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Digital Transformation and Agile Leadership: Bibliometrics Analysis and Future Avenue

I Komang Mahayana Putra[1], I Ketut Pasek[2], I Wayan Edi Arsawan[3]
Politeknik Negeri Bali[1,2,3]
Kampus Bukit Jimbaran Kuta Selatan Badung Bali, 80364, Indonesia
Correspondence Email: komangmahayanaputra@pnb.ac.id
ORCID ID: 0000-0002-1934-380X

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ABSTRACT

Turbulence and globalization require organizations to improve their capability to win the competition, face turbulence, improve performance and competitiveness. The literature reveals that digital transformation and leadership play an important role in building agility and resilience but there is no map of the relationship between these two constructs. The present study aims to identify research trends in the Scopus database through the identification of keywords digital transformation and agile leadership in the last two decades. The results show that the visual trend is increasing in the number of publications, impact factors, citations trend and author-country networks. This systematic literature review provides guidance on how organizations are implementing digitization for building organizational agility and resilience.

Keywords: Agile Leadership, Bibliometrics Analysis, Digital Transformation, Visual Trend.

INTRODUCTION

Turbulence and globalization simultaneously change the business landscape to become more dynamic (Knudsen, Lien, Timmermans, Belik, & Pandey, 2021; Lee, Yang, & Park, 2020) and unpredictable (Knudsen et al., 2021). As a result, organizations are required to change dynamically and sustainably by optimizing internal resources and mapping opportunities to survive. Internal resources can be knowledge (Arsawan, Koval, et al., 2022; Lai et al., 2022), human resources (Arsawan, Kariati, et al., 2022), leadership pattern (Darvishmotevali & Altinay, 2022; Hartnell, Karam, Kinicki, & Dimotakis, 2020; Schell, 2019) and readiness to carry out digital transformation in routine organizational activities (Horsman, 2020; Viswanathan & Telukdarie, 2021) which ultimately leads to increased innovation capabilities (Arsawan, Hariyanti, Atmaja, Suhartanto, & Koval, 2022). Digital transformation deals with not only changing services to online but also overall integration of service areas to produce changes create value (Saniagati, & Welly, 2021).

Given that the organization is a combination of tangible and intangible resources (Barney, 1991) that develops dynamically, organizations need to pay attention to the leadership aspects associated with digital transformation (Denicolai, Zucchella, & Magnani, 2021; Gavrila & de Lucas Ancillo, 2021). This is due to the important role of leadership which has been proven to be an important driver of organizational performance (Hartnell et al., 2020; Masa'deh, Obeidat, & Tarhini, 2016; Ur Rehman, Shafique, Khawaja, Saeed, & Kalyar, 2021), as well as the role of leadership in changing the organizational structure to be more agile so that it still has a good reputation (Martinez, Russell, Maher, Brandon-Lai, & Ferris, 2017). However, the role of leadership as a trigger in driving digital transformation has not been clearly explored by scholars, so there is an urgent need to examine the relationship between these constructs. Moreover, in the era of the industrial revolution 4.0 the role of technology as part of digital transformation is very important, so that studies discussing this construct are also increasing. This means that digital transformation driven by the role of agile leadership can bring organizations to be more innovative and agile (Arsawan et al., 2022). Furthermore, the topic of digital transformation and leadership is increasing from year to year but there are still many things that have not been answered because there are still many limitations (Colovic, 2021; Darvishmotevali & Altinay, 2022; Ur Rehman et al., 2021), there is no consensus and have mixed results in each type of industry (Dabić et al., 2021; Gavrila & de Lucas Ancillo, 2021; Isensee et al., 2020; Ulas, 2019).

Furthermore, agile leadership is also reported to have not been connected with digital transformation so that it is not optimal in increasing productivity and various organizational outputs (Ardito, Raby, Albino, & Bertoldi, 2021; Ballestar, Díaz-Chao, Sainz, & Torrent-Sellens, 2020; Costa, Soares, & de Sousa, 2020; Hilali & Manouar, 2019; Knudsen et al., 2021). So this research gap has become a motivation in conducting bibliographic-based literature mapping so that it can provide a more comprehensive perspectives. Based on these reasons, this study aims to highlight research trends in digital transformation related to agile leadership. The results of the research can be used as guidance in increasing the number of researches and the potential to build expertise based on interdisciplinary collaboration. So far, research trends have only focused mainly on related fields, carried out on single case studies, or literature reviews without visualization. To our best knowledge, there are no studies that provide a comprehensive picture in the form of visualization of articles in reputable journals. Thus, researching trends in these two topics is a neccessity.

