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A Bibliometric Analysis on Supply Chain Collaboration

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Abstract

Supply Chain Collaboration (SCC) has been a topic of great interest among the supply chain researchers for decades now. Collaboration among channel-partners is imperative for successful supply chain management and may be the most critical core competency for enhancing the supply chain performance. This paper examines the various SCC frameworks and their development through a bibliometric analysis of the SCC literature published under the Web of Science (WoS) database in the last twenty years from 2003 to 2022 (including early access for January, 2023) comprising of 4249 research articles. The analysis and graphical visualization of the bibliometric data is presented using measures of descriptive statistics and visualization tools identifying the linkages between the published literature. This study analyses the distribution of the publications based on the research author analysis, most cited publications analysis, publication source analysis, country-wise literature analysis and the keywords co-occurrence analysis. The study also examines the most cited researches on SCC in last two decades and attempts to collate the major developments in the SCC knowledgebase. This research corroborates the enormity of the research conducted in the past and accentuates the ever-growing significance of collaboration in the supply chains for future researchers and businesses worldwide. On an average more than two hundred articles are published every year on SCC and the time-series forecasts reaffirm its progressiveness and relevance as a research domain more than ever engaging researchers and business organisation across the globe. The systematically collated data of top twenty most cited articles, authors, journals, keyword and countries involved in SCC research has been prepared which will provide a source of practical reference for the early supply chain researchers and professionals globally.

Keywords: Supply Chain Collaboration (SCC), Bibliometric Analysis; Citations, Co-occurrence, WoS, VOSviewer.

Introduction

No firm can be successful in today's global village market place scenario without collaboration in the strategic logistics operations. The same can be termed as a business operation whereby the collaborative partners involved work closely towards attainment of common objectives that reciprocally promote the partnering firms. It is actually an integration of human, financial, technical and other several resources in the supply network. The management among the channel-partners is crucial in these processes and their interrelationship is examined in this study using bibliometric analysis. The advent of analysis indicates that there are numerous studies based on the supply chains and its attributes, but there are a very few quality studies focused in the direction of analysing the existing knowledgebase on collaborations in supply chains. Where previous studies have reflected the important aspects and terminologies related with the collaborations in the supply chains, this analysis is a novice approach in the direction of studying the researches done in last two decades on supply-chain collaboration using VOSviewer software-based bibliometric network analysis. The Web of Science (WoS) database analysed in this research indicates the importance of SCC and consequently it is derived that similar databases also advocate the studies on the level of integrations, cooperation and coordination in the supply chains and point out the relevance of the

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research and the interrelationships between them. Although the studies indicated that using keyword-based analysis it is difficult to correlate with the level of the importance these aspects have for SCC, it was an assumption in the beginning but the study indicated that there are many strong correlational aspects inside Supply Chain Collaboration.

Our analysis has revealed that numerous authors have a propensity to use the word "collaboration" pretty casually. We ought to be conscious that there are several diverse supply chain relationships designs that may exist, and not all of them correspond to collaboration (Harrison *et al.,* 2014). There exists a multitude of relationship styles from vertical integration to partnership agreements, transactional ties, contract, and arms distance relationships. (Helper, S., & Sako, M. 2010) The supply chain ecosystem and advancements are driven by the stimulating elements that are present in each of these relationship models. Additionally, according to these authors, the length, scope, proximity, and strength of the partnership amongst supply chain participants varies from time to time (Harrison *et al.*, 2014). Collaboration within the supply network is acknowledged as an essential factor in ensuring the competitiveness in a supply chain and as an important study subject. With the amount of research published over the years, it has gained traction in the field of supply-chain management. (SCM). Supply chains are widely recognized as being more efficacious with coordinated and integrated activities among partners simply because they are inter-institutional across various functions. Ellram and Cooper (1990) pioneered this concept as a source of inspiration for effective SCM, and as a result, many researchers are investigating various perspectives to examine the key characteristics, enablers, constraints, and effects of collaboration efforts within the supply chain members. SCC has been explained by several authors in their own sight, a brief list of some of the important available definitions is compiled below in Table.1.

Table 1: Important definitions of Supply Chain Collaboration (SCC)

SCC Definitions	Author
"Collaboration requires high levels of trust, commitment, and information sharing among supply chain partners. It also requires a shared and common vision of the future in a way that future design and product performance, and long-term strategic intentions are shared. In a collaborative relationship, partners are engaged in joint planning and processes beyond levels reached in less intense trading relationships".	"Spekman et al., 1998"
"A collaborative relationship based on information exchange in support of joint strategic, tactical and operational planning, forecasting and demand fulfilment processes".	"Barrat, 2004"
"SC collaboration is defined as the ability to work across organisational boundaries to build and manage unique value-added processes to better meet customer needs".	"Fawcett et al., 2008"
"Collaboration describes the cooperation among independent, but related firms to share resources and capabilities to meet their customers' most extraordinary or dynamically changing needs".	"Simatupang & Sridharan, 2008"
"SCC is defined as a partnership process where two or more autonomous firms work closely to SCC is defined as a partnership process where two or more autonomous firms work closely to plan and execute SC operations towards common goals and mutual benefits".	"Cao & Zhang, 2011"

According to documented research, SCC facilitates better supply chain performance in the corporations by maximising on resources, capabilities, methodologies, and procedures carried out by partnering firms (Fawcett *et al.*, 2012; Mentzer et al., 2008). Collaboration between the channel-partners of supply chains is a relevant area for research, which has a great impact on the SCM

of firms (Hudnurkar et al., 2014). Moreover, as companies seek for productive efficiencies in procuring, manufacturing, distributing, retailing, other supply chain operations, rapid advancements in technology, internationalization, and competitiveness have renewed interest in and potential for inter-organisational ties. When preserving inter-organizational ties, these, along with changing customer demand, cause uncertainty in enterprises. In terms of transaction costs, Tokman *et al.* (2007) suggested that organizations would strive to regulate joint-operations by undergoing long-term collaborations or vertical integration instead of relying on short-term relationships, as the extent of unpredictability escalates. Although there are many perks to SCC, the issue is that due to structural and cultural constraints, meaningful cross-border collaboration is typically very hard to achieve (Stank *et al.*, 2001; Fawcett et al., 2010, 2012). However, businesses that work together can gain from doing so in a number of ways, including improved market positioning, better resource utilisation, and the development in capabilities (Nooteboom, 2004). However, a number of problems often restrict companies from sharing confidential information or unique resources, due to low level of trust among businesses in supply chains (Fawcett *et al.*, 2008, 2010; McCarter & Northcraft, 2007).

The current study focuses on extensive bibliographic analysis of around twenty years of the existing publications on supply chain collaboration (SCC) taken from the Web of Science (WoS) database. However, numerous researches have already been carried out in the area of SCM and stream related to channel relationships - coordination, cooperation and collaboration. Several other bibliometric researches have been done on topics like "supply chain management, supply chain integration, supply chain coordination, sustainable supply chain management and green technologies, closed-loop supply chain, green supply chain management, internet of things", etc. However, the last bibliometric analysis on supply chain collaboration was conducted in 2014 taking WoS – Social Sciences Citation Index (WoS-SSCI) and was published in 2016. Further, to the best of my knowledge no such analysis has been done recently which focuses specifically on SCC and has taken into account the articles published in the last twenty years and used using bibliometric software, VOSviewer for their analysis in order to assess the present state and directions for the given stream.

The novice contribution of this article are as follows:

- This study is the first bibliometric examination of the evolution of SCC (supply chain collaboration) research over the last two decades (twenty years), and provides a deep insight towards the contribution of authors, publishers and countries towards development trends in this field.

- Use of VOSviewer software for the bibliometric Study, specifically on SCC literature taken from the WoS database comprising 4249 published articles from 2003 to 2023 has been done.

- 4249 published articles in the WoS database comprise of *Articles-3,783; Review Articles-225; Early Accesses-128; Proceeding Papers-79; Editorial Materials-27; News Items-3; Meeting Abstracts-2; Reprints-2 across from all the categories of Web of Science.*

- We examined the development of SCC research and identified the most influential researchers, authors and journals over the last twenty years with the help network visualisation by VOSviewer.

- We also identified the most influential factors for SCC addressed by the researchers with the help of the revelations from visualisation analysis of

co-occurring keywords and citations done by VOSviewer.

Research Questions:

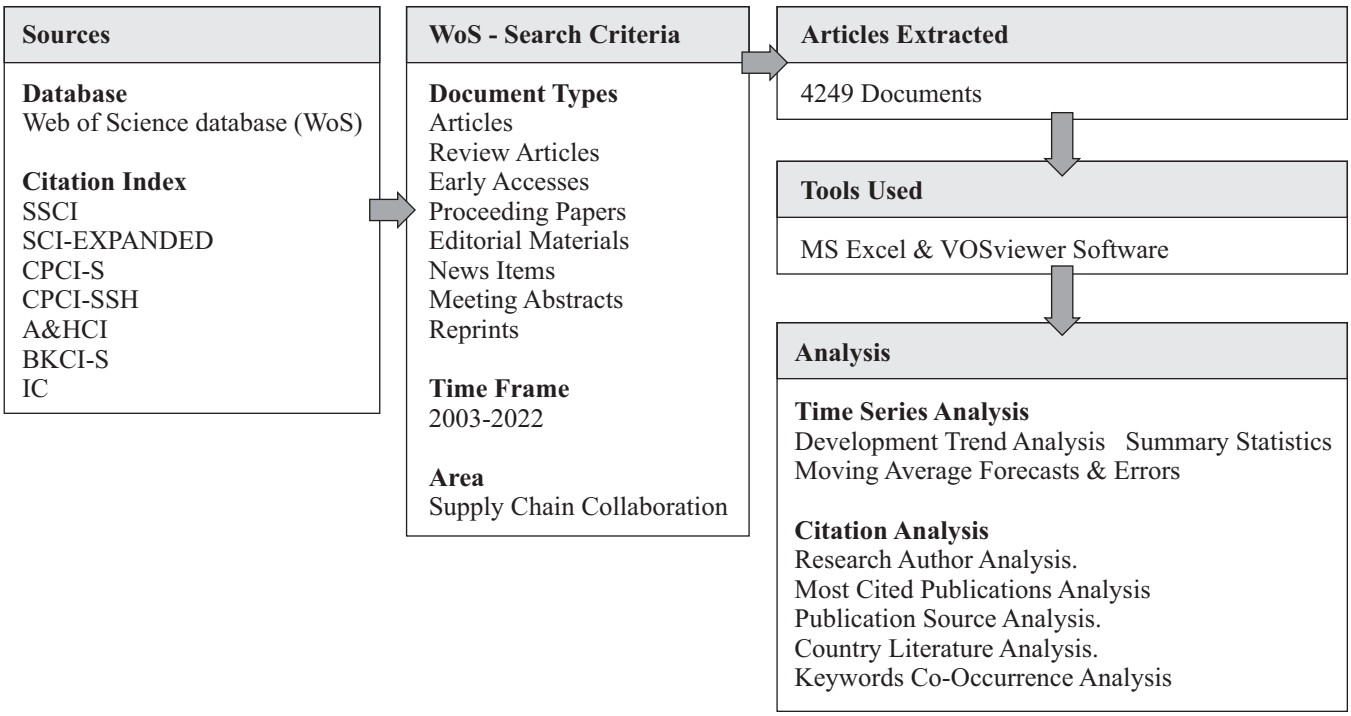
Specifically, our analysis builds on the literatures published in last two decades taken from WoS database and uses bibliometric analysis using VOSviewer software and attempts to address the following issues in research:

- How has the research within SCC has evolved in last twenty years?
- What is the research potential of SCC for future researchers?
- Which are the most influential researchers in SCC?
- Which are the most sought after and preferred Journals for SCC publications?
- Which countries have contributed significantly to the field of SCC research?
- Which are the most occurring keywords, indicative of the importance past researches have placed on various SCC parameters in the published database?

