

## Inventory Management

### Introduction to Inventory Management

In any business or organization, all functions are interlinked and connected to each other and are often overlapping. Some key aspects like supply chain management, logistics and inventory form the backbone of the business delivery function. Therefore these functions are extremely important to marketing managers as well as finance controllers.

**Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet.** Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial figures.

Inventory is always dynamic. Inventory management requires constant and careful evaluation of external and internal factors and control through planning and review. Most of the organizations have a separate department or job function called inventory planners who continuously monitor, control and review inventory and interface with production, procurement and finance departments.

### Defining Inventory Management

Inventory is an idle stock of physical goods that contain economic value, and are held in various forms by an organization in its custody awaiting packing, processing, transformation, use or sale in a future point of time.

Any organization which is into production, trading, sale and service of a product will necessarily hold stock of various physical resources to aid in future consumption and sale. While inventory is a necessary evil of any such business, it may be noted that the organizations hold inventories for various reasons, which include speculative purposes, functional purposes, physical necessities etc.

From the above definition the following points stand out with reference to inventory:

- All organizations engaged in production or sale of products hold inventory in one form or other.
- Inventory can be in complete state or incomplete state.
- Inventory is held to facilitate future consumption, sale or further processing/value addition.
- All inventoried resources have economic value and can be considered as assets of the organization.

## Inventory Management Concepts

Inventory management and supply chain management are the backbone of any business operations. With the development of technology and availability of process driven software applications, inventory management has undergone revolutionary changes. In the last decade or so we have seen adaptation of enhanced customer service concept on the part of the manufacturers agreeing to manage and hold inventories at their customers end and thereby effect Just In Time deliveries. Though this concept is the same in essence different industries have named the models differently. Manufacturing companies like computer manufacturing or mobile phone manufacturers call the model by name VMI - Vendor Managed Inventory while Automobile industry uses the term JIT - Just In Time where as apparel industry calls such a model by name - ECR - Efficient consumer response. The basic underlying model of inventory management remains the same.

Let us take the example of DELL, which has manufacturing facilities all over the world. They follow a concept of Build to Order where in the manufacturing or assembly of laptop is done only when the customer places a firm order on the web and confirms payment. Dell buys parts and accessories from various vendors. DELL has taken the initiative to work with third party service providers to set up warehouses adjacent to their plants and manage the inventories on behalf of DELL's suppliers. The 3PL - third party service provider receives the consignments and holds inventory of parts on behalf of Dell's suppliers. The 3PL warehouse houses inventories of all of DELL's suppliers, which might number to more than two hundred suppliers. When DELL receives a confirmed order for a Laptop, the system generates a Bill of material, which is downloaded at the 3PL, processed and materials are arranged in the cage as per assembly process and delivered to the manufacturing floor directly. At this point of transfer, the recognition of sale happens from the Vendor to Dell. Until then the supplier himself at his expense holds the inventory.

### **Let us look at the benefits of this model for both Dell as well as Its Suppliers:**

1. With VMI model, Dell has reduced its in bound supply chain and thereby gets to reduce its logistics and inventory management costs considerably.
2. DELL gets to postpone owning inventory until at the time of actual consumption. Thereby with no inventories DELL has no need for working capital to be invested into holding inventories.
3. DELL does not have to set up inventory operations and employ teams for operations as well as management of inventory functions.

Inventory is a necessary evil that every organization would have to maintain for various purposes. Optimum inventory management is the goal of every inventory planner. Over inventory or under inventory both cause financial impact and health of the business as well as effect business opportunities.

Inventory holding is resorted to by organizations as hedge against various external and internal factors, as precaution, as opportunity, as a need and for speculative purposes.

## Types of Inventory Management

Inventory Management deals essentially with balancing the inventory levels. Inventory is categorized into two types based on the demand pattern, which creates the need for inventory. The two types of demand are Independent Demand and Dependant Demand for inventories.

