Analyzing sustainable organizational development with VOSviewer: a bibliometrical analysis

Muh Rizwal Padwiansyaha | Rr Sri Handari Wahyuningsihb | Siti Dyah Handayani

a Master of management, Universitas Muhammadiyah Yogyakarta, Indonesia.
b Department of Management, Universitas Muhammadiyah Yogyakarta, Indonesia.

Abstract The purpose of this study is to determine and analyze the development of publications on sustainable organizational development using the SCOPUS database. This research uses a bibliometric analysis approach using VOSviewer software to build and visualize bibliometric networks. Researchers conducted screening with the keyword sustainable organizational development in the SCOPUS database in the 2018–2022 time span. The number of publications according to the keywords used was 1,916 documents. Then, filtering was carried out, and the results obtained were 394 publications. The development of publications on Sustainable Organizational Development within 5 years tends to continue to increase and reach its highest point in 2022. Based on the results of the analysis with VOSviewer, the results of network visualization of cooccurrence based on keywords are 55 items divided into 6 clusters marked with different colors. The results of this study show that research on sustainable organizational development contributes greatly to the scientific focus of management. This is then supported by the phenomenon that change is always faced by a company, so it requires steps and strategies so that the company can sustain these changes and adapt. The results of the analysis using VOSviewer software produce network visualization, overlay, and density, and it can be concluded that within five years, the development of publications or research on this topic has increased significantly.

Keywords: innovation, resilience, development, sustainable

1. Introduction

Organizations are very familiar today (Bussu and Marshall 2020), and it is not uncommon to find various forms of organizations around us, be they formal organizations or community organizations (Lenart- gansiniec and Su 2020). The development of organizations is influenced by many factors, both internal and external (Farashah and Blomquist 2021), but the thing that underlies an organization that emerges is the existence of interests that want to be addressed; generally, these interests are large-scale and cannot be addressed individually (Rothman et al 2019).

Organizations are certainly interesting things to assess (Babkin et al 2023), and one of the common points to assess from an organization is performance. Performance has many perspectives, be it the perspective of workers or the perspective of the organization (Kovilage 2021), but in general, the performance of the organization can be assessed based on the performance of workers or people in the organization or company (Foster and Foster 2019).

Therefore, sustainable organizational development is needed (Karman and Savanevičienė 2021). Sustainable organizational development is a continuous improvement process carried out by an organization to improve efficiency, effectiveness, and overall performance (Ukko et al 2022). The purpose of sustainable organizational development is to ensure that the organization can adapt to changes in its environment and continue to grow and develop in the future (Zieba et al 2022).

Sustainable organizational development involves identifying and solving problems (Zhang et al 2023), as well as implementing effective solutions to improve the processes, products, or services offered by the organization (Eschenfelder et al 2018). It also involves a commitment to continuity and sustainability and a focus on improving organizational capacity and performance (Dukeov et al 2020). Continuous organizational development is critical to organizational sustainability (Zdravkova 2023), as it helps ensure that the organization can continue to adapt to changes in its environment (Haile and Tüzüner 2022). It also helps to improve the overall performance of the organization, as well as strengthen its reputation and image in the eyes of consumers and other stakeholders (Volchik and Maslyukova 2023).

In addition, when we look at the phenomenon that occurred in 2021, the COVID-19 pandemic has also been able to make the whole world experience a considerable impact (Botha et al 2022). Many organizations and companies have issued policies to lay off their employees, making some people lose their jobs (Dahlgard 2022). Then, companies and organizations are forced to adapt to the use of technology, creating new cultures in managing companies (Lindeberg et al 2022). The development also continues during the pandemic so that companies can survive in these conditions by maximizing their human resources (Rawashdeh et al 2022).
Therefore, sustainable organizational development is certainly something that must be owned by companies or organizations (Almawishir and Benlaria 2023). This development includes how to adapt to changes that occur in the micro or macro realm (Bussu and Marshall 2020).

The purpose of this study is to analyze the development of publications on sustainable organizational development within 5 years (2018-2022) using data accessed in SCOPUS. The topic is interesting considering that organizational development certainly experiences increases and decreases so being a developmentally stable organization is an added for a company if it succeeds in doing so.

