Bibliometric Computational Mapping Analysis of Publications on Supply Chain Management

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Abstract

This study uses a bibliometric approach to computational mapping analysis with VOSviewer to look at the evolution of supply chain management research. Using the ‘publish or perish’ reference manager tool, the Scopus database was queried for the article data. The search is directed by using the keyword "Supply Chain Management" in the article's title and abstract. There were 182 items that were deemed to be pertinent. The research period considered for the study is the most recent ten years of Scopus-indexed articles (2018 to 2023). The findings demonstrated that the terms "Supply Chain Management", "Retail" and "Supplier" can be used to categorize research on Supply Chain Management research. The term "supply chain performance" is connected to by 60 different sources, with a total link strength of 549.

Keywords: Bibliometric Analysis, Supply Chain Management, Supplier, Retail

INTRODUCTION

Nowadays, the retail sector has reached its capacity to provide a wide range of products to its clients. In order to fulfill the requirement based on demand, the retailer requires outstanding support from the supplier (Monoarf\(\hat{a}\) et al., 2023). Utilizing a quick and secure information system will enable this help (Menne et al., 2024). For the advantage of all stakeholders, retailers, suppliers, and customers should be integrated utilizing information technology and supply chain management techniques. Both traditional and contemporary stores in Indonesia have shown significant growth in recent years (Nurasyiah et al., 2023). The potential demand from Indonesians for the retail industry is still very high (Muflih & Juliana, 2021).

Supplier development is crucial to the performance and integration of the supply chain across all industries (Nughraha et al., 2023). Given the diversity of actors and requirements in the retail market, there are no formal procedures for the selection-assignment of supplier development programs, making the management of these programs complex and ambiguous (Lindiawatie & Shahreza, 2023).

Thus, supplier development contributes to supply chain integration and performance, thus playing an essential role in any industry (Juliana et al., 2024). In the retail market, no formal procedures exist for the selection-assignment of supplier development programs, meaning that respective management is complex and unclear given actor and requirement heterogeneities (Monoarf\(\hat{a}\) et al., 2023). Collaboration between a supplier and a manufacturer has drawn increased interest as goods have grown more intricate and sophisticated, and as a result, it has been extensively researched (Menne et al., 2022; Mahri et al., 2024).

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One analytical method, bibliometric analysis, can be used to assess the trajectory of research in the area of supply chain management. Researchers can investigate bibliographic content and citation analysis from articles published in journals and other scientific papers with the help of bibliometric analysis, a type of meta-analysis of research data.

However, there has not been any research on computational mapping of bibliometric analysis of published data in the subject of supply chain management that has been done specifically to assess the direction of the research. Especially through the VOSviewer application's bibliometric examination of research published in the previous five years between the years 2018 and 2023.

As a result, this study used VOSviewer software to conduct computational research on mapping bibliometric analysis of publications indexed by Scopus. This study was undertaken with the hopes that it would serve as a guide for future studies and help researchers choose appropriate research themes, particularly for studies pertaining to the field of supply chain management.

**Theory**

According to Vu et al. (2020), collaboration, information technology, inventory, production, location, and transportation define the course of the supply chain strategy for merchant businesses. Supply chain activity is a type of supply chain practices. Practiced supply chain operations can boost competition, particularly when it comes to store performance in comparison to rivals.

Tarigan et al. (2020) stated that supply chain practices enable the retailer to improve the performance by connecting the retailer and the supplier and the customer. Information technology is a very useful tool to enhance the effect of supply chain practices on retailer performance. Beside moderating, information technology also directly improves retailer performance. The adoption of information technology provides a double impact in enhancing retailer performance as a direct and moderating impact. The use of information technology can increase the company's integration with its suppliers and customers. Information technology in an organization aims to help improve the performance of its employees, information technology is also often contained in the company's mission and vision, business objectives, operating procedures, in increasing the company's competitiveness.

Supplier selection has the strongest effect on logistics collaboration, and relationship history has the strongest effect on logistics performance. Rather than meetings and operational features, the elements of interpersonal skills, organizational culture, and communication appear to be the most important contributors to logistics performance achievements; relationship history leads to better performance (Aharonovitz et al., 2018).

