ABSTRACT

Purpose: The main purpose of this study is to run a bibliometric analysis in examining the trends of digital leadership and performance published in Scopus from 2016-2023.

Theoretical Framework: The study identifies the document and source types, the volume of publication over the years, countries, key authors, subject area and the most important research topics related to digital leadership and performance. The study reveals that the first research on this area was published in Scopus in 2016. Starting from 2019, the topic has gained much attention by the researchers.

Design/methodology/approach: Our sample is composed of all documents related to digital leadership and performance published in Scopus. A bibliometric assessment revealed that there were 46 documents listed in Scopus from 2016 to June 2023. Of these, one document has been removed due to incomplete information available in the database. Thus, only 45 documents were analysed. VOSviewer and Microsoft Excel were employed for data analysis.

Findings: The results revealed that of these 45 documents, journal article is the most frequent type and source of document. Starting from 2019, the research on the studied areas has garnered much attention as the number of publications and citations has started to accelerate. Interestingly, 20 of these articles were published in Malaysia and Indonesia. Based on the top cited articles on digital leadership indicated that besides its impact on business performance, researchers also have placed much attention on the performance within the academic institutions. Finally, the trend of digital leadership research is starting to embark on the areas of innovation, green environmental science, energy and engineering.

Research, Practical & Social implications: The researchers suggest for future research agenda and emphasize the contributions which will guide scholars who want to initiate research in digital leadership and performance.

Originality/value: Digital leadership is the new form of leadership in this digital society. A bibliometric analysis provides significant findings of existing research and significant researchers in this topic and provides potential avenues for future research.

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Keywords: digital leadership, performance, bibliometric analysis, scopus.

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MAPEAR A PAISAGEM RUMO À SUSTENTABILIDADE: UMA ANÁLISE BIBLIOMÉTRICA DA LIDERANÇA E DESEMPENHO DIGITAIS

RESUMO


Quadro teórico: O estudo identifica os tipos de documento e fonte, o volume de publicação ao longo dos anos, países, autores-chave, área de estudo e os tópicos de pesquisa mais importantes relacionados à liderança e desempenho digital. O estudo revela que a primeira pesquisa sobre esta área foi publicada na Scopus em 2016. A partir de 2019, o tema ganhou muita atenção por parte dos pesquisadores.


Resultados: Os resultados revelaram que desses 45 documentos, o artigo de revista é o tipo e a fonte de documento mais frequente. A partir de 2019, a pesquisa nas áreas estudadas tem atraído muita atenção à medida que o número de publicações e citações começou a acelerar. Curiosamente, 20 destes artigos foram publicados na Malásia e na Indonésia. Com base nos artigos mais citados sobre liderança digital indicou que, além de seu impacto no desempenho dos negócios, os pesquisadores também têm colocado muita atenção no desempenho dentro das instituições acadêmicas. Finalmente, a tendência da pesquisa de liderança digital está começando a embarcar nas áreas de inovação, ciência ambiental verde, energia e engenharia.

Pesquisa, Implicações práticas e sociais: Os pesquisadores sugerem para a futura agenda de pesquisa e enfatizam as contribuições que orientarão os estudiosos que querem iniciar a pesquisa em liderança e desempenho digital.

Originalidade/valor: A liderança digital é a nova forma de liderança nesta sociedade digital. Uma análise bibliométrica fornece resultados significativos de pesquisas existentes e pesquisadores significativos neste tópico e fornece potenciais avenidas para pesquisas futuras.

Palavras-chave: liderança digital, desempenho, análise bibliométrica, scopus.

MAPEANDO EL PANORAMA HACIA LA SOSTENIBILIDAD: UN ANÁLISIS BIBLIOMÉTRICO DEL LIDERAZGO Y EL DESEMPEÑO DIGITAL

RESUMEN

Marco teórico: El estudio identifica los tipos de documentos y fuentes, el volumen de publicación a lo largo de los años, los países, los autores clave, el área temática y los temas de investigación más importantes relacionados con el liderazgo y el desempeño digital. El estudio revela que la primera investigación sobre esta área se publicó en Scopus en 2016. A partir de 2019, el tema ha ganado mucha atención por parte de los investigadores.

