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Supply Chain Performance Measurement: Systematic Literature Review & Bibliometric Presentation

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Abstract:
Assessing supply chain efficiency is essential to making sure efficiency, competitiveness, and sustainability in an increasingly complex global market. This systematic literature review aims to consolidate existing knowledge on supply chain performance measurement by employing fundamental basic tools and bibliometric analysis. The review explores various frameworks and methodologies that have been proposed and applied across diverse industries. By synthesizing findings from peer-reviewed papers, case studies and industrial reports, the paper identifies the key performance indicators commonly used in supply chain assessments, such as cost, customer service, asset management, quality, productivity, customer performance measurement, competitive performance measurement, and time. A structured approach is employed to categorize the tools and techniques utilized in performance measurement, including balanced scorecards, activity-based costing, and the SCOR Model. The study highlights the evolution of these tools over time and their adaptability to different supply chain contexts, from traditional manufacturing to contemporary e-commerce environments. Furthermore, the paper discusses the challenges and limitations associated with current performance measurement practices, such being problems with data quality, integration challenges and the requirement for a comprehensive strategy that includes risk management and sustainability. In addition to traditional literature review methods, this research employs bibliometric analysis techniques, such as citation and co-citations analysis, to identify influential works and new developments in the field. The bibliometric analysis reveals significant growth in research output over the past two decades, with notable contributions from key scholars and institutions. By providing a comprehensive overview of the literature, this review offers insightful observations for researchers and professionals seeking to refine their evaluation of performance strategies. The results highlight the significance of adopting a balanced and integrative approach to capture the multifaceted nature of supply chain performance. Future research directions are proposed to address gaps in the literature and to explore innovative methodologies for more reliable and flexible assessment of the supply chain's performance.

Keywords:
Supply chain performance, Key performance indicators, Balanced scorecards, SCOR model, Benchmarking and Bibliometric Analysis.

1. Introduction-

In a time when technology breakthroughs and globalization have drastically changed the economic landscape, supply chain performance evaluation has become a crucial component of organizational strategy. The supply chain, which includes the complete process from acquiring raw materials to shipping the final product, is crucial for determining the effectiveness, sustainability, and competitiveness of a company. Measuring the supply chain performance effectively helps with long-term planning and strategic decision-making in addition to improving operational efficiency. There is an urgent need for strong frameworks and procedures to appropriately evaluate performance as supply networks become more complicated. Using core methodologies, this comprehensive literature review's primary objective is to compile the current knowledge on evaluating the supply chain's performance. Examining the many frameworks and methodologies that have been published and applied across a range of sectors is the purpose of this review. This study aims to determine the key performance indicators that are often used in supply chain assessments by integrating information from industry reports, case studies, and peer-reviewed literature. Cost, customer service, asset management, quality, productivity, competitive performance measurement, customer performance measurement, and time are some of these KPIs. Organizations looking to gain a competitive edge and optimize their supply chain operations must comprehend these KPIs.

The instruments and methods used in performance measurement are categorized using an organized method. The SCOR Model, activity-based costing, balanced scorecards, and benchmarking are a few of the most well-known approaches. Every one of these instruments provides distinct perspectives and advantages, adding to a thorough comprehension of supply chain efficiency. For example, the balanced scorecard offers a multifaceted viewpoint that harmonizes operational activities with the strategic goals of the company. Activity-based costing improves efficiency and cost management by providing a more precise cost allocation. Known for its adaptability, a standardized framework for evaluating supply chain operations is provided by the SCOR Model. Contrarily, benchmarking enables companies to assess their performance in relation to industry best practices, promoting ongoing development.

The paper also emphasizes how these tools have changed over time and how they may be applied to a variety of supply chain scenarios, including modern e-commerce sites and conventional manufacturing settings. In today's dynamic market, supply networks must be adaptable and sensitive to shifts in demand, technical breakthroughs, and worldwide disruptions. This flexibility is especially important. Notwithstanding the progress made in performance measurement techniques, a number of obstacles and restrictions still exist. Important areas of concern include problems with data quality, challenges with integration, and the requirement for a comprehensive strategy that includes risk management and sustainability. These difficulties highlight how difficult it is to measure supply chain performance effectively and how important it is to continuously improve evaluation methods. By providing a comprehensive overview of the literature, this review offers insightful information for practitioners and scholars aiming to refine their performance measurement strategies. The results highlight the significance of adopting a balanced & integrative approach to capture the multifaceted nature of supply chain performance. Additionally, this paper proposes upcoming studies directions to complete the literature's gaps and explore innovative methodologies for more robust and dynamic performance measurement in supply chains. Through this review, the paper adds to the continuing discussion on supply chain management and performance evaluation, ultimately supporting organizations in their quest for operational excellence and sustainability. Table 1 shows the different elucidation by the authors.

Table 1: Different Elucidation by the authors

Sr. No.	Year	Authors	Elucidation
01	2022	Wong et al.	The *"Performance evaluation of supply chain"* involves the assessment of chain of supplies processes to ensure efficiency, effectiveness, and adaptability in dynamic markets.
02	2021	Queiroz et al.	Utilization of analysis of dataset and performance metrics to assess the operational and supply chain operations' strategic effectiveness.
03	2021	Tiwari et al.	The performance measurement involves evaluating key metrics such as cost, time, quality, and flexibility to optimize supply chain functions."
04	2020	Gupta and George	The evaluation of supply chain activities and outcomes using quantitative metrics to drive decision-making and continuous improvement.
05	2020	Ivanov and Dolgui	An all-encompassing strategy to measuring the effectiveness of supply chain networks, focusing on cost efficiency, service levels, and sustainability.
06	2019	Choi et al.	A structured methodology for assessing supply chain performance, emphasizing resilience, agility, and customer satisfaction.
07	2019	Kumar et. al.	The systematic assessment of supply chain operations using KPIs to ensure alignment with organizational goals and market demands.
08	2018	Govindan et al.	It is the process of utilizing key performance indicators to monitor, analyze, and improve supply chain operations for better strategic alignment.
09	2018	Schoenherr and Speier-Pero	A thorough foundation for monitoring and improving the evaluation of supply chain through real-time data analysis and strategic KPIs.
10	2017	Dubey et al.	The process of monitoring and controlling supply chain operations to improve competitiveness and adapt to shifting market conditions.
11	2013	N. Chandrasekaran	SCM is a crucial strategic component for boosting organizational performance and accomplishing objectives including enhanced profitability, better customer service, and competitiveness. The supply chain performance metrics, including those for quality, customer service, productivity, and cost, are covered in this book chapter.
12	2008	Annilie Pettersson	With the focus shifting to supply chain management, performance assessment is becoming increasingly crucial. Time, quality, and cost are the three main metrics, Numerous different measurements are based on these three categories. Performance, both internal and external, is another area of concern.

