OME752 SUPPLY CHAIN MANAGEMENT

UNIT –I INTRODUCTION

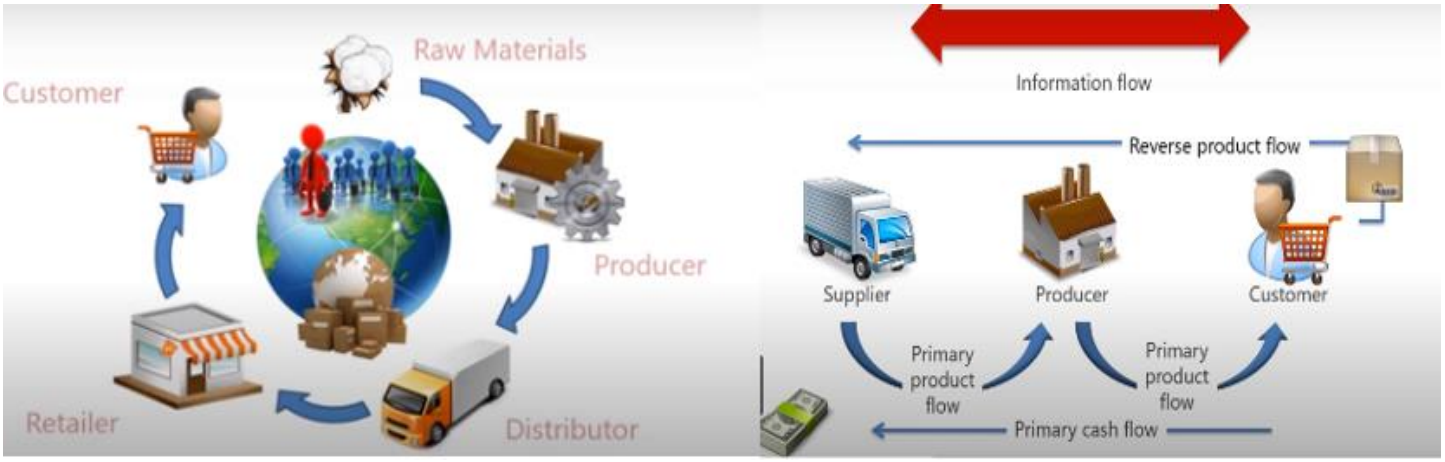
Role of Logistics and Supply chain Management: Scope and Importance- Evolution of Supply Chain - Decision Phases in Supply Chain - Competitive and Supply chain Strategies – Drivers of Supply Chain Performance and Obstacles.

Supply chain Management(SCM)

why SCM?

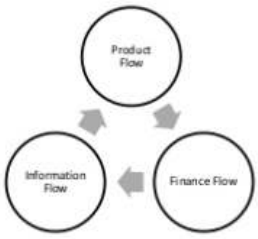
- ✓ Every product reaches to end user.
- ✓ Maximize customer value.
- ✓ Organization have paid attention only .(Few organization realized good delivered to end user).

Supply Chain Management (SCM), the management of the flow of goods and services, involves the movement and storage of raw materials, of work-in-process inventory, and of finished goods from point of origin to point of consumption.



• Supply Chain Management flows can be divided into three main flows:

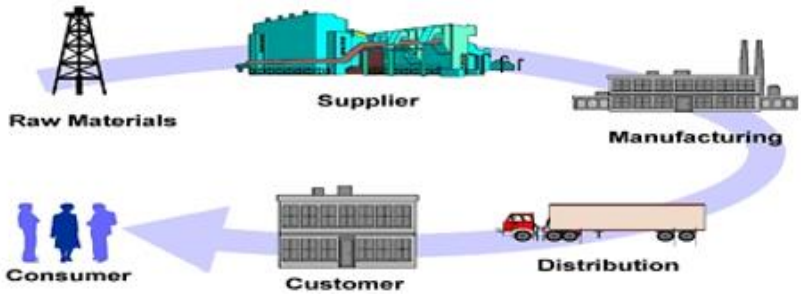
1.Product Flow
2.Finance Flow
3.Information Flow



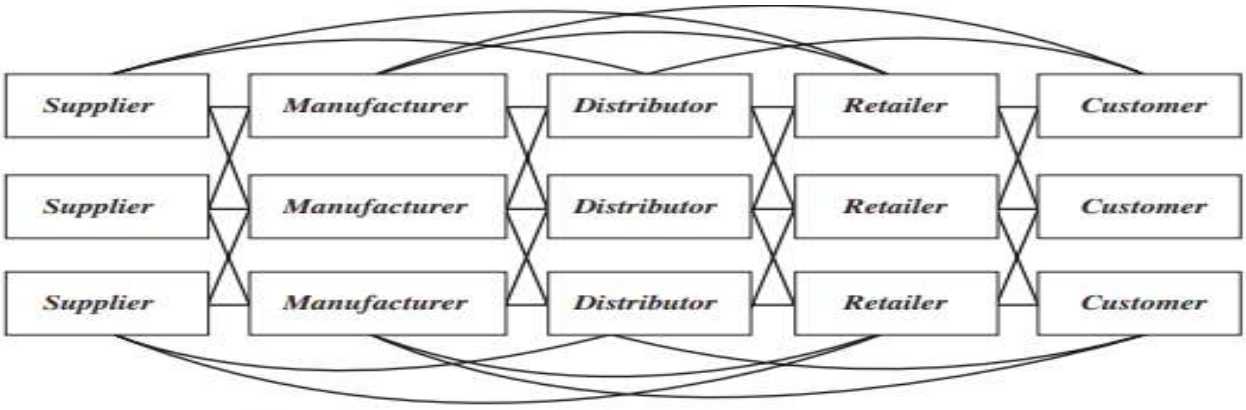
- ✓ A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request.
- ✓ The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves.
- ✓ Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request.