Methodology

A total of four thousand two hundred and forty-nine (4249) articles published from 2003 up to 2022 (including early access for January, 2023) from the WoS database (Web of Science) have been taken for the bibliometric analysis. Initially the bibliometric data has been analysed and the time-series forecasts have been drawn using various figures, tables and graphs on Microsoft Excel - 2021 software. The complete database for this analysis was downloaded for analysis by December 31, 2022. The Web of Science search focused on "all fields" search filter category for the term "supply chain collaboration" taking all the categories of Web of Science into consideration for the analysis. The data for our analysis has been taken from following databases within WoS collection: "Social Sciences Citation Index (SSCI), Science Citation Index Expanded (SCI-EXPANDED), Conference Proceedings Citation Index – Science (CPCI-S), Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH), Arts & Humanities Citation Index (A&HCI), Book Citation Index – Science (BKCI-S) and Index Chemicus (IC)". The 4249 articles in the WoS database also contains 128 early access articles i.e., articles under review for publications, which also includes 13 articles indicated by the database to be published in the year 2023. A unified process flow for the analysis performed in this research is depicted in the Figure.1 given below:-

Figure 1: Process Schematics for Bibliometric Analysis



We have used VOSviewer Software for bibliometric analysis, using visualisations from the bibliographic data of the WoS database files. VOS viewer is an application software designed to conduct bibliometric analysis through network visualization. It analyses the various parameters extracted from databases i.e., citations, bibliography, and author keywords, etc from the research databases. VOS viewer develops a network diagram which is based on total link strengths or connections which signify that there exists some relationship between the two entities connected on the map. The strength of such connections will be high when the commonality between the two entities is high and vice-versa. The commonality can be in terms of areas of research, keywords, country, co-authorships, publishers, bibliographic coupling (common citations and references), organisations, etc. We have conducted the co-occurrence analysis and citation analysis for the various keywords, authors, publication sources, number of documents and countries on WoS database of 4249 articles.

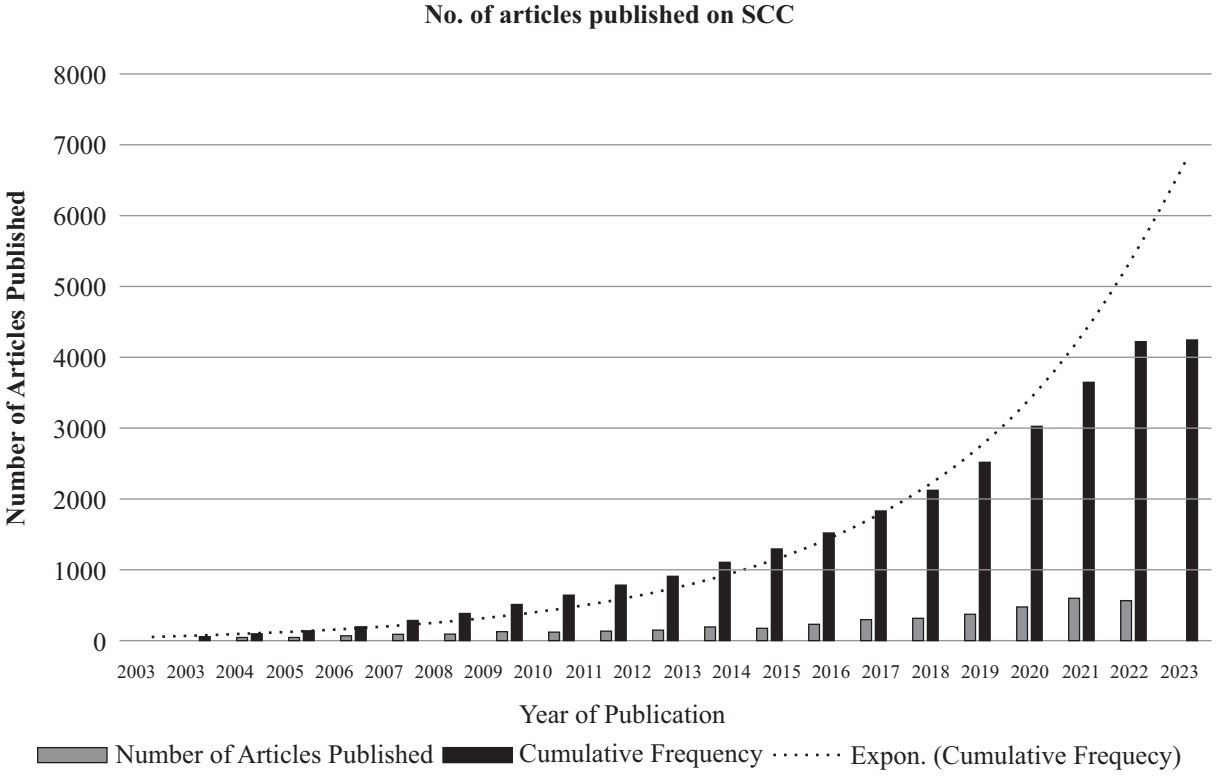
We have used Excel, Microsoft Office 2021 edition and version 1.6.18 of the VOSviewer software released on January 24, 2022, available for download from VOSviewer website download link for Microsoft windows systems. (https://www.vosviewer.com/downloads/VOSviewer_1.6.18_exe.zip).

Development Trend Analysis

A significant indicator of the quantity, quality, and overall contribution that a piece of scientific work has made to the body of knowledge is the number of journal publications that has been published in a specific domain. Since the expansion of knowledge is strongly tied to the number of published papers, any shift that occurs in the research papers provide a direct reflection of any associated shifts in the total quantity of scientific information available in the domain. Deploying descriptive statistics measures we have obtained the following results as illustrated in Table.2 & Table.3 corresponding to the research articles published in the last twenty years, the greatest number of articles published are **630**

articles published in the year **2021.** Further the least number of articles published are **13** in the current year i.e., **Year 2023** as it is the first month of the year and very few articles are available for early access in the month of December, 2022 when the database has been downloaded and analysed. Whereas average number of articles published across the time period between 2002 to 2023 is around **202** articles with a standard deviation of **182.79** approximately. As illustrated in Fig. 2, it is evident from the graph that there has been an increasing trend in SCC research every year and the database pertaining to SCC is continuously developing, being one the most popular domain for supply chain researchers.

Fig. 2 Published researches on Supply Chain Collaboration (Source: Publication statistics from WoS)



Year of Publication	No. of Articles Published	Cumulative Frequency	Percentage (%)	Cumulative (%)
2003	25	25	0.59	0.59
2004	34	59	0.80	1.39
2005	47	106	1.11	2.49
2006	50	156	1.18	3.67
2007	65	221	1.53	5.20
2008	75	296	1.77	6.97
2009	90	386	2.12	9.08
2010	128	514	3.01	12.10
2011	118	632	2.78	14.87
2012	146	778	3.44	18.31

Year of Publication	No. of Articles Published	Cumulative Frequency	Percentage (%)	Cumulative (%)
2013	149	927	3.51	21.82
2014	196	1123	4.61	26.43
2015	187	1310	4.40	30.83
2016	236	1546	5.55	36.39
2017	291	1837	6.85	43.23
2018	324	2161	7.63	50.86
2019	387	2548	9.11	59.97
2020	482	3030	11.34	71.31
2021	630	3660	14.83	86.14
2022	576	4236	13.56	99.69
2023	13	4249	0.31	100.00

Table 3: Descriptive Statistics

Summary Statistics	
Mean	202.3333
Standard Error	39.88754
Median	146
Mode	#N/A
Standard Deviation	182.7877
Sample Variance	33411.33
Kurtosis	0.4595
Skewness	1.169726
Range	617
Minimum	13
Maximum	630
Sum	4249
Count	21

Further using a three-period moving average we obtain the forecast for expected number of publications in the year 2023 based on time-series analysis to be equal to 406 as illustrated in Fig.3 and Table.5. We also computed the forecast for expected number to paper publication in the field of SCC for next five years including 2023 using Forecast Worksheet in Microsoft Office Excel 2021 as illustrated in Table.6 and Fig.4.

Fig. 3: Time series analysis using three-period MA on the WoS Data

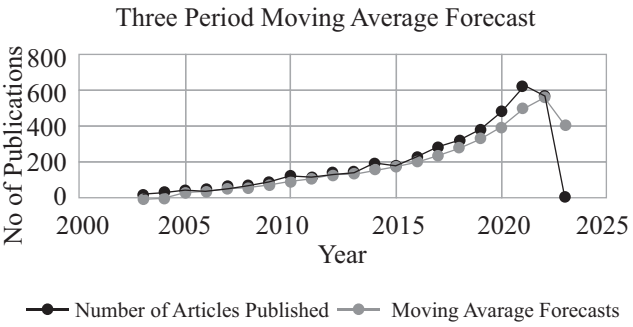


Table 4: Forecast Statistics

Statistic	Value
Alpha	1.00
Beta	0.00
Gamma	0.00
MASE	3.26
SMAPE	0.14
MAE	56.53
RMSE	78.83

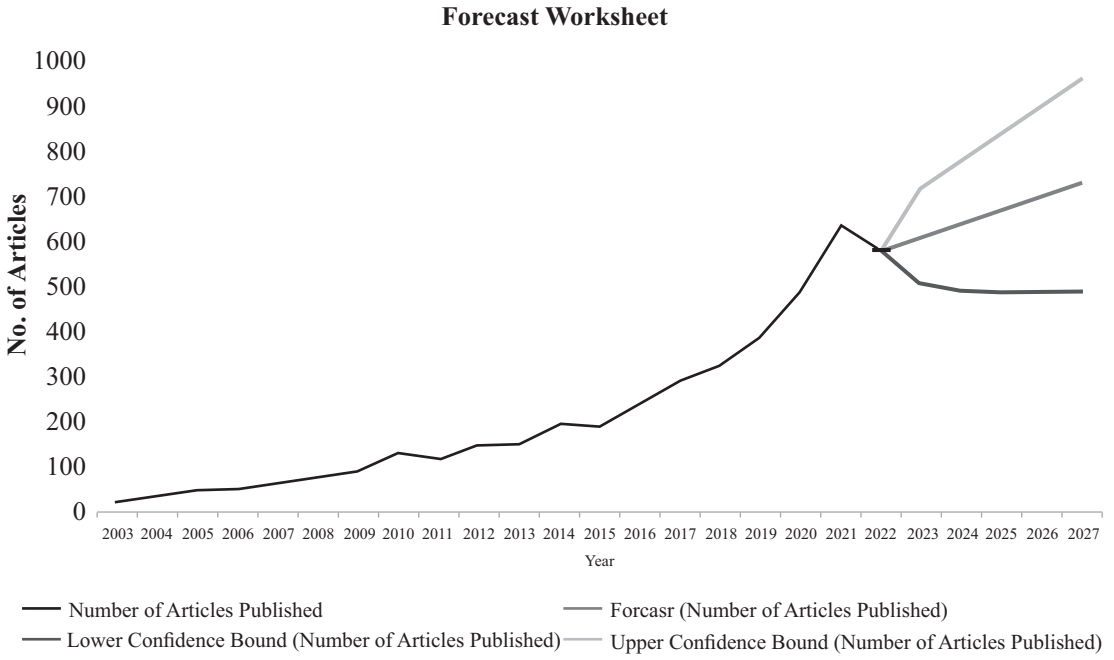
Table 5: MA Forecasts on WoS Data

Year	No. of Articles	MA Forecasts
2003	25	-
2004	34	-
2005	47	35
2006	50	44
2007	65	54
2008	75	63
2009	90	77
2010	128	98
2011	118	112
2012	146	131
2013	149	138
2014	196	164
2015	187	177
2016	236	206
2017	291	238
2018	324	284
2019	387	334
2020	482	398
2021	630	500
2022	576	563
2023	-	406

Table 6: Forecasts for Next 5 Years at 95% Confidence Interval

Year	Articles	Forecast	Lower Bound	Upper Bound
2003	25			
2004	34			
2005	47			
2006	50			
2007	65			
2008	75			
2009	90			
2010	128			
2011	118			
2012	146			
2013	149			
2014	196			
2015	187			
2016	236			
2017	291			
2018	324			
2019	387			
2020	482			
2021	630			
2022	576	576	576	576
2023		604	500	708
2024		633	486	780
2025		661	481	841
2026		690	482	898
2027		718	486	951

Fig. 4: Five-Year Forecasts for Expected No. of Publications at 95% Confidence Interval



Forecast Worksheet on MS-excel uses historical data to create visual forecasts. We computed the forecast from 2023 to 2027 at 95% confidence interval with automatic detection of seasonality, interpolation methodology to obtain any missing data points and averaging for aggregation of duplicates. The 'forecast' computed for expected number of article publications by the MS Excel software for year 2023 is 604 with lower confidence bound forecast – 500 and upper confidence bound forecast – 708. Similarly, the forecast for the year 2024-633, 2025-661, 2026-690 and 2027-718 respectively. Further the forecast statistics (See Table. 4) gives the values of MASE – 3.26, SMAPE-0.14 and RMSE – 78.89. Thus, we can deduce from the time series analysis that statistical forecasting places the number of articles expected to be published in 2023 in the field of SCC anywhere from 500 to 708.Thus, the importance of SCC and its significance among researchers and organisations is expected to be similar and stronger in the coming years as well.

