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# Revisiting operations strategy for competitiveness: Exploring potential research opportunities

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**Abstract:** Operations strategy for competitiveness have been the subject of extensive and developed research. Despite the topic's wider applicability, there is a lack of a thorough understanding of the conceptual connections and effects of the field in this dynamic business environment. It is therefore appropriate to assess its progression and shape a possible future direction. Through scientific mapping and thematic progression, this study synthesizes existing research and proposes paths to advance the operations strategy for competitiveness research. The study reveals earlier, deeply researched themes like operations research, quality assurance, and strategic planning as well as more recent topics that have attracted scholars' interest, like decision-making, sustainability, cost- and profit-optimization, and investments in environmental management. In addition, the key themes are organized into five categories: manufacturing and competition, supply chain management, costs, decision-making, and sustainable development. Generally, this study offers a comprehensive resource to acquire knowledge about the recent advancements, trends, and future paths of operation strategy and competitive advantage.
***Keywords:*** *Competitiveness, Competitive priorities, Operations strategy, Performance, Scientific mapping.*

## 1. Introduction

The long-term development of operations resources and procedures to maintain competitive advantage is covered by operations strategy, which covers what must be done to overcome present and future problems posed by the competitive environment (Slack and Lewis, 2018). To link manufacturing strategy and business-level competitive strategy, it is necessary to balance market requirements and operational resources (Stevenson, 2020). However, operations' full potential is not adequately utilized, which in turn does not help businesses improve their competitive position (Slack, 2005). This stated that enhancing competitiveness necessitates a solid grasp of operations strategy. Thus, establishing initiatives to improve a company's competitive position is made easier by identifying the efficiency frontier of operations strategy (Veiga et al., 2022). This clear visualization empowers managers can take action to improve ongoing efforts to design and implement strategies directed towards competitiveness. However, according to Anand and Grey (2017), there is still unexplored research in operations strategy that helps organisations remain competitive and view themselves in a better position. This demonstrates that different studies investigating undiscovered operational strategies that are beneficial to a firm's ability to compete. This motivates us to do a review study that offers thorough understanding on the subject and provide future insights.

Since the last two decades, a variety of industries' business perspectives have changed quickly, creating fierce competition between businesses and their intricate supply chains. In order to maintain their operations and remain competitive, businesses are under tremendous pressure (Zhu et al., 2017). Today's manufacturing organizations operate in a volatile environment where customer demand is quickly changing, product lifetime is shortening, and new technologies and business models are


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emerging more frequently (Ahmad and Murray, 2019). This has encouraged manufacturers to adapt their capabilities to the market-oriented environment that supports them in competing with their rivals (Dey et al., 2019). Companies compete at both capabilities and product market outcomes in a broader sense (Pisano, 2017). A company's ability to remain competitive determines whether it succeeds, barely makes it, or collapses. If any business hopes to prosper in this cutthroat market, it needs to focus on its operations strategy. In light of this, it's critical to comprehend how the operations strategy contributes to the company's performance in this competitive environment. Therefore, elements like the operations strategy itself, competitiveness criteria, and alignment with the company plan all have an impact on how well operations strategy and competitiveness integrate. This support the creation of unified, integrated strategies that strengthen a business's position in the market.

According to Chikan et al., (2021), manufacturing firms are driven differently to operate (ordinary capacities) and enhance (dynamic capabilities). Along with the other four competitive dimensions—cost efficiency, quality, dependence, and flexibility—time is becoming increasingly important in developing the operational strategy as well as competitiveness. These basic strategic choices, then, set the tone for the shape and content of the operations function and what it accomplishes. A conversion process designed for one type of focus is often ill suited for success in another, alternative focus. This demonstrates that the need for explicit and thorough contributions from these kinds of activity still exists. Managers may enhance their competitiveness position, obtain insights into their competitive advantages, and successfully adjust to shifting market situations by comprehending the relationship between operations strategy and competitiveness. In this regard, a comprehensive mapping of the scientific information pertaining to operations strategy and competitiveness research is still lacking, which is important for determining the conceptual aspects of the field's major themes and subjects. Additionally, competitive factors like productivity have to do with how successfully an organization uses its resources and competes in the market against other businesses that provide comparable goods or services. This shows that in relation to operations strategy and competitiveness, it is necessary to comprehend additional factors like productivity.

This manuscript explores scientific mapping and thematic progression of operations strategy and competitiveness. A literature search using well-known databases and search engines Scopus database has been used to identify the research topic which will predominantly include operations strategy, competitiveness, competitive advantage, performance, sustainability, supply chain management, innovation, environmental management, economic analysis, decision making, competitive priorities, competitive strategies. Based on these, the current study has established the first baseline data on this topic for future comparisons and for policymakers to draw plans on operations strategy and competitiveness. Building upon a body of operations strategy and competitiveness research that has grown and changed over time, this study goes beyond evaluating previous researches. It further covers every facet of operations strategy and competitiveness, without focusing on just one set of variables. However, prior research has provided particular variables that could be helpful in managerial decision-making. The managers who are currently in practice lack comprehensive expertise due to the fragmented nature of these understandings. As a result, this study is beneficial since it unifies the disparate and contentious evidence and offers a thorough understanding of the subject. Thus, the objective of this study is to examine the existing research and thematic evolutions of operations strategy and competitiveness and showing future research trends. In line with this objective, the study will answer the following research questions. 1) What are the ontological and epistemological foundations of operations strategy for competitiveness study? 2) What are the trending topics and themes in the subject of operations strategy for competitiveness? 3) What are the key themes to be researched by future researchers?

Despite the topic's wider applicability, there is a lack of a thorough understanding of the conceptual connections and effects of the field operations strategy and competitiveness. To our knowledge, this is the first study that examines hundreds of papers and offers thorough understandings on the topic. This method provides a thorough review of the subject, highlighting its intellectual framework as well as its thematic development. Therefore, the primary contribution of the study is its summary of the scientific production in terms of authors' collaboration, institutional and country collaboration, and collaboration,

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as well as the subject's expanding tendencies. This study tends to offer new insights on the development and variety of operations strategy and competitiveness in this regard.

Second, the study presents the thematic advancements and changing research areas, which provides a clue for future studies has been identified and suggested for future researchers. Comprehending the theme structure of operations strategy and competitiveness is essential for comprehending its application in assuring the success of the firm, and it is particularly important for academic and practical applications. Our study, which focuses on the productivity, evolution, and subject scope of the field, provides a very thorough and objective assessment of operations strategy and competitiveness research using a bibliometric approach.

Third, the key themes related to the subject of operations strategy and competitiveness in terms of its consequences is clearly revealed for further studies and practitioners. By recommending possible directions for further investigation, the paper advances the field. Because a crucial step in determining the productivity and evolution of the field is to thoroughly analyze the performance of subject in terms of publishing and evolution (Donthu et al. 2021). As a result, this study is a crucial resource that offers a current and thorough summary of the state of operations strategy and competitiveness research as well as its future direction.

## 2. Methodology

### *2.1. Study Setting*

Bibliometric analysis is reportedly growing more and more prevalent in business and economics research, according to recent evidence from a variety of academics (e.g., Donthu et al., 2021). According to Linnenluecke et al. (2020), the bibliometric study specifically makes use of the authors' experience in managing, analysing, and drawing conclusions from large amounts of data, including details about intellectual structure, significant contributors, authors, affiliations, countries, sources, and references. The most popular R package for this purpose is bibliometrix, which is being utilized in an increasing number of studies (Linnenluecke et al., 2020). Additionally, network visualization maps were created utilizing the gathered data using VOSviewer.

According to Donthu et al., (2021), performance analysis and science mapping are two of the major techniques employed in bibliometric analysis. This study also used bibliometric analysis based on these two approaches to provide a full grasp of the disciplines that relate operational strategy and competitiveness. The knowledge structure of the subject was mapped as part of the investigation. In particular, the performance analysis provides the number of products by publication year, productivity of publishing, the most relevant publications, relevant affiliations, authorship and country, and relevant sources. The science mapping analysis makes use of co-authorship analysis, collaboration networks, and keyword co-occurrences among other techniques.

