

## **Literature Review of Supply Chain Management with its Structure and Directions for Future Research**

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**Abstract:** This paper examines the relations of two topics: Supply Chain Management (SCM) and its structure. Integrating these two fields is an important part of anxiety for modern managers and researchers. A structure of supply chains defines the routine activities that examine and co-ordinate the goal and happenings of autonomous organizational units that include the supply chain. Managers have understood that the structure can improve Supply Chain Management by creating actual time facts obtainable and empowering cooperation among trading partners. A literature review has been conducted for the period 2001 – 2015 in significant academic journals in the field of management. The purpose is to accumulate, arrange and combine current information concerning to Supply Chain Management and its structure. Our study has labelled the influence that the structure has on the diverse procedures that Supply Chain Management hold. The literature review taken on the theme has revealed that Supply Chain Management has been acknowledged as an exceptional subject in the supply chain literature in the most significant journals of Logistics and Operations Management, exclusively after 2006. The core themes have been procurement, information flow and fulfilment. The purpose of this paper is to highlight Supply Chain Management and how research in this area has developed during the period 2001 – 2015 and to recognize some outlines of future research.

**Keywords:** Supply Chain Management, Supply Chain Structure and Supply Chain Integration.

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### **I. Introduction**

One of the most important changes of new business management is that individual businesses no longer compete as uniquely independent entities, however relatively as supply chains (Christopher, 1998). Several organizations are implementing supply chain management to diminish costs, develop products, make shorter lead time and improve competitiveness for the complete chain (Cavinato, 1991; Mentzer et al., 2001). Lambert and Cooper (2000) highlight supply chain management so as to improve a standard model that can instruct managers in their efforts to develop and manage their supply chains. These Authors, emphasize the increasing awareness of executives in their research program for supply chain management. In order to achieve the requirements of the customer through managing the supply chain with the flow of materials from suppliers to influence a stability between the contradictory target of great service to customer, reduce inventory investment and reduce unit cost (Stevens, 1989). Theories of traditional organization, however, do not clearly address the structures and strategies of multi-organisation, and multi-level supply chains. Researchers have just started to improve empirically based theories on structure of supply chain, managing the relationship in the supply chain and the leadership of supply chain management enterprises (Choi and Hong, 2002; Ho et al., 2002). Thus, established theory in the field of supply chain management is required to provide a basis for empirical research (Ho et al., 2002).

### **II. Review of literature**

Colin Pilbeam et al. (2012) inspected on the supply networks control using a variety of tools regarding to conventional theoretical approaches like transaction costs or system viewpoints and then concluded with a comprehensive attention of trust and power.

Premaratne Samaranayake (2005) proposed a framework among supply chain partners to merge different components like resources, materials, activities engaged in a business process. The integration of individual

components, elimination of interfacing steps among partners, representation of relationships (component precedence, parent-component, component-component) and functionality for planning and execution of components are the various features of such framework. Many applications in supply chain management like manufacturing, distribution and maintenance based on unitary structuring has been successfully implemented. The statistical testing results also show that the structure can eliminate interfacing steps and provide a basis for an integrated approach to model supply chain environment.

Karl Ulrich and Taylor Randall(2001)examine the relation among product variety, supply chain structure, and firm performance. The cost trade-offs between production costs and market mediation costs are present anytime a firm chooses to locate production outside its target market. These observations suggest that a firm's choice of variety type may be affected and driven by the capabilities of the existing supply chain. Such behaviour is logical, given that product line decisions are typically made frequently relative to supply chain decisions. The outsourcing either mitigates or exacerbates the relation between variety, market-mediation, and production costs. Firms have incentive to obtain scale to provide production dominant variety. In our specific case, scale-efficient suppliers are found outside the target market exacerbating the cost trade-offs. Contradicting theory suggests that plants with scale can mitigate market mediation costs through inventory pooling. There are several criteria necessary for this effect including: (1) product characteristics are not specific to each regional market, (2) firms hold inventory at the scale efficient location, and (3) savings from pooled inventory outweigh the potential lost sales because of longer response time. It is observed violations of the criteria in our specific industry context. However, these conditions would allow firms to mitigate market-mediation costs in a scale-efficient location, suggesting that firms might manage these cost trade-offs by globalizing product characteristics and holding central inventories rather than changing the structure of the supply chain. The ultimate success of high-variety strategies may rest not only on a supply chain's ability to physically deliver variety, but also on the ability to communicate and present options to consumers.

