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Strategic Role of Supply Chain Performance Measurement in Enhancing Organizational Competitiveness: An Integrative Review

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Abstract

This research aimed to measure supply chain performance using a bibliometric analysis method. By examining a collection of scientific articles published between 2014 and 2023, the analysis identified evolving trends, central themes, and gaps in the field. The results showed a significant increase in supply chain performance and management publications identified as core elements of the topic and practice. Furthermore, the research emphasized the importance of agility, risk management, resilience, and information sharing in improving supply chain performance. These results contributed significantly to understanding the factors driving the evolution of supply chain performance and offered valuable insights for academics and practitioners addressing the dynamics, particularly in the context of improving organizational success in the challenging digital era.

Keywords: *Supply Chain Performance, Bibliometric Analysis, Supply Chain Management, Agility, Resilience.*

Introduction

In the context of increasingly competitive business dynamics, the measurement of supply chain performance is becoming a crucial element in determining the operational success of an organization (Asrol, 2017). Supply chain performance measurement does not only function as an instrument for achieving competitive advantage (Kara, 2024) but also provides greater control over the performance of an organization in a dynamic business environment (Asrol, 2017). Recent publications have shown a significant increase in both research and practitioner attention to the measurement of supply chain performance, recognizing the importance of strengthening the competitiveness and operational efficiency of an organization (Jamehshooran et al., 2015).

Effectiveness in supply chain performance, achieved by integrating supply chain antecedents such as business analytics, develops into a valuable strategic method for ensuring competitive advantage and improving overall achievement (Jamehshooran et al., 2015). In an ever-evolving business environment, competition has shifted from the individual organizational level to the overall supply chain level (Nugraha & Hakimah, 2019). This shift forces organizations to focus on supply chain performance as part of the most critical aspects across various industrial sectors (Balfaqih et al., 2016).

Supply chain performance has further evolved into a key component of an organization's competitive strategy with a primary focus on increasing productivity and profitability (Ul-Hameed et al., 2019). The continuous improvement not only provides direct benefits to the organization but also creates added value for customers and suppliers engaged at various levels of the supply chain (Fri et al., 2019). In this context, internal transformation in organizations is driven by the need to adapt to changing external conditions while strategic partnerships with external actors through supply chain collaboration are crucial in strengthening performance and increasing competitiveness (Novijanti et al., 2023). Additionally, advancement and innovation in logistics have significantly contributed to improving supply chain performance through more innovative and adaptive methods (Kara, 2024). The supply chain further plays an increasingly crucial role in overall business development, where continuous exploration and innovation are needed to continuously improve performance and ensure long-term competitive advantage (Tutuhatunewa et al., 2019).

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Bibliometric analysis is a research tool used to create a map of knowledge that describer the relationship between research topics and helps understand the direction of scientific development. This research is in line with of Aria et.al (2017), which plays an important role in introducing Biblioshiny with RStudio, Which can significantly simplify the bibliometric work map (Aria & Cuccurullo, 2017). Since incorporating Biblioshiny, Aria and his team have become pioneers in using bibliometric data to visualize research fields. Ongoing collaboration with university academics from several disciplines from several disciplines has resulted in numerous works that have set new benchmarks in specific fields (Altay et al., 2018; Aria, D'Aniello, et al., 2024; Aria et al., 2020; Aria, Le, et al., 2024; Aria & Cuccurullo, 2017; Cuccurullo et al., 2016; Di Cosmo et al., 2021; Fortuna et al., 2020; Leoni & Aria, 2021; Scarano et al., 2023). From 2014 to 2023, research on supply chain performance using Bibliometric analysis in the Scopus Journal was detected, with only 26 articles containing the keywords "Supply Chain Performance" AND "Bibliometric Analysis".

In the context of supply chain management, the measurement of performance has received substantial attention as organizations strive to drive business development by strengthening operational achievement and ensuring the implementation of long-term competitive advantage strategies. This literature review synthesizes research related to supply chain performance through a bibliometric analysis method, showing key themes, trends, and potential future publication directions. The bibliometric analysis focuses on articles published from 2014 to 2023 covering topics related to supply chain performance. This research further comprises various scientific publications including journal articles, conference papers, and academic reviews that have reached the final stage. All analyses are conducted based on publications registered in the Scopus database, aiming to identify dominant trends, research gaps, and key contributions from various articles in the field of supply chain performance.

Figure 1 visually shows the increasing trend in the number of publications discussing "Supply Chain Performance" from 2014 to 2023.

