

SUPPLY CHAIN MANAGEMENT

Q.No.1. Write a short note on any 5 with examples

20

a. Value matrix analysis.

Ans: In today's fast economic climate we find few growth markets with global competitors making the going together. Hence emphasis in business has swung towards those strategies that can create long term customer loyalty has the main focus. It is important to understand customer expectation & service. It is through customer service that the organization differentiates itself.

Customer today is very demanding & ask for more & more value. Following matrix will show change which was brought in customer expectation.

Market entry condition	Capacity to produce	High production capacity	Less price	Quality	Delivery
Market leadership	High production capacity	Less price	Quality	Delivery	Value

The capability required for market entrance & leadership has changed from ability to supply to add more & more value to the customer. This situation can be regarded as a basic cause of the evolution of SCM. The companies which have success in this process, have already found themselves in a very comfortable position.

b. **VIM & CMI**

Ans: **VIM (Vendor Inventory Management)** – When the retailers manage inventory one of the methods for inventory control was to use some form of trigger point method replenishment program i.e. when the item on stock is finished to the trigger point a purchase order is placed on the vendor to replenish the item . In such systems retailers make their own calls and vendor require their customer to supply them with information about product sales and current inventory levels.

CMI (Customer Managed Inventory)- Inventory or stock level is based on customers order. According to order received from customer supply chain starts to deliver the goods through various network. The planning and manufacturing process is initiated after receiving the sales orders from the customer. The whole process is customer focused and throughout the supply chain process the connection with the customer can be maintained. This process enables the manufacturer to track progress for a customer order. The primary benefit of this process is that a manufacturer can meet specific customer requirements and track the profitability of each sales order.

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c. *Model of supplier partnership*

Ans: Distribution refers to the step taken to move and store a product from the supplier to a customer in a supply chain. Raw materials and components are moved from supplier to manufacturing whereas finished products are moved from manufacturer to the customers. The supplier is usually not in position to supply the goods as decided or as he promises. In the context of the vendors in India it is observed that there is rather rare supplier who supplies as per promises and of the quality essential. This situation leads to overstock the quantity. To maintain good supplier relations it is important that payments are made on the dates they are due.

Objectives –

- To increase the overall profitability of the firm
- It evaluates customer needs that are met and cost of meeting customer needs
- Some measures and components of customer service are influenced with the help of distribution network structure. These components are response time, product variety, product availability, customer experience
- It provides one stop shopping with products from several manufacturer
- Reduction in inventory costs
- Reduction in inbound transportation cost because of trucks load shipment from manufacturer to distributor
- The choice of distribution network can be used to achieve variety of supply chain objectives ranging from low cost to high responsiveness
- It gives more stable order stream from distributor to the manufacturer allows manufacturer to lower the costs by planning production more effectively
- Reduction in important costs that managers most consider include inventories cost, transportation cost, facilities and handling and information providing costs

d. *Private fleet management*

Ans: Private fleet consists of a firm providing its own transportation. They are not for hire & are not subjected to economic regulation although they must comply with regulation concerning hazardous good movement, vehicle pollution norms, and vehicle safety specified by govt.

The firms own or lease the transport and provide managerial direction regarding the operations. The primary distinction between for-hire and private fleet, transportation actively should be incidental to the main business of the firm

E.g. Scooters own by Pizza Companies

Fleet management is an important area requiring consideration. Managing and operating a fleet of cars and vans if not done well could result in about 35% increase in running cost.

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Issues need to be considered

1. Running the most suitable vehicle
2. Selecting the appropriate fuel
3. Controlling associated costs
5. Minimising environmental impact

Steps in Managing a Fleet

1. Developing a fleet action plan
2. Assess current position
3. Identify outlined objectives
4. Review the performance

The three factors need to be considered for fleet management

1. Transport requirement
2. Vehicle driver
3. Vehicle selection

e. **3 PL**

Ans: Third party logistics refers to the concept of outsourcing the logistics and distribution of manufacturing or service firm to a logistic services provider so that the manufacturing company can focus on its core competencies of new product development, manufacturing them and marketing the products.