According to the study, the majority of food retail stores deal with their individual suppliers for late deliveries, damaged product, theft, high gasoline costs, and expired stock. It was discovered that companies experience comparable supply chain risks. Additionally, technological advancements and innovations like the internet of things (IoT) and social media are influencing broader industrial development (Hove-Sibanda et al., 2021).

**METHOD**

The research from articles that were published in journals that were indexed by Scopus served as the basis for the article data used in this study. In this study, we choose Scopus because its database is very credible for academic purposes. A management reference tool called Publish or Perish was employed to gather study data. A literature review on the subject has been done with the Publish or Perish program.

The research was conducted in stages, including:

- utilizing the publish or perish program to gather publication data
- processing of article bibliometric data collected using the Microsoft Excel application
- using the VOSviewer application, computational mapping analysis of bibliometric publication data, and analysis of the findings of computational mapping analysis
Bibliometric Computational Mapping Analysis of Publications on Supply Chain Management

Publish or Perish’s article data search is used to filter publications using the keyword "supply chain management" based on the title criteria of the publications. The papers that were used were released between 2018 and 2023. Everything was collected in January 2018. Research information system (.ris) and comma separated value (*.csv) files were used to export the articles that were gathered and met the requirements for analysis in this study. Bibliometric maps were also employed with VOSviewer to examine and assess trends. After that, the article data from the original database was mapped (Adzina et al., 2024).

Utilizing network visualization, density visualization, and overlay visualizations based on the network (co-citation) between existing items, VOSviewer was used to produce several mapping publications. The frequency of a keyword was specified to be found at least five times while constructing a bibliometric map. As a result, 86 phrases and keywords that were found to be less important were eliminated.

RESULTS AND DISCUSSION

Publication Data Search Results

Based on the data search, 124 data articles that fit the criteria for the research were found utilizing the application reference manager publish or perish data search. The information was gathered in the form of metadata, which included the name, title, year, journal name, publisher, citation count, article links, and associated URLs for each author. In the VOSViewer examination of this study, several samples of published data are shown in Table 1. The 20 top publications with the most citations were used as the data samples. The average author of the articles used is 0.99, the average number of citations per article is 8.51, the average number of citations per year is 314.80, and the total number of citations is 1574. Additionally, the average h-index for all the articles is 25, and the average g-index is 34.

