ISSN: 2321-2152

IJMECE

International Journal of modern electronics and communication engineering

E-Mail
editor.ijmece@gmail.com
editor@ijmece.com

www.ijmece.com

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

"Navigating Modern Business Landscapes: The Dynamics and Impact of Supply Chain Management"

[1]S K V Prasad N, [2]Dr. Kedar Naryan Bairwa

Abstract: Optimization of the movement of goods and services from raw materials to final customers is the focus of Supply Chain Management (SCM), a key enabler of contemporary company success. Demand forecasting, inventory management, supplier cooperation, logistics and distribution optimization, information integration, risk reduction, sustainability, and resolving problems provided by globalization are all crucial aspects. Successful supply chain management (SCM) improves operational efficiency, reduces costs, increases customer happiness, and helps businesses succeed in increasingly complicated global markets. Achieving these objectives calls for forethought, creativity, and the ability to respond quickly to changing market conditions. This summary summarizes the many facets of SCM and provides a springboard for future research and practical implementation in today's corporate settings.

Keywords: Demand Forecasting, Supplier Collaboration, Information Integration, Risk Management

INTRODUCTION

The last step is delivery to the customer, which follows distribution and logistics across all channels, entry and management, and then delivery to the customer. The term "supply chain management" refers to the practice of combining all of these distinct activities into a unified workflow. In today's highly competitive climate, a company's ties with both its customers and its suppliers will have a significant impact on the company's future growth. The supply chain is a defined process that may assist businesses in achieving their aims of benefiting both themselves and their consumers. In general, companies want their customers to benefit as well as themselves. Controlling supply and demand, purchasing raw materials and replacement components, manufacturing and assembling, maintaining inventory in warehouses, and placing orders via a streamlined and structured process are all components of the supply chain, as stated by Somoygi et al. (2009). (Somoygi et al, 2009). The introduction of the supply chain was done with the main intention of connecting the important business activities that take place from the supplier to the end user, which is where the information from the process adds value to the consumer.

[1]Research Scholar, [2]Research Supervisor
[1,2] Department of Mechanical Engineering, University of Technology
Fatehpura Road,Post Kumhariawas, Vatika, Tehsil Sanganer, Jaipur – 303903

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

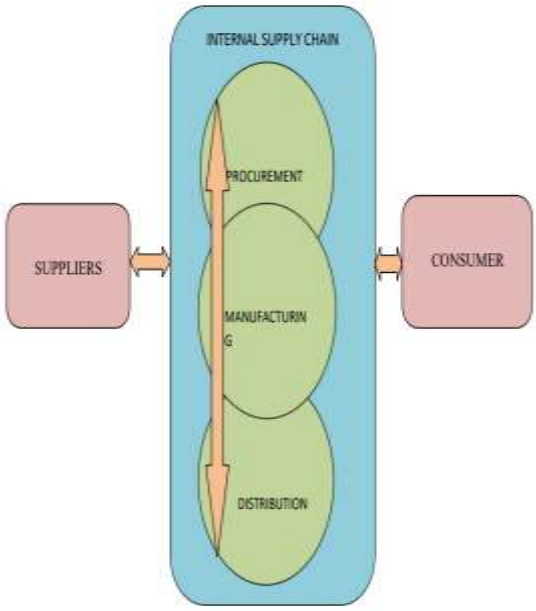

Figure1 : Illustration of company's supply chain (Somoygietal,2009)

According to Wallerius and Zakrisson, the expectations and conditions of the supply chain have changed in recent years in conjunction with the production and distribution firms (2010). The demand for supply chain and management inside the organization is developing as a direct result of the fact that the manufacturing company continues to preserve its core competencies there while contracting out the vast majority of the other processes to a significant degree.

According to Mentzer et al., a supply chain is a group consisting of three or more entities (organizations or persons) who are actively involved in the upstream and downstream flow of products, services, money, and information from a source to a customer (2001). The supply chain may be identified by its conventional supply chain, its extended supply chain, or its ultimate supply chain, all of which represent more complicated forms of the supply chain.

