

Analysis on Supply Chain Management

Pallavi Ghorpade¹ and Satish Petekar²

Assistant Professor, B.Com, Suman Education Society's LN College, Borivali East, Mumbai, India¹

Student, B.Com, Suman Education Society's LN College, Borivali East, Mumbai, India²

Abstract: *Supply chain management is an essential component of any organisation. This article provides an outline of supply chain management's recent developments. In the first section, different definitions and essential supply chain management challenges are presented, followed by a discussion of the complexities inherent with managing supply chains. We then explore the primary inefficiencies caused by poor supply chain management. Finally, a brief assessment of past research activities and a discussion of future supply chain management difficulties are provided.*

Keywords: *Supply Chain Management; Operations Management; Manufacturing; Service; Logistics; Sourcing; Outsourcing; Procurement; Competition; Information; Technology; Globalization; Sustainability*

I. INTRODUCTION

Management of the supply chain is one of the most important components of operating business. Many people outside the direct community (in research and industry) are unaware of this, as the average customer typically only perceives its consequences. Recall the times when the item you desired was unavailable at your favourite clothing or grocery store, how many times you got a great "deal" at the end of the season, the sudden increases in gas prices due to shortages, the times when your e-commerce site promised availability but later could not send the required product or sent you the wrong product, or the times when your customised product (such as a personal computer or kitchen cabinet) arrived damaged or defective. All of the aforementioned consumer experiences, as well as a number of others, are direct results of organisations' supply chain activities. In contrast to business-to-consumer interactions, supply chain practises have a direct effect on business-to-business transactions. While some companies were negatively affected by poor supply chain management - Amazon, Wal-Mart, and Zara have continuously surpassed the competition due to their superior supply chain capabilities.

Since 1982, when Keith Oliver, a consultant at Booz Allen Hamilton, originated the term, supply chain management has developed from being viewed as merely logistics to a sophisticated multifunctional business activity that includes procurement, demand forecasting, distribution, and after-sales support. Supply chain management is such a broad subject that people frequently define it differently based on their own personal experiences. For some, supply chain management is all about managing suppliers, selecting what to outsource and to whom, and managing supplier relationships. Others view it as cost-effective means of transporting commodities from one location to another, taking into consideration distribution and transportation expenses. For another group, it is all about how the many enterprises in the distribution channel or value chain combine their information systems and inventory management procedures. To a third group, it is the proper management of fixed and variable assets essential for corporate operation. In a sense, all of these definitions are like to blind folks defining an elephant by its many organs. The following is a detailed definition of supply chain management.

A supply chain is the set of entities involved in the design of new products and services, the procurement of raw materials, their transformation into semifinished and finished goods, and their delivery to end customers (Swaminathan 2001). Supply chain management is the efficient administration of the entire process, beginning with the design of the product or service and continuing through its sale, consumption, and disposal by the consumer. Concerns of supply chain management can be divided into two basic categories: configuration and coordination. Configuration-level concerns pertain to the supply chain's high-level architecture and fundamental infrastructure, whereas coordination-level difficulties pertain to tactical decisions and day-to-day operations.

Important areas of decision regarding to Supply Chain Management

Plant location decisions

Where and how many manufacturing, distribution, or retail locations should a global production company have distribution system? How much capacity should each of these locations have? Which portion of the supply chain should be kept on land, along the coast, or offshore? What type of distribution channel should a company employ: traditional brick-and-mortar, direct to consumer via the Internet or telephone, or a combination of these?

Product portfolio decisions

What kind of products and services will be supported by the supply chain? How much variety should you offer your customers? What level of similarity should the product portfolio possess?

Information support decisions

Should software for enterprise resource planning be standardised throughout a company's functional units? Standard protocols, such as XML (extended markup language), or proprietary standards?

Coordination-strength Issues Material flow Management

How much inventory of various product kinds should be kept? Should inventory be kept in a finished or unfinished state? How frequently should stock be replenished? Should a company handle all inventory decisions, or is it preferable to have the supplier manage inventory? Should vendors be compelled to deliver items promptly?

Cash flow choices

When do suppliers receive payment for their shipments? What types of cost-reduction initiatives are implemented throughout the supply chain (or are required of suppliers)? In which currency will a supplier be paid by a worldwide company?

Capacity decisions

How can the existing capacity in terms of labour and machines be properly utilised? How do you schedule a manufacturing line such that jobs are completed on time? How much buffer capacity should be available for unforeseen circumstances with additional demand?

Configuration and coordination concerns are linked, as is clear. Configuration issues are long-term strategic decisions, whereas coordination issues are intermediate to short-term considerations. Typically, businesses define a strategy for configuration-level decisions and then base coordination decisions on that strategy.