2. Literature Review

2.1. Sustainable Development

The last two decades have seen a great deal of writing on the principles of sustainable development and the need for organizations to establish sustainable practices (Al Hammadi and Matloub 2019), drastically changing the way of doing business and creating a major impact on corporate performance. Sustainable development is an approach that integrates economic, social, and environmental aspects (Rasool et al 2019) in development activities to create conditions that can meet the needs of current generations without compromising the ability of future generations to meet their own needs.

Sustainable development has reduced the focus of discussion, which is divided into other fields, namely, sustainable economics (Tortia et al 2022), environment, sustainable social, government and public policy, and sustainable technology (Pham 2022). In each of these fields, of course, there is an emphasis on the focus of their respective problems so that they become more specific.

2.2. Organizational Performance

Organizational performance can be defined as the extent to which an organization achieves its goals effectively and efficiently (Abdulkarem et al 2021). Organizational performance can be measured through various indicators, such as financial performance, operational performance (Widjaja et al 2020), and human resources performance (Bieńkowska et al 2021). Factors Affecting Organizational Performance There are many factors (White et al 2021) that affect organizational performance, including internal factors such as organizational culture, organizational structure, and leadership (Sayyadi 2019). External factors such as industry competition, government regulations, and market trends can also affect organizational performance.

Measures of organizational performance may vary depending on the type of organization and its objectives (Pham 2022). Some commonly used performance measures include productivity, profit, market share, and customer satisfaction (Ullah et al 2019). Measuring Organizational Performance There are various methods for measuring organizational performance, including quantitative methods such as financial measurements and qualitative methods such as customer satisfaction measurements. A combination of these two methods can also be used to produce a more complete picture of organizational performance (Husan Tarigan et al 2021).

3. Material and Methods

This study aims to analyze the development of sustainability organizational performance in organizations using the SCOPUS online database. The database is analyzed with a bibliometric approach using Vosviewer software to build and visualize bibliometric networks. Researchers screened publications on sustainability organizational performance in the SCOPUS database in the range of 2018-2022.

The reason for the researchers to filter the database within 5 years is to obtain a broad picture of the development of writing or publications related to sustainability organizational performance. Researchers conducted screening by determining restrictions including year, subject area, document type, keyword, and language. The final number of publications after filtering is 394 articles from the initial number before filtering as many as 394 articles from the initial number before filtering as 1,916 documents. Furthermore, the file is analyzed using Vosviewer software. The research method used by researchers in compiling this bibliometric study is more detailed and explained in Figure 1.

4. Results

4.1. Publication by year

The development of publications on sustainable organizations within 5 years is quite significant. As presented in Figure 2, the trend graph continues to increase from 2018 to the highest in 2022. The development of this publication is certainly influenced by the development of industrial revolution 4.0, and there is also the phenomenon of the COVID-19 pandemic that occurred, but it does not affect the increase in the number of articles on sustainable organizational performance.
4.2. Document by affiliation

Based on Table 1, it can be seen that within 5 years, most affiliations were by the University of Plymouth, Montpellier Business School, and Plymouth Business School with 8 articles each; National Institute of Industrial Engineering, University of Sharjah, and NEOMA Business School with 7 articles each; Sant’Anna Scuola Universitaria Superiore Pisa with 6 articles; then Universiti Sains Malaysia, Northwestern Polytechnical University and Universidade de Sao Paulo with 5 articles each.

4.3. Document by author

Table 2 shows the top 10 authors who wrote on the topic of sustainable organizational performance. The top author is Gunasekaran, A. with a total of 5 publications. Based on the Scopus database, Gunasekaran, A. is an author from the United States with a total document contribution of 594 documents and has been cited by 24,995 documents.
Table 1 Top 10 affiliates related to the topic.