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2. Review Methodology-

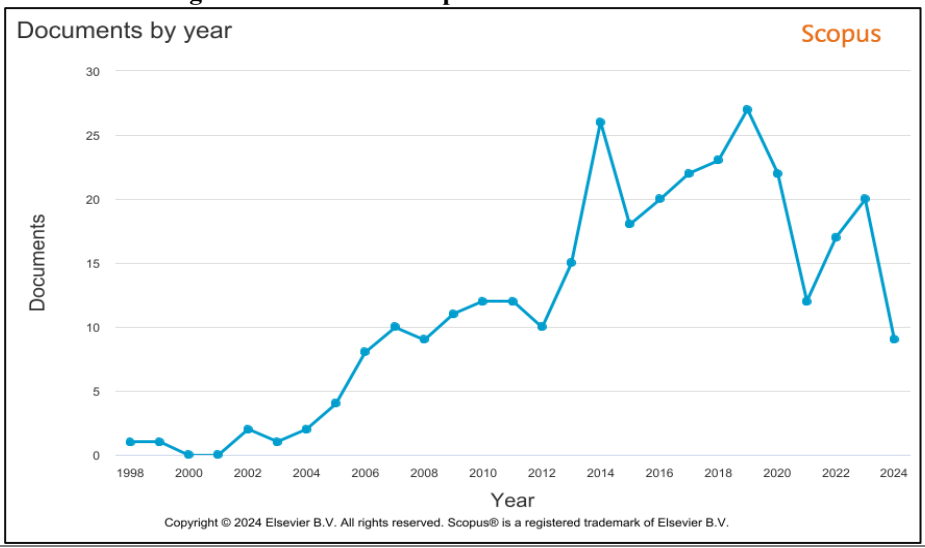
There have only been a few literature evaluations on performance measurement of supply chains networks, with some concentrating regarding sustainability and other aspects of the supply chain overall. The research articles for the review that may be accessed with the aid of different journal websites were initially found using the Scopus database and database provided the CSV file for download. The term "Supply chain performance measurement" appeared in 314 papers between 1998 and 2024. A taxonomy of the 314 articles has been created, and 31 of them are deemed to be much more pertinent to the subjects that overlap with supply chain and performance assessment. Because of this, the review of this study is predicated on 31 publications from prestigious journals.

Table 2 shows the distribution of these papers among the journals.

Scopus Datebase
Search Keyword: Supply Chain Performance Measurement
Time Framework: 1998-2024
314 Articles
31 Relevant Articles Selected

The Scopus Database's year-by-year publishing graph is displayed in Figure 1. According to the graph, various papers in the supply chain performance assessment literature has consistently grown.

Figure: 1 Year Wise Graphical Distribution of Publication



Year	Document	Year	Document	Year	Document
1998	1	2007	10	2016	20
1999	1	2008	9	2017	22
2000	0	2009	11	2018	23
2001	0	2010	12	2019	27
2002	2	2011	12	2020	22
2003	1	2012	10	2021	12

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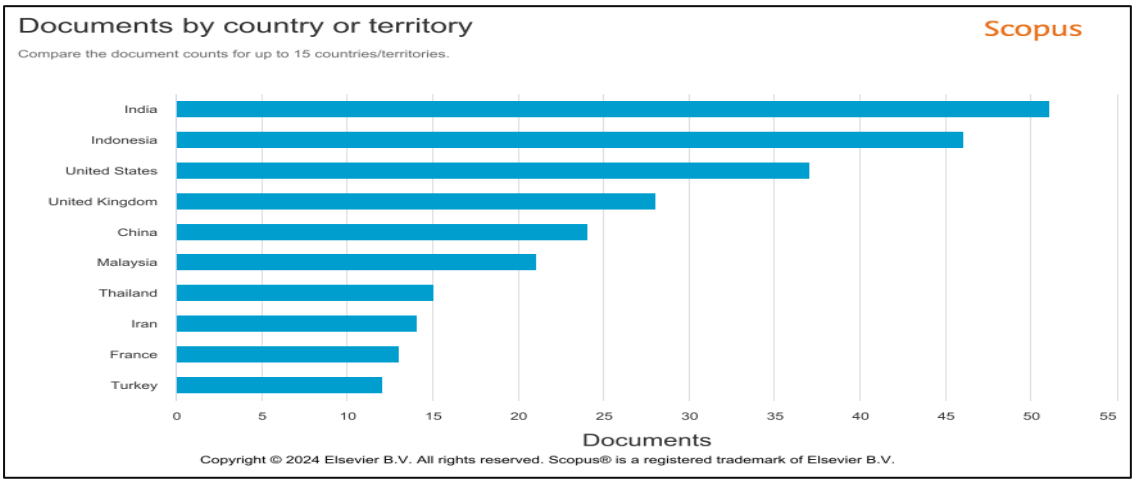
2004	2	2013	15	2022	17
2005	4	2014	26	2023	20
2006	8	2015	18	2024	9

Table: 2 Year Wise Tabular Distribution of Publication

India, Indonesia, United States, United Kingdom, China and Malaysia lead in the researches in Supply Chain Performance Measurement (Figure: 2). India's contribution is highest with 51 documents, Indonesia has 46 documents, United States has 37 documents, United Kingdom has 28 documents, China has 24 documents, Malaysia has 21 documents, Thailand has 15 documents, Iran has 14 documents, France has 13 documents, Turkey has 12 documents, Hong Kong has 9 documents, Finland has 8 documents, Canada, Italy, Portugal has 7 documents, Brazil, Morocco, Singapore, United Arab Emirates has 6 documents, Bangladesh, Germany, Saudi Arabia, Spain, Tunisia has 5 documents, Australia, Iraq, Netherlands, South Korea has 4 documents, Egypt, Japan, Pakistan, Poland, Serbia, Taiwan has 3 documents, Austria, Belgium, Denmark, Greece, Ireland, Mexico, Switzerland has 2 documents, Colombia, Ethiopia, Ghana, Latvia, New Zealand, Norway, Peru, Russian Federation, Sweden, Viet Nam has 1 documents and 4 is undefined documents.

