

# **Chapter three**

## **Material management**

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Introduction to material management, Functions and objectives of Materials management, Purchasing or procurement, Introduction, objectives of purchasing department. Activities/duties of purchasing department. Purchasing. Organization buying Techniques, Store Management, Functions of Store department, and duties of the store keeper, Location and Layout of stores, Receipt, & issue of material, store record, store ledger.

# Materials Management

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**What is material management?....** The grouping of management functions supporting the complete cycle of **material flow, from the purchase and internal control of production materials** to the planning and control of work in process to the warehousing, shipping, and distribution of the finished product

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

# Objectives of Materials Management

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The main objectives of material management is two:

**1. Maximize the use of the firm's resources by**

- Manufacturing Planning and Control

**2. Provide the required level of customer service**

- Customer service means being able to provide the customer the right quality, quantity, time, place, price

# Objectives of Materials Management

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# Functions of **Materials Management**

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The typical tasks associated with material management:

- Procurement and purchasing
- Materials planning
- Materials handling
- Distribution
- Cost control
- Inventory management / Receiving/ Warehousing
- Transportation

# Benefits of Materials Management

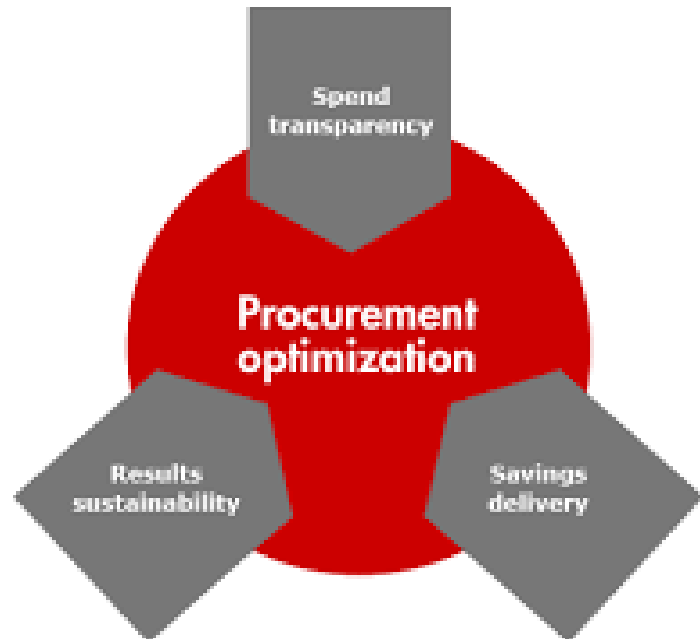
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- Reducing the overall costs of materials
- Better handling of materials
- Reduction in duplicated orders
- Materials will be on site when needed and in the quantities required
- Improvements in labor productivity
- Improvements in project schedule
- Quality control
- Better field material control
- Better relations with suppliers
- Reduce of materials surplus
- Reduce storage of materials on site
- Labor savings
- Stock reduction
- Purchase savings

# Purchasing or procurement

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**What is purchasing?...** The term “Purchasing” refers to the **process of ordering and receiving goods and services**. It is a subset of the wider procurement process. Generally, purchasing refers to the process involved in ordering goods such **as request, approval, creation of a purchase order record (a Purchase Order or P.O.) and the receipting of goods**.



# Objectives of procurement system

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- Acquire needed supplies as inexpensively as possible
- Obtain high quality supplies
- Assure prompt & dependable delivery
- Distribute the procurement workload to avoid period of idleness & overwork
- Optimize inventory management through scientific procurement procedures

# Principles Of Purchasing Management OR (8 R'S)

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1. Buying Material at Right **QUALITY**.
2. In the Right **QUANTITY**.
3. From the Right **SOURCE**.
4. At the Right **PRICE**.
5. Delivered at the Right **PLACE in**.
6. At the Right **TIME**.
7. With Right mode of **TRANSPORT**.
8. With Right **Contract**.

# Inventory Model

- Inventory models deal with idle resources like men, machines, money and materials. These models are concerned with two decisions: how much to order (purchase or produce) and when to order so as to minimize the total cost.
- The ‘order quantity’ means the quantity produced or procured during one production cycle. Economic Order Quantity (EOQ) is that size of order which minimizes total costs of carrying and cost of ordering.

Economic order quantity can be determined by two methods:

- Tabulation method.
- Algebraic method.