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Number of publications</th>
</tr>
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<tbody>
<tr>
<td>University of Plymouth</td>
<td>8</td>
</tr>
<tr>
<td>Montpellier Business School</td>
<td>8</td>
</tr>
<tr>
<td>Plymouth Business School</td>
<td>8</td>
</tr>
<tr>
<td>National Institute of Industrial Engineering</td>
<td>7</td>
</tr>
<tr>
<td>University of Sharjah</td>
<td>7</td>
</tr>
<tr>
<td>NEOMA Business School</td>
<td>7</td>
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<tr>
<td>Sant'Anna Scuola Universitaria Superiore Pisa</td>
<td>6</td>
</tr>
<tr>
<td>Universiti Sains Malaysia</td>
<td>5</td>
</tr>
<tr>
<td>Northwestern Polytechnical University</td>
<td>5</td>
</tr>
<tr>
<td>Universidade de São Paulo</td>
<td>5</td>
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</tbody>
</table>

Source: Scopus database

Table 2 Top 10 authors with the most publications related to the topic.

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Number of publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunasekaran, A.</td>
<td>5</td>
</tr>
<tr>
<td>Belhadi, A.</td>
<td>4</td>
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<tr>
<td>Kamble, S.</td>
<td>4</td>
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<tr>
<td>Kusi-Sarpong, S.</td>
<td>4</td>
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<tr>
<td>Mangla, S.K.</td>
<td>4</td>
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<tr>
<td>Sarkis, J.</td>
<td>4</td>
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<tr>
<td>Caeiro, S.</td>
<td>3</td>
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<tr>
<td>Coelho, A.</td>
<td>3</td>
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<tr>
<td>Daddi, T.</td>
<td>3</td>
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<tr>
<td>Fontoura, P.</td>
<td>3</td>
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</tbody>
</table>

Source: Scopus database

4.4. Document by country

Table 3 shows the top 10 countries that made significant contributions and a related to the topic. The United Kingdom on first place with 53 documents, followed by United States with 50 documents, and India in the third place with 49 documents. The results presented in table 3 need to be of more concern, considering that there are only 3 Asian countries that are contributors in the topic area. therefore, increasing the exploration of research on this topic needs to be done by other Asian countries, one of which is Indonesia, considering that Indonesia is one of the developing countries in Asia.

Table 3 Top 10 countries with the most publications related to the topic.

<table>
<thead>
<tr>
<th>Country/Territory</th>
<th>Number of Documents</th>
</tr>
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<tbody>
<tr>
<td>United Kingdom</td>
<td>53</td>
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<tr>
<td>United States</td>
<td>50</td>
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<tr>
<td>India</td>
<td>49</td>
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<tr>
<td>China</td>
<td>43</td>
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<tr>
<td>Italy</td>
<td>28</td>
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<tr>
<td>Brazil</td>
<td>24</td>
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<td>France</td>
<td>23</td>
</tr>
<tr>
<td>Malaysia</td>
<td>22</td>
</tr>
<tr>
<td>Australia</td>
<td>21</td>
</tr>
<tr>
<td>Spain</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Scopus Database

4.5. Document per year by Source

Figure 3 shows that, over the 5 years, the majority of publications on various topics came from multiple sources. Journal Of Cleaner Production stands out with 88 publications, followed by Business Strategy And The Environment with 30 publications. In third place, IEEE Transactions On Engineering Management contributed 9 publications.
4.6. Co-occurrence of Keywords

Based on the results of the analysis using the Vosviewer software, the results of the network visualization of co-occurrence based on keywords in Figure 3, 55 items are divided into 6 clusters marked with different colors. Cluster 1 consists of 15 items such as business development, corporate social responsibility, corporate strategy, corporate sustainability, corporate sustainability, economics, industrial performance, innovation, management practice, organizational performance, organization, organizational capability, organizational framework, organizational learning, and strategic approach.

Cluster 2 consists of 12 items such as economic and social effects, operational performance, organizational culture, organizational cultures, performance indicators, project management, quality management, social aspects, social responsibilities, sustainability performance, sustainable development, and triple bottom line. Cluster 3 consists of 10 items, such as artificial intelligence, environmental technology, Industry 4.0, organizational performance, performance assessment, performance management, small and medium-sized enterprises, strategic management, supply chain performance, and sustainable manufacturing.