Diseño/metodología/enfoque: Nuestra muestra está compuesta por todos los documentos relacionados con el liderazgo y desempeño digital publicados en Scopus. Una evaluación bibliométrica reveló que había 46 documentos listados en Scopus desde 2016 hasta junio de 2023. De estos, un documento se eliminó debido a que la información disponible en la base de datos estaba incompleta. Así, sólo se analizaron 45 documentos. Se emplearon VOSviewer y Microsoft Excel para el análisis de datos.

Hallazgos: Los resultados revelaron que de estos 45 documentos, el artículo de revista es el tipo y fuente de documento más frecuente. A partir de 2019, la investigación en las áreas estudiadas ha atraído mucha atención a medida que la cantidad de publicaciones y citas ha comenzado a acelerarse. Curiosamente, 20 de estos artículos se publicaron en Malasia e Indonesia. Según los artículos más citados sobre liderazgo digital, se indicó que, además de su impacto en el desempeño empresarial, los investigadores también han prestado mucha atención al desempeño dentro de las instituciones académicas. Finalmente, la tendencia de la investigación de liderazgo digital está comenzando a embarcarse en las áreas de innovación, ciencia ambiental verde, energía e ingeniería.

Implicaciones de investigación, prácticas y sociales: Los investigadores sugieren una agenda de investigación futura y enfatizan las contribuciones que guiarán a los académicos que quieran iniciar la investigación en liderazgo y desempeño digital.

Originalidad/valor: El liderazgo digital es la nueva forma de liderazgo en esta sociedad digital. Un análisis bibliométrico proporciona hallazgos significativos de investigaciones existentes e investigadores significativos en este tema y proporciona vías potenciales para futuras investigaciones.

Palabras clave: liderazgo digital, desempeño, análisis bibliométrico, scopus.

1 INTRODUCTION

Sustainable development goals (SDGs) were adopted by the United Nations as a universal call to action to end poverty, protect the planet, and ensure prosperity for all by 2030. The goals encompass a wide range of social, economic, and environmental objectives. All sectors and industries can relate towards the achievement of SDGs. For example, high-performing organizations contribute to economic growth by creating jobs, investing in innovative technologies, and promoting entrepreneurship. Thus, a thriving business environment is essential for achieving sustainable and inclusive economic growth.(Kalimuthu, L. P., 2023)

In the modern business landscape, technology has become a backbone for organizational performance. In today's highly interconnected and fast-paced world, technology plays a pivotal role in shaping how organizations operate, compete, and innovate. Among others technology contributes towards data-driven decision making,
efficiency and productivity, innovation and competitiveness, adaptability and resilience, risk management and securities all of which contribute towards the sustainability of organizational performance. Thus, technology has become an indispensable component of any form of organization. Digital development and digital transformation have become essentially important to the economy (Bielialov et al., 2023) and leveraging the right technologies can significantly impact an organization's success, growth, and ability to meet the challenges of the dynamic business landscape.

As businesses increasingly rely on technology and digital transformation to drive growth and innovation, the role of digital leaders has become even more significant. Digital leaders are individuals who possess the vision, skills, and expertise to navigate the complexities of the digital landscape and effectively lead their organizations through the process of digital transformation. (Alasiri, N., & AlKubaisy, Z., 2022) Their strategic vision, technological expertise, and ability to lead digital transformation initiatives are essential for organizations to remain competitive, innovative, and successful in rapidly evolving digital circumstances. Organizations are forced to adapt and thrive to fit in with the current market conditions. de Aurojo et al. (2021) suggested that poor performance of many businesses today is due to the lack of leadership being practiced by the leaders of organizations. Abbu and Gopalakrishna (2021) also agreed that many companies are responding to changes in their new digital business strategies without a clear understanding and practice of the role of digital leadership in this process. Thus, in order to fit with these new operational conditions, a new form of digital leadership has been discussed and established by scholars (Arham et al. 2023).