Bibliometric Analysis

Bibliometric analysis provides a summarised overview of the knowledgebase & general information regarding the researches available in a specific domain (Cancino et al., 2017). Bibliometrics uses facts to inspect books, articles, and different publications to draw inferences regarding the studies in a particular area. Bibliometric analysis is a standard and comprehensive method for locating and evaluating a vast body of research literature (Fang. et al., 2022). Bibliometrics not only enables systematic analysis of the published databases, facilitates the research investigations & identification of the trends in the researches but also identifies the most contributing researches by using graphical methods for visual analysis (Asgari et al., 2017). In this paper the bibliometric analysis studies the WoS database extracted by conducting following analysis:

1) Research Author Analysis.
2) Most Cited Publications Analysis
3) Publication Source Analysis.
4) Country Literature Analysis.
5) Keywords Co-Occurrence Analysis.

Research Author Analysis

The 4249 journal papers that we retrieved from the WoS databases included 12007 authors irrespective of the number of citations. Further we applied the following filters choosing 'citation' as our 'type of analyses and 'authors' as our 'counting method' to this authors list taking a threshold i.e., minimum 'author documents should be atleast one' and 'minimum number of citations should be at least 100'. For the given filters we retrieved 981 authors from 12007 authors. From the 981 authors we further took the top 100 authors based on their link strength for citations (See Fig.5). It is evident from VOSviewer network visualisation map for the most cited authors, that "Klassen, Robert D." (Green Circle) has the highest citations – 2552 followed by "Vachon, Stephan" (also Green Circle) with total citations – 2492, partially overlapping each other and "Fawcett, Stanley E." (Red Circle) with total citations – 2141. However, author contributions in terms of the greatest number of publications exhibits a different result i.e., "Lenzen, Manfred" (very low link strength, not among top 100 authors) and "Tseng, Ming-Lang" (Yellow Circle) had the largest number of papers published i.e., 18 articles followed by "Fawcett, Stanley E." (Red Circle) with 17 articles. From the findings we can say that the Top 20 authors have contributed as much as 5.91 % (out of 4249) of the total articles published in the last twenty years. From the top 100 authors network, we deduced the Top 20 author list based on their contribution in the area of SCC by collating the list of authors with the highest overall citations and the authors with the maximum articles published on SCC by an as illustrated in Table.7.

Table 7: Top 20 Research Authors - Citation & Publication

Highest No. of Publications				
R	**Author**	**P**	**C**	**TLS**
1	Lenzen, Manfred	18	553	61
2	Tseng, Ming-Lang	18	845	45
3	Fawcett, Stanley E.	17	2141	33
4	Lim, Ming K.	15	370	35
5	Luthra, Sunil	15	709	42
6	Seuring, Stefan	15	2048	11
7	Malik, Arunima	13	482	57
8	Klemes, Jiri Jaromir	12	239	28
9	Wagner, Stephan M.	12	240	7
10	Wu, Kuo-Jui	12	377	26
11	Cannella, Salvatore	11	350	19
12	Govindan, Kannan	11	1278	6
13	Paulraj, Antony	11	1186	10
14	Ramanathan, Usha	11	645	8
15	Caniato, Federico	10	597	25
16	Geschke, Arne	10	273	46

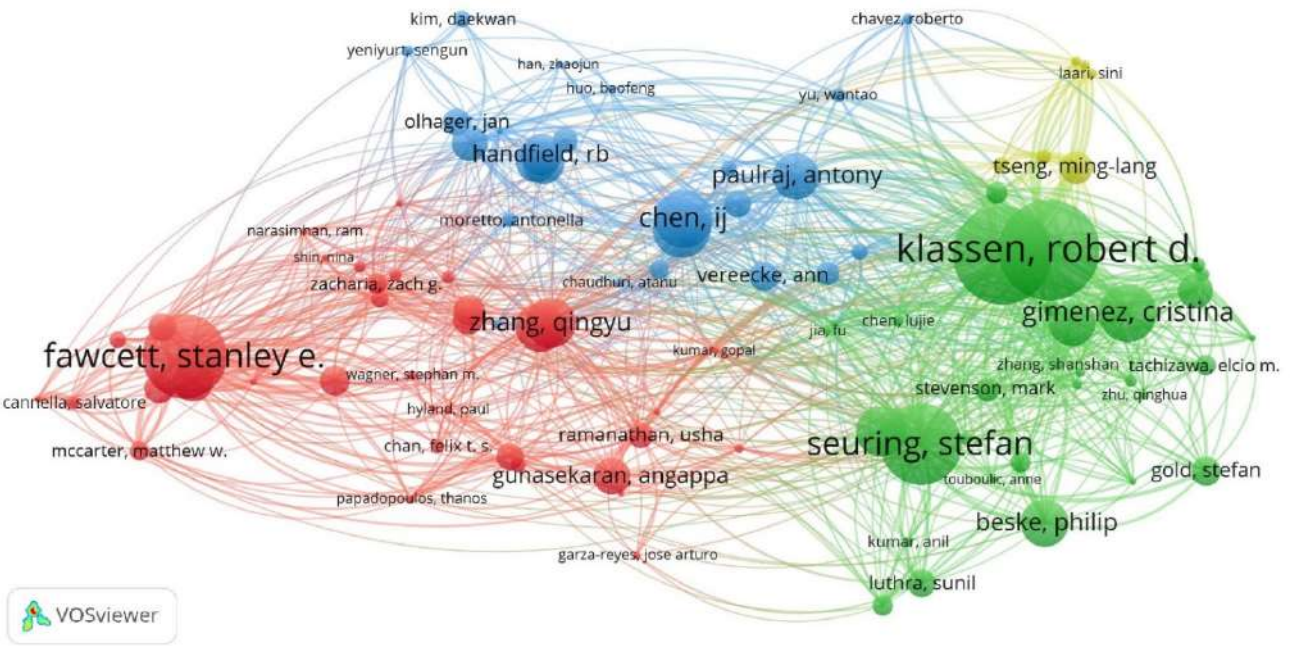
Highest Citations				
R	**Author**	**P**	**C**	**TLS**
1	Klassen, Robert D.	5	2552	5
2	Vachon, Stephan	7	2492	4
3	Fawcett, Stanley E.	17	2141	33
4	Seuring, Stefan	15	2048	11
5	Bauer, Christian	1	1895	5
6	Moreno-Ruiz, Emilia	1	1895	5
7	Reinhard, Jurgen	1	1895	5
8	Steubing, Bernhard	1	1895	5
9	Weidema, Bo	1	1895	5
10	Wernet, Gregor	1	1895	5
11	Gimenez, Cristina	9	1464	13
12	Zhang, Qingyu	5	1279	3
13	Govindan, Kannan	11	1278	6
14	Cao, Mei	3	1248	3
15	Beske, Philip	4	1203	5
16	Sarkis, Joseph	9	1192	13

R	Author	P	C	TLS
17	Gunasekaran, Angappa	10	943	25
18	Lehoux, Nadia	10	239	7
19	Mangla, Sachin Kumar	10	526	21
20	Nof, Shimon Y.	10	211	4
	Total	251		
	% of the WoS DB	5.91		

R	Author	P	C	TLS
17	Paulraj, Antony	11	1186	10
18	Handfield, Rb	2	1072	4
19	Petersen, Kj	2	1072	4
20	Ragatz, Gl	2	1072	4
	Total	108		
	% of the WoS DB	2.54		

R -- Rank; P - Number of Published articles; C - Citations; TLS - Total Link Strength (Collated by the author)

Fig.5: Most Cited Authors Network Visualisation Map.



Most Cited Publication Analysis

The most cited publications are identified by taking 'citation' as our 'type of analysis and 'document' as our 'counting method' to VOSviewer software. From a total 4249 articles we obtained only 291 papers that were above the taken threshold of minimum 100 or more number of citations. For this given filter criteria we retrieved 227 articles from 291 based on their network link strengths. From the results obtained using visualisation mapping by the VOSviewer software we have collated a list of twenty most cited research publications (See Table.8) under SCC. The findings present the publication by authors, "Gregor Wernet, Christian Bauer, Bernhard Steubing, Jürgen Reinhard, Emilia Moreno-Ruiz & Bo Weidema" titled "The ecoinvent database version 3 (part I): overview and methodology" in the year 2016 as the most cited article, with – 1984 citations, published by "International Journal of Life Cycle Assessment (Springer Heidelberg)". However, the VOSviewer network visualisation map does not include the same due to "Total Link Strength" being zero.

The VOSviewer visualisation in Fig.6. acknowledges the article by authors "Injazz J Chen, Antony Paulraj" (Purple Frame) published in the year 2004 as the most cited article with the highest number of citations i.e., 1,187 followed by

"Stephan Vachon, Robert D. Klassen" in 2008 (Dark Green Frame) with 956 citations and "Mei Cao, Qingyu Zhang' in 2011 (Green Frame) with 956 citations each. Further we have compiled the contributions of top 20 most cited research articles in terms of their important research findings, their Sources of publications and their relative importance which is depicted by their indexing category (ranking) and average value of yearly citations received. Further the distribution of various shades of colour frames in purple, green and yellow exhibits the publications throughout the last twenty years, and it is evident that the articles on SCC have been not only published regularly but also cited uniformly till date which further validates the significance of the research domain and its popularity among the supply chain scholars across the world. We have also showcased the major contributions of these top twenty most cited articles (See Table.9) and some other important researches (See Table.10) on SCC listing their core findings and other bibliometric details with respect to their impact on the research community based on the journal categories and citations (including average yearly citations).