Figure: 2 Documents by Country

A plethora of scholars have delineated their model or framework (Figure 3) via their work on articles, conference papers, book chapters, reviews, books, and erratums. Displaying the distribution by table in **Table: 3**



Document Type	Documents
Articles	171
Conference Papers	93
Book Chapters	25
Review	19
Conference Review	3
Book	2
Erratum	1

Table: 3 List of Document Type

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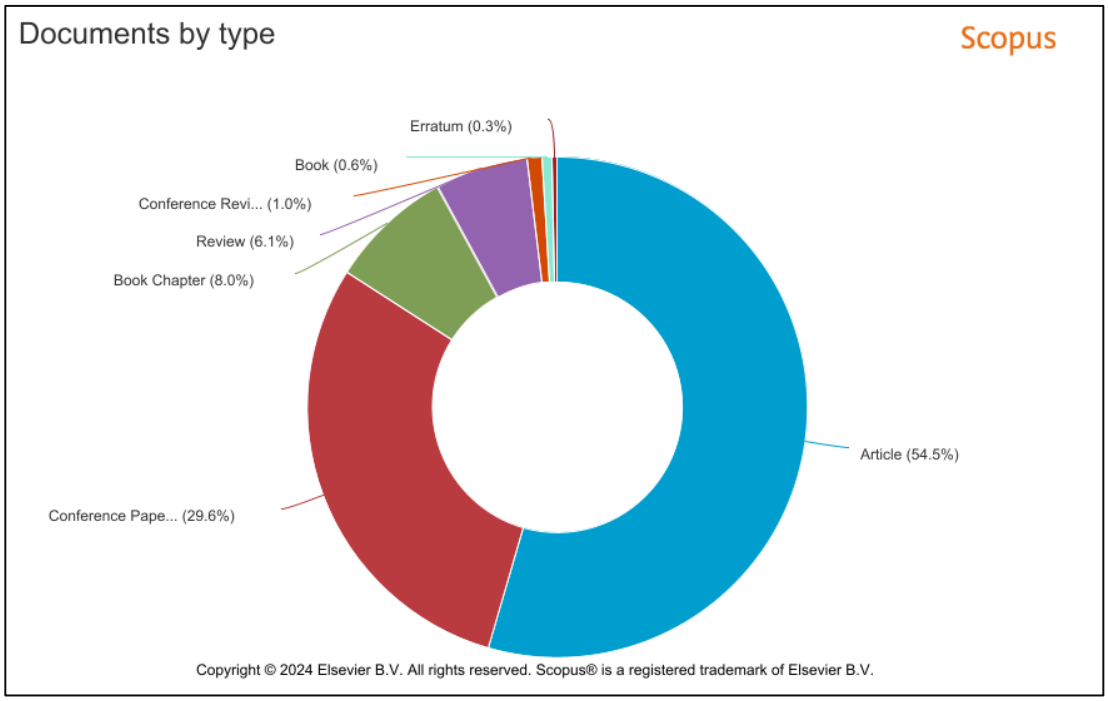


Figure: 3 Graphical Presentation of Document Type

Table: 4 Classification with respect to Findings/Results/Focus

Sr. No.	Authors	Year	*Title*	Findings/Results/Focus
1	Wulandari, Ratna *et al.*	2023	*"Halal Supply Chain Performance Measurement Model in Food Industry Using SCOR Model, AHP Method and OMAX"*	The study developed a system for measuring the performance of a company, identifying areas for improvement and strengths in reliability, responsiveness, and cost. The system includes a dashboard, specification, input data, and productivity pages for analysis. It aims to mitigate risks and enhance overall performance, referencing previous relevant studies.
2	Saleheen, Ferdoush *et al.*	2023	*"Supply chain performance measurement for manufacturing industry: A study during pandemic (Covid-19)"*	Beyond the constraints of current models such as the Balanced Scorecard and the supply chain operations reference model, an integrated Supply Chain Performance assessment model is presented, providing a more complete approach to performance assessment in the contemporary setting.
3	Asrol M. *et al.*	2022	*"Supply Chain Performance Measurement and Improvement for Forging Industry"*	Utilizing the Supply Chain Operation Reference (SCOR) model and the Analytical Hierarchy Process (AHP) proved effective in analyzing supply chain performance within the forging industry. The SWOT analysis was instrumental in identifying areas needing improvement, leading to the development of initiatives
4	Rahiminezhad Galankashi M. *et al*	2022		

			"Financial performance measurement of supply chains: a review"	aimed at enhancing overall efficiency and effectiveness.
5	Govindan K.; *et al.*	2022	*"Supply Chain 4.0 performance measurement: A systematic literature review, framework development, and empirical evidence"*	The most commonly used metrics for assessing financial performance in supply chains include COST, ROA, Turnover, Net Sales, Asset turnover, profit margin, return on investment, Cash-to-Cash Cycle, Market Share, revenue growth and EVA.
6	Sardjono W. *et al.*	2021	*"Supply chain measurement in the industry 4.0 using balanced scorecard"*	The study report outlined 14 essential Industry 4.0 technologies and ideas that are critical to improving supply chain efficiency. A framework including 4.0 Procurement, 4.0 Manufacturing, 4.0 Logistics, and 4.0 Warehousing dimensions was devised in the study to investigate the possible supply chain performance metrics that may be attained with the aid of 4.0 technologies.
7	Sholeh M.N. *et al.*	2021	*"Implementation of construction supply chain flow based on SCOR 12.0 performance standards"*	The study article highlights the importance of utilizing the Balanced Scorecard approach to measure supply chain performance in the context of Industry 4.0. It highlights how supply chains are affected by technology breakthroughs, how realignment is necessary, and what the Internet of Things may provide supply chain managers. The technique helps to navigate digital complexity for better output. Efficiency, integration, transparency, cooperation, flexibility, and responsiveness were among the supply chain process dimensions that were improved via the application of information technology.
8	Susanto N. *et al.*	2021	*"Supply chain performance measurement with supply chain operation references approach (A case study in a batik company)"*	The study concentrated on a number of performance indicators, including total supply chain management costs, cost of goods sold, cash-to-cash cycle time, return on supply chain fixed assets, and return on working capital. Other indicators included perfect order fulfillment and order fulfillment cycle time.
9	Nguyen T.T.H. *et al.*	2021	*"Supply Chain Performance Measurement using SCOR Model: A Case Study of*	The SCOR method was employed to assess the supply chain performance of a Batik company. The results showed average performance with key indicators in the source, make, deliver, and return categories in need of improvement. Strategies like supply network optimization and flexible
10	Lehyani F. *et al.*	2021		supply base were among the