Table 1. Top Paper by Number of Citation

<table>
<thead>
<tr>
<th>No</th>
<th>Authors</th>
<th>Title</th>
<th>Year</th>
<th>Cited by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Burgos, D., Ivanov, D.</td>
<td>Food retail supply chain resilience and the COVID-19 pandemic: A digital twin-based impact analysis and improvement directions</td>
<td>2021</td>
<td>83</td>
</tr>
<tr>
<td>2</td>
<td>Petljak, K., Zulauf, K., Štulec, I., Seuring, S., Wagner, R.</td>
<td>Green supply chain management in food retailing: survey-based evidence in Croatia</td>
<td>2018</td>
<td>78</td>
</tr>
<tr>
<td>3</td>
<td>Yang, L., Tang, R.</td>
<td>Comparisons of sales modes for a fresh product supply chain with freshness-keeping effort</td>
<td>2019</td>
<td>57</td>
</tr>
<tr>
<td>4</td>
<td>Liu, B., De Giovanni, P.</td>
<td>Green process innovation through Industry 4.0 technologies and supply chain coordination</td>
<td>2019</td>
<td>57</td>
</tr>
<tr>
<td>5</td>
<td>Shee, H., Miah, S.J., Fairfield, L., Pujawan, N.</td>
<td>The impact of cloud-enabled process integration on supply chain performance and firm sustainability: the moderating role of top management</td>
<td>2018</td>
<td>56</td>
</tr>
<tr>
<td>6</td>
<td>Gustavo, J.U., Pereira, G.M., Bond, A.J., Viegas, C.V., Borchardt, M.</td>
<td>Drivers, opportunities and barriers for a retailer in the pursuit of more sustainable packaging redesign</td>
<td>2018</td>
<td>49</td>
</tr>
<tr>
<td>7</td>
<td>Wang, M., Zhao, L., Herty, M.</td>
<td>Joint replenishment and carbon trading in fresh food supply chains</td>
<td>2019</td>
<td>45</td>
</tr>
<tr>
<td>8</td>
<td>Brancoi, P., Lundin, M., Bolton, K., Eriksson, M.</td>
<td>Bread loss rates at the supplier-retailer interface – Analysis of risk factors to support waste prevention measures</td>
<td>2019</td>
<td>44</td>
</tr>
<tr>
<td>9</td>
<td>Liu, M., Dan, B., Zhang, S., Ma, S.</td>
<td>Information sharing in an E-tailing supply chain for fresh produce with freshness-keeping effort and value-added service</td>
<td>2021</td>
<td>42</td>
</tr>
<tr>
<td>10</td>
<td>de Vass, T., Shee, H., Miah, S.J.</td>
<td>Iot in supply chain management: a narrative on retail sector sustainability</td>
<td>2021</td>
<td>38</td>
</tr>
<tr>
<td>12</td>
<td>Ha, A.Y., Tong, S., Wang, Y.</td>
<td>Channel Structures of Online Retail Platforms</td>
<td>2022</td>
<td>36</td>
</tr>
<tr>
<td>13</td>
<td>Kim, B., Park, K.S., Jung, S.-Y., Park, S.H.</td>
<td>Offshoring and outsourcing in a global supply chain: Impact of the arm’s length regulation on transfer pricing</td>
<td>2018</td>
<td>33</td>
</tr>
</tbody>
</table>
Research Development in The Field of Supply Chain Management

Table 2 displays the evolution of research on the topic of supply chain management that has been published in a journal that is indexed by Scopus. Based on the information in Table 2, it is clear that 124 publications related to supply chain management research were published between 2018 and 2023. There were 19 articles in 2018. There were 21 articles in 2019. There were 14 articles in 2020. There were 26 articles in 2021. There were 41 articles in 2022 and 3 articles in 2023. It is clear from the number of publications that research on supply chain management was show fluctuation research frequency. Increase in 2018 to 2019 then decrease at 2020. Furthermore, research number is increase from 2021 until 2022.

Table 2. Development of Supply Chain Management Research.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NUMBER OF PUBLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>19</td>
</tr>
<tr>
<td>2019</td>
<td>21</td>
</tr>
<tr>
<td>2020</td>
<td>14</td>
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<tr>
<td>2021</td>
<td>26</td>
</tr>
<tr>
<td>2022</td>
<td>41</td>
</tr>
<tr>
<td>2023</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
</tr>
<tr>
<td>Average</td>
<td>20.67</td>
</tr>
</tbody>
</table>

Fig. 1. Level of Development in supply chain management research.
Bibliometric Computational Mapping Analysis of Publications on Supply Chain Management

Visualization Supply Chain Management Topic Area Using Vosviewer

The data from the article was subjected to computational mapping. Computational mapping makes use of VOSviewer. 86 objects were discovered from the computational mapping findings. Data mapping divides each thing relevant to supply chain management into 5 clusters, including:

Cluster 1 has 45 items and marked in red. These are adoption, application, author, biomarker, business, case study, challenge, cloud, collaboration, company, covid, cross docking, data, design methodology approach, food, food waste, fruit, implementation, innovation, internet, interview, lack, literature, manager, need, originality value, pandemic, performance, practice, quality, relationship, resilience, response, retail industry, retail sector, retail store, role, store, supermarket, supplier selection, supply, supply chain performance, sustainability, technology and visibility.

Cluster 2 has 24 items and marked in green. These are chain, context, contract, country, csr, decentralized supply chain, government, government subsidy, inflation, inventory inaccuracy, market demand, member, mnf, order quantity, price, pricing, production cost, profit, reciprocal preference, retail price, supply chain member, trade credit, uncertainty, and wholesale price.