Fig. 6: Most Cited Publication Network Visualisation Map

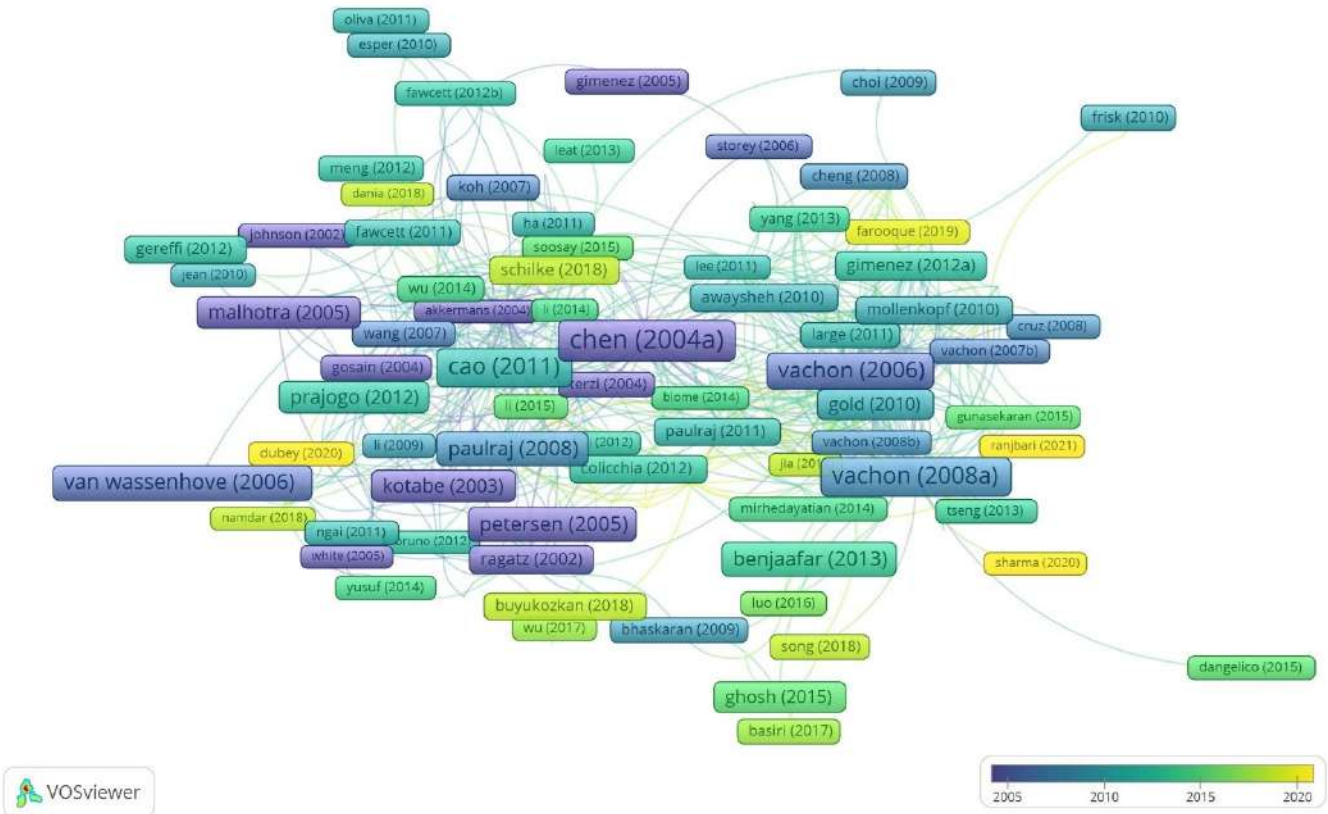


Table 8: Top 20 Most Cited Articles by Researchers

Id	Rank	Document	Citations	Links
3264	1	Wernet (2016)	1984	0
607	2	Chen (2004a)	1187	30
214	3	Vachon (2008a)	956	49
53	4	Cao (2011)	968	22
681	5	Vachon (2006)	804	43
879	6	Van Wassenhove (2006)	799	4
873	8	Fahimnia (2015)	767	12
3531	9	Adner (2017)	740	0
3	10	Barratt (2004)	718	34
1036	11	Benjaafar (2013)	705	3
1331	12	Petersen (2005)	696	6
2622	13	Krause (2007)	680	12
2885	14	Paulraj (2008)	621	19
1298	15	Waller (2013)	619	6
3549	16	Gawer (2014)	624	1
1395	17	Prajogo (2012)	598	12
2046	18	Govindan (2013)	589	4
2946	19	Kotabe (2003)	569	7
1152	20	Nyaga (2010)	537	16

Table 9: Most Cited Publication Analysis – (twenty most cited articles in last twenty years and their key findings)

Id	Rank	Authors / Year	Article Title	Key Findings	Journal / Publisher	Category	Citations	Citations	C/Y
3264	1	"Gregor Wernet, Christian Bauer, Bernhard Steubing, Jürgen Reinhard, Emilia Moreno-Ruiz & Bo Weidema" (2016)	"The ecoinvent database version 3 (part I): overview and methodology"	Ecoinvent's Life Cycle Inventory (LCI) database offers a range of sustainability analyses. This article highlights the methodological advances of LCA (Life cycle assessment) for enabling regionalized LCIA. Allowing for better regional data integration, resulting in decreased maintenance requirements when installing numerous system models. The goal of ecoinvent version 3 was to create a strong, adaptable data system for managing a worldwide inventory database. Support for regionalized LCI data and regionalized LCIA, application of multiple system models and the flexibility to introduce new models, complex supply chain data, increased transparency in documentation and flow properties, and integration of data models in datasets were among the key features envisioned. With multiple system models, consistent consumption mixes, global supply chains, support for regionalized LCIA, support for water footprinting, improved transport modelling, increased transparency	"International Journal Of Life Cycle Assessment" (Springer Heidelberg)	Q2	1984	1984	248

				through parametrization and improved documentation in the datasets, and more flow information in the form of properties, version 3 offers many technical possibilities that previous versions did not.					
607	2	"Injazz J Chen, & Antony Paulraj" (2004)	"Towards a theory of supply chain management: the constructs and measurements"	The Study examined 400 publications in order to identify and combine various supply chain processes and components in order to propose main SCM constructs. Supply uncertainty (SU), Demand uncertainty (DU), Technology uncertainty (TU), Customer focus (CF), Competitive priorities (CP), Strategic purchasing (SP), Top management support (TM), Information technology (IT), Supply network structure (SS), Long-term relationship (LR), Supply base reduction (SR), Communication (CO), Cross-functional teams (CT), Supplier involvement (SI), and Logistics were identified and validated using partial factor analysis (LI).	"Journal Of Operations Management" (Wiley)	Q1	1,187	1,187	59.35
214	3	"Stephan Vachon & Robert D. Klassen" (2008)	"Environmental management and manufacturing performance: The role of collaboration in the supply chain"	Partnership tactics with "green" suppliers offered broader benefits. However, depending on the client, the results might be different. The evidence pointed to a correlation between upstream behaviours and product performance, and downstream cooperation with product performance. There was a wider range of benefits associated with "green" supplier cooperation methods. Client work, however, resulted in a wide range of results. In general, the evidence pointed to a connection between downstream cooperation and product-based success, whereas upstream practises were more closely associated with process-based performance.	"International Journal Of Production Economics" (Elsevier Science BV)	Q1	956	956	59.75
53	4	"Mei Cao & Qingyu Zhang" (2011)	"Supply chain collaboration: Impact on collaborative advantage and firm performance"	The research identifies seven interrelated features as crucial to the effectiveness of supply chain collaboration: information sharing, goal congruence, decision synchronisation, incentive alignment, resource sharing, collaborative communication, and shared knowledge generation. Results from the research also show that effective supply chain cooperation boosts both firm performance and collaborative advantage.	"Journal Of Operations Management" (Wiley)	Q1	968	968	74.31
681	5	"Stephan Vachon & Robert D. Klassen" (2006)	"Extending green practices across the supply chain - The impact of upstream and downstream integration"	Technology integration with important suppliers and customers was associated favourably with collaborative environmental monitoring. It was discovered that only environmental supplier monitoring was related to logistical integration. As the number of suppliers shrank, so did the amount of environmental cooperation with main suppliers.	"International Journal Of Operations & Production Management" (Emerald Group Publishing Limited)	Q1	804	804	44.67
879	6	"Van Wassenhove" (2006)	"Blackett Memorial Lecture -	This paper advocates the use of private logistics for enhanced performance for humanitarian logistics, properly	"Journal Of The Operational Research Society" (Taylor &	Q2	799	799	44.39

			Humanitarian aid logistics: supply chain management in high gear"	identifying its limitations. It stresses on the potential of cross-learning between the humanitarian logistics sector & private sector for disaster relief & CSR. Key strategy for improving preparedness needs the logistics of the firms to be highly "agile, adaptable and aligned" – as a core competency. The article discusses six cases - South-African food crisis, Gujrat earthquake, Mozambique floods, Afghanistan winterization, Nokia-Ericsson preparedness and TNT-WFP - hunger eradication campaign illustrating role of collaboration for higher performance & effective response.	Francis Ltd)				
873	8	"Behnam Fahimnia, Joseph Sarkis, Hoda Davarzani" (2015)	"Green supply chain management: A review and bibliometric analysis"	The study is based on green supply chain management bibliometrics of 1000 published articles, identifying the most important factors and researchers. By the Use of bibliometric tools, this paper identifies major research topics, the linkage between, them and patterns in collaboration mechanism. The investigations collate evolution of GSCM identifying major areas of interests for researchers and the potential areas for future researches. The topical classification of the researches suggest that new researchers are showing greater interest on prescriptive, normative and quantitative modelling. Thus, the future researches are expected to be focused on areas such as sustainability, sub-supplier management, behavioural issues in SC, and barriers & enablers for sustainable SC implementations.	"International Journal Of Production Economics" (Elsevier)	Q1	767	767	85.22
3531	9	"Adner, R" (2017)	"Ecosystem as Structure: An Actionable Construct for Strategy"	This article provides a structuralist interpretation of the ecosystem construction. It gives a clear explanation of what an ecosystem is, how ecosystems work, and what makes ecosystem strategy special. With this technique, the strategy literature may see where the ecosystem construct contributes and subtracts knowledge in comparison to other constructs (such as business models, platforms, coopetition, multisided marketplaces, networks, technology systems, supply chains, and value networks).	"Journal Of Management" (Sage Publications Inc)	Q1	740	740	105.7
3	10	"Mark Barratt" (2004)	"Understanding the meaning of collaboration in the supply chain"	This article suggests that the best setting for collaboration is one in which the supply chain is segmented depending on consumer purchasing patterns and service requirements. The study also asserts the need for a deeper comprehension of the components of supply chain collaboration, particularly how the pertinent cultural, strategic, and execution components interact with one another.	"Supply Chain Management-An International Journal" (Emerald Group Publishing Ltd)	Q1	718	718	35
1036	11	"Saif Benjaafar, Yanzhi Li, Mark Daskin" (2013)	"Carbon Footprint and the Management of Supply Chains: Insights From	The research illustrates how conventional models may be modified to assist decision-making that accounts for both costs and carbon footprint by combining carbon emission characteristics in operational decision-	"IEEE Transactions On Automation Science And Engineering" (IEEE-Inst Electrical Electronics Engineers Inc)	Q1	705	705	64.09

			Simple Models"	making pertaining to procurement, manufacturing, and inventory management. The levels of these factors, as well as the effect of regulatory emission control strategies, are also evaluated in the research. The models look at whether or not adjustments to operations can meet carbon reduction targets without the need for expensive investments in carbon-cutting equipment. Companies in the same supply chain work together to reduce costs and carbon emissions by analysing the results of this collaboration.					
1331	12	"Kenneth J. Petersen, Robert B. Handfield, Gary L. Ragatz" (2005)	"Supplier integration into new product development: coordinating product, process and supply chain design"	This research explores the integration of suppliers with new product development (NPD), which can provide numerous benefits such as improved quality, reduced cost of new products, and facilitating the smooth launch of new products. These collaborative relationships can be depicted by design consultation with the suppliers by entrusting complete responsibility for the design of components or systems to the suppliers. Early collaboration of manufacturer-supplier is critical for coordinating such design processes for supply chain, product, and processes. The paper focuses on the impact of managerial practices for supplier involvement and its variability with varying responsibilities and tests the results through survey data from global firms to validate their influence on financial returns and/or performance which is supported by the results of a multiple regression analysis.	"Journal Of Operations Management" (Wiley)	Q1	696	696	36.63
2622	13	"Daniel R. Krause, Robert B. Handfield, Beverly B. Tyler" (2007)	"The relationships between supplier development, commitment, social capital accumulation and performance improvement"	The paper explains industrial buyer-supplier relationships along with other parameters and in the next step it also advocates how the social capital facets of those relationships affect the productivity of purchasing organisations. The study finds that the various social capital dimensions—cost and overall cost vs. quality, service, and flexibility—have various effects depending on the performance objectives. Then in the next discussion the stress is how the Relational capital in the form of supplier and buyer reliance and cognitive capital in the form of shared values and the simple aspects as explained above were particularly important in explaining buyer performance successes in terms of cost and total cost.	"Journal Of Operations Management" (Wiley)	Q1	680	680	40
2885	14	"Antony Paulraj, Augustine A. Lado, Injazz J. Chen" (2008)	"Inter-organizational communication as a relational competency: Antecedents and performance	This research identifies Inter-organizational communication as a critical factor for strategic collaboration among firms based on a survey of 200 American firms to test several hypotheses by using structural equation modelling. The Study looks into the causes and effects of inter-organizational communication on the	"Journal Of Operations Management" (Wiley)	Q1	621	621	38.81