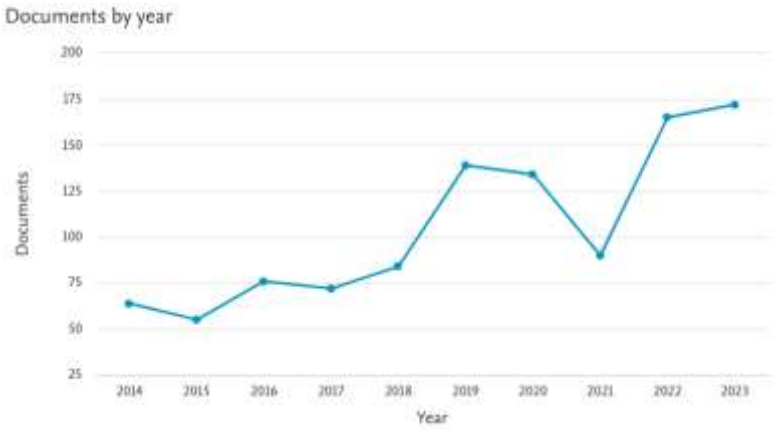

Figure 1. Research Trend in Supply Chain Performance

In Figure 1. It is visualized that there was a sharp decline in 2021 when this research was affected by the COVIC-19 pandemic, where the focus of the research shifted towards critical handling, rapid adaptation and short-team solutions to keep operations running. Research from 2020 to 2021 was heavily influenced by the context of the pandemic, with the main focus on increasing supply chain resilience in uncertain conditions.

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Using a bibliometric analysis method to the available literature, this research explores two questions which include the following.

1. RQ1: What are the main thematic clusters that define the field of Supply Chain Performance, and how have these clusters evolved?

2. RQ2: What disruptive factors are significantly reconfiguring the Supply Chain Performance landscape, and how can organizations proactively adapt to the evolving trends to ensure competitive advantage?

The significant contribution of this review lies in providing a comprehensive understanding of the current evolution and trends affecting supply chain performance based on an in-depth bibliometric evaluation. Therefore, this research aims to identify gaps in the existing literature that require further exploration and presents structured recommendations for future publication directions. The results are expected to provide valuable insights to the academic and practitioner communities, guide future publication initiatives, and inform Supply Chain Performance development strategies aimed at enhancing organizational success in the challenging digital era.

Literature Review

The existing literature emphasized the importance of measuring supply chain performance. In the last few decades, there have been a shift from traditional performance measurement methods to more sophisticated and integrated approaches. During the 1980s and early 1990s, numerous investigations proposed various performance frameworks for managing organizational achievement (Shaw et al., 2010). This development triggered a dominant research question in the operations management discipline, particularly since the mid-1990s on how these performance measurement systems should be developed and implemented (Neely, 2005).

A well-performing organization served as an indicator of a country's economic progress where discussions on business performance over the past three decades focused on the importance of the measurement, system models, and frameworks (Bititci et al., 2000; Neely, 1999; Neely et al., 2001; Venkatraman & Ramanujam, 1986). Currently, the competition among organizations in the marketplace had become increasingly unpredictable (Christopher & Holweg, 2011; Dubey et al., 2018). Performance measurement also played a critical role in managing and guiding organizations through the volatile and competitive global marketplace. It enabled organizations to track progress against the strategies, identified areas for improvement and acted as an effective benchmark against competitors or industry leaders. The information provided by performance measurement also allowed managers to make timely and informed decisions. Therefore, supply chain performance measurement was crucial for improving the efficiency and effectiveness of the entire supply chain (Gunasekaran et al., 2004). It identified areas for potential improvement, optimized business operations, and enabled responsiveness to dynamic market changes (Syahputra et al., 2020).

A depiction of the distribution of research documents related to Supply Chain Performance in various subject areas was presented in Figure 2. The strategic management component received significant emphasis, as evidenced by the majority of research being concentrated in the fields of Business, Management and Accounting (37.2%) as well as Decision Sciences (19.7%).

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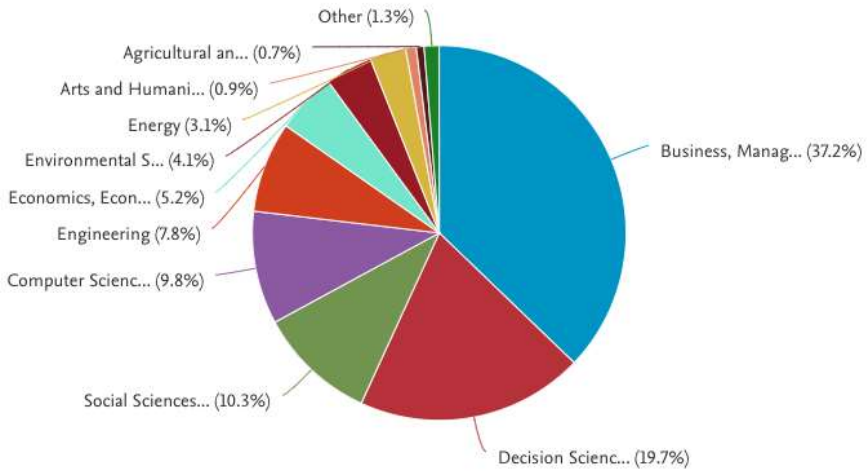

