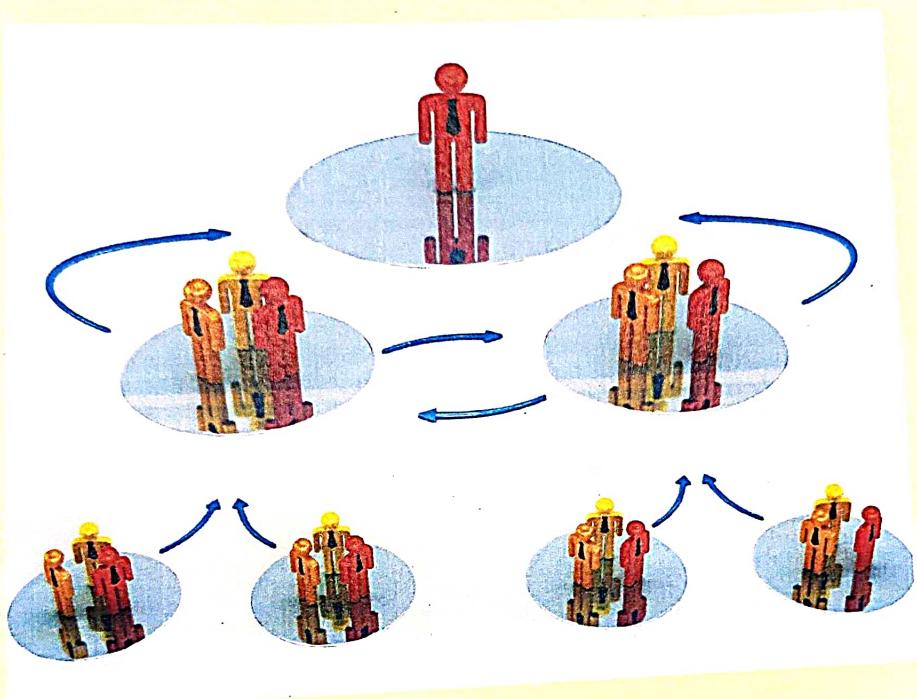


# DISHA COLLEGE

DEPARTMENT OF MANAGEMENT

NOTES FILE



SUBJECT NAME- Material Management  
SUBJECT INCHARGE- Kajal Tripathi

Unit

II

Manpower &  
Capacity Requirement  
Planning

# Objectives of Material Management

## Primary Objectives

- 1) Low Price - purchasing should be done at lowest cost.
- 2) High Inventory turnover - This means that the average inventory locked up is low compared to the sales volume. Inventory means idle money and ∴ the lower it is higher will be the profit.  
Storage and carrying cost of inventory will therefore also be lower if the volume is small. Low cost acquisition and possession.
- 3) Continuity of Supplies. Regular flow of material is required.
- 4) Consistency of quality → Material of right quality has to be bought. Otherwise the quality of the end product may suffer.
- 5) Low payroll cost:- Material Mgmt dept should also run at lowest possible cost.
- 6) Favourable Supplier relations: In order to ensure continuity of supply and consistency of quality, it is necessary to have a favourable supplier/buyer relation.
- 7) Development of Personnel. It is necessary that the person dealing with materials are apprised of the latest ideas or trends.
- 8) Maintainance of regular records. For an efficiently run department it is necessary to have good, updated and easily accessible records.

## Secondary Objectives

### 1. Favourable reciprocal relations

It sometimes pays to buy materials from the companies to whom the end products are sold. This is called reciprocal relationship. A good material management department should encourage such reciprocal relationship with other companies.

### 2. New materials & products

Should have knowledge regarding development of new products by its competitors.

### 3. Make or buy decision

The material department along with the help of engineering dept by taking pros & cons of making or buying should buy from outside sources only if it is economical to do so.

### 4) Standardization

Materials req'd bought from outside should be standardised so as to have fewer number of materials. This will reduce total inventory.

### 5) Product Improvement

M. dept should also help the company in improving the quality of the end product by suggesting various alternative ~~models~~ methods.

### 6) Forecast

The material dept has to prepare the material budget and forecast of payments. The dept will also forecast the prices of materials to be purchased.