### *2.2. Data Base and Search Strategy*

The selection of a database is influenced by elements like coverage, owner, selection criteria, and metrics employed (Bauer, 2020). For searching and assessing academic content, academics frequently use Web of Science and Scopus databases. Even if the accessible functionality for both databases are comparable, there are still important differences to take into account when selecting one over the other. According to Stahlschmidt and Stephen (2019), Web of Science is recognized to favor basic research while Scopus is known to favor applied research. These facts lead to the selection of Scopus as the database for the intended study. Then this review starts by selecting the appropriate database (Scopus) in order to extract the documents.

The reporting quality and the capability of the search query have been assessed in order to determine the effectiveness of the data search method. This has been accomplished by choosing pertinent keywords that are adequate and include pertinent synonyms. Once the data base has been selected, the search terms were entered as “operation strategy” OR “operations strategy” OR “operating strategy” OR “operational strategy” OR “operation* strategies” AND “competitiven*”. After choosing these terms, the search query was further refined using Boolean operators like "AND" and "OR". By obtaining specific and pertinent material for the review, it also helps to define the interconnections

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between search terms, and uncover hidden connections and patterns in the operations strategy and competitiveness themes.

In general, the quality of the search query can be improved by minimizing irrelevant results by carefully choosing appropriate synonyms, employing proper Boolean operators, and using an appropriate search space. Then, the topics were extracted from Scopus database including "all fields". There were 2,769 results for the initial search. The usage of exclusion and inclusion criteria follows. Thus, by limiting the search to only journal articles, the results were reduced to 2006 documents. Excluding 71 articles in press comes next. Following this, 1,853 articles were left after articles published in languages other than English were removed (Table 1). Finally, papers published in 2023 were disregarded in order to extend the analysis year from its inception to 2022. In the end, 1,835 articles will be used for analysis.

**Table 1:**
Inclusion and exclusion strategies.

| Refinement category | Refinement criteria | No. of articles excluded | No. of refined articles |
|---|---|---|---|
| First search | Search "All Fields" | - | 2769 |
| Document type | Limited to only journal articles | -763 | 2006 |
| Publication stage | Exclude articles in press | -71 | 1935 |
| Publication year | Exclude articles published in 2023 in order to include only full year operations | -82 | 1853 |
| Language | Articles written in other languages other than English were excluded | -18 | 1835 |

At the conclusion of the search operation, the final sample of articles was exported in the bib text and comma-separated values (CSV) file formats required by the R package software.

*2.3. Implementation and Analysis Techniques*

In order to identify patterns in publishing and production, quantitative analysis was applied. Based on mathematical statistics, bibliometrics is the application of information science to books, papers, and other publications (Su et al., 2021). To give full knowledge and insightful findings, many bibliometric markers were applied. To do this, the retrieved data was processed using the statistical programme R studio. Bibliometric analysis has been carried out in R using R Studio (Linnenluecke et al., 2020). R studio has been used to analyze a variety of aspects using bibliometric coupling analysis, including the conceptual framework, productivity, key scientific actors, themes trend, and thematic structure of the journal. Besides, VOS Viewer version 1.6.17 was employed to cluster the author's co-occurrence and keyword co-occurrences. --The mapping analysis, such as analysis of keyword cooccurrences, and co-authorship were all carried out using the VOSviewer. Moreover, Microsoft Excel was utilised to create editable charts and tables and to validate a number of tests, including the production of citations, journal productivity, and affiliations.

## 3. Results and Analysis

The bibliometric analysis is presented in this section both in terms of performance analysis and scientific mapping.

*3.1. Scientific Productivity of Operations Strategy for Competitiveness Research*

The issue of operations strategy for competitiveness involves study of the most relevant papers, sources, citations, affiliations, and scientific development. Figure 1 indicates that recently the annual scientific production on the subject of operations strategy and competitiveness is exponentially increasing.

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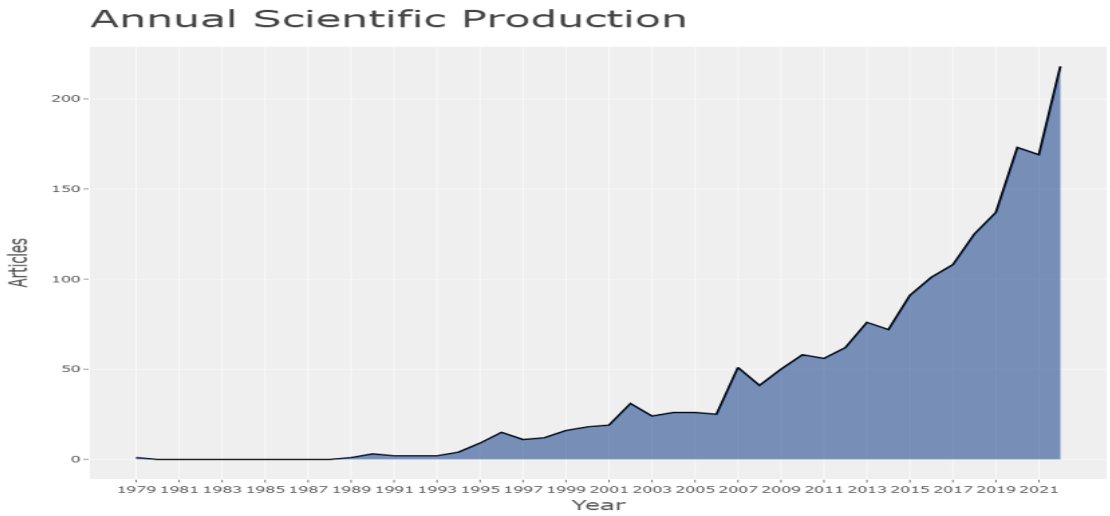


**Figure 1:**
Annual scientific productions in Scopus.

The topic is a growing phenomena and a crucial problem that calls for more research, according to recent developments in academic literature on the subject. Because of the rising level of interest among scholars in the area, the trend is anticipated to last into the future. Following the COVID-19, which caused governments, businesses, and scholars to grow concerned, the year 2022 saw the biggest amount of publications since the global financial crises. This exponential growth in the productivity of publications leads to scattered findings and with several variables linked to the subject matter. This requires to provide a comprehensive understanding by studying the integration of the two concepts.

**Table 2:**
Top 10 most relevant affiliations, countries, documents and authors.

| **Most relevant affiliations** | | **Most cited countries** | | **Most cited documents** | | **Most relevant authors** | |
|---|---|---|---|---|---|---|---|
| **Affiliations** | **N** | **Country** | **TC** | **Paper** | **TC** | **Authors** | **Articles** |
| Michigan State University | 30 | USA | 25048 | Porter ME, 2000, Econ Dev Q | 2474 | Liu Y | 17 |
| University of Vaasa | 25 | UK | 7935 | Frohlich & Westbrook, 2001, J Oper Manage | 1675 | Gunasekaran A. | 14 |
| Aalborg University | 22 | Spain | 3509 | Chen I.J., and Paulraj A 2004, J Oper Manage | 1494 | Deshmukh SG | 13 |
| Monash University | 21 | Canada | 3482 | Shah R., Ward P.T, 2007, J Oper Manage | 1448 | Zhang Y | 13 |
| Linkping University | 17 | China | 3200 | Li et al., 2006, Omega | 1226 | Takala J | 11 |
| University of Cambridge | 16 | Italy | 2857 | Bengtsson M., Kock S, 2000, Ind Mark Manag | 1124 | Wang Y | 11 |
| Jnkping University | 15 | Finland | 2513 | Choi TY et al., 2001, J Oper Manage | 1010 | Roth AV | 10 |
| Arizona State | 14 | India | 2441 | Gordon I., & | 900 | Li Y | 9 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| University | | | | McCann P. 2000, Urban Stud | | | |
| Chalmers University of Technology | 14 | Australia | 2172 | Klassen R.D., Whybark D.C., 1999, Acad Manage J | 859 | Narasimhan R | 9 |
| Indian Institute of Technology Delhi | 14 | Hong Kong | 1740 | Gunasekaran & Ngai. 2004, Eur J Oper Res | 798 | Pinheiro DE Lima E | 9 |
| | | | | | | Schoenherr T | 9 |