The flow of products and services between suppliers, producers, and consumers is referred to as the traditional supply chain. This movement occurs both upstream and downstream of the chain (Mentzer et al, 2001). According to Beamon (1999), traditional supply chains are integrated manufacturing processes in which raw materials are turned into completed commodities prior to being supplied to the customer (Figure 1).

1.1 Traditional supply chain

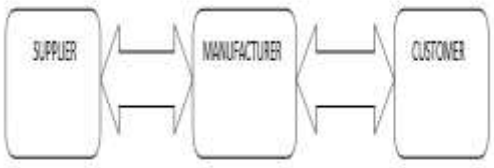

Figure2:-Traditional Supply Chain(Mentzer etal,2001

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

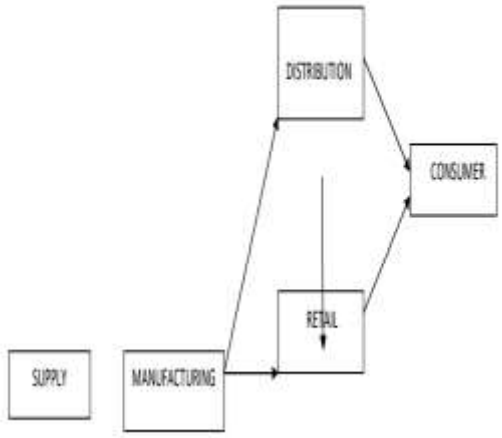

Figure 3: Traditional Supply Chain (Beamon,1999)

According to Mentzer et al., the extended supply chain is the supply chain that encompasses suppliers of the immediate supplier and customers of the immediate customer with upstream and downstream flows of goods, money, and information. This type of supply chain also includes both upstream and downstream flows of goods, money, and information (2001). (Figure 4). The idea of an extended supply chain, which was first proposed by Beamon in 1999, can be summed up as a method for tightly incorporating environmental considerations into the production process, beginning with the acquisition of raw materials and continuing all the way through to the ultimate disposal of the goods. This method was put forward by Beamon.

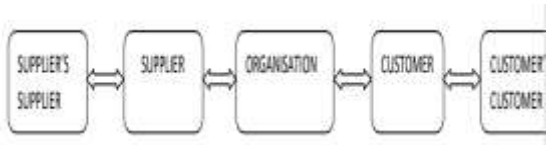

Figure 4 : Extended Supply Chain (Mentzeretal,2001)

According to the definition provided by Mentzer et al. (2001), the ultimate supply chain consists of the upstream and downstream flows of every organizational action, beginning with the ultimate supplier and ending with the ultimate consumer.

It is possible that the results of adopting conventional or extended SCM will contribute to an efficient flow of information inside each company; nevertheless, these elements will not be sufficient to construct a robust supply chain on their own. Although SCM includes principles such as lean manufacturing and waste management, none of these approaches can, on its own, reduce the negative impact that the supply chain has on the environment. As a direct consequence of this, a novel concept known as "green supply chain management" has emerged in order to fulfill the environmental requirements that have been set and to improve the efficiency of the supply chain in terms of its impact on the environment.

I. GREEN SUPPLY CHAIN MANAGEMENT: AN OVERVIEW

The fundamental challenge that modern mankind faces on a daily basis is that of the environmental fallout that results from industrial activity. The conventional supply chain that was used by companies in the early 1990s places an emphasis on lowering costs and improving the efficiency of a variety of internal activities, but it does not take into consideration the environment (Srivastva 2007). Therefore, by incorporating environmental concerns into the supply chain and making enterprises commercially viable through the usage of this enlarged supply chain, researchers and businesses started to rethink the traditional supply chain. This was accomplished by expanding the supply chain. In today's highly competitive and globalized market,

businesses are coming under increasing amounts of pressure to implement environmental management practices. These requirements are being posed by both internal and external stakeholders of the company (Zhu et al, 2008). As a result, there is a growing demand for practice across all types of enterprises and among individual customers.