## Manpower Planning

Manpower planning which is also called as human Resource Planning consists of putting right no. of right kind of people at right place, at right time doing the right things for which they are suited for achievement of goals of the Orgn

HRP procedure is as follows

- Analysing the current manpower inventory
- Making future manpower forecasts
- Developing employment programmes
- Design training programmes.

### Steps in Manpower Planning

- 1) Analysing the current manpower inventory
  - Type of Orgn
  - Number of departments
  - No and qty of such departments
  - Employees in these work units

- 2) Making future manpower forecasts

### Manpower forecasting techniques

1. Expert forecasts - includes informal decisions, formal expert surveys and Delphi technique
2. Trend Analysis - Manpower needs can be projected through extrapolation (projecting past trends), induction (using base year as reference) and statistical analysis (Central tendency measure).

3. Work load Analysis - It is dependent on the <sup>nature of</sup> workload in a department in a branch or division.
4. Work force Analysis - Whenever production & time period has to be analysed, due allowances have to be made for getting net manpower requirements.
5. Other Methods - e.g. Regression, new venture analysis
- 6) Developing Employment programmes - Once the current inventory is compared with future forecasts, the employment programmes can be framed and developed accordingly.

## Importance of Manpower Planning

- 1) Key to Managerial functions: The managerial functions can be put into actions only through manpower or employees who are going to exercise those functions.
- 2) Efficient Utilization: Large scale industries require management of large scale manpower for handling the Orgn
- 3) Motivation: Manpower Planning also includes proper and justified formulation of investment plans for further participation and employment of <sup>incentive</sup> employees in concern.
- 4) Better Human Relations:- An Orgn can stabilize itself if human relations developed are strong. Human relation become strong through effective control, clear communication, effective supervision and leadership in concern.
- 5) Higher productivity. Productivity increases when resources are utilized in best possible manner.

## Material Planning

It is the scientific technique of determining in advance the req of raw materials, ancillary parts, & components spares etc as directed by the production program.

## Objectives of Material Planning

1. Ensure best possible production
2. Least Wastage
3. Quality Control
4. Maintain Just in time
5. Maintain strict delivery schedule.

1) MPS : It is initially developed from firm customer orders or from forecasts of demand before MRP system begins to operate. The MRP system translates end items into schedule demands & translates MPS into specific component requirements. Many systems make a simulated trial run to determine whether the proposed master can be satisfied.

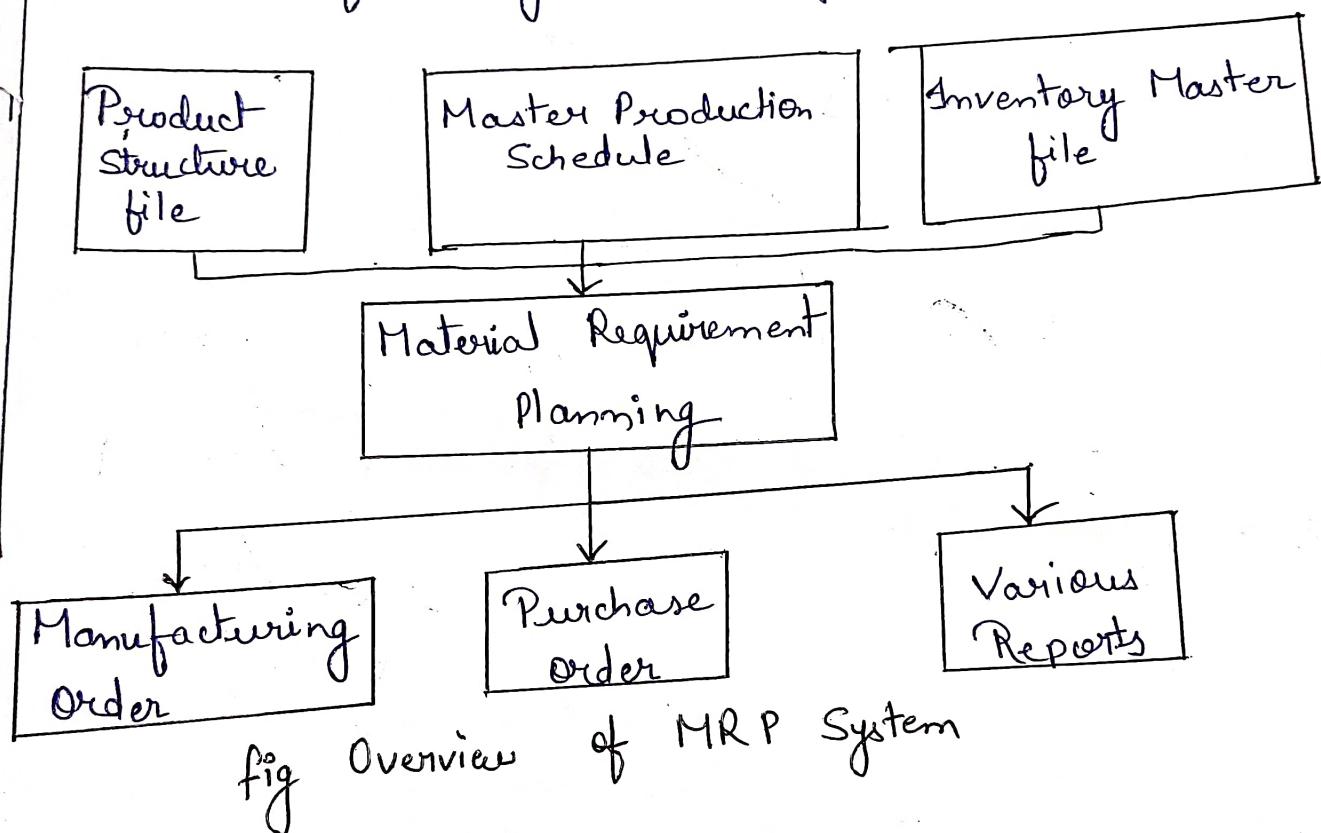
2) BOM The information is obtained from product design documents, workflow analysis and other standard manufacturing information.