Only four of the most productive institutions—shown in Table 2—have published more than 20 publications. Michigan State University (n=30), University of Vaasa (n=25), Aalborg University (n=22), and Monash University (n=21) are the universities having the most affiliations. With a total of 25048 and 7935 citations each, the United States and the United Kingdom are the most referenced nations. Spain and Canada come next with 3509 and 3482 citations each. These numbers reveal that the United States has a far higher total citation rate than other countries, indicating that there are more high-caliber articles published there. The outcome further demonstrates that scholars in affluent countries are intensely motivated to study the topic and are creating high-caliber articles. When it comes to the significance of publications in terms of citations, Porter ME (2000), which was published in Economic Development Quarterly, is in the lead with a total of 2474 citations. Frohlich M.T., and Westbrook R. (2001), Chen I.J., and Paulraj A. (2004), and Shah R., Ward P.T. (2007) are the authors listed after these, with a total of 1675, 1494, and 1448 citations, respectively. The Journal of Operations Management published each of these three articles. The top ten most relevant authors are shown in Figure 4. Liu Y. is in the lead with 17 papers published, followed by Gunasekaran A. with 14 documents. Zhang Y and Deshmukh SG each published 13 documents.

*3.2. Scientific Mapping of Operations Strategy for Competitiveness*

This section presents the scientific mapping of co-authorship network, keyword co-occurrences, and the three field plot of country, authors, and theme.

*3.2.1 Scientific Mapping of Co-Authorship*

Figure 2 depicted a co-occurrence of authorship that shows network of collaborated authors who are working together. The figure shows 24 clusters, which shows the number of documents and strength of co-authorship link.

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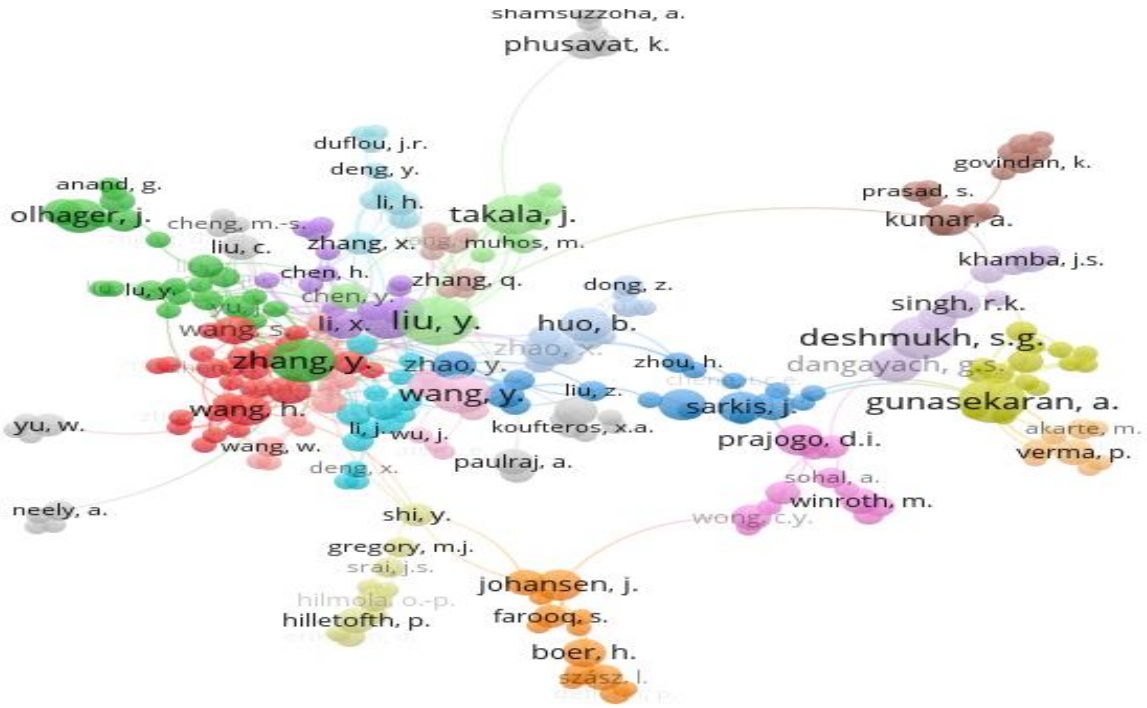


**Figure 2:**
Authorship co-occurrence.
**Note:** Minimum number of documents of an author =2; 632 meets the threshold of the 4268 authors. A total of 256 items, 24 clusters, 536 links, and 706 total link strength appeared in the network.

The first group of 25 authors, shown by the red color and led by Wang, are working together. Five authors are represented in the second group (green). Zhang Y stands out from the group with 13 papers and a 25 total link strength. The third group, which consists of seven documents with four links each, is represented in blue and is led by Sarkis J. and Wang X. The fourth group, which is depicted in yellow and has 15 authors (with 14 papers and 18 link strength), is directed by Gunasekaran A. The fifth group, which includes Li Y. (9 documents and 14 link strength), is denoted by the color purple. Liu Y. (17 documents and 27 link strength), the author with the second-highest number of publications, was located in cluster 11, and Deshmukh SG. (13 documents and 16 link strength), was located in cluster 14.

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*3.2.2. Scientific Mapping of Keyword Co-Occurrence Network*

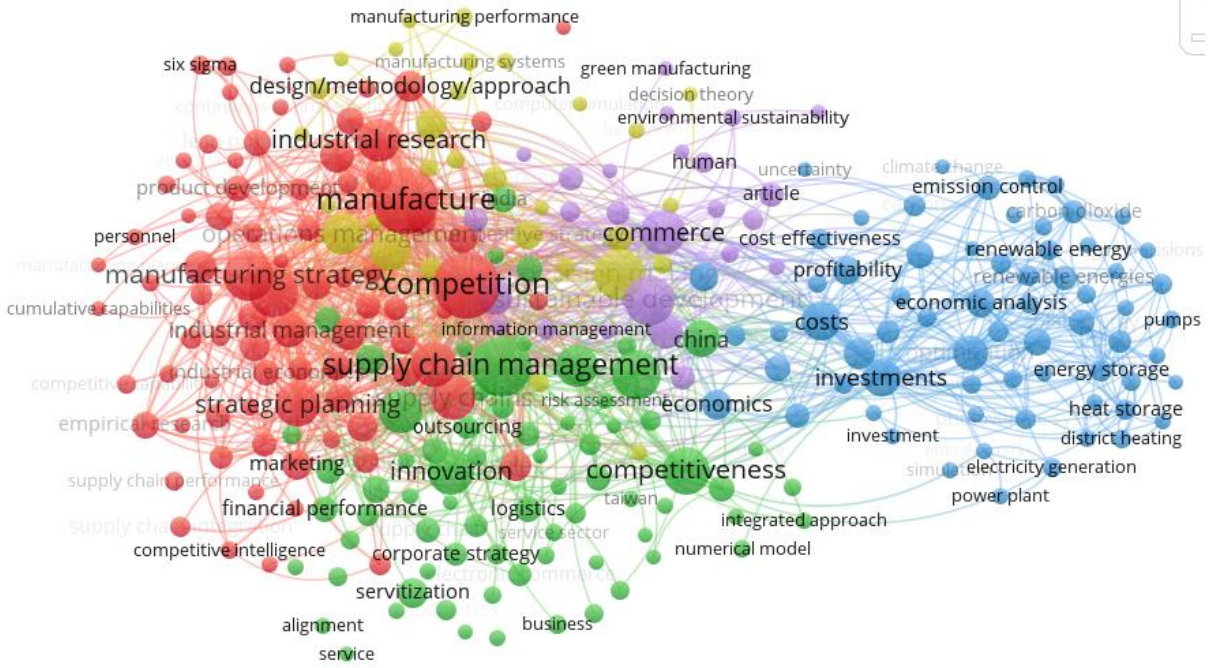


**Figure 3:**
Keyword co-occurrence analysis.

Note: Minimum number of occurences of keywords is setted to 10; number of keywords meet the threshold are 275 of the 8719 keywords; the total number of links is 9569; and the total link strength is 18862. Keyword analysis is carried out to learn more about the distribution of terms and to represent the state of the art in the areas of operations strategy and competitiveness. Manufacturing and competitiveness (red), supply chain management (green), costs (blue), decision-making (yellow), and sustainable development (purple) are the five primary groupings (Figure 3). The themes are interlinked.