According to Srivastva, green supply chain management may be traced back to its roots in supply chain management as well as green management (2007). According to Srivastva (2007), green supply chain management is the process of "integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers, as well as end-of-life management of the product after its useful life." Green supply chain management encompasses all aspects of the supply chain, from product design to the management of the product after its useful life. This demonstrates that environmental considerations are taken into account at every stage of the product's life cycle. "Green supply chain" aims towards sustainability, as stated in Johansson and Winroth's (2009) research.

Continuous progress is being made to enhance industrial processes and products in order to reduce or eliminate pollution of the air, water, and land. In addition, they said that by implementing these improvements, the potential risks to both people and other animals might be mitigated. According to Richards (1994), there are a few challenges that come along with green manufacturing. These challenges include meeting the demands of consumers for environmentally friendly products, developing recycling programs, cutting down on the amount of materials used, and selecting materials that have a minimal impact on the environment.

When a green component is added to the supply chain, the natural environment is taken into consideration as part of the process. The green supply chain is comparable to the supply chain in that each link in the network is responsible for its own

Green procurement, green distribution from supplier to manufacturer to consumer, and integrated green supply chains are some of the sectors and boundaries that are taken into consideration. Even the concept of reverse logistics, abbreviated as RL, was included by Zhu and Sarkis into their work on green supply chain management (2004).

The process of working together with one's suppliers and customers to improve one's environmental performance is called "green supply chain management," and it is practiced across all industries. These environmental performances may be practiced from a variety of perspectives. (2) The Green Business Network in 2002.

Focus on reducing or eliminating the excess materials used in the manufacturing processes or products.

Focus on the supplier’s environmental compliance status during the operations.

Joint venture for developing the new materials, products and solutions for environmental issues.

Requiring suppliers to implement and possibly certify environmental management systems.

Educating the suppliers regarding the material use, prevention of pollution and tools of interest to the customer company.

Refining the suppliers would help in developing new materials, parts and process with environmental concern.

II. MOTIVES FOR GREEN SUPPLY CHAIN MANAGEMENT

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

The green supply chain is a response to the fundamental shifts occurring in the industrial sector over the long term. Vertical integration and consolidation are two characteristics of the manufacturing industries of the early 20th century. Vertical integration and consolidation indicate that the primary product components are manufactured and assembled inside the sector. The second half of the 20th century was characterized by the phenomenon of outsourcing, which compelled businesses to depend more and more on their suppliers for the requisite quality, rapid delivery of goods, and the capacity to make things at prices that are competitive with one another. As a result, the environmental impact of the supplier might have an effect on any one of those elements; hence, it is vital that the supplier adopt a green supply chain in order to aid the firm in solving environmental challenges (Green Business Network, 2001).

Within an organization, the implementation of a green supply chain may be driven by a variety of factors, both internal and external. According to the New Zealand Business Council for Sustainable Development (NZBCSD), the supply chain is primarily focused on three areas as important in their practical guide for Business Guide to a Sustainable supply chain. This information can be found in their guide for Business Guide to a Sustainable supply chain (2003):

3.1 Improving the performance of business's own operations.

Ensuring that the goods and services provided by suppliers are sustainable and working with the suppliers increases the efficiency and competitiveness.