			the Coffee Supply Chain in Vietnam"	recommendations. Subsequent investigations may include Green Supply Chain management within the batik sector.
11	Xie Y. *et al.*	2020	*" Defining and Measuring Supply Chain Performance: A Systematic Literature Review"*	Using the SCOR model, the research assesses the Kontum, Vietnam coffee supply chain, highlighting areas for improvement in production, delivery, sourcing, and planning and offering suggestions for improvement.
12	Khan S.A. *et al.*	2020	*"Intelligent supply chain performance measurement in Industry 4.0"*	The study papers focus on evaluating supply chain performance, emphasizing key metrics such as cost, quality, flexibility, and customer satisfaction. Various techniques and tools are utilized for assessment and improvement.
13	Matondang N. *et al.*	2019	*"Supply chain performance measurement systems: A qualitative review and proposed conceptual framework"*	The study addresses Industry 4.0 supply chain management and suggests a framework for performance evaluation based on important features. Emphasizing the integration of current technology, it aims to boost supply chain efficiency.
14	Kusrini E. *et al.*	2019	*"Measurement and Proposed Improved Supply Chain Performance approach with PDCA frame work"*	The research papers emphasize how SCPMS must change in order to keep up with new developments like Industry 4.0. In order to increase efficacy, suggested frameworks place a strong emphasis on combining qualitative and quantitative criteria, expert knowledge, technology adoption, and matching supply chain architecture with performance assessment.
15	Widyarto W.O. *et al.*	2019	*"Supply Chain Performance Measurement Using Supply Chain Operation Reference (SCOR) 12.0 Model: A Case Study in A Leather SME in Indonesia"*	The primary goal of the study was to assess supply chain effectiveness using the SCOR method. It identified critical performance indicators in the red category, such as raw material planning, order fulfillment, timely delivery, product quality, shipping expenses, and customer complaints, which require immediate improvement.
16	Tripathi S. *et al.*	2019	*"Key performance indicators on supply chain performance measurement in an electronic commerce: A literature review"*	The research paper concludes that to enhance overall performance, the textile and fashion apparel industry company must improve in several areas, including forecasting, supplier collaboration, cost management, logistics, product returns, and systematic supply chain performance.
				The study publications stress how crucial it is to gauge supply chain effectiveness in online sales. Among the determined key

17	Jagan Mohan Reddy K. *et al.*	2019	*"A current review of supply chain performance measurement systems"*	performance indicators (KPIs) are sales, profitability, ROI, operating expenses, customer support, and delivery time. To evaluate KPIs, investigate novel techniques to measurement, and create a comprehensive measurement model, more study is advised.
18	Lemghari, R. *et al.*	2018	*"A review on supply chain performance measurement systems"* *'Supply chain performance measurement: A case study about applicability of*	The articles that have been evaluated stress the significance of monitoring supply chain performance and go over different approaches, KPIs, and frameworks. The two main concepts that are emphasized are alignment with corporate strategy and continuous development.
19	Guersola, M. *et al.*	2018	*SCOR model in automotive industry firm"*	According to the report, the most often used performance monitoring tool in supply chain management is the balanced scorecard. It highlights the need for more study in supply chain performance modeling using simulation approaches and offers recommendations for how decision makers can choose appropriate systems and indicators.
20	Saleheen, F. *et al.*	2018	*"Supply chain performance measurement: a systematic literature review"*	The research utilizes the Supply Chain Operations Reference model to evaluate supply chain performance in the automobile sector. The focus is on achieving strategic coherence by matching performance measurements to company objectives. Using a case study, the SCOR model's application to increase operational efficiency is shown, along with its advantages and disadvantages for further study and business applications.
21	Moharamkhani, A. *et al.*	2017	*"Supply chain performance measurement model: A literature review"*	The assessment of the literature reveals an increasing interest in measuring supply chain performance, although additional study is required to verify frameworks. Lean supply chains, decision theory, and sustainability are all the subject of numerous research. Measurement becomes more difficult when there are conflicts between the groups that utilize AHP and DEA. Proposals should be tested, and obstacles should be addressed, in subsequent studies.
22	Maestrini V. *et al*.	2017		The literature review reveals a growing interest in measuring supply chain performance, but further research is needed to validate the frameworks. Lean supply

23	Rosado J.O. *et al.*	2016	*"Supply chain performance measurement using SCOR model based on interval-valued fuzzy TOPSIS"*	chains, decision theory, and sustainability are all the subject of numerous research. Measurement becomes more difficult when there are conflicts between the groups that utilize AHP and DEA. Proposals should be tested, and obstacles should be addressed, in subsequent studies.
24	Voltolini A.O. *et al.*	2016	*"Supply chain performance measurement systems: A systematic review and research agenda"*	In this study, the interval-valued fuzzy TOPSIS approach and the supply chain operation reference model are used to investigate supply chain performance monitoring. Fuzzy sets and expert judgment manage uncertainty, and agility is essential. The study provides recommendations for future directions for MCDM technique research by ranking options in an automotive supply chain.
25	Balfaqih H. *et al.*	2016	*"Integral supply chain performance management system design and implementation"*	Trends including an emphasis on SCPMS design, theoretical and case study techniques, interest in sustainable SCPMS, and the systematic literature review of Supply Chain Performance Measurement Systems identified the potential future impact of new technologies.
26	Sellitto M.A. *et al.*	2015	*"Performance measurement for supply chain management: A systematic literature review"*	The papers stress the need of information exchange, performance measurement systems, and supply chain management techniques in gaining a competitive edge. They provide supply chain frameworks like the SMART pyramid and SCPMS to improve overall performance, customer value, and cost effectiveness.
27	Jamehshooran B.G. *et al.*	2015	*"Review of supply chain performance measurement systems: 1998–2015"*	The literature study and bibliometric analysis demonstrated a growing interest in performance assessment in supply chain management, highlighting the need for greater effort in implementing and validating proposed frameworks.
28	Sillanpää I.	2015	*"A SCOR-based model for supply chain performance measurement: Application in the footwear industry"* *"Assessing supply chain performance through applying the SCOR model"*	Numerous methods, strategies, and standards for gauging supply chain effectiveness were found in research conducted between 1998 and 2015. Safety precautions, industry-specific SCPMS, and sustainability measurements are among the topics of future study. For comparison, a move toward comprehensive performance review and uniform language was stressed. Using a SCOR-based model, the research study found delivery and flexibility

