

# Future Scope of Logistics and Supply Chain - An Detailed Analysis

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**Abstract** – Logistics and Supply chain play a crucial role in the functioning of commercial operations. A supply chain encompasses the process of acquiring and distributing commodities, while logistics pertains to the transportation, warehousing, and overall handling of resources and products. Both commercial and emergency supply chains encounter various obstacles, however they may derive valuable insights from one other's tactics and business models. Logistics comprises several components, including transportation, storage, inventory management, packaging, and information processing. The primary objective of logistics management is to effectively coordinate the availability of appropriate resources, ensuring their timely delivery to the designated destination. Supply chain management is a strategic approach that combines essential business activities in order to enhance value for both customers and stakeholders. Supply chain management encompasses the harmonization of several entities, including suppliers, manufacturers, warehouses, transporters, retailers, and consumers, with the objective of fulfilling client demands while simultaneously reducing expenses. There is a prevailing agreement among scholars that SCM and logistics constitute a crucial area of study. However, it is noteworthy that there is a scarcity of literature evaluations pertaining to this subject matter. This study aims to identify and discuss prominent topics in contemporary research by conducting a comprehensive literature assessment from the standpoint of operations management. Furthermore, we have derived some insights and identified potential avenues for further study in this particular domain.

**Keywords** – Supply Chain Management, Logistics and Supply Chain, Logistic Management, Bill of Lading, Commercial Supply Chains.

## I. INTRODUCTION

A supply chain refers to a complex network that facilitates the movement of goods and commodities. It encompasses all the entities involved in the various stages of the supply chain, including sourcing, manufacturing, storing, and dispensing. Figure 1 illustrates a representative supply chain that encompasses several stakeholders, beginning with the supplier and concluding with the dispensing locations. This depiction aids in comprehending the interconnectedness of the supply chain. The term "reverse logistics" as shown in **Fig 1** pertains to the assortment of operations involved in the disposal and treatment of waste materials generated by the populace. Recent research has provided evidence to support the efficacy of implementing a multi-echelon commercial supply chain. An illustration of this may be seen in the study conducted by Li and Chen [1], where a three-tiered supply chain was modeled, including the manufacturer, third-party entity, and retailer. When comparing emergency supply networks to commercial supply chains, it is evident that the former presents more challenges due to the inherent uncertainties and chaotic nature of the operating environment, particularly during times of crisis such as a pandemic. Nevertheless, there are significant similarities between these two supply networks. The potential for leveraging the parallels between commercial supply networks and emergency supply chains lies in the application of information and tactics used by the former. To clarify, it is possible to use commercial concepts from the field of supply chain management to humanitarian supply chains.

Logistics, in essence, is the enhancement of "place utility" for a product. This implies the necessity to transfer a product from one geographical location, such as UK, Newcastle upon Tyne, to another, such as Hungary, Budapest (see **Fig 2**). The product may serve as a raw material for further processing, necessitating management of a material, inside a factory. Alternatively, the product may be completed within the production and thereafter delivered to the market for consumption. The concept of "place utility" in logistics refers to the agreement between a seller and a buyer on the sale and purchase of a product, which includes specific criteria such as delivery time and price. In accordance with the mutually agreed upon terms, a service provider specializing in logistics and transportation will be engaged by either the seller or buyer, according to the

terms of the transaction, to facilitate the migration of products from the seller's area to the buyer's area. During the transportation or while being managed by a logistics firm, the phrase "product" will be referred to as "cargo". In accordance with the agreement, it may be necessary to keep the cargo at a specific site during transit. This service is often referred to as "warehousing."