Geoffrey et al. (2002) identifying the environmental care strategy of the chain is an important first step in choosing the type of Life Cycle Assessment (LCA). Requirements determine the feasibility of the execution of LCA itself and the results of the LCA. To ensure the execution of LCA and the implementation of the LCA-based goals of the environmental chain strategy, it is important to understand the relation between the type of LCA and the type of chain structure. It is proposed that the relation between the particular type of LCA and the chain structure is not static. This strategy is influenced by factors outside the chain such as competition, governmental laws, consumer preferences and preferences of other stakeholders. In short, other more general analysis and choices have to be made which directly affect the choices concerning the environmental aspect of the supply chain. The integration of environmental care into the more general policy of chains should therefore boost the integration of LCA in supply chains.

Handfield and Bechtel (2002) In order to reduce cycle times between supply chain entities, managers must work to create new relational forms that rely on trust to a greater extent. A model is presented suggesting that to build relationships based on trust, suppliers must invest in site-specific and human assets, and buyers must judiciously apply contracts to control for relative levels of dependence within the relationship. This model also suggests that buyer-dependence, supplier human asset investments, and trust are all positively associated with improved supply chain responsiveness, defined in this study as the supplier's ability to quickly respond to the buying party's needs. The results suggest that even in cases when buyers do not have a great deal of control over their suppliers, working to build trust within the relationship can improve supplier responsiveness. As organizations seek to identify means of managing these new forms of relationships, researchers must develop new models and methods to identify which suppliers to approach in relationship development, the methods for implementing and sustaining such relationships, and the appropriate processes for dealing with conflicts within such relationships when they arise.

Muriati Mukhtar et al. (2002) discussed the issues pertaining to the incorporation of buyer-supplier relationships in supply chain models and the representation of such relationships in the simulation of supply chains. Strategic analysis will also help supply chain members in deciding who to partner with and what type of relationship would be most useful for the player or the supply chain. The question of whether to integrate or not to integrate and with whom can be discussed by investigating effects and trade-offs from such a venture.

Daesik Hur et al. (2004) Factors that are proposed to influence the structure of the supply chain are: customer needs/demand characteristics; product complexity; process complexity; organisational strategies; and industry structure. Supply chain mapping can identify the critical segments of the structure and the processes for its value enhancement efforts. Clear measures for supply chain management performance must be formulated. At the highest level, company-wide strategic performance measures should be defined. After performance measures

are defined, issues of cost and benefit sharing among the supply chain member firms can be managed better. Inter-organisational performance improvements and sharing the savings from chain-wide efforts are critical issues that have not been adequately addressed.

Clifford Delee and Stank (2005) extends a central paradigm of the strategy literature to the supply chain environment to foster a better understanding of the elements characterizing strategic decisions that lead to supply chain structural development and performance.

Narasimha Kamath and Rahul Roy (2005) Designing a supply chain structure for a volatile market can be tricky. This is more so for products with a short lifecycle. A capacity constrained supply chain in such a setting impedes the product's market acceptance by limiting product availability and thereby frustrating customers. The supply chain structure is represented using system dynamics formalism. Experiment on the model leads to an indication of the cost that the system would incur. Using this cost and through loop dominance analysis feedback loops are identified that primarily determine system behaviour. It is shown that by strengthening the dominant feedback loop, significant improvement in performance can be achieved.