Figure 2. Supply Chain Performance Research Distribution

The main conclusion underscored the importance of a performance evaluation that provided feedback or information related to activities affecting customer satisfaction, expectations, and strategic objectives. This information was crucial for improving areas with inadequate performance, eventually leading to increased efficiency and quality (Chan, 2003). The research had important implications for evaluating supply chain performance which acted as an indicator of improving organizational performance to achieve a competitive advantage. This was achieved by observing the entire supply chain which was a key element in the competitive strategy to increase organizational productivity and profitability (Arzu Akyuz & Erman Erkan, 2010; Li et al., 2006). Furthermore, higher productivity and profitability supported the sustainability efforts in the business world (Nguyen & Sarker, 2018).

Various publications examining supply chain performance showed a significant empirical gap regarding the practical implementation and real-world challenges faced by organizations in measuring and improving performance from both financial and non-financial perspectives across industries (Baraka Israel et al., 2023). Although there was extensive literature examining performance metrics, less research explored how the metrics were effectively applied across sectors and the specific challenges organizations experienced in the process. Further exploration was needed to examine the benefits of measuring supply chain performance in a practical context, focusing on diverse industry settings.

Additional research was further needed to investigate the long-term impact of integrating sustainability into the supply chain function on overall business performance including challenges faced during implementation. Organizations with strong supply chain performance which were characterized by high reliability, flexibility, utility, and responsiveness, further improved the competitiveness in the market. Supply chain performance also contributed more to enhancing competitiveness than the direct influence of information technology, emphasizing the importance of focusing on performance in an organization's competitive strategy (Li et al., 2006).

Factors such as sourcing, manufacturing, and delivery significantly impacted sustainability performance which further influenced supply chain performance. In this context, planning evolved as the most contributing factor, followed by production and sustainability. This discovery outlined the importance of effective planning in improving supply chain performance, particularly in the context of sustainability (Katiyar et al., 2018).

Fundamental analysis of supply chain performance through a balanced method of measurement included both financial and non-financial metrics at the strategic, tactical, and operational levels. Comprehensive supply chain performance measurement not only supported strategic decisions but also improved the

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competitiveness and effectiveness of organizations. Therefore, it underscored the urgency to develop and implement a measurement framework that could better respond to global market dynamics (Gunasekaran et al., 2001).

Methodology

This research adopted a scientific mapping workflow established in previous publications. The process in Figure 3. of the research consisted of four stages, namely the scheme of the article, data collection, bibliometric analysis and visualization, as well as interpretation (Donthu et al., 2021; Nasir et al., 2020; Nugroho & Surendro, 2024).