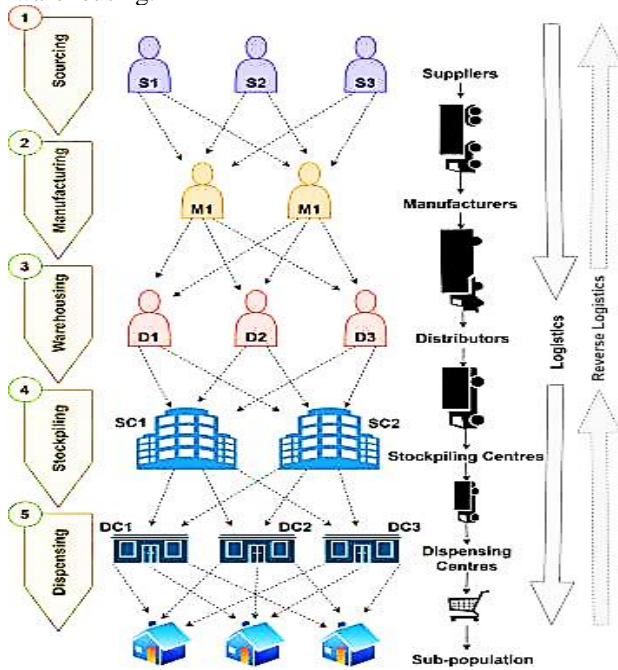


Fig 1. The end-to-end approach of LSCM operations

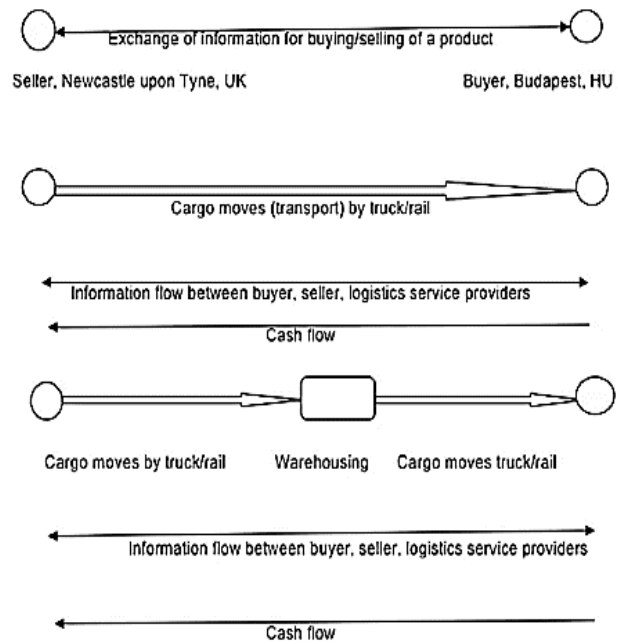


Fig 2. Logistics: a graphical example

The determination of the warehouse location, size, type, and other relevant factors will rely on the specific requirements and nature of the cargo. The purchasing choice made by the buyer may impact the inventory management of the buying firm, since it involves choosing between buying the goods in large quantities or making smaller, more frequent purchases on a monthly or weekly basis. It is worth noting that inventory incurs both capital and interest expenses. In order to ascertain the most advantageous magnitude of inventory, several ideas such as Just-in-time (JIT) may be used. JIT is a procurement approach characterized by a 'pull' mechanism, wherein the buyer acquires the goods just when it is required. The objective of this approach is to achieve an optimal zero level of inventory. In contrast, the conventional strategy involves the use of the 'push' technique, when the buyer purchases a significant quantity of the goods and maintains a certain inventory level. The inventory technique in question is further examined in a subsequent section.

In the context of transportation and storage services, the appropriate packaging method will be used based on the specific characteristics of the product in question. Throughout the whole process, many administrative tasks will be carried out, including the issuance of a B/L by the provider of transport service. The Bill of Lading (B/L) includes comprehensive information on the shipping of the goods and confers ownership of the cargo to a designated entity, often the buyer. The Bill of Lading (B/L) has significant importance within the realm of international commerce as it serves as a crucial document ensuring the provision of payment to the seller (exporter) and the delivery of the goods to the buyer (importer).

This article presents a comprehensive overview of the operations management current research within the field of supply chain and logistics. In this article, we begin by providing a clear definition of supply chain and logistics management, which establishes the boundaries for our subsequent research studies. The main focus of this article is to provide a number of significant topics within this field, supported by illustrative examples that demonstrate the many research perspectives through which these studies contribute. In conclusion, this work presents the insights derived from our analysis and outlines potential avenues for future research in this particular sector.

The paper's structure is as follows: Section II presents a review of the key concepts such as logistics and supply chain management. Section III presents a history of supply chain and logistics. Section IV provides a critical analysis of prevailing issues in the sector of logistics and supply chain management, and Section V reviews future scope in the sector. Lastly, Section VI draws a final remark to the article.

## II. OVERVIEW OF KEY CONCEPTS

### Logistics

According to Xing, Yan, and Zhou [2], logistics can be described as the finished goods, strategic management of procurement, storage of materials, transportation, and components, along with the associated data flows, within a company and its channels of marketing. The objective is to ensure profitability by fulfilling orders in a cost-effective manner, while considering both future and present actions, with a perspective that is holistic, logistics management entails the focus on meeting consumer demands by effectively coordinating the flow of supplies and information across many stages, starting

with the marketplace, extending through the firm's activities, and reaching out to suppliers. In order to accomplish a comprehensive integration of the organization, it is evident that a distinct orientation is necessary, diverging from the usual approach often seen in other companies. In order to facilitate the integration of the organization, it is essential that all departments engage in collaborative activity as a synergistic process. According to Rutner and Langley [3], Logistics may be defined as the organizational function that oversees the movement of materials, starting with suppliers and continuing via internal operations, until the final delivery to clients. Logistics may be defined as the systematic management of the flow of commodities into and out of an organization. Consequently, the primary logistics goal is to ensure the fulfillment of customer satisfaction.

The five primary constituents of logistics include transportation, storage, inventory management, packaging, and information processing. Transportation is often regarded as the primary component of the majority of logistics services. Transportation management encompasses various crucial components, including modes of transportation like intermodal or multimodal, air, pipeline, rail, road, waterways. Additionally, it involves the consideration of transportation infrastructure, geographic conditions, delivery types like regular, overnight express, or long distance, load planning within the scheduling, routing, and cargo unit. The critical factors of management of warehouse include the geographical placement, quantity (in relation to the central versus decentralized warehousing policy), size (also linked to the policy of warehousing), type of storage (e.g., garments, electronics, refrigerated cargo), and the equipment used for material handling.