Agrawal and Seshadri (2005) considered a problem in which a single risk neutral distributor supplies a short-lifecycle, long-leadtime product to several retailers that are identical except in their attitudes towards risk. They proved that the distributor should not offer the same terms to every retailer but instead offer less risky (from the demand risk perspective) contracts to more risk averse retailers. They did not prove the optimality of their menu. Their results are reconstructed when the number of retailers is infinite and their coefficient of risk aversion is drawn from a continuous distribution. Optimal control theory is used to solve this problem. It is shown that this distribution uniquely determines the channel structure. Moreover, the optimal contract menu not only has the same structure as in Agrawal and Seshadri but is also optimal among nearly all contracts. The implications of these findings for channel design are discussed.

Juimin Hsiao et al. (2008) To investigate the relationship between organizational structure, supply chain management, and organizational performance. Supply chain management, companies facing challenges from great variation are to be sensitive with quickly variation in the era of supply chain management with good use of their own competitive advantages, information from supplier and resources sharing, attempting to respond to market needs quickly and to increase market share. From the perspective of "global village", companies need to integrate upstream and downstream partners to compete with product revolution from supply chain management.

Thangam and Uthayakumar (2008) A two-level supply chain consisting of a retailer and  $n$  "non-identical" customers. The retailer orders different perishable products in response to the demands of the customers. The unsatisfied demand at a retailer is partially backlogged with a time-proportional backlogging rate. Models are formulated for a postponement system and an independent system to minimize the total average cost function per unit time for ordering and keeping  $n$  "non-instantaneous deteriorating items." Economic order quantity (EOQ)-based models have been developed with "non-instantaneous deteriorating" items to evaluate the impact of a postponement strategy on the retailer in a supply chain. The deterioration rate of raw materials is the same as that of end-products. But in real life, the deterioration rate of raw materials, such as integrated circuit (IC) chips, is often smaller than that of the end-products. So utilizing a postponement system can yield more savings in the total cost in practice.

Arnold Maltz et al. (2009) Organizational Alignment (OA) and Supply Chain Governance Structure (SCGS) may provide some insight into how to promote better internal supply chain integration within the firm, and may allow for an assessment of the governance structure of the firm's supply chain. In different industries and at different times, this knowledge may prove useful in supply chain design and supply base optimization decisions. They represent initial attempts to assess upper management influence on internal supply chain alignment (OA), and to assess the governance structure of a firm's supply chain. SCGS and modularity are more recent topics of study, but seem to have become more significant as the competitive environment becomes increasingly intense, uncertain, and accelerated. A more thorough understanding of SCGS and modularity would benefit researchers seeking to understand the broader contextual issues influencing the behaviour of various supply chain actors. Research on buyer-supplier relations often focuses upon trust and commitment to the relationship; research models in this area could be enriched by adding transaction complexity or perceptions of supplier capabilities as moderating or contextual variables.

Hung and Shih-jieh (2009) The decision framework with integrated costing and performance evaluation for green supply chain (GSC) has not been well developed so far in the literature. A fuzzy goal programming (FGP) approach is proposed that integrates activity-based costing (ABC) and performance evaluation in a value-chain structure for optimal GSC supplier selection and flow allocation. The sensitivity analyses show that pure maximisation of financial profit can achieve the highest profit level, which also has the largest Euclidean distance to the multiple aspiration goals. In order to determine the final objective structure, an analytic hierarchy process (AHP) is used. Here a new approach is proposed to assess and control a complex GSC based on value-chain activities, and obtain a more precise solution. The establishment of this GSC model not only helps decision-makers to monitor GSC comprehensive performance but also can facilitate further improvement and development of GSC management. To provide an FGP approach for GSC supplier selection and flow allocation under integrated ABC and performance assessment in a value chain structure. GSC performance will be clearer when cost and benefit measures are integrated based on value-chain activities.