Working effectively with customers and sales channel to design sustainable products and services

Primary motivations	
Internal motivations and possible effects	**External motivations and possible effects**
Risk management • Supply interruption • Long term risk to human and environment • Competitive disadvantage	**Enhanced brand image** • Corporate culture of forecasting trendsand moving proactively • Potential for harm to public image forenvironmental concern.
Regulatory stance • Desire to go beyond compliance • Suppliers knowingly or unknowingly provide problematic substances • Supplier non-compliance poses production risk	**International purchasing restrictions** • Eco-labeling and product take back gaining momentum • May drive the creation of system forcollection •Frequently focused on high-profile brands transport, disassemblyor recycling
	Customer pressure • Often appear in conjunction with a threat to brand image • Regularly focusing on high-profile brands

Secondary motivations	
Cost reduction as suppliers apply pollutionprevention	**Increased innovation** • Can result from supplier participation in new product development
Enhanced quality	

According to Zhu and Sarkis (2004),

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

environmental management systems and quality management have a strong correlation with one another (EMS). A similar inquiry on the topic of Automobile manufacturers in China have said that they may improve their EMS processes by drawing on the knowledge they have gained through their work with quality management systems (Zhu et al,2008).

Environmental and Economic Benefits of Green Supply Chain Management

The most important research on designing and putting into action environmentally friendly supply networks have already been carried out. The study on environmental performance and the benefits it offers been contributed to by a number of different authors. According to a study that was conducted on small and medium-sized enterprises (SME) in Canada by Lefebvre et al. (2000), implementing green strategies within an organization can assist in enhancing organizational innovativeness, which can include enhancing product, process, and managerial innovation in addition to organizational competitiveness (cost containment, liability management, and export performance).

III. GREEN SUPPLY CHAIN MANAGEMENT THROUGHOUT THE PRODUCT LIFE CYCLE

According to Wang et al research's companies may more effectively manage their environmental strategies by using green supply chains. [Citation needed] The essential principle of green supply chain management is the notion of incorporating the concept of being environmentally friendly across the whole life cycle of a product. One of the best practices for the supply chain is to design the supply chain concurrently with the product. Additionally, the supply chain can be made more environmentally friendly by integrating the concept of being green into each and every one of its activities.

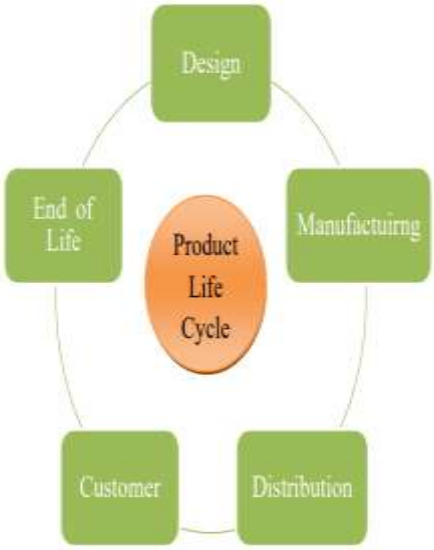

Figure 5 Product Life Cycle

4.1 Activities in Green supply Chain Management

Ninlawan et al. (2010) provided a number of suggestions after doing study on the topic of environmentally responsible supply chain management in the electronics sector. These acts put every stage of the environmentally friendly supply chain in jeopardy, from product recycling and waste management all the way through environmentally friendly manufacturing and distribution. Thai companies contributed their findings on a wide variety of aspects of environmentally responsible production (Ninlawn, et al., 2010).