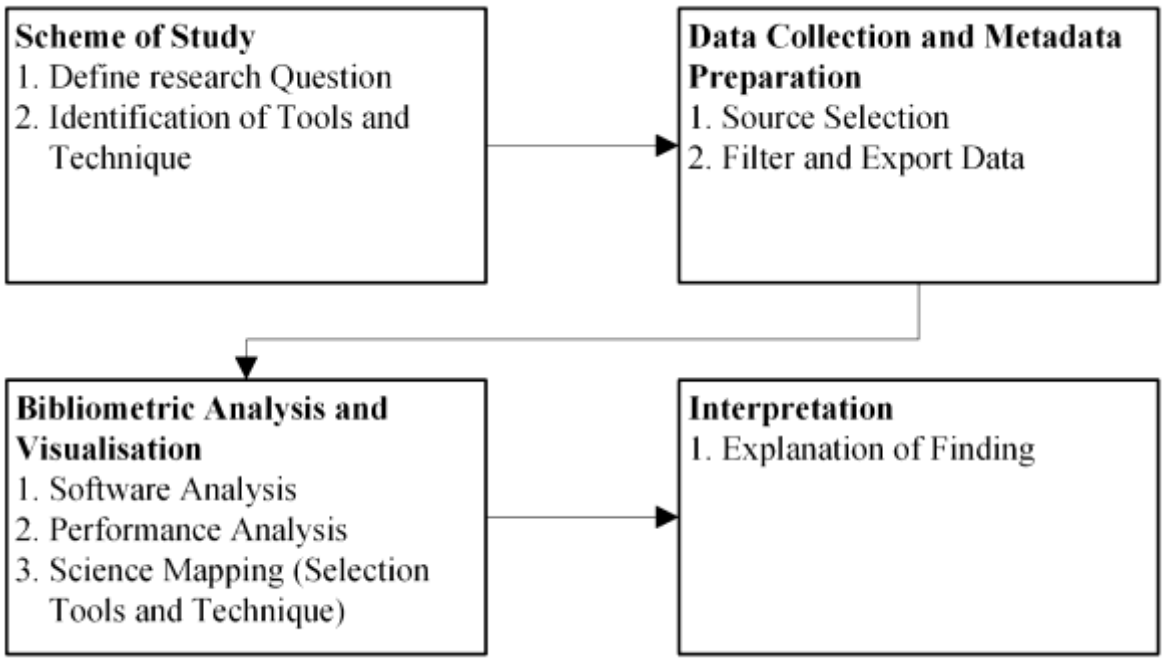

Figure 3. Bibliometric Analysis Step

A. Scheme of Article

Preparing a systematic review required a significant allocation of resources, and the search strategy used to find relevant material greatly influenced the success of the research (MacFarlane et al., 2022; Nugroho & Surendro, 2024). This stage included formulating specific and clear research questions which formed the foundation for the entire analysis process, determining the research focus, and direction of the data collection.

B. Data Collection

In this stage, data sources relevant to the research question were selected. Sources were selected from the reputable scientific database Scopus. Subsequently, in Table 1 is the relevant data were filtered to ensure that only information supporting the research objectives was used.

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Table 1. Completeness of metadata

Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
CR	Cited References	2	0.16	Good
AU	Author	3	0.24	Good
C1	Affiliation	7	0.57	Good
DE	Keywords	21	1.71	Good

C. Bibliometric Analysis and Visualization

This stage used BiblioShiny as a tool for conducting bibliometric analysis. The collected data were loaded and converted into a format suitable for analysis. Bibliometric analysis was further carried out to create a research map on the topic of supply chain performance and the evolution over time, enabling decisions regarding future policy development and publication strategies.

D. Interpretation

The final stage included interpreting the analysis results from the bibliometric analysis. These results were explained in the context of the initial research questions and within a broader context related to the development of the supply chain performance field.

Result

The metadata presented offered a comprehensive analysis of scientific publications produced between 2014 and 2023. These documents which were sourced from Scopus included 1,107 documents and included 2,772 authors. Over these nine years, there was a consistent annual increase with an average growth rate of 10.02% in the number of documents. This growth showed the rising interest and research activity in the field of supply chain performance articles as shown in Figure 4. Overall, this metadata reflected that the research field was dynamic and growing with extensive scientific contributions.

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Figure 4. Main Information Supply Chain Performance

In conducting bibliometric analysis, the "Most Relevant Sources" provided a visualization or list that identified the most frequently cited journals or publications in a particular research field as depicted in Figure 5. This visualization also emphasized the topics with the greatest contributions to research development. By reviewing the "Most Relevant Sources" list, the most influential journals were identified and recognized as authorities in the field, helping to understand evolving research trends.

Research on supply chain performance appeared prominently in reputable journals. The International Journal of Supply Chain Management evolved as the most dominant source with 105 published documents. Other significant journals included Uncertain Supply Chain Management and Sustainability (Switzerland) contributing 54 and 51 documents, respectively. The substantial number of published documents showed that intensive research efforts were focused on the field of supply chain performance. Overall, this analysis outlined key journals that significantly contributed to disseminating research in supply chain management, particularly focusing on topics such as uncertainty, sustainability, and logistics efficiency.