Strategic decision-making about the storage of inventory is a critical component within the realm of inventory management, including considerations pertaining to the selection, location, and quantity of items to be stored. There is sometimes confusion between warehouse management and inventory management. The responsibility of warehouse management pertains to the storage and organization of inventory, whereas inventory management primarily concerns itself with the quantification of products or raw materials held in stock. Packaging is required for completed, semi-finished, and raw products. Unitization and packaging are key components of logistics. The basic components of unitization and packaging include the product's value and kind, including aspects such as its sort, cost, and other relevant considerations. For example, the expenses associated with packaging and unitization may be significant for commodities with high value, whilst the cost of raw materials should be comparatively more affordable.

The primary objective of logistics management is to ensure optimal allocation of resources or inputs, in terms of quantity and timing, while effectively coordinating their transportation to designated locations, ensuring their integrity, and ultimately delivering them to the intended internal or external recipients. In the context of the natural gas business, logistics include the oversight and coordination of several components such as pipelines, trucks, storage facilities, and distribution centers. These elements play a crucial role in facilitating the transportation and transformation of oil across the supply chain. Efficient supply chain management and effective logistical operations play a crucial role in cost reduction and the sustained enhancement of operational efficiency. Inadequate logistical operations result in delayed delivery, inability to satisfy customer demands, and eventually contribute to the decline of the firm. The paradigm of commercial logistics has undergone significant changes since the 1960s. The growing complexity associated with the provision of goods and resources to businesses, along with the global advancement of supply chains, has necessitated the expertise of professionals often known as logisticians of supply chain. The advent of the contemporary period has given rise to a surge in technological advancements and intricate logistics procedures, leading to the development of logistics management software and specialized organizations with a focus on logistics. These entities aim to enhance the efficiency of resource movement across the supply chain.

### *Supply Chain*

According to Wieland [4], Supply Chain Management refers to the process of integrating essential company operations, starting with the end user and extending to the original suppliers. This integration aims to provide goods, information, and services that enhance value for stakeholders and customers. According to Lane and Sterman [5], Jay Forrester, a professor at MIT, conducted a study in the early 1960s examining the bidirectional relationships between suppliers and customers. Forrester's findings revealed that inventories within a supply pipeline exhibit increased oscillation as they are located further away from the customer. This phenomenon often results in either unfulfilled orders or excessive inventory. Another scholar, Ghalwash, Ouf, and Wassef [6], proposed that companies can enhance their competitiveness by improving their ability to effectively oversee the entirety of activities that constitute the existing supply chain structure. This comprehensive management approach, known as the value chain, encompasses the interconnections between customer service, inbound logistics, marketing, operations, outbound logistics, and sales.

As per Dumitrascu [7], SCM refers to a coordinated set of activities and decisions aimed at integrating retailers, suppliers, warehouse, manufacturers, transporters, and customers in a more efficient manner. The primary objective is to ensure the availability and distribution of the appropriate product or service, in the correct quantities, at the correct prices, to the appropriate locations, in optimal factor, and at the appropriate time. This approach aims to minimize costs across the entire system while striving to meet customer demands. The author asserts that the primary goal of SCM is to attain a sustained competitive benefit. According to Walters [8], Supply Chain Management may be defined as a sequential process including many activities and organizations through which products are transported from originating suppliers to ultimate clients.

From the author's perspective, each product has its own distinct supply chain, which might vary in terms of length, complexity, and simplicity. The concept of a value chain refers to a collection of interconnected businesses that collaborate

to provide a desired product or service to the end consumer. The supply chain may be conceptualized as a visual representation, akin to a map, that delineates the whole trajectory of commodities as they traverse from one location to another. During the course of this process, several entities such as retailers, raw materials suppliers, wholesalers, manufacturers, transport firms, finishing operations, third-party operators, logistics centers, warehouses, and numerous more activities are involved in the movement of material. Papadonikolaki and Wamelink [9] provide an alternative definition of SCM, characterizing it as the amalgamation of key processes responsible for overseeing the flow of information and materials in both directions, encompassing intra-organizational activities as well as inter-organizational interactions within the supply chain, ultimately culminating in the delivery of goods and services to end consumers. The primary objective of Supply Chain Management, as stated by proponents, is to enhance value for stakeholders and customers across the many stages of the process.

### III. HISTORY OF SUPPLY CHAIN AND LOGISTICS

Logistics and SCM have been present throughout history, although the specific name "logistics" was not used until the 1950s. Throughout the extensive and intricate history of SCM and logistics, several variables warrant consideration. This part will analyze the historical development of SCM and logistics, from its origins to its current state. The course will include several subjects pertaining to SCM and logistics, including areas such as technology improvements, alterations in transportation infrastructure, and the impacts of globalization. Furthermore, this study will analyze the historical progression of logistics and SCM and explore their contemporary applications.

#### *Early History*

The use of logistics may be traced back to ancient times, as military forces utilized advanced techniques to effectively convey supplies and personnel over vast distances. This study was conducted to ensure that the military have the resources to effectively participate in a victorious conflict. Logistics was used as a means of facilitating the transportation of commodities across different geographical locations, exemplified by the practice of merchants transferring products from one urban center to another. Traditionally, the transportation of goods of this kind was often facilitated by the use of ships or caravans.