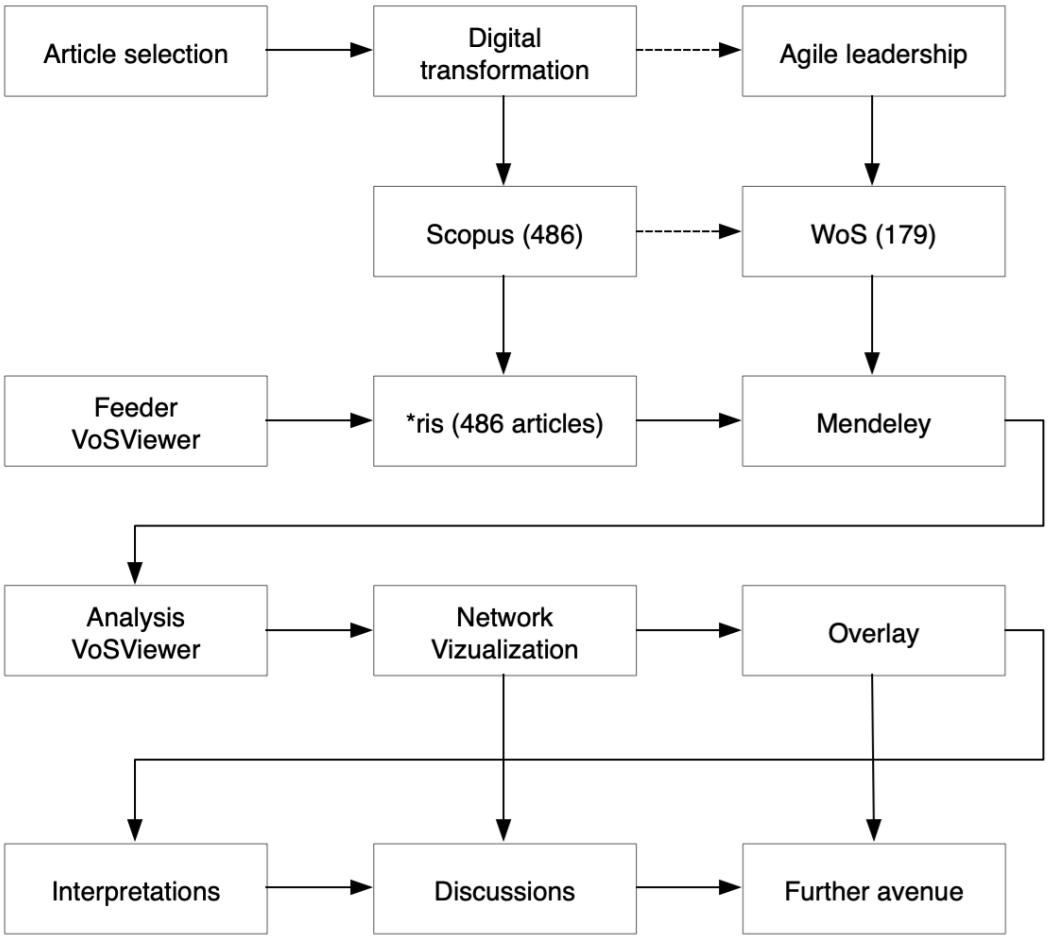
LITERATURE REVIEW

Drawing from dynamic capabilities (Teece, Pisano, & Shuen, 2009), organizations must be sensitive to changes that occur both regarding the organization and its environment. The goal is to create agile strategic capabilities (Arsawan et al., 2022; Harsch & Festing, 2020) so that it can survive in various scenarios (Jafari, Zarei, Azar, & Moghaddam, 2021). To achieve this purposed, the character of the leader is needed as a driver of resilience (Hartnell et al., 2020; Zeb, Abdullah, Hussain, & Safi, 2019) because it can increase the motivation of all organizational resources. Good leaders are also drivers of digital transformation (Asencio, 2016; Le & Lei, 2019) because it provides a relevant perspective on the importance of innovating sustainably (Zhu, 2017; Stone, 2006). Digital transformation is expected to be a strong foundation for changing processes, mechanisms and procedures in routine organizational activities (Horsman, 2020; Ulas, 2019; Viswanathan & Telukdarie, 2021). Thus, by optimizing digital transformation, organizations can become more agile, flexible and able to survive in every business landscape scenario and its dynamics (Anning-Dorson & Nyamekye, 2020; Gorondutse, Arshad, & Alshuaibi, 2020; Koçyiğit & Akkaya, 2020; Miroshnychenko, Strobl, Matzler, & de Massis, 2021).

RESEARCH METHOD

This study aims to analyze research trends in the context of digital transformation and agile leadership. For that reason, we use the VOS Viewers software as a tool to analyze data (van Eck & Waltman, 2010; Xie, Chen, Wang, Zheng, & Jiang, 2020). Firstly, we identified the database that was used as a data download venue, namely Scopus-ScienDirect. Because we check publications based on quality, the data is taken from the Scopus bibliography by taking articles that have gone through a rigorous peer review process. Next, we identify the keywords “digital transformation” and “agile leadership” as the basis for data mining. As a result, we got 486 selected papers which were then downloaded in the form of a research information system (*ris) which was then fed to the Mendeley software.

Data was downloaded for two months in June-July 2022 considering the many sources that must be identified and selected to achieve research objectives. The parameters are; firstly, paper that has gone through peer review, second, published in the Scopus-ScienDirect indexed journal. Furthermore, VOS Viewer is used considering its function in making data visualizations in the form of images of publication maps, countries, citations, and keywords (Jalilvand, Shahin, & Vosta, 2014; van Eck & Waltman, 2010; Xie et al., 2020). In addition, VOS Viewer is software that can help researchers for data mining, database mapping, authorships and doing article grouping. The research process is presented in Figure 1.



RESULTS

This study aims to map the position of literature related to digital transformation and agile leadership by conducting a systematic review analysis through several stages, namely, firstly, searching articles on Scopus-ScieneDirect with the following conditions: 1) articles published from year of 2002 - 2022 to obtain longitudinal patterns for two decades, 2) the topics are digital transformation and agile leadership, 3) the types of articles are research and review articles that have gone through a rigorous peer review process, 4) title publications, and 5) subject areas. Based on the area classification, the distribution composition is as follows: 1) the business, management and accounting area consists of 286 articles; 2) social sciences as many as 59 articles; 3) economics, econometrics and finance as many as 31 articles, and 4) decision sciences represented by 110 articles. So, the total articles that meet the criteria are 468 articles. The distribution of article data by journal is presented in Table 1.

Table 1. Article positions

No	Journal	Ammount
1	Journal of Business Research	98
2	Industrial Marketing Management	92
3	International Journal of Information Management	76
4	Procedia Manufacturing, Information & Management	54
5	Journal of Cleaner Production	43
6	The Journal of Strategic Information Systems	31

7	Technovation	19
8	International Journal of Production Economics	15
9	Technology in Society	10
10	Business Horizons	9
11	Journal of World Business	7
12	Organizational Dynamics	7
13	International Business Review	5
14	European Management Journal	2
	Total	468