A typical supply chain may involve a variety of stages, including the following:

- Customers
- Retailers
- Wholesalers/distributors
- Manufacturers
- Component/raw material suppliers



Stages of Supply chain:

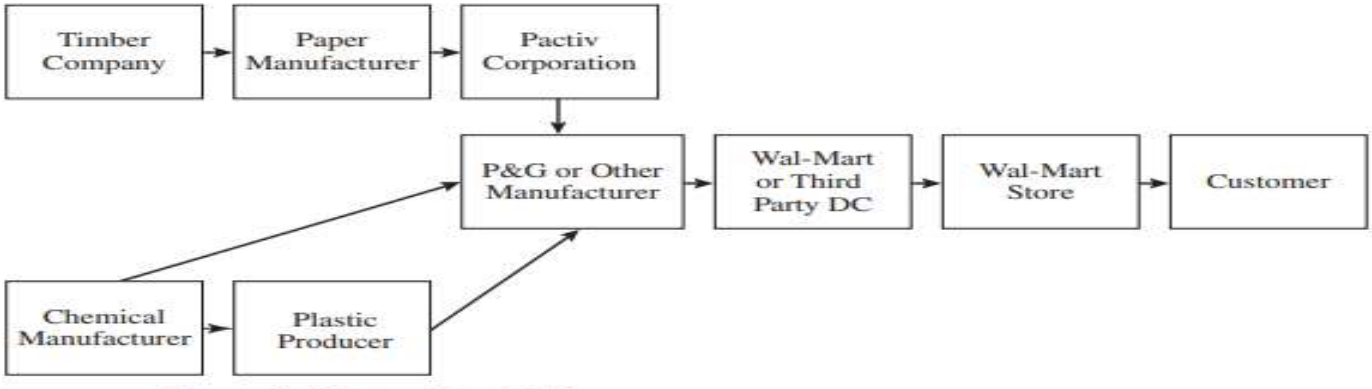


Supply Chain Stages

Example:

Consider a customer walking into a Wal-Mart store to purchase detergent. The supply chain begins with the customer and his or her need for detergent. The next stage of this supply chain is the Wal-Mart retail store that the customer visits. Wal-Mart stocks its shelves using inventory that may have been supplied from a finished-goods warehouse or a distributor using trucks supplied by a third party. The distributor in turn is stocked by the manufacturer (say, Procter & Gamble [P&G] in this case).

The P&G manufacturing plant receives raw material from a variety of suppliers, who may themselves have been supplied by lower-tier suppliers. For example, packaging material may come from Pactiv Corporation (formerly Tenneco Packaging) while Pactiv receives raw materials to manufacture the packaging from other suppliers.



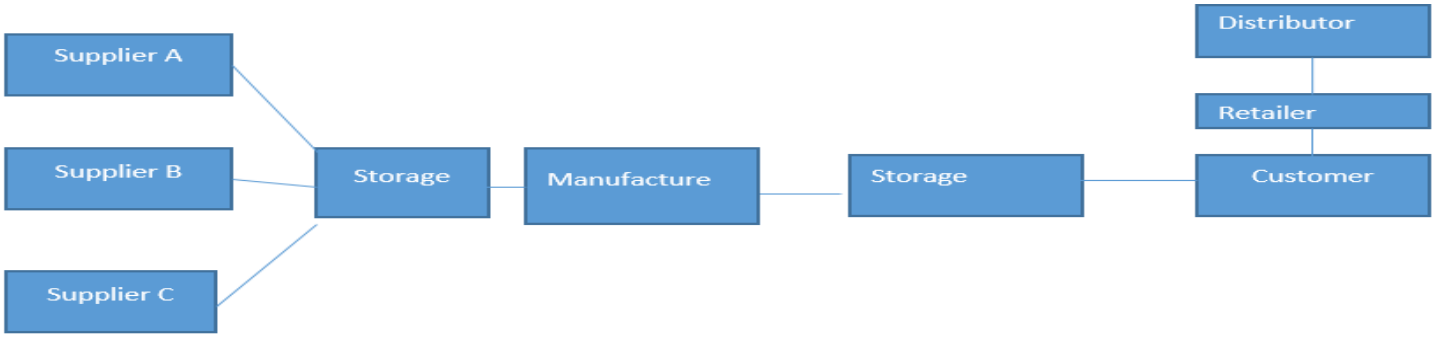
Stages of a Detergent Supply Chain

Example:

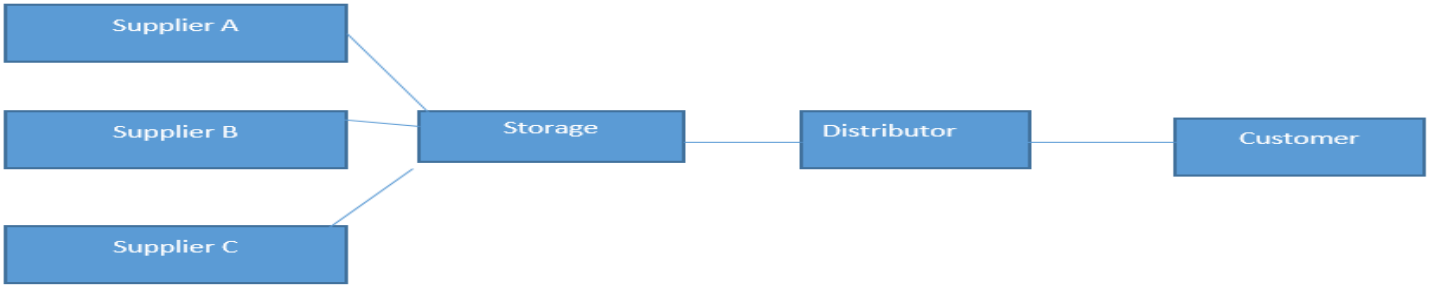
Dell is another example of a company that enjoyed tremendous success based on its supply chain design, planning, and operation but then had to adapt its supply chain in response to shifts in technology and customer expectations.

Dell reacted by adjusting its supply chain with regard to both direct selling and building to order. The company started selling its PCs through retail chains such as Wal-Mart in the United States and GOME in China. It also outsourced a large fraction of its assembly to low-cost locations, effectively building to stock rather than to customer order.