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

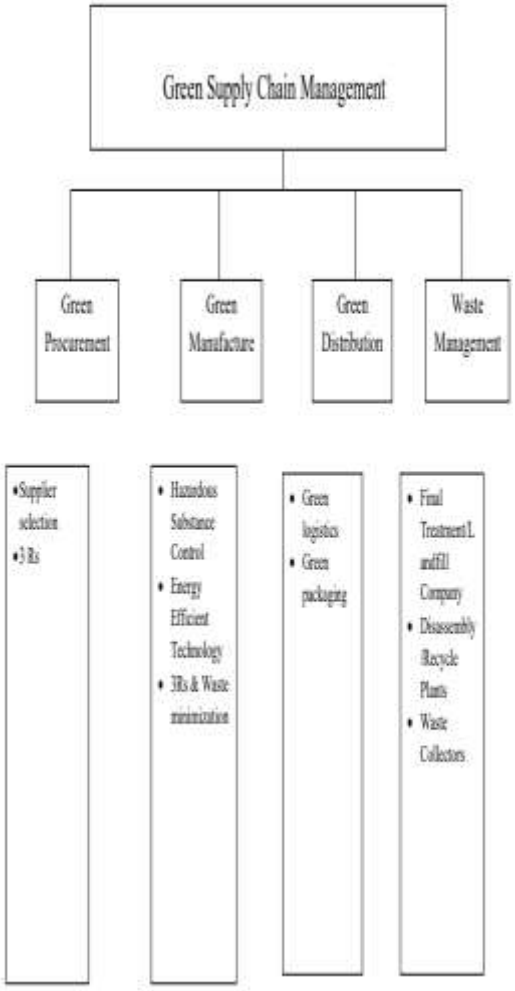

Figure 6: Activities in Green supply chain (Ninlawanetal.,2010)

4.2 Green Design of Product and Processes

The phrase "green design" refers to any design that takes into consideration the surrounding environment throughout the whole of the product's life cycle. A key component of environmentally friendly design is the elimination of waste (Srivastva, 2007). The major objective of "green design" is to broaden our awareness of the ways in which certain design decisions might contribute to the increased eco-friendliness of a product (Navin-Chaindra, 1991). The normal approach is to process a chemical that has less problems rather than one that might pose possible dangers; however, there are situations in which this approach is not desired and has the effect of depleting a potentially restricted resource in a shorter amount of time. Graedel (2002). (2002). (2002).

Green design, as defined by Hendrickson et al. (2001), contributes to the development of an environmentally friendly ambiance. Both the procedures and the products According to the findings of Hendrickson and colleagues, environmental concerns were not taken into account at any point throughout the development of new goods or processes (2001). The disposal of potentially harmful waste is accomplished in the most time- and labor-saving manner possible. It is possible that these problems may be fixed if the concept of becoming green is included into the design process. As stated by a

According to Johansson and Winroth (2009), the vast majority of companies believe that green design considerably contributes to a decrease in the amount of money spent on process costs. The use of environmentally friendly architecture and interior design not only improves efficiency but also reduces the negative impact on the natural world. In their paper titled "Introduction to Green Design," Hendrickson et al. (2001) provide many instances of green design, some of which include the recycling of hazardous waste, the use of solvent substations, and technical developments.

The major objective of green design in terms of social goals is to work toward the establishment of a sustainable community that values the earth and all of its natural resources. According to Hendrickson et al. (2001), the concept of environmentally friendly design need to place primary emphasis on three goals for a more sustainable future.:

Reduce or minimize the use of non-

ISSN:2321-2152
www.ijmece .com
Vol 10, Issue.1Jan 2022

renewable resources.

Manage renewable resources to insure sustainability.

Reducing or eliminating the toxic and other harmful emissions to the environment, including emissions contributing to the environment.

The ultimate utilization of green design will be only reached when these goals are accomplished. Hendrickson et al (2001) suggested that systems effects decisions should be considered in green design. There are two different approaches of system thinking

Life Cycle Assessment (LCA)

From the source of the raw materials all the way through the process of production and disposal, this sort of technique provides a detailed breakdown of the environmental impacts that will be caused by the development of a new product or process as well as the resources that will be necessary. In order to provide a comprehensive analysis of the effects that environmental variables have, this kind of technology employs a particular technique. The life cycle assessment sets a limit for lowering or preventing the increase of inventory emissions and resources, and it does this by establishing a limit on the total number of cycles (Hendrickson et al, 2001).

According to Gungor and Gupta (1999), a life cycle assessment is a method that evaluates the consequences of a product on the environment, occupational health, and resource consumption at every step of the product's existence, beginning with its creation and ending with its disposal.