Cluster 4 consists of 9 items such as economic performance, environmental performance, environmental sustainability, human resource management, green supply chain management, information management, social and environmental, and social sustainability. Cluster 5 consists of 6 items: big data analytics, competition, organizational, planning, sustainable business, and sustainable performance. Cluster 6 consists of 3 items: financial performance, performance, and resilience.
4.7. Coauthorship

Figure 5 presents a visualization of the authors who contributed to the topic using VOSviewer. The most contributors are marked with a larger circle, based on Figure 5 Gunasekaran A. is the most contributors to the topic. He is a Professor in Pennsylvania State University of Harrisburg, School of Business Administration.

4.8. Co-occurrence of keywords: Sustainable Development

Based on the results of the analysis using the software VosViewer, network visualization of co-occurrence based on the keyword sustainable development is shown in Figure 6. It can be concluded that the keyword sustainable development has links with many items such as resilience, triple bottom line, environmental sustainability, social responsibilities, competition, project management, human resource management, sustainable performance, artificial intelligence, organizational, big data analytics, business development, strategic management, corporate strategy, management practice, corporate social responsibility, innovation, sustainable manufacturing, industrial performance, information management, small and medium-sized enterprise, performance assessment, organizational framework, and financial performance.

4.9. Co-occurrence of keywords: Organizational Performance

Based on the results of the analysis using Vosviewer software, network visualization of co-occurrence based on keyword organizational performance is shown in Figure 7. It can be concluded that the keyword organizational performance has links with many items, such as green supply chain management, corporate social responsibility, sustainable performance, triple
bottom line, organizational, sustainable business, business development, innovation, performance, corporate sustainability, environmental performance, quality, management, and competition.

Figure 7 Network visualization of co-occurrence based on keywords: Organizational performance.

4.10. Overlay Visualization of sustainable organizational performance

Figure 8 presents an overlay visualization depicting the historical progression of previous research related to the keyword "sustainable organizational development" over the past half decade. It is evident that a considerable number of publications have been made during this period. Dark colors indicate publications from previous years, while lighter colors represent more recent publications. Publications made during the pre- and post-pandemic period, particularly in the period of 2018-2022, are represented with bright yellow and green colors. These publications cover various topics such as artificial intelligence, project management, big data analysis, performance management, strategic management, and industrial performance, all of which are interconnected.

Figure 8 Overlay visualization of sustainable organizational performance publications in 2018-2022.

4.11. Item density visualization of sustainable organizational performance

Item density visualization depicting the emphasis and distribution of research within clusters can be observed in Figure 9. This visualization allows the identification of under-explored research areas, and the use of blue in the background makes it easy to assess how often these areas are explored.
Denser nodules indicate extensively researched topics, such as sustainable development, performance assessment, environmental performance, performance, and sustainable performance.

On the other hand, fainter nodules indicate less explored areas, including resilience, environmental sustainability, big data analysis, artificial intelligence, competition, organizational culture, performance indicators, and green supply chain management.

Figure 9 Item density visualization of sustainable organizational performance publications in 2018-2022.

4.12. Cluster density visualization

The cluster density visualization illustrates the emphasis and contribution based on the clusters that have been determined when processing the data using VOSviewer. Figure 10 presents an image with cluster emphasis that has been grouped by color, using black as the background to easily identify the clusters that have been divided. Cluster visualization density is divided into 6 parts as described in figure 4 network visualization of co-occurrence.

Figure 10 Cluster density visualization of sustainable organizational performance in 2018-2022.

5. Discussion

5.1. The Relationship between Sustainable Development and Organization Performance

Research on sustainable organizational performance is still an interesting topic to research and discuss. This can be seen from the development in the past 5 years supported by the number of publications that have increased very significantly. Based
on the data processing that has been done, it can be seen that the existence of the COVID-19 pandemic and the development of the industrial revolution have not caused publications on this topic to decrease, and different things occur. The highest level of the number of publications is in 2022.

Based on the results of the VOSviewer analysis, it can also be seen that there are many indicators related to sustainable organizational development, so more publications related to this matter may appear, enriching knowledge based on these indicators.