## Determination of EOQ by Tabulation (Trial & Error) Method

This method involves the following steps:

- Select the number of possible lot sizes to purchase.
- Determine average inventory carrying cost for the lot purchased.
- Determine the total ordering cost for the orders placed.
- Determine the total cost for each lot size chosen which is the summation of inventory carrying cost and ordering cost.
- Select the ordering quantity, which minimizes the total cost.

The data calculated in a tabular column can be plotted showing the nature of total cost, inventory cost and ordering cost curve against the quantity ordered

# Algebraic method

$$Q^* = \sqrt{\frac{2SD}{H}}$$

## Example:

Assume a car dealer that faces demand for 5,000 cars per year, and that it costs \$15,000 to have the cars shipped to the dealership. Holding cost is estimated at \$500 per car per year. How many times should the dealer order, and what should be the order size?

$$Q^* = \sqrt{\frac{2(15,000)(5,000)}{500}} = 548$$

# Activities and duties of purchasing department... Cond

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## Evaluating Price

A purchasing department also is charged with continuously evaluating whether it is receiving these materials at the **best possible price** in order **to maximize profitability**.

Purchasing department staff may **communicate with alternate vendors**, **negotiate better pricing** for bulk orders or **investigate the possibility** of procuring cheaper materials from alternative sources as part of their daily activities.

# Activities and duties of purchasing department

## **Procuring Materials**

One role of the purchasing department is to **procure all necessary materials needed for production** or daily operation of the company or government organization.

In a retail environment, the purchasing department makes sure there is always sufficient product on the shelves or in the **warehouses to keep** the customers happy and keep the store **well-stocked**.

Purchasing also oversees all of the vendors that supply a company with the items it needs to operate properly.

# Activities and duties of purchasing department

## **Paperwork and Accounting:**

Purchasing departments handle all of the paperwork involved with purchasing and delivery of supplies and materials.

Purchasing ensures timely delivery of materials from vendors, generates and tracks purchase orders and works alongside the receiving department and the accounts payable department to ensure that promised deliveries were received in full and are being paid for on time.

# Organization buying techniques

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Organizational buyers (really, buyers of all types, including final consumers) use four basic approaches to evaluating and buying products:

(1) inspection, (2) sampling, (3) description, and (4) negotiated contracts.

Understanding the differences in these buying methods is important in strategy planning.:

**1. Inspection buying:** means looking at every item. It's used for products that are not standardized and require examination. Here, each product is different – as in the case of livestock or used equipment. Such products are often sold in open markets – or at auction if there are several potential buyers. Buyers inspect the goods and either haggle with the seller or bid against competing buyers.

# Organization **buying techniques**

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**2. Sampling buying:** means looking at only part of a potential purchase. As products become **more standardized** – perhaps because of careful grading or quality control – buying by sample becomes possible.

Prices may be based on a sample. Although demand and supply forces may set the general price level, **actual price may vary depending on the quality of a specific sample.**

People in less-developed economies do a lot of buying by inspection or sampling – regardless of the product. The reason is skepticism about quality – or lack of faith in the seller.

# Organization **buying techniques**

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**3. Description (specification) buying:** means **buying from a written** (or verbal) description of the product. Most manufactured items and many agricultural commodities are bought this way – often **without inspection**. When quality can almost be guaranteed, buying by description – grade, brand, or specification – may be satisfactory, especially when there is mutual trust between buyers and sellers. Because this method **reduces the cost of buying**, buyers use it whenever practical.

Once the purchase needs are specified, it's the buyer's job to get the best deal possible. If several suppliers want the business, the buyer will often **request competitive bids**. Competitive bids are the terms of sale offered by different suppliers in response to the buyer's purchase specifications.

# Organization buying techniques

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**4. Negotiated contract buying:** means agreeing to a **contract** that allows for changes in the purchase arrangements.

Sometimes the buyer knows roughly what the company needs but can't fix all the details in advance. **Specifications or total requirements may change** over time. .

To be sure of dependable quality, a buyer may develop loyalty to certain suppliers. This is especially important when buying non standardized products. When a supplier and buyer develop a working partnership over the years, the supplier practically becomes a part of the buyer's organization.