#### *The Industrial Revolution*

The Industrial Revolution brought about a substantial transformation in the methods of production and transportation of products. The advancement of novel tools and technology has resulted in enhanced manufacturing efficiency, as well as accelerated and enhanced transportation systems. Consequently, commodities might be efficiently delivered over extended distances within reduced timeframes. Consequently, the importance of logistics increased significantly as firms sought expedient and efficient methods for transporting their merchandise.

#### *The Development of Technology*

Advancements of technology has had a substantial influence on the management of supply chains and logistics. The advent of computers facilitated enhanced precision and efficiency in shipment tracking for companies. Additionally, novel software tools were developed, facilitating the enhancement of supply chain optimization and inventory management for organizations. Consequently, enterprises were capable of reducing costs and enhancing efficiency.

#### *The Evolution of Transportation Systems*

The growth of transportation systems has had a considerable influence on SCM and logistics as well. The advent of trains, ships, aircraft, and vehicles facilitated the expedited and more effective conveyance of commodities over extended geographical spans. This development facilitated the expedited and efficient transportation of commodities for enterprises, surpassing previous capabilities. In addition, the advent of containerization has facilitated the transportation of commodities in large quantities, hence enhancing operational effectiveness.

#### *The Impact of Globalization*

Globalization has had a substantial influence on the sector of SCM and logistics. The expansion of international commerce has facilitated companies in accessing resources from many global sources, hence enhancing their efficiency and cost-effectiveness in the production of commodities. Furthermore, the advent of international transportation networks has facilitated the expeditious transit of commodities across national boundaries, enabling firms to effectively meet the demands of consumers. The increasing globalization of markets has necessitated firms to enhance their SCM in order to remain competitive. As a result, the field of logistics has gained considerable importance. Throughout history, logistics and supply chain management have seen substantial advancements since its inception in ancient times. The significance of logistics has grown in tandem with advancements in technology and transportation systems, as firms strive to optimize their supply chains in order to maintain competitiveness within an increasingly international market. The significance of logistics in company operations is expected to persist for the foreseeable future, owing to advancements in technology and the increasing efficiency of transportation networks.

#### IV. PREVAILING CONCERNS

Given the vast scope of research in the field of operations management pertaining to SCM and logistics, it is impractical to provide a full analysis within the confines of a single publication. In this part, we highlight a selection of significant concerns and current research subjects that have garnered considerable interest from both academic and industrial sectors.

##### *Behavior Operations*

The choices pertaining to consumer behavior play a crucial role in enabling enterprises to gain a competitive benefit and enhance their profitability. The behavior of customers might exhibit characteristics such as loss aversion, risk aversion, regret, and strategic decision-making. Consequently, research articles that include these variables are considered to be of growing significance. In their research, Wang, Chen, and Wang [10] investigate the process of pricing for a product category and assortment planning that consists of diverse types of products from two different brands. They analyze choice of the consumer by employing the nested multinomial logit framework, which incorporates two structures of hierarchy. The first structure, known as the model of primary-brand, involves consumers selecting first a brand and then choosing a product type within that brand. The second structure, referred to as the type-primary model, entails consumers first selecting the type of product and subsequently choosing a brand within that specific type of product.

In their research, Lu, Wang, Li, and Li [11] examine the consequences of a novel reference price mechanism that is driven by behavioral factors and operates on the basis of the memory mode of peak-end. This mode proposes that consumers tend to anchor their perception of a reference price by considering an averagely weighed of the lowest price and the most recent price. It has been determined that for the associated dynamic pricing issue, an optimum solution is achieved by using a variety of constant price rules. The study conducted by Zeelenberg [12] delves further into the impact of expected regret on consumer decision-making, as well as its implications for business profitability and policies. This investigation specifically focuses on an advance selling scenario, wherein purchasers possess unknown values. In their work, Harvey and Quinn [13] provide a model that tackles the issues of production and pricing choices inside a company, using the framework of rational expectations. The findings demonstrate that companies have the capacity to provide a significant level of product availability, even in the face of conspicuous spending. However, it is observed that the implementation of scarcity tactics becomes more challenging as demand unpredictability rises.

In study [14] examines the strategic behavior of a corporation that engages in the sale of two items with vertical differentiation in terms of quality. The firm operates within a two-period framework and interacts with customers that possess forward-looking decision-making capabilities. The firm adopts a dynamic pricing strategy, adjusting prices in each period. Research has shown that the extent of loss resulting from strategic customer behavior may be mitigated by offering two product variations, as opposed to a single-product benchmark. This finding suggests that product diversity can be used as a strategic tool when managing interactions with strategic consumers. In their study, Cragg [15] examine the case of a store that operates inside a limited selling season and faces unpredictable demand for their goods. The researchers identify three distinct sorts of customers: myopic consumers, bargain-hunting consumers, and strategic consumers. The researchers observe that the presence of strategic customers leads to reduced stock levels, smaller price reductions, and worse profitability for retailers compared to situations when strategic consumers are absent. Consequently, retailers are advised to typically refrain from committing to a predetermined pricing trajectory throughout the season.