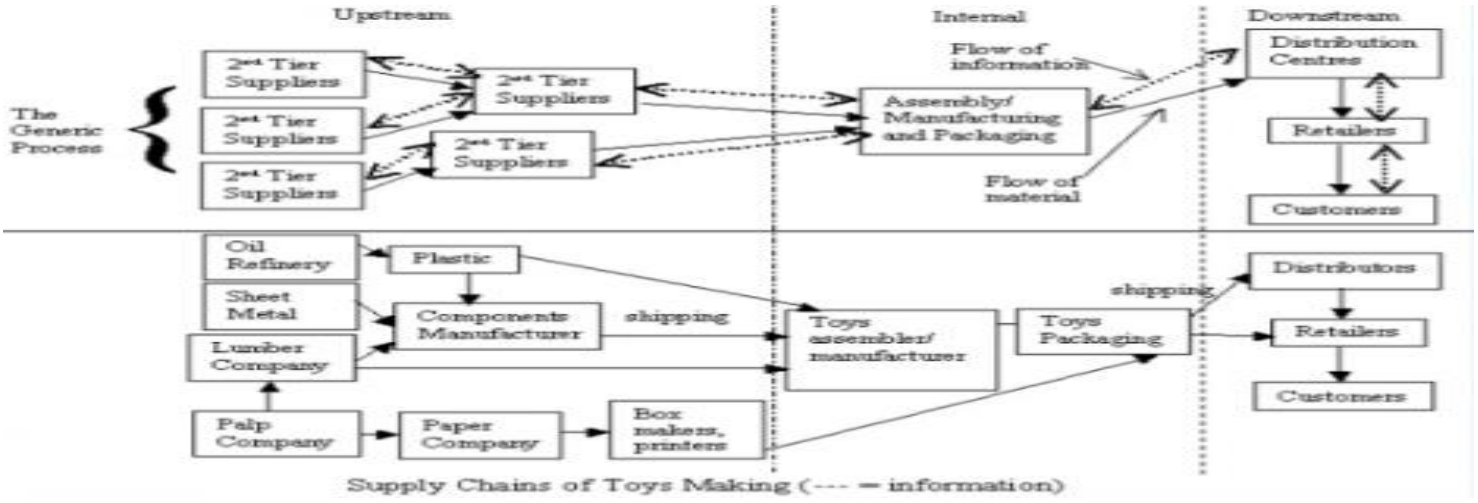
SCM-Manufacturing organization



SCM –service organization



Components of SCM



Objective(SCM)

- ✓ The objective of every supply chain should be to maximize the overall value generated.
- ✓ The value (also known as supply chain surplus) a supply chain generates is the difference request. between what the value of the final product is to the customer and the costs the supply chain incurs in filling the customer's.
- ✓ supply chain profitability.
- ✓ Supply chain management tries to minimize shortages and keep costs down.
- ✓ To Minimise work in progress.
- ✓ To Reduce transportation cost.
- ✓ To increase distribution channel of the product.
- ✓ To provide social services by giving them electricity, food, medicine and etc.
- ✓ To make plans and strategy in order to maximise productivity and achieve on-time performance.
- ✓ To increase customer satisfaction by delivering products to consumers on time and providing fast service.

Supply Chain Surplus = Customer Value – Supply Chain Cost

1.1.1 Scope and Importance:

- ✓ **Minimises Operating Cost**

Supply chain management focuses on reducing the overall operating cost of the organisation. It aims at bringing efficiency and raising the profitability of organisations. By developing a proper chain it brings down the purchasing cost, production cost and delivery cost. It enables smooth flow of raw materials from the supplier to an organisation which reduces the holding period of materials with the supplier and avoids any losses due to delay in production. Similarly, companies are not required to hold on expensive inventories for a longer time and distribute quickly through the supply chain.

✓ **Boosts Customer Service**

Supply chain management helps in providing better service to customers. All production strategies are framed in accordance with requirements of customers to manufacture right product. It properly anticipates the demands of customers before initiating the production. Supply managers monitor all operations of business and ensure that quality products are produced using best combination of resources.

Right product available to right cost provide better satisfaction to customers. This will boost their confidence level in company's products.

✓ **Enhance Financial Position**

Management of supply chain has an effective role on the financial position of business. It improves the efficiency of the organisation, cut down the excessive cost and avoids any shortage. Supply chain manager bring down the cost by reducing the use of fixed assets like plants, transportation vehicles, warehouses etc. Proper supply chain results in speedy flow of products which minimises the blockage of funds in inventories. It ensures that optimum funds are always available which helps in improving financial position.

✓ **Manages Distribution**

Distribution of products at the right time and the right location is a complex task for every organisation. Supply chain management accelerated the overall distribution system of an organisation. It coordinates with various transportation channels and warehouses for attaining faster movement of goods. Supply chain managers ensure that all products get delivered at the right location within the time limit. By developing a proper network for movement of goods it has to ease the whole distribution system.

✓ **Bring Coordination Among Partners**

Proper coordination among all partners of business increase productivity and profitability. It develops a proper channel through which employees, supplier and customers can easily interact with business. Managers can easily control the activities of their subordinates by communicating them all the required information.

Employees in case of any problem or error can contact their supervisors. Customers can also access their brands for any information through self-portals which are developed as a part of the customer support system. This enables a better exchange of information and brings coordination among partners.

✓ **Inventory Management**

Maintaining an optimum inventory is a must for uninterrupted operation of every business. It keeps record of all inventories that is raw materials, spare parts and finished goods. Supply chain managers ensure that the proper amount of inventory is always maintained within the organisation. They work towards avoiding situations like understocking or overstocking. Supply chain managers frame proper strategies for procuring, producing and maintaining all inventories as per requirements.

✓ **Supplier Management**

Supply chain management works on strengthening the relationships between business and suppliers. It tracks and records every interactions or transaction with the suppliers. Proper supply chain enables timely procurement of all required raw materials from suppliers.

It develops a proper network through which suppliers and business can easily interact. Supply chain management solutions provide a self-service portal through which suppliers can contact the company in case of any issues or problems

Features of Supply chain management:

- ✓ Management Of Inventory
- ✓ Processing Customer Requirements
- ✓ Forecasting Of Demand
- ✓ Supplier Relationship Management
- ✓ Managing Logistics And Shipping
- ✓ Return Management

1.1.2 Importance of Supply chain management:

There is a close connection between the design and management of supply chain flows (product, information, and funds) and the success of a supply chain. Wal-Mart, Amazon, and Seven-Eleven Japan are examples of companies that have built their success on superior design, planning, and operation of their supply chain. In contrast, the failure of many online businesses such as Webvan can be attributed to weaknesses in their supply chain design and planning.

The failure of many online businesses such as Webvan and Kozmo can be attributed to their inability to design appropriate supply chains or manage supply chain flows effectively.

Seven-Eleven Japan is another example of a company that has used excellent supply chain design, planning, and operation to drive growth and profitability.

Wal-Mart has been a leader at using supply chain design, planning, and operation to achieve success. From its beginning, the company invested heavily in transportation and information infrastructure to facilitate the effective flow of goods and information. Wal-Mart designed its supply chain with clusters of stores around distribution centers to facilitate frequent replenishment at its retail stores in a cost-effective manner.

It is well known that supply chain management is an integral part of most businesses and is essential to company success and customer satisfaction.

Boost Customer Service

- ✓ Customers expect the correct product assortment and quantity to be delivered.
- ✓ Customers expect **products to be available at the right location**. (i.e., customer satisfaction diminishes if an auto repair shop does not have the necessary parts in stock and can't fix your car for an extra day or two).
- ✓ **Right Delivery Time** – Customers expect products to be delivered on time (i.e., customer satisfaction diminishes if pizza delivery is two hours late or Christmas presents are delivered on December 26).
- ✓ **Right After Sale Support** – Customers expect products to be serviced quickly. (i.e., customer satisfaction diminishes when a home furnace stops operating in the winter and repairs can't be made for days)

Reduce Operating Costs

✓ **Decreases Purchasing Cost** – Retailers depend on supply chains to quickly deliver expensive products to avoid holding costly inventories in stores any longer than necessary.