Veen-Dirks and Verdaasdonk (2009) The behaviour of several entities in the chain is explained by examining the present local management control systems. The main conclusion is that these systems call for behaviour that is not congruent with the broad supply chain objective. The paper demonstrates that the local management control systems may hinder the achievement of the supply chain objective. Possible design implications for both local management control systems and governance structures in the supply chain are outlined. Focuses on local information sharing concerns and on local performance measurement and incentive issues at the intra-organisational level but within a supply chain context. As Thrane and Hald (2006) indicate in their paper, boundaries between companies acting in a supply chain are ever-changing. This makes it more difficult to clearly distinguish between intra and inter-firm relations. Control systems for intra-organisational control become more and more related to the governance structure of the inter-organisational relation.

Awaysheh and Klassen (2010) The link between supply chain structure and the adoption of supplier socially responsible practices are examined. The construct of social issues is defined and framed within the broader debate on sustainable development and stakeholder management. Social practices are delineated for supply chain management, and a set of scales is empirically validated for assessing the degree of development of supplier socially responsible practices. As the plant was positioned further upstream in the supply chain, managers reported increased use of supplier codes of conduct. To that end, relationships between supply chain structure and supplier practices were tested empirically. Evidence pointed to two factors in supply chain structure – transparency and distance – being related to supplier socially responsible practices.

Dmitry Ivanov et al. (2010) introduces a new conceptual framework for multi-structural planning and operations of adaptive supply chains with structure dynamics considerations. A vision of adaptive supply chain management (A-SCM) is described, which is a new dynamic model and tools for the planning and control of adaptive supply chains. SCM is addressed from perspectives of execution dynamics under uncertainty. Supply chains are modelled in terms of dynamic multi-structural macro-states, based on simultaneous consideration of the management as a function of both states and structures. The research approach is theoretically based on the combined application of control theory, operations research, and agent-based modelling. The findings suggest constructive ways to implement multi-structural supply chain management and to transit from a ‘‘one-way’’ partial optimization to the feedback-based, closed-loop adaptive supply chain optimization and execution management for value chain adaptability, stability and crisis-resistance.

Shogun Xiao et al. (2014) A retailer-Stackelberg pricing model is developed to investigate the product variety and channel structure strategies of manufacturer in a circular spatial market. It is found that the motivation for the manufacturer to use dual channels decreases with the unit production cost, while increases with (i) the marginal cost of variety, (ii) the retailer’s marginal selling cost, and (iii) the customer’s fit cost. The equilibrium analysis demonstrates that it is more likely for the manufacturer to use dual channels under the retailer Stackelberg channel leadership scenario than under the manufacturer Stackelberg scenario if offering a greater variety is very expensive. When offering a greater variety is inexpensive, the decentralization of the indirect channel may invert the manufacturer’s channel structure decision.

Vikram Bhakoo et al. (2015) To develop a better understanding of how the supply chain structure (i.e. degree of vertical integration) of a focal organization shapes the breadth of its portfolio of technologies. The information technologies employed by the three focal case organizations and their extended trading partners varied in terms of level, type, complexity and sophistication. The authors found that disintegrated supply chain structures have a broader portfolio of technologies, whereas integrated supply chains have a narrow portfolio. Integration requires consideration of the full range of possibilities, from hierarchy to market-based transactional activities

(Williamson, 2008). Frohlich and Westbrook's (2001) arcs of integration framework is expanded by employing it along two dimensions: technology diversity and governance structure. This makes the framework more comprehensive and meaningful in terms of practical application as it applies to portfolio of technologies choices organizations need to make.

Christos Tsinopoulos and Carlos Mena (2015) Process structure and product newness require different supply chain configurations, which change as products mature. Supply chain integration is dynamic, and the extent of collaboration between suppliers and customers will be different at different moments in time. The authors define and discuss four key supply chain configurations: customised; ramp-up; recurring; coordinated. The configuration of integration will change as the manufacturing plant becomes more familiar with a product. Additionally, different suppliers may provide better support at different stages of a product's lifecycle. To yield better performance, supply chain integration would need to take different forms. Efforts to integrate with suppliers should not be avoided as, when certain conditions are met, integration can lead to improved performance.