Three Complexities Related to Supply Chains

As evidenced by the preceding section, supply chain management encompasses multiple functional and geographical domains. This increases the complexity of supply chain planning and operation. The following elements contribute to the complexity of supply chain management decisions:

1 Multiple Agents

Issues pertaining to the supply chain must be decided by diverse entities with varying interests. For instance, a merchant may request that the distributor provide extremely high product availability without charging the shop any additional fees. The retailer may not be willing to give information regarding actual client sales when the wholesaler agrees to this. Even when decisions must be made within the same organisation, incentive problems may arise. For instance, the marketing or sales department, which is normally a revenue centre, presents the production department, which is a cost centre, with the future demand prediction. Clearly, the former have an incentive to overestimate, whereas the latter have a motivation to underproduce (as compared to the forecast). This causes numerous challenges when determining the quantity of inventory to stock. A related issue occurs when the marketing department pushes for a vast array of product/service options, which the production department may not want to accept because it creates additional difficulties during execution.

2 Uncertainties

Effective supply chain management aims to precisely match supply and demand, but this is hindered by uncertainty at various levels of the process. Uncertainty exists in product and technology development, client demand forecasting, day-to-day operations, manufacturing, and supply. Typically, uncertainty increases the system's inefficiency. For instance, if the ultimate demand for a sweater at a store cannot be correctly predicted, the company would either stock too little (and experience stock-outs) or make too much (in which case it has to salvage the inventory through a huge sale at the end of the season). Similarly, supply unpredictability may need an increase in buffer inventory.

3 Lead Time

Every step in the supply chain requires time, and the resources (people, machinery, and computers) have limited processing capability. Consequently, not all jobs can be accomplished after the actual need is understood, and some work must be undertaken in advance (which may or may not get utilised based on the actual demand realized). In addition, the restricted capacity of the resources produces uncertainty in the actual lead time, necessitating increased resource demands at the subsequent step of the supply chain. Several sorts of inefficiencies in the supply chain result from the aforementioned complications, which are commonly seen as "negative impacts" of inefficient supply chain management.

Shortcomings of Supply Chain Management

1 Inadequate Use of Inventory Assets

Having surplus inventory at different levels of the supply chain while experiencing shortages at other stages is a common result of inadequate supply chain management. Since inventory represents a large portion of a company's working capital, ineffective management could result in enormous inefficiencies. Lee and Billington (1992) provide a good summary of the dangers and opportunities connected with supply chain inventory management.

2 Informational Distortions

The bullwhip effect is caused by the lack of visibility of demand and supply information throughout the supply chain. This effect outlines how a slight blip in consumer demand may be amplified down the supply chain due to the fact that the various entities in the supply chain develop and adjust their own estimates and do not coordinate or exchange actual demand data. Lee et al. (1997) outline this effect's causes and controls.

3 Stock-outs

Inadequate supply chain management also leads to late deliveries and significant stock-outs. Fundamentally, these consequences are the result of the company's failure to estimate its need for raw materials and equipment capacity, as well as the uncertainty connected with timely product deliveries from its suppliers. Fisher et al. (1994) demonstrate how precise fashion industry estimates could potentially alleviate this inefficiency.

4 Customization Difficulties

As the level of customization in the marketplace has increased, one of the immediate repercussions of ineffective supply chain management is the late delivery of customised products. Various tactics are being developed by businesses in order to give variety while maintaining cost control. These include deferring product differentiation and establishing greater commonality and modularity across product lines (see Swaminathan and Tayur 1998).

Five Emerging Trends in Supply Chain Management

1 International Supply Chain

In a world economy that is becoming increasingly globalised, even a small manufacturing company may face the difficulty of maintaining an international supply connection. Globalization is not a new phenomena, but the globalisation trend that emerged in the first decade of the 21st century flattened the globe more than ever before in history. In recent years, however, the cost disparity between emerging and industrialised nations is steadily decreasing. This compels many organisations to reassess their supply chain designs, including their cost-driven outsourcing approach. In the past few years, some large and small industrial companies have brought production back onshore. In the meantime, the expanding market size of non-developed economies has made global supply chain footprint growth a

more viable alternative. Finding the optimal balance between domestic and international sourcing will continue to be a crucial aspect of supply chain strategy.

2 Resilient Supply Chains

In the past decade, environmentalists, NGOs, and corporations have paid a great deal of attention to the development of sustainable supply chains. This society-wide sustainability drive has influenced the supply chain strategy of numerous businesses. In 2005, Walmart, for example, established three overarching sustainability goals: (1) use 100 percent renewable energy; (2) produce zero waste; and (3) offer products that preserve our resources and environment (Denend and Plambeck 2007). To attain these objectives, the company analysed several components of its supply chains to identify regions with the most sustainability potential. In addition, it utilised a variety of incentives to encourage its suppliers to contribute to its sustainability objectives.

