development of digital technology to create values in new ways (Gobble, 2018). Digital technology developments have supported the core building of the Industrial Revolution 4.0, which reflects the future of the manufacturing industry, and the Society 5.0 initiative, which seeks to go beyond traditional boundaries to create a smart society (Nair et al., 2021). On the other hand, digital technology developments have changed the work environment in various sectors to become more unstable, more complex, and full of uncertainty (Kokot et al., 2021). In the public sector context, for example, the impact

of digital technology developments not only influences public service processes but also significantly reforms the structure and working methods of the organization (Lemke et al., 2021). One of the most affected aspects by technological developments is leadership, which is now entering to the digitalization era (Banks et al., 2022). In general, leadership in this era is different and has changed a lot from previous leadership styles, so it requires a new "lens" in viewing the existing leadership dynamics (Avolio et al., 2014). Consequently, the emergence of digital technology and digital work system scenarios has led to the advancement of a new leadership style, known as digital leadership, which effectively motivates employees to foster innovation and progress (Araujo et al., 2021).

Digital leadership is different from the already known e-leadership. If e-leadership focuses on the utilization of information technology and the influence exerted by leaders, digital leadership focuses on changing and improving the mindset, competencies, and influence processes of leaders throughout an organization dominated by digital technology (Lin, 2024). According to Eberl & Drews (2021), digital leadership is defined as a comprehensive approach to digital transformation within organizations through developing leadership and personnel management. Meanwhile, Benitez et. al. (2022) provides the concept of digital leadership as competence as well as behavior of a leader in influencing its personnel to leverage digital technology and drive the organization's digital transformation. Based on this explanation, digital leadership can be broadly characterized as the integration of leadership competencies and behavioral processes that leverage digital technology to drive changes in attitudes, emotions, thinking, behavior, and performance, ultimately generating value and facilitating digital transformation within organizations. It is regarded as a leadership approach that shapes organizations through the use of digital technologies and leadership attributes (Sharvina et al., 2022).

Style of digital leadership can be implemented in various organizations that have adopted digital technology as part of their core business, such as government organizations. A study conducted by (Susilawati et al., 2021) showed that digital leadership improved the government's performance, and it is increasingly urgent for the immigration sector in order to maintain national security and prevent international threats (Damayanti et al., 2023). Currently, Indonesian immigration has adopted many technologies to carry out its duties and functions in terms of public services, state security, and law enforcement. For instance, autogate for immigration clearance at the airports (Putra & Arifin, 2020), Aplikasi Perlintasan Keimigrasian (immigration crossing application) that connects to enhanced cekal system and Interpol's I-24/7 system to identify people on the list of blacklist and international police's fugitive (Rahmanto & Primawardani, 2023), and Passenger Analysis Unit (PAU) (Direktorat Jenderal Imigrasi, 2024).

Figure 1. Autogate for Immigration Clearance

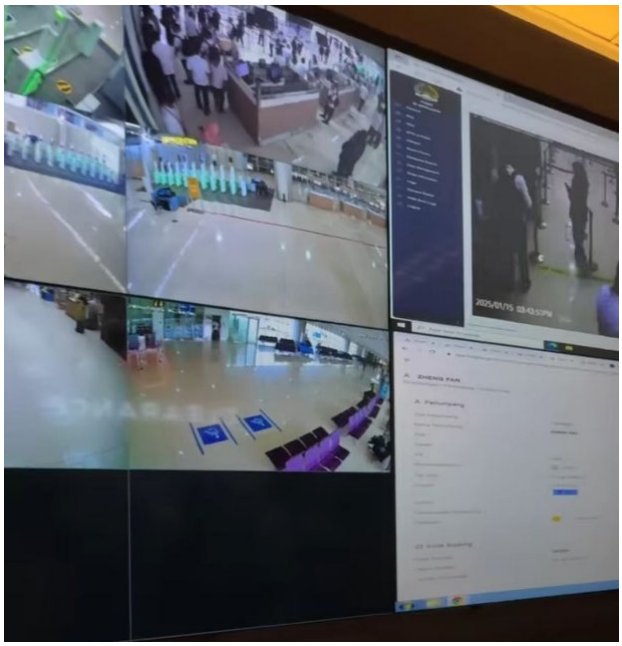

Figure 2. Passenger Analysis Unit (PAU)

Therefore, Indonesian immigration needs to adapt to the digital leadership style to optimize the role of leaders in facing challenges in the digital era. A previous study shows that digital leadership positively influences the performance of immigration officers (Purnomo et al., 2024). However, there is no existing literature that explores the adaptation process of the digital leadership style in the immigration sector. This research is essential for use as a reference concept so that every immigration office in Indonesia has measurable leadership standards.