Another area of study is on the risk propensity shown by companies within the supply chain. Ke, Wu, and Zhang [16] is credited as one of the first researchers to investigate the newsvendor boy issue within the mean-variance paradigm. This approach incorporates the variation of profit system. Several recent studies have utilized a comparable methodology to examine supply chain issues. For instance, Saha [17] investigated a supply chain model incorporating a return policy. Chen, Hao, and Li [18] explored commitment-option contracts, while Gutierrez and He [19] focused on channel coordination. Additionally, Qiu and Xu [20] examined profit-sharing schemes and wholesale pricing.

##### *Transportation and inventory management on specific fields*

As previously said, the current research on logistics management in the field of operations mostly focuses on the conventional areas, namely inventory management (including transportation management and production planning. Nevertheless, it is worth noting that a prevalent trend in academic articles is the prioritization of certain domains, whereby notable characteristics are included into their models, therefore offering new insights to the existing body of knowledge.

The discipline of inventory management for perishable items, also known as degrading products, has a long history and is well-established within the domains of SCM and logistics. The primary area of research in this field revolves on the development and analysis of replenishment strategies for managing inventory. The topic of fashion products decaying at the conclusion of certain storage periods was examined by Agarwal [21]. Subsequent to then, much focus has been devoted to this particular area of investigation. Cassidy [22] presents an extensive review of the scholarly literature produced prior to the 1980s. Recent research has examined the declining inventory models, as shown by the works of Shah and Raykundaliya [23]. These studies provide comprehensive reviews of the relevant literature produced in the 1990s and 1980s.

Nevertheless, it is still possible to create novel models that may effectively include the present management characteristics and provide fresh managerial perspectives. Perishable products are susceptible to two primary forms of loss: quantity loss and quality loss. The existing body of literature has mostly focused on a one category of loss. Mubiru [24] use a model of stochastic to examine a chain of supply whereby a distributor acquires a certain amount of a perishable commodity

from a manufacturer. Throughout the transportation process, the distributor must exert diligent efforts to maintain the optimal goodness of the product. The degree of success in this endeavor significantly influences both the quantity and quality of the product ultimately supplied to the market. Rasi and Jaihouni [25] significantly expanded the existing model to include a three-stage chain of supply that includes transportation outsourcing.

Transportation is another significant area of study. The study conducted on the VRP and its several risings has been well recognized in academic circles. Nevertheless, there are also other emerging areas within the field of transportation that may provide intriguing subjects for investigation. The rise of intermodal transportation in recent years has been significant, but there has been a lack of corresponding academic engagement. As a result, there is a notable opportunity for further study in the field of intermodal transportation. Arnold, Peeters, and Thomas [26] examines a key operational concern within the intermodal transportation system, namely the optimal route selection for foreign goods over the intermodal network. The issue at hand is presented as a multi-objective multimodal multicommodity flow drawback that incorporates time frames and concave costs. To address this challenge, a proficient heuristic is introduced. Sungwook Hong [27] propose an initial endeavor to establish a framework that is analytic for the strategic planning of rail-truck intermodal movement of materials that are hazardous. Their approach involves the formulation of a bi-objective model of optimization, which aims to effectively plan and oversee shipments of intermodal, while accurately reflecting the prevailing industry practices.

The routing decisions within the model are primarily affected by the delivery time requirements stipulated by the buyers. The subject of load planning for trains at terminals of intermodal container is investigated by Majer, Budziński, and Gardas [28]. The primary goal is to allocate units of load to railway wagons in a manner that maximizes the usage of the train while minimizing setup and transportation expenses at the terminal. In their research, Bruns, Goerigk, Knust, and Schöbel [29] go more into the issue of load planning of robust for trains at terminals of intermodal container. The objective of load planning is to optimize the selection of wagon configurations and allocation of load units to railway wagons, with the aim of maximizing train utilization and minimizing setup and transit expenses at the terminal. de Givry and Jeannin [30] propose a methodology of novel hybrid that integrates operations research approaches with AI search methods. This approach aims to provide high-quality solutions for intricate multimodal transport issues by leveraging the advantages offered by both types of techniques. The approach has been implemented in a practical scenario involving a prominent Spanish corporation, whereby multimodal transportation was used to address a real-world issue.

#### *Marketing and Sourcing in Supply Chain*

Sourcing serves as the first stage inside a supply chain. In recent years, there has been a significant body of study conducted on the topic of source. This creates an opportunity for a provider to enhance efficiency over a period of time by engaging in additional optimization of the manufacturing processes. The transfer of research and engineering responsibilities from original equipment manufacturers (OEMs) to their suppliers has the potential to provide substantial benefits in terms of knowledge accumulation and cost reduction. This shift involves the delegation of complicated tasks and the production of customized goods. The fluctuation in supplier prices has a significant impact on the negotiating process of sourcing contracts.