29	Avelar-Sosa L. *et al.*	2014	*"Empirical study of measuring supply chain performance"*	performance gaps in the footwear sector supply chain. Component performance was evaluated using the Analytical Hierarchy Process, yielding an overall supply chain performance of 75.29%. Future research directions and modifications tailored to the needs of the sector were suggested.
30	Ren T.	2008	*"Techniques and attributes used in the supply chain performance measurement: Tendencies"*	Using the SCOR model, the research consistently demonstrates a favorable association between Supply Chain Performance (SCP) and Business Analytics (BA). The findings show that several kinds of analytics are advantageous to SCP in the automobile sector. It is supported by Resource-Based Theory (RBT) that BA increases competitive advantage in SCM.
31	Kang S. *et al.*	2007	*"Application of supply chain performance measurement based on SCOR model"*	The study showed enhancements in profitability and on-time delivery, while also identifying challenges in capacity management. A practical framework for measuring supply chain performance was developed and tested, proving to be a valuable tool for managers. Construct validity was confirmed through multiple sources of evidence.
			"Performance measurement for SCM based on balanced score card and self-adaptive RBF neural network"	Various studies have identified attributes crucial for evaluating supply chain performance, including networks, collaboration, productivity, agility, innovation, and cost. Multivariate analysis is commonly used, with a focus on delivery, information flow, and process activities. Research spans multiple countries and industrial sectors, emphasizing performance improvement. The study emphasizes how supply chain effectiveness in manufacturing shall be measured using the supply chain operations references model and balanced scorecard. It emphasizes how crucial performance evaluation is to raising competitiveness. A case study highlights the importance of a committed team, senior management backing, and strategic alignment with corporate objectives in order to achieve effective implementation. The proposed method for measuring supply chain performance, using a Self-Adaptive Radial Basis Function Neural Network and a Balanced Scorecard approach, provided a

	more accurate and unbiased assessment compared to traditional techniques. In terms of accuracy improvement, the self-adaptive RBFNN model outperformed the conventional RBFNN and BP network models.

Key performance indicators and fundamental instruments for measuring supply chain performance are covered in several of the research included in the following literature review table. In this section qualities and contribution of the works assessed are explored in detail under these subheadings.

3. Fundamental Features and Input of the Examined Works:

3.1 Papers having direct focus on 'performance measurement of supply chain'

Guersola, M. et al. (2018) discussed methods for measuring supply chain performance, including DEA, fuzzy logic, BSC, supply chain operations reference, and AHP. *Nazarudin, Matondang et al. (2019)* Talk about the many performance measurement types that are used to characterize systems, particularly the production, distribution, and inventory systems. Given the abundance of measurement systems available, it may be somewhat challenging to choose which measurement system is best for measuring SCM. Due to changes in the business sector, there is an increasing trend in performance measurement that focuses on nonfinancial metrics. A balanced performance measuring method requires businesses to take into account both non-financial and financial factors. Nonfinancial metrics are a superior way to manage production and distribution processes, even though financial performance assessment is crucial for external reporting and strategic decision making. *Khan S.A. et al.* (2020) examines how SCPMS have developed from simple bookkeeping to sophisticated systems, highlighting the necessity of intelligent SCPMS in the digital era. It suggests a conceptual framework for next-generation SCPMS that takes into account both non-financial and financial measures, incorporates the expertise of decision makers, and is in line with new trends like Industry 4.0. By offering theoretical understandings and useful managerial suggestions to enhance research attempts to close the gap between the current *"Supply Chain Performance Measurement Systems (SCPMS)"* and the demands of contemporary supply chain management by examining entire performance of supply chain. *Govindan K.; et al*. (2022) the correlation between performance of supply chain and specific Industry 4.0 technologies, proposed framework encompassing 4.0 Manufacturing, 4.0 Procurement, 4.0 Logistics, and 4.0 Warehousing and the validation of this framework through actual case studies are some of the key findings related to performance evaluation of supply chain 4.0 that have been identified. *Saleheen, Ferdoush et al.* (2023) Although much study an evaluation of supply chain effectiveness has been conducted in the producing sector, effective performance assessment strategies still need to be properly incorporated into the operations of many firms. There's not proven relationship between the supply chain and qualities and measurement index and how they affect an organization's bottom line. As a result, businesses were unable to use any integrated SCM performance assessment methodology.

3.2 Papers that focus on 'key performance measurement'

Widyarto, W.O. et al. (2019) The capacity to evaluate the supply chain's efficacy facilitates ongoing and strategic management, assisting the supply chain in achieving its goals. The foundation of management, communication, and business strategy to enhance operations may be found how supply chain performance is measured. KPIs are performance indicators that are required in order to assess the supply chain's efficacy. The KPI used to monitor supply chain efficiency must be chosen with the company's objectives in mind. The difficulty in assessing supply chain performance is in selecting indicators based on business strategy objectives, figuring out how to evaluate them, and figuring out how to put them into practice. *Kusrini E. et al. (2019)* KPIs are metrics that assess the worth or caliber of an organization's business, industrial, and performance processes. KPI values may be found through a variety of talks, some comprehensive, subjective data that is both qualitative and quantitative, and an evaluation based on personal experience or knowledge. *Rahiminezhad Galankashi M. et al.* (2022) The most widely used metrics for measuring financial performance as key performance indicators are outlays, assets profitability, turnover, asset productivity, investment return, market portion, stock turnover, net margin, income growth, economic profit, and floe cycle.

3.3 Papers that focus on 'balanced scorecard model'

Mathiyalagan et al. (2014) said that the indicators on a balanced scorecard are selected based on the strategic goals of the company. There are objectives that has to be met in a given amount of time. Objectives are highly specific, useful, quantifiable, and have a deadline. They are arranged to lead the synchronized to its intended strategic goal. Therefore, the scorecard for balance can provide an accurate representation of actuality. Additionally, the scorecard for balance may help the business

grow internally and internationally in all aspects. However, according to *Agami et al. (2012)*, The decision makers' choices are not synchronized within the Supply Chain network, the cause and effect of subpar performance are not evident, and Balanced scorecards aren't helping cooperation throughout the SC network. *Saleheen, F. et al. (2018)* BSC as a reliable instrument for performance management. In both research and commerce, it is increasingly acknowledged as the main instrument for evaluating performance. Administrators may quickly identify a well-reasoned comprehension of operational response and financial response thanks to it. The writer suggested that administrators keep an eye on and adhere to four fundamental views: financial and consumer reaction, internal operations procedures and perceptions of learning and innovation. When it comes to give supervisors a complete an overview of the company's performance, BSC is unmatched. *Jagan Mohan Reddy K. et al. (2019)* The BSC approach is usually applied when choosing and integrating SC performance indicators derived from the balanced perspective. It was stressed that the four classes- customers, money, internal processes, and innovations- need to be balanced. *Khan S.A. et al. (2020)* the balanced scorecard was created in 1992 by Kaplan and Norton as a PM tool. After a year of development, it emerged as a premier PM tool for practitioners and scholars alike. It provides businesses with a framework for carrying out corporate strategy. The four primary views used by the balanced scorecard to assess performance are the internal business process, financial perspective, customer perspective, and learning and growth perspective. *Sardjono W. et al. (2021)* Early in the 1990s, Robert Kaplan and David P. Norton presented the Balanced Scorecard (BSC). They contend that because businesses operate in a complicated business environment, they must be able to comprehend their objectives and know how to attain them in order to continue existing. At first, BSC was only a basic instrument for measuring performance. However, BSC has evolved into a management system approach. The two primary components of supply chain performance measurement are operational time and cost effectiveness. When applied, the BSC offers a number of benefits over alternative measurement instruments, such as the capacity to clarify causal links, comprehensiveness, and the ability to raise organizational performance. Sarma et. al. (2007) state that the BSC technique is broken down into four measures, **which are as follows:**