Mikihisa Nakano (2015) This study found many differences between traditional and efficient/responsive firms on process variables. With regard to structure variables, the existence of a supply chain management department, which is a variable of internal structure, in responsive and efficient/responsive firms is statistically more likely than in efficient firms. In addition, this study found significant differences between efficient and responsive firms, and traditional firms on some variables of external structure. It explores the relationship among management elements in supply chains including not only strategy but also structure and processes. Through this study, it is implied that the strategy-structure-processes-performance paradigm adopted in this study is useful for exploring the patterns of other management elements that fit in with supply chain strategies.

### **III. Classification of literature based on methods**

This section presents a comprehensive review of literature of supply chain management of the supply chain structure based on the methods as listed below, which are used to design the supply chain management.

- Case study
- Qualitative data from manufacturers
- Framework
- Equilibrium Analysis
- Literature review
- Parallel scale development and index construction
- Fuzzy goal programming approach
- Survey and conceptualization or Case research
- Questionnaire survey
- Algorithm model for optimal solutions
- Experimental Method
- Interviews
- Simulation
- Comparative Analysis
- Optimal control theory

The summary of literature on the supply chain management under the above classification is shown in Table 1.

**Table 1. Summary of reference of supply chain structure**

S.No.	Method	Details of References
1	Case Study	Chia, Vikram Bhakoo Prakash Jagat Singh Austin (2015), Verdaasdonk, Pdirks Peter J A (2009), Daesik Hur, Janet L. Hartley & Chan K. Hahn (2004), Hagelaar, G. Jack G.A.J. Van der Vorst (2002)
2	Qualitative data from Manufacturers	Mena, Christos Tsinopoulos Carlos (2015)
3	Exploratory Framework	Nakano, Mikihisa (2015), Defee, C Clifford Stank, Theodore P (2005)
4	Equilibrium Analysis	Xiao, Tiaojun Choi, Tsan-Ming Cheng, T.C.E. (2014)
5	Literature Review	Awaysheh, Amrou and Klassen, Robert D. (2010)
6	Parallel scale development and Index construction	Ashenbaum, Bryan Maltz, Arnold Ellram, Lisa Barratt, Mark (2009)
7	Fuzzy goal programming approach	Tsai, W Hung, Shih-jieh (2009)
8	Survey and Conceptualization or Case research	Dedrick, Jason Xu, Sean X I N Zhu, Kevin Xiaoguo (2008)
9	Questionnaire survey	Juimin Hsiao, Ming-Chu Weng, Shih-Chin Su (2008)
10	Algorithm model for optimal solutions	Thangam, A. Uthayakumar, R. (2008)
11	Experimental Method	B, Narasimha Kamath and Rahul Roy (2005)
12	Mail survey and Interviews	Handfield, Robert B. Bechtel, Christian (2002)
13	Simulation	Muriati Mukhtar, Awaluddin Mohamed Shaharoum, Mohd Shariff Nabi Baksh (2002)
14	Comprehensive Interviews and Questionnaire survey	Randall, Taylor Ulrich, Karl (2001)
15	Conceptual Framework	Ivanov, Dmitry Sokolov, Boris Kaeschel, Joachim (2010), Ernst, Ricardo Kamrad, Bardia (2000), Stock, Gregory N. Greis, Noel P. Kasarda, John D. (2000)
16	Pilot Study	RRK Sharma, Rahul Sharma, H. Hazarika
17	Comparative Analysis	Netessine, Serguei Rudi, Nils
18	Optimal control theory	Seshadri, Ying-Ju Chen and Sridhar (2005)

#### IV. Classification of literature based on years

This section shows the classification of literature in the field of supply chain management based on the years. The classification of the literature founded on years is shown in Table 2. The frequencies of publications with respect to 2015, the frequency is the peak. From 2011-2013 onwards, it is in increasing trend except the last time interval which has slight decrease. This shows the significance of the research problems in the supply chain management.