One salient concern is to the incorporation of auctioning inside the sourcing approach. One of the first studies in this domain may be attributed to Zhang and Smith [31], who examines a procurement issue with a solitary customer and many possible suppliers possessing confidential data on their respective manufacturing costs. The buyer employs an optimum procurement approach by first determining a payment amount for each potential purchase quantity, followed by inviting producers to submit bids for the contract. The auction may be performed using several forms, including the Vickrey auction, English auction, first-priced auction, Dutch auction, and sealed-bid auction. In their research, Benzidia [32] examine a supply chain scenario in which an upstream provider conducts auctions for their inventory or capacity as a bundled offering. This formulation of the issue results in a two-stage chain of supply consisting of a solitary source and two resellers. The study conducted by Huh and Janakiraman [33] examines the use of auctions and other sales channels in periodic-review inventory replenishment issues. The findings of their research illustrate that the effectiveness of (s, S) policies of inventory replenishment goes beyond the conventional settings of sales that have been previously explored in the inventory literature. The study conducted by Meena, Sarmah, and Sinha [34] examines a chain of supply scenario where a sole buyer aims to acquire a bundle of products or services from multiple suppliers who have access to confidential cost data. The researchers illustrate how the customer can maximize their profit and effectively coordinate the supply chain by implementing a scheme of contract that incorporates profit sharing, audits, and auctions.

The need for a supplier that offers vital and specialized components is intimately tied to, and thus influenced by, fluctuations in the market for the finished product. One of the huge issues encountered by producers in the automobile sector is the unclear and unstable domestic volume of particular models, which may be attributed to the proliferation of customer options. The consumer electronics business is well recognized for the inherent risks associated with short product life cycles and the unpredictable nature of demand. Moreover, it is often observed that there exists a higher degree of uncertainty about future demand as compared to existing demand. The presence of demand uncertainty introduces an additional factor of future uncertainty, alongside the potential for supplier changing to short-term relationships, which impacts the determination of investment of initial capacity.

Marketing is an integral component within the broader context of SCM. The implementation of SCM is significantly influenced by the adoption of a market orientation. To begin with, it is important to note that a firm's market orientation plays a crucial role in the acquisition and retention of useful market knowledge, which is essential for the development,

sustenance, and improvement of supply chain partnerships. For instance, given that a firm possesses data pertaining to its customers, suppliers, competitors, sociopolitical environments, and technological trends, it becomes capable of addressing inquiries such as determining the most suitable supply chain to cater to its customers' requirements, identifying potential partners for implementing SCM, and establishing the objectives to be pursued within the realm of SCM. Furthermore, Moller [35] proposed that one crucial aspect of SCM adoption is the exchange of information via bilateral communication among partners within the supply chain. A market orientation might potentially facilitate the dissemination of information throughout a supply chain, since the market intelligence acquired by individual partners can serve as the foundation for shared information across all participants in the supply chain. The act of exchanging information among partners in a supply chain may be seen as a manifestation of organizational learning within the context of the supply chain as a whole, rather than being limited to individual businesses or specific inter-firm partnerships.

According to Holmström and Partanen [36], there are two significant continuing transformations in supply chain management (SCM) techniques. These changes include the facilitation of organizational learning across the supply chain and the enhancement of collaboration with suppliers. When integrated, these modifications facilitate the development of enhanced bilateral connections between partners within a supply chain and their respective providers. With enhanced information interchange, partners are more proficient in leveraging supplier creativity and expertise, enhancing procedures (especially in terms of cost savings and performance advantages within the supply chain), and fostering individual development within an established supply chain framework. A market orientation ultimately enables the practice of relationship marketing, which in turn has the potential to indirectly support the adoption of SCM via relationship marketing. According to Bataineh [37], it is necessary to establish and sustain strong, enduring partnerships between firms that extend beyond contractual obligations in order to facilitate effective supply chain management (SCM) via enhanced inter-firm coordination. According to Cowan, Paswan, and Van Steenburg [38], relationship marketing is contingent upon inter-firm collaboration, which prioritizes the methodical cultivation of enduring, collaborative commercial partnerships. Consequently, the use of relationship marketing facilitates the cultivation of inter-firm collaboration, as well as the establishment of enduring and intimate connections among the participants of the supply chain.

#### *Supply Chain and Green Logistics*

The term "green logistics" pertains to a logistics model that utilizes sophisticated technology of logistics to strategize and execute habitat-friendly recovery, transportation, processing, storage, circulation, packaging, and other related operations. The objective of this initiative is to mitigate environmental contamination and minimize resource consumption resulting from logistical operations, so achieving a mutually beneficial outcome in both logistics advancement and ecological preservation. Green logistics has emerged as a significant pathway towards achieving sustainable development objectives. It has garnered more focus due to its potential to facilitate industrial upgrading, economic structural transformation, and the advancement of logistics development. These features are crucial in the pursuit of sustainable development strategies. The concept of a green supply chain refers to the management of the chain of supply with shared aims and fundamental consequences. The term "sustainable management" is often used interchangeably with SCM and green logistics.

Green supply chain and sustainability activities are increasingly gaining prominence in several enterprises and firms as they endeavor to lower supply chain expenses, minimize their carbon emissions, and enhance their role as caretakers of the Earth's natural resources. Transportation and logistics operations account for more than 75% of a company's carbon footprint. The implementation of a proficient transportation management system has the potential to support green supply chain activities and simultaneously reduce freight expenses by a range of 5% to 40%. Logistics play a vital role in the functioning of contemporary transportation networks, including the SCM implementation techniques and methods aimed at mitigating the energy and environmental impact of freight distribution. The primary areas of attention included by this study are packaging, waste management, material handling, and transportation. The concept of green logistics encompasses several aspects pertaining to physical distribution, materials management, and production planning. This allows for a diverse range of possible applications using environmentally-friendly tactics across supply chains. This suggests that various stakeholders may use different solutions, all of which are categorized as green logistics. One firm may prioritize packaging of product, while another may strategize on alternative vehicles fuel, both of which are engaged in the implementation of environmentally sustainable logistics practices.