Company opts for 3 PL of following reasons:

1. Improved strategic focuses : using 3 pl's companies can concentrate on their core task and improve customer satisfaction
2. Lowered cost: according to research Reports Company can reduce their inventory management cost by around 15 to 30 per cent. Also 3 PL service provider invest large sums of money in developing process that aim to logistical excellence, which are unavailable to other companies

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3. Expansion of markets: outsourcing logistical activities to 3PLs allow company to get into new businesses, new market or a new channel of distribution quickly and with a limited outlay of cash.
4. For more professional and scientific approach to logistical problems.
5. For improvement in service channels with improved response time.
6. For efficient management of inventory resulting in better utilization of working capital
7. Increased flexibility : a 3PL contract provides for relatively short term commitments as compared to building and maintaining the same resources by the company itself, thus freeing up resources for other uses.

The infrastructure required for 3pl

1. warehouse
2. fleet of vehicles
3. hardware and software to take care of information needs
4. advance material handling capabilities
5. good team of consultants
6. trained men power
7. Reach in terms of geography.

Operations of Indian 3PL's

1. Gati
2. Transport corporation of India ltd.
3. Blue dart logistic
4. FedEx

f. **Third party logistics role**

- Ans:
- Third party logistics refers to the concept of outsourcing the logistics and distribution of manufacturing or service firm.
 - 3 PL service provider invest large sums of money in developing process that aim to logistical excellence, which are unavailable to other companies
 - It can reduce there inventory management cost by around 15 to 30 per cent.
 - Expansion of markets: outsourcing logistical activities to 3PLs allow company to get into new businesses, new market or a new channel of distribution quickly and with a limited outlay of cash.
 - For more professional and scientific approach to logistical problems.
 - For improvement in service channels with improved response time.
 - For efficient management of inventory resulting in better utilization of working capital
 - Increased flexibility : a 3PL contract provides for relatively short term commitments as compared to building and maintaining the same resources by the company itself, thus freeing up resources for other uses.

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Q.No.2. a. What is materials management? Explain the performance evaluation of supplies in vendor ratings.

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Ans: Material management is the process of maintaining the appropriate level of stock in warehouse. An appraisal has to be made of vendors actual performance. There are factors like quality, service and has to be considered to evaluate the vendor's performance.

a) Searching for good suppliers:

- Inviting quotation
- Purchasing directions
- Catalogue & vendor files
- Personal contacts

b) Knowledge about suppliers:

- Facilities
- List of equipments
- Plant visits
- Personal management
- Financial resources
- Reputation

c) Assistances to suppliers: A progressive buyer must support to the supplier in departments like design, quality & mfg to bring out the best quality required.

b. Explain the routing models, what decisions in SCM?

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Ans: Routing: the most important operational decision related to transportation in supply chain is routing. Managers must decide on the customers to be visited by a particular vehicle and the sequence in which they will be visited. The success of its operation turns on its ability to decrease transportation and delivery cost, while providing the promised levels of responsiveness to customer. Typical objective is minimizing cost by decreasing no. Of vehicles needed, the total distance traveled by vehicle and the total travel time of vehicles as well as eliminating service failure because transportation cost typically ranges between one third to two third of total logistic cost improving efficiency through maximum utilization of transportations equipment and personnel is the major concern to reduce transportations cost and improve customer service, finding the best path that the vehicle should follow through a network of road, rail lines, shipping lines which will minimize time distances is a frequent decision problem. Although there are many variation of routing problem, we can reduce them to few basic types.

Routing models:

- 1) The sweep method.
- 2) The saving matrix method.
- 3) Shortest cyclic route method.
- 4) Shortest acyclic route method.