MATERIAL FLOWS AND CYCLES

The use of this sort of technology makes it possible to monitor the consumption and placement of the material throughout the course of time. Hendrickson et al. (2001) created a unique difference between open loop and closed loop. If we were to define open loop, it would be the process of reusing waste resources for a purpose other than their original intent. Materials that may be used for a variety of applications but do not meet certain quality standards. Green design methods and tools

The green design process makes use of a variety of methods and technologies in order to carry out an effective life cycle process. This is done in order to achieve the desired result. These methods and sources, which were suggested by Hendrickson et al. (2001), contribute to the process of deciding the conclusion of the thesis.

5.1 Mass balance analysis

Tracking the movement of materials and energy as they go through a process is possible with the use of this technology. The calculations for the mass balances are based on the measurements of the inflows, inventories, and outflows of the system.

5.2 Green indices

The green indices are a mechanism for compressing the impacts that humans have on the environment into an easy-to-understand scale. After that, a person responsible for making decisions or a designer compares these indices to the "green score" of the various options.

5.3 Design for dis assembly and recycling aids

Because it is possible to recycle each component separately, the first parts should be presented in a manner that allows them to be swiftly dismantled or deconstructed in order to maximize their potential for reuse. This procedure not only saves time but also makes it very easy to determine which items are recyclable (Hendrickson et al. 2001).

5.4 Risk analysis

Analyzing risks entails keeping track of

the possibility that certain events will come to pass, which is analogous to the method of learning via trial and error.

5.5 Material selection and label advisors

Rules for the selection of materials are an essential component of the concept of "green design" due to the fact that a single product may be made from a variety of components, each of which has a unique level of impact on the surrounding environment. As a consequence of this, companies need to proceed with extreme care while selecting their materials. Since Gradel and Allenby (1995) gave helpful ideas for the selection of materials, a number of authors have examined and discussed these guidelines for the selection of materials:

- Choose abundant, non-toxic materials where possible.
- Chose materials familiar to nature rather than manmade materials.
- Minimize the number of materials used in a product or process.
- Try to use materials that have an existing recycling infrastructure.
- Use recycled materials where possible.

5.6 Full cost accounting methodologies

Many companies are ready to back or produce environmentally friendly products, but they often lack the knowledge essential to do so because of a lack of transparency. Because of this, the companies are compelled to finish The full cost accounting methodology, also known as the information about costs that is revealed around decisions about materials, products, and manufacturing processes, enables businesses to determine the method by which they can eliminate the harmful effects that the materials have on the environment and choose the most suitable alternative (Hendrickson et al. 2001).

5.7 Green Procurement of product and processes

According to Salam (2008) Green Procurement is defined as an environmental purchasing which involves activities like reduction, reuse, and recycling of materials in the process of purchasing. Salam (2008) stated that it is a solution for environmentally concerned and economically conservative business. This concept minimizes environmental impact by selection of products. Richard-Nicolas supported the argument of Salam stating that Green procurement is the purchasing of materials or services which have less impact on environment over the whole life cycle. Green procurement also involves the integration of environmental issues into purchasing decisions based on price, performance and quality. Along these decisions the environmental impacts has to be consider more important for reducing the waste and pollution. Nicolas suggested some typical Green procurement program elements:

5.8 Recycled content products

- Energy efficient products and energy efficient standby power devices
- Alternative fuel vehicles, alternative fuels, and fuel-efficient vehicles
- Bio-based products
- Non-ozone depleting substances
- Alternative fuels and fuel-efficient vehicles

Environmental Protection Priority Chemicals These program elements help in selecting the product for manufacturing process but the supplier selection plays a major role in green procurement.

Supplier selection: The materials and parts should be purchased only from ―Green partners‖ (Zhu, et al. 2007). The suppliers who have ISO 14000 should only be considered (Sarkis, et al. 2003). The supplier who control hazardous

substances in the industries and has obtain green certificate achievements can be considered has efficient supplier (Ninlawan et al., 2010)

3 Rs in procurement process: The 3 Rs in procurement process are Reuse/ Recycle/ Refurbish. According to Zhu, et al. (2007) the paper parts containers should be reused. The emails should be used for placing the order instead of paper (Sarkis, et al. 2003).

