C P PATEL AND F H SHAH COMMERCE COLLEGE, ANAND

NILAM PARMAR [NP]

Materials and Production Management

Unit 1 Introduction to Materials Management

- **Meaning and Definition of Materials Management**
- **Classification of Materials**
- **Objectives of Materials Management**
- **Importance and Scope of Materials Management**

Introduction

Materials management is a core supply chain function and includes supply chain planning and supply chain execution capabilities. Specifically, materials management is the capability firms use to plan total material requirements. The material requirements are communicated to procurement and other functions for sourcing. Materials management is also responsible for determining the amount of material to be deployed at each stocking location across the supply chain, establishing material replenishment plans, determining inventory levels to hold for each type of inventory (raw, WIP, Finished Goods), and communicating information regarding material needs throughout the extended supply chain.

Typical roles in Materials Management include: Materials Manager, Inventory Control Manager, Inventory Analyst, Material Planner, Expediter and emerging hybrid roles like "buyer planner".

The primary business objective of Materials Management is assured supply of material, optimum inventory levels and minimum deviation between planned and actual results.

Meaning

Material management is an approach for planning, organizing, and controlling all those activities principally concerned with the flow of **materials** into an organisation.

Definition

L.J. De Rose:

“Material management is the planning, directing, controlling and co-ordination of all those activities concerned with material and inventory requirements, from the point of their inception to their introduction into manufacturing process.”

As per De Rose all those functions which start with the procurement of materials and end with completion of manufacturing are a part of material management.

N.K. Nair:

"Material management is the integrated functioning of the various sections of an organization dealing with the supply of materials and allied activities in order to achieve maximum co-ordination."

Materials management has been defined in several ways. Some of the important definitions are as follows:

(i) Materials Managements is the "management of the flow of materials into an organization to the point, where, those materials are converted into the firm's end product(s)." (*Bailey and Farmer*) ...

(ii) Materials management is the "process by which an organization is supplies with goods and services that it needs when the material is either consumed or incorporated into some product. The executives, who engage in materials management, are concerned with three basic activities viz., buying, storage of materials and movement". (*Ammer*)

(iii) Materials management is "a confederacy of traditional materials activities bound by a common idea-the idea of an integrated management approach to planning, acquisition, conversion, flow and distribution of production materials from the raw materials stage to the finished product stage." (*Lee and Dobler*)

(iv) Materials management is "the grouping of management functions related to the complete cycle of materials 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 finished product. It differs from materials control in that the latter term, traditionally is limited to the internal control of production on materials". (American production and inventory control society)

Classification of Materials

1. **Raw materials:** Raw materials are purchased from the original producer or manufacturers and are used directly or subjected to a conversion process in producing the firm's product. For example, plastic granules are the raw materials which are converted into plastic products through conversion processes such as plastic moulding. The moulded plastic part shall be a raw material for some assembly along the supply chain.

2. **Purchase components:** Nowadays, most of the industries purchase finished components from the vendors and assemble them within their plant to obtain the finished product. Usually 95 per cent purchased components are those which do not represent the core competency of the buying firm. But 5 per cent of in-house components which represent the core competency of that industry go into the final finished product. These 5 per cent are critical high value parts.
3. **Work-in-progress:** This category represents the materials in the semi-finished state as a result of operation being performed on raw materials purchased from outside. These constitute a large proportion of inventory blocked as capital. Lean manufacturing or low inventory manufacturing has the objective of minimizing the WIP (Work-in-Progress) through speeding up the operation by using a pull system on the downstream side.
4. **Finished goods:** The finally produced goods are termed finished goods. They are ready for sale and function as a buffer between production and marketing departments.

5. **Spares:** Spares are important inventories and usually represent the standby for important components of production equipment which convert the raw material to finished product. Spares are classified into three categories: vital, essential and desirable.
6. **Consumables:** These materials are used in the manufacturing process and cannot be reused for the same purpose. Coal, mineral oil, lubricants, cotton waste, paints, oxygen, stationery items like pencil, paper, ink, etc represent some of the consumable stores.
7. **Machinery and equipment:** All the machinery, power and hand-driven equipment such as presses, lathe machines, typewriters, electric motors and other machines used in production in other departments is classified as stated above. A complete record of these machines during their lifetime in terms of repair, replacement and renewal is usually kept on a history card.

8. **Inflammables:** Due to their hazardous nature, inflammables are generally stored as far as possible from the main building, with fire-fighting arrangement nearby. Materials such as petrol, kerosene, paints and films fall into this category.
9. **Chemicals:** Chemicals should be stored, preserved and issued very cautiously after a careful scrutiny and proper analysis since their use could put even life to risk. Items such as carbides acids and nitrous gases belong to this class.
10. **Furniture:** Moveable contents of a house like chairs, tables and almirahs are furniture items. Their maintenance is quite important and a record should be maintained, since they are loaned at times.
11. **Scrap materials:** Scrap represents the waste material produced in the process of production. Scrap is sold to secondary markets so as to fetch some value out of it.
12. **Packaging materials:** These include all kinds of wrapping materials such as paper, sawdust, straw and containers like boxes, drums, bottles as well as protective coating such as wax, grease, etc.