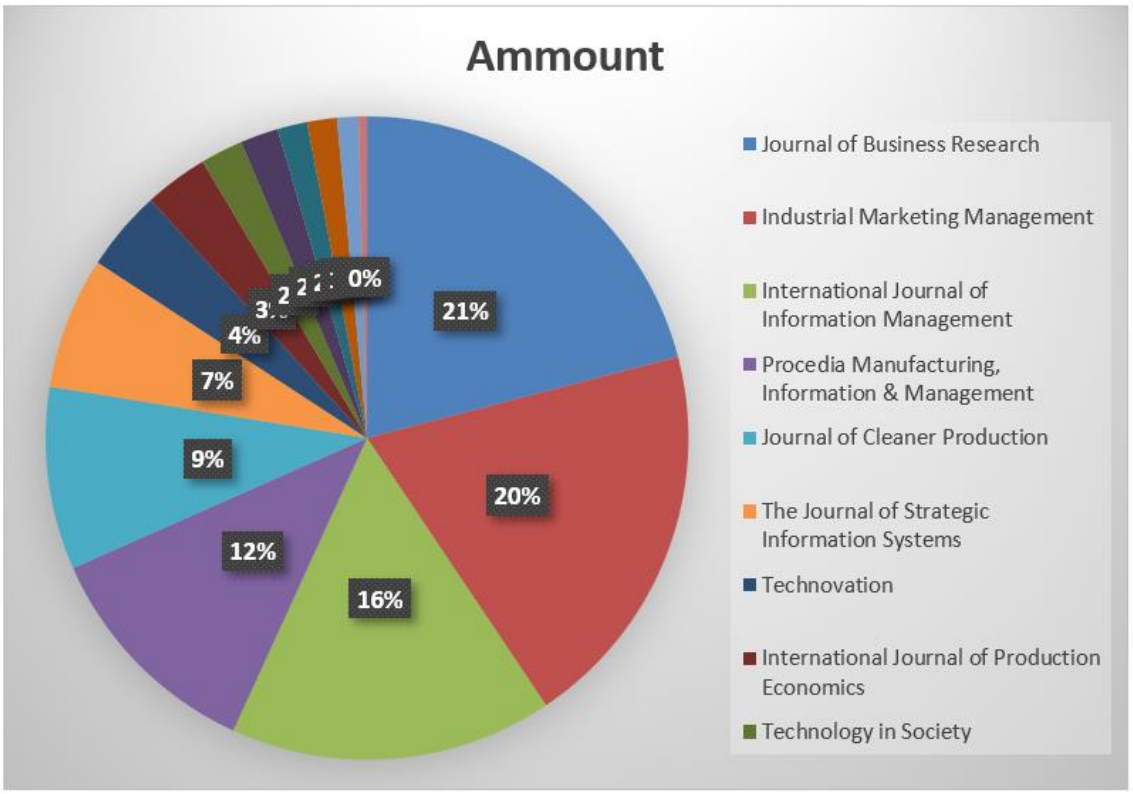


Figure 1. Article Compositions Based on Publications

Table 1 reveals the distribution of publications on these two topics. The highest publication in the Journal of Business Research, followed by Industrial Marketing Management and other journals. The potential for publication is increasing considering that digital transformation is an important driver of business performance in the era of knowledge based economy (Arsawan et al., 2022). Furthermore, the topic of responsive and agile leadership is a new topic that is expected to be a topic that helps organizations become more flexible in dealing with turbulence and market dynamics (Anning-Dorson & Nyamekye, 2020; Xiu, Liang, Chen, & Xu, 2017).

Next, the second stage is analyzing data with VOSviewer software considering its function is to build and visualize bibliometric networks such as journals, titles, authors, authors, publications and metrics (van Eck & Waltman, 2010; Xie et al., 2020). In this study, we conducted three data mappings, namely: 1) based on network, 2) based on bibliographic data, and 3) based on text data. The data articles in this study were taken from Scopus-ScieneDirect, so the mapping can be done through the following steps: first, choosing create a map based on bibliographic data because this analysis can be used to create co-authorship, keyword co-accurance, citation, bibliographic coupling , co-

citation map based on bibliographic data, so as to be able to map data based on keywords, secondly, the analysis is carried out based on co-occurence with the unit of analysis based on the keywords “digital transformation” and “agile leaderships”. Third, the counting method uses full counting to find 1,137 keywords that occur. Then the researcher uses a minimum number of accurance of a keyword as much as 3, meaning that a keyword that appears at least 3 times in all selected articles will be data for visualization analysis. From these criteria, 85 terms were obtained from a total of 1,137 keywords. Finally, the data is then analyzed to find network, overlay, and density visualization.

