Supply Chain Management

Block

1

PRINCIPLES OF SUPPLY CHAIN MANAGEMENT

Ref. No. SCM-SLM-IFHE– 112022B1

For any clarification regarding this book, the students may please write to The ICFAI Foundation for Higher Education (IFHE), Hyderabad specifying the unit and page number.

While every possible care has been taken in type-setting and printing this book, The ICFAI Foundation for Higher Education (IFHE), Hyderabad welcomes suggestions from students for improvement in future editions.

Our E-mail id: cwfeedback@icfaiuniversity.in

Centre for Distance and Online Education (CDOE)
The ICFAI Foundation for Higher Education
(Deemed-to-be-University Under Section 3 of UGC Act, 1956)
Donthanapally, Shankarapalli Road, Hyderabad- 501203

COURSE INTRODUCTION

Global competition prompted organizations across the world to achieve and maintain operational excellence and competitive advantage to remain in business. Operational excellence is enabled by various performance parameters like efficient processes, continuously improving quality, increasing productivity, and customer delight. All these parameters are significantly influenced by supply chain management. The enlarging scope of supply chain management covers, not merely the production processes but also important concerns like environmental impact of operations, carbon footprint, waste management, business ethics, etc. New technologies like Robotics, Artificial Intelligence, Internet of Things, Machine Learning and Big Data are making supply chain management an area to focus. It is against this background that the subject of supply chain management needs to be studied and understood, in a holistic perspective. The course is spread over five logically grouped blocks, with twenty units populating these blocks.

Block 1, *Principles of Supply Chain Management*, has one unit providing an Overview, covering such topics as Supply Chain for Competitive Advantage, Definition of Supply Chain Management, Objectives, Concepts and Components of a Supply Chain, Schools of Thought, Factors Driving the Evolution of SCM, SCM Processes, Operational Excellence and Innovation, Drivers of SCM Competitive Advantage, Concept of Zero Defect and Zero Effect and Advances in Information Technology.

Block 2, *Supply Chain Planning & Design*, with five units covers topics like Supply Chain Integration, Demand Forecasting in a Supply Chain, Managing Demand and Supply in a Supply Chain and Facility Network Design

Block 3, *Supply Chain Processes*, spread over eight units, covers such topics as Purchasing and Manufacturing in a Supply Chain Context, Inventory Management, Managing Transportation, Warehousing, Returns Management, Customer Service, and Order Fulfilment.

Block 4, *Supply Chain Coordination*, with three units covers the topics of Cooperation and Coordination, Role of Outsourcing and Measuring Supply Chain Performance

Block 5, *Contemporary Issues in Supply Chain Management* has four units covering topics like Information Technology in Supply Chain, E-Business and the Supply Chain, Financial Flow in Supply Chain and Emerging Trends in Supply Chain Management.

The course exposes the students to a wide spectrum of concepts and their practical application in industries. The learning includes definitions, components, various schools of thought, methods, tools and techniques. By familiarizing with latest trends and technologies, the students will be equipped with all ingredients to comfortably work in the domain of supply chain management. In view of the need to make supply chains more efficient to acquire competitive advantage, the changing landscape is bound to create more job opportunities for well-informed students, who acquire the necessary knowledge and contemporary skills.

This edition has added a large number of contemporary examples and deleted old examples and exhibits.

BLOCK 1: PRINCIPLES OF SUPPLY CHAIN MANAGEMENT

Supply Chain Management appears to be the most disrupted area in recent times. This is happening mostly because of the significant impact of emerging technologies on supply chain management, the key element of operational excellence. Efficiency of supply chain management started deciding the competitive position of an organization. Climate change concerns across the world brought awareness among all stakeholders about eco-friendly operations, as manufacturing happens to be the most polluting sector. Thus a need arose to adopt green processes across the supply chain. Above all, interventions in supply chain management are to ensure sustainable and profitable operations to remain in business. Thus certain basic principles covering, definitions and conceptual framework of supply chain management is necessitated to provide a starting point for the learners to navigate the subject of supply chain management.

This block with its one unit provides a curtain raiser to the entire course of supply chain management, by providing an overview of Supply Chain Management. The topics covered include Introduction to Supply Chain Management (SCM),Supply Chain for Competitive Advantage, Definition of SCM, Objectives, Concepts, Components of a Supply Chain, Schools of Thought, Factors Driving the Evolution of SCM: Customer Expectations, Globalization, Competition, SCM Processes: Customer Relationship Management, Demand Management, Order Fulfilment, Manufacturing Flow Management, Sourcing and Procurement, Product Development and Commercialization, Returns Management, Customer Service Management. SCM: Operational Excellence and Innovations, Drivers of SCM Competitive advantage, Concept of Zero Defect and Zero Effect and Advances in Information Technology

Unit 1

Supply Chain Management – An Overview

Structure

"Supply Chain is like nature, it is all around us."

- Dave Waters, Emeritus Fellow of St Cross College,
and an Honorary Life Fellow of the Mineralogical
Society of Great Britain and Ireland

1.1 Introduction

In the changing industrial world, supply chain management is the backbone both for products and services organizations. Organizations are totally dependent on quick, accurate, high performing and reliable, supply chain operations in every aspect of their activities.

To achieve and maintain competitive advantage, organizations are under pressure to reduce product development times, improve product quality, and reduce production lead-times and production costs. These pressures have led companies to attempt improving the efficiency of their internal processes by adopting new business practices like Total Quality Management (TQM), Just-In-Time (JIT), etc. But, they have now realized that isolated improvements in individual organizations within the larger system of interdependent organizations, would not

be enough to achieve their objectives. As such, they have recognized the need for better coordination with upstream firms that supply inputs, and the network of downstream firms, responsible for distribution of their products to consumers and providing after-sales service. This has resulted in the emergence of the concept of "supply chain management (SCM)", advocating the integration of business processes across the supply chain to reduce the costs and improve the responsiveness of producers to the demands of the consumers.