- **Independent Demand**

An inventory of an item is said to be falling into the category of independent demand when the demand for such an item is not dependant upon the demand for another item.

Finished goods Items, which are ordered by External Customers or manufactured for stock and sale, are called independent demand items.

Independent demands for inventories are based on confirmed Customer orders, forecasts, estimates and past historical data.

- **Dependant Demand**

If the demand for inventory of an item is dependant upon another item, such demands are categorized as dependant demand.

Raw materials and component inventories are dependant upon the demand for Finished Goods and hence can be called as Dependant demand inventories.

Take the example of a Car. The car as finished goods is an held produced and held in inventory as independent demand item, while the raw materials and components used in the manufacture of the Finished Goods - Car derives its demand from the demand for the Car and hence is characterized as dependant demand inventory.

This differentiation is necessary because the inventory management systems and process are different for both categories.

While Finished Goods inventories which is characterized by Independent demand, are managed with sales order process and supply chain management processes and are based on sales forecasts, the dependant demand for raw materials and components to manufacture the finished goods is managed through MRP -Material Resources Planning or ERP - Enterprise Resource Planning using models such as Just In Time, Kanban and other concepts. MRP as well as ERP planning depends upon the sales forecast released for finished goods as the starting point for further action.

Managing Raw Material Inventories is far more complicated than managing Finished Goods Inventory. This involves analyzing and co-coordinating delivery capacity, lead times and delivery schedules of all raw material suppliers, coupled with the logistical processes and transit timelines involved in transportation and warehousing of raw materials before they are ready to be

supplied to the production shop floor. Raw material management also involves periodic review of the inventory holding, inventory counting and audits, followed by detailed analysis of the reports leading to financial and management decisions.

Inventory planners who are responsible for planning, managing and controlling Raw Material inventories have to answer two fundamental questions, which can also be termed as two basic inventory decisions.

- a. Inventory planners need to decide how much of Quantity of each Item is to be ordered from Raw Material Suppliers or from other Production Departments within the Organization.
- b. When should the orders be placed ?

Answering the above two questions will call for a lot of back end work and analysis involving inventory classifications and EOQ determination coupled with Cost analysis. These decisions are always taken in co ordination with procurement, logistics and finance departments.

### **How it works (Example)**

Inventories are company assets that are intended for use in the production of goods or services made for sale, are currently in the production process, or are finished products held for sale in the ordinary course of business. Inventory also includes goods or services that are on consignment (subject to return by a retailer) or in transit.

There are three types of inventory: raw materials, work-in-progress, and finished goods. Given the significant costs and benefits associated with inventory, companies spend considerable amounts of time calculating what the optimal level of inventory should be at any given time. Because maximizing profits means minimizing inventory expenses, several inventory-control models, such as the ABC inventory classification method, the economic order quantity (EOQ) model, and just-in-time management are intended to answer the question of how much to order or produce.

Inventory management also means maintaining effective internal controls over inventory, including safeguarding the inventory from damage or theft, using purchase orders to track inventory movement, maintaining an inventory ledger, and frequently comparing physical inventory counts with recorded amounts.

Common inventory accounting methods include "first in, first out" (FIFO), "last in, first out" (LIFO), and lower of cost or market (LCM). Some industries, such as the retail industry, tailor these methods to fit their specific circumstances. Public companies must disclose their inventory accounting methods in the notes accompanying their financial statements.

Inventory management makes its biggest mark on the inventory line item of the balance sheet. That line item doesn't just reflect the cost of the inventory; it also reflects costs directly or indirectly incurred in readying an item for sale, including not only the purchase price of that item

but the freight, receiving, unpacking, inspecting, storage, maintenance, insurance, taxes, and other costs associated with it.

### **Techniques of inventory management**

Some of the major techniques of inventory management are as follows: 1. Economic Order Quantity 2. Inventory Models 3. ABC Analysis 4. Material Requirements Planning 5. VED Analysis.

#### ***1. Economic Order Quantity:***

A problem which always remains in that how much material may be ordered at a time. An industry making bolts will definitely would like to know the length of steel bars to be purchased at any one time.