Based on the VOSviewer analysis, the results of the visualization get 12 clusters, namely; 1) Cluster 1 consists of 10 items, namely: absorptive capacity, climate change, digital sustainability, emerging markets, information management, information systems, information technology, multinational corporation, strategic agility, 2) Cluster 2 consists of 10 items including: agile, bibliographic coupling, business model, business model innovation, dynamic capability, entrepreneurship, fsQCA (Fuzzy Set Qualitative Comparative Analysis), india, review, 3) Cluster 3 consists of 9 items, namely: bibliometric analysis, competitive advantage, covid-19 pandemic, digital economy , dynamic capabilities, environmental uncertainty, organizational agility, organizational ambidexterity, strategic management, 4) Cluster 4 consists of 8 items, namely: design thinking, digital innovation, digital technologies, digital technology, digital transformation, innovation performance, strategy, and knowledge based view . Furthermore, Cluster 5 consists of 7 items, namely: circular economy, digital strategy, industry 4.0, leadership, maturity, maturity model, resource based view, 6) Cluster 6 consists of 7 items, namely: ambidexterity, case study, innovation, qualitative research, resource based theory, SMEs, technology adoption, 7) Cluster 7 consists of 6 items, namely: agility, digitalization, digitization, internet of things, learning factory, systematic review, 8) Cluster 8 consists of 6 items, namely: big data, capabilities, Europe, social media, supply chain, management, value creation, 9) Cluster 9 consists of 6 items, namely: AI (artificial intelligence), artificial intelligence, organizational culture, performance, supply chain management, value creation, 10) Cluster 10 consists of 6 items, namely: digital servitization, manufacturing, servitization, strategy, systematic literature review, transformation, 11) Cluster 11 consists of 5 items, namely: barriess, covid-19, crisis, crisis management, resilie nce, 12) Cluster 12 consists of 4 items, namely: big data analytics, firm performance, business value, meta-analysis. Overview of the results of each cluster is presented in Figure 2,3, and 4 as follows.