Digital leadership is a style of leadership where leaders focus on promoting digital transformation within their respective organizations. Work environment and learning cultures are digitized for organizations to tap into extensive opportunities of digital technologies in improving the productivity and performance of the organizations (Sagbas & Erdogan, 2022). Digital leaders are able to connect people and resources globally, penetrate into new markets and create new value in line with the changes in the demographics and landscape of the markets. Despite the relative importance of research in the context of digital technology and leadership, current contributions have been inconclusive across disciplines (Jameson et al., 2022). Therefore, this study intends to fill the gap by conducting a bibliometric review on the topic of digital leadership and performance. Such review is a valuable instrument to guide scholars on established
research in these areas and inform future academicians who want to start researching into these topics (Ellegaard & Wallin, 2015). Our study addresses the following research questions in the areas of digital leadership and performance:

1. What are the document types and source types?
2. What is the volume of publications over the years?
3. Which are the most productive countries?
4. Who are the most productive authors in the field?
5. What are the subject areas related to the topic?
6. What are the most important research topics studied and potential research gap opportunities?

2 REVIEW OF LITERATURE

As being a new form leadership style, the term digital leadership was coined by Fisk (2002). In his review, digital leadership is a style of leadership that integrates between conventional with transformational leadership attributes to develop organizational values in a digital society that is dynamic, fast-paced, networked, non-linear, virtual and technology-enabled. The author proposed four attributes of digital leadership that include visionary, engaging, fusing and collaborating.

Only until 2014, this new form of leadership being picked up by Sheninger (2014) in his book Pillars of Digital Leadership. The authors focused on school education and contended that the school education must change how they view leadership should they intend to engage and develop students for success in a digital world. Starting from 2016 onwards, more refined definitions of digital leadership have been established theoretically and empirically by different scholars in the literature. For example, El Sawy et al. (2016) and Arham et al. (2022) associated digital leadership with thinking differently for strategic success of digitalization by doing the right things. Wasano and Furinto (2018) combined the leadership skill and digital capability to optimize digital technology in enhancing organizational performance. Kane et al. (2019) asserted digital leadership as the ability to face with digital transformation, and Sagbas and Erdogan (2022) added the elements digitalization of work environments and learning cultures.

A recent qualitative study by Brunner et al. (2023) proposed aggregated dimensions of digital leadership consisting of personal, social and organizational capital. These capitals are essential in driving strategic change within the context of digital
technologies. They also concluded that personal and organizational capital possessed strong and moderate associations on dynamic service innovation capabilities. As de Araujo et al. (2021) contended that, in dealings with uncertainties of digital environment, digital leaders are essential to motivate people to work with new technologies that even may or may not be used in the organization. Employees may be reluctant to explore and exploit the digital future as there are issues of digital uncertainties. The presence of digital leader with the new skills may alleviate these challenges and create a smooth transition of change within organization (Frank et al., 2019).

3 METHOD AND DATA COLLECTION

All data in this study is collected as at 22nd June 2023 from the Scopus database. The Scopus database has been recognized as the largest coverage of literature, with strong coverage within business and economic research (Levine-Clark & Gil, 2008). It is also an extensive searchable citation and abstract engine of literature. Many researchers have relied on Scopus in various citation analysis and reviews of literature (Valenzuela et al., 2017).

For the purpose of this study, the methodological technique being adopted is bibliometric analysis. This analysis provides a systematic, transparent and detailed overview of a research area (Saggese et al. 2016). Specifically, this study focuses on all documents related to digital leadership and performance.

Figure 1 below depicts the systematic protocols for obtaining the dataset. The researchers have used the modified PRISMA diagram as proposed by Ahmi (2022) to explain the research process. This diagram summarizes the approach undertaken beginning with the topics of the study, scope and the criteria resulted in the total number of documents to be analysed in this bibliometric study.

