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MATERIALS MANAGEMENT

It is concerned with planning, organizing and controlling the flow of materials from their initial purchase through internal operations to the service point through distribution.

OR

Material management is a scientific technique, concerned with Planning, Organizing &Control of flow of materials, from their initial purchase to destination.

` INVENTORY CONTROL

It means stocking adequate number and kind of stores, so that the materials are available whenever required. Scientific inventory control results in optimal balance.

Objective of Inventory Control

The main objective of inventory management is to maintain inventory at appropriate level to avoid excessive or shortage of inventory because both the cases are undesirable for business. Thus, management is faced with the following conflicting objectives:

1. To keep inventory at sufficiently high level to perform production and sales activities smoothly.
2. To minimize investment in inventory at minimum level to maximize profitability.

Functions of inventory control

a) To provide maximum supply service, consistent with maximum efficiency & optimum investment.
b) To provide cushion between forecasted & actual demand for a material.
   To smooth production requirements.
c) To decouple operations.
d) To protect against stock-outs.
e) To take advantage of quantity discounts.
f) To help hedge against price increases.
g) To meet anticipated demand

Advantages Of Inventory Control

a) It improves the liquidity position of the firm by reducing unnecessary tying up of capital in excess inventories.
b) It ensures smooth production operations by maintaining reasonable stocks of materials.

c) It facilitates regular and timely supply to customers through adequate stocks of finished products.
d) It protects the firm against variations in raw materials delivery time.
e) It facilitates production scheduling, avoids shortage of materials and duplicate ordering.
f) It helps to minimise loss by obsolescence, deterioration, damage, etc.
g) It enables the firms to take advantage of price fluctuations through economic lot buying when prices are low.

ECONOMIC ORDER OF QUANTITY :

The Economic Order Quantity (EOQ) is the number of units that a company should add to inventory with each order to minimize the total costs of inventory—such as holding costs, order costs etc. The EOQ is used as part of a continuous review inventory system in which the level of inventory is monitored at all times and a fixed quantity is ordered each time the inventory level reaches a specific reorder point. The EOQ provides a model for calculating the appropriate reorder point and the optimal reorder quantity to ensure the instantaneous replenishment of inventory with no shortages. It can be a valuable tool for small business owners who need to make decisions about how much inventory to keep on hand, how many items to order each time, and how often to reorder to incur the lowest possible costs.

Economic order quantity (EOQ) is the order quantity of inventory that minimizes the total cost of inventory management.

There is a fixed cost for each order placed, regardless of the number of units ordered. There is also a cost for each unit held in storage, commonly known as holding cost, sometimes expressed as a percentage of the purchase cost of the item.

Ordering costs are costs that are incurred on obtaining additional inventories. They include costs incurred on communicating the order, transportation cost, etc.

Carrying costs represent the costs incurred on holding inventory in hand. They include the opportunity cost of money held up in inventories, storage costs, spoilage costs, etc.

EOQ applies only when demand for a product is constant over the year and each new order is delivered in full when inventory reaches zero.

Total inventory costs = Ordering costs + Holding costs
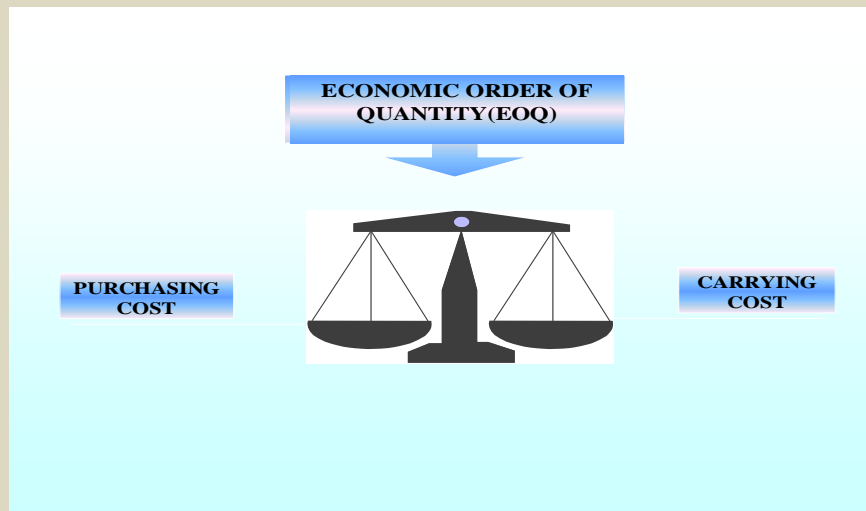
By taking the first derivative of the function we find the following equation   for minimum cost:

$$EOQ = \sqrt{\frac{2 \times D \times S}{H}}$$

D =   Annual demand (units) or quantity
S =   Cost per order
C =   Cost per unit
 I =   Holding cost (%)
H =   Holding cost ($) or Carrying Cost Per Order = I x C

Example:

A Company is engaged in sale of mines shoes. Its cost per order is 400rupees and its carrying cost unit is 10 rupees per unit per annum. The company has a demand for 20,000 units per year. Calculate the order size, total orders required during a year, total carrying cost and total ordering cost for the year.