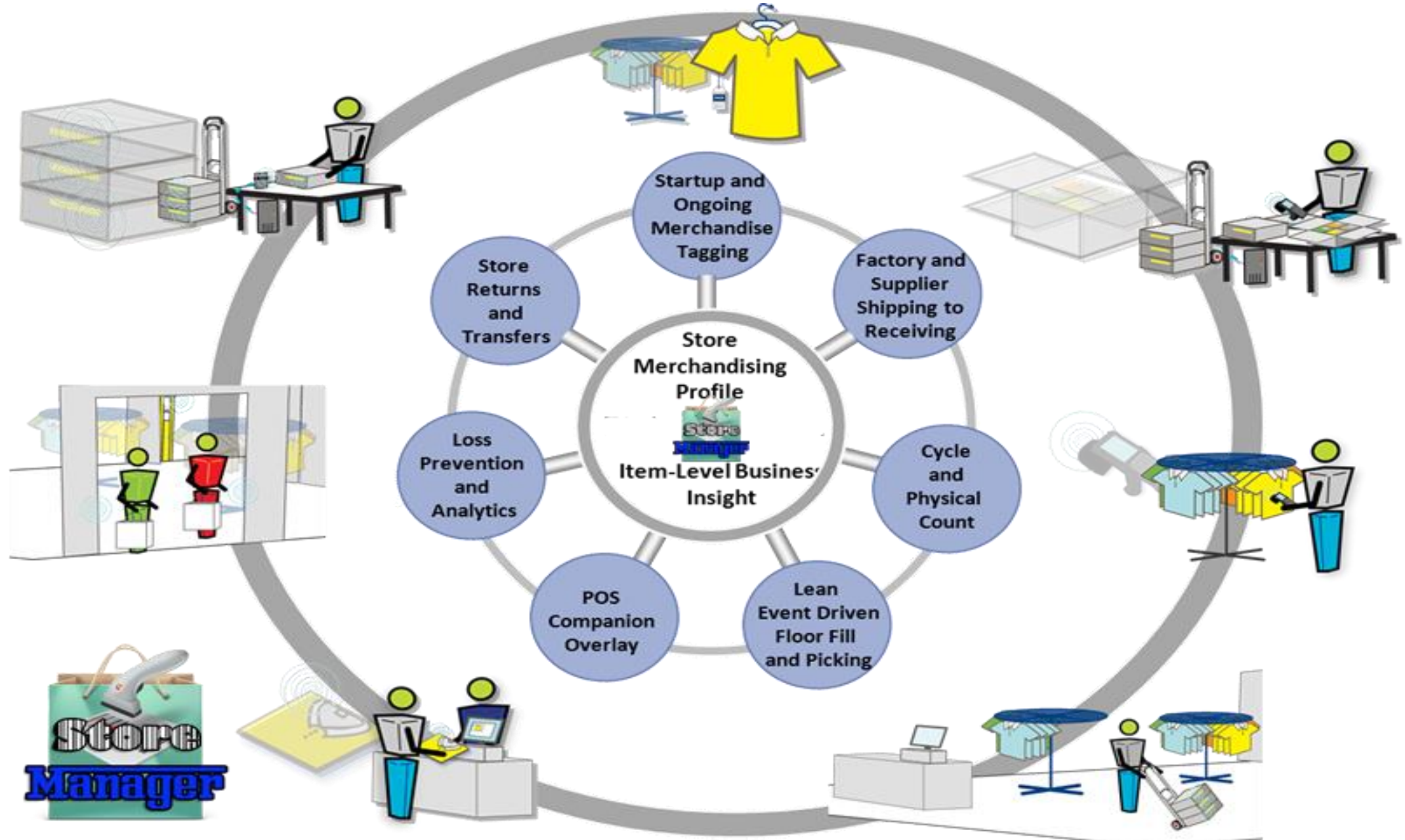
# Store management

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Storekeeping is that aspect of material control concerned with the physical storage of goods.”

In other words, storekeeping relates to art of preserving raw materials, work-in-progress and finished goods in the stores.

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# Objectives of Store management

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**Following are the main objectives of an efficient system of storekeeping:**

1. To ensure **uninterrupted supply of materials** and stores without delay to various production and service departments of the organization.
2. To prevent **overstocking and under stocking** of materials,
3. To protect materials from pilferage, theft fire and other **risks**.
4. To minimize **the storage costs**.
5. To ensure **proper and continuous control over materials**.
6. To ensure most **effective utilization of available storage space** and workers engaged in the process of storekeeping.