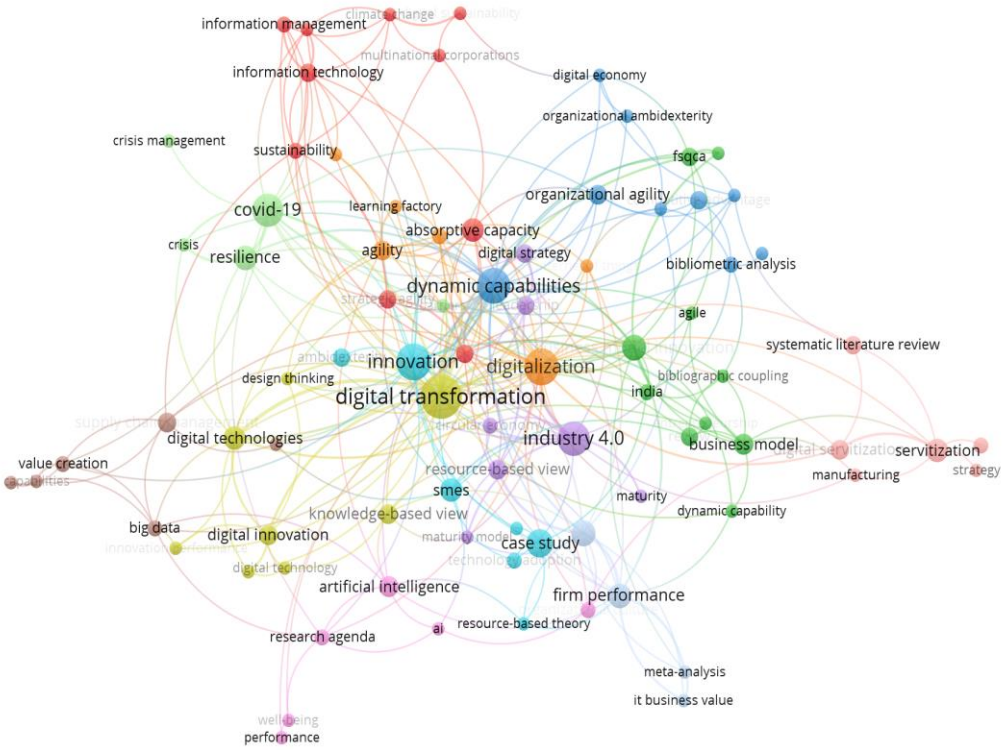


Figure 2: Network visualization

Figure 2 presents the results of the network visualization showing the network between terms. The results of the mapping show that the five most researched topic items show the largest circle compared to others, including dynamic capabilities, digital transformation, innovation, digitalization, and industry 4.0. The network results show that digital transformation is one of the variables that has been widely studied but what is interesting here is that this topic has many networks with new variables so that it provides high opportunities for future research. These items are: design thinking, technologies, knowledge base view, digital innovation, digital technology, innovation performance. The topic of agile leadership, from the results of the analysis, shows that there are still few studies that have been carried out which can be seen from the network, because the network of leadership is almost invisible. While studies related to agile that have been carried out are organizational agility and strategic agility, but there are very few networks on this topic. This provides a great opportunity for future research to develop the topic. This result is in line with the study (Harsch & Festing, 2020; Jafari et al., 2021) that agile organizations need dynamic, digital-assisted change processes (Horsman, 2020).