This length is called “economic order quantity” and an economic order quantity is one which permits lowest cost per unit and is most advantages.

#### ***2. Inventory Models:***

##### **Concept:**

Inventory models determine when and how inventory to carry.

##### **i. Inventory models handle chiefly two decisions:**

- (a) How much to order at one time.
  - (b) When to order this quantity to minimize total costs.
- ii. Lowest-cost decision rules for inventory management pertain to either buying products from outside or producing them within the company.
- iii. Single inventory models assume no delivery delay and that demand is known.
- iv. Probabilistic models handle situations of risks and uncertainty.

#### ***3. ABC Analysis:***

#### ***4. Material Requirements Planning:***

MRP is a computational technique that converts the master schedule for end products into a detailed schedule for raw material and components used in the end products. The detailed

schedule identifies the quantities of each raw material and component items. It also tells when each item must be ordered and delivered so as to meet the master schedule for the final products.

### 5. VED Analysis:

**Vital essential and desirable analysis is used primarily for the control of spare parts. The spare parts can be divided into three categories:**

- (i) Vital
- (ii) Essential
- (iii) Desirable

#### (i) Vital:

The spares the stock out of which even for a short time will stop production for quite some time and future the cost of stock out is very high are known as vital spares.

#### (ii) Essential:

The spare stock out of which even for a few hours of days and cost of lost production is high is called essential.

#### (iii) Desirable:

Spares are those which are needed but their absence for even a week or so will not lead to stoppage of production.

## What Are Common Components of an Inventory Management System?



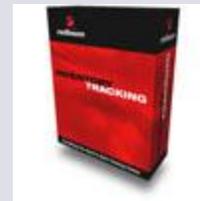
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## **Why Is Inventory Control Important?**

The ultimate goal of inventory control is getting your stock "just right."

If your business requires maintaining an inventory, you might sometimes feel like you're walking a tightrope. Not having enough inventory means you run the risk of losing sales, while having too much inventory is costly in more ways than one. That's why having an efficient inventory control system is so important.

### **Avoiding Stockouts**

One of the worst things you can do in business is to turn away customers -- people who are ready to give you their money -- because you've run out of the item they want. "Stockouts" not only

cost you money from missed sales, they can also make you lose customers for good, as people resolve to take their business somewhere that can satisfy their needs. An efficient inventory control system tracks how much product you have in stock and forecasts how long your supplies will last based on sales activity. This allows you to place orders far enough ahead of time to prevent stockouts.

### **Overstock Hazards**

When inventory isn't managed well, you can also wind up with overstock -- too much of certain items. Overstock comes with its own set of problems. The longer an item sits unsold in inventory, the greater the chance it will never sell at all, meaning you'll have to write it off, or at least discount it deeply. Products go out of style or become obsolete. Perishable items spoil. Items that linger in storage get damaged or stolen. And excessive inventory has to be stored, counted and handled, which can add ongoing costs.

### **Working Capital Issues**

Inventory is expensive to acquire. When you pay, say, \$15 for an item from a supplier, you do so with the expectation that you will soon sell the item for a higher price, allowing you to recoup the cost plus some profit. As long as the item sits on the shelf, though, its value is locked up in inventory. That's \$15 you can't use elsewhere in your business. So inventory control isn't just about managing the "stuff" going in and out of your company; it's also about managing your working capital, keeping you from having too much precious cash tied up in operations.

### **Manufacturer's Angle**

Inventory control isn't just a concern for companies that deal in finished goods, such as retailers and wholesalers. It's also critical for manufacturers, who maintain three types of inventory: raw materials, works in process and finished goods. If you run out of an essential ingredient or component, production will halt, which can be extremely costly. If you don't have a supply of finished goods on hand to fill orders as they come in, you risk losing customers. Staying on top of inventory is essential if you're to keep the line running and keep products moving out the door.

## **REFERENCES**

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