13. **Fuel stock:** These are also consumable store items. But there is a slight difference between the two in terms of their use. A fuel stock is directly used for production as a fuel for furnace, oven, etc. Sometimes it may be taken as raw materials. Coal is fuel stock but is also raw material for iron and steel industry.
14. **General stores:** In large undertakings a general stores section is separate from other stores under an independent in-charge to cover a large number of items not directly linked with production process. However, they are required for efficient running of the enterprise. For example, soap, brasso, brooms, stationery, etc. Belong to this class.

Objectives of Materials Management

Primary Objectives:

1. Low Prices:

If materials department succeeds in reducing the price of items it buys, it contributes in not only reducing the operating cost but also in enhancing the profits.

2. Lower Inventories:

By keeping inventories low in relation to sales, it ensures that less capital is tied up in inventories. This increases the efficiency with which the capital of the company is utilized resulting in higher return on investment. Storage and carrying costs are also lower.

3. Reduction in Real Cost:

Efficient and economical handling of materials and storage lowers the acquisition and possession cost resulting in the reduction in the real cost.

4. Regular Supply:

Continuity of supply of materials is essential for eliminating the disruption in the production process. In the absence of regular supply of materials, production costs go up.

5. Procurement of Quality Materials:

Materials department is responsible for ensuring quality of materials from outside suppliers. Therefore, quality becomes the single most objective in procurement of materials.

6. Efficient handling of Materials:

The effective material control techniques help the efficient handling of materials resulting in the lowering of production cost.

7. Enhancement of firm's goodwill:

Good relations with the suppliers of materials enhance the company's standing in the society as well as in the business community.

8. Locating and developing future Executives:

Materials manager must devote special effort to locate men at lower position who can take up the executive posts in future. It helps in developing talented personnel who are ready to undertake future responsibilities of the business relating to materials management.

Secondary Objectives:

The following are the important secondary objectives of materials management.

1. Reciprocity:

The purchase of raw materials from the organisations/customer's by the concern and in turn, sale of finished products to the above customers is known as reciprocity. It serves the twin purpose of increasing purchasing as well as sales.

2. New Developments:

The staff of the materials department deals regularly with the suppliers responsible for new developments in material handling. These developments can be successfully applied in material handling and management.

3. Make or Buy Decisions:

The material manager with regular reviews of cost and availability of materials can safely conclude that whether the material is to be purchased or developed in the organisation itself.

4. Standardisation:

Standardisation of materials is greatly helpful in controlling the material management process. With regular stock-taking, the non-standardised items can be rejected and standard components may be brought into product designs to reduce the cost of production. It is further helpful in promoting the standardisation with suppliers.

5. Assistance to Production department:

By supplying the standardised materials or components to the production department, quality products can be assured. It is helpful in imparting the economic knowledge in bringing about the desired improvement in the product.

6. Co-operation with other departments:

Successful management of materials department contributes to the success of every other department in the organisation. At the same time the success of materials department depends on how successful it is in getting the co-operation of the staff of the other departments.

7. Conception of future outlook:

The materials manager must have some conception of future outlook for prices, cost and general business activity. Forecasting can be made about the future

trends in materials. The materials manager should be able to foresee the prices and costs of the raw materials and general business conditions through their daily contracts with the suppliers.

From the above it is clear that materials management serves two fold objectives viz., to strive for a reduction in cost of production and distribution and to help the enterprise in attaining its objectives.

These dual objectives of the materials management further aim at maintaining the regular flow of production by purchasing materials of right quality, in a right quantity at a right time from a right source, on right terms and conditions and at lower price.

It is helpful in efficiently controlling the inventories. It is further beneficial in developing good buyer seller relations. Coordination with other departments is established and considerably helps the organisation to grow and advance in technical field.

Importance of Material Management

Material management is a service function. It is as important as manufacturing, engineering and finance. The supply of proper quality of materials is essential for manufacturing standard products. The avoidance of material wastage helps in controlling cost of production. Material management is essential for every type of concern.

The importance of material management may be summarized as follows:

1. The material cost content of total cost is kept at a reasonable level. Scientific purchasing helps in acquiring materials at reasonable prices. Proper storing of materials also helps in reducing their wastages. These factors help in controlling cost content of products.

2. The cost of indirect materials is kept under check. Sometimes cost of indirect materials also increases total cost of production because there is no proper control over such materials.