"Supply chain management", as an area of study and business improvement, came into prominence in early 1980s. Since then, it has received immense attention from corporates and management experts. Globalization further increased its importance.

Global competition prompted organizations across the world to achieve and maintain operational excellence and competitive advantage to remain in business. Operational excellence is decided by various performance parameters like efficient processes, continuously improving quality, increasing productivity, and customer delight. All these parameters are significantly influenced by supply chain management. The increasing scope of supply chain management covers, not merely the production processes but also important concerns like environmental impact of operations, carbon footprint, waste management, etc. It is against this background that the subject of supply chain management needs to be studied and understood, in a holistic perspective.

In this unit, we will define the term 'supply chain' and list its components. Then, we will discuss the concept of supply chain management and various schools of thought, which contributed to this concept. A discussion of key business processes involved in supply chain management will follow. The factors driving the evolution of the idea of 'supply chain management' will also be discussed. The concepts of Zero Defect and Zero Effect will also be presented, ending the unit with a brief, on the advances in information technology.

1.2 Objectives

After going through this unit, you will be able to:

- Define Supply Chain Management (SCM), and list its objectives and components.
- Ex key concepts, and different schools of thought with their salient features.
- Discuss the factors driving the evolution of SCM.
- Explain Supply Chain Management processes.
- Know in relation to SCM, Operational Excellence and Innovation.
- Illustrate concept of Zero Defect and Zero Effect.

1.3 Supply Chain Management for Competitive Advantage

Intense global competition reoriented the attention of organizations on supply chain management as most of the organizational resources are deployed there. Competitive advantage is decided by offering the best (in class) quality products and services at lowest cost, and on demand. Thanks to approaches like Total Quality Management, Balanced Score Card, Six Sigma, Just-in-Time and other tools and techniques, SCM is in a position to achieve the objective of global competitiveness. Selection of appropriate tools and techniques depends upon the complexity of the organization and the nature of operations. Campaigns for adopting Green Operations to reduce carbon footprint and reduce waste have potential to make the supply chains efficient, profitable, and sustainable. Thus, SCM is adequately empowered to effectively address the criteria for competitive advantage.

Example: Supply Chain and Competitive Advantage at Domino's Pizza

Domino's had developed a well planned supply chain process, which led to necessary and useful competitive advantages. One of them was: make purchasing centralized, for every of its store to meet defined corporate standards. It assured that, the company procured and maintained high quality products to help provide sustainable quick services. Next focus as part of supply chain was on effective location strategy. The Domino supply chain plan ensured that, their suppliers could reach any of their store within maximum time of 48 hours. Food products mostly have a limited shelf life and minimum area coverage helps the company to perform service in time, a crucial factor for the food segment.

Other important aspect of their supply chain plan was that delivery procedures were elegantly planned and eliminated the "maximum of back-of-store activities". The deliveries being carried out at nights, drivers made responsible for identifying the stocking shelves, which need to be used in priority, aided the store's workers to be able to fully focus on their service. Domino's employed the current technologies which enhances the efficiency of their supply chain system. Pulse (Domino's computer system) was custom built system ensuring the reliable connection between customers and stores, stores and delivery services. Thus, the notable competitive advantages of Dominos' supply chain could be stated as: "centralized purchasing, effective region coverage, well planned delivery, and use of state of the art technologies".

Source: https://business-essay.com/dominos-case-study-supply-chain-and-competitive-advantage/ February 2022, Accessed on 5th August, 2022

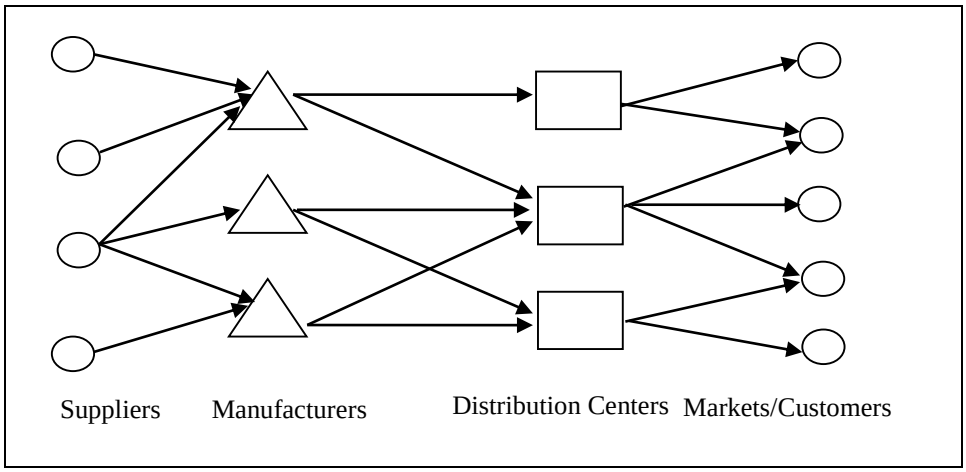
1.4 Definition of SCM

A supply chain is a network of manufacturers, suppliers, distributors, transporters, storage facilities and retailers/ customers, that performs functions like

procurement and acquisition of material, processing and transformation of the material into intermediate

and tangible finished goods and finally, the physical distribution of the finished goods to intermediate or final customers. Figure 1.1 shows a typical supply chain network.

Figure 1.1: Supply Chain



Source: ICFAI Research Center

A firm's supply chain includes both its upstream supplier networks and the downstream distribution networks, along with their internal functional departments.