This study aims to examine the trends in digital leadership research, which has received more attention since its early discussion in 2015, and discover opportunities for further research related to the immigration sector. A bibliometric analysis is employed to synthesize the landscape of digital leadership papers and identify themes and trends based on the existing literature. Moreover, this study explores the tops on year issuance, contributors, affiliation and author.

METHOD

This study applies bibliometric analysis to analyze large amounts of scientific data related to digital leadership from the Scopus database. Bibliometric analysis is utilized as a method to find novelties by mapping relevant research or to report research trends on specific topics (Jauhariyah et al., 2021). Meanwhile, Scopus was chosen for its global reputation and quality, which are widely recognized by research institutes and universities (Difa, 2023). The data was retracted on 5 February 2025 through four stages.

First, the researcher entered “digital AND leadership” in the search documents column to find the word elements within the article’s title, abstract, and keywords. There were 6,534 documents found at this first stage. Then, the researcher narrowed the finding by applying filter by keyword and limit to “digital leadership” only, so the word “digital leadership” would be counted as one united term instead of two separate words. Next, the researcher limited the time from the earliest of digital leadership discussion until 2025. At this stage, the investigation resulted in 366 documents, as presented in Figure 1. On an advanced query, it referred to TITLE-ABS-KEY (digital AND leadership) AND PUBYEAR > 2014 AND < 2026 AND (LIMIT-TO (EXACTKEYWORD , “Digital Leadership”)). In the last stage, the researcher selected all documents and exported them into a (.ris) file. Finally, to create a visualization of the data landscape in digital leadership, the researcher used VOSviewer software (Eck &

Waltman, 2023). This rigorous approach provided valuable insight into the field (Suyoto et al., 2024).

Table 1. Document Sources

No	Document Type	Quantity
1	Article	245
2	Conference Paper	64
3	Book Chapter	32
4	Review	18
5	Note	2
6	Editorial	2
7	Book	3

Source: Processed by Author

RESULTS AND DISCUSSION

Documents by Year

The earliest discussion on digital leadership in Scopus resulted in only two documents in 2015. They were McLeod, who described how administrators in schools and preservice preparation programs enhanced leadership, technology integration, and implementation efforts (McLeod, 2015) and Valentine & Stewart, who examined a multi-method approach to develop the board of directors' competencies in the digital transformation era for effective Enterprise Business Technology Governance (EBTG) (Valentine & Stewart, 2015). The number of digital leadership studies rose four times in the following year with eight documents. Despite a slight decline in 2017 by five documents, scholars' interest in exploring the field of digital leadership showed an increase in the next years, with the highest spike occurring in 2024 as many as 132 documents. There was no decrease from 2018 until 2024, as presented in Figure 3. However, in early 2025, seven documents related to digital leadership were published, and it may still be counting. Of all of the documents, none of them were specifically conducted for the implementation of digital leadership in the immigration sector