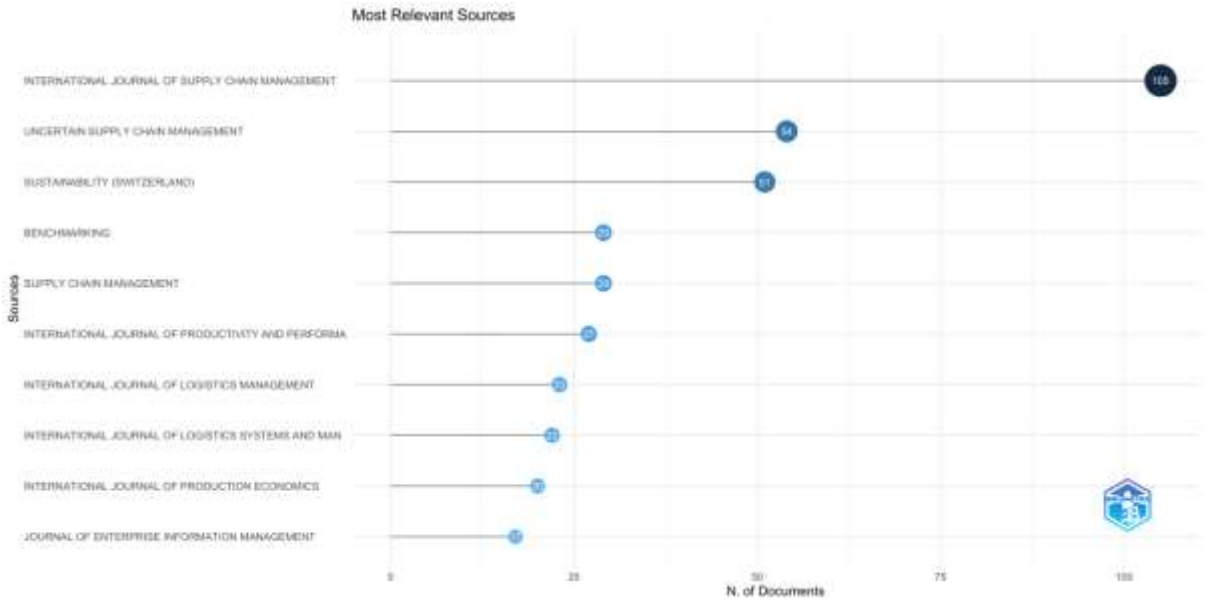

Figure 5. Most Relevant Sources Supply Chain Performance

Besides "Most Relevant Sources," the visualization performed using a word cloud in Figure 6 showed the frequency and relevance of keywords related to the supply chain performance topic. The word cloud further explained how research in supply chain performance referred to areas such as supply chain integration and performance measurement, sustainability, information sharing and collaboration, resilience, as well as technology.

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1. Supply Chain Integration and Performance Measurement

Supply chain integration and performance measurement were the most prominent terms in the word cloud, signifying the significance in discussions of performance. The integration was often considered crucial for improving efficiency and responsiveness, while performance measurement was essential for evaluating and enhancing efficiency.

2. Sustainability

Sustainability also appeared prominently, reflecting the importance of sustainable supply chain practices in evaluating performance. This included the efficient use of resources, waste reduction, and environmental impact management.

3. Information Sharing and Collaboration

Information Sharing and Collaboration underscored the importance of effective communication and cooperation among all supply chain stakeholders. Real-time information sharing and close collaboration improved visibility and synchronization, eventually benefiting supply chain performance.

4. Resilience

Resilience in the supply chain emphasized the ability to cope with disruptions, becoming increasingly important in the context of globalization and unexpected events such as pandemics or natural disasters.

5. Technology

Words such as Blockchain Technology and Industry 4.0 showed the crucial role of technology in the modern supply chain. Technologies including blockchain enhanced transparency while Industry 4.0 advanced automation and data analytics.

Figure 6. Word Cloud - Supply Chain Performance

Based on the analysis, research on supply chain performance strongly correlated with integration, effective performance measurement, sustainability, and resilience. Additionally, technology and collaboration played significant roles in supporting and enhancing these aspects. The word cloud in Figure 6. showed these themes as the main focus, supporting the relevance and importance of the research. The timeline of the

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word cloud further visualized the landscape of research developments in supply chain performance between 2014 and 2023.

From a supply chain performance perspective, this visualization provided a significant foundation for academic inquiry. The changes in key keywords over the past few years suggested a transformation in how organizations conceptualized and implemented performance measurement. Through a systematic analysis of the data, the research could identify the underlying evolution of these changes and determine the specific drivers of sustainability, resilience, and technology that warranted further exploration and implications for future publications. Furthermore, this research could serve as a stepping stone in developing more strong and adaptive performance measurements, effectively supporting organizations in achieving strategic objectives in increasingly complex and competitive business environments.