**Table 2. Classification of literature based on years**

<b>Year</b>	<b>Author name and year</b>	<b>Number of papers</b>
2015	Mikihisa Nakano (2015), Vikram Bhakoo, Prakash Jagat Singh and Austin Chia (2015), Christos Tsinopoulos and Carlos Mena (2015)	3
2014	Tiaojun Xiao, Tsan-Ming Choi and T.C.E. cheng (2014)	1
2010	Amrou Awaysheh and Robert D. Klassen (2010), Ivanov, Dmitry Sokolov, Boris Kaeschel, Joachim (2010)	2
2009	Bryan Ashenbaum, Arnold Maltz, Lisa Ellram and Mark A. Barratt (2009), Verdaasdonk, Paula M G Van Veen-dirks Peter J A (2009)	2
2008	W.H.Tsai and Shih-Jieh Hung (2008), Thangam.A and Uthayakumar. R (2008), Juimin Hsiao, Ming-Chu Weng and Shih-Chin Su (2008), Jason Dedrick, Sean Xin Xu and Kevin Xiaoguo Zhu (2008)	4
2007	RRK Sharma, Rahul Sharma and H. Hazarika (2007)	1
2005	C.clifford Defee and Theodore P. Stank (2005), Narsimha Kamath B. and Rahul Roy (2005), Ying-Ju Chen and Sridhar Seshadri (2005)	3
2004	Daesik Hur, Janet L. Hartley and Chan K. Hahn (2004)	1
2004	Serguei Netessine and Nils Rudi (2004)	1
2002	Robert B. Handfield and Christian Bechtel (2002), Geoffrey J.L.F. Hagelaar and Jack G.A.J. Van der Vorst (2002), Muriati Mukhtar and Awaluddin Mohamed Shahrour (2002)	3
2001	Taylor Randall and Karl Ulrich (2001)	1
2000	Ricardo Ernst and Bardia Kamrad (2000), Stock, Gregory N. Greis, Noel P. Kasarda, John D. (2000)	2

## **V. Classification of literature based on journals of publications**

This section gives the classification of research articles in the field of supply chain management based on the journals of publication of the articles as given in Table 3.

- Journal of Information & Optimization Sciences
- International Journal of Logistics: Research and Applications
- Journal of Management Information Systems
- International Journal of Logistics Management
- International Journal of Physical Distribution & Logistics Management
- European Journal of Operational Research
- International Journal of Production Research
- International Journal of Advanced Manufacturing Technology
- Industrial Marketing Management
- International Food and Agribusiness Management Review
- Management Science Informs
- Supply Chain Management: An International Journal
- Journal of Operation Management

**Table 3. Classification of literature based on journals of publications**

Journal Name	Author name and year	Number of papers
Journal of Information & Optimization Sciences (JIOS)	Juimin Hsiao, Ming-Chu Weng and Shih-Chin Su (2008)	1
Proceedings 14 <sup>th</sup> European Simulation Symposium (2002)	Muriati Mukhtar and Awaluddin Mohamed Shaharoun (2002)	1
International Journal of Logistics: Research and Applications (IJLRA)	Daesik Hur, Janet L. Harley and Chan K. Hahn (2004)	1
Journal of Management Information Systems (JMIS)	Jason Dedrick, Sean Xin Xu and Kevin Xiaoguo Zhu (2008)	1
International Journal of Logistics Management (IJLM)	Mikihisa Nakano (2015), Bryan Ashenbaum, Arnold Maltz, Lisa Ellram and Mark A. Barratt (2009) C.Clifford Defee and Theodore P. Stank (2005)	3
International Journal of Physical Distribution & Logistics Management (IJPDLM)	Vikram Bhakoo, Prakash Jagat Singh and Austin Chia (2015)	1
International Journal of Operations & Production Management(IJOPM)	Christos Tsinopoulos and Carlos Mena (2015), Amrou Awaysheh and Robert D. Klassen (2010),	2
European Journal of Operational Research (EJOR)	Tiaojun Xiao, Tsan-Ming Choi and T.C.E. Cheng (2014), Ivanov, Dmitry Sokolov, Boris Kaeschel, Joachim (2010), Ricardo Ernst and Bardia Kamrad (2000)	3
International Journal of Production Research (IJPR)	W.H. Tsai and Shih-Jieh Hung (2008)	1
International Journal of Advanced Manufacturing Technology (IJAMT)	Thangam.A and Uthayakumar. R (2008)	1
Proceedings of the 38 <sup>th</sup> Hawaii International Conference on System Sciences (2005)	Narsimha Kamath B. and Rahul Roy (2005)	1
Industrial Marketing Management (IMM)	Robert B. Handfield and Christian Bechtel (2002)	1
International Food and Agribusiness Management Review (2002)	Geoffrey J.L.F Hagelaar and Jack G.A.J. van der Vorst (2002)	1
Management Science Informs (2001)	Taylor Randall and Karl Ulrich (2001)	1
Supply Chain Management: An International Journal (IJSCM)	Verdaasdonk, Paula M G Van Veen-dirks Peter J A (2009)	1
Journal of Operation Management (JOM)	Stock, Gregory N. Greis, Noel P. Kasarda, John D. (2000)	1