For example, electronics stores require fast delivery of 60" flat-panel plasma HDTV's to avoid high inventory costs.

✓ **Decreases Production Cost** – Manufacturers depend on supply chains to reliably deliver materials to assembly plants to avoid material shortages that would shutdown production.

For example, an unexpected parts shipment delay that causes an auto assembly plant shutdown can cost $20,000 per minute and millions of dollars per day in lost wages.

✓ **Decreases Total Supply Chain Cost** – Manufacturers and retailers depend on supply chain managers to design networks that meet customer service goals at the least total cost. Efficient supply chains enable a firm to be more competitive in the market place.

For example, Dell's revolutionary computer supply chain approach involved making each computer based on a specific customer order, then shipping the computer directly to the customer. As a result, Dell was able to avoid having large computer inventories sitting in warehouses and retail stores which saved millions of dollars. Also, Dell avoided carrying computer inventories that could become technologically obsolete as computer technology changed rapidly.

Improve Financial Position

✓ **Increases Profit Leverage** – Firms value supply chain managers because they help control and reduce supply chain costs. This can result in dramatic increases in firm profits.

For instance, U.S. consumers eat 2.7 billion packages of cereal annually, so decreasing U.S. cereal supply chain costs just one cent per cereal box would result in $13 million dollars saved industry-wide as 13 billion boxes of cereal flowed through the improved supply chain over a five year period.

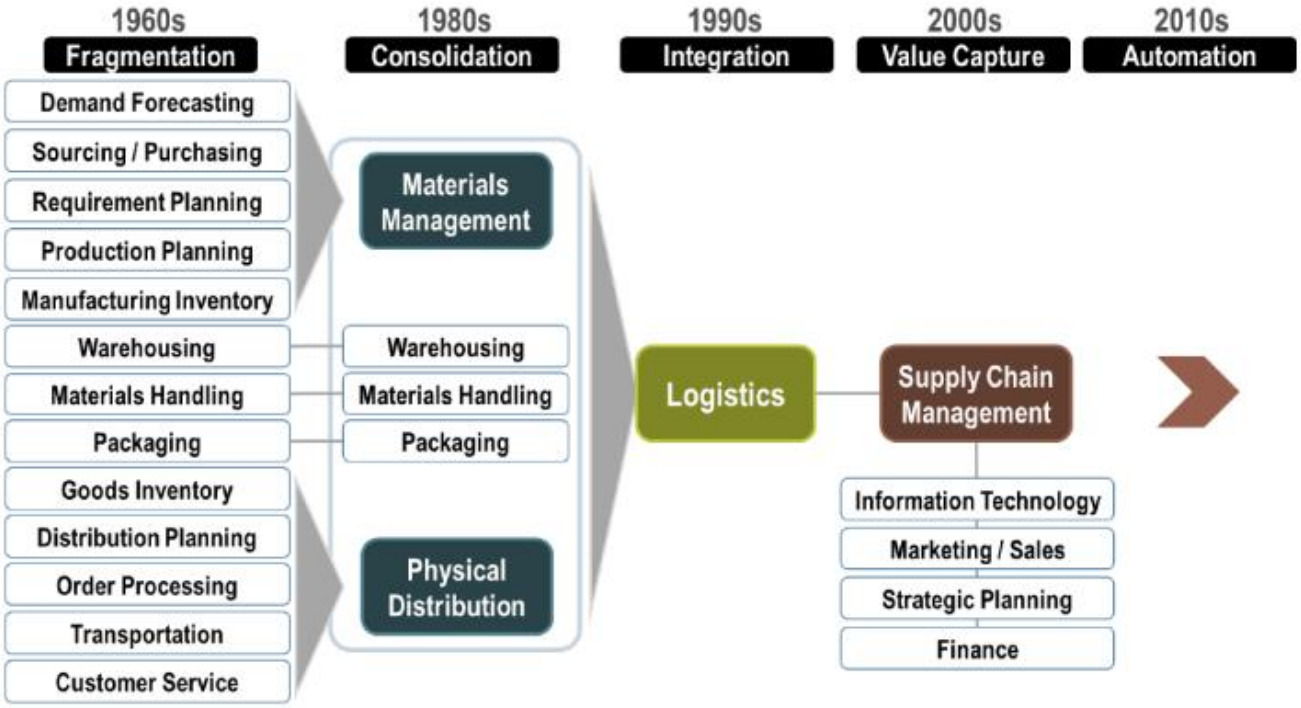
✓ **Decreases Fixed Assets** – Firms value supply chain managers because they decrease the use of large fixed assets such as plants, warehouses and transportation vehicles in the supply chain. If supply chain experts can redesign the network to properly serve U.S. customers from six warehouses rather than ten, the firm will avoid building four very expensive buildings.

✓ **Increases Cash Flow** – Firms value supply chain managers because they speed up product flows to customers. For example, if a firm can make and deliver a product to a customer in 10 days rather than 70 days, it can invoice the customer 60 days sooner.

1.2 Evolution of Supply Chain Management

Six major movements in the evolution in SCM

- ✓ Creation Era
- ✓ Integration Era
- ✓ Globalization Era
- ✓ Specialization Era 1
- ✓ Specialization Era 2
- ✓ SCM 2.0



The Evolution of Supply Chain Management

The evolution of supply chain management has been characterized by an increasing degree of integration of separate tasks, a trend that was underlined in the 1960s as a key area for future productivity improvements since the system was highly fragmented. Although the tasks composing logistics have remained relatively similar, they initially consolidated into two distinct functions related to materials management and physical distribution during the 1970s and 1980s. This process moved further in the 1990s as globalization incited a functional integration and the emergence of logistics in a true sense; all the elements of the supply chain became part of a single management perspective.

However, only with the implementation of modern information and communication technologies did a more complete integration became possible with the emergence of supply chain management. It allows for the integrated management and control of information, finance and goods flows and made possible a new range of production and distribution systems. Supply chain management has become a complex sequence of activities aiming at value capture and competitiveness.

More recently, the growing level of automation of supply chains has been a dominant element of the evolution of both physical distribution and materials management. This digitalization is particularly notable within distribution centers that have experienced a remarkable push towards automation such as storage, materials handling, and packaging. Automation may eventually lead to automated delivery vehicles.

Stepwise and according to improvements in information and communication technologies, the two ends of the assembly line became integrated into the logistics of the supply chain: the timely supply of raw materials and components from outside, and the effective organization of distribution and marketing.