Other topics including manufacturing strategy, operations strategy, strategic planning, performance, supply chain, and industrial research are discussed within the context of the "manufacture" and "competition" themes. These findings demonstrate how manufacturing and competitive research has historically been focused on operational strategy, strategic planning, and performance with an emphasis on supply chain and industrial research. This demonstrates that the cluster's attention is on competitiveness and performance-related strategic challenges. The concept of "supply chain management" is connected to other themes including innovation, competitive advantage, competitiveness, sustainability, and manufacturing. The connected themes for the "costs" subject include economic analysis, profitability, investments, and optimization. The theme of "decision making" is closely related to operations management, competitive priorities, manufacturing industries, and competitive strategy. A connection exists between the "sustainable development" theme and business, industry, and environmental management. Big data, computer simulation, operational capabilities, environmental uncertainties, industrial development, knowledge, servitization, process management, agility, technology adoption, etc., on the other hand, are some of the themes with the lowest number of occurrences. However, further research is needed in the topic areas stated above.

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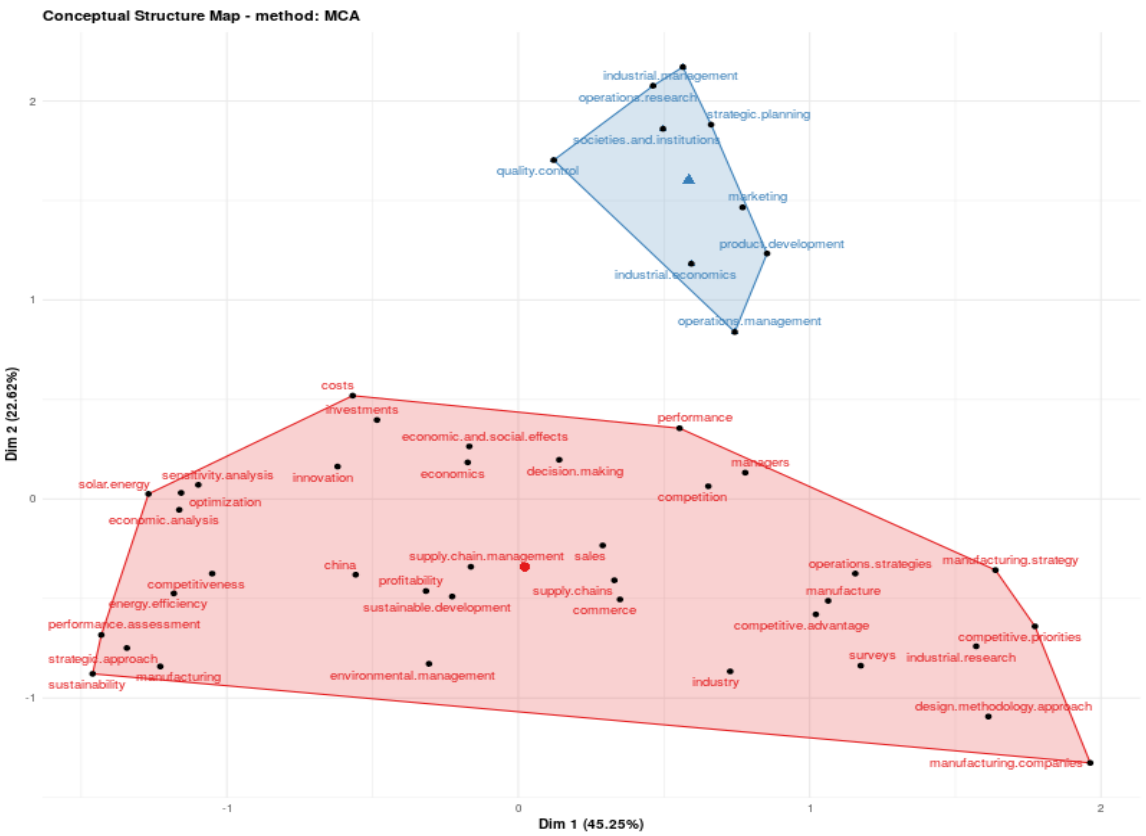


**Figure 4:**
Conceptual structure map.

Additionally, R studio analysis demonstrates that the conceptual structure made the two main clusters visible (Figure 4). As a result, the first strand focused on supply chain management, socioeconomic implications, sustainability, and related ideas. To provide an overview of these themes, it is worth noting that current operationalizations of sustainability primarily focus on short-term synergies and fail to address the inherent tensions between economic performance and social or environmental performance (Shevchenko et al., 2022). Furthermore, the concept of social sustainability has emerged as an important issue that organizations must confront in order to maintain their competitiveness. By understanding and addressing social challenges, and by adopting social sustainability practices, organizations can effectively cultivate a sustainable social supply chain and gain a competitive edge (Bathool, 2022). Another theme within the first strand pertains to supply chain management. The integration of this supply chain strategies with marketing decisions facilitates the optimization of an organization's overall strategy (Wacker and Samson, 2021), allowing for the creation of a competitive advantage through improved supply chain performance (Jamili et al., 2014). Furthermore, it is important to recognize that operations management and competitiveness have significant socioeconomic implications. The techniques employed in operations management can influence the competitiveness of clusters, which are characterized as productive firms (Molina et al., 2019). Thus, the integration of supply chain management, socioeconomic implications, and sustainability into operations strategy is of utmost importance for organizations seeking to enhance their competitiveness.

The second strand encompassed operational quality, marketing, and product development concepts. First, the comprehensive viewpoint on quality permits organizations to effectively compete by revolutionizing their perception of customers, competition, and the business climate (Belohlav, 1993). Similarly, the significance of communication, trust, and synergy between operations and marketing is

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underscored as crucial for enhancing the performance (Malhotra and Sharma, 2002) and competitiveness of firms. The amalgamation of operational quality and marketing themes is also apparent in areas such as process technology, capacity strategy (Beckman and Rosenfield, 2007), and product development, among others. This demonstrates the imperative nature of considering operational quality, marketing, and product development in the formulation of operations strategy for the sake of competitiveness.

*3.3. Trending Topics and Thematic Evolutions*

In this section, the R studio biblioshiny is used to depict the trending topics and thematic evolutions.