### Techniques of Material Planning

The basis for material planning is the forecast demand for the end products. Forecasting techniques such as Weighted average method, Exponential smoothening & time series models are used for the same.

Material Requirement Planning System  
MRP is a production planning, scheduling & inventory control system used to manage the manufacturing processes.

- It is a computerized Inventory Control
- It is Production Planning System
- It is MIS
- It is manufacturing control system



1) Master Prod<sub>n</sub> Schedule  
It is a plan that shows how many products should be made and when they should produced. It helps coordinate production activities and ensures that the right amount of products is available to meet customer demand.

2) Inventory Record File  
This file gives complete up to date information about on hand inventory, transit inventory, planned order and schedule receipt.

## Bills of Material

It gives information about how product is manufactured specifying sub component items and their sequence of build up in the final product.

## Capacity Requirements Planning

CRP are the processes of determining whether a company's available production capacity can meet its production goal. Also CRP first looks at the company's planned manufacturing schedule. This method then weighs the schedule against the company's production capabilities to see if meeting the capacity is realistic. If the company finds that its production capacity is inadequate, it may alter its production goals or take other steps to bring production capacity in line with capacity. CRP goes hand in hand with MRP which ensures a company has the physical assets to meet production needs.

## Steps for Capacity Requirement Planning

### Step 1: Assess Current Capacity

Look for the number and hours of shifts available as well as absenteeism estimates and supply chain variables, like vendor performance, lead time and inventory.

Step 2: - Develop a strong demand Plan Supply chain planning will provide the most accuracy, since it allows for aggregated demand forecasting, calculating work center capacity by production times identifying bottlenecks, planning

"What if" scenarios, master scheduling & more.

Step 3: Determine Capacity Modification Requirements

Adjustments are done as per demand. Additional shifts or overtime may be required. One may need to outsource certain production aspects.

Purchasing additional equipment may also be needed if the demand will be consistent.