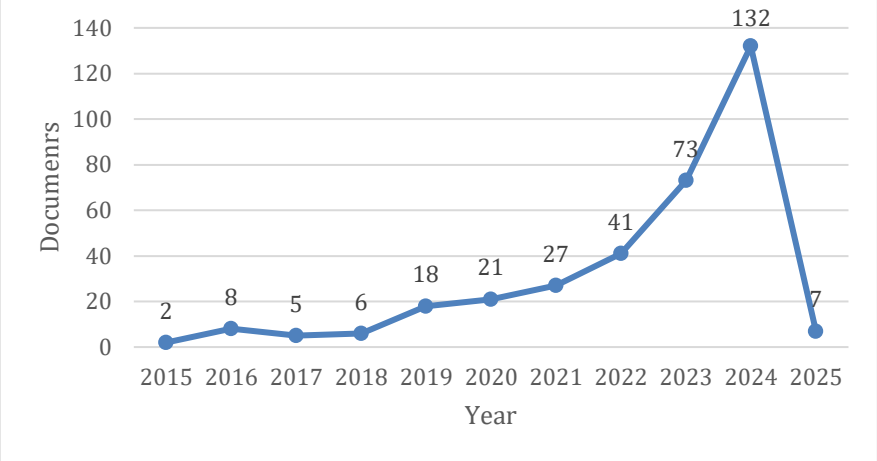

Figure 3. Research Trend on Digital Leadership by Year

Documents by Country/Territory

Scopus listed countries or territories that contributed to the research on digital leadership. The top ten contributors on the list included Indonesia (62), Germany (44), Malaysia (36), China (36), United States (24), Turkey (22), United Kingdom (22), Pakistan (15), Saudi Arabia (11), and India (11). Among the countries with the highest contribution, the most productive continent to produce digital leadership research is Asia, followed by Europe, and North America. Even though Indonesia possesses the highest number, however, the research on digital leadership was initiated by the United States in 2015 published by the Journal of Research on

Leadership Education. The digital leadership topic is more popular in Indonesia compared to any other country on the list. Unfortunately, the urgency of digital leadership implementation in the context of the immigration sector still did not attract the interest of scholars and practitioners to investigate further.

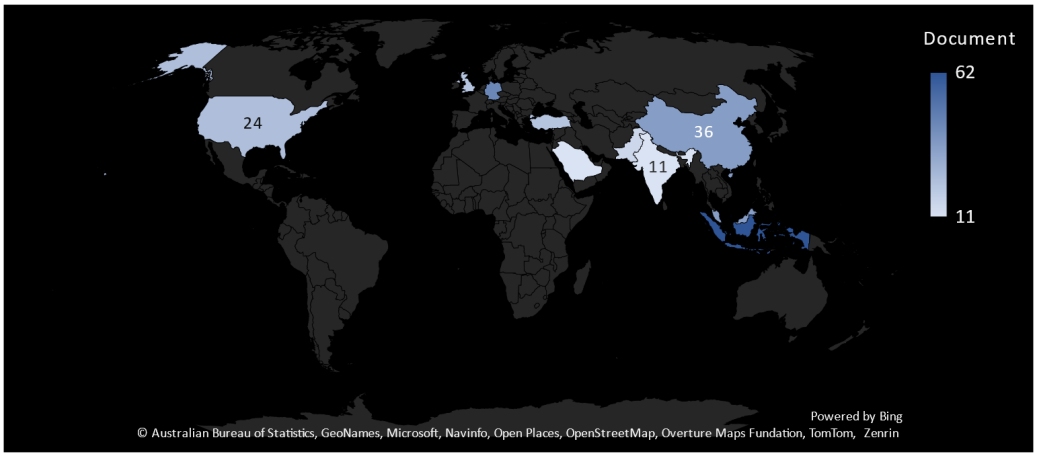

Figure 4. Publications on Digital Leadership by Country/Territory

Documents by Affiliation

Among the publications on digital leadership, the researcher displays the top ten institutions with the most affiliation. Based on the data delivered in Figure 5, researchers are mostly affiliated with Bina Nusantara University, with a total of 15 documents. They were followed by Rheinisch-Westfälische Technische Hochschule Aachen and NC State University with the number seven documents each. University Kebangsaan Malaysia and National University of Sciences and Technology followed with six documents each. The rest of the institutions, namely Universiti Sains Malaysia, Universitas Pendidikan Indonesia, Utrecht University of Applied Sciences, Universitas Negeri Malang, and Dumlupinar Universitesi, each have the least five documents. Three of those institutions are in Indonesia, which shows that Indonesian institutions dominated the research on digital leadership, namely Bina Nusantara University, Universitas Pendidikan Indonesia, and Universitas Negeri Malang. However, none of those institutions applied digital leadership to the immigration sector. Based on the researcher's investigation, digital leadership was primarily implemented in the sectors of business (44 percent), education (40 percent), and health (4 percent). In other words, the chance to conduct research on digital leadership is still widely open to immigration leaders in Indonesia.

