

Unit 14

Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL

Inventory is a stock or store of goods.

What to Inventory?

- (A) Raw materials and purchased parts
- (B) Partially completed goods
- (C) Finished-goods inventories
- (D) Replacement parts and tools.
- (E) Goods-in-transit to warehouses or Goods In progress

Types of Demand:**1) *Dependent Demand***

These are items that are typically subassemblies or component parts that will be used in the production of a final or finished product. Example: Demand for wheels for new cars.

2) *Independent Demand*

These are items that are the finished goods or other end items. These items are sold or at least shipped out rather than used in making another product.

Functions of Inventory

1. ***To meet anticipated customer demand.*** These inventories are referred to as anticipation stocks because they are held to satisfy planned or expected demand.
2. ***To smooth production requirements.*** Firms that experience seasonal patterns in demand often build up inventories during off-season to meet overly high requirements during certain seasonal periods. Companies that process fresh fruits and vegetable deal with seasonal inventories
3. ***To protect against stock-outs.*** Delayed deliveries and unexpected increases in demand increase the risk of shortages. The risk of shortages can be reduced by holding safety stocks, which are stocks in excess of anticipated demand.
4. ***To take advantage of order cycles.*** Inventory storage enables a firm to buy and produce in economic lot sizes without having to try to match purchases or production with demand requirements in short run.
5. ***To hedge against price increase.*** The ability to store extra goods also allows a firm to take advantage of price discounts for large orders.

Objectives of Inventory Management

To achieve satisfactory levels of customer service while keeping inventory costs within reasonable bounds.

Requirements for Effective Inventory Management

To be effective, management must have the following:

1. A system to keep track of the inventory on the hand on order.
2. A reliable forecast of demand that includes an indication of possible forecast error.
3. Knowledge of lead times and lead time variability.
4. Reasonable estimates of inventory holding costs, ordering costs, and shortage costs.
5. A classification system for inventory items.

Inventory Counting Systems

1) Periodic System

This is a physical count of items in inventory is made at periodic intervals (e.g. weekly, monthly) in order to decide how much to order of each item. **Major users:** Supermarkets, discounts stores, and department stores.

Advantage

Orders for many items occur at the same time, which can result in economies in processing and shipping orders

Disadvantages

- a) Lack of control between reviews.
- b) The need to protect against shortages between review periods by carrying extra stock.
- c) The need to make a decision on order quantities at each review

2) Perpetual Inventory System (also known as a continual system)

This keeps track of removals from inventory on a continuous basis, so the system can provide information on the current level of inventory for each item.

Advantages

1. The control provided by the continuous monitoring of inventory withdrawals.
2. The fixed-order quantity; management can identify an economic order size.

Disadvantage

1. The added cost of record keeping.

Two-bin-system method

Is two containers of inventory; reorder when the first is empty. The advantage of this system is that there is no need to record each withdrawal from inventory; the disadvantage is that the reorder card may not be turned in for a variety of reasons (e.g., misplaced, the person responsible forgets to turn it in).

Tracking System

Universal Product Code (UPC) bar code printed on a label that has information about the item to which it is attached. Bar coding represents an important development for other sectors of business besides retailing. In manufacturing, bar codes attached to parts, subassemblies, and finished goods greatly facilitate counting and monitoring activities.



Demand Forecast and Lead time Information

Managers need to know the extent to which **demand and lead time** might vary; the greater the potential variability, the greater the need for additional stock to reduce the risk of a shortage between deliveries.

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

Inventory Cost (Three Basic Costs)

1. **Holding or Carrying Cost** is the costs to carry an item in inventory for a length of time usually a year. Cost includes interest, insurance, taxes, breakage, etc.
2. **Ordering Cost** is cost of ordering and receiving inventory. These include determining how much is needed, preparing invoices, inspecting goods upon arrival for quality and quantity, and moving the goods to temporary storage.
3. **Shortage cost** is cost resulting when demand exceeds the supply of inventory on hand. These costs can include the opportunity cost of not making a sale, loss of customer goodwill, late charges, and similar costs

Classification System

An important aspect of inventory management is that items held in inventory are not of equal importance in terms of dollars invested, profit potential, sales or usage volume, or stock-out penalties. Example: A producer of electrical equipment might have electric generators, coils of wire, and miscellaneous nuts and bolts among the items carried in inventory. It would be unrealistic to devote equal attention to each of these items.

A-B-C Approach

A-B-C Approach classifies inventory items according to some measure of importance, usually annual dollar usage, and then allocates control efforts accordingly.

Three Classes of Items Used:

A (very important)

B (moderately important)

C (least important)

The key questions concerning cycle counting for management are:

1. How much accuracy is needed?
2. When should cycle counting be performed?
3. Who should do it?

ECONOMIC ORDER QUANTITY MODELS

Economic Order Quantity (EOQ) is the order size that minimizes total cost. **EOQ models** identify the optimal order quantity in terms of minimizing the sum of certain annual costs that vary with order size.

Three (3) Order Size

1. The economic order quantity model.
2. The economic order quantity model with non instantaneous delivery.
3. The quantity discount model.

Inventory Cycles begins with the receipt of an order of Q units, which are withdrawn at instant rate over time. When the quantity on the hand is just sufficient to satisfy demand during lead time, an order for Q units is submitted to the supplier.

Developing EOQ Mathematical Model

Assumption of the Basic EOQ Model

1. Only one product is involved.
2. Annual demand requirements are known.
3. Demand is spread evenly throughout the year so that the demand rate is reasonably constant.
4. Lead time does not vary.
5. Each order is received in a single delivery.
6. There are quantity discounts.