High rack storage, which later became automatically driven, or the internal movement of packages by flat robots were early expressions of logistical engineering. Initially, logistics was an activity divided around the supplying, warehousing, production, and distribution functions, most of them being fairly independent of the other. With the new organization and management principles, firms were following a more integrated approach, thus responding to the upcoming demand for flexibility without raising costs. At the same time, many firms took advantage of new manufacturing opportunities in developing economies through outsourcing and offshoring.

As production became increasingly fragmented, activities related to its management were consolidated. Spatial fragmentation became a by-product of economies of scale in distribution.

1.Creation Era

• The term "supply chain management" was first coined by Keith Oliver in 1982.

• The concept of a supply chain in management was of great importance long before, in the early 20th century, especially with the creation of the assembly line.

• The characteristics of this era of supply chain management include the need for large-scale changes, re-engineering, downsizing driven by cost reduction programs, and widespread attention to Japanese management practices.

2. Integration Era

• This era of supply chain management studies was highlighted with the development of electronic data interchange (EDI) systems in the 1960s, and developed through the 1990s by the introduction of enterprise resource planning (ERP) systems.

• This era has continued to develop into the 21st century with the expansion of Internet-based collaborative systems.

• This era of supply chain evolution is characterized by both increasing value added and cost reductions through integration.

3. Globalization Era

• The third movement of supply chain management development, the globalization era, can be characterized by the attention given to global systems of supplier relationships and the expansion of supply chains beyond national boundaries and into other continents.

4.Specialization Era 1

• This specialization model creates manufacturing and distribution networks composed of several individual supply chain specific to producer to end consumer.

• Supply chain management works as a service.

5. Specialization Era 2

There are many function of this era:

- ✓ Transportation Management
- ✓ Storage and Inventory Management
- ✓ Planning Development Management
- ✓ Performance Management

6. SCM 2.0

• SCM 2.0 is a trend in the use of the WWW, that means to increase creativity, information sharing and collaboration among users(End Users).

• SCM 2.0 designed to rapidly deliver results with the quickly manage the future change for continuous flexibility, value and success. Globalization Era Specialization Era.

1.3 Decision Phases in Supply Chain

Decision phases can be defined as the different stages involved in supply chain management for taking an action or decision related to some product or services. Successful supply chain management requires decisions on the flow of information, product, and funds that fall into three decision phases.

Here we will be discussing the three main decision phases involved in the entire process of supply chain. The three phases are described below –

Supply Chain Strategy or design:

- During this phase, a company decides how to structure the supply chain over the next several years.
- It decides what the chain's configuration will be, how resources will be allocated, and what processes each stage will perform.
- Strategic decisions made by companies include whether to outsource or perform a supply chain function in-house, the location and capacities of production and warehousing facilities, the products to be manufactured or stored at various locations, the modes of transportation to be made available along different shipping legs, and the type of information system to be utilized
- decision is taken by the management
- decision to be made considers the sections like long term prediction and involves price of goods that **are very expensive** if it goes wrong
- important to study the market conditions at this stage.
- decisions are taken by the higher authority
- These decisions include deciding manufacturing the material, factory location, which should be easy for transporters to load material and to dispatch at their mentioned location, location of warehouses for storage of completed product or goods and many more.
- Consequently, when companies make these decisions, they must take into account uncertainty in anticipated market conditions over the next few years

Supply Chain Planning

- For decisions made during this phase, the time frame considered is a quarter to a year
- Planning includes making decisions regarding which markets will be supplied from which locations, the subcontracting of manufacturing, the inventory policies to be followed, and the timing and size of marketing and price promotions.
- As a result of the planning phase, companies define a set of operating policies that govern short-term operations
- Supply chain planning should be done according to the demand and supply view. . In order to understand customers' demands, a market research should be done. The second thing to consider is awareness and updated information about the competitors and strategies used by them to satisfy their customer demands and requirements.
- This phase includes it all, starting from predicting the market demand to which market will be provided the finished goods to which plant is planned in this stage. All the participants or employees involved with the company should make efforts to make the entire process as flexible as they can. A supply chain design phase is considered successful if it performs well in short-term planning

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Supply Chain Operations

The third and last decision phase consists of the various functional decisions that are to be made instantly within minutes, hours or days. The objective behind this decisional phase is minimizing uncertainty and performance optimization. Starting from handling the customer order to supplying the customer with that product, everything is included in this phase.

- The time horizon here is weekly or daily. During this phase, companies make decisions regarding. individual customer orders
- During this phase, firms allocate inventory or production to individual orders, set a date that an order is to be filled, generate pick lists at a warehouse, allocate an order to a particular shipping mode and shipment, set delivery schedules of trucks, and place replenishment orders.
- Because operational decisions are being made in the short term (minutes, hours, or days), there is less uncertainty about demand information

For example, imagine a customer demanding an item manufactured by your company. Initially, the marketing department is responsible for taking the order and forwarding it to production department and inventory department. The production department then responds to the customer demand by sending the demanded item to the warehouse through a proper medium and the distributor sends it to the customer within a time frame. All the departments engaged in this process need to work with an aim of improving the performance and minimizing uncertainty.

1.4 Competitive and Supply chain Strategies:

A company's competitive strategy defines, relative to its competitors, the set of customer needs that it seeks to satisfy through its products and services.

It defines the set of customer needs a firm seeks to satisfy through its products and services .

- **Low cost**
- **Rapid Response**
- **Product Differentiation**

Ex: Migros versus BIM ,HP versus Dell

Supply chain strategy: – determines the nature of material procurement, transportation of materials, manufacture of product or creation of service, distribution of product Consistency and support between supply chain strategy, competitive strategy, and other functional strategies is important.

Product development strategy: specifies the portfolio of new products that the company will try to develop

Marketing and sales strategy: specifies how the market will be segmented and product positioned, priced, and promoted.

Supply Chain Strategy Traditionally, **SC strategy includes**

- ✓ Suppliers Strategy
- ✓ Operations Strategy
- ✓ Logistics Strategy

regarding inventory, transportation, operating facilities, information flows.

Definition:

- ✓ Designing a firm's supply chain to meet the competitive priorities of the firm's operations strategy.
- ✓ Supply chain strategy to ensure superior value to the end customer in an efficient manner
- ✓ Optimum decision making between trade offs and costs.
- ✓ Innovation to obtain competitive advantage

Concepts related to Supply Chain Strategies :

- Customer Service and Cost Trade Offs

There are 4 components of Customer Service:

1.Order Delivery Lead Time

2.Responsiveness

3.Delivery Reliability

4.Product Variety

Customer Service & Trade Offs

• Costs are directly associated with service provision.