			outcomes in collaborative buyer–supplier relationships"	performance of supply chains. The finding of the study testifies that inter-organizational communication is a relational ability that has a positive impact on the performance of customers and suppliers.					
1298	15	"Matthew A. Waller & Stanley E. Fawcett" (2013)	"Data Science, Predictive Analytics, and Big Data: A Revolution That Will Transform Supply Chain Design and Management"	In this study, data science, predictive analytics, and big data are used to examine the connection between and dependence between SCM and DPB. To identify the SCM based parameters and their affecting nature on DPB, the outcomes of predictive analysis and big data-based examples are analysed.	"Journal Of Business Logistics" Wiley (Blackwell)	Q1	619	619	56.27
3549	16	"Annabelle Gawer" (2014)	"Bridging differing perspectives on technological platforms: Toward an integrative framework"	An integrative model connecting engineering design and economics with reference to technological platforms is presented in this study. In addition to speculating on the patterns of platform innovation and competition, the author has postulated that platforms function along an organisational continuum that includes enterprises, supply chains, and industry ecosystems. This conception recognises that the constitutive agents of the platform might perform a variety of roles that change throughout time. Additionally, by understanding platforms as organisations or meta-organizations, agency, which had been lost in the engineering view of platforms, is brought back while maintaining the crucial structural aspect of their architecture (core-periphery).	"Research Policy" (Elsevier)	Q1	624	624	62.4
1395	17	"Daniel Prajogo, Jan Olhager" (2012)	"Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration"	This article investigates the effects of supply chain partners' ability to share data and materials on operational efficiency. For this reason, we are concentrating on the role of long-term supplier partnerships as the engine of integration. Using information from 232 Australian companies, we find that logistics integration has a major effect on operational performance. The capacity of information technology and the ease with which information may be shared have important effects on logistical integration. Indirectly, long-term supplier collaborations boost performance significantly via their benefits on logistical and information integration.	"International Journal Of Production Economics" (Elsevier)	Q1	598	598	49.83
2046	18	'Kannan Govindan, Roohollah Khodaverdi , Ahmad Jafarian ' (2013)	"A fuzzy multi criteria approach for measuring sustainability performance of a supplier based on triple bottom line approach"	In order to find an effective model for supply chain supplier selection based on the Triple Bottom Line (TBL) approach (economic, environmental, and social concerns), this research investigates sustainable supply chain activities and employs a fuzzy multi-criteria approach to solving this problem. We utilise triangular fuzzy numbers as a means of encoding the linguistic values of experts' subjective selections. In qualitative performance assessment,	"Journal Of Cleaner Production" (Elsevier Sci Ltd)	Q1	589	589	53.55

				fuzzy numbers are utilised to establish the weights of the criteria, and an example is provided to show how the suggested method, Fuzzy TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), is used to rank providers.					
2946	19	"Masaaki Kotabe, Xavier Martin, Hiroshi Domoto" (2003)	"Gaining from vertical partnerships: knowledge transfer, relationship duration, and supplier performance improvement in the U.S. and Japanese automotive industries"	This paper inspects the sources of operational performance improvement in supplier partnerships. The research builds on the idea that if a buyer and a supplier have established time-bound relational assets and the businesses take advantage of the resultant communication efficiency by sharing productive knowledge, supplier performance will be most advantageous. Information exchange together with the length of the previous buyer-supplier relationship has been analyzed based on survey responses. In two survey samples of Japanese and American automobile suppliers, it is found that regular technical exchanges have a consistent impact on supplier performance enhancement regardless of the length of the partnership. Whereas, the impact of higher-level technology transfer becomes increasingly beneficial throughout the course of a relationship. The literature also explores knowledge transfer, supplier-buyer relationships, and the general performance dynamics of inter- and intra-firm connections.	"Strategic Management Journal" (Wiley)	Q1	569	569	27.1
1152	20	"Gilbert N. Nyaga, Judith M. Whipple, Daniel F. Lynch" (2010)	"Examining supply chain relationships: Do buyer and supplier perspectives on collaborative relationships differ?"	Using structural equation modelling, this research explores collaborative partnerships in two independent investigations; the first study looks at buyers' perspectives, and the second study looks at suppliers' perceptions. Then, using invariance testing, the two studies are compared to identify the economic and interpersonal elements that influence performance and satisfaction from the viewpoint of each side. The findings demonstrate that cooperative actions, such as information sharing, combined effort in building relationships, and focused investments, foster trust and commitment. Improved performance and satisfaction follow trust and dedication. The findings from the two separate studies show similarities and differences. While the conceptual model is very similar, certain paths differ in significance and/or importance across buyer and supplier firms, with buyers placing more emphasis on relationship outcomes and suppliers seeking to protect their transaction-specific investments through information sharing and collaborative relationship efforts.	"Journal Of Operations Management" (Wiley)	Q1	537	537	38.36

Table.10: Some Other Important Researches in SCC

S.No.	Authors / Year	Article Title	Key Findings	Journal / Publisher	Category	Citations	C/Y
1	"Cristina Gimenez, Elcio M. Tachizawa" (2012)	"Extending sustainability to suppliers: a systematic literature review"	Despite the fact that the new collaborative paradigm emphasises that assessment alone is inadequate, evaluation and cooperation both have a positive effect on environmental performance and corporate social responsibility. There are advocates for these kinds of initiatives, despite how few there are. Participation from suppliers and evaluation of those suppliers appear to have a beneficial effect on environmental performance and CSR outcomes as governance mechanisms. The study also differentiated between internal (such as the company's commitment to the environment, senior management support, and the availability of resources) and external (such as government rules and regulations) enablers (such as trust and clarity objectives in the buyer supplier relationship).	"Supply Chain Management-An International Journal" (Emerald Group Publishing Ltd)	Q1	418	34.8
2	"Robert D. Klassen & Stephan Vachon" (2003)	"Collaboration and evaluation in the supply chain: The impact on plant-level environmental investment"	With the intention of improving environmental management in manufacturing facilities, this research explores the significance of collaboration and evaluation across the supply chain. Site visits, staff exchanges, and technical assistance are all examples of collaborative activities, whereas evaluations could involve things like gauging suppliers' performance, relying on certification to forego inspection, recognising suppliers' triumphs, and offering feedback. It was discovered that as the number of customer-driven collaborative activities increased, so did investment in environmental management at the plant level. There was less evidence, however, to back up the assertion that evaluation efforts influenced ecological investments.	"Production And Operations Management" (Wiley)	Q1	356	17
3	"Kirstin Scholten & Sanne Schilder" (2015)	"The role of collaboration in supply chain resilience"	Significant results show that supply chain resilience is improved through increased visibility, rapidity, and adaptability as a result of particular collaborative actions (information sharing, collaborative communication, jointly created knowledge, and joint relationship efforts). At each node in the supply chain, we uncover the underlying mechanisms and interdependencies between these variables.	"Supply Chain Management-An International Journal" (Emerald Group Publishing Ltd)	Q1	324	35.6
4	"I. J. Chen & A. Paulraj" (2004)	"Understanding supply chain management: critical research and a theoretical framework"	The three streams of supply network coordination, logistics integration, and strategic supply purchasing/supply management are used to categorise the body of knowledge associated with SCM in this study. This study demonstrates that there is no coherent theory in the field of SCM. To be more precise, it has not been adequately investigated how important different supply chain enablers are relative to one another, how these enablers interact, how they affect supply chain performance directly or indirectly, or how they influence other constructs. The article suggests a research framework that offers a solid and reliable foundation for the theoretical development of alternative models and develops a cogent theory of SCM.	"International Journal Of Production Research" (Taylor & Francis Ltd)	Q1	309	15.5

5	"Philip Beske & Stefan Seuring" (2014)	"Putting sustainability into supply chain management"	Firstly, we take a look at South Carolina's sustainable management practises from five different perspectives: orientation towards SCM and sustainability; continuity; collaboration; risk management; and proactivity. In addition to incorporating stakeholder management and life cycle evaluation, SSCM is also committed to the triple bottom line. Third, in order to attain high sustainability performance, businesses will need to make greater efforts to achieve true sustainability throughout the entire supply chain. It is advised that parts of the approach such as "Enhanced Communication," "Technological Integration," and "SC Partner Selection" all work together.	" Supply Chain Management-An International Journal	Q1	264	26.3
6	"Stanley E. Fawcett, Cynthia Wallin, Chad Allred, Amydee M. Fawcett, Gregory M. Magnan" (2011)	"Information Technology as an enabler of supply chain collaboration: a dynamic-capabilities perspective"	The study found that when SC connection and the organising framework of an information-sharing culture are combined to create a dynamic collaboration capability, they most effectively contribute to differential firm performance. The primary findings were: (1) IT's "connection" role continues to be a highly valued and uncommon capability. (2) Greater success results from a company's openness to share information. (3) The productivity component of company performance has seen a more pronounced impact from IT.	"Journal Of Supply Chain Management" (Wiley)	Q1	255	19.5
7	"Cristina Gimenez & Eva Ventura" (2005)	"Logistics-production, logistics-marketing and external integration - Their impact on performance"	The study supports their prior findings that there is a correlation between internal and external integration and that external integration improves logistical performance. (1) Among the key findings is that supply chain partners can reduce costs, stock-outs, and lead times through external collaboration. (2) External integration has the biggest impact on a company's ability to provide logistical services. The manufacturer's perspective is included in the study.	"International Journal Of Operations & Production Management (Emerald Group Publishing Limited)"	Q1	237	12.5
8	"Mei Cao, Mark A. Vonderembse, Qingyu Zhang & T.S. Ragu-Nathan" (2010)	"Supply chain collaboration: conceptualisation and instrument development"	In this study by instead engaging in detailed structural model testing, the primary objective of this study is to develop the SCC construct and test its predictive validity by looking at its business performance impact. The findings suggest that SCC has a significant influence on company performance, which suggests a high degree of predictive validity.	"International Journal Of Production Research" (Taylor & Francis Ltd)	Q1	220	15.6
9	"Rameshwar Dubey, Angappa Gunasekaran, David J. Bryde, Yogesh K. Dwivedi & Thanos Papadopoulos " (2020)	"Blockchain technology for enhancing swift-trust, collaboration and resilience within a humanitarian supply chain setting"	Studying how BT can affect ST and OSTC in the context of disaster relief activities is the focus of this study. Using data collected from 256 respondents from international NGOs engaged in disaster assistance, a conceptual model was built based on OIPT and RV, and then empirically tested. Research concludes that BT collaboration significantly improves supply chain visibility. After that, they both make considerable contributions to the development of the highly anticipated ST, which in turn has a statistically significant effect on the CO and SCR.	"International Journal Of Production Research' (Taylor & Francis Ltd)	Q1	186	46
10	"Usha Ramanathan & Angappa	"Supply chain collaboration: Impact of success	In this investigation, we posited six hypotheses on the relationship between collaborative planning and supply chain	"International Journal Of Production Economics" (Elsevier)	Q1	179	17.7

	Gunasekaran: (2014)	in long-term partnerships"	management. Factor analysis has identified five intangible processes essential to successful collaboration: planning, decision making, execution, success, and sustainability (LTC). Research shows that the collaborative activities within supply chains significantly increase the likelihood of success. Another finding is that the three main areas of collaboration in relationships in constructions and SC are planning, decision-making, and execution. The success of SC collaborations is strongly correlated with the amount of SC collaborations there are (planning, implementation, and decision making).				
11	"Jia Lim, Jing Dai, Antony Paulraj" (2022)	"Collaboration as a structural aspect of proactive social sustainability: the differential moderating role of distributive and procedural justice"	According to the findings, (1) According to the findings, the collaboration-performance connection is differently influenced by distributive justice, and a Proactive Social Strategy might motivate corporations to cooperate with suppliers on collaborative social activities. and (2) The relationship between social collaboration and operational performance benefits from distributive fairness, whereas the relationship between social cooperation and social performance suffers. Surprisingly, procedural fairness did not substantially influence the connection between social cooperation and performance.	"International Journal Of Operations & Production Management" (Emerald Group Publishing Ltd)	Q1	166	1
12	"Cristina Sancha, Cristina Gimenez, Vicenta Sierra" (2016)	"Achieving a socially responsible supply chain through assessment and collaboration"	Through statistical analysis from 120 Spanish manufacturers, the research examines the effect on the social performances of the purchasing firm and the supplier. 1. SMARTPLS-based analysis demonstrates that working with suppliers improves their social performance. 2. The research illustrates that businesses eager to enhance their social representation can adopt better supplier evaluation procedures. 3. The collaboration, as proposed by the RBV, has a favourable and direct influence on the social performance of the suppliers.	"Journal Of Cleaner Production" (Elsevier Sci Ltd)	Q1	140	17.5
13	"Stanley E. Fawcett, Stephen L. Jones, Amydee M. Fawcett" (2012)	"Supply chain trust: The catalyst for collaborative innovation"	The importance of managers comprehending the nature of trust and the dynamics of trust building is emphasised in the paper. The article discusses a paradigm for measuring trust maturity for the SCM and contrasts the competitive power of trust. Look up elements like cooperation, creativity, and competitive performance in the system created using the dynamic systems model for the process of creating trust. The study places emphasis on the following managerial considerations: (1) Strategically signal SCM based trustworthiness. (2) Scan for SCM based value creation potential (3) Establish SCM based trust-building organizational routines (4) Aligning SCM based incentives (5) 5. Cultivate a SCM based collaborative philosophy. The main reason why the risk curve in Stage 3 and Stage 4 relationships slopes up in new technology studies using a graphical technique may be because projects and programmes are being examined that have a potentially higher payoff but also more uncertainty and risk (If assessed correctly).	"Business Horizons" (Elsevier)	Q1	139	11.6