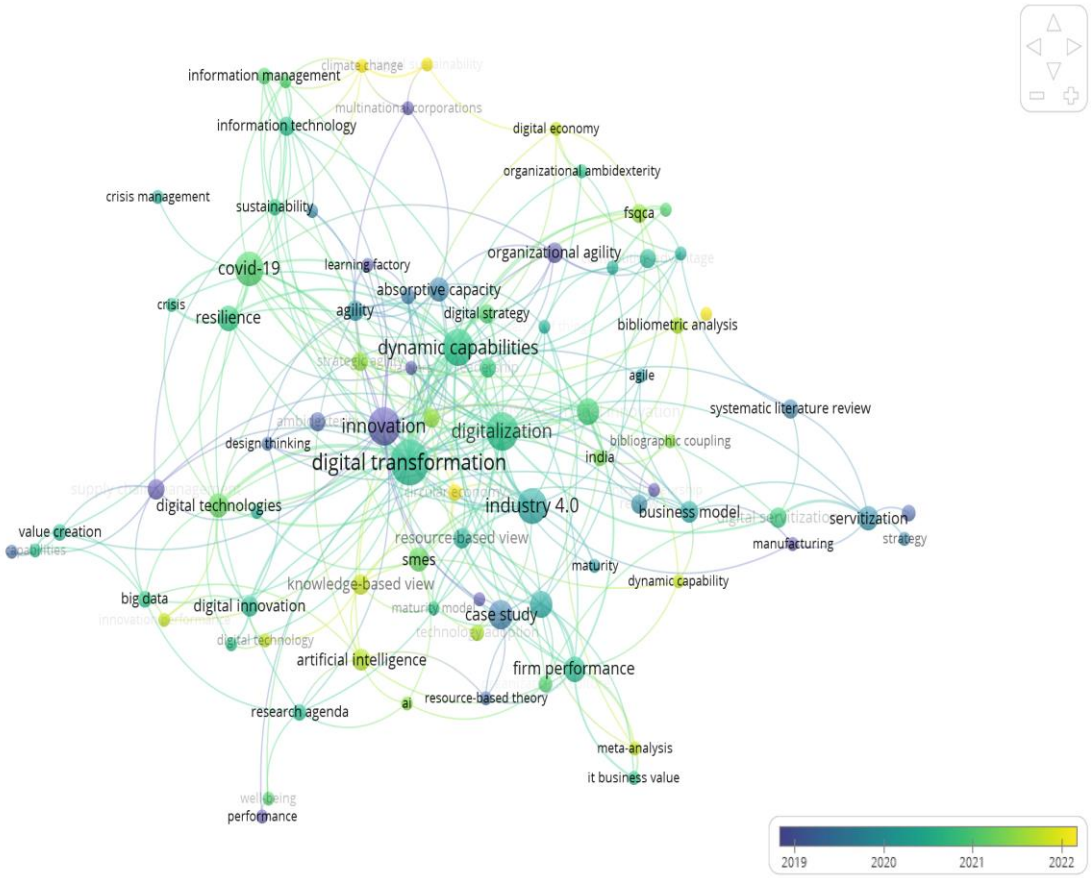


Figure 3: Overlay Visualization

Overlay visualization is a data mapping in bibliometric analysis based on the history of related research. Figure 3 shows the results of the overlay visualization that research in 2019 was mostly done on the variables of innovation, performance, manufacturing, organizational agility, learning factory, servitization, agile, business model, absorptive capacity, ambidexterity. In 2020, the most studied variables are digital transformation, digitalization, industry 4.0, dynamic capabilities, firm performance, digital innovation, big data, resilience, crisis management, sustainability, value creation, capabilities, resource based view, business value, information technology , information management. 2021: covid-19, digital technologies, SMEs, dynamic capability, FsQCA, strategic agility. 2022: digital technology, innovation performance, artificial intelligence, knowledge based view, digital economy, climate change, circular economy, sustainability. The results of the overlay show the latest topics, namely in 2022, thus helping researchers and determining topics for future research.