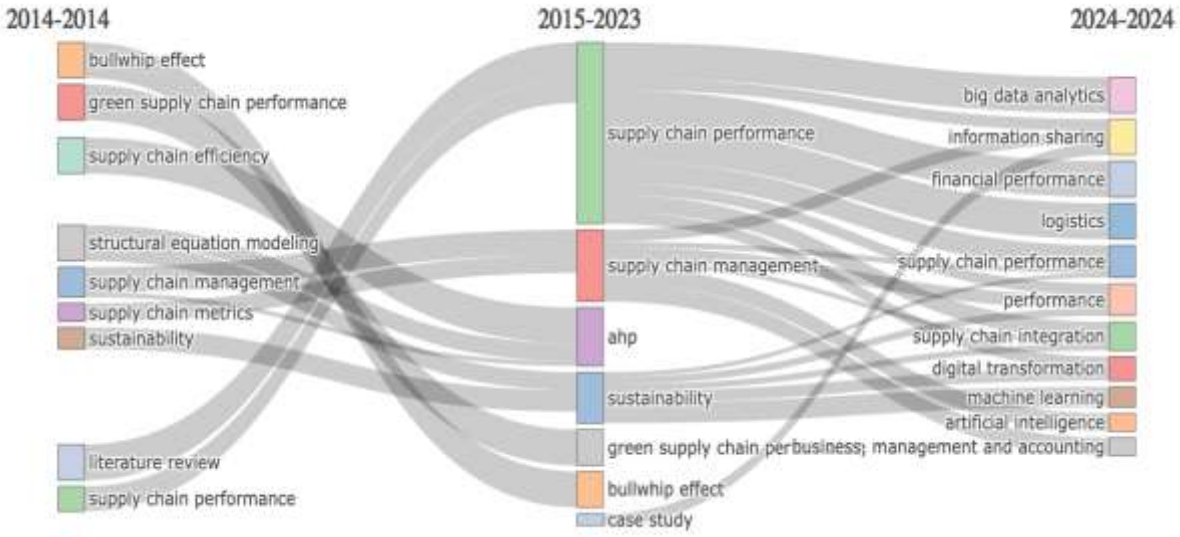

Figure 7. Thematic Evolution - Supply Chain Performance

Thematic evolution in supply chain performance as shown in Figure 7 showed how research themes evolved and shifted over time. This thematic evolution map showed that from 2014 to 2024, the concept of "supply chain performance" transitioned from a relatively simple method to a more complex one, integrating advanced technology. This shift reflected an increased focus on technologies such as big data, machine learning, and digital transformation, alongside a greater emphasis on sustainability and resilience in the supply chain. The thematic evolution map further showed that research and implementation in the field had progressed from merely managing basic efficiency and sustainability to incorporating advanced technologies. This trend suggested the changing priorities of organizations, increasingly relying on technology to build more adaptive, efficient supply chains capable of addressing complex global challenges.

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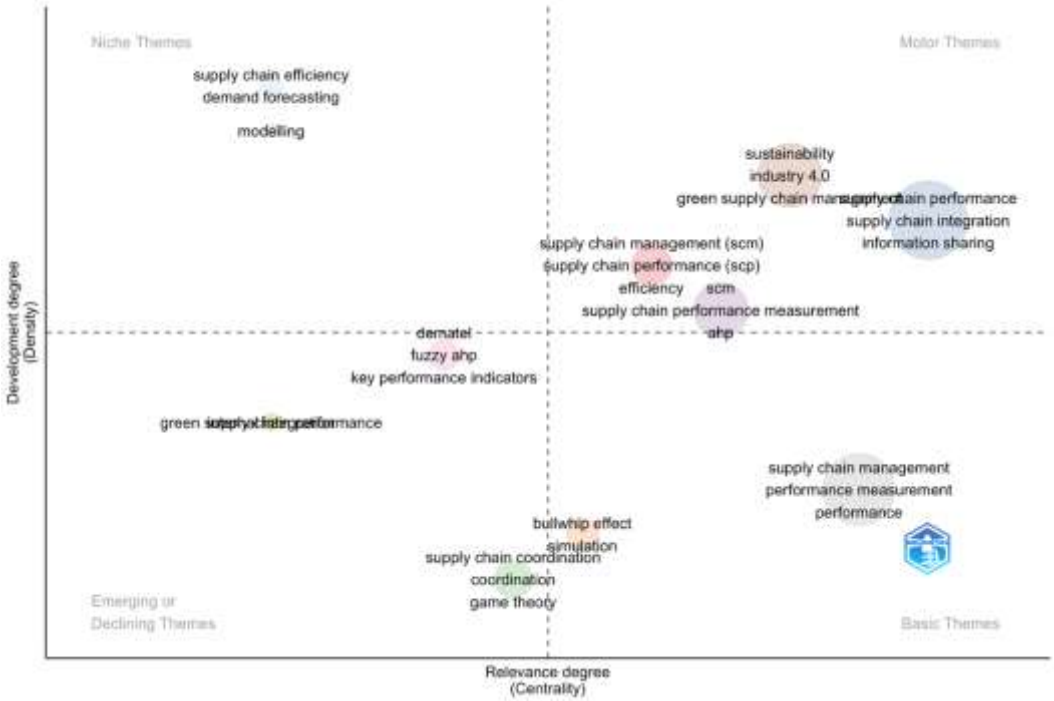

Figure 8. Thematic Map - Supply Chain Performance

The Thematic Map in Figure 8 showed that from 2014 to 2024, there was a significant shift in research and practice within the supply chain field towards a more sophisticated method. Key themes such as sustainability, supply chain integration, and the adoption of Industry 4.0 technologies evolved as major drivers in this evolution. Research on supply chain management correlated with the current themes in the Motor Themes quadrant, namely Supply Chain Performance and Supply Chain Performance Measurement with the following key points.

1. Supply Chain Performance: Operational efficiency was crucial for minimizing costs and cycle times while maintaining high quality. Supply chain agility enabled quick responses to market changes, while sustainability ensured environmentally and socially responsible operations. Collaboration and integration among stakeholders further enhanced visibility and synchronization where resilience allowed recovery from disruptions, and customer satisfaction reflected the supply chain's ability to meet expectations.

2. Supply Chain Performance Measurement: Establishing relevant key performance indicators (KPIs) enabled the evaluation of supply chain effectiveness. A data-driven method and a balanced scorecard provided a holistic, evidence-based view. Benchmarking compared industry best practices, while sustainability measurement assessed environmental and social impacts. Risk analysis prepared the supply chain for disruptions, and continuous improvement methodologies such as Six Sigma and Lean ensured current performance enhancement.