Through a search being done in June 2023 in topic field in titles, abstracts and keywords, by the expressions “digital leadership” and “performance”, the result yields 46 documents in Scopus, for the entire period available until 2023. However, after data cleaning, 1 document is removed. The decision to remove was made after a thorough search and the finding indicated that this entry is a book series containing a compilation of conference proceedings. Therefore, this document is removed due to its incomplete information presented in the database. VOSviewer and Microsoft Excel 2019 is used to
calculate, generate and tabulate the frequencies, percentage, charts and percentages of the published materials (Ahmi et al. 2020).

4 RESULTS

4.1 DOCUMENT PROFILES

The first analysis is to observe on the document profiles. As presented in Table 1, of 45 documents, 35 of them were journal articles with 77.78%. This is followed by five conference papers, and three book chapter with 11.11% and 6.67% respectively. There were two article reviews represented by 4.44%.
Table 1: Document Type

<table>
<thead>
<tr>
<th>Document Types</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article</td>
<td>35</td>
<td>77.78</td>
</tr>
<tr>
<td>Conference Paper</td>
<td>5</td>
<td>11.11</td>
</tr>
<tr>
<td>Book Chapter</td>
<td>3</td>
<td>6.67</td>
</tr>
<tr>
<td>Review</td>
<td>2</td>
<td>4.44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>45</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Prepared by authors

Table 2 presents three source types published in the studied areas. The highest type is represented by journal publications, with 82.22%. This is followed by conference proceedings with 11.11% and finally books with only 6.67%.

Table 2: Source Types

<table>
<thead>
<tr>
<th>Source Types</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal</td>
<td>37</td>
<td>82.22</td>
</tr>
<tr>
<td>Conference Proceeding</td>
<td>5</td>
<td>11.11</td>
</tr>
<tr>
<td>Book</td>
<td>3</td>
<td>6.67</td>
</tr>
</tbody>
</table>

Source: Prepared by authors

4.2 YEAR OF PUBLICATION, VOLUME OF PUBLICATION AND CITATIONS

Table 3 and Figure 1 present the data based on the year of publication, volume of publication and citations. As we can see from Table 3, the publication on the topic of digital leadership started only in 2016 onwards in the Scopus database. It started with only 1 publication in that particular year and the number of publications increases steadily until today except that in 2018, there is none. The highest number of publications happened in 2022, with 15 publications and followed with 10 publications to date in 2023.

Table 3: Years, Volume and Total Citations

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume of Publications</th>
<th>Total Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>1</td>
<td>56</td>
</tr>
<tr>
<td>2017</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>2018</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2019</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>2020</td>
<td>7</td>
<td>47</td>
</tr>
<tr>
<td>2021</td>
<td>4</td>
<td>39</td>
</tr>
<tr>
<td>2022</td>
<td>15</td>
<td>84</td>
</tr>
<tr>
<td>2023</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
<td><strong>266</strong></td>
</tr>
</tbody>
</table>

Source: Prepared by authors

With regards to yearly citations, of 45 documents, there are 266 citations ranging from 2016 to 2023. Looking into Figure 2, the trend experienced a sharp decline in 2018 but the trend gained global attention starting from 2020. In 2022, the highest number of
citations were recorded with 84 citations. Perhaps due to the pandemic of COVID-19 where all businesses were interrupted globally, much attention has been given to the scope of digital leadership. The volume of publications on this topic also is increasing starting from 2020.

![Figure 2: Years, Volume and Total Citations](image)

Source: Prepared by authors

4.3 GEOGRAPHICAL DISTRIBUTION OF PUBLICATION

Looking into Table 4, the retrieved documents were published by researchers from 28 different countries. Interesting findings emerged as more research into the areas of study were found in the Southeast Asia region. Malaysia and Indonesia were in the top ranked with each has a total of 10 publications. This is followed by Germany with five publications, India with four, and China with three. The remaining with one or two publication respectively.
4.4 CITATION ANALYSIS