## VI. Classification of literature based on objectives used by researchers

This part exhibit the classification of literature based on the objectives that are used by the researchers. The list of objectives used by the researchers is shown in Table 4, which are coded from 1 to 24. The classification based on these coding is shown Table 5.

**Table 4. Coding for Objectives**

Code	Objectives	Code	Objectives
1	To improve a clear comprehending of how the supply chain structure of a central organization design the breadth of its selection of technologies.	13	To show a supply chain structure analysis and formulate method to assess various demand patterns and calculating methods.
2	To examine the structure of supply chain integration.	14	To show a clear understanding of the components describing strategic decisions that leading to structural development of supply chain and performance.
3	To provide some empirical evidence of the affiliation between strategy and configuration/procedure in supply chains.	15	To reconstruct Agrawal and Seshadri model effect when the number of retailers is immeasurable and their measurement of risk aversion is dragged from a uninterrupted distribution.
4	Retailer fixing of prices model to examine the product variation and network configuration strategies of manufacturer in a globular spatial market.	16	To explore supply chain structure define the method that restrain and co-ordinate the purposes and undertakings of self-governing organizational units that include the supply chain.
5	To examine the size of supply chain structure especially dependency, distance and transparency for the acceptance of these informally liable habit.	17	To claim that integral align with a distinction amid environmental caution chain policies and environmental chain execution, a distinction among kinds of LCAs must be prepared (between conformance-procedure and market-oriented LCAs).
6	To introduce a modern conceptual framework for multiple structure planning and processes of versatile supply chains with configuration dynamics attentions.	18	To diminish cycle times between supply chain individuals, managers have to work to make innovative relational practices that depend on trust to a superior level.
7	To introduce and validate the sympathetic of how and why organizations unite their internal supply chains and measure the control configuration of their supply chains.	19	The problems relating to the combination of buyer-supplier relationships in supply chain design and the symbol of such relationships in the model of supply chains.
8	To suggest a fuzzy goal programming (FGP) approach that mixes activity-based costing (ABC) and performance assessment in a value-chain configuration of optimum Green Supply Chain supplier choice and flow distribution.	20	To examine the association amongst supply chain structure, product variety, and firm performance.
9	To exhibit control systems of local management inside the supply chain arrangement and the control structure of supply chains are twined together have an significant outcome on the operative of the supply chain.	21	To present a theoretical framework for assessing different supply chain structures in the background of modularization and postponement.
10	Examines the association among a manufacturer's practice of information technology(IT) (mainly electronic procurement) and the total of suppliers in its supply chain.	22	To inspects the suitable between an organization's logistics integration competences and its supply chain structure.
11	To investigate the association among supply chain management, organizational structure and organizational performance.	23	To find purposes of supply chain and communicate to three broad approach, Defenders, Prospectors and Analysers.
12	Develop simulations for a postponement system and an independent method to reduce the total average cost function per unit time for assembling and holding $n$ "non-instantaneous deteriorating items"	24	To analyse the relations between a wholesaler and a sole retailer for fall shipment supply chain in a multiple period environment.