• Higher service in low cost is desirable.

• A firm cannot operate beyond a certain limit in increasing its efficiency by increasing costs for higher services.

• The firm's revenue is also affected by its service levels at certain costs.

Order Delivery Lead Time

• The time taken by the supply chain from placement of order to delivery is known as Order Delivery Lead Time

• The time take from sourcing of material to delivery is known as Supply Chain Lead Time.

• Penetration Point is the point at which customer places order. It is also known as Decoupling Point.

• Different types of models are followed to make efficient delivery like MTS, MTO & CTO

Supply Chain Responsiveness

• The firm's ability to handle the uncertainties of market demand.

• Based on uncertainties, products are classified into:

1. Functional Products 2. Innovative Products

• Example: CISCO

Delivery Reliability

• The fraction of satisfaction obtained by the customer within the promised delivery lead time.

• For achieving higher reliability, a quick inventory turnover is needed, stock outs needs to be prevented.

• Cost management at this stage is very important.

• **Example: Safexpress**

Product Variety

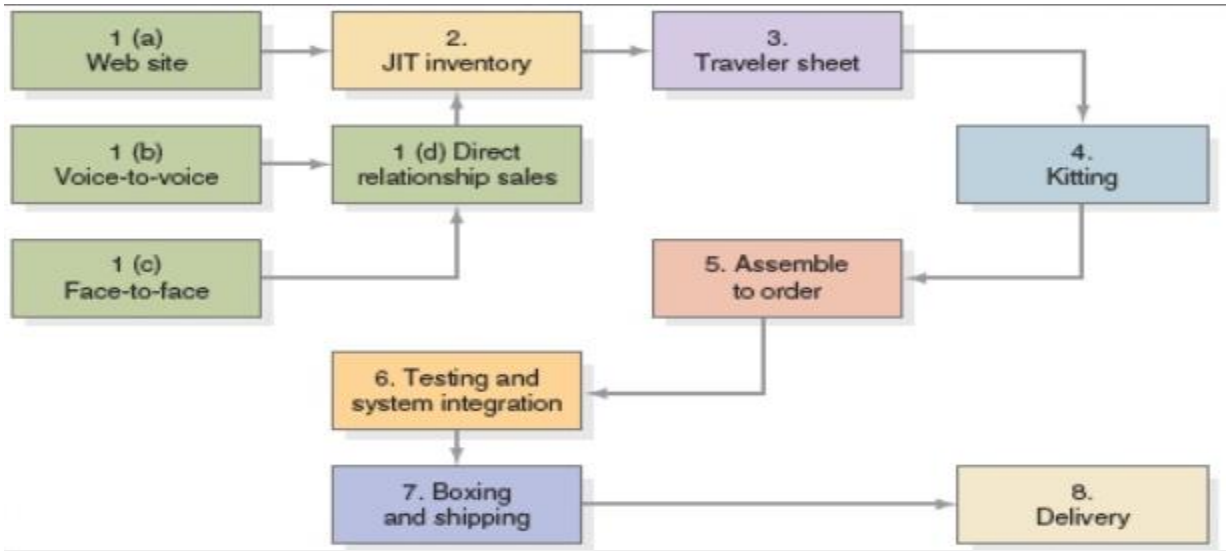
• Variety Explosion has occurred in large number of goods.

• It will also increase cost.

• It increases complexity in supply chain.

• **Example: P&G**

Dell's order fulfillment process



Thus, a firm's competitive strategy will be defined based on its customers' priorities. Competitive strategy targets one or more customer segments and aims to provide products and services that satisfy these customers' needs. To see the relationship between competitive and supply chain strategies, we start with the value chain for a typical organization, as shown in below Figure.

The value chain begins with new product development, which creates specifications for the product. Marketing and sales generate demand by publicizing the customer priorities that the products and services will satisfy. Marketing also brings customer input back to new product development. Using new product specifications, operations transforms inputs to outputs to create the product.

Distribution either takes the product to the customer or brings the customer to the product. Service responds to customer requests during or after the sale. These are core processes or functions that must be performed for a successful sale. Finance, accounting, information technology, and human resources support and facilitate the functioning of the value chain.

Other supply chain strategies:

1.Off shoring

2.Vendor Rationalization

3.Forward Integration

4.Backward Integration

5.Efficient supply chain

6.Responsive supply chain

1.5 Drivers of Supply Chain Performance and Obstacles:

Supply Chain (SC)Drivers

SC goal is to link key financial measures of firm performance to supply chain performance. The goal is to structure the drivers to achieve the desired level of responsiveness at the lowest possible cost, thus improving the supply chain surplus and the firm's financial performance.

Three logistical drivers

Facilities, inventory, and transportation

Three cross-functional drivers

Information, sourcing, and pricing—that determine the performance of any supply chain.

Financial performance:

Selected Financial Data for Amazon.com Inc.			
Year ended December 31 ($ millions)	**2010**	**2009**	**2008**
Net operating revenues	34,204	24,509	19,166
Cost of goods sold	26,561	18,978	14,896
Gross profit	7,643	5,531	4,270
Selling, general, and administrative expense	6,237	4,402	3,428
Operating income	1,406	1,129	842
Interest expense	39	34	71
Other income (loss) – net	130	66	130
Income before income taxes	1,497	1,161	901
Income taxes	352	253	247
Net income	1,152	902	645
Assets			
Cash and cash equivalents	3,777	3,444	2,769
Short-term investments	4,985	2,922	958
Net receivables	1,783	1,260	1,031
Inventories	3,202	2,171	1,399
Total current assets	13,747	9,797	6,157
Property, plant and equipment	2,414	1,290	854
Goodwill	1,349	1,234	438
Other assets	1,265	1,492	705
Total assets	18,797	13,813	8,314
Liabilities and Stockholder Equity			
Accounts payable	10,372	7,364	4,687
Short-term debt			59
Total current liability	10,372	7,364	4,746
Long-term debt		109	533
Other liabilities	1,561	1,083	363
Total liabilities	11,933	8,556	5,642
Stockholder equity	6,864	5,257	2,672

Growing the supply chain surplus is the ultimate goal of a supply chain.From a shareholder perspective, return on equity (ROE).ROE measures the return on investment made by a firm's shareholders.

$$ROE = \frac{Net\ Income}{Average\ Shareholder\ Equity}$$

Year:2009(Amazon)

$$ROE = 902/5,257 = 17.2 \text{ percent}$$

- **ROA can be written as the product of two ratios—profit margin and asset turnover:**

Return on assets (ROA) measures the return earned on each dollar invested by the firm in assets.