Objectives of SCM

One of the major objectives of supply chain management is to reduce the total volume of resources, necessary to provide the required level of customer service to a particular customer group. Other objectives of supply chain management are to:

- Gain competitive advantage over others
- Reduce inventory levels
- Improve customer service
- Make more efficient use of human resources
- Ensure better delivery through reduced cycle times
- Increase the sharing of information and technology among the participants in the supply chain.
- Enable firms to focus on core competencies
- Enhance public image of companies
- Induce greater trust and interdependence within supply chain partners
- Increase shareholder value

1.4.2 Components of a Supply Chain

A supply chain may consist of a variety of components depending on the business model selected by a firm. A typical supply chain consists of the following components:

- Customers
- Distributors
- Manufacturers
- Suppliers

Customers

The customer forms the focus of any supply chain. Customer activates the processes in a supply chain, by placing an order with the retailer. The customer order is fulfilled by the retailer, either from the existing inventories, or by placing a fresh order with the wholesaler/ manufacturer. In some cases, a customer bypasses all these supply chain components by getting in touch with the manufacturer directly. For example, in the case of an online purchase of a computer from Dell Computers, customers place orders directly with the manufacturer.

Retailers / Distributors

The retailer acts as a link between the customer and the distributor/ manufacturer. He caters to the needs of the customer by making the products available at his store. As part of this process, the retailer places orders with the manufacturer to replenish the stocks. In a typical supply chain, purchase orders originate at the retailer's end, but in some cases, where there is arrangement to share the Point of Sale (POS) information with manufacturers, the manufacturer monitors the stock levels and replenishes automatically. For example, Walmart has such an arrangement with P&G.

Manufacturers

The manufacturer plays a key role in deciding the structure of a supply chain. Depending on the market situation, the manufacturer either uses the pull or the push strategy to generate demand required for the movement of products in the supply chain. The manufacturer, then, plans for a production schedule, depending on the resultant demand.

Suppliers

Suppliers facilitate the manufacturers' production process by ensuring continuous supply of raw materials including components and intermediates. Manufacturers place orders with suppliers on the basis of forecasted customer demand. Since, it is very difficult to forecast demand accurately, manufacturers try to integrate their

processes with those of the suppliers to be in a better position to respond to fluctuations in customer demands. Suppliers help manufacturers in reducing their inventory levels by arranging Just-in-time supplies.

1.4.3 Key Concepts of Supply Chain Management (SCM)

Supply chain management involves the use of a set of approaches to integrate efficiently the activities of suppliers, manufacturers, warehouse providers, transporters, and retailers. It is done so that goods are produced and distributed in right quantities, to the right locations, and at the right time, in order to minimize system-wide costs, while meeting customer service expectations.

Organizations are focusing on what they can do best and relying on their supply chain partners for other capabilities, thereby, collaborating and growing together –a "total" integration of all stakeholders within a supply chain. Further, companies strive to align their goals with that of the supply chain partners, and work towards contributing to the overall objectives.

SCM focuses on long-term relationship with partners on the development of mutual trust, and commitment to the relationship while sharing the demand-and-supply information with channel partners.

1.4.4 Supply Chain Management – Schools of Thought

Supply chain management, as a concept, is still in a nascent stage, and different businesses view it differently. The varied views on SCM are classified by Bechtel and Jayaram, under the following four schools of thought:

- Functional School
- Linkage/ Logistics School
- Information School
- Integration/ Process School

Exhibit 1.1 gives a list of various SCM definitions and the schools of thought, where they best fit in.

Exhibit 1.1: Supply Chain - Schools of Thought	
Author(s)	**Definition**
	Functional Chain School
Jones and Riley (1985)	"Supply chain management deals with the total flow of materials, from suppliers through end users."
Houlihan (1988)	"Supply chain management covers the flow of goods from supplier, through manufacturer and distributor, to the end user."

Contd….

Langley and Holcomb (1991)	"Supply chain management focuses attention on the interactions of channel members to produce an end product/ service that will provide best comparative value for the end user."
Cavinato (1991)	Supply chain management is, "the entire sourcing, value added, and marketing activities of the overall chain of firm up to final customers."
Novack and Simco (1991)	"Supply chain management covers the flow of goods from the supplier, through the manufacturer and distributor, to the end user."
Stevens (1990)	"Control the flow of material from suppliers, through the value adding (production) processes and distribution channels, to customers."
Lee and Billington (1992)	"Networks of manufacturing and distribution sites that procure raw materials, transform them into intermediate and finished products, and distribute the finished products to customers."
	Linkage Logistics School
Scott and Westbrook (1992)	"…supply chain is used to refer to the chain, linking each element of the production and supply process, from raw materials through to the end customer."
Turner (1993)	"…technique that looks at all the links in the chain from raw materials suppliers, through various levels of manufacturing, to warehousing and distribution to the final customer."
	Information School
Johannson (1994)	"SCM is really an operations approach to procurement. It requires all participants of the supply chain to be properly informed. With SCM, the linkage and information flow between various members of the supply chain are critical to overall performance."
Towill, Naim & Wikner (1992)	"A supply chain is a system, the constituent parts of which include materials suppliers, production facilities, distribution services, customers linked together via the feed-forward of materials and the feedback flow of information."

Contd….

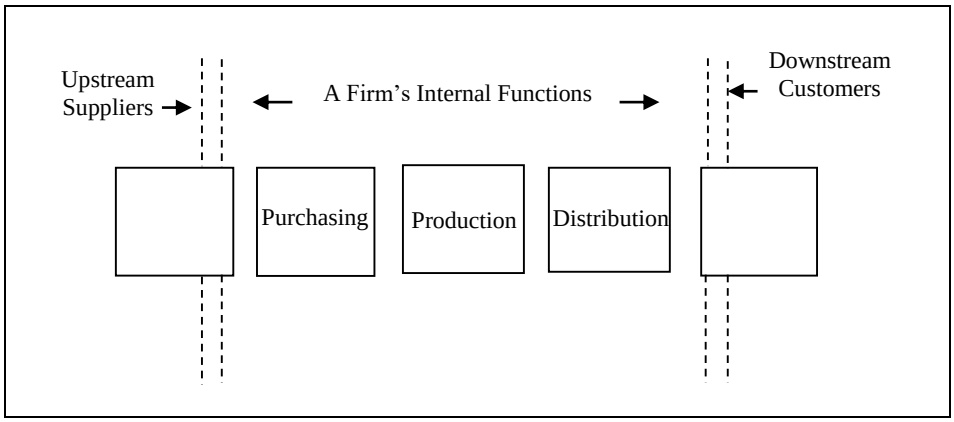
Manrodt and Harrington (1995)	"Product and information flow, encompassing all parties beginning with the supplier's supplies and ending with customers or consumers/ end users flows are bi-directional."
	Integration School
Cooper and Ellram (1990)	"An integrative philosophy to manage the total flow of a distribution channel from the supplier to the ultimate user."
Ellram and Cooper (1993)	"Supply chain management is an approach, whereby the entire network from suppliers to the ultimate customer is analyzed and managed, in order to achieve the 'best' outcome for the whole system."
Hewitt (1992)	"Supply chain integration is only a natural result of re-designed business processes, not realignment of existing functional organizations."