Upon deeper test of the idea and its practical implementations, several contradictions and paradoxes emerge, indicating that its usage may be more problematic than first anticipated. There has been much discourse around the comprehensive definition of green logistics, with the transportation sector exhibiting a tendency to focus on certain and limited aspects of the matter. The use of green logistics techniques may be inferred when transportation costs are lowered and assets like distribution facilities, terminals, and cars are utilized more efficiently. The emergence of green logistics as a formal sector of study and action since 2005 may be attributed to a range of well-documented concerns, including sustainability, energy consumption, waste management, climate change, as well as specific considerations such as vehicle emissions, noise levels, and size [39]. The green SCM implementation practices in distribution activities encompasses various strategies such as enhancing energy efficiency, mitigating greenhouse gas (GHG) emissions, conserving water resources, minimizing waste generation, promoting the use of biodegradable packaging, adopting recycling and reusing practices for products and packaging, and incorporating environmentally friendly procurement practices. Habitat ideas, such as the flow of materials, have also become very relevant and applicable to the field of SCM.

While traditional logistics primarily focuses on managing the forward distribution process, encompassing inventory control, transportation, packaging, and warehousing to the consumer from the producer, the emergence of environmental concerns has given rise to new market opportunities in recycling and disposal. Consequently, a distinct sub-sector known as reverse logistics has emerged. This process of reverse distribution encompasses the transportation of garbage and the transfer of used commodities. Although the terminology "reverse logistics" is often used, other designations like "reverse-flow logistics" and "reverse distribution" have also been utilized. The incorporation of logistics into the processes of recycling and waste disposal, encompassing various types of materials including those that are toxic and hazardous, has emerged as a significant and expanding market. However, this market does not fully capture the concept of green logistics, which entails the implementation of environmentally-friendly practices in both the reverse and forward components of chains of supply.

The emergence of the green chain of supply network idea has been seen since 2010. The integration of the "green" notion with the "supply chain" concept establishes a fresh paradigm in which the chain of supply is directly linked to the environment. This observation is significant since throughout history, these two perspectives have been in conflict with one another. The concept of a green supply chain network refers to the integration of environmental considerations into the management of the chain of supply. This includes several aspects such as product distribution to the end customer, product design, material selection, and procurement, and the management of the product's life cycle after it has been used. Lin, Kulangara, Foster, and Shang [40] published a thorough review of literature on networks of Green Supply Chain, focusing on network analysis. Based on the findings, it can be seen that the geographical distribution of the research works indicated that Europe, although having a limited number of highly influential publications, exhibited the highest quantity of works, closely followed by North America. According to Yeh [41], the process of job dispersion in Asia is now commencing. The researchers used an objective clustering methodology to ascertain that the establishment of a foundation and the representation of the most prominent works are evident in both conceptual and empirical investigations. The classification of their thematic literature also indicated that quantitative and prescriptive modeling has started to gain more significance.

Green SCM refers to the strategic coordination of the chain of supply, whereby environmental considerations are integrated and inter-organizational actions are taken into account. The concept of green SCM is centered around the procurement, distribution of materials, and manufacturing in order to meet the stakeholders needs and improve the profitability, and retailers in the medium and short terms, competitiveness, and manufacturing systems, and resilience of suppliers. This is achieved through the implementation of strategies that enhance green performance, as discussed by Labella-Fernández [42]. The advantages of implementing green chain of supply initiatives encompass the capacity to efficiently strategize distribution routes in collaboration with customers and suppliers, optimize capacity utilization by transporting full containers, consolidate multiple customer orders, and reduce the need for expedited and additional shipping expenses to ensure timely delivery while meeting customer delivery deadlines. The integration of these many components serves to enhance a company's competitive advantage while simultaneously mitigating the environmental repercussions associated with logistical operations. In recent years, there has been a significant surge in the attention given to green supply chain management by both practitioners and researchers. This heightened interest may be attributed to the increasing pressure exerted by a range of stakeholders, such as customers, community activists, non-governmental organizations, regulation of the government, and global competitiveness.

The need to maintain chains of supply has led several organizations to adopt a certain degree of dedication towards their sustainability strategies. Academic institutions and diverse sectors of the world economy has adopted sustainability measures in their operations. These measures encompass the implementation of efficient energy technologies, the utilization of renewable resources, recycling practices, environmentally-friendly carbon emission tracking, procurement strategies, social responsibility initiatives, reduced packaging, and employee recognition programs. These efforts are aimed at promoting sustainability and addressing environmental considerations in supply chain management and planning. In a sustainable network of chain of supply, which is essential for members to adhere to habitat and social standards in order to retain their position within the chain of supply. Simultaneously, it is anticipated that competitiveness will be maintained through fulfilling consumer requirements and corresponding economic criteria.

## V. FUTURE SCOPE

Based on the aforementioned study, the following future directions and insights may be gleaned in the field of operations research pertaining to SCM and logistics.