Solution

EOQ = SQRT(2 × 20,000 × 400/10) = 1,265 units
Annual demand is 20,000 units so the company will have to place 20000/1265 = 16 orders
Total ordering cost is= 400x 16 = 64,000rupees
Average inventory held is 632.5 ((0+1,265)/2) which means total carrying costs = 632.5 × 10rupees = 6325

Few Important Terms Related To Inventory

Reorder level (or reorder point) is the inventory level at which a company would place a new order or start a new manufacturing run.

Reorder Level = Lead Time in Days × Daily Average Usage

Lead time is the time it takes the supplier or the manufacturing process to provide the ordered units.

If a business is holding a safety stock to act as buffer if daily usage accelerates the reorder level would increase by the level of safety stock.

Reorder Level = Lead Time in Days × Daily Average Usage + Safety Stock

Safety stock or buffer stock is the stock held by a company in excess of its requirement for the lead time. Companies hold safety stock to guard against stock-out.

Safety stock is calculated using the following formula:

Safety Stock = (Maximum Daily Usage – Average Daily Usage) × Lead Time

Example

XYZ Ltd. is engaged in production of drill rod. It purchases iron rods from ABC Ltd. an external supplier. ABC Ltd. takes 10 days in manufacturing and delivering an order. XYZ requires 10,000 units of rods. Its ordering cost is Rs 1,000 per order and its carrying costs are Rs3 per unit per year. The maximum usage per day could be 50 per day. Calculate economic order quantity, reorder level and safety stock.

Solution

EOQ = SQRT (2 × Annual Demand × Ordering Cost Per Unit / Carrying Cost Per Unit)
Maximum daily usage is 50 units and average daily usage is 27.4 (10,000 annual demand ÷ 365 days).
Safety Stock = (50-27.4) × 10 = 226 units.
Reorder Level = Safety Stock + Average Daily Usage × Lead Time
Reorder Level = 226 units + 27.4 units × 10 = 500 units.

ABC ANALYSIS

In materials management, the ABC analysis is an inventory categorization technique. ABC analysis divides an inventory into three categories- "A items" with very tight control and accurate records, "B items" with less tightly controlled and good records, and "C items" with the simplest controls possible and minimal records.

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost, while also providing a mechanism for identifying different categories of stock that will require different management and controls.

The ABC analysis suggests that inventories of an organization are not of equal value. Thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance.

ABC analysis categories

On cost criteria: It helps to exercise selective control when confronted with large number of items it rationalizes the number of orders, number of items & reduce the inventory.

1. About 10 % of materials consume 70 % of resources

2. About 20 % of materials consume 20 % of resources

3. About 70 % of materials consume 10 % of resources

On value Of Items

1. "A" approximately 10% of items or 66.6% of value

2. "B" approximately 20% of items or 23.3% of value

3. "C" approximately 70% of items or 10.1% of value

'A' ITEMS

'A' items are very important for an organization. Because of the high value of these 'A' items, frequent value analysis is required.

Small in number, but consume large amount of resources

a) These items must have:
b) Tight control
c) Rigid estimate of requirements
d) Strict & closer watch
e) Low safety stocks
f) Managed by top management

'B' ITEMS

'B' items are important, but of course less important than 'A' items and more important than 'C' items. Therefore, 'B' items are intergroup items.

Larger in number, but consume lesser amount of resources

a) Ordinary control measures
b) Purchase based on usage estimates

c) High safety stocks

ABC analysis does not stress on items those are less costly but may be vital

'C'ITEM

'C' items are marginally important.

a) Moderate control
b) Purchase based on rigid requirements
c) Reasonably strict watch & control
d) Moderate safety stocks
e) Managed by middle level management

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Pareto's law in this example is that a few high usage value items constitute a major part of the capital invested in inventories whereas a large number of items having low usage value constitute an insignificant part of the capital.

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