However, what is of interest to researchers is one of the results of the VOS viewer analysis in Figure 3, which links to Industry 4.0 items. The development of Industry 4.0 is also a stepping stone as well as an obstacle that is certainly experienced by an organization or company (Mastrocinque et al 2022). It is certainly of interest what positive and negative impacts are obtained by companies or organizations, considering that industrial development is considered something new so that it can disrupt the stability of the performance and development of organizations and companies.

Figure 11 also shows how the relationship exists between sustainable development and organizational performance. The indicators that arise from these two variables can be taken into consideration for a company or organization.

Indicators that allow a company to be sustainable are by improving the following things, namely, organizational performance, financial performance (Ramadani et al 2022), corporate sustainability, organizational framework, environmental performance, innovation (Hindi and Frenkel 2022), human resource management, planning, and performance assessment (Kühnen et al 2022). Then, these indicators can be supported by other things, such as artificial intelligence and big data analytics.

In general, some companies have implemented the indicators that have been mentioned and have also been displayed in Figure 10, but the supporting indicators are not given much attention by the company (Stock et al 2018). As has been explained, supporting factors, namely, artificial intelligence and big data analytics (Bai et al 2020), are related to the development of industrial revolution 4.0, and these supporting factors also have better value to be used and developed by companies (Bag et al 2021).

5.2. The Relationship between Resilience and Sustainable Development

The journey of sustainable organizational development in the past 5 years has one indicator that supports resilience (Figure 12). In 2020, the start of the pandemic period throughout the world caused organizations and companies to experience a decline in both quality and quantity. Organizational resilience is interpreted as an organization’s ability to survive and adapt to environmental changes that are dynamic and complex, as well as to solve the risks and challenges that are being faced (Marchese et al 2018). This organizational resilience certainly has supporting factors, namely, strong and visionary leadership, an inclusive and adaptive work culture, employee skills and competencies, clear business plans and strategies, and sufficient financial resources (Elmqvist et al 2019).

The relationship between organizational resilience and sustainable development is interrelated, important, and mutually supportive. Organizational resilience can enhance an organization's ability to achieve sustainable development. Organizations that can survive and thrive in the long term are more likely to consider the environmental and social impacts of their activities and take steps to minimize negative impacts.
Sustainable development can strengthen organizational resilience. Focusing on managing long-term risks and paying attention to the needs of society, sustainable development can help organizations build a strong reputation, improve financial performance, and reduce legal and social risks (Metaxas and Psarropoulou 2021). The relationship between the two is externally dependent. Organizations that operate in a stable, safe, and sustainable environment are more likely to achieve long-term resilience and consider sustainability factors in their decision-making.

6. Final Considerations

Research on sustainable organizational development, which contains two elements between sustainable development and organizational performance, is still an interesting topic to be studied in more depth. This can be seen from the development of publications over the last 5 years with an ever-increasing number. Based on this study, it appears that the COVID-19 pandemic has not affected the number of publications on this topic to decrease, and on the contrary, it reaches its highest point in 2022. This is due to the COVID-19 pandemic in the last 3 years, making organizations and companies have to be able to adapt to changes other than the development of the Industrial Revolution 4.0, which is a stimulus for companies to innovate, making the work of organizations and companies more effective and efficient.

6.1. Limitations

The limitation of this study is that the analysis was carried out using only bibliometric analysis from one database, namely, SCOPUS. In addition to SCOPUS, there are other citation and abstract indexing databases, such as Microsoft Academic, Dimensions, Web of Science, PubMed, Crossref, Europe PMC, and others. Each of these databases has advantages and disadvantages so that it will be more interesting and add to the results of a more comprehensive analysis in the form of additions or comparisons between several databases when conducting bibliometric analysis.

6.2. Implications for the Future

The bibliometric analysis in this study has practical and academic implications that are useful for future research. The results of this study indicate that the topics discussed show an increasing trend for 5 years, and interestingly, the topics in this study will reach their highest point in 2022. Future research can examine topics with many choices, not only the relationship between sustainable development and organizational performance but also other topics, as shown in Figures 7, 10, and 11.

Ethical Considerations

Not Applicable.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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