1. Measuring financial parameters including profitability, increase in turnover, and profit maximization for shareholders.
2. Assessing customer satisfaction with the business, taking into account cost-effectiveness, product quality, and service excellence.
3. Assessing internal company procedures,
4. Views on development and learning for future business effectiveness.

Lehyani F. et al. **(2021)** A new method for estimating the performance of the manufacturing industries from four viewpoints is provided by the Balanced Scorecard, a management tool (Balakannan et al., 2016). In order to assess a specific business process and SCM, it is used to monitor and manage strategic guidelines utilizing indicators created for the corporate objectives in each viewpoint (Jaimes et al., 2011). (Pungchompoo & Dunyakul, 2017). Nonetheless, the BSC method offers several benefits, like enhanced operational goals and customer satisfaction, expanded operational criteria, focused strategic aims, and more (Nikabadi & Shahrabi, 2015). However, there are certain drawbacks, such the inability to combine data from performance factors and prioritize weight (Verdecho et al., 2014).

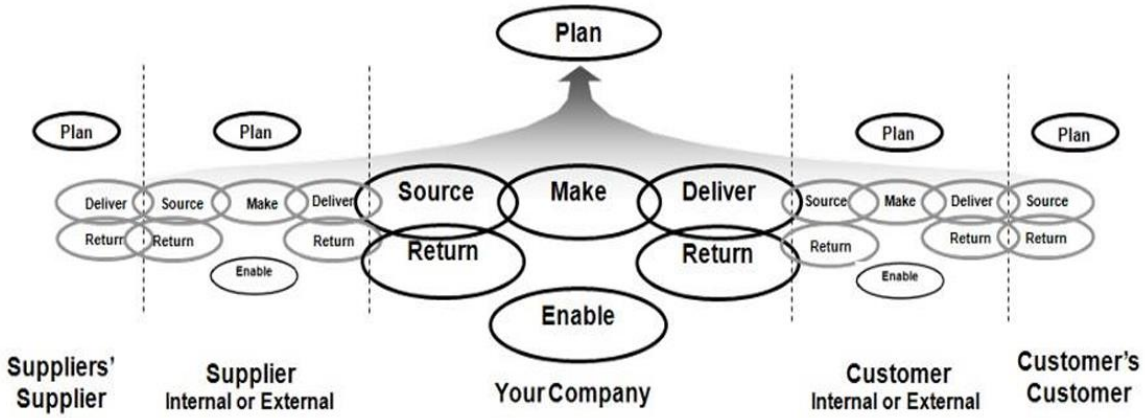
3.4 Papers that focus on 'SCOR model (basic tool)'

Ren T. (2008) The SCOR model takes a process-based approach to the chain of supplies. Measurements of supply chain performance and process modeling may be done using the process thinking of the SCOR model (Figure 4). Performance metrics based on processes are the main topic of this study. We've evaluated the cross-industry framework created by the Supply Chain Council to learn how to identify areas for improvement and gauge supply chain performance. This offers recommendations for enhancing an organization's procedures for source, make, distribute, and return as well as the supply chain. It is based on five different management processes that are used by every firm in the supply chain: schedule, acquire, produce, supply and restore. *Jamehshooran B.G. et al.* (2015) AMR Research and the management consulting firm PRTM created the process reference model known as SCOR. The Council for the chain of supplies supports SCOR as the de facto industry-standard supply chain management diagnostic tool. Supply chain best practices may be discussed, addressed, and exchanged with all parties engaged in an extended firm using SCOR. SCOR provides common terminology, concepts, and metrics for business procedure. Arrange, procure, produce, ship, and return are the five main functional areas that it helps businesses to enhance business processes in. It also allows them to influence future application development and measure themselves against others. A management tool that connects suppliers and customers is called SCOR. The model was developed in order to clarify the commercial activities required to satisfy a client's request at each level. Plan analyze (PA), source analyze (SA), make analyze (MA), delivery analyze (DA), and return analyze (RA) are the five components that make up the SCOR-model. *Saleheen, F. et al. (2018)* The SCOR framework was developed by the SCC and was initially implemented in 1996. It serves as a guide for in-depth supply chain research by characterizing and classifying the chain-building process, offering metrics for such developments, and assessing similar standards. It is a thorough, multidisciplinary

structure that connects performance indicators, best practices, and software requirements. Performance methods are evaluated based on five perceptions: timeliness, cost, flexibility, asset, and reliability. The model is thought to be a comprehensive approach requires a clearly specified configuration, totally dedicated managerial materials, and continuous Re-engineering business processes to bring the organization into compliance with industry best practices. With material, labor, and information flows, it extends the chain from supplier to supplier to customer to customer and affiliates.

Figure: 4 SCOR Model framework
Source: The Association for Operations Management (APICS)

Kusrini E. et al. (2019) The effectiveness of a supply chain within an industry may be evaluated using a variety of techniques. The



Supply Chain Council launched the 1996 model or style of approach known as APICS (The Association for Operations Management), which is short for Supply Chain Operations Reference. The SCOR Model is a framework that aids in managing business operations, assessing how well a company meets customer demand, and evaluating the effectiveness of supply chains within an industry. The variables and characteristics of the SCOR Model also alter as a result ofchanges to industrial reality or situations. There are some differences between the previous version and the latest SCOR Model, SCOR 12.0. *Nguyen T.T.H. et al. (2021)* In order to demonstrate the company processes pertaining to all times of meeting customer expectations, the Supply Chain Council (SCC) developed the SCOR in 1996. 2014 saw the combination of the SCC with the American Production and Inventory Control Society (APICS). They thus created the most recent SCOR version, 12.0, in 2017. The SCOR separated the supply chain management into six crucial activities between the supplier's providers and the ultimate customer, namely Plan, Source, Make, Deliver, Return, and Enable. This version, in contrast to other versions, introduced and modified various metrics and procedures.