Sweep method-

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This method is simple to lend itself to hard calculation even for large size problems. This method solves problems rapidly without requiring enormous amount of computer memory. The disadvantage of this method has to do with the way routes are formed the process is 2 stage with stops assigned to vehicles 1st then the stop sequences on the rules is determined. Because of the 2 stage process timing issues such as total time spent and time window allowance are north well held

This method can be paraphrased as follows

- Locate all the steps including the major depot on the grid
- Extend the straight line from the depot in any direction. Rotate the line clockwise and anticlockwise until it intersects a stop
- Ask the question: if the inserted stop is inclined on the route will the vehicle capacity to be exceeded? If the answer is no proceed the line installation till the next stop is intersected
- Will the cumulative volume exceed the vehicle capacity? Use the largest vehicle first .If the answer is yes exclude last point and define route
- Continue the line sweep begin an new route with the last point that was excluded from previous route
- Continue with the sweep until all the points have been assigned to the routes with each route sequences stop to minimize distances.

Shortest acyclic route method:

When we wish to go from one place to another or to several other places and we are to select the shortest route of many alternatives to reach a desired station. Such acyclic route network problem can be easily solved by graphical method. A network is defined as a set of points or nodes, which are connected by links. A way of going from one node to another is called route or path. The links in a network may be one way or two ways. The no. On the links in the network represent the time, cost or distance traveled.

Q.No.3. a. What is mean by LCC? When in the system life cycle should LCC analysis be applied?

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Ans: - In the era of control regime, the task of purchasing and selling was relatively easy - competition was less and the market was assured. But suddenly all that changed - the markets opened and competition increased; selling is now possible only if prices are reduced and quality improved in other words, the customer wants more and more per unit cost.

To minimize the total production costs, it is recognized that one way is to tighten operations; another time tested method is to reduce cost of inputs. While it would be desirable that our suppliers reduce the cost of their supplies to us, the importance of building a relationship with the supplier has been recognized.

Establishing a long term relationship is possible only when the supplier and purchaser jointly decide to reduce the life cycle cost of an item by proper procurement, in such a way that it would lead to a win-win situation to both the parties - in other words, suppliers become "Partners in Progress".

Purchaser cannot squeeze the supplier endlessly; sourcing the right item from the right vendors,

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getting it to the purchaser's premises in the right way at the right price and at the right time can alone optimize costs for the purchaser. This is possible only if there is mutual trust, which builds up in long term relationships.

b. What is benchmarking & SCM modelling?

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Ans: Benchmarking helps to organization identifying their standard of performance related to other organizations.

Types- 1) Internal benchmarking - It is related with performance within the organization.

2) External benchmarking- It includes performance other than within the organization

3) Quantitative benchmarking –This type of benchmarking helps to measure progress towards goals

4) Process benchmarking – It examines how top performing companies accomplish specific process.

Benefits of benchmarking:

1) Helps to organization to make better informed decision.

2) Exposes organization to innovations & break through.

3) Allows organization to see beyond the barriers, to embrace change, to think outside the box.

Supply chain modeling- supply chain operation reference modeling is used to seeing the performance of supply chain. It is helpful to endure superiority in terms of customer preferences with low cost. It exists in both services & manufacturing organization. S.C.M consists of a company, immediate supplier, immediate customer directly linked by one or more of the upstream & downstream flows of products, services, finances& information. Optimize per & post production inventory levels, obtain greater efficiency from labor, equipment & space across the company & provide flexible planning & control mechanism. It gives following advantages-

- Solving supplier's problems.
- Customer service performance improvement.
- Minimizing variance by means of standardization, variety reduction, etc.
- Product quality control.

Q.No.4. a. Why is demand chain management a better goal than supply chain management? What is the key distinction?