14	"Stanley E. Fawcett, Amydee M. Fawcett, Bradlee J. Watson, Gregory M. Magnan" (2012)	"Peeking Inside The Black Box: Toward An Understanding Of Supply Chain Collaboration Dynamics"	Inductive, interview-driven research is used to analyse the collaboration hypothesis in this study. In the study, 50 structured interviews were conducted at two different times to illustrate an example of SC performance. (1) In order to keep up with the competition in the market, businesses must develop their collaborative skills. (2) Managers create specialised value by utilising special resources and distinguishing skills. (3) While relatively few businesses have been able to make the major cultural and structural changes required to fully support high-level collaboration, it has been discovered that practically all businesses are actively taking part in enablers. (4) To create a dynamic collaborative strategy, businesses must modify their culture and organisational structure in order to eliminate fear and reward risk-taking in collaboration. (5) Establishing long-term trust in SCM is a prerequisite for developing cooperation skills. (6) It is advised that businesses look inside the "black box" in order to better understand the dynamics of collaboration.	"Journal Of Supply Chain Management" (Wiley)	Q1	139	11.6
15	"Fawcett, SE; Magnan, GM; Mccarter, MW" (2008)	"A THREE-STAGE IMPLEMENTATION MODEL FOR SUPPLY CHAIN COLLABORATION"	Every executive knows that the inadequacy of our current tools for gathering and analysing data is the biggest obstacle to effective SC collaboration. Issues that include people, such as culture, trust, resistance to change, and lack of collaboration, are more difficult to resolve. When investing in SC enablers like technology, information, and measurement systems, businesses shouldn't forget that people are the fundamental bridge for effective collaborative innovation.	"Journal Of Business Logistics" (Wiley)	Q1	131	8.19
16	"Blome, C; Paulraj, A; Schuetz, K" (2014)	"Supply chain collaboration and sustainability: a profile deviation analysis"	A synergy between the supply chain efforts under examination is shown to be beneficial. (1) It is derived that the more sustainable firms as per the assessment are in their production processes shows that the benefits achieved through supply chain collaboration is on a greater scale. (2) The modern supply chain collaboration is complex but it also results in performance gains and the study strongly advocated the same. (3) This research demonstrates that a company's intrinsic and internally sustainable output mediates the effects of alignment on performance measurements..	"International Journal Of Operations & Production Management" (Emerald Group Publishing Ltd)	Q1	128	12.8
17	"Zhang, Qy & Cao, M" (2018)	"Exploring antecedents of supply chain collaboration: Effects of culture and interorganizational system appropriation"	The study explores the impact of collaborative culture and IOS use especially on supply chain collaboration by probing a Structural equation modelling (LISREL) moderated mediation model. The key components are collaborative culture and IOS appropriation and surprisingly overdependence on technology and factors like an overlooked role of collaborative culture along with the lack of trust makes collaboration in the chain difficult.	"International Journal Of Production Economics" (Elsevier Science BV)	Q1	98	16.3
18	"Kache, F & Seuring, S" (2014)	"Linking collaboration and integration to risk and performance in supply chains via a	Specifically, we highlight statistical evidence of a correlation between the concepts of collaboration/integration and the evaluated risk/performance. This paper employs a statistically-supported	"Supply Chain Management-An International Journal" (Emerald Group Publishing Ltd)	Q1	83	8.3

		review of literature reviews"	contingency analysis to make the case for conducting a content analysis on 103 pieces of literature reviews pertaining to SCM. There was a robust and statistically significant link between collaboration/integration and risk/performance across all six categories (dependence values 0.300).				
19	"Fawcett, SE; Mccarter, MW; Fawcett, AM; Webb, GS; Magnan, GM" (2015)	"Why supply chain collaboration fails: the socio-structural view of resistance to relational strategies"	To illustrate, we provide the flywheel idea, which proposes Managers need to keep banging on the flywheel to create the necessary momentum for change if they want to see any results. When momentum is trying to gain speed, relationship resistors get in the way. The socio-structural perspective also lays out how the intrinsic (interacting) character of humans and the architecture of organisations work together to stymie the evolution of routines inside organisations that foster cooperation.	"Supply Chain Management-An International Journal" (Emerald Group Publishing Ltd)	Q1	82	9.11
20	"Awan, U , Kraslawski, A & Huiskonen, J" (2019)	"Governing Interfirm Relationships for Social Sustainability: The Relationship between Governance Mechanisms, Sustainable Collaboration, and Cultural Intelligence"	This research emphasises social sustainability, a topic that is gaining traction in the fields of supply chain and international business, and draws on data from 239 export manufacturing enterprises across a range of industries. The results of this research suggest that manufacturing companies should prioritise the development of more HR rules, the enforcement of severe child labour policies, the improvement of workers' living standards, and their overall health and safety in and around the workplace. Based on the findings, the authors conclude that contract governance is useful for coordinating fundamental collaborative activities. Cultural intelligence (CQ) is identified in the research as crucial in the case of inter-firm collaboration, and it plays a vital role in the development and execution of supply chain collaboration.	"Sustainability' (MDPI)	Q3	75	12.5
21	"Allaoui, H; Guo, Yh; Sarkis, J" (2019)	"Decision support for collaboration planning in sustainable supply chains"	The study's overarching goal is to strike a fair keel between economic growth and resolving pressing environmental and social problems. Through a series of pilot projects, we test, refine, and validate an information and communication technology platform across a variety of food distribution systems. The "Collaboration Planning Tool (CPT)" was designed to disseminate the necessary framework for basic supply chain planning across complex networks that have an impact on supply chain sustainability. The second pilot showed speed in the chosen supply chain and gate-to-gate transit times, suggesting a reduction of up to 50% was possible.	"Journal Of Cleaner Production" (Elsevier Sci Ltd)	Q1	70	14
22	"Decampos, HA; Fawcett, SE; Melnyk, SA" (2022)	"Collaboration expectation gaps, transparency and integrated NPD performance: A multi-case study"	This research examines six case studies, with the conclusion that CEGs of varied degrees may have an effect on the success of new product development (NPD) projects. When both companies in a cooperation fully understand the drivers of that partnership (benefits, risks, and costs), they have achieved a level of transparency. We see that cooperation transparency influences CEG development across an NPD project's life cycle. These results deepen our knowledge of buyer-supplier dynamics in NPD initiatives, while also introducing the ideas	"Journal Of Purchasing And Supply Management" (Elsevier Sci Ltd)	Q1	64	-

			of CEG and collaboration transparency as key factors in comprehending enhanced performance via cooperation.				
23	"Govindan, K" (2013)	"Vendor-managed inventory: a review based on dimensions"	An upstream (vendor) perspective on inventory management at a later point in the supply chain is the focus of this investigation (customer). The results of an investigation of the consequences of SCM integration are reviewed across three dimensions: dimensions of time, dimensions of space, and dimensions of technique. According to the research, factors including coordination, information sharing, and teamwork account for 9% of the pieces. Little over a tenth of the publications evaluate how VMI affects transportation expenses. Third, many various concepts, including CPFR, Continuous Replenishment (CR), and Value-Added Collaboration (VIC), are discussed in the study as means by which cooperation might be monitored effectively.	"International Journal Of Production Research" (Taylor & Francis Ltd)	Q1	61	5.55
24	"Jin, Y; Fawcett, Am & Fawcett, SE" (2013)	"Awareness is not enough Commitment and performance implications of supply chain integration"	According to the research, just a small fraction of businesses reported making end-to-end chain integration a top priority. Researchers use a mixed-methods design (survey, interviews, and a replication) to examine the impact of integration on supply chain management. Strong executive buy-in is necessary for integrated business models, which in turn is required to mobilise resources, extend planning horizons, and adjust expectations.	"International Journal Of Physical Distribution & Logistics Management" (Emerald Group Publishing Ltd)	Q1	46	4.18
25	"Govindanan, K; Jha, Pc; Agarwal, V; Darbari, JD" (2019)	"Environmental management partner selection for reverse supply chain collaboration: A sustainable approach"	The paper recommends a narrative approach for evaluating OEMs' success across several parameters, notably in the context of reverse SC cooperation. Throughout the course of the research, a total of thirteen environmental and social qualities were completed, in addition to the original set of seventeen economic attributes. And, the qualities are evaluated beforehand using the COPRAS approach, and then ranked with the best-worst method (BWM).	"Journal Of Environmental Management" (Academic Press Ltd- Elsevier Science Ltd)	Q1	40	8
26	"Govindan, K; Aditi; Darbari, JD; Kaul, A; Jha, PC" (2021)	"Structural model for analysis of key performance indicators for sustainable manufacturer-supplier collaboration: A grey-decision-making trial and evaluation laboratory-based approach"	This study examines fifteen key performance indicators (KPIs) for evaluating a supplier's performance from a variety of stakeholder viewpoints, using a DEMATEL model developed through the DEMATEL grey-based decision-making trial and evaluation laboratory. Information disclosure, environmental management system, environmental competence, employee interests and rights, training, education, and community influence, pollution controls, and recycling are the cause groups that need to be focused on most to reach the intended aim. The remaining eight effect group KPIs are as follows: Environmental Costs; Employment Practices; Occupational Health and Safety Management System; Work Health and Safety; Return Handling Capabilities; Waste Material Treatment Capability;	"Business Strategy And The Environment" (Wiley)	Q1	28	9.33
27	"Shin, N , Park, Sh & Park, S" (2019)	"Partnership-Based Supply Chain Collaboration: Impact on Commitment,	Pollution Prevention and Green Image; and Work Health and Safety. In order to acquire a representative sample of supplier, buyer, and parallel-aligned company perspectives on partnership	"Sustainability' (MDPI)	Q3	27	5.4

		Innovation, and Firm Performance"	models, researchers polled 423 persons. The authors use structural equation modelling to investigate how employees' commitment to the success of their company varies depending on whether or not the organisation is structured as a partnership. Supply chain managers can use the suggested model construction and empirical marks analysis to plot out a course for strategic partnership management that will lead to the targeted improvement in innovation, operations, and financial performance.				
28	"Subramanian, N; Gunasekaran, A; Papadopoulos, T; Nie, P" (2016)	"4th party logistics service providers and industrial cluster competitiveness Collaborative operational capabilities framework"	According to the study's conclusion, managers lose enthusiasm for collaboration when they are pressured to overcome institutionalised barriers to cooperation. Institution of a relational capacity also requires patience and perseverance within the study's limitations. Recognizing the interdependence of sociological and structural resistors is critical to understanding the failure of group effort tactics. Organizational resistance is a four-pronged phenomenon, with each form of resistor reinforcing the others to create a solid block of anti-collaborative behaviour.	"Industrial Management & Data Systems" (Emerald Group Publishing Ltd)	Q2	20	2.5
29	"Brun, A, Karaosman, H & Barresi, T" (2020)	"Supply Chain Collaboration for Transparency"	This research illustrates how a fashion conglomerate establishes links inside its supply chain, which in turn affects the company's public claims of openness. As far as supply chain partnerships go, having an open dialogue is seen as crucial. The shift from basic surveillance and contractual agreement to trust and cooperation.	"Sustainability' (MDPI)	Q3	19	4.75
30	"Swanson, D; Jin, YH; Fawcett, AM; Fawcett, SE" (2017)	"Collaborative process design A dynamic capabilities view of mitigating the barriers to working together"	The authors employed SmartPLS to investigate the ways in which suppliers' interactions with one another and with the purchasing firm's staff led to a recovery in the latter's social performance, as well as an improvement in their own. A related practical conclusion is that businesses that care about their public image should adopt supplier assessment procedures.	"International Journal Of Logistics Management" (Emerald Group Publishing Ltd)	Q2	17	17
31	"Luthra, S; Sharma, M; Kumar, A; Joshi, S; Collins, E; Mangla, S" (2022)	"Overcoming barriers to cross-sector collaboration in circular supply chain management: a multi-method approach"	It is clear from the study that governance hurdles (GOB) and contextual obstacles pose the greatest difficulties for cross-sector collaboration and circular development (COB). Due to the findings of this study, policymakers now have a better understanding of the aspects that should be considered when tackling the problem of cause-and-effect groupings. This study proves the significance of effect group barriers such operational, strategic, and managerial hurdles, as well as the significance and causality of contextual, perceptual, and governance hurdles..	"Transportation Research Part E-Logistics And Transportation Review" (Pergamon-Elsevier Science Ltd)	Q1	14	7
32	"Fawcett, SE; Fawcett, AM; Knemeyer, AM; Brockhaus, S; Webb, GS" (2021)	"Overcoming the collaborative challenge: commitment as a super-ordinate enabler of value co-creation"	According to the findings, top-down support from management is crucial to the development of employee commitment. Studying dedication has led researchers to focus on three distinct types: instrumental, normative, and transformational. Management investments in collaborative value co-creation may be aided by the findings of the commitment to collaboration taxonomy, which examines varying levels of	"International Journal Of Physical Distribution & Logistics Management" (Emerald Group Publishing Ltd)	Q1	5	1.67

			commitment. This classification shows the exits from superficial devotion and the way to profound dedication.				