**Table 5. Classification of literature based on objectives used by researchers**

S.No.	Author Names and Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total No. of Objectives
1	Chia, Vikram Bhakoo Prakash Jagat Singh Austin (2015)	X																								1
2	Mena, Christos Tsinopoulos Carlos (2015)		X																							1
3	Nakano, Mikihisa (2015)			X																						1
4	Xiao, Tiaojun Choi, Tsan-Ming Cheng, T.C.E. (2014)				X																					1
5	Awaysheh, Amrou Klassen, Robert D. (2010)					X																				1
6	Ivanov, Dmitry Sokolov, Boris Kaeschel, Joachim (2010)						X																			1
7	Ashenbaum, Bryan Maltz, Arnold Ellram, Lisa Barratt, Mark (2009)							X																		1
8	Tsai, W Hung, Shih-jieh (2009)								X																	1
9	Verdaasdonk, Paula M G Van Veen-dirks Peter J A (2009)									X																1
10	Dedrick, Jason Xu, Sean X I N Zhu, Kevin Xiaoguo (2008)										X															1
11	Juimin Hsiao, Ming-Chu Weng, Shih-Chin Su (2008)											X														1
12	Thangam, A. Uthayakumar, R. (2008)												X													1
13	B, Narasimha Kamath and Rahul Roy (2005)													X												1



## VII. Conclusion

It has been established that the supply chain structure be a significant influence on the management of the supply chain and it can enhance the effectiveness of firms. In this paper, an effort has been made to present a comprehensive literature review of the supply chain management that are applied to design supply chain structure. The review has been classified based on method, year of publication, journal of publication, and objective used by researcher.

Under the classification based on methods, the different methods include conceptual models, simulation, framework, equilibrium analysis, literature review, parallel scale development and index construction, fuzzy goal programming approach, case research, questionnaire survey, algorithm model for optimal solution, experimental method, interviews, comparative analysis, optimal control theory.

The researchers have developed few supply chain models for the supply chain structure. But, the applicability of such models for medium and large size supply chain structure problems is very less. However, these can be used to compare a various supply chain structure for their closeness towards its performance.

From the evaluation, it is clear that more researchers have contributed on the development of supply chain simulations, supply chain framework and designs for the supply chain structure and only less number of researchers worked for all other aspects. So, researchers may concentrate in developing various models under supply chain management.

Constructed on the classification of the literature based on years, it is clear that during 2000-2008, the frequency is the peak. From 2015 onwards, it is in increasing trend except the last time interval which has slight decrease.

Based on the journal of publication, it is clear that the journals as per decreasing order of the number of papers published in the field of supply chain management for significant number of journals is Journal of Information & Optimization Sciences, International Journal of Logistics: Research and Applications, Journal of Management Information Systems, International Journal of Logistics Management, International Journal of Physical Distribution & Logistics Management, European Journal of Operational Research, International Journal of Production Research, International Journal of Advanced Manufacturing Technology, Industrial Marketing Management, International Food and Agribusiness Management Review, Management Science Informs, Supply Chain Management: An International Journal, Journal of Operation Management.

Based on the objective used by the researchers in supply chain structure, the decreasing order of the objectives in terms of significant number of papers is to improve clear thoughtful of supply chain structure shapes through technologies, to evaluate different demand patterns and forecasting techniques, to encourage a clear understanding of strategic decision of supply chain structural development and performance, to examine the product diversity and network configuration strategies, to explore the integration and collaboration of supply chain to examine the association between supply chain management, organizational structure and organizational performance.

The review of literature of supply chain management and its structure based on four different classifications presented in this paper may be of great use for the researchers to select future researches.

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