$$ROA = \frac{Earnings\ before\ interest}{Average\ total\ assets} = \frac{Net\ income + [Interest\ expense \times (1 - Tax\ rate)]}{Average\ total\ assets}$$

Year:2009(Amazon)

ROA= $[902+34*(1-.35)]/13,813 = 6.7$ percent

- **The difference between ROE and ROA is referred to as return on financial leverage (ROFL). attributed to financial leverage (accounts payable, debt, etc.).**

In 2009, Amazon had ROFL :

In 2009, Amazon had ROFL = 17.2 − 6.7 = 10.5 percent

$$ROA = \frac{Earnings\ before\ interest}{Sales\ revenue}(Profit\ margin) \times \frac{Sales\ revenue}{Total\ assets}(Asset\ turnover)$$

In 2009,ROA= [902 + 34*(1−.35)]/24,509 = 3.8 per-

Financial leverage is accounts payable turnover (APT)

$$APT = \frac{Cost\ of\ goods\ sold}{Accounts\ payable}$$

In Amazon's case, in 2009 APT = 18,978/7,364 = 2.58

ART, INVT,PPET

- **The key components of asset turnover are accounts receivable turnover (ART); inventory turnover (INVT); and property, plant and equipment turnover (PPET).**

$$ART = \frac{Sales\ revenue}{Accounts\ receivable};\ INVT = \frac{Cost\ of\ goods\ sold}{Inventories};\ PPET = \frac{Sales\ revenue}{PP\&E}$$

Amazon achieved accounts receivable turnover of 24,509/1,260 = 19.45 {34,204/1,783 = 19.18 in 2010} in 2009. Amazon collected its money from sales relatively quickly (in about 52/19.45 = 2.7 weeks on average in 2009) after it made a sale. Amazon turned its inventory about 18,978/2,171 = 8.74 {26,561/3,202 = 8.30 in 2010} times and had PPET = 24,509/1,290 = 19.00 {34,204/2,414 = 14.17 in 2010} in 2009. Thus, inventory sat with Amazon in 2009 for about 52/8.74 = 5.95 {52/8.30 = 6.27 in 2010} weeks on average, and each dollar invested in property, plant and equipment supported about $19 {$14.17 in 2010} of sales in 2009. Observe that Amazon saw its inventory turns and PPET decrease in 2010 relative to 2009.

Cash 2 Cash (C2C):

C2C = − weeks payable (1/APT) + weeks in inventory (1/INVT) + weeks receivable (1/ART)

In Amazon's case, we obtain C2C = –20.18 + 5.95 + 2.70 = –11.53 {–20.31 + 6.27 + 2.71 = –11.33 in 2010} in 2009. In 2009 and 2010, Amazon was collecting its money from the sale of

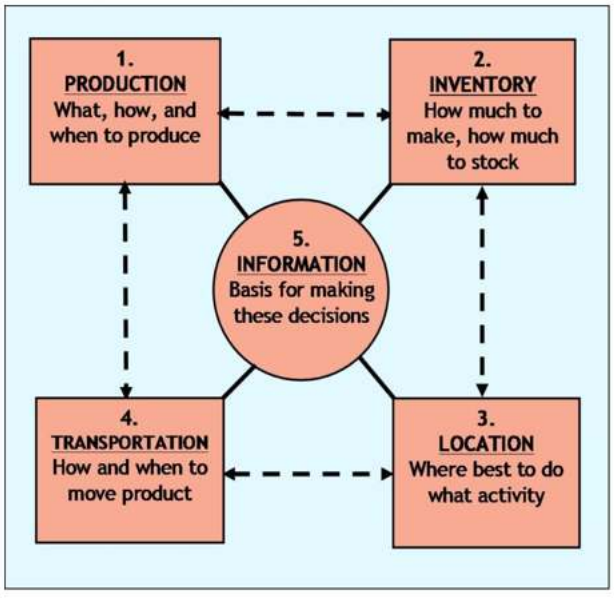
Drivers interact to determine the supply chain's performance in terms of responsiveness and efficiency. The goal is to structure the drivers to achieve the desired level of responsiveness at the lowest possible cost, thus improving the supply chain surplus and the firm's financial performance.

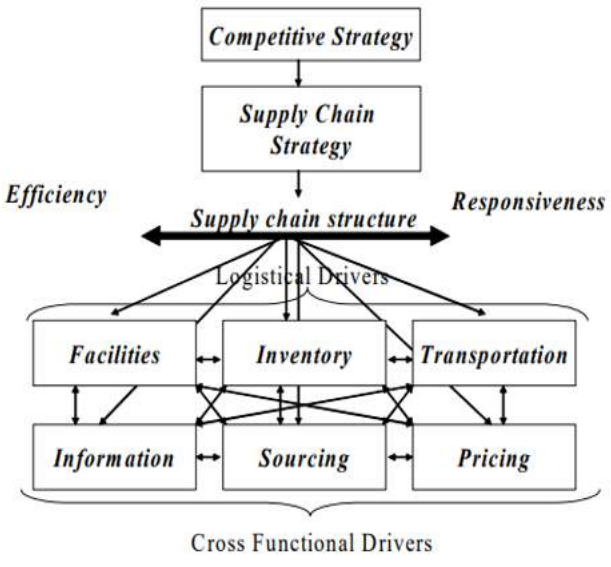
Five Drivers of SC performance:

- ✓ Facilities
- ✓ Inventory
- ✓ Transportation
- ✓ Information
- ✓ Sourcing
- ✓ Pricing

1. Facilities are the actual physical locations in the supply chain network where product is stored, assembled, or fabricated. The two major types of facilities are production sites and storage sites. Decisions regarding the role, location, capacity, and flexibility of facilities have a significant impact on the supply chain's performance.

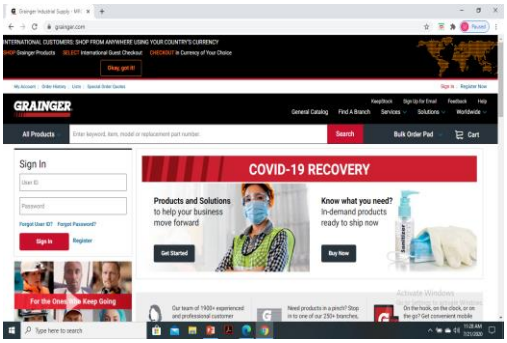
For example, in 2009, Amazon increased the number of warehousing facilities located close to customers to improve its responsiveness. In contrast, Blockbuster tried to improve its efficiency in 2010 by shutting down many facilities even though it reduced responsiveness. Facility costs show up under property, plant and equipment, if facilities are owned by the firm or under selling, general, and administrative if they are leased.