3.5 Papers that focus on 'activity-based costing"

Ferdoush Saleheen et al. (2018) Activity-Based Costing (ABC) focuses on connecting financial metrics with operational performance by analyzing processes into specific tasks or cost drivers and evaluating the time and resources needed for each. Instead of traditional cost accounting methods, such as distributing overhead proportionally or using less relevant cost drivers, ABC allocates costs based on these identified drivers. This approach was designed to provide a more precise assessment of the costs and efficiency involved in supply chain operations. *Sharfuddin Ahmed Khan et al. (2020)* Integrating operational and financial performance was the main objective of the activity-based costing (ABC) methodology. This method was established by Kaplan and Bruns (1987) to estimate resources in terms of cost. They also built the breakdown structure and divided activities into individual tasks. This was the first effort to enhance the assessment of the SC process's cost and productivity. This technique has a downside in that it assesses the productivity of the entire SC, yet it depends heavily on financial indicators and metrics overall. In a similar vein, Marwah et al. (2014) described ABC as an accounting technique that associates costs with individual activities rather than with goods or services. (Agami et al., 2012).

3.6 Papers that focus on "analytical hierarchy process"

Miguel Afonso Sellitto (2015) AHP is a decision-making tool that breaks down difficult problems into a multi-level hierarchical structure comprising objectives, criteria, sub-criteria, and alternatives. This helps to explain the basic choice operation. Metrics and strategic aspects in SCPM have also been prioritized using AHP and other multi-criteria techniques. *Jagan Mohan Reddy. K (2018)* In the 1970s, Thomas created the analytical hierarchy process (AHP). This method, which

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takes psychology and mathematics into account, may be helpful for organizing and understanding complicated decisions. Although it was created in the 1970s, its application in the SCM context did not begin until the 2000s. To enable pairwise comparisons, a numerical weight was given to each member of the hierarchy. *Mariana Guersola et al. (2018)* One method that is frequently used to solve the MCDM problem is the analytic hierarchy process (AHP). It is one of the most well-liked and effective MCDM techniques, assisting with logical and methodical decision-making and ranking. The approach offers a framework for handling scenarios with several criteria. Cho et al. (2012) described the AHP approach as consisting of the following crucial steps: "This technique first divides the complex problem under study into a hierarchical system of elements." The constituents in each hierarchy are compared pairwise using a nominal scale in the next stage. Therefore, the matrix's eigenvector is recovered in order to express the relative weights among different members of a given hierarchy. Next, comparative findings are quantified to create a comparison matrix. Lastly, the eigenvalue is employed to evaluate the comparison matrix's consistency ratio and choose whether to accept or reject the data. *Fatma Lehyani et al. (2021)* A quantitative method called the Analytic Hierarchy Process (AHP) makes it easier to structure a complicated multi-attribute problem. According to Yang (2009), AHP is a reasonably flawless assessment method that may be used for several goals and regulations. Because the therapeutic ideas linked to people's subjective judgments are vague, AHP is an insufficient approach. AHP is a generic method for breaking down an issue and comparing all of the elements at one level to comparable items in the level directly above in pairs.

4. Bibliometric Analysis:

One of the most important processes in the field of bibliometric analysis is keyword analysis, which we conducted using the VOSviewer for the purpose of explore into the measurement of supply chain performance. Regarding a certain item, these insights into the development of a particular field and developing subject might be determined. Figure 5 shows all the keyword (unit of analysis) of cooccurrence type of analysis, full counting method should be use. A keyword must appear at least five times; among the 1361 keywords, 75 match the criterion. For each of the 75 keywords, the co-occurrence links with other keywords having the highest total link strength will be selected. Five clusters were formed from the 75 keywords. There are eighteen elements in Cluster 1 (red), seventeen in Cluster 2 (green), sixteen in Cluster 3 (blue), fifteen in Cluster 4 (yellow), and nine in Cluster 5 (violet).