The change in inputs is an important tool in green manufacturing process. There may bemajor or minor ingredients or inputs which contribute to production. The changes in minor inputs substantially reduce the environmental impacts.

5.9 Green Manufacturing

According to Atlas and Florida, "green manufacturing" refers to production methods that employ materials that have minimally negative effects on the environment, are highly effective, and produce little to no waste or pollution. These production methods are considered to be examples of "green manufacturing."

According to Johansson and Winroth (2009), green manufacturing is an approach that strives to decrease or eliminate pollution of the air, water, and land via the continual improvement of industrial processes and the products that result from those processes. He said that by implementing these improvements, it could be able to lessen the risks posed to both humans and other kinds of organisms. According to Richards (1994), some of the challenges associated with green manufacturing include satisfying consumer demands for environmentally friendly products, developing recycling programs, reducing the number of materials used, and selecting materials that have minimal impact on the environment.

CONCLUSION

In conclusion, Supply Chain Management (SCM) stands as a vital cornerstone of modern business operations, where the intricate orchestration of processes and resources leads to streamlined operations and enhanced competitiveness. Through effective demand forecasting, efficient inventory management, collaborative supplier relationships, optimized logistics, and integrated information systems, organizations can navigate the complexities of global markets and swiftly respond to dynamic customer needs. The recognition of risks, both internal and external, coupled with sustainable practices, further fortifies the resilience of supply chains. As technology and markets continue to evolve, the principles of SCM remain ever-relevant, offering a roadmap for organizations to deliver value efficiently, minimize costs judiciously, and cultivate enduring customer satisfaction. The journey of Supply Chain Management is not only a pursuit of operational excellence but a continual commitment to innovation and adaptability in the face of evolving business landscapes.

REFERENCES

1. E. Belavina and K. Girotra, "The Relational Advantages of Intermediation", *INSEAD Working papers Collection*, no. 19, pp. 1-33, 2012.
2. M. Bostrom, A. M. Jonsson, S. Lockie, A. P. J. Mol and P. Oosterveer, "Sustainable and responsible supply chain governance: challenges and opportunities", *Journal of Cleaner Production*, vol. 107, pp. 1-7, 2015.
3. E. Brousseau, "The Governance of Transactions by Commercial

Intermediaries: An Analysis of the Re-engineering of Intermediation by Electronic Commerce", *International Journal of the Economics of Business*, vol. 9, no. 3, pp. 353-374, 2002.

4. M. Eskandarpour, P. Dejax, J. Miemczyk and O. Peton, "Sustainable supply chain network design: An optimization-oriented review", *Omega*, vol. 54, pp. 11-32, 2015.
5. S. Kaplan and M. Sawhney, "E-Hubs: The New B2B Marketplaces. (cover story)", *Harvard Business Review*, vol. 78, no. 3, pp. 97-103, 2000.
6. R. Klein, J. Wareham and K. Cousins, "Electronic Intermediary Functional Roles and Profitability", *Decision Sciences*, vol. 42, no. 2, pp. 309-337, 2011.
7. Z. Qu, H. Raff and N. Schmitt, "Inventory Control and Intermediation in Global Supply Chains", *Nicolas Schmitt*, 2015.
8. . D. Wu, "SUPPLY CHAIN INTERMEDIATION: A Bargaining Theoretic Framework", *Handbook of Quantitative Supply Chain Analysis: Modeling in the E-Business Era*, pp. 67-115, 2004.
9. Z. Wu and M. Pagell, "Balancing priorities: Decision-making in sustainable supply chain management", *Journal of Operations Management*, vol. 29, no. 6, pp. 577-590, 2011.
10. "Supply chain management: practice in Hongkong leafeng group", *Li & Fung Research Center.*, no. 10, pp. 90-9, 2009.