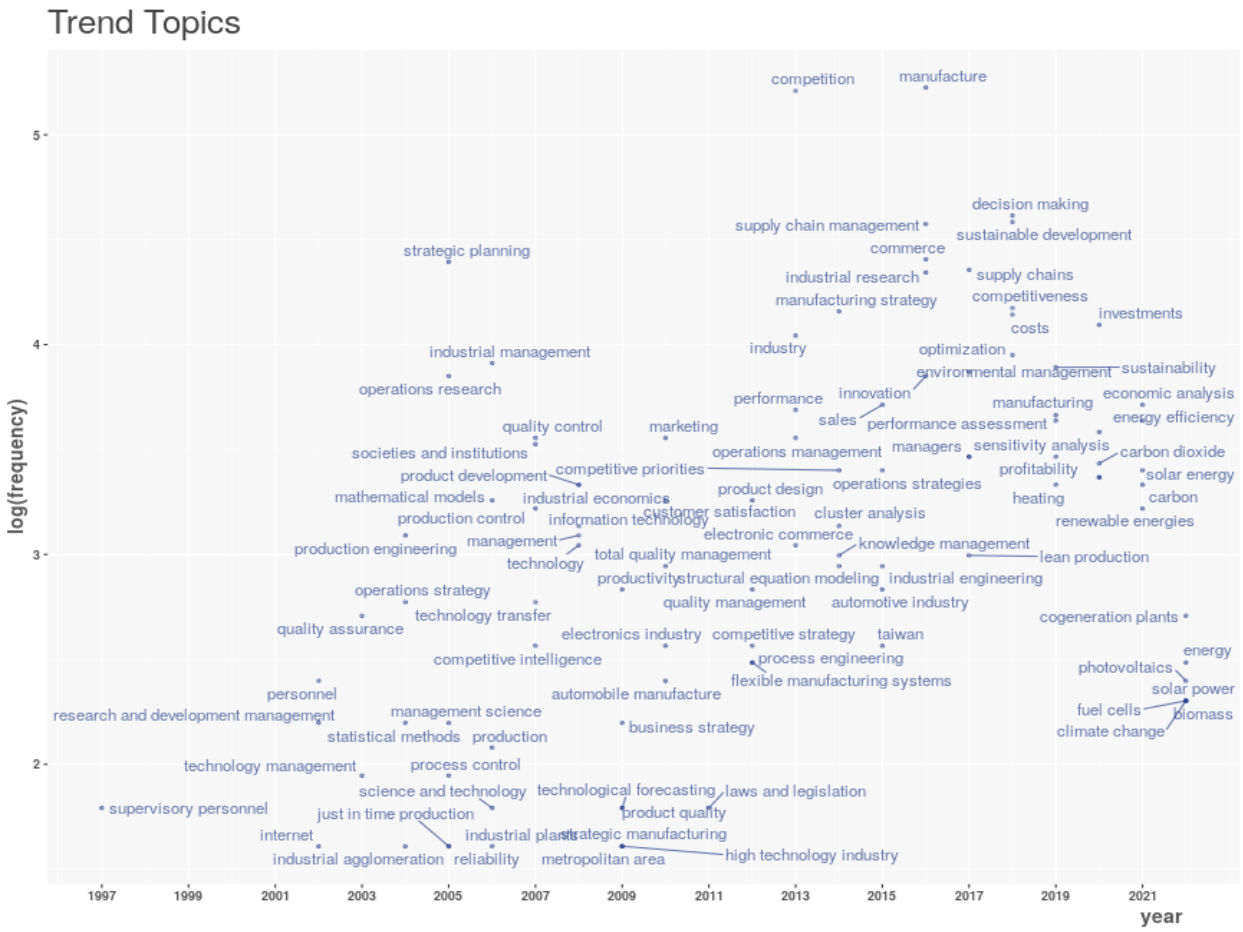


**Figure 5:**
Trending topics.

The other interesting analysis is the analysis of trending topics on operations strategy and competitiveness. Figure 5 demonstrates how recently the most commonly occurring keywords in keyword analysis have been widely used. Prior to 2000, there was little research on operations strategy and competitiveness. Strategic planning, quality control, operations research, competitive priorities, product development, industrial economics, and others have received the most research attention from 2001 to 2011. Following 2011, supply chain management, manufacturing strategy, commercialization, innovation, performance, and other topics have received the greatest attention from researchers. Decision making, sustainable development/sustainability, cost and profit optimisation, investments in environmental management, and other themes have recently attracted a lot of scholarly attention.

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To provide an overview of some of the widely researched topics in the field of operations strategy for the purpose of competitiveness, we will delve into previous findings on the subject matter. For instance, organizations can align their supply chain activities with their overall business strategy by integrating supply chain management practices with strategic management views and theories (Akyuz and Gursoy, 2020). Moreover, the adoption of effective supply chain strategies contributes to the attainment of competitive advantage through the establishment of long-term relationships with suppliers, the adoption of competitive standards, and the reduction of errors in the supply chain process (Qi et al., 2017). Therefore, the inclusion of supply chain management in the development of operations strategy for competitiveness enables organizations to optimize their supply chain activities and enhance their overall performance in the market.

Another set of themes closely associated with the examination of operations strategy for competitiveness are manufacturing strategy and commercialization. By connecting this manufacturing strategy with operations strategy, firms can align their strategic objectives with their production capabilities, resulting in enhanced performance and competitiveness (Okoshi et al., 2019). Additionally, the exploration of the relationship between manufacturing strategy and competitiveness facilitates the identification of the crucial factors that contribute to a firm's competitive advantage, such as technology choices and competitive priorities (HoangMr et al., 2020). This body of knowledge can guide managers and practitioners in making well-informed decisions pertaining to operational strategies, ultimately leading to the improvement of firm performance.

By taking into account the strategies for commercialization, businesses can ascertain the most appropriate pricing, make adjustments to the characteristics of their products, and pinpoint areas for enhancement in order to bolster their competitive position (Games et al., 2021). A comprehension of the connection between operations strategy and commercialization enables businesses to align their internal processes and resources with their overarching business strategy, thereby ensuring their ability to effectively bestow value upon customers and capture value for themselves (Kudryavtseva et al., 2017). Consequently, the amalgamation of operations strategy and commercialization is indispensable for businesses to adeptly navigate the evolving and competitive milieu, enabling them to uphold their competitive advantage.

It is imperative to establish a link between the theme of innovation and the exploration of operations strategy and competitiveness, as innovation plays a pivotal role in augmenting competitiveness (Mendoza-Silva, 2021). Given that innovation enables companies to forge new products, technologies, and processes, which can confer upon them a competitive edge in the marketplace (Agolla, 2018), its integration within the operations strategy can yield significant benefits for companies. This integration empowers organizations to adapt to fluctuating market conditions, meet the needs of customers, and surpass competitors. Besides, decision-making grounded on strategic priorities facilitates the establishment of consistent and comprehensive decisions, thereby promoting the effective implementation of specific strategic decisions (Tambe and Kulkarni, 2018). Furthermore, the integration of optimization within the analysis of operations strategy assumes a paramount role in fostering competitiveness as it allows for more refined process modeling and optimization strategies, especially in the context of dynamic operations (Biegler, 2017). Ergo, the incorporation of optimization in operations strategy empowers companies to attain superior resource utilization, waste reduction, and energy consumption curtailment, thus augmenting their competitive edge.

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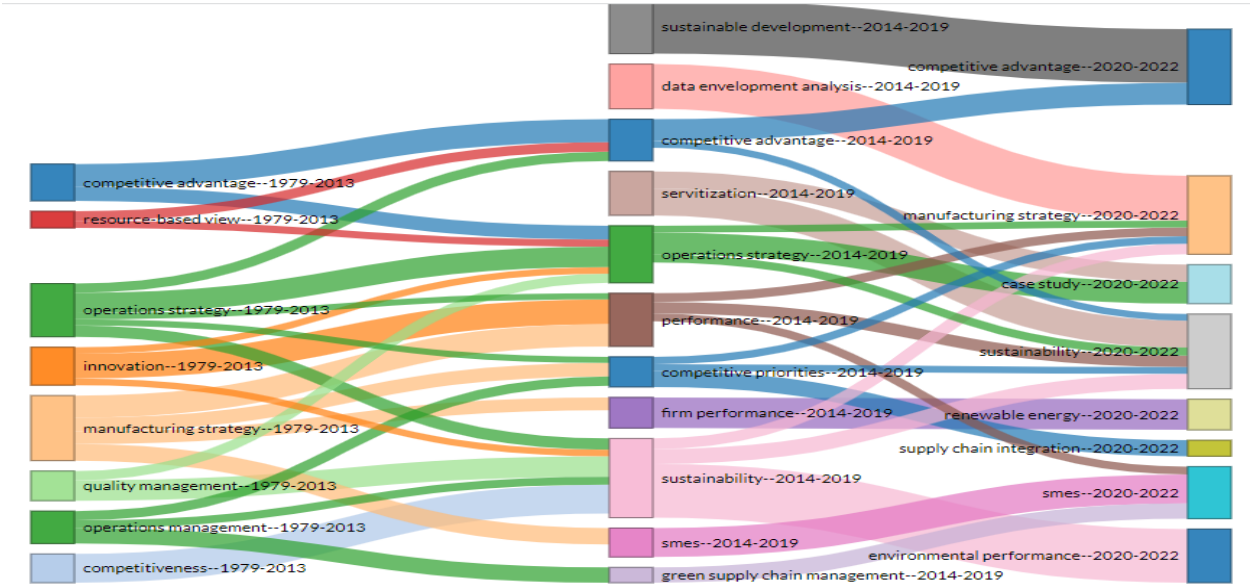