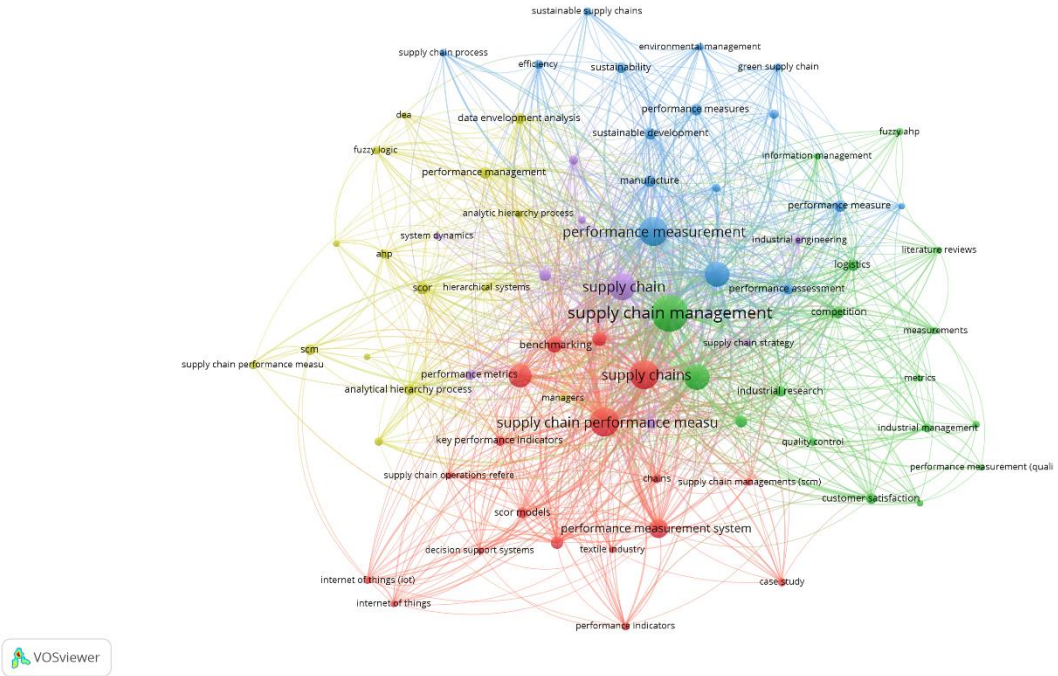


Figure 5: Mapping of Keywords Analysis

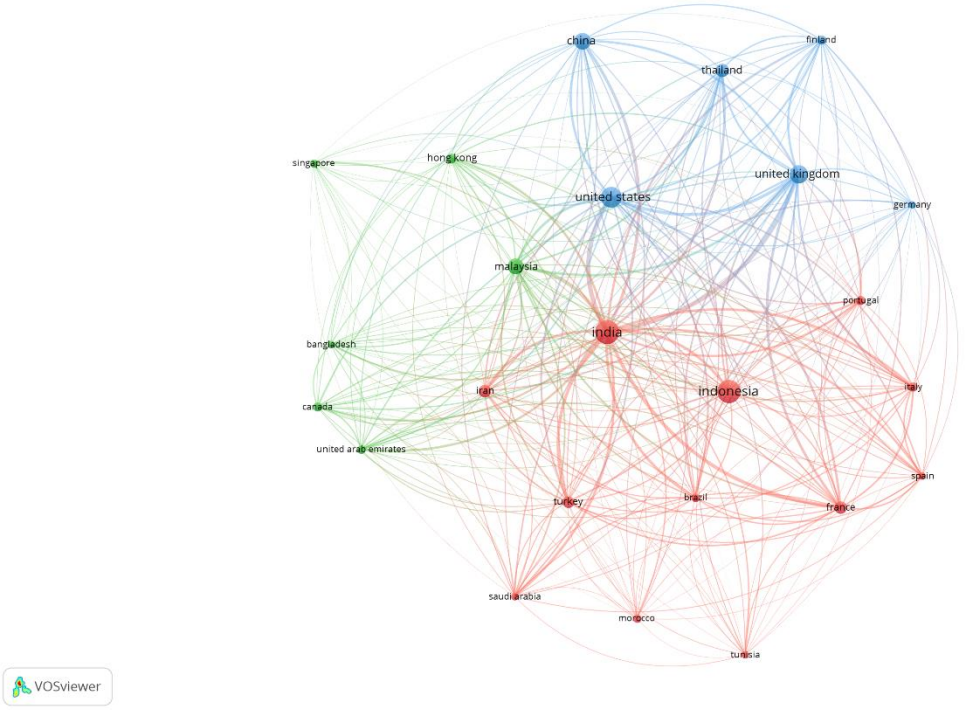
This image is a network visualization created in VOSviewer, showing the connections and relationships among various terms related supply chain administration and evaluation of performance. The colors represent different clusters or groups of terms that frequently co-occur in literature, indicating thematic clusters within the broader topic. In this visual representation, larger nodes denote terms that are more frequently explain in the literature, such as supply chain management and performance

measurement, indicating their centrality and importance. The edges or lines connecting these nodes represent co-occurrences of terms within the same documents, with thicker lines suggesting stronger relationships or frequent co-occurrences. The different colored clusters highlight thematic areas within the field, revealing distinct subfields and emerging trends. The dense network of interconnections suggests a well-developed research field with numerous interrelated studies, while sparser areas may indicate potential research gaps. This visualization aids researchers in identifying key research areas, understanding the interrelationships between concepts, and spotting opportunities for novel contributions, hence provide a thorough summary of the state of supply chain management and performance assessment research at the moment.

Figure 6 shows the countries wise bibliography coupling. There are 54 countries, 24 meets the threshold and the minimum number of documents of a country is 5. The overall strength of the bibliographical coupling linkages with other nations will be determined for each of the total countries. The nations with the strongest links overall will be chosen. There are twenty-four nations to choose from. The countries divided into 3 cluster. Cluster 1 (red) includes Brazil, France, India, Indonesia, Iran, Spain, Portugal, Saudi Arabia, Italy, Morocco, Tunisia, and Turkey. Cluster 2 (green) includes Bangladesh, Canada, Hong Kong, Malaysia, Singapore and United Arab Emirates. Cluster 3 (blue) includes China, Finland, Germany, Thailand, United Kingdom and United States.

Figure 6: Country-wise Bibliography Coupling

Each node represents a country, and the connections between nodes indicate co-occurrence or collaboration in research outputs. The color-coding represents clusters, suggesting groups of countries that tend to collaborate more closely with each other.



In this visualization, India is centrally positioned and represented with a larger node, indicating that it plays a prominent role in international collaborations in this research domain. India has strong connections with other countries, especially within the red cluster that includes Indonesia, France, Italy, Spain, and Portugal. This suggests that India and these countries frequently co-publish or collaborate, forming a closely linked research community.

The blue cluster consists of countries like the USA, China, the UK, Thailand, Finland, and Germany. This cluster suggests another set of frequently collaborating nations, primarily Western and East Asian countries. The green cluster, with countries such as Canada, the United Arab Emirates, Hong Kong, and Singapore, indicates a separate grouping with specific collaboration patterns.

This visualization highlights the global nature of research collaboration in this field, showing that while some countries form distinct regional or thematic clusters, others, like India and the United States, bridge different groups, promoting cross-cluster collaboration. For researchers and policymakers, this network map provides insights into potential areas for strengthening

international collaboration, identifying regions with limited connectivity, and understanding the global structure of research partnerships in this domain.

5. Findings and Prospects for Further Research-

The issues and demands of the expanded, e-enabled supply chain performance measurement systems of today have been outlined in this study as being different from those of the previous performance assessment systems. The report emphasizes the significance of the SCOR model as the backbone of the performance management system and the value of the balanced scorecard approach. It is clear that the problem is multifaceted and involves the ideas of total quality, fit, and excellence.
According to the study, supply chain performance evaluation is still a productive topic for research, and the analysis found several very clear justifications for the need for more study in this area. The primary recommendations for more study are as follows:

- More study on the instruments for measuring performance in 21st-century business models, the necessity for action research, the creation of more exact frameworks, and empirical testing of the performance measurements.
- Establishing KPIs for partnerships, validating performance indicators that have been defined, and creating models for virtual and e-commerce settings.
- Creating performance and measurement mechanisms, such as new maturity models backed by SCOR, to allow benchmarking.
- Research across industries is necessary.
- It is necessary to create metrics to evaluate the usefulness and efficacy of IT in supply chain management.
- Metrics and performance evaluation for responsive SC.
- The study demonstrates the immaturity of the frameworks and models, and the authors anticipate that future contributions to the field will mostly originate from:
- Framework development initiatives.
- The creation of measurements for business excellence, agility, flexibility, partnership, and cooperation.
- More explanation of the fit-performance links, using case studies and modeling.

According to the authors, the concepts of total quality, business process, fit, and excellence will continue to be crucial for future performance assessment systems. Strong evidence for these notions' immaturity in respect to supply chains was found in the survey. To put it succinctly, supply chain business excellence merits more consideration in any further studies.

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