Top 10 cited documents in the studied areas were tabulated in Table 5. Table 5 also indicates the authors for the respective documents as well as the title and the source of publication. Based on the table, the most cited article was the pioneered article in the subject areas published in the Scopus database. This article entitled “The dynamics of CIO derailment: How CIOs come undone and how to avoid it” by Gerth and Peppard, published in Business Horizons in 2016 with a total of 56 citations. Important to note that the most recent articles published in 2022 by Benitez et al. (2022) and Borah et al. (2022) were ranked as the 2nd and the 3rd most cited articles in the studied areas.
4.5 SUBJECT AREA

This study also tabulated the published documents based on its subject area. The result is presented in Table 6. From this table, most of the research being conducted in the studied areas were in the area of Business, Management and Accounting with 21.43% of the total documents. This is followed by the Social Sciences area with 19.39% and Computer Science with 14.29% respectively. The other subject areas covered in digital leadership and performance research are tabulated in Table 6.
Table 6: Subject Area

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business, Management and Accounting</td>
<td>21</td>
<td>21.43</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>19</td>
<td>19.39</td>
</tr>
<tr>
<td>Computer Science</td>
<td>14</td>
<td>14.29</td>
</tr>
<tr>
<td>Economics, Econometrics and Finance</td>
<td>8</td>
<td>8.16</td>
</tr>
<tr>
<td>Engineering</td>
<td>8</td>
<td>8.16</td>
</tr>
<tr>
<td>Psychology</td>
<td>8</td>
<td>8.16</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>5</td>
<td>5.10</td>
</tr>
<tr>
<td>Energy</td>
<td>4</td>
<td>4.08</td>
</tr>
<tr>
<td>Pharmacology, Toxicology and Pharmaceutics</td>
<td>4</td>
<td>4.08</td>
</tr>
<tr>
<td>Decision Sciences</td>
<td>3</td>
<td>3.06</td>
</tr>
<tr>
<td>Medicine</td>
<td>1</td>
<td>1.02</td>
</tr>
<tr>
<td>Multidisciplinary</td>
<td>1</td>
<td>1.02</td>
</tr>
<tr>
<td>Nursing</td>
<td>1</td>
<td>1.02</td>
</tr>
<tr>
<td>Physics and Astronomy</td>
<td>1</td>
<td>1.02</td>
</tr>
</tbody>
</table>

Source: Prepared by authors

4.6 NETWORK ANALYSIS: WORD CLOUD CO-OCCURRENCE OF KEYWORDS

To answer the final research question of this study, a word cloud analysis and co-occurrence of keywords analysis were performed. Figure 3 shows the result of the word cloud. Word cloud allows for the examination of the most frequent terms used by majority of the research in the studied area (Mulay et al., 2020). In this figure, it can be observed that the word digital came out as the most important keyword. Relevant keywords related to digital are performance, leadership, innovation and information. Word cloud also indicates the emerging themes in the studied areas like green, capabilities, technology, human and communication. The website www.freewordcloudgenerator.com was used to build the cloud in this study.

![Figure 3: Word Cloud](image)

Source: Prepared by authors

Finally, one of the tools for mapping the research domain in a specific research area is by examining the links between keywords. This analysis is known as a network analysis of keyword occurrences. Keywords referred to as a set of terms that would allow
for correct indexing in computerised databases, thus, maximizing the sourcing of scientific literature. The frequency of the nodes will be represented by the size of the nodes, where larger nodes indicate higher frequency. The colors of the nodes represent which cluster that they belong and the thickness and the length of the edges represent the closeness of the interactions between two nodes (Bruni et al., 2021). According to the keyword co-occurrences map in Figure 4, the bigger and centrally located node was digital leadership. As this area of study is still relatively new, thus the analysis is limited to only two clusters. Digital leadership and digital transformation were commonly listed together in green color. Whereas, leadership, sustainability, spatiotemporal analysis and South Korea have a similar red color.

Figure 4: Co-occurrence Analysis by Keywords

Source: Prepared by authors

5 DISCUSSION AND FUTURE DIRECTION

For research question 1, the most common document type is research article and the most common sources type is journal publication as compared to conference proceeding and book. As the topic has begun to receive much attention, it is expected that more research to be published in the studied area.