**Figure 6:**
Thematic evolution.

Figure 6 provides additional explanation of the subject's thematic evolution. The outcome demonstrates how the themes of operational strategy and competitiveness become increasingly diverse over time. The most popular subjects in the past have been manufacturing strategy and operations strategy. Although money scholars have focused on issues like innovation and quality management, they were not given much thought in relation to the study of operations strategy and competitiveness. Recent usage of the word "competitiveness" has decreased in favour of more researched phrases like "competitive advantage," "performance," and "sustainability." Later, from 2014 to 2019, operations strategy remained a hot topic despite the popularity of topics like sustainability, sustainable development, and performance. In this period, academics frequently place more emphasis on topics like competitive priorities, firm performance, and servitization than manufacturing strategy. After 2020, the concept will start to be reexamined. Competitive advantage, sustainability, and manufacturing strategy from 2020–2022 are currently hot topics of research. In addition, SMEs and environmental sustainability are two more hot themes.

More precisely, sustainable development finds its foundation in sustainability leadership, necessitating organizations to possess leaders with values that are oriented towards sustainability so as to effectively implement sustainable strategies (Wangmo, 2021). This signifies that the integration of sustainability into operations strategy aids in the optimization of resource efficiency, waste reduction, and the diminishment of carbon footprint, thereby conferring benefits not only upon the environment, but also enhancing operational efficiency and cost-effectiveness. Furthermore, the adoption of sustainable practices by businesses can furnish them with a competitive edge. Hence, the consideration of sustainability within the study of operations strategy for competitiveness is of utmost significance.

Figure 10 also demonstrates that the dominant theme during the years 2014-2019, "sustainable development", has progressed towards "competitive advantage" in the years 2022-2022. Moreover, the theme of "sustainability" has made strides towards "environmental performance". In accordance with this, it is contended that sustainable development is underpinned by sustainability leadership, organizational values, innovation, and social capital, all of which establish sustainable development as a determinant of competitiveness (Villa et al., 2022). This indicates that scholars are presently placing greater emphasis on competitive advantage as opposed to sustainable development, as they acknowledge the imperative of bridging the gap between sustainability and business success. While the initial focus of sustainable development primarily revolved around environmental and social impacts, there has been an

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increasing realization that businesses must incorporate sustainability into their strategies in order to sustain competitiveness in the long run.

The study of sustainability is advancing towards environmental performance. Scholars have conducted research on the linkage between the selection of environmental strategies and environmental performance, discovering a substantial and positive impact of proactive environmental strategies and environmental performance (Seroka-Stolka, 2023). The discussion on the trade-offs between economic and environmental performance in the management of sustainable operations has resulted in the emergence of the concept of sustainability performance frontiers. These frontiers establish legitimate boundaries for the pursuit of sustainability and eliminate the perceived conflict between trade-offs (Zargartalebi, 2021). This shift towards the examination of environmental performance research is motivated by the acknowledgement of the crucial role played by the environment in attaining long-term sustainability objectives. While sustainability encompasses various dimensions such as social and economic aspects, the environment is frequently regarded as the basis for achieving overall sustainability. Consequently, by directing their attention towards environmental performance, scholars aim to offer practical guidance, strategies, and innovations that assist organizations in reducing their environmental impact, complying with regulatory requirements, meeting stakeholder expectations, and contributing to a more sustainable future.

Competitive advantage is a topic that has been studied from the start and is still being actively investigated. However, the majority of the previously investigated themes, such as strategic planning, resource-based innovation, manufacturing strategy, and quality control are disappeared recently. Besides, recent studies on operations strategy and competitiveness have not taken operations management and competitiveness into account. This is so that a specific topic can be explored, rather than the broad reach of the word "operations management." Similarly, researchers are beginning to concentrate on particular problems such as competitive priorities and green supply chain management.

The relevance of various themes such as strategic planning, resource-based innovation, manufacturing strategy, and quality management has been further demonstrated through the examination of previous studies. For instance, the integration of strategic planning into operations strategy enables organizations to align their operational decisions and actions with their overarching strategic direction (Warren and Churchill, 2022). This alignment is of utmost importance for organizations to maintain their competitiveness in an ever-evolving business environment (Li et al., 2019). Consequently, by connecting strategic planning with operations strategy, organizations can effectively allocate resources, optimize processes, and make informed decisions that support their competitive advantage (Koch et al., 2015). Overall, the linkage between strategic planning themes and the study of operations strategy and competitiveness enables organizations to accomplish their strategic objectives, enhance operational efficiency, and sustain a competitive edge in the market.

Another significant theme that has been explored in the study of operations strategy and competitiveness is quality control. Koch et al. (2015) posited that quality and flexibility are critical factors in achieving competitive advantage, and through the implementation of various operations strategies, organizations can achieve consistent growth. Hence, by linking quality control with operations strategy and competitiveness, organizations can ensure that their products and services adhere to high quality standards, resulting in customer satisfaction, improved operational performance, and ultimately, success in the market (Alshurideh et al., 2022). This highlights the vital role of integrating quality control with the study of operations strategy for organizations to uphold and enhance their competitiveness. By prioritizing quality control, organizations can enhance customer satisfaction, reduce costs, cultivate a positive reputation, drive continuous improvement, and ensure compliance with industry standards. These factors collectively contribute to the overall competitiveness of the organization in the marketplace.

The theme of competitive priorities is also an essential aspect that necessitates reconsideration in the analysis of operations strategy and competitiveness. For instance, empirical studies have indicated that competitive priorities, including cost, quality, delivery, and flexibility, serve as driving factors for the advancement of intelligent manufacturing (Arcidiacono et al., 2023) and the enhancement of organizational performance across various industries (Karuga & Yatich, 2023; Hong & Yang, 2022).

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Furthermore, the investigation underscores the significance of establishing a suitable organizational environment and formulating more effective policies to facilitate the implementation of competitive priorities and attain enhanced performance (Arcidiacono et al., 2023; Karuga & Yatich, 2023). These findings underscore the criticality of integrating the competitive priorities theme within the analysis of operations strategy to achieve and sustain competitiveness within the ever-changing business landscape. Moreover, comprehending and aligning competitive priorities with operations strategy enables organizations to effectively respond to customer demands, optimize resource allocation, and differentiate themselves from competitors.

The incorporation of resource-based innovation into the analysis of operations strategy holds considerable importance for competitiveness. By integrating resource-based innovation, organizations can augment their operational performance, enhance the performance of logistics service providers, and improve overall business performance (Shah et al., 2023). Hence, establishing a linkage between the resource-based innovation theme and the study of operations strategy becomes paramount for organizations seeking to bolster their competitiveness. The understanding and utilization of resources for innovation can lead to the development of sustainable competitive advantages, heightened operational efficiency, and enhanced performance.

The integration of the manufacturing strategy theme into the examination of operations strategy is of significant importance for achieving competitiveness. This integration allows for the identification of competitive priorities and the improvement of strategic positioning (Khajeh et al., 2023). Moreover, research has demonstrated a positive impact between manufacturing strategy and competitive performance, underscoring the significance of incorporating manufacturing strategy into operations strategy to enhance competitive performance (Okoshi et al., 2019). This is due to the pivotal role manufacturing strategy plays in shaping an organization's capacity to deliver products of high quality, enhance efficiency, and effectively respond to dynamic customer demands. Consequently, the linkage between the manufacturing strategy theme and the study of operations strategy is critical for organizations aiming to augment their competitiveness within the marketplace.