Source: ICFAI Research Center

Functional View

The functional view of supply chain management was first set down by Houlihan. According to Houlihan, "supply chain management covers the flow of goods from suppliers, through manufacturer and distributor, to the end user." This view concentrates on the material flow and value addition process in different functional departments of a firm and of other players, in the supply chain. This school of thought individual organizations needed to procure material, to convert it, and to sell it. It is supported by material suppliers, transportation providers, and other groups. The main concern of supply chain management, according to this view, is reducing costs in the firm's primary functions. Figure 1.2 depicts this school of thought.

Figure 1.2: The Functional Chain Awareness School



Source: ICFAI Research Center

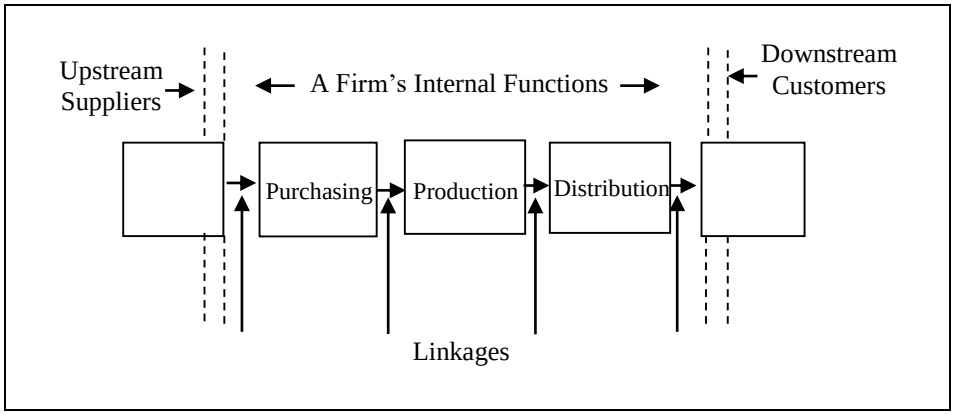
Linkage Logistics View

Scott and Westbrook, and Turner, are two prominent advocates of the linkage logistics school of supply chain management. According to Turner, "SCM is a technique that looks at all the links in the chain from raw material suppliers, through various levels of manufacturing to warehousing and distribution, to the final customer."

This school of thought concentrates on the linkages between different functional areas of a supply chain. The supply chain is the set of facilities, through which a product passes, finally, to the end-consumers.

Figure 1.3 depicts the logistics school of supply chain management thought. The facilities include: factories, warehouses, sales offices, transportation, and distribution centers. The main objective of this school is to lower the cost of firm's logistics.

Figure 1.3: The Linkage / Logistics School



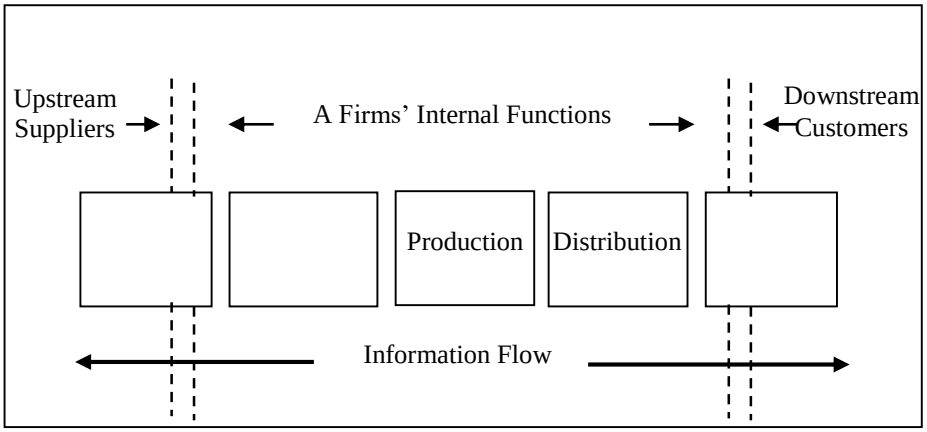
Source: ICFAI Research Center

Information View

One of the outstanding definitions of SCM, from the point of view of information in the supply chain, is given by Johannson (1994). He feels that "SCM is really an operations approach to procurement. It requires all the participants of the supply chain to be properly informed. With SCM, the linkage and information flow between various members of the supply chain are critical to overall performance." This school of thought concentrates on the flow of information up and down the supply chain. This information may be a) demand and sales data necessary for forecasting, b) advance shipment notices, c) order status or d) inventory availability information.

The supply chain is integrated by the movement of information between many participants. An integrated supply chain has a common information base and the mechanism to share this information among the participants. The objective of this school is low information processing firm's cost. Figure 1.4 depicts the Information School.