3. The equipment is properly utilized because there are no break downs due to late supply of materials.

4. The loss of direct labour is avoided.

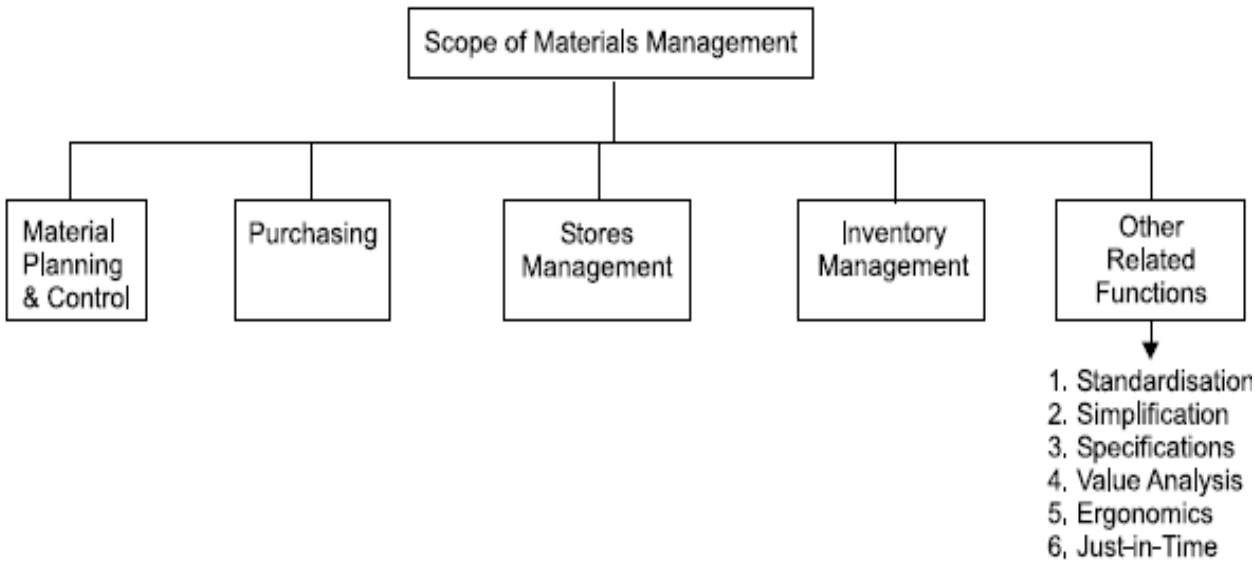
5. The wastages of materials at the stage of storage as well as their movement is kept under control.

6. The supply of materials is prompt and late delivery instances are only few.

7. The investments on materials are kept under control as under and over stocking is avoided.

8. Congestion in the stores and at different stages of manufacturing is avoided.

Scope of materials management



1. **Materials planning and control:**
   Based on the sales forecast and production plans, the materials planning and control is done. This involves estimating the individual requirements of parts, preparing materials budget, forecasting the levels of inventories, scheduling the orders and monitoring the performance in relation to production and sales.

2. **Purchasing:**
   This includes selection of sources of supply finalization in terms of purchase, placement of purchase orders, follow-up, maintenance of smooth relations with suppliers, approval of payments to suppliers, evaluating and rating suppliers.

3. **Stores management or management:**
   This involves physical control of materials, preservation of stores, minimization of obsolescence and damage through timely disposal and efficient handling, maintenance of stores records, proper location and stocking. A store is also responsible for the physical verification of stocks and reconciling them with book figures. A store plays a vital role in the operations of a company.

4. **Inventory control or management:**
   Inventory generally refers to the materials in stock. It is also called the idle resource of an enterprise. Inventories represent those items, which are either stocked for sale or they are in the process of manufacturing or they are in the form of materials, which are yet to be utilized. The interval between receiving the purchased parts and transforming them into final products varies from industries to industries depending upon the cycle time of manufacture. It is, therefore, necessary to hold inventories of various kinds to act as a buffer between supply and demand for efficient operation of the system. Thus, an effective control on inventory is a must for smooth and efficient running of the production cycle with least interruptions.

5. **Other related activities**

   a. ***3S***

   i. **Standardization:** Standardization means producing maximum variety of products from the minimum variety of materials, parts, tools and processes. It is the process of establishing standards or units of measure

by which extent, quality, quantity, value, performance etc. may be compared and measured.

ii. **Simplification:** The concept of simplification is closely related to standardization. Simplification is the process of reducing the variety of products manufactured. Simplification is concerned with the reduction of product range, assemblies, parts, materials and design.

iii. **Specifications:** It refers to a precise statement that formulizes the requirements of the customer. It may relate to a product, process or a service.

b. **Value analysis**: Value analysis is concerned with the costs added due to inefficient or unnecessary specifications and features. It makes its contribution in the last stage of product cycle, namely, the maturity stage. At this stage research and development no longer make positive contributions in terms of improving the efficiency of the functions of the product or adding new functions to it.

c. **Ergonomics** *(Human Engineering):* The human factors or human engineering is concerned with man-machine system. Ergonomics is "the design of human tasks, man-machine system, and effective accomplishment of the job, including displays for presenting information to human sensors, controls for human operations and complex man-machine systems."