For research question 2, even though the research on the studied areas only begun in 2016, the number of publications has shown an increasing trend, indicating that the topics has received greater attention by the scholars. As digitalization is a global issue, all businesses and organizations require the presence of digital leader that could lead them towards digital transformation. A review by Khaw et al. (2022) also indicated that digital leadership is an important determinant for a sustainable business performance.
For research question 3, it was noted that most of the published documents in Scopus during the period of 2016-2023 were found to be originated from Malaysia and Indonesia. Perhaps, as developing countries, more efforts have been invested to take on opportunities in the digital economy. Sharon (2022) had highlighted that the effort between both countries to embark on collaboration towards digital economy has started in 2018. With the geographical location benefit, abundance of resources and massive digital evolution, the topic of digital leadership has gauged much attention by scholars in both countries. Thus, we propose for other developing countries to embark in more research on digital leadership in the future.

For research question 4, of the top 10 published documents in Scopus, majority of them (60%) were conducted to measure digital leadership towards sustainable business, innovative and market performance. The remaining studies were conducted in the academic environment like in schools or universities. It shows that, not only the corporate sectors are concerned with the digital leadership and digital transformation, the schools and the universities also acknowledge the important role that they play as educators in shaping and developing future digital leaders. It is suggested that, future study on content analysis should be conducted to observe the literature on digital leadership across countries and industries. This would allow for the acquisition of insights to better comprehend the important elements of digital leadership across industries and across countries. Also, as much attention has been given on the topic of digital leadership in the academic institutions, scholars are advised to develop measures of digital leadership that would be suited with digital leadership among students and educators. Their role in producing more and becoming digital leaders is important to ensure a successful implementation of digital transformation and business sustainability.

For research question 5, business, management and accounting, social sciences and computer science areas were among the top three subject areas of which the attention has been given by scholars. Thus, more research is required in environmental science, energy, engineering and decision sciences as these areas are highly related to the sustainable development goals too.

For the last research question, the topic of digital leadership has only being published in Scopus starting from 2016. It is not exhaustive like other leadership topics like transformational leadership or transactional leadership. However, based on the word cloud and co-occurrence by keywords analysis, more research on digital leaders is
suggested to be conducted by scholars in innovation, business capability, green technology and business performance as digital leadership has been recognized to be linked to digital transformation and sustainability. Also, competing the Industrial Revolution 4.0 era, where technological developments are unlimited, innovativeness becomes a strategic priority in fulfilling the needs and demands of the community (Fatmawaty et al., 2023). Finally, important to note that this study was exclusively based on the Scopus database, thus, future research is suggested to use additional database sources like, WOS, EBSCO Host, Science Direct and Google Scholar to comprehensively examine the research trends relating to digital leadership and performance.

6 CONCLUSION AND LIMITATIONS

As a conclusion, this study on bibliometric analysis of research on digital leadership and performance has provided a systematic analysis of the discipline's progression, trends, and well-known scholars and identifying potential gap. The research on this area has started in 2016 and the results highlight that digital leadership has begun to receive greater attention in 2019 as digital transformation is one of the agenda to support sustainable performance. The analysis identified a significant increase in the study of digital leadership through time, signifying the ongoing interest of researchers and practitioners in understanding and adopting digital leadership within respective industries. The utilization of bibliometric analysis in the study of digital leadership attracts attention of researchers to discover areas that lack sufficient investigation and potential research prospects and make valuable contributions to the progression of knowledge in this significant domain of leadership.

However, our study has few limitations. First, this study relied only on documents published Scopus database. It is noted that Scopus is one of the largest databases, however, there are still other search engines that could be included like previously mentioned. Also, there are still unindexed journals that have been published and not being accounted and ignored for the analysis of studied areas. Second, our bibliometric analysis only analyzes the documents based on the number of publications and number of citations. The content of the documents has not been considered.
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