Figure 1.4: The Information School

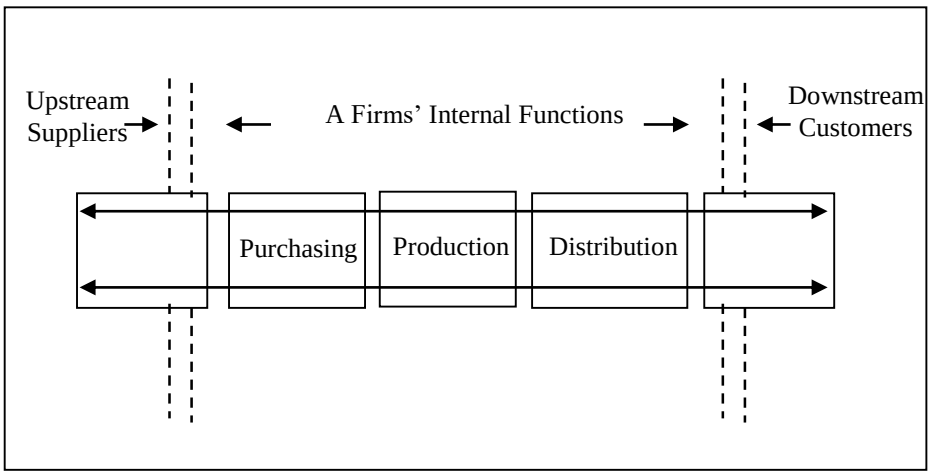


Source: ICFAI Research Center

Integration/ Process View

This school of thought regards a supply chain as a sequence of processes and flows that take place within and between different supply chain components for satisfying a customer's need. A typical definition of supply chain management from the integration point of view was given by Cooper, Lambert, and Pagh. "The integration of business processes across the supply chain is what we call supply chain management." This is the most comprehensive view of SCM which brings in all the activities involved in serving the customer from point of origin to point of consumption. This school of thought advocates that business processes should be integrated across the supply chain to serve customers cost-effectively. Figure 1.5 shows the Integration/Process School of Thought.

Figure 1.5: The Integration/Process School of Thought



Source: ICFAI Research Center

Example: Supply Chain Definition in Medical Air Transport

HOSP1 voivodeship hospital located in Lower Silesian Voivodeship had the task to provide inpatient and outpatient health services. Air medical transport was used for medical cases of sudden deterioration of health or multiple-organ injuries and trauma and pediatric neurology, and surgery cases. The core element in the Medical air transport logistics chain included, the patient, the Air Ambulance Service and the hospital where the patient need to be shifted.

The supply chain links could be defined in the inter hospital patient transfer as: "internal transfer between the hospital ward and the Hospital Emergency Department (HED), transport of the patient from the HED to the helicopter, patient transit and the transfer to the target hospital, fully addressing the medical interventions like, preparatory, stabilising and qualifying needs". COVID-19 has made it necessary to add additional tests related to determining the patient's condition, and in tested positive cases, provide additional protection for the staff, flight service and their equipment including sanitizing the helicopter after trip.

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8998864/April 2022, Accessed on 5th August, 2022

Activity 1.1

Being a dominant aspect of business operations, supply chain management has come to occupy center stage in driving operational excellence.

You are required to identify the relevant factors in ensuring operational excellence in contemporary global competitive environment.

Check Your Progress - 1

1. Which of the following does not support the need for supply chain management?
   a. Global competition
   b. Operational excellence
   c. Profitability at any cost
   d. Environmental compliance
   e. Customer relations

2. Which of the following is not a significant component of supply chain management?
   a. Customers
   b. Distributors
   c. Manufacturers
   d. Suppliers
   e. Shareholders
3. Which of the following is an 'odd-man', among schools of thought in supply chain management?
   a. Functional school
   b. Outsourcing school
   c. Linkage/ logistics school
   d. Information school
   e. Integration/ process school
4. Who is considered as the founder of the functional school of SCM?
   a. Houliham
   b. Hewitt
   c. Cooper and Elham
   d. Turner
   e. Johansson
5. Who propounded the information view for the definition of SCM?
   a. Turner
   b. Cooper and Elham
   c. Johansson
   d. Houliham
   e. Hewitt

1.5 Factors Driving Evolution of SCM

Supply chain networks and the need to manage them have gained prominence in the last decade. Some of the key factors that were responsible for this growing importance are: customer expectations, global dispersion of manufacturing and distribution facilities, demand for customized products for local markets, competitive pressures, and rapid advances in information technologies in the form of Electronic Data Interchange (EDI), internet technologies, electronic commerce, and others.

We are looking at some of these factors in detail below.

1.5.1 Customer Expectations

Customers in the 21st century are well-equipped with an ocean of information when they make purchase decisions. They are capable of tapping sources of supply well beyond their physical reach. They are able to compare the prices, quality and level of services offered by the suppliers/ retailers across the world. Thus, the empowered customer, who demands competitive prices, high levels of quality and service, custom made products/ services, convenience, and responsiveness has emerged.

In this scenario, companies have to work tirelessly to satisfy ever-increasing customer expectations of service, speed, customization, and cost. For this reason, they are falling back on their supply chain managers to help them meet these challenges. Companies like Dell (home computers), Walmart (retail chain), and Amazon (e-commerce) have become success stories primarily on account of their ability to manage their supply chains effectively.

1.5.2 Globalization

Liberalization of world economies has led to the emergence of global markets where companies operate across borders and source materials from across the globe. Further, companies now have to think much beyond their local boundaries to answer questions like: From where should we source materials? Where should we locate our manufacturing facilities? Where should we sell our products and services? Where should we set up distribution centers to serve our markets? and What transportation strategies should we use to serve our customers?

Thus, globalization has raised the need to manage the complex global networks of supply and distribution to gain competitive advantage.

1.5.3 Competition

K-Mart's inability to innovate its supply chain practices was seen as one of the major causes for it falling behind competitors like Walmart and Target. Along with the intense competition arising from globalization, advanced technology has been a major force behind the evolution of SCM as an important dimension in business. Many companies rely on their supply chain responsiveness to achieve competitive advantage. Dell has gained competitive advantage from its direct-marketing model of selling to companies and consumers over the Internet or telephone, without using distributors or retailers.

Example: Evolution of SCM at Amazon

Amazon could bring in dramatic changes in retail by use of innovative supply chain strategies, which had been put in to deployment by relevant technologies evolved over time.

Contd….