Publication Source Analysis

Further we conducted analysis of the bibliographic network of the sources that have contributed to our SCC database from WoS of 4249 journal articles. For this purpose, we choose 'citation' as our 'type of analysis' and 'sources' as 'unit of analysis'. We restricted the scope of our network by defining the 'minimum number of documents from a source' equal to '5' and 'minimum number of citations from a source' equal to '50'. For the given filters we obtained '114' sources out of total '913' sources. Out of 114 sources we selected all of them based on their greatest total link strength by sources, however from the 114 sources network, a set of 109 sources was the largest connected network while the remaining were not. Journal "Sustainability" (Green Circle) has contributed the largest number of journal papers – 238 with total citations of 2448 and total link strength of 1164. However, "International Journal of Production Economics" (Yellow Circle) has the highest citations – 12307 followed by "Supply Chain Management-An International Journal" (Blue Circle) with 11177 citations and "Journal of Cleaner Production" (Green Circle) with 10049 citations. The Top 20 Journal have contributed 32.34 % of the total publication in the domain of SCC in the undertaken database. The Top 20 Journal list has been collated based on the highest number of citations and total number of publications is given below in Table.11 Along with network visualisation map of the same in Fig.7 below:

Fig. 7: Visualisation Analysis of highly cited Publication Sources

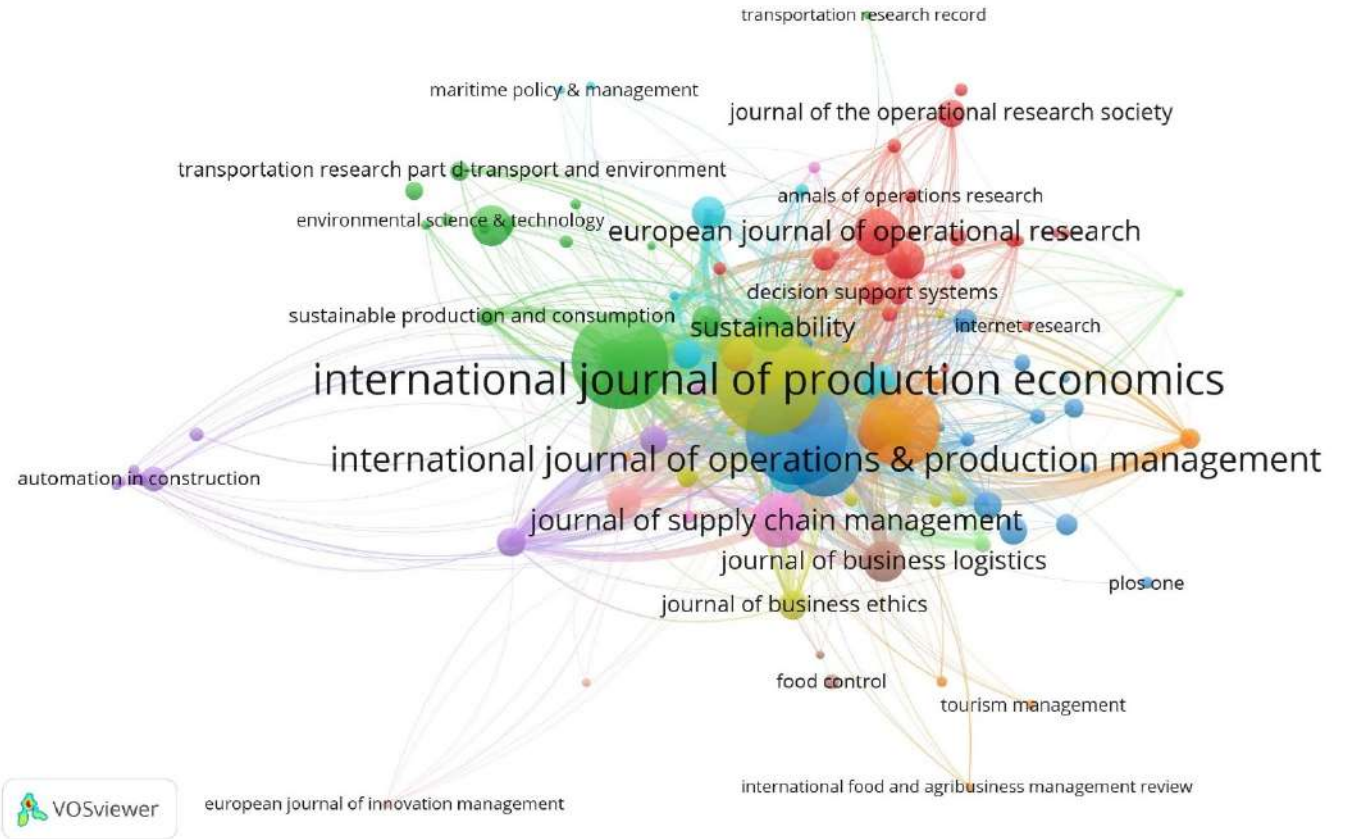


Table 11: Publication Source with highest number of publications and citations

R	Source	P	C	TLS
1	"Sustainability"	238	2448	1164
2	"Supply Chain Management-An International Journal"	204	11177	2521
3	"Journal Of Cleaner Production"	198	10049	1386
4	"International Journal of Production Economics"	166	12307	1965
5	"International Journal of Production Research"	134	5571	1143
6	"Production Planning & Control"	109	2655	815
7	"International Journal of Operations & Production Management"	108	6126	1277
8	"International Journal of Logistics Management"	86	1492	801
9	"International Journal of Logistics-Research And Applications"	68	1114	556
10	"International Journal of Physical Distribution & Logistics Management"	63	2081	518
11	"Industrial Management & Data Systems"	56	1384	400
12	"Business Strategy And The Environment"	55	1496	499
13	"Computers & Industrial Engineering"	50	1819	339
14	"European Journal of Operational Research"	49	2673	258
15	"Journal of Supply Chain Management"	45	3341	635
16	"Journal of Operations Management"	40	7062	1112
17	"Journal of Business & Industrial Marketing"	39	391	236
18	"Journal of Business Logistics"	38	2129	395
19	"British Food Journal"	38	552	190
20	"Industrial Marketing Management"	37	843	212

R	Source	P	C	TLS
1	"International Journal of Production Economics"	166	12307	1965
2	"Supply Chain Management -An International Journal"	204	11177	2521
3	"Journal of Cleaner Production"	198	10049	1386
4	"Journal of Operations Management"	40	7062	1112
5	"International Journal of Operations & Production Management"	108	6126	1277
6	"International Journal of Production Research"	134	5571	1143
7	"Journal of Supply Chain Management"	45	3341	635
8	"European Journal of Operational Research"	49	2673	258
9	"Production Planning & Control"	109	2655	815
10	"Sustainability"	238	2448	1164
11	"Journal of Business Logistics"	38	2129	395
12	"International Journal of Physical Distribution & Logistics Management"	63	2081	518
13	"International Journal of Life Cycle Assessment"	6	1991	7
14	"Computers & Industrial Engineering"	50	1819	339
15	"Production and Operations Management"	36	1611	234
16	"Management Science"	13	1589	123
17	"Business Strategy and the Environment"	55	1496	499
18	"International Journal of Logistics Management"	86	1492	801
19	"Industrial Management & Data Systems"	56	1384	400
20	"Transportation Research Part E-Logistics and Transportation Review"	36	1361	251

R -- Rank; P - Number of Published articles; C - Citations; TLS - Total Link Strength
(Collated by Author using VOSviewer)

Country Literature Analysis

Country-wise contribution to SCC literature and their significance in terms of their respective published articles & citations, we further conducted bibliographic network analysis on VOSviewer software on our WoS database. Under filter criteria we chose 'citation' as our 'type of analysis' and 'countries' as our 'unit of analysis'. We confined our network by defining the 'minimum number of documents from a source' equal to '5' and 'minimum number of citations from a country' equal to '50'. Under the given conditions we got '69' countries meeting the thresholds out of total '122' countries from our WoS database. Further from 69 countries we selected the top 50 countries owing to their greatest total link strength. From the obtained results we observed that among the top 50 countries, "USA" (Green Circle) with '1009' published articles has been the most popular in area of SCC with '46794' citations followed by "England" (Green Circle) with '650' published articles & '20891' citations and "Peoples R China" (Blue Circle) with '732' published articles & '16776' citations. The Top 20 countries that have immensely contributed in the area of SCC receiving highest citations on the articles published are as follows:

Fig. 8: Visualization of Country's Literature Contributions

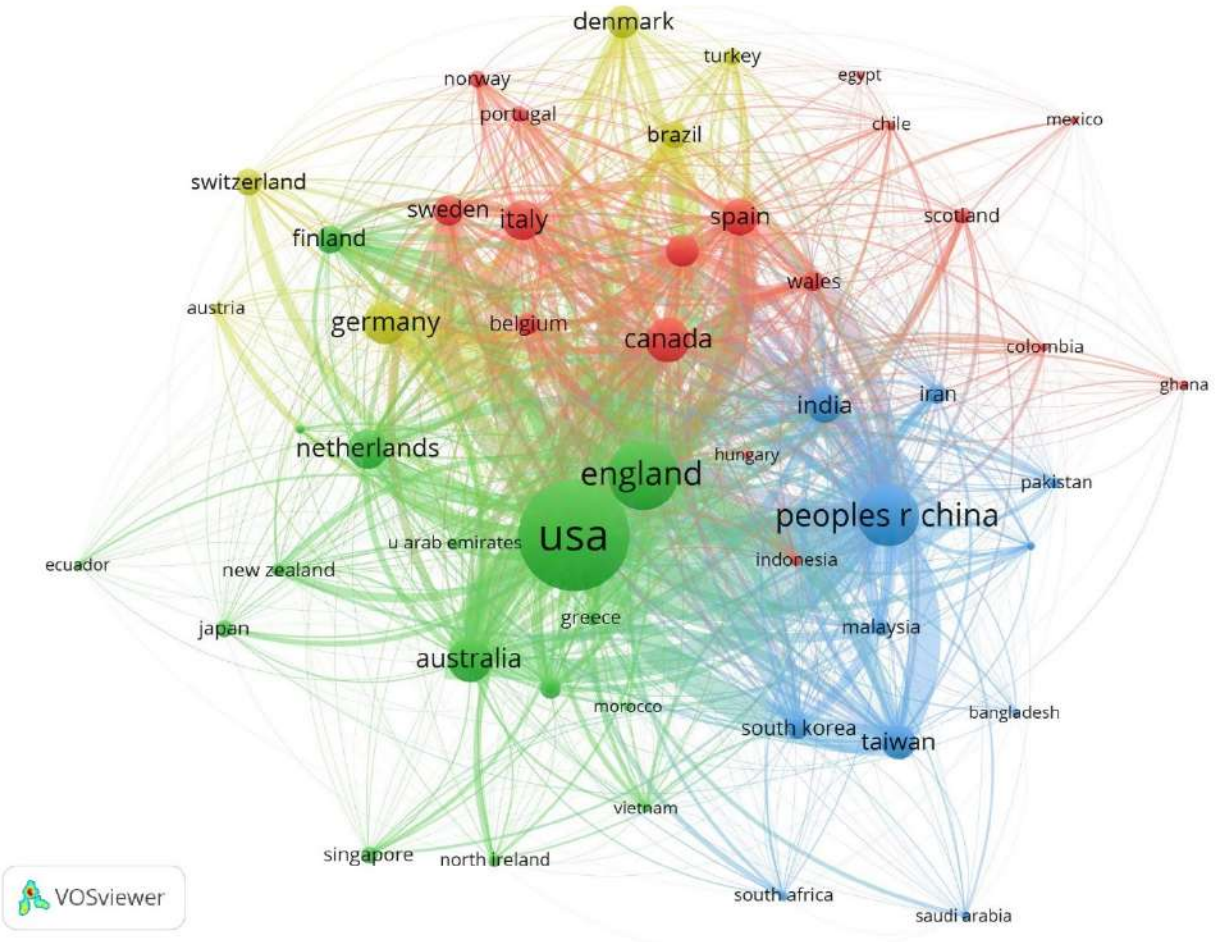


Table 12: Top 20 Country's Literature Contributions based on Citations.