## 4. Discussions and Research Implications

Key themes in the study of operations strategy and competitiveness have been discovered based on the keyword network analysis. While some of these issues have received considerable research, others need more study. Thus, these studies offer some conceptual groundwork for upcoming scholars in areas that need additional empirical investigation. In other words, the study demonstrates to future researchers what has to be looked at further, where analysis is necessary, and how these issues will be handled.

The results of this study showed that operations strategy has recently become a subject of lively discussion among academics. This calls for more research in this field to make the ideas and effects more clear. The issue is expanding across many disciplines, as evidenced by the fact that it is also becoming of interest in fields other than business and economics. Additionally, the study demonstrates that while researchers in underdeveloped nations record low production, researchers in wealthy countries are more productive and produce quality articles that are relevant to the field. Developed countries exhibit a greater degree of collaboration, thereby necessitating future researchers to conduct their studies in countries where such cooperation is less prevalent. Furthermore, the significance becomes more pronounced when comparing advanced nations with developing countries.

Strategic planning, quality control, operations research, competitive priorities, product development, industrial economics, and other related issues were heavily explored in the 2000s. However, following 2011, subjects including supply chain management, manufacturing strategy, commercialization, innovation, performance, and others became heavily explored. Making decisions, sustainable development and sustainability, cost and profit optimization, and investments in environmental management were recent themes that attracted a lot of scholarly attention. Contemporary studies must be carried out in order to gain a deeper understanding of the conceptual foundations of current issues and subjects connected to operation strategy and competitive advantage. In addition, the five primary clusters identified by the term co-occurrence network analysis include

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manufacturing and competition, supply chain management, costs, decision-making, and sustainable development. Based on the keyword analysis and emerging trends of the study, the following main themes have been identified in this study.

*4.1. Advancements in Integrating Manufacturing Strategy, Competitiveness and Performance*

The common criticism among managers that "markets are always becoming more competitive" or "margins are continuously getting smaller" has a conceptual basis thanks to emerging ideas in manufacturing strategy (Corbett & Van Wassenhove, 1993). Traditional managerial approaches for improving manufacturing performance are built on the trade-off paradigm. The trade-off paradigm, we contend, is not always applicable. Therefore, businesses should choose their competitive priorities or trade-offs in order to be competitive in the market (Ferdows & De Meyer, 1990). As a result, the conceptual framework created at a different time is evolving and has to be further enhanced. Even though the terms "competitive priorities" of cost, quality, reliability, flexibility, and innovativeness are commonly used, there is a lack of universally acknowledged definitions and dimensions for these terms. In addition, Boyer & Lewis (2002) came up with four major manufacturing competitive priorities (or capabilities) after reviewing a variety of works: cost or efficiency, flexibility, quality, and delivery. This conceptual ambiguity hinders the creation of a comprehensive theory of manufacturing strategy and leads to a dearth of operationally practical measuring standards to support empirical research. Thus, future researchers are expected to clarify this conceptual ambiguities in order to provide a comprehensive framework.

According to Avella et al., (2001), there may not always be a direct link between manufacturing strategy and overall firm performance. Kaur et al. (2017) also established a link between a manufacturing system's component flexibility, competitiveness, and business performance and discovered a beneficial impact of component flexibility on company performance. They also took into consideration how the environment affects manufacturing strategy and competitiveness. The manufacturing strategy's effects on the productivity and competitiveness of the enterprises, however, are still not entirely obvious. Furthermore, past studies did not assess the magnitude of the impact of manufacturing strategy among small and larger enterprises. Therefore, it is recommended that future studies compare small and large businesses to determine how much an operational strategy affects a company's performance and competitiveness.

A study from (Ali & Saifi, 2011), which supports (Kaur et al., 2017), makes the argument that manufacturing enterprises should offer enough flexibility in the manufacturing systems in order to survive in the dynamic market and remain competitive. Clarifying the degree of flexibility and its impact on company performance across various types and sizes of manufacturing enterprises is also necessary. For designing such strategies and policies, it is important to know those operations strategy factors that influence the performance of the system. Researchers can create plans to improve a company's strategic posture and determine the primary drivers of competitiveness by examining operations strategy (Veiga et al., 2021). In other words, for efficient planning, decision-making, and gaining a competitive edge in a variety of industries, researching operations strategy and competitiveness is vital (Veiga et al., 2022). Investigating the many problems and elements pertaining to the operations plan is therefore essential. It's also critical to demonstrate how organizations' success was influenced by the convergence of competitiveness and operational strategy.

The relationship between manufacturing strategy, competitiveness and performance is not comprehensive. That is, the choice of manufacturing strategy has a significant impact on a company's competitiveness and performance. The relationship between competitive strategies and business performance, for example, is mediated by manufacturing operations. Firm performance is impacted by various aspects of manufacturing strategy, including quality, cost, delivery, and flexibility (Kharub, Mor, and Rana, 2022). Comprehending the origins of competitive advantages can aid organisations in formulating tactics that render marketplaces unfavourable to their rivals and improve their performance (Cooper et al., 2023). However, a company's overall financial performance is greatly impacted by the combination of production strategy and competitiveness (Rinawiyanti et al., 2019). This indicates that the three concepts do not have a thorough and obvious link, which needs to be explained by more

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research. For practitioners, through an awareness of the sources of competitive advantages, organisations can better respond to changing market conditions by further comprehending the integration of operations strategy, competitiveness, and performance (Cooper et al., 2023). It is significant because it provides a methodical framework for determining the operations strategy efficiency frontier, which aids in the establishment of initiatives by organisations to strengthen their position in the market (Veiga et al., 2022). Organisations can more easily adapt to significant changes in their environment by having a clear understanding of the procedures used to develop their operations plan. Organisations can therefore better comprehend their competitive environment and develop new strategies by integrating operations strategy, competitiveness, and performance.

*4.2. Further on Supply Chain Management Innovation, Competitive Advantage and Sustainability*

SCM innovation is the ongoing development and integration of new tools and methods into the supply chain management process. Better productivity and cost savings may result from this, strengthening a business's position in the market. Avoiding the sustainability issues from the firm's operational strategies may not be viable given the current global environmental movement (Chien & Shih, 2007). This is due to the fact that the idea of the green supply chain has been used to introduce and integrate sustainable development into the sphere of operations. That is, integrating sustainability into the supply chain improves the company's reputation and long-term prosperity in addition to helping the environment. Businesses may fully realize the promise of sustainable supply chain management and contribute to a more sustainable future through joint efforts and strategic initiatives. Therefore, the industries must lessen the environmental impact of their supply chain (Mathiyazhagan et al., 2013). This shown that in order to enhance the firm's competitive edge and overall sustainability, supply chain management (SCM) innovation must be combined with green activities.

According to research conducted by Vafaei et al. (2019) sustainable supply chain management practices offer a long-term competitive advantage. However, contrary arguments have been made by (Masoumik et al., 2014), who claimed that, despite the theoretical claims that environmentally friendly practices will give businesses a competitive edge. According to Khaksar et al. (2015), there is a negative though substantial association between a green supplier, green innovations, and environmental performance, as opposed to a positive and significant relationship between the three. This demonstrates that the association is still inconsistent, and other researchers will need to clarify these contentious findings by empirically evaluating the relationships. Since the nature of competition has changed significantly, all organisations must acknowledge this fact when building their supply chain innovation strategy (Comas Mart & Seifert, 2013). This necessitates further study on clarifying the nature of relationship between SCM innovation, competitive advantage, and sustainability.