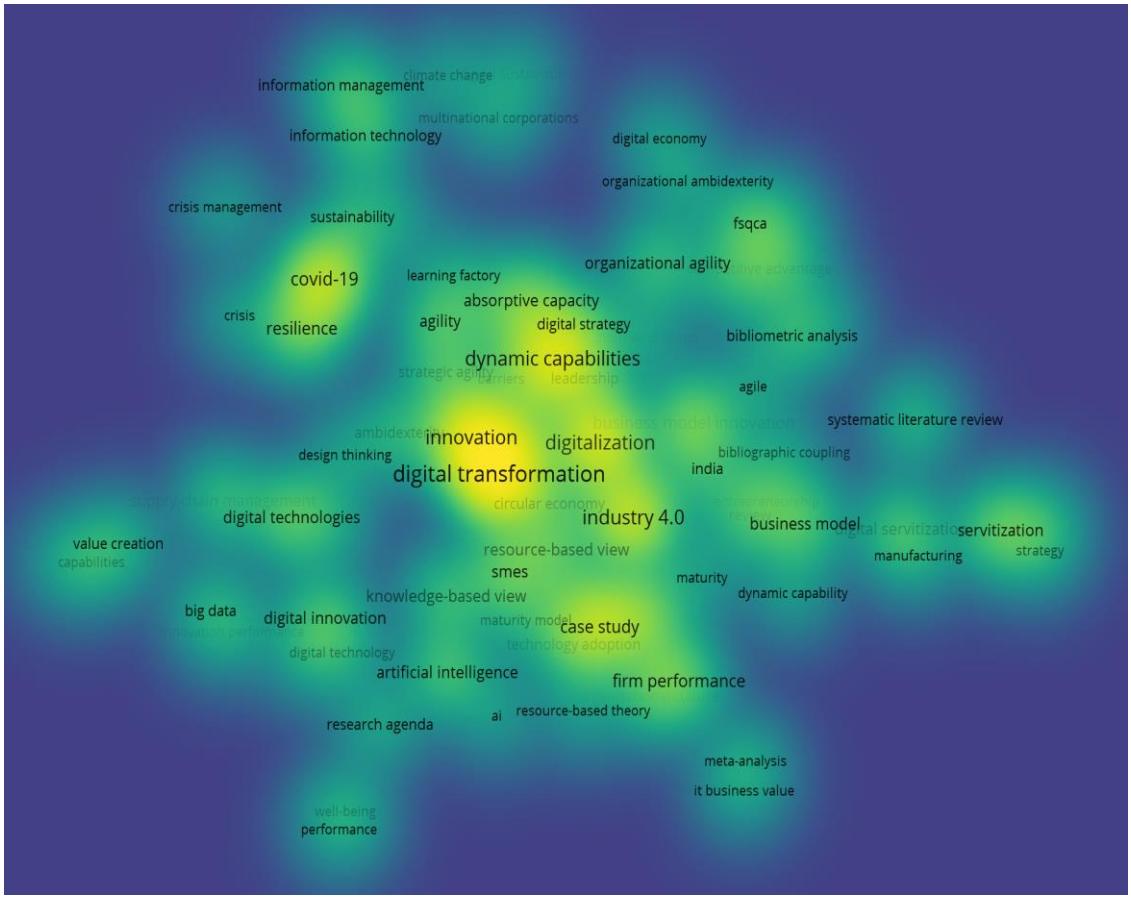


Figure 4. Density Visualization

Density visualization displays the results of visualization analysis with an emphasis on research on a research group, meaning that the brighter a variable is, the more people who do research on that variable, and the dimmer indicates that the less research is done on the topic. From the results of density, Figure 4, it shows that the variables located in the bright areas are digital transformation, innovation, dynamic capabilities, and covid-19. In the results of this analysis, the variables are evenly distributed and the number of variables is located in a dim area. This provides a great opportunity for the emergence of various topics related to digital transformation, because the distribution of variables is almost evenly distributed in dim areas. While the topic of agile leadership, is almost invisible. These results indicate that the topic is very rarely studied.