The amount of Amazon's innovations and transformation in supply chain management had been astonishing, and gave tough competition to lower-volume competitors. Amazon evolution on supply chain encompassed, more investment in supply chain automation, reduction of overall delivery time, strategic improvement of number of warehouses. To sum up, the proper utilization of sophisticated information technology, a well planned and extensive network of warehouses, layered inventory management, and reliable transportation, own logistics were the key factors.

Amazon's own warehouses were selected closer to metropolitan areas, helping to use push strategy for the products, while pure pull strategy was used for the products from third-party sellers, utilizing the model of order-by-order fulfillment model. Amazon had more than 45,000 warehouse robots, to pick and pack without any human assistance The next evolution was aimed at picking as well as packing orders on their own by robots. Amazon could keep its overall per unit supply cost to a minimum, due to huge economies of scale. The company had developed a drone-based delivery system called "Amazon Prime Air" for delivery of products.

Source: https://www.thebalancesmb.com/how-amazon-is-changing-supply-chain-management-4155324, November 13, 2020. Accessed on 5th August, 2022

1.6 Supply Chain Management Processes

Although there are many views of supply chain management, many practitioners look upon SCM as the management of key business processes across the network of organizations that form the supply chain. According to the definition given by the Global Supply Chain Forum, SCM is the integration of key business processes from end-user to original suppliers that provide products, services, and information. There are eight business processes that are carried out across the supply chain.

They are:

- Customer Relationship Management
- Demand Management
- Order Fulfillment
- Manufacturing Flow Management
- Sourcing and Procurement Management
- Product Development and Commercialization
- Returns Management
- Customer Service Management

Each of the above processes consists of a set of activities from various internal functions of the organizations in the supply chain. These functions include marketing, production, finance, research and development, logistics, etc.

Customer Relationship Management

Customer relationship management involves establishing a framework for building and maintaining relationships with customers. This involves identifying the customer groups who form the target for achieving the firm's business objectives. Then, the customer service teams design the product or service agreements specifying the level of service that is to be offered to each of these customer groups. These teams work in close coordination with the key account customers to reduce demand variability. Performance reports are designed to measure a) the levels of service made available to the customers and b) the profits resulting from serving each of the customer groups.

1.6.2 Demand Management

Demand management is the key to effective supply chain management. It plays a major role in balancing the customer's requirements with the firm's supply capabilities. Demand management involves determining forecasting methods to gauge customer demand, synchronizing demand with the supply capabilities of the firm, and developing contingency management systems to handle variations in demand. Steps involved in planning demand and supply in a supply chain, are discussed in Unit 4.

1.6.3 Customer Order Fulfillment

The effectiveness of a supply chain is determined by its ability to fill customer orders on time. A high order fulfillment rate with low costs requires coordination between various organizations across the supply chain and their internal functions like manufacturing, distribution, and transportation. The order fulfillment process includes activities like receiving orders, evaluating the logistics network, developing plans for order fulfillment, etc. This topic is discussed in detail in Unit 13.

1.6.4 Manufacturing Flow Management

Manufacturing flow management is concerned with ensuring smooth production of goods, and developing flexible manufacturing processes that can respond to the demands of the target markets. This supply chain process includes activities like determining the degree of manufacturing flexibility required, manufacturing and material planning, synchronizing production and demand, etc.

1.6.5 Sourcing & Procurement Management/ Supplier Relationship Management

Supplier relationship management guides the interactions of the firm with its suppliers. This process aims at developing long-term relations with suppliers to ensure uninterrupted flow of supplies for the firm's manufacturing processes. Such relationships are essential for effective supply chain management.

1.6.6 Product Development and Commercialization

Reducing the time to market is one of the objectives of SCM. The product development and commercialization process involves establishing cross-functional product development teams, designing, and building prototypes, developing product rollout plans, etc. This requires the integration of customers and suppliers into the product development process to ensure speedy rollout of new products.

1.6.7 Returns Management

Many companies are forced to recall products to rectify defects or recycle them. Thus, the returns management capability of a firm also plays a major role in providing a competitive edge to the firm. There may be many environmental issues associated with the way a firm handles its returns. Hence, managing the products returned is also a major part of supply chain management. The returns management process is discussed in detail, in Unit 11.

1.6.8 Customer Service Management

Customer service management is concerned with providing the customer with up-to-date information relating to shipping dates, product availability, product application, etc. The customer service management teams act as an interface between the customers and the functional departments like R & D, production, and logistics. Various aspects of customer service management are discussed at length in Unit 12.

Example: CRM at McDonald's

McDonald's partnered with Astute Solutions, for its complete CRM activities (a part of its SCM operations) and analysis, for consumer feedback and customer satisfaction indices. The system could address restaurants region wise, and also individually to trace actionable customer relationship issues. This proactive nature helped McDonald's resolve the issues cropped up, early in the cycle, so that they do not turn out to serious problems.

The system processes helped McDonald's franchisees and own centre corporate managers with adequate access to all customer related information. The system could collect individual data from independent network of restaurants and integrate them into the CRM tool. This had led to increased accuracy of all data related to customers, which helped the company to make more intelligent decision-making. Thus the tool understood the needs of the McDonalds, and built necessary analysis data for McDonalds to raise to meet the constantly changing needs of customers through continued innovation, helping overall supply chain activities.