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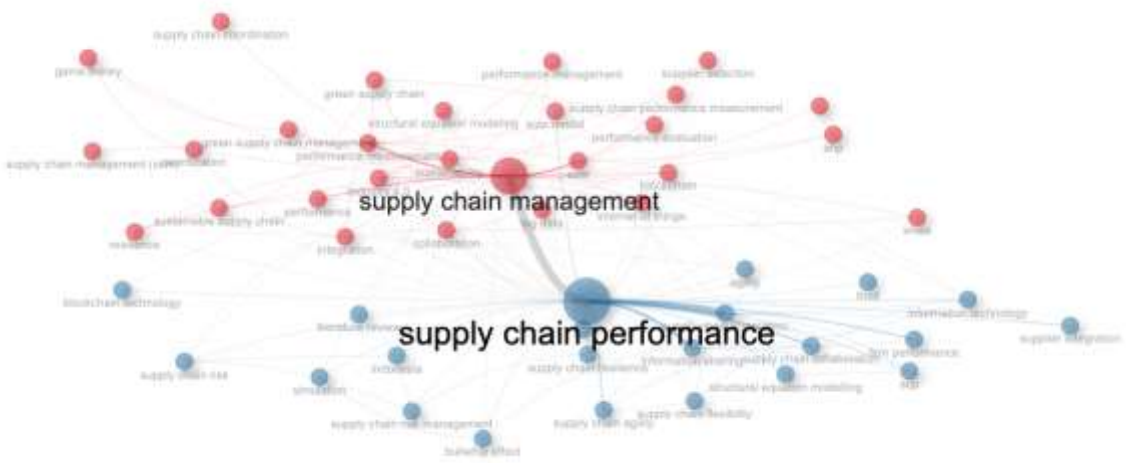

Figure 9. Co-Occurrence Supply Chain Management

In Bibliometric analysis, a co-occurrence network was used to identify and analyze relationships between keywords, terms, or concepts frequently appearing together in scientific literature. This network allowed experts to map key themes often discussed in tandem. By exploring these relationships, a co-occurrence network suggested deep interactions between different topics and how the concepts impacted each other.

These networks could evaluate the evolution of topics over time, helping experts identify evolving research trends and shifts in focus within a particular field. Another important function was the ability of these networks to show research gaps, areas with few or no explored relationships between important concepts, suggesting new opportunities. Co-occurrence networks in bibliometric analysis were crucial tools for visualizing knowledge dynamics, identifying trends and patterns, and finding new opportunities for further scientific exploration.

In Figure 9, the Co-occurrence Network showed the close relationship between supply chain performance and management, suggesting that both were core elements in the research and practice of supply chain management. Furthermore, supply chain performance had significant relationships with sub-themes such as agility, risk management, resilience, and information sharing, outlining the importance of these aspects in improving performance. These relationships suggested that agility, resilience, risk management, and effective information sharing were essential components in creating a resilient and responsive supply chain capable of adapting to market dynamics.

Conclusion

In conclusion, the research showed that articles on supply chain performance experienced significant growth in recent years based on the results of the bibliometric analysis. Several important results related to RQ1 included the following.

1. **Supply Chain Integration and Performance Measurement:** This theme remained a significant focus, underscoring the importance of comprehensive performance measurement to improve supply chain efficiency and effectiveness.

2. **Sustainability:** Growing awareness of environmental issues drove research on sustainable supply chain practices, integrating social and environmental aspects into performance measurement.

3. **Technology:** The adoption of technologies such as blockchain, big data, and artificial intelligence transformed the supply chain landscape, enabling better decision-making and increased efficiency.

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4. **Resilience:** The ability of the supply chain to recover from disruptions became an increasingly important concern, particularly in the aftermath of events such as the COVID-19 pandemic.

5. **Collaboration:** The importance of collaboration among various stakeholders in the supply chain gained recognition for the role in improving visibility and coordination.

The bibliometric analysis further identified several driving forces changing the supply chain performance measurement landscape, addressing RQ2. The disruptive factors that significantly reconfigured the supply chain performance landscape included the following.

1. **Technological Change:** The adoption of new technologies such as artificial intelligence, the Internet of Things, and robotics changed how organizations managed supply chains.

2. **Globalization:** The increasing complexity of global supply chains and geopolitical uncertainties introduced new challenges.

3. **Sustainability:** Pressure from consumers and regulators compelled organizations to adopt more sustainable business practices**.**

4. **COVID-19 Pandemic:** The pandemic accelerated the adoption of digital technologies and increased awareness of the need for a resilient supply chain.

To proactively adapt, organizations needed to adhere the following recommendations:

1. **Apply Technology:** Leverage technology to enhance supply chain visibility, efficiency, and flexibility.