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Ans: In economics, demand management is the art or science of controlling economic demand to avoid a recession. In natural resources management and environmental policy more generally. It refers to

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policies to control consumer demand for environmentally sensitive or harmful goods. Such as water and energy. Within manufacturing firms the term is used to describe the activities of demand forecasting, Planning, and order fulfillment. In economics the term is also used to refer to the management of the distribution and access to goods and services on the basis of needs. An example is social security and welfare services. Rather than increasing budgets for these things. Government may develop policies that allocate existing resources according a hierarchy of neediness. It is inspired by Keynesian macroeconomics. Though today elements of it are a part of the economic mainstream.

The other-end linkages are with the sales and operations planning (SOP) module and the master production scheduling (MPS) module as it is concerned with identifying all sources in demand for manufacturing capacity including service-part demands. Intra-company requirements, and promotional inventory buildups or other needs for pipeline inventory stocking. The information provided to SOP is used to develop sales and operations (including manufacturing) plans covering a year or more in duration at a fairly high level of aggregation. Both forecast and actual demand information is provided to the MPS module. It is in the MPS module that short-term. Product-specific manufacturing plans are developed and controlled as actual demand is available and the information is provided to provide delivery promises and order status to customers. It includes the decisions, how to structure supply chain for a given marketing & pricing plans, chain configuration, resources allocation, transportation, etc. Decisions should be taken with account of marked condition as per demand from customer.

b. What is the role of information system in SCM?

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Ans: IT can be referred to as the study, design, development, implementation, support or management of computer based information system, particularly software applications and computer hardware. It is the combination of telecommunications and computing to obtain process, store, transmit and output information in the form of voice, pictures, words and numbers.

Information technology architecture is an integrated framework for acquiring and evolving IT to achieve strategic goals. It has both logical and technical components. Logical components include mission, functional and information requirements, system configurations, and information flows. Technical components include IT standards and rules that will be used to implement the logical architecture.

Role of IT

There are several reasons why information technology is considered to be useful to us. The three most common reasons are-

Data transfer:

Transfer of information and data from one location to another via a transmission medium. The most prevalent form of message switching is the electronic mail (e-mail). Today, e-mail is quickly becoming a primary communication method for both personal and business use.

Information retrieval:

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With the increase in technological developments around the world, most business places now have computers to aid them in doing certain task. For example, most businesses have moved from the traditional method of storing data or files in filing cabinets and towards storing the data on computers. Information retrieval therefore is recovering stored data from a particular storage medium.

Machine and process control:

Computers are now being used in several institutions and factories to do certain jobs which human beings may not be capable of handling. For example, in the making of aluminum sheets a computer is used to monitor the thickness of the sheets and report on the task at hand. A human in place would be subjected to certain chemicals and radiations, which would distort or shorten his life span and also be more prone to making error.

In the IT perspective we can say that SCM is all about improving logistics, relationship management with the suppliers and delivering value by doing business.

The main benefits of IT in business today are:

- To provide multiple ways of reaching the objectives.
- The constraints can be understood well in advance
- It gives a defined set of steps to attain the set objectives.

Using information technology systems to analyze and capture the information can have substantial impact on the firm's performance. For example a major manufacturer of computer workstations and servers found that much of the information on customer demand was not being used to set production schedules and inventory levels. The manufacturing group lacked this demand information and was forced to make inventory and production decisions blindly.

By installing a supply chain software system the company was able to analyze and gather the data needed to recommend the required stocking level. Using the information technology enabled systems the company was enabled to cut its inventory in half because managers could now make decisions based on information rather than educated guesses. Large impacts of this underscore the importance of information technology as a driver for supply chain.

Q.No.5. a. Explain the classification and basic consideration of material handling system. 10

Ans: Classification of material handling system:

a) Manual material handling system: here the initial investment is low. The equipment used in such a system are racks, drawers, bins, hand trucks and gravity conveyors. The operations are done manually. So the problems related to labor control exist.

b) Manual equipment:

a) Hand carts – Unpowered wagons, dollies and trucks pushed about by workers.