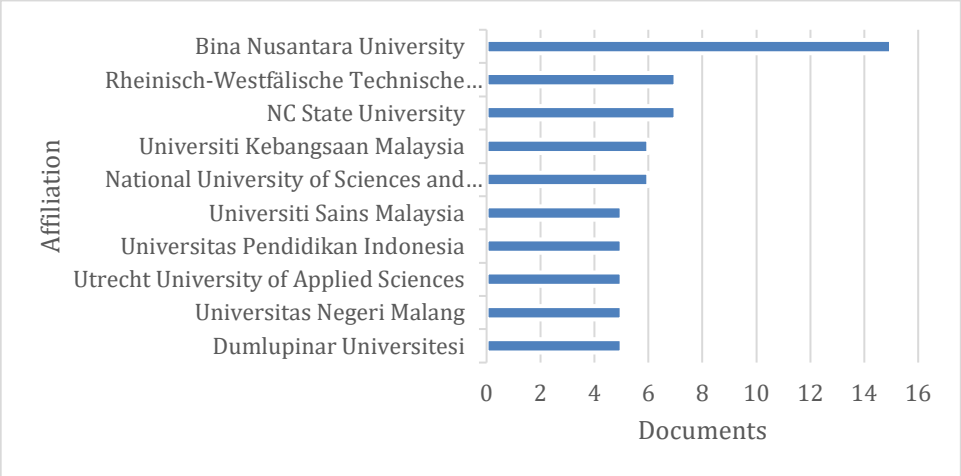

Figure 5. Publications on Digital Leadership by Affiliation

Documents by Author

Figure 6 shows the top ten authors with the most digital leadership writings. Most of the authors produced four documents, including Hoeborn, G., Elidjen, and Mollah, M.A. Meanwhile, Raziq, M.M. and Malik, M. recorded five documents. Karakose, T. and Mihardjo, L.W.W. each contributed six documents, and Mugge, P. and Gudergan, G. have slightly more documents, with the number of seven each. The top author was occupied by Abbu, H., with eight documents. Abu, Haroon R. is a researcher from Poole College of Management, the North Carolina State University business school in the United States. Based on the origin, authors were commonly from Indonesia (Elidjen and Mihardjo, L.W.W.), the United States of America (Mugge, P. and Abbu, H.), and Germany (Hoeborn, G. and Gudergen, G.). As one of the countries with the most authors, digital leadership topics have not obtained much attention among authors in Indonesia despite their effectiveness in driving organizations in the digital era. The scarcity of digital leadership documents increased, especially when they were associated with the Indonesian immigration sector.

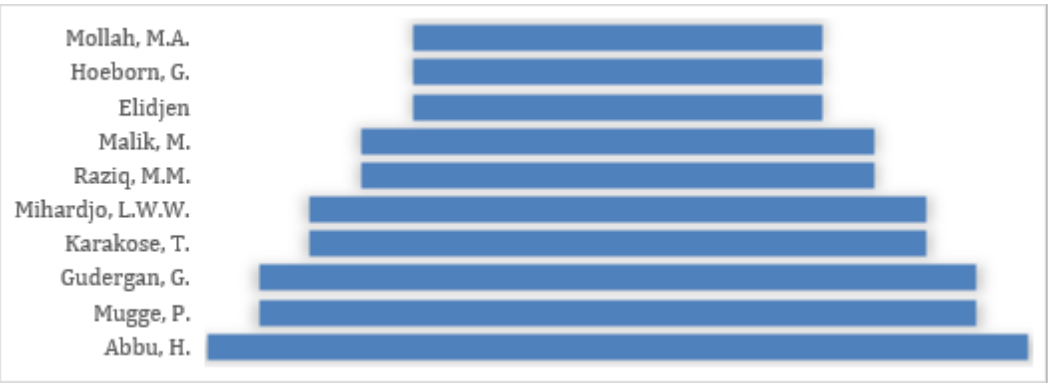

Figure 6. Publications on Digital Leadership by Author

Clusters in Digital Leadership Research

All 366 documents retracted from the Scopus database are clustered into several thematic topics to comprehend how digital leadership is viewed from different perspectives. This can be useful for finding research novelty. The visualization, displayed in Figure 7, was generated using VOSviewer software.