2. **Build Resilience**: Identify and mitigate risks while developing contingency plans for disruptions.

3. **Focus on Sustainability:** Adopt sustainable business practices to reduce environmental and social impacts.

4. **Enhance Collaboration:** Foster strong partnerships with suppliers, customers, and other stakeholders.

5. **Monitor Trends:** Continuously monitor industry developments and adjust business strategies as necessary.

The bibliometric analysis showed that research on supply chain performance increased, focusing on integration, sustainability, technology, resilience, and collaboration. Organizations aiming to maintain a competitive advantage needed to proactively adapt to the changing business landscape by adopting new technologies, building resilience, and prioritizing sustainability. Future publications should also explore the impact of disruptive factors on supply chain performance and develop a more comprehensive and adaptive performance measurement framework.

Research on supply chain performance significantly contributed to understanding how organizations could achieve a competitive advantage and reach strategic goals. However, some gaps remained that warranted further exploration including the following.

1. **Simulation Modeling:** Developing simulation models to analyze the impact of different scenarios on supply chain performance.

2. **Cross-Cultural Analysis:** Comparing supply chain performance practices across countries and cultures.

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3. **Developing New Performance Metrics:** Developing more relevant metrics to measure supply chain performance in response to evolving business dynamics.

Author Contributions

The conception and design of the study were carried out by Agus Rahayu and Lili Adi Wibowo. Retno Setyorini was responsible for the analysis and interpretation of the data. The drafting of the paper and its critical revision for intellectual content were done by Mokh. Adib Sultan the final approval of the version to be published was given by Retno Setyorini. Every author acknowledges their responsibility for all aspects of the work.

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No potential conflict of interest was reported by the author(s).

Data Availability Statement

Data available on reasonable request from the corresponding author.

Additional Information

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This research received no external funding

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Dean of FPEB UPI (2016-2020), Vice Chancellor for Resources and Finance, UPI (2020-2022), and Vice Chancellor for Innovation, Culture and Information System, UPI (2022-present).

Lili Adi Wibowo

Dr. Lili Adi Wibowo, S.Sos, S.Pd., MM, is an Associate Professor at Universitas Pendidikan Indonesia, specializing in business management and marketing. He earned his Doctorate in Business Management from Universitas Padjadjaran in 2009, where his dissertation explored the impact of experiential marketing and emotional branding on customer loyalty. Before that, he completed his Master of Management (MM) at the same university in 2002, with a thesis examining the relationship between product quality, service quality, and customer satisfaction. Dr. Lili also holds a Bachelor's degree in Social Welfare from Sekolah Tinggi Kesejahteraan Sosial (STKS) and a Bachelor's degree in Business Management Education from Institut Keguruan dan Ilmu Pendidikan (IKIP) Bandung. His expertise lies in business management and marketing, focusing on developing competitive business models, strategies, and management practices. He has extensive experience in entrepreneurship development, particularly within academic settings, where he has played a pivotal role in fostering entrepreneurial ecosystems and driving innovation. His proficiency in digital marketing, particularly sensory marketing and e-commerce for SMEs, further enhances his ability to address contemporary marketing challenges. He has obtained certifications, including Certified Strategic Business Analysis (CSBA) and Certified Business Operation Associate (CBOA), as well as certifications in Digital Marketing, Creative Thinking, and Change Management. His research interests include entrepreneurship and business ecosystems, digital marketing, brand loyalty, and SME development. He is particularly keen on exploring the application of digital sensory marketing to enhance consumer engagement and investigating the impact of innovation on SME performance through strategic management and digital tools.

Mokh. Adib Sultan

Dr. Mokh Adib Sultan is an Associate Professor at Indonesian Education University (UPI) with a robust educational background in Industrial Engineering and Management. He earned his Doctorate in Economics from Universitas Sebelas Maret in 2015 and his Master's degree in Transportation from Institute of Technology Bandung (ITB) in 2005. His areas of expertise include supply chain management, marketing management, operations management, and business planning and simulation. These competencies are further strengthened by various professional certifications, such as Certified Strategies Business Analysis (CSBA), Certified Business Operation Associate (CBOA), and certifications in Digital Marketing and Change Management. He is actively engaged in research, primarily focusing on developing sustainable and resilient supply chain models, digital transformation, business model innovation for SMEs and the creative industry, as well as consumer behavior studies. His recent research projects include designing consumer behaviour models for brand sustainability and developing sustainability supply chain models to enhance the export competitiveness of coffee products. He has also contributed to the development of green supply chain models aimed at improving the competitiveness of environmentally friendly products. His expertise and research interest demonstrate a strong commitment to integrating technology and innovation in supply chain management and optimizing business strategies for sustainability and economic growth. With extensive academic and professional experience, he continues to make significant contributions to the fields of supply chain management and business management in Indonesia.

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