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b) Stackers and portable cranes – these are used for loading and unloading heavy material from trucks. These are operated hydraulically.

c) Manual stacker- these are fabricated from steel channels for strength. They can be shifted anywhere in the shop. Without bending they can lift heavy materials.

c) Mechanized system:

Mechanized & automatic equipments need higher level investment. On long term they may be economical. In these cases the human interaction is reduced & in automatic operation it is almost eliminated. Machine power, electrical energy used in place of labor.

d) Automated system:

The concept of a totally automated storage and retrieval system has been inviting the attention of professionals to match the storage system with rapid development in the technology. In this type of system computer programs are used to achieve controls on the movements of equipments.

The material handling is moving the object from one place to another. To reduce total logistic cost & effective customer service, logistic management is needed. The basic consideration of material handling is to reduce number of handling of material. No material should be handled in more than required time.

b. What are the advantages and disadvantages of using common, regulated, contract exempt and private carriage in the logistics system? 10

Ans: Advantages of using common logistic system:

- i. No any hard procedure to get common logistic system. i.e. easily available.
- ii. it is available with very low rate.

Disadvantages of using common logistic system:

- i. No quick service
- ii. No safe & material can be damaged.

Advantages of using regulated logistic system:

- i. Continuous and smooth supply of material can be possible.
- ii. Safe & quality delivery of material

Disadvantages of using regulated logistic system:

- i. Possibility of ignorance on focusing core task by company.

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ii. Maintenance problem leads to late delivery of goods.

Advantages of using contract exempt logistic system:

i. Easily available.

Disadvantages of using contract exempt logistic system:

i. No punctuality.

ii. Variable rates.

Advantages of using private carrier logistic system:

i. It gives services with right time, at right place and right quality.

ii. Fast delivery service.

Disadvantages of using private carrier logistic system:

i. High rate.

Q.No.6. a. Explain the role of SCM module in ERP system.

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ERP system offers tremendous benefits by integrating functions across the organization. They help in automating the business processes and enable reliable information capture and retrieval. SCM systems offer capabilities to integrate various entities making up the supply chain and facilitate seamless flow of information between all the supply chain partners. Given the intra-organizational and inter organizational advantages offered by ERP and SCM respectively, integration of both the same can help in deriving substantial leverage and the potential of such integration is quite huge. Integration of ERP and SCM is a very tough task as each member in the supply chain may have different hardware, software and it is very difficult to insist that your company's supply chain partners maintain same system. It would however be ideal if all the parties involved could agree up front to abide by open standards. This would help easier integration. In the following lines we will try to study some of the approaches to integration.

ERP-SCM SYSTEM LINKAGE

As per this approach, the integration of supply chain is through the linking of ERP and SCM systems. This may be done so as to capitalize on the strengths of the two systems (ERP and SCM). For this purpose, sophisticated middleware interface software, which enable sharing of data and processes are used. This software help linking the ERP and SCM systems at the points where they have overlapping features.

For example, SAP uses SAP's ALE (application link enabling) to exchange data between SAP R/3 and its SCM product "Rhythm". There are also some specialized software called Specialized integration software, which allow ERP and other systems to share processes and data. This software allows integration by simply choosing the sending application and receiving application and the process to be linked.

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b) *What are the cost/benefits and risk of outsourcing the physical distribution of product?*

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Ans: It means getting some of the activities related to the products from outside source like using warehouses for storage, uses of IT companies as a back office, vendor to supply parts or even strategic alliance. Outsourcing is partnering with outside firm to handle a part of the supply chain activities. The relationship with outsourced company may be based on a single event a long term contract.

Benefits of Outsourcing:

- 1) Cost saving
- 2) Leads to lean organization
- 3) Responsibility to the outsiders
- 4) Better control on quality & schedules
- 5) Provides flexibility
- 6) Expansion can be done easily

e.g. Banks like ICICI, CITI bank, have their back officer are handled by IT companies for activities like data feeding report creating, contracting & customer handling.