Cluster 1, the red dots, represents gendered leadership. It comprises seven items: article, digitalization, female, human, leadership, male, and questionnaire. This cluster focuses on the relationship between gender (roles of women and men) and leadership, highlighting the role of digitalization in influencing leadership dynamics in the context of questionnaire-based research. Cluster 2, the green dots, represents e-leadership in education. It includes five items: digital leadership, e-leadership, higher education, performance, and systematic literature review. This cluster explores e-leadership in the context of higher education, emphasizing performance enhancement through digital technologies and employing a systematic literature review approach.

Cluster 3, the blue dots, represents digital innovations and sustainability. It consists of five items: covid-19, digitization, innovation, sustainability, and technology. This cluster highlights the role of digital technology and innovation in sustainability, particularly in addressing the challenges triggered by the COVID-19 pandemic and how digital transformation supports sustainability in various sectors. Cluster 4, the yellow dots, represents artificial intelligence (AI) and digital learning. It includes four items: artificial intelligence, digital innovation, digital technologies, and e-learning. This cluster focuses on applying AI and digital innovation in e-learning, highlighting how the latest technologies support learning processes and educational development. Cluster 5, the purple dots, represents digital transformation and capabilities. It covers four items: digital culture, digital transformation, dynamic capabilities,

and information systems. This cluster examines digital culture changes and digital transformation in organizations, highlighting the development of dynamic capabilities and the crucial role of information systems in the transformation process.

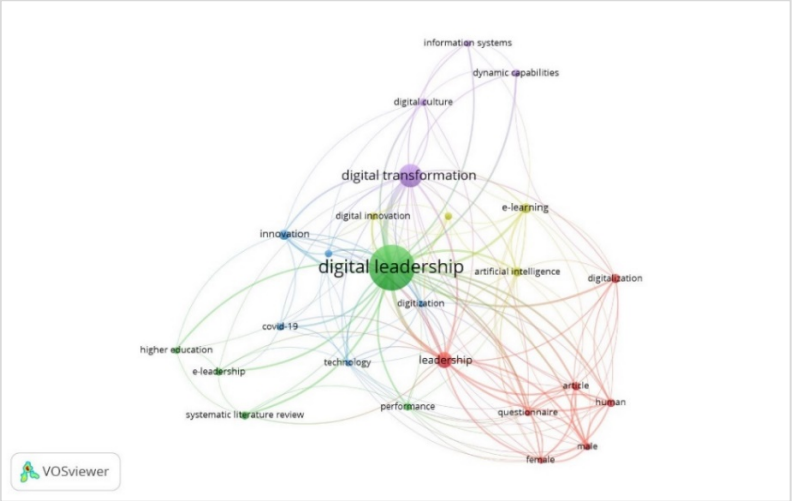

Figure 7. Clusters in Digital Leadership Research

CONCLUSION

Digital leadership is a contemporary leadership style that demands leaders with digital skill sets to transform organizations and face challenges in the digital era. Research shows that digital leadership positively correlates with work performance at various organizations. However, research on digital leadership is minimal in the public sector context, especially in the Indonesian immigration sector, despite the widespread adoption of digital technology to carry out immigration tasks and duties.

Based on the bibliometric analysis, the interest in digital leadership research has shown a positive trend since its early publication in 2015 until 2024. Its rapid growth involves Indonesia as the country with the most contributors, and digital leadership research is mainly affiliated with an Indonesian institution, Bina Nusantara University.

Indonesian also excels in the top ten authors because the majority of the authors are Indonesian. However, digital leadership in Indonesia is prominently used in business, education, and health and pays less attention to the government sector.

Digital leadership is essential for the government to enhance its performance amidst digital era challenges and is increasingly urgent in the immigration sector. Immigration plays critical roles since it carries out public services, national security, and law enforcement at once. Immigration has strategic authorities to filter human traffic from entering and leaving Indonesia to prevent international threats, conduct surveillance of foreigners in Indonesia, and take legal actions against immigration lawbreakers. This study opens opportunities for scholars and practitioners to further explore digital leadership adoption in the context of the Indonesian immigration sector to produce an effective leadership model in the digital era.

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