The issue of the logistics of people's livelihood has emerged as a focal point. The conventional study in this context pertains to electronic, fashion, and perishable products, all of which has a limited lifespan. In contemporary times, subjects of interest may include municipal logistics, emergency logistics, and agricultural SCM. Furthermore, advancements in the technology and economy have the potential to provide novel approaches to SCM and logistics. One such instance is the field of information technology, which has prompted investigations into e-business and the associated decision-making processes for distribution channels. In contemporary times, the widespread use of RFID technology, cloud computing techniques, and big data analytics has emerged as significant areas of research that hold promise for future investigation.

Furthermore, the field of environmental study will continue as a significant concern. The worldwide worry about resource problem, ecological harm, environmental pollution, and other difficulties has been prompted by the continual expansion in global population and economic size. The worldwide society has reached an agreement on the pursuit of socioeconomic sustainable development by adopting a more environmentally friendly economic pattern and lifestyle. Numerous nations



endeavor to foster a fresh perspective in the realm of industrial and technological rivalry via heightened investments in the domain of green supply chain and logistics. This is achieved by designing and executing diverse legislations, plans, and strategies, while concurrently reinforcing the execution of the green economic strategy of advancement. In future periods, the scope of this subject matter will include not just closed-loop supply chain, reverse logistics, and remanufacturing. The exploration of low-carbon concerns has significant potential as a crucial avenue for academic study.

Multimethodology emerges as a significant avenue for prospective investigation. In the field of operations management, there exists a conventional categorization of significant research approaches. These methodologies include behavioral experiments, theoretical modeling, surveys, simulations and computing, and cases. In recent years, there has been a noticeable inclination towards the integration of several research approaches in order to investigate research challenges within the fields of SCM and logistics. In the context of tackling SCM challenges, several academic articles have focused on establishing models and validating their results via real-world case studies. Other papers have opted to perform behavioral experiments in order to explore the practical applicability of certain theoretical models. Furthermore, it is anticipated that there will be a continuing increase in the quantity of articles that explore novel applications of established methodologies, such as cooperative game theory and behavioral operations.

## VI. CONCLUSION

As elucidated within the aforementioned article, the primary objective of logistics management is to ascertain the appropriate allocation of resources, ensuring their timely, accurate, and optimal delivery to the intended recipients, while also considering the specific location and condition requirements. Maintaining efficiency and minimizing expenses are essential for organizations. The notion of commercial logistics has seen significant development since the 1960s, necessitating the presence of specialized professionals such as supply chain logisticians. SCM refers to the comprehensive essential business integration operations that span from the final consumers to the initial suppliers. This integration encompasses the provision of data, goods, and services that contribute to enhancing value for stakeholders and customers. The primary objective is to attain a sustained competitive advantage via the effective management of the value chain, including many key components such as customer service, inbound logistics, marketing, outbound logistics, sales, and operations. The historical trajectory of SCM and logistics encompasses several epochs, such as antiquity, the Industrial Revolution, developments in technology, the growth of transportation systems, and the ramifications of globalization. Technological improvements, the evolution of transportation systems, and the effect of globalization have had significant influence on the development of SCM and logistics.

SCM is an essential component of corporate operations, whereby the adoption of a market orientation plays a substantial part in its implementation. The market orientation of a corporation plays a crucial role in the establishment, sustenance, and improvement of supply chain partnerships via the provision of significant market intelligence pertaining to consumers, suppliers, rivals, sociopolitical contexts, and technical advancements. The act of exchanging information facilitates the development of improved bilateral connections with suppliers, fosters individual learning, and yields cost-saving advantages. Relationship marketing plays a crucial role in facilitating the adoption of SCM by cultivating collaborative efforts and creating enduring connections among the various components of the supply chain. Green logistics, which falls under the umbrella of SCM, is a strategic approach that seeks to mitigate environmental contamination and minimize resource use. Its primary objective is to foster sustainable development and preserve the ecological environment. The concept encompasses several behaviors, including but not limited to energy efficiency, trash reduction, and recycling. Reverse logistics is a specific domain within the realm of green logistics that encompasses the transportation of garbage and the transfer of used commodities.

The idea of the green supply chain network was first introduced in 2010, with the aim of incorporating environmental considerations into the sector of SCM. This strategy places emphasis on the aspects of customer delivery, product design, material selection, and procurement with a concurrent focus on managing the product's post-consumption phase. The objective of green SCM is to improve the financial performance, competitive advantage, and capacity to withstand disruptions of suppliers, retailers, distribution centers, and production systems. The advantages of implementing green supply chain efforts include the attainment of cost-effective distribution routes, optimization of capacity, and reduction in shipping costs. Companies are incorporating sustainability measures, such as the adoption of energy-efficient technology and use of renewable sources, into their supply chain planning and management processes to guarantee sustainability and address environmental concerns. Potential areas for future study include the examination of livelihood matters, the advancement of economies and technologies, the mitigation of environmental challenges, and the integration of multimethodology within the field of operations management.

### **Data Availability**

No data was used to support this study.

### **Conflicts of Interests**

The author(s) declare(s) that they have no conflicts of interest.

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## Competing Interests

There are no competing interests.

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