# Functions of Storekeeping

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1. **Issuing purchase requisitions** to Purchasing Department as and when necessity for materials in stores arises.
2. **Receiving purchased materials** with the purchasing order quality.
3. **Storing and preserving materials** at proper and convenient places
4. **Storing the materials** to prevent losses due to defective storage handling.
5. **Issuing materials to various** departments against material requisition slips duly authorized by the respective departmental heads.
6. **Undertaking a proper system of inventory control**, taking up physical inventory of all stores at periodical intervals and also to maintain proper records of inventory.
7. **Providing full information about the availability** of materials and goods etc., with the help of bin cards and stores ledger etc.

# Working of the stores

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There are four sections in the process of storekeeping .

- (a) Receiving section,
- (b) Storage section,
- (c) Accounting section, and
- (d) Issue section.

# Working of the stores

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## **(a) Receiving Section:**

There are four kinds of inventories received by stores viz., (i) raw materials, (ii) stores and supplies, (iii) tools and equipments, (iv) work-in- progress or semi-finished goods.

**Following procedure is followed in receiving these inventories:**

- (i) **Receiving these incoming** materials in stores.
- (ii) **Checking and inspection** of these incoming materials and stores etc.
- (iii) **Recording the incoming** materials in goods received book.
- (iv) **Preparing and forwarding** goods inwards note to purchasing section.
- (v) **Informing the purchase department** about damaged and defective goods and surplus or deficit supplies etc. along with rejection forms and notes.
- (vi) **Returning damaged** or defective goods to the suppliers in accordance with the instructions of the purchase department.
- (vii) **Forwarding the materials** to respective stores and locations where these are to be stored or preserved.

# Working of the stores

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## (b) Storage Section:

The store room should be located at a **convenient and appropriate** place. It should have ample facilities to store the materials properly viz. **bins, racks and shelves etc.** There can be a **single store room in case of a small organization**, but a **large scale concern can have different or multiple stock rooms** in addition to general or main store.

The **separate stockrooms** may be used for different classes of inventories. The material should be stored in such a manner as to protect it against **the risks of damage**, destruction and any kind of loss. Each article should have identifying marks viz., stamping, embossing, colour, coding and painting etc. These risks are very useful in locating or identifying an article in the stores.

# Working of the stores

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## **(c) Accounting Section:**

This section is concerned with keeping proper records with regard to **receipt and issue of materials**. The primary task of this section is to undertake the process of inventory control.

## **(d) Issue Section:**

The materials should be issued to respective departments on receiving duly **authorised requisition slips**. An entry should be made **immediately on the bin card attached** with the bin from where the material has been issued.

Bin cards contain valuable information with regard to **receipt and issue of materials**, which is greatly helpful in exercising a system of inventory control. These cards are further helpful in determining various levels of materials viz., **maximum, minimum, and re-ordering level**.

# Working of the stores

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## What is a stores ledger?

A *stores ledger* is a manual or computer **record of the raw materials** and production supplies stored in a production facility. It is maintained by the person responsible for **these assets, such as the warehouse manager**. A stores ledger is particularly useful for maintaining a perpetual inventory system, since it tracks the current quantity of items on hand.

A stores ledger can be used for the following purposes:

- **By auditors**, to see how well the company's inventory records compare to its on-hand quantities.
- **By the purchasing staff**, to determine when and in what quantities to purchase additional inventory items.
- **By the accounting staff**, to use as the basis for calculating the ending cost of inventory on hand.

# What is a stores ledger?

MATERIAL REQUISITION							
Charge job/ Cost Centre No: .....				Serial No: ..... Date: .....			
Code No.	Description	Quantity or weight	Cost office only				Stores ledger
			Rate	Unit	\$	\$	
Authorised by:		Storekeeper:		Prices entered by:			
Received by:		Bin card entered:		Calculations checked:			

# Store design

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The store room is commonly described as a place for everything and **everything at its place**.

The size and the type of the storage space is dependent on varied factors such as number of **items to be stored, quantity, characteristics of the materials to be stored, space**, due consideration should also be given to the space required for the movement of material handling equipment inside the store area.

The ways inside the store room are divided between the **main tracks and side streets**. The main track must provide for two way movement and the side streets for one way.

# Store design

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The following eight types of equipment are commonly used in storing materials:

- 1) Pallets and skids
- 2) Open and closed shelving
- 3) Cabinets (with or without counters)
- 4) Bins
- 5) Tacking boxes
- 6) Special storage racks
- 7) Gravity feed racks
- 8) Outdoor platforms and racks

# Factors to Consider in Manufacturing Layouts

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- Type of product
- Type of production process
- Ergonomic considerations
- Economic considerations
- Space availability within the facility