DISCUSSION

Based on the results of VoSViewer, there are several important discussions in this study which are expected to contribute theoretically to dynamic capabilities theory (Teece, Peteraf, & Leih, 2016; Teece et al., 2009). Firstly, there are still many research opportunities that can be done with digital transformation and agile leadership which raises several new variables that are not directly related, such as design thinking (Hoag & Kuo, 2016), technologies (Chiaroni, del Vecchio, Peck, Urbinati, & Vrontis, 2020), knowledge base view, digital innovation, digital technology, innovation performance (Arsawan, Koval, et al., 2022). As for the topic of "agile leadership", the results of the analysis show that there are still few studies that have been carried out which can be seen from the network, because the network of leadership is almost invisible. While studies related to agile that have been carried out are organizational agility and strategic agility, but there are very few networks on this topic (Arsawan et al., 2022). So the

existence of this literature gaps can provide researchers with instructions to take this latest topic.

Second, considering that the overlay output visualization shows opportunities for new research trends, the results of this research can add to these opportunities by using topics related to digital transformation and leadership and there are still opportunities for future research, namely strategic agility (Arsawan et al., 2022), digital technology, innovation performance (Falahat, Ramayah, Soto-Acosta, & Lee, 2020; Ferraris, Giachino, Ciampi, & Couturier, 2021; Hameed, Nisar, & Wu, 2021), artificial intelligence (Belhadi, Mani, Kamble, Khan, & Verma, 2021; Botega & da Silva, 2020), knowledge based view (Flöthmann, Hoberg, & Gammelgaard, 2018), circular economy (Chiaroni et al., 2020; Sartal, Ozcelik, & Rodríguez, 2020; Suryantini, Arsawan, I., Darmayanti, Moskalenko, & Gorokhova, 2021; Trigkas, Karagouni, Mpyrou, & Papadopoulos, 2020), climate change, and sustainability (D'Amato, Veijonaho, & Toppinen, 2020; Isensee, Teuteberg, Griese, & Topi, 2020; Kuo & Chang, 2021; Nayak et al., 2021). Third, based on density visualization analysis, the variable that can be used as the next topic is digital transformation (Ulas, 2019), innovation (Arsawan et al., 2022; Audretsch & Belitski, 2022; Jin & Shao, 2022), and dynamic capabilities (Al-Shami & Rashid, 2022; Permatasari, Dhewanto, & Dellyana, 2022). So, this opportunity provides an overview and guidance on topics that might be explored in the future.

CONCLUSION

This study aims to map research patterns over the past two decades with the topic of digital transformation and agile leadership. This research provides opportunities for further researchers to close gaps and information so that they can enrich the body of knowledge. This study produces two conclusions, first, the research trend is towards digital transformation to build innovation. Evidently, from year to year the number of studies and citations tends to increase. Second, unexplored variables can be used as a basis for conducting future research such as (1) organizational agility and strategic agility, (2) innovation performance, (3) circular economy, (4) sustainability, (5) dynamic capabilities, (6) knowledge based view, and (7) digital technology.

LIMITATION

Considering that this study is a systematic literature review, this study has several limitations that need to be considered. First, the research results cannot be justified because it is still in the early stages, it is still in the form of a literature study so that in the future it is necessary to conduct field testing regarding the relationship between constructs. Second, the literature notes that digital transformation is related to leadership, but agile leadership has not been explored in empirical research, for this reason, further research can examine the relationship between the two constructs to obtain a valid relationship and enrich theory about leadership and strategic management.

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DECLARATION OF CONFLICTING INTERESTS

The author declares there is no conflict of interest.

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