Cluster 3 has 7 items and marked in blue. These are echelon supply chain, incentive, information, information sharing, quantity, signal and supply chain efficiency.

Cluster 4 has 7 items and marked as yellow. There are competition, mode, numerical example, order, party, platform and revenue.

Cluster 5 has 3 items and marked as purple. There are blockchain, blockchain technology and transparency.

Each existing cluster demonstrates the connections between individual phrases. A colored circle denotes the label for each phrase. The size of the circle varies for each term depending on its frequency. The label circle's size is positively correlated with how frequently the term is used in the abstract and title. As the word is used more often, the label size grows. The mapping visualization that was looked at in this study consists of three elements: network visualization (see Fig. 2), density visualization (see Fig. 3), and overlay visualization (see Fig. 4).

![Network visualization of supply chain management](Fig 2)
Figure 2 illustrates the connection between the ideas. The link between terms is depicted as an interconnected network. Each area that is often researched and related to the study of supply chain management is clustered together in Figure 2. The clusters in the network visualization show that there are two main areas of research into supply chain management.

The first of these is the supply chain performance term, which is included in cluster 1 and has 60 total links, 549 total link strength, and 25 occurrences (see Fig. 5). The second term, "retail sector," is a part of cluster 1, with 18 occurrences, 38 total linkages, and a total link strength of 288. (see Figure 7). The third term, "supplier selection," is a part of cluster 1, with 15 occurrences, 26 total linkages, and a total link strength of 178. (see Figure 7).
Fig 5. Network visualization of Supply Chain Performance term.

Fig 6. Network visualization of retail sector term.
The depiction of density is shown in Figure 3. According to density visualization, a phrase will occur more frequently the yellow color is brighter and the circle that contains its labels is larger in diameter. This indicates that extensive research has been done on the subject. In contrast, there aren't many research on the term if the color of the term fades close to the color of the background. According to Fig. 3, there have been a lot of studies done on the topics of supply chain, supply chain performance, chain, covid, company and retail price.

The overlay visualization used in studies on supply chain performance is shown in Figure 4. This overlaying graphic demonstrates the uniqueness of research on linked terms. Figure 4, which is made clear in Figure 8, demonstrates that the majority of the study on supply chain management was done from 2018 to 2023. The term "supply chain performance", “retail sector” and “supplier selection” has reached the height of its use in research. As a result, conducting fresh research on supply chain management topic especially in supply chain performance, retail sector and supplier selection.

Figure 5 depicts a network of concepts related to supply chain performance includes cloud, originality value, design methodology approach, sustainability, relationship, pandemic, practice, technology, data, case study, performance, context, visibility, information sharing, information and chain. Figure 6 depicts a network of concepts related to retail sector includes retail store, store, quality, information sharing, innovation, company, practice, adoption, implementation, challenge, performance, manager, collaboration, author, sustainability, originality value, design methodology approach and chain. Figure 7 depicts a network of concepts related to supplier selection includes collaboration, author, relationship, performance, retail industry, case study, quality and chain.

CONCLUSION

This study examines the development of supply chain management research using a bibliometric approach to computational mapping analysis with VOSviewer. For the article data, the Scopus database was searched using the publish or perish reference manager tool. The article's title and abstract contain the keyword "supply chain management” which guides the search. The 86 items that were determined to be relevant. The most recent 5 years' worth of Scopus indexed articles are the research period taken for the study (2018 to 2023). The results showed that research on supply chain management may be categorized using the terms "supply chain performance", "retail sector", and "supplier selection".

The term "supply chain performance" is connected to by 60 different sources, with a total link strength of 549. The term "retail sector" has a link strength of 288 with 38 links. The five-year study of the development of
supply chain management publishes machinery demonstrates a yearly fluctuative growth. 124 papers were determined to be relevant in total. The mapping of the data from the articles that were collected shows that the keyword "chain" has been the subject of the most investigation. The majority of studies have referenced chain or related disciplines. We can seek for more recent and relevant research on supply chain in the current year based on the findings of this study.

REFERENCES


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