Source: https://www.expertmarket.co.uk/crm-systems/customer-relationship-management-case-studies, April 2021, Accessed on 5th August, 2022

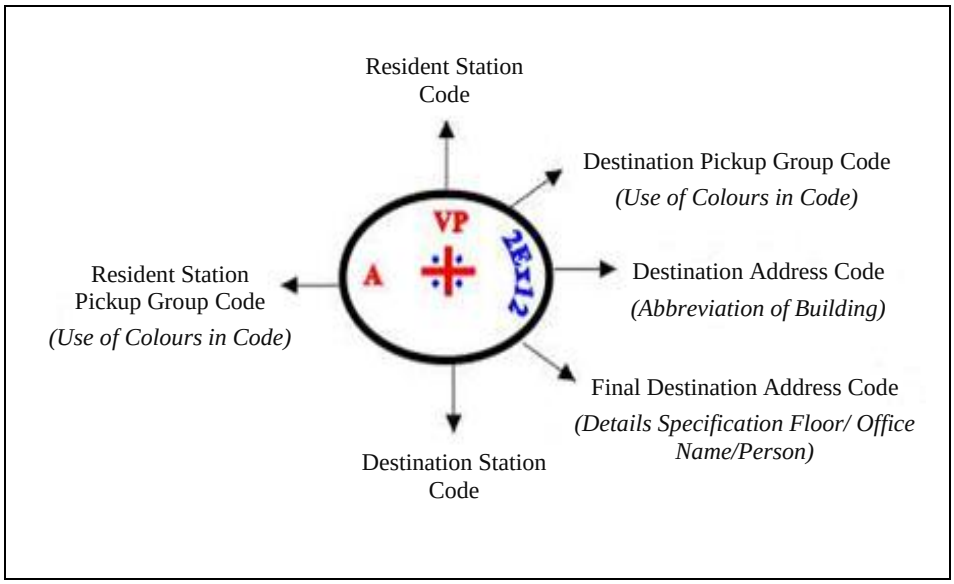
1.7 SCM: Operational Excellence and Innovation

An efficient supply chain is vital for businesses to deliver their products to the consumers who want or need them. As the global marketplace continues to evolve, supply chain managers must think of continuous evaluation of supply chain with an aim to provide innovative solutions to the customer needs through better quality products or services.

1.7.1 Operational Excellence and Innovation

Operational excellence involves producing better quality products, cheaper and faster. This involves focusing on what customers want and doing the right things to achieve that. Excellence is a journey and needs measurement and monitoring of key processes, such as delivery performance, order fulfillment rate, lead time, supply chain response time, etc., and improving them continuously. In the process, companies need to look for innovative solutions to cater to customers' needs. Innovation can be brought, in various facets of supply chain, from sourcing to manufacturing and delivery. Mumbai Dabbawalas' coding of the lunch boxes as shown below (Figure 1.7), use of low cost public transportation system, and localization, are examples of innovation to reduce the delivery time, in the supply chain.

Figure 1.7: Mumbai Dabbawalas' Coding System



Source: ICFAI Research Center

1.7.2 Drivers of SCM Competitive Advantage

With the availability of a host of tools and techniques, stage is set for gaining competitive advantage through efficient management of supply chains. Following are the most important factors that can drive this competitive advantage.

However, every organization has its own approaches that suit its organizational culture, etc. The following are mostly generic and applicable to any organization.

- Top Management Commitment and Support: SCM entails lion's share of organizational resources, which need to be committed and provided by the management. Management also has a responsibility to ensure efficient use of these resources, which in turn lead to higher productivity and profitable operations.
- Stakeholders' Commitment: Every stakeholder, in every activity along the entire supply chain, has a responsibility to ensure optimal use of resources to enhance competitive advantage.
- Focus on Quality, Safety, and Environment: Quality reduces wastage and ensures smooth operations, besides making supply chains more efficient. Safety is important to drive out fear from everybody and ensure safe working conditions that are conducive for efficient operations. Eco-friendly operations are the current requirement, in view of global concern about emissions, carbon footprint, and climate change.

1.7.3 Concept of Zero Defect and Zero Effect

Zero Defect

Quality Guru, J M Juran, while defining quality asserted that 'zero defect is quality'. He promoted it as a movement in view of a defect-free requirement of areas like defence, aero-space, etc., where failures are intolerable and may lead to fatalities. Even though, industry in general, did not agree for this utopian prescription, logic suggests that it is a genuine requirement. However, the spirit behind the slogan is that the aim of any organization should be a state of zero defects in any activity, process, product, or service. Towards this pursuit, organizations will have to adopt world class standards and practices and strive for continuous improvement.

Zero Effect

This essentially refers to the need for eco-friendliness in supply chain management. Present concern across the world is climate change, global warming, pollution and their impacts on scarce resources, health of the human beings, and other components of the environment like the flora, fauna, land, water, and air. Research studies, as endorsed by the United Nations and all member countries, suggest that intolerable climate change concerns and the carbon footprint are mostly due to industrialization and neglect of its impact on environment. Therefore, preventing further environmental degradation by rapidly reducing emissions, and the associated impacts become immediate priorities in supply chain management.

1.7.4 Advances in Information Technology

Advances in information technology have changed the way companies do business. They have completely changed the way sellers interact with buyers. The growth of the Internet has facilitated the growth of online transactions between businesses (B2B), and between businesses and customers (B2C). The proliferation of new telecommunications devices and advances in computer technology has made possible the sharing of information across the supply chain, in real time. Apart from this, businesses also have access to various modeling tools and techniques for managing the huge volumes of data generated across the supply chain. Thus, technology has also contributed in a big way to the evolution of advanced supply chain practices. Various IT solutions that help supply chain management are discussed in detail in Units 17 and 18.

Example: Operational Excellence at Sports Group

A multinational corporation that designs and manufactures athletic and casual footwear, apparel and accessories, used the services of Roboyo for drastic improvement of crucial supply chain processes in North America division. Prior to automation, around 2000 transactions related business data were retrieved manually using Jesta ERP application weekly at the sports corporation. Roboyo recommended Robotic Process Automation (RPA) as pilot.

A set of bots consistently retrieved the current in transit data from an Excel file for multiple business units. The bots verified this data with JestaERP, for correctness and duplicity. After this activity, it prepared the execution report and clearly stated the success or fail status of each intransit data for all business units helping the users to look at corrective actions. The bot could process in 9 hours, the 2000 transactions weekly. Thus automation of crucial supply chain process by Roboyo, gave a saving of 40 hours of manual work per week. Thus, the automation helped world's leading sports brand to achieve required maximum operation efficiency, reduction of human errors, 100% data accuracy freeing valuable human resources for higher-value and strategic work

Source: https://roboyo.global/case-study/supply-chain-delivering-next-level-operational-excellen0ce/ June 2022, Accessed on 5th August, 2022

Activity 1.2

Climate change concerns has been imposing demand on supply chain management to restrict emissions from operations to mandated levels.