Q.No.7. a. *How does a hub allow two firms in a supply chain to work more effectively?*

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Ans: In case of hub and spoke model, the distribution model's hub is the location that holds inventory for a large region, with each spoke leading to a smaller distribution centre, which houses inventory for smaller region. The main driver of the hub and spoke model is the proximity to the customer, with the goal being to supply to a maximum amount of customers in minimum amount of time.

Functionality:

It provides two basic functions:

1. Product Movement
2. Product Storage

1. Product Movement : It is a primary transportation function. It moves the product up and down the value chain. Whether the product is in the form of materials, components, assemblies, work-in-progress or finished goods, transportation is necessary to move it to the next stage of mfg. process of physically closer to the ultimate customer.

However, during the transportation of the product there could be some loss on account of damage or product loss. Also, the product is inaccessible for use when it in transit. There could also be environmental hazards due to the use of polluting fuels.

2. Product Storage :

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This is the less common function of transportation. This is because vehicles make rather expensive storage facilities. However, it makes sense to use it as a storage facility in the following instances:

When the in-transit product requires to be moved shortly and the cost of loading and unloading will be more than the charge of storage in the vehicle. To put it simply in mechanical forms.

When the origin and destination warehouse space is limited. In such a case transit time increased then it would be in case of a direct route.

Benefits:

1. Reduced delivery cost to your customer.
2. Meet customer delivery requirements.
3. Reduced claims.
4. Handle peaks in business effectively.

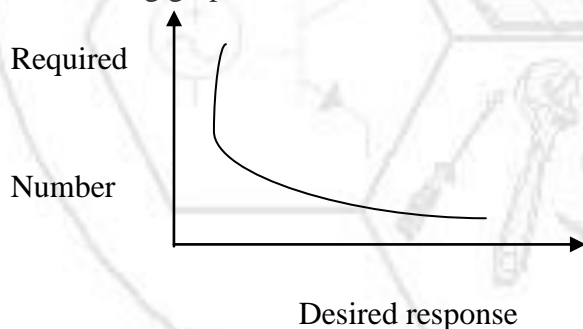
c. **What is total distribution cost? Explain importance in SCM?**

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Ans: The change in total cost caused by the change in the system. Thus the addition of an extra warehouse to the distribution network will bring about cost changes in transport, inventory investment and communications. Different costs in scm

Purchase Price+ Training Costs+ Administration Costs+ Operating Costs+ Maintenance Costs+ Support Costs+ Related Facility/Services Costs

The response time and the customer's desire for the facilities are inversely proportional. It can be seen in following graph.



Basic four costs of supply chain are as follows:

- Inventories
- Transportation
- Facilities and handling

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- Information

Change in the network design affects above costs as follows.

1. To decrease inventory cost firm limits the number of facilities.
2. Increasing on of facilities increases total transportation cost.
3. Facility costs decreases the number of facilities.

In the era of control regime, the task of purchasing and selling was relatively easy - competition was less and the market was assured. But suddenly all that changed - the markets opened and competition increased; selling is now possible only if prices are reduced and quality improved in other words, the customer wants more and more per unit cost.

To minimize the total production costs, it is recognized that one way is to tighten operations; another time-tested method is to reduce cost of inputs. While it would be desirable that our suppliers reduce the cost of their supplies to us, the importance of building a relationship with the supplier has been recognized.

Establishing a long-term relationship is possible only when the supplier and purchaser jointly decide to reduce the life cycle cost of an item by proper procurement, in such a way that it would lead to a win-win situation to both the parties - in other words, suppliers become "Partners in Progress". Purchaser cannot squeeze the supplier endlessly; sourcing the right item from the right vendors, getting it to the purchaser's premises in the right way at the right price and at the right time can alone optimize costs for the purchaser. This is possible only if there is mutual trust, which builds up in long term relationships. The purchase bill can be lowered if the total life cycle cost is optimum. In other words, the Total Cost of Acquisition and Ownership of the item must be optimum. The major costs involved as we trace the path of a product from its raw material stage till it is consumed in our process.