Management

classmate
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Page

Supply chain

Supply chain is the system of organization, people, activities information and ~~service~~ resources involved in moving a product or service from supplier to customer. Supply chain activities transform raw materials and components into a finished product delivered to end customer.

Supplier → Manufacturer → Distributor → Retailer → Customer

Upstream
↓
Downstream

Aims to match ~~off~~ supply and demand, profitably for products and services.

Services

The right product + The right price + The right place + The right quality + The right customer + The right time

Supply chain = Max profit

The organization that make the supply chain are "linked" together through physical flows and information flows. It is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents effort by the supply chain firms to develop and run supply chains in the most efficient ways possible.

Components of supply:

How to achieve

Efficiency ⟷ Responsiveness

Functions of inventory

- To meet anticipated demand.
- To smooth product requirements
- To decouple operations
- To protect against stock-outs
- To take ~~advantage~~ advantage of order cycles.
- To help hedge against price increases.
- To permit operations.
- To take advantage of quantity discounts.

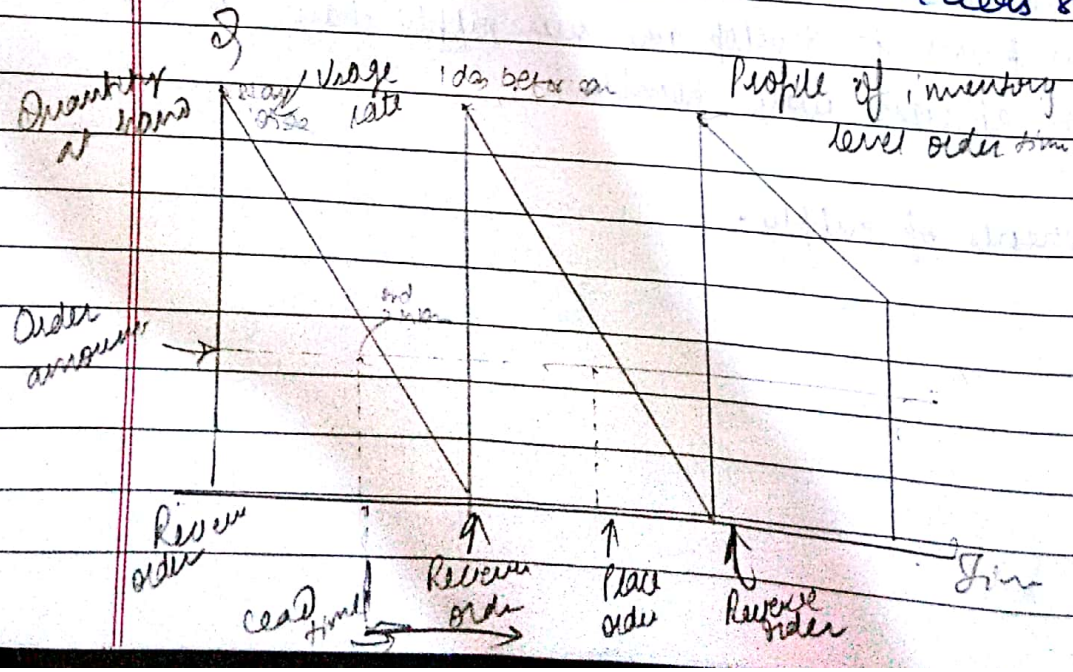
Key inventory terms

Lead time: time interval between ordering and receiving the order.

Holding (carrying cost): Cost to carry an item in inventory for a length of time usually a yr.

Ordering cost: costs of ordering and receiving inventory

Shortage cost: costs when demand exceeds supply



Cost relationships

- Total inventory cost = Annual material cost + annual ordering cost + Annual inventory holding costs

$$TIC = DC + D/Q \times S + \frac{Q}{2} \times H$$

TC : Total inventory cost
D - Annual demand
C - cost per unit
Q - Quantity to be ordered (EOQ)
S - setup cost or cost of placing an order

To find the order quantity when TC is min.

$$TC = DC + D/Q \times S + \frac{Q}{2} \times H$$

$$\frac{dTC}{dQ} = 0 + \left(\frac{-DS}{Q^2}\right) + \frac{H}{2} = 0$$

to be minimum

$$\text{or } Q^2 = 2DS/H$$

$$Q = \sqrt{\frac{2DS}{H}}$$

Q. A company has got a demand for particular part at 1000 units per month. The cost per unit is Rs. 50 and it costs Rs. 500 to place an order and to process the delivery. The inventory carrying cost at 20% of average inventory investment cost:

Determine -

Economic order quantity.
Optimum no. of orders place per annum.
Min. TC of inventory per annum.