You are required to trace the responsibility of manufacturing operations to the present crisis of uncontrolled emissions and the need to combat them on a war footing.

Examine the concept of 'Zero Effect' against this background and suggest possible solutions to ensure eco-friendly operations.

Check Your Progress - 2

6. Which of the following is not an SCM process within the globally understood framework?
   a. Customer relations management
   b. Customer service management
   c. Demand management
   d. Order fulfillment
   e. Receivables management
7. Providing up-to-date product information to customers is the responsibility of which of the following SCM processes?
   a. Demand management
   b. Customer service management
   c. Customer relations management
   d. Order fulfillment
   e. Product development and commercialization
8. Which of the following is not a major activity of SCM?
   a. Returns management
   b. Product development and commercialization
   c. Marketing the product
   d. Sourcing and procurement
   e. Manufacturing flow management
9. Which of the following is the most important factor that impacts evolution of SCM?
   a. Changing business environment
   b. Need for making profits
   c. Satisfying the shareholders
   d. Financial support of top management
   e. Technological changes

10. Which of the following concepts directly represents eco-friendly SCM?
    a. Zero effect
    b. Zero defect
    c. Customer relationship management
    d. Returns management
    e. Order fulfillment

1.8 Summary

- A supply chain is a network of manufacturers, suppliers, distributors, transporters, providers of storage facilities, and retailers.
- The supply chain performs the functions of procurement and acquisition of material, processing, and transformation of the material into intermediate and finished goods. Finally, the physical distribution of the finished goods to the intermediate or final customers.
- Supply chain management involves the use of a set of approaches to integrate efficiently the activities of suppliers, manufacturers, warehousing providers, and retailers. It is done so that goods are produced and distributed in right quantities to the right locations, and at the right time, in order to minimize system-wise costs while meeting customer service expectations.
- The unit also traces the evolution of supply chain management by studying the definitions of theorists belonging to different schools of thought.
- Bechtel and Jayaram have classified various views on SCM into four schools of thought: Functional School, Linkage/ Logistics School, Information School, and Integration/ Process School.
- The unit also discusses various supply chain management processes carried out across the supply chain.
- They include: customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, procurement, product development and commercialization, and returns management.
- This unit explores the drivers of the growth of supply chain management and the objectives of companies, adopting supply chain management practices.
- This unit emphasizes the need for adopting the concepts of zero defect and zero effect as a corporate social responsibility to ensure sustainable supply chain management.

1.9 Glossary

B2B: Business to Business is a situation where one business exchanges or sells its products or services to another business.

B2C: Business to Customers is a situation where business directly sells its products or services to the customers.

SCM: Supply Chain Management refers to the flow of goods, finances or data for a product or services right from the procurement of raw material till the delivery of goods.

Zero Defect: A state of quality, where there is no defect in production

Zero Effect: A situation, where the supply chain operations do not cause any environmental hazards

1.10 Self-Assessment Test

1. Discuss the need for emphasis on efficient supply chain management in the context of global business environment.
2. What are different schools of thought about SCM, and what are their common features?
3. What is the importance of customer relationship management, in the overall supply chain management?
4. What are the factors driving continuous evolution of SCM?
5. Explain the concepts of zero defect and zero effect.

1.11 Suggested Readings / Reference Materials

1. Ashley McDonough, Operations and Supply Chain Management Essentials You Always Wanted to Know: 15 (Self Learning Management Series) Paperback – 1 January 2020
2. Russel and Taylor, Operations and Supply Chain Management, 10ed, ISV Paperback – October 2019
3. Chopra and Kalra, Supply Chain Management 6/e Paperback – 17 June 2016

1.12 Answers to Check Your Progress Questions

1. (c) Profitability at any cost

Profitability at any cost does not support the need for supply chain management.

2 (e) Shareholders

Shareholders do not constitute an important component of SCM

3 (b) Outsourcing school

There is nothing like ‘Outsourcing School’

4 (a) Houliham

Houliham is the founder of the Functional School of SCM

5. (c) Johansson

Johansson propounded the information view for the definition of SCM.

6. (e) Receivables Management

Receivables Management is not an SCM process within the globally understood framework.

7. (b) Customer service management

Customer service management includes providing up-to-date product information to customers

8. (c) Marketing the Product

Marketing the Product is not a major activity of SCM.

9. (a) Changing Business Environment

Changing Business Environment is the most important factor that impacts evolution of SCM.

10. (a) Zero Effect

Zero Effect directly represents eco-friendly SCM.

Supply Chain Management

Course Structure

Block 1: Principles of Supply Chain Management	
Unit 1	Supply Chain Management-An Overview
Block 2: Supply Chain Planning & Design	
Unit 2	Supply Chain Integration
Unit 3	Demand Forecasting in a Supply Chain
Unit 4	Managing Demand and Supply in a Supply Chain
Unit 5	Facility Network Design
Block 3: Supply Chain Processes	
Unit 6	Purchasing and Supply Chain Management
Unit 7	Manufacturing in a Supply Chain Context
Unit 8	Inventory Management
Unit 9	Managing Transportation in a Supply Chain
Unit 10	Warehousing in a Supply Chain
Unit 11	Returns Management and Supply Chain
Unit 12	Customer Service in a Supply Chain
Unit 13	Order Fulfilment and Supply Chain
Block 4: Supply Chain Coordination	
Unit 14	Cooperation and Coordination in a Supply Chain
Unit 15	Role of Outsourcing in a Supply Chain
Unit 16	Measuring Supply Chain Performance
Block 5: Contemporary Issues in Supply Chain Management	
Unit 17	Information technology in Supply Chain
Unit 18	E-Business and the Supply Chain
Unit 19	Financial Flow in Supply Chain
Unit 20	Emerging trends in Supply Chain Management