S.No.	Country	Documents	Citations	Total Link Strength	Cluster
1	USA	1009	46794	9891	2
2	England	650	20891	6880	2
3	Peoples R China	732	16776	5980	3
4	Canada	200	9576	2964	1
5	Australia	281	9132	3162	2
6	Germany	278	8617	2651	4
7	Italy	248	7851	2339	1
8	Netherlands	208	7735	1748	2
9	Spain	214	6641	2624	1
10	Taiwan	173	6061	2196	3
11	India	208	5930	2539	3
12	France	216	5576	1841	1
13	Denmark	99	5567	1026	4
14	Sweden	147	4793	1804	1
15	Finland	125	4231	1473	2
16	Switzerland	82	3963	629	4
17	Brazil	124	3826	1547	4
18	Belgium	84	2795	1040	1
19	South Korea	123	2674	1277	3
20	Ireland	51	2592	847	2

(Collated by Author using VOSviewer)

Keywords Co-Occurrence Analysis

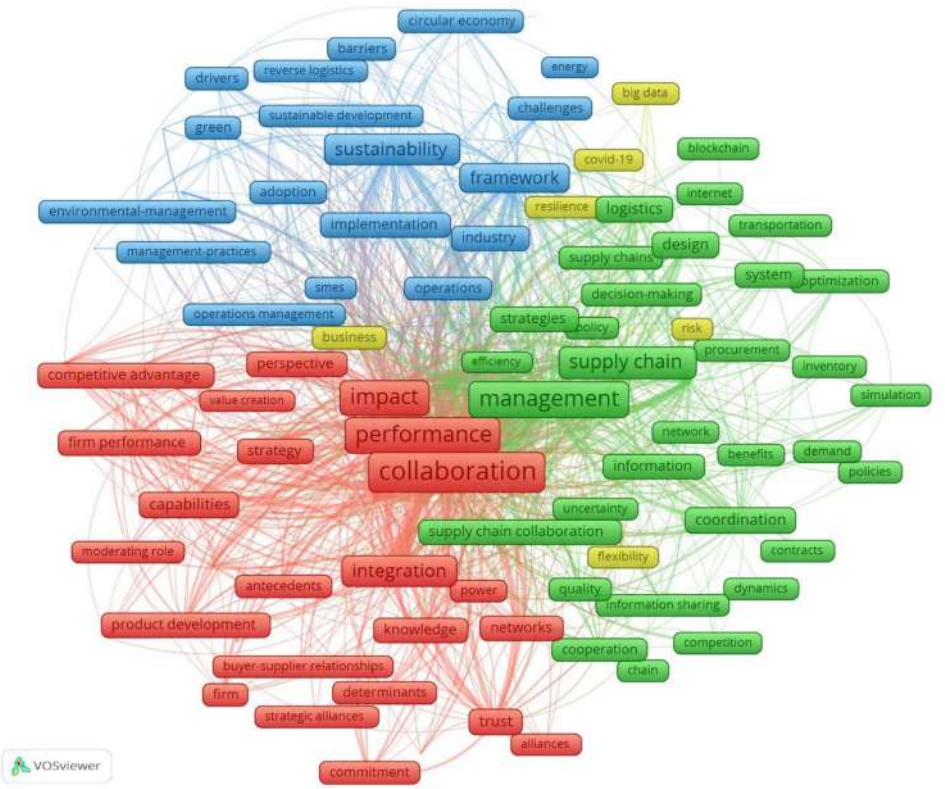
With the objective to analyse the most important research areas under Supply Chain Collaboration (SCC) domain we further undertook keyword analysis focused on the number occurrences of any keyword all across the WoS database under analysis pertaining to supply chain collaboration. In the bibliographic network analysis taking our WoS database we now chose 'co-occurrence' as our 'type of analysis' and 'All author keywords' as our 'unit of analysis'. We restricted our network by specifying the 'minimum number of occurrences of a keyword' equal to '10'. We obtained '625' keywords meeting the criteria from around '14299' keywords. For all the '625' keywords greatest total link strength of co-occurrence was calculated and a bibliographic network of '100' keywords has been constructed. It is evident from the Keyword Co-occurrence Visualisation Analysis illustrated in Fig.8 that the keyword, “collaboration” (Red Frame) has occurred the greatest number of times '1329' times with total link strength of '7042' followed by “management” (Green Frame) occurring '979' times with total link strength of '4928' and “performance” (Red Frame) occurring '968' times with total link strength of '5349'. Some of the other important keywords with varying number of occurrences and total link strengths, identified in our WoS database - keyword analysis through VOSviewer software are collaboration, coordination, commitment, cooperation, innovation, dependence, trust, resilience, buyer-supplier relationships, information technology, value chain, firm performance, dynamic capabilities, knowledge sharing, stakeholders,

strategy, supply network, artificial intelligence, flexibility, interoperability, traceability, transparency, big data analytics, closed-loop supply chain, efficiency and resource sharing. The Top 20 keywords that have the greatest number of co-occurrences from our chosen WoS database on SCC have been collated in the Table.11 below.

Table 13: Keyword Co-Occurrences Analysis for highest occurrence of keywords.

Rank	Id	Keyword	Occurrences	Total Link Strength
1	1903	collaboration	1329	7042
2	7691	management	979	4928
3	9488	performance	968	5349
4	6115	impact	788	4369
5	12578	supply chain management	776	3748
6	12488	supply chain	635	2588
7	6589	integration	491	2956
8	12754	sustainability	469	2378
9	8235	model	468	2184
10	5080	framework	437	2295
11	6453	innovation	381	2066
12	3213	design	275	1282
13	7509	logistics	275	1341
14	13590	trust	275	1543
15	2552	coordination	264	1331
16	13004	systems	261	1161
17	1336	capabilities	237	1548
18	13120	technology	220	1206
19	12278	strategy	218	1247
20	6338	information	217	1128

Fig. 9: Visualisation Analysis of Keyword Co-Occurrences



Discussion & Conclusion

In this research paper, we have systematically reviewed the research associated with supply chain collaboration. The panel of researchers employed a VOSviewer working software tool to examine and visualize the contribution of different authors, publishers, nations and co-occurring keywords related to supply chain collaboration research. The core findings in this regard are-

- The progression of SCC as a research domain has been enormous, validated by researches published in the last two decades. Bibliometric Analysis reveals the maximum number of articles published were 630 in the year 2021 and further Time-Series Analysis predicts the publication to range between 500 to 708 for the year 2023 which shows its progressiveness in the days to come.

- The research potential of SCC is tremendous as evidently the interest of researchers is seemingly growing day-by-day with growing number of publications on SCC and inter-firm relationships. It is indicative that businesses acknowledge more than ever the role of collaborative activities among their partner firms for enhancing their supply chain performances.

- Author contributions as evident from the bibliometric analysis on supply chain collaboration, is not limited to any core author-panel but has maintained standard total link strength at individual author level. We have identified the leading authors to be 'Klassen, Robert D.' with the highest overall citation and 'Lenzen, Manfred' & "Tseng, Ming-Lang" with the greatest number of published articles on SCC. However, surprisingly the most cited research articles were, "The Ecoinvent Database Version 3 (Part I): Overview and Methodology" authored by "Gregor Wernet, Christian Bauer,

Bernhard Steubing, Jürgen Reinhard, Emilia Moreno-Ruiz & Bo Weidema (2016)" and "Towards a theory of supply chain management: the constructs and measurements" authored by "Injazz J Chen, Antony Paulraj (2004)" which were the most referred researches in the stream.

- Among the list of most sought after and preferred Journals for SCC publications "International Journal of Production Economics" with overall 12307 citations for its 166 articles were most cited Journal, and its article published in 2008 by 'Vachon, S; Klassen, RD' (2008) with 958 citations, was among the top-five of the journal's most-cited articles ever.

- Further the country wise literature analysis revealed that literature connected to supply chain collaboration has been significantly contributed by super nations like the United States of America, England, Peoples R China, etc. which indicates a healthy sign towards analysis in this particular field. Among 122 countries, the country leading in the SCC research is 'USA' with a total of 1009 articles cited 46794 times till now.

- Further the Keywords Co-Occurrence Analysis revealed that the pivotal keyword that emerged considering type and unit of analysis were 'Collaboration', 'management' and 'performance' with the maximum total link strength among all other keywords. It is indicative that collaborative partnerships and management of supply chain activities among the channel partners is imperative for supply chain performance. Hence among other parameters 'collaboration', 'management' and 'performance' have been placed on high importance by the past researchers.

On a conclusive note, the current research work tries to identify how the existing body of knowledge on SCC relates to our present and future societal standards. Some major topics and problems in the field have emerged as a result of this. Fewer studies have been done on horizontal or lateral cooperation over the years than on dyadic viewpoints. Although there is a growing body of research in this area, we have discovered many avenues that merit exploration and could lead to significant new contributions. These include going beyond the traditional dyadic structure and looking at collaboration from a more macro perspective in order to better understand the many facets it has. We also highlight the benefits of SCM and the possibilities for further empirical research in the field of B2C collaboration. As Fawcett et al. (2012) states that the people's issues are important for collaboration to work, but they are hard to predict and handle. In the same way, information is a key resource for running and managing the supply chain well. But it's not clear how far the companies are will to go speaking of sharing information, given the levels of trust, power dynamics, and structure to govern the supply chains. It is also known that companies often take part in more than one supply chain. Obviously, they will have to be pickier about who to work with and who not to work with. For better or worse, "partnership" and "collaboration" have been called "one of the most overblown terms in modern business; yet it is generally recognised that you can truly partner with only a few" (Harrison et al., 2014).

Research & Managerial Implications

The study is significant for the researchers and managers currently engaged in the area of SCM. The analysis narrows down the most important contributions on the topic of supply chain collaboration indicating important journals, important papers and leading authors with strong knowledgebase on supply chain collaboration. Hence this paper will not only give direction to the

future researchers in streamlining their researches by identifying the important contributions so far but also will encourage them towards exploration of newer avenues. Further researchers can also use this information for pursuing their publication interests in the right journals in the given stream. This Paper provides a consolidated reference for last twenty years of research on SCC, which can come in really handy for managers to work on collaboration dynamics for achieving greater supply chain performance in their firms. The study will provide the managers with right direction to look for their individual supply chain solutions in the Top Journals and Papers. Moreover, the list of top authors may serve as a database for potential consultants and experts those may be approached for their professional guidance & advices in the area of SCC by the managers.

Limitations & Future Research

Bibliometric analysis can be further utilized in the other critical areas of supply chain management and may provide strong linking between the various other aspects of supply chain relationships among the partner firms. This bibliometric study is based on the dynamic nature of the publication statistics taken for a particular time-period only. Hence the number citations for papers or published papers may increase in the due time course which will in turn bring variations to the top authors, top journals, most cited papers and country level contributions. Some of the top research and authors may have been left out due to the chosen number of minimum citations for the bibliometric analysis. We have used WoS database only for our analysis and may have missed some of the notable contributions from other databases, hence other databases may be considered for future research. Further a comparative bibliometric study may also be conducted taking multiple databases into account in future.

This same analysis can also be done by isolating different industry types and then a tailor-made study can be carried out for all such sectors, in a way future research may also include sectoral studies. Another aspect is that India and other countries are more converging towards the service sectors and in order to have the collaboration and cooperation analysed for such service sectors a very different approach may be needed to be developed and in order to have a complete analysis a different study may be undertaken for service sector and consultancy-based firms. A dynamic database developed for separate industry types can offer more accurate results for such industries and it can be used as a ready to use guide for the industries. The market trends and economic factors (Macro & Micro) can also lead towards the development of various other factors in this study and it will make the study more accurate and efficient. So, in future the author suggests for sector-based studies along with the inclusion of the service sector and consideration of economic factors and market indices/levels, so that the results are more accurate.

Note: Please refer website for the colour version of the figure No. 5,6,7,8 & 9.

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