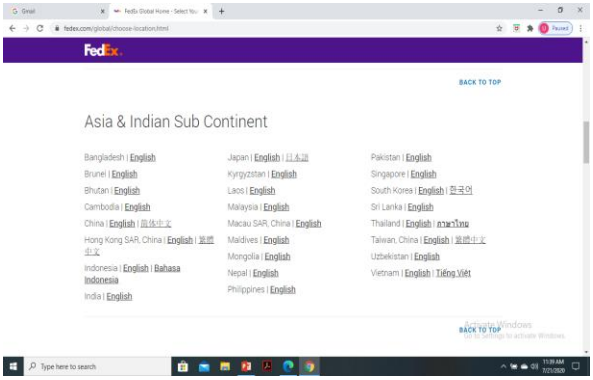
2. Inventory encompasses all raw materials, work in process, and finished goods within a supply chain. The inventory belonging to a firm is reported under assets. Changing inventory policies can dramatically alter the supply chain's efficiency and responsiveness.

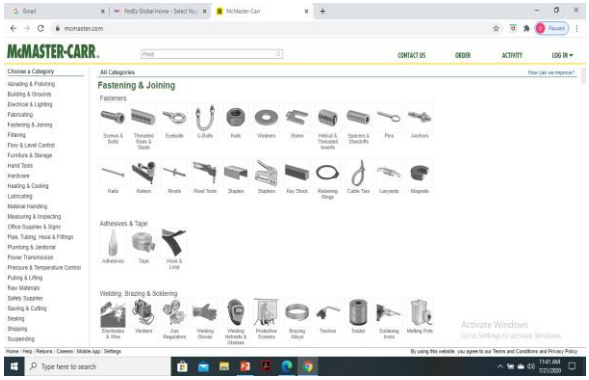
For example, W.W. Grainger makes itself responsive by stocking large amounts of inventory and satisfying customer demand from stock even though the high inventory levels reduce efficiency. Such a practice makes sense for Grainger because its products hold their value for a long time. A strategy using high inventory levels can be dangerous in the fashion apparel business where inventory loses value relatively quickly with changing seasons and trends. Rather than hold high levels of inventory, Spanish apparel retailer Zara has worked hard to shorten new product and replenishment lead times. As a result, the company is very responsive but carries low levels of inventory. Zara thus provides responsiveness at low cost.



3. Transportation entails moving inventory from point to point in the supply chain. Transportation can take the form of many combinations of modes and routes, each with its own performance characteristics. Transportation choices have a large impact on supply chain responsiveness and efficiency.

For example, a mail-order catalog company can use a faster mode of transportation such as FedEx to ship products, thus making its supply chain more responsive, but also less efficient given the high costs associ ated with using FedEx. McMaster-Carr and W.W. Grainger, however, have structured their supply chain to provide next-day service to most of their customers using ground transportation. They are providing a high level of responsiveness at lower cost. Outbound transportation costs of shipping to the customer are typically included in selling, general, and administrative expense, while inbound transportation costs are typically included in the cost of goods sold.





4. Information consists of data and analysis concerning facilities, inventory, transportation, costs, prices, and customers throughout the supply chain. Information is potentially the biggest driver of performance in the supply chain because it directly affects each of the other drivers. Information presents management with the opportunity to make supply chains more responsive and more efficient.

For example, Seven-Eleven Japan has used information to better match supply and demand while achieving production and distribution economies. The result is a high level of responsiveness to customer demand while production and replenishment costs are lowered. Information technology–related expenses are typically included under either operating expense (typically under selling, general, and administrative expense) or assets. For example, in 2009, Amazon included $1.24 billion in technology expense under operating expense and another $551 million under fixed assets to be depreciated.

5. Sourcing is the choice of who will perform a particular supply chain activity such as production, storage, transportation, or the management of information. At the strategic level, these decisions determine what functions a firm performs and what functions the firm outsources. Sourcing decisions affect both the responsiveness and efficiency of a supply chain.

After Motorola outsourced much of its production to contract manufacturers in China, it saw its efficiency improve but its responsiveness suffer because of the long distances. To make up for the drop in responsiveness, Motorola started flying in some of its cell phones from China even though this choice increased transportation cost.

Flextronics, an electronics contract manufacturer, is hoping to offer both responsive and efficient sourcing options to its customers. It is trying to make its production facilities in high-cost locations very responsive while keeping its facilities in low-cost countries efficient. Flextronics hopes to become an effective source for all customers using this combination of facilities. Sourcing costs show up in the cost of goods sold, and monies owed to suppliers are recorded under accounts payable

. 6. **Pricing** determines how much a firm will charge for the goods and services that it makes available in the supply chain. Pricing affects the behavior of the buyer of the good or service, thus affecting supply chain performance.

For example, if a transportation company varies its charges based on the lead time provided by the customers, it is likely that customers who value efficiency will order early and customers who value responsiveness will be willing to wait and order just before they need a product transported.

Differential pricing provides responsiveness to customers that value it and low cost to customers that do not value responsiveness as much. Any change in pricing impacts revenues directly but could also affect costs based on the impact of this change on the other drivers.

Obstacles to Achieving Strategic Fit:

Obstacles to Achieving Strategic Fit

- A company's ability to find a balance between responsiveness and efficiency that best meet the needs of the targeted customer is the key to achieving strategic fit
- Companies face many obstacles in deciding where this balance is to be located on the responsiveness spectrum

Obstacles

- Increasing variety of products
  - Increased variety (mass customization) tend to raise uncertainty, and uncertainty frequently results in increased cost and decreased responsiveness
- Decreasing product life cycles
  - This makes the job of achieving strategic fit more difficult as supply chain must constantly adapt to manufacture and deliver new product in addition to coping with these product's demand uncertainty
- Increasingly demanding customers
  - Today's customers are demanding faster fulfillment, better quality and better performing products for the same price they paid years ago means that the supply chain must provide more just to maintain its business
- Fragmentation of supply chain ownership
  - Now-a-days most firms have become less vertically integrated
  - More members in supply chain for providing goods
  - Many owners with its own policies and interests, the chain (network) more complicated to coordinate
- Globalization
  - Supply chains are more global
  - Global supply chains creates many benefits such as ability to source from a global base of suppliers who may offer better or cheaper goods than were available in a company's home nation
  - Suppliers are apart making coordination much more difficult
  - Removal of trade barrier results in increased competition from global companies
  - Companies that once protected has to find time for responding to needs of customer that arise due to competition
  - Now more strain on supply chain better trade-off
- Difficulty executing new strategies
  - Creating successful strategy is not easy
  - Skillful execution of strategy is as important as creating successful strategies
  - For instance others could figure out Toyota's brilliant strategies; the difficulty was in executing that strategy