Businesses are always looking for strategies to maintain their growth and acquire a competitive advantage in the fast-paced commercial environment of today. For long-term success, SCM innovation and competitive advantage combined are not enough, though. Then, firms may better connect their operations with social and environmental goals while strengthening their competitive position by integrating SCM innovation, competitive advantage, and sustainability. In addition to helping the environment and society, these initiatives improve a business's brand, draw in eco-aware clients, and increase long-term profitability. As a result, SCM decisions and actions need to strategically match the company's overarching business plan (Saragih et al., 2020). Thus, regardless of the costs associated with implementing these integration for societal and environmental sustainability, corporations are obliged to do so. Additionally, via working with different stakeholders, businesses can come up with creative solutions to problems related to sustainability. For businesses to prosper in the future, this integration is essential in a world where stakeholders are becoming more and more concerned with sustainability.

*4.3. Commercializing Environmental Management Towards Sustainable Development*

Due to demand from various stakeholders, environmental regulations and sustainable development concepts have recently gained popularity and have moved up the priority list for the majority of corporate sectors (Gryshchenko et al., 2022). However, it is still unclear why some businesses are responding to external pressure while others are incorporating the idea into their internal plans and

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sales techniques. Given these facts, future research should attempt to clearly define the degree to which manufacturing enterprises are taking into account the sociological and environmental aspects. This link should also be thoroughly understood. This is due to the fact that different manufacturing companies give different amounts of care to economic, social, and environmental issues. Further, the situation under which these companies are considering these different aspects needs further study.

Khandelwal & Saxena, (2010) saw sustainability as an interconnected system of a sustainable social system, a sustainable economic system, and a sustainable environmental system. Companies are therefore expected to include these considerations into their commercialization strategy by conserving natural resources in order to fulfil the necessary environmental concerns and social obligations in addition to the economic aspects. A relationship exists between the commercialization of environmental management and the adoption of sustainable business and industry practises. The commercialization of environmental management has become a potent instrument in attaining sustainable development as the globe struggles with environmental issues. Commercialization offers a mechanism for enterprises to actively participate in sustainable development by incorporating market forces and profit objectives into environmental management practices. In doing so, it generates new markets and business prospects in addition to promoting sustainable growth for our planet. This incentivizes businesses to continue thinking about this important matter.

The promotion of sustainable development is greatly aided by the commercialization of environmental management. Commercialization promotes investment in environmental R&D, drives companies to adopt sustainable practices, and incorporates environmental management into business strategies, among other ways it supports sustainable development. Furthermore, firms are incentivized to embrace sustainable practices, invest in clean technologies, and generate economic opportunities through the integration of market forces, economic incentives, and corporate responsibility. Stakeholder cooperation improves environmental management initiatives even more. We may use commercialization to use business's ability to accelerate the shift to a future that is more ecologically sensitive and sustainable. It is therefore anticipated that the company's operational actions will take this significant issue into account.

*4.4. The Economic Aspects of Operations Strategy*

To guarantee corporate success, businesses look for new operational strategies. Accordingly, improving the productivity and competitiveness of globalized operations is made possible by the alignment of the companies' cost management techniques and competitive strategies (Pacheco da Costa et al., 2005). The majority of large corporations, on the other hand, appear to be oblivious to the fact that their cost systems have not been updated to deal with the current competitive climate; the techniques used to evaluate product costs are permanently out of date (Kaplan 1984). As a result, it is necessary to explain these contentious points and take into account how cost management affects a company's profitability.

Given the above fact, it is necessary to do comparisons and ascertain how the cost-benefit analysis is incorporated into the firm's operational strategies. In this regard, it has been suggested that the interaction between the functional areas of manufacturing and marketing has an effect on both business outcomes and organizational success (O'Leary-Kelly & Flores, 2002). This necessitates a deeper integration of optimization concepts with marketing tactics including distribution, pricing, and promotion. The operational plans will therefore be expected to be combined with the marketing choices to ensure the financial success of the company. Additionally, a competitive logic drives a migration of capital and productive resources in pursuit of more advantageous places to achieve their business goals, in their quest for new markets and for more economic locations (Pacheco da Costa et al., 2005).

To obtain a competitive advantage in the fiercely competitive and ever-changing business world of today, organisations must always work to maximize their operational efficiency. However, boosting economic performance is just as important to operations strategy as increasing operational efficiency. Organisations can attain long-term sustainability and profitability by emphasizing supply chain management, capacity planning, cost reduction, resource management, and innovation. An operations plan that is clearly defined helps businesses to increase productivity, reduce expenses, enhance the

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quality of their products, and take advantage of new market opportunities. Therefore, in order to succeed in the difficult business environment of today, organisations must acknowledge and give priority to the economic components of operations strategy.

*4.5. Decision Making on Competitive Priorities and Competitive Strategies*

Organisations need to make key decisions about their competitive priorities and strategies in order to stay ahead of their competitors in the increasingly competitive business world. Competitive strategies are the long-term plans developed to gain a sustainable competitive advantage, whereas competitive priorities are the areas in which firms strive for excellence. According to Torjai et al. (2015), the connection between business strategy and functional strategies is made via competitive priorities. Thus, the company should carefully choose and flourish in the competitive priority areas that deliver advantages among the potential areas of competitive advantages. Cost leadership, quality, speed, adaptability, and innovation are a few examples of these priorities. Depending on its industry, target market, and available resources, a corporation must make decisions about which goals to prioritise. Thus, when making judgements in various scenarios, businesses must carefully consider each priority. Because choosing between cost leadership and quality is one of the most important decisions that organisations must make. It is also anticipated that future researchers would contrast and elucidate these objectives within various decision-making contexts.

A study by Hussain et al. (2015) found that while smaller manufacturing firms typically place more emphasis on the "Know-What" attribute through their emphasis on flexibility and quality, large manufacturing firms tend to place greater emphasis on the "Know-Why" attribute in all four competitive priorities for achieving customer satisfaction. In order to do so, all managers must be capable of strategic thinking. Managerial choices have an effect on strategy and help bring about strategic transformation (Papulova & Papulova, 2006). Top management should use strategy to examine the surroundings carefully. Understanding alternate strategic goals and objectives as well as the capacity to analyze different environments are necessary for strategic thinking. In particular, small and medium-sized businesses that comprehend their clients can gain a competitive edge and profit from lower prices and customer loyalty. Then, increased capacity utilization may contribute to cost savings (Papulova & Papulova. 2006). Besides, other competing goals that necessitate thoughtful decision-making are speed and adaptability. Organisations must therefore balance the advantages and disadvantages of speed and flexibility. Quick decisions and effective procedures could be essential in sectors that move quickly, like technology or fashion. However, a more deliberate approach might be better in industries where predictability and stability are valued. Therefore, in order to strike the right balance between speed and flexibility, decision makers must assess the capabilities of their organization, the dynamics of the market, and client expectations.

Making decisions is often essential for figuring out competitive priorities and tactics. To make well-informed judgments, organisations need to carefully consider customer preferences, market trends, and their own capabilities. Effective decision making is essential for attaining a sustained competitive advantage, whether it is deciding between cost leadership and quality, speed and flexibility, or putting a differentiation, cost leadership, or focus strategy into practice.

## 5. Conclusion

This study provides baseline data for future comparisons and policymakers to analyze operations strategy and competitiveness, examining research evolutions and future trends. The study demonstrates areas for further analysis and potential solutions. It highlights the growing interest in operations strategy among academics, expanding across various disciplines. Research shows that underdeveloped countries have lower production, while wealthy countries produce quality articles and higher levels of cooperation. Regarding the thematic trending, 2000s focused on strategic planning, quality control, operations research, competitive priorities, product development, industrial economics; 2011 focused on supply chain management, manufacturing strategy, innovation, performance, sustainable development, cost optimization, and environmental management.

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Keyword network analysis uncovers key themes in operations strategy and competitiveness, offering conceptual groundwork for future scholars in fields requiring further empirical investigation. Contemporary studies on operation strategy and competitive advantage should focus on five clusters: manufacturing, competition, supply chain management, costs, decision-making, and sustainable development. Based on this clusters the main themes identified in this study are; 1) Manufacturing strategy, competitiveness and performance, 2) Supply chain management innovation, competitive advantage and sustainability, 3) Commercialization of environmental management towards sustainable development, 4) Economic aspects of operations strategy, and 5) Decision making on Competitive priorities and competitive strategies.



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