II. RESEARCH ON THE SUPPLY CHAIN: PAST, PRESENT AND FUTURE

The origins of supply chain management date back to the early 1950s, when a number of scholars became interested in determining the ideal inventory management practises. One of the earliest contributions to this field relates to the models created by Clark and Scarf (1958) for managing multiple-level inventories. Since the 1950s, hundreds of scholars have investigated related inventory problems in stochastic and deterministic systems. Researchers have traditionally concentrated on defining optimal policies and guidelines for specific supply chain concerns under the assumption of centralised supply chain management. In the 1990s, researchers began analysing supply chain problems using a decentralised multi-agent approach, integrating information availability across the supply chain with logistics decisions, developing new models for supply contracts and demand forecasting, and incorporating product design into supply chain management.

Companies confront significant problems in the twenty-first century due to global competition and customer demands for greater variety, quicker and more reliable delivery times, and cheaper pricing. The introduction of e-commerce has generated enormous potential, but has also made businesses more susceptible to logistics errors. Customers today not only purchase things, but also purchase delivered products. Consequently, contentment is as essential as making the transaction. In contrast to older channels, where inventory might be stored to conceal other inefficiencies in terms of lead time and poor forecasting, such arrangements are less useful in the fast-paced electronic business environment. As a result, businesses are beginning to prioritise supply chain management. Both business-to-consumer and business-to-business e-commerce settings have created various supply chain management difficulties that scholars are expected to investigate in the near future.

III. CONCLUSION

The Internet's prevalence has led to the emergence of vertical market places that claim to improve the efficiency of the purchasing process in a variety of businesses. On the one hand, these marketplaces are expected to cut the cost of items for the manufacturer as a result of more competition resulting in lower costs. This line of thinking suggests that future supply chains may be more flexible and supplier relationships may be focused on the short term. Several businesses, on the other hand, recognise that larger benefits can be realised if some of these marketplaces are utilised for supply chain-wide process integration and collaboration. In such an environment, businesses must cultivate stronger trust in order to exchange information with their supply chain partners. Today, researchers are attempting to determine under what circumstances one or the other scenario may occur and what kind of new models and analyses must be produced. The Internet has contributed to the spread of global supply chains. Today, it is considerably simpler for remote suppliers to compete for contracts with huge companies in developed nations with whom they may not have done business in the past. Coordination issues connected to global supply chain management are likely to be a key aspect of future supply chain management research. Sustainable supply chain management is another essential study issue. Historically, experts have focused solely on the efficient flow of commodities from supplier to buyer. Now, a greater number of researchers are examining issues associated with the disposal of used products, the refurbishment of old products, the development of environmentally friendly packaging, and the selection of suppliers based on environmental criteria in addition to the traditional criteria of price, quality, and dependability.

The study of supply chains in the service industry is a second new area of research. Due to the inability to hold inventory, service-oriented supply networks are more complex than typical manufacturing-oriented supply chains. In such instances, additional buffer capacity is used to manage uncertainty. Researchers are beginning to examine supply chain management-related behavioural difficulties such as trust, constrained rationality, mental accounting, etc.

REFERENCES

- [1]. Clark, A. J., & Scarf, H. (1958). Optimal policies for a multi-echelon inventory problem. *Management Science*, 6, 475–490.
- [2]. Denend, L., & Plambeck, E. (2007). Wal-mart's Sustainability Strategy (A). Stanford Graduate School of Business Case OIT-71.
- [3]. O. Ergun, G. Karakus, P.Keskinocak, J.Swann, M.Villarreal (2009), "Humanitarian Supply Chain Management - An Overview," in *Models and Algorithms for Optimization in Logistics*, C. Barnhart, U. Clausen, U. Lauther, R.H. Mohring (editors), Germany.
- [5]. Feng, Q., & Lu, L. X. (2012). The Strategic Perils of Low Cost Outsourcing. *Management Science*, 58(6), 1196-1210.
- [6]. Graves, S. C., Rinnooy Kan, A. H. G., & Zipkin, P. H. (1993). *Logistics of Production and Inventory, Handbook in OR and MS. (Vol. IV)*. Amsterdam.
- [7]. Fisher, M. L., Hammond, J. H., Obermeyer, W. R., & Raman, A. (1994). Making supply meet in an uncertain world. *Harvard Business Review*, 72(3), 83–89.
- [8]. Lee, H. L., & Billington, C. (1992). Managing supply chain inventory: Pitfalls and opportunities. *Sloan Management Review*, 33(3), 65–73.
- [9]. Lee, H. L., Padmanabhan, V., & Whang, J. (1997). Information distortion in a supply chain: The bullwhip effect. *Management Science*, 43(4), 546–548.
- [11]. Swaminathan, J.M. (2009). UNICEF Case: Getting Food to Disaster Victims, *Financial Times*, [12]. 2010.
- [13]. Komrska, J., L. Kopczak and Jayashankar M. Swaminathan, When Supply Chains Save Lives, *Supply Chain Management Review*, January- February.
- [14]. Swaminathan, J. M., & Tayur, S. (1998). Managing broader product lines through delayed differentiation using vanilla boxes. *Management Science*, 44(12), S161–S172.