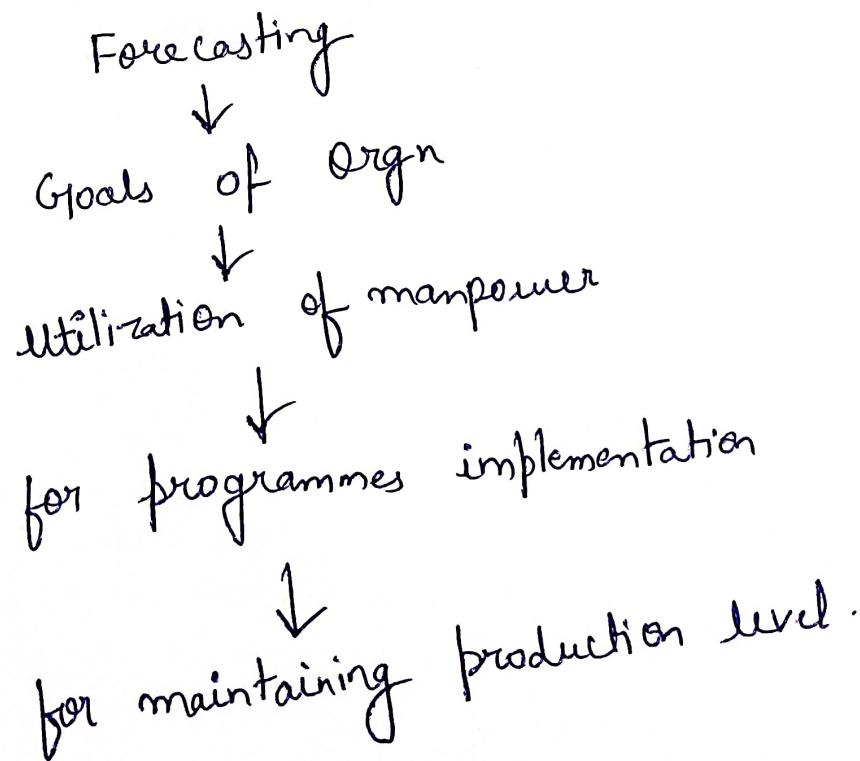
## Manpower Planning

Manpower planning is a process which includes  
Right Qty of people  
Right Quality of people  
Right Time  
Right Job.

to meet the requirements of the organisation.

### Objectives

- For correct estimation
- For need of Orgn
- For continuous production run
- For recruitment & selection
- For suitable recruitment process



## Capacity Requirement Planning

Defn: Capacity planning is the process of determining the production capacity needed by an organization to meet changing demand for its products.

Goal: To meet the current & future level of the requirement at the minimum wastage

Capacity is calculated as,

$$(\text{No of M/c or workers}) \times (\text{No of shifts}) \times (\text{Utilization}) \times (\text{Efficiency})$$

$$\frac{\text{Actual Output}}{\text{Effective Capacity}}$$

Questions

1. What type of capacity req?
2. How much capacity is req?
3. When capacity is required?

## Types

1. Long term
2. Medium term
3. Short term

## Capacity Planning in Material & Production Management

Production managers are more concerned about the capacity for the following reasons:

Sufficient capacity is required to meet the customer demand on time.

Capacity affects the cost efficiency of operations

Capacity affects the scheduling system

Capacity creation requires an investment.

**Objectives of Material Management, Manpower planning and Material Management, Materials Planning, Capacity Requirements Planning.**

## **INTRODUCTION**

Materials management is important as most manufacturing concerns spend more than 60% of the money they take in, on materials. That means materials soak up a substantial portion of the capital invested in the industry. This emphasizes the requirement for adequate materials management and control because even small savings in materials can reduce the production cost very effectively, thus profit increases.

Materials management makes sure the required materials available are available with the consumer's demands, thus giving a schedule of costs and resources that the company needs. Material management involves controlling the type, amount, location, movement, timing of the purchase of various materials, etc.

Materials management definition can be expressed as "Materials Management is the planning, directing, controlling and coordinating of the activities which are concerned with materials and inventory requirements, from the point of their origination to their introduction into the manufacturing process. It starts with the inspection of materials quality and quantity and ends with its issuance to production to meet customer's demand as per the schedule and at the lowest possible cost."

### **❖ Objectives of Materials Management:**

"The objectives of materials management department are:

#### **Primary**

- Right price**
- High turnover**
- Low procurement & storage cost**
- Continuity of supply**
- Consistency in quality**
- Good supplier relations**
- Development of personnel**
- Good information system**

#### **Secondary**

- Forecasting**
- Inter-departmental harmony**
- Product improvement**
- Standardization**
- Make or buy decision**
- New materials & products**
- Favorable reciprocal relationships**

### **A. Primary Objectives:**

1. Low price.
2. High inventory turnover (Inventory turnover  
= Sale/Average Inventory)
3. Low cost of acquisition and possession.
4. Continuity of supply.
5. Consistency of quality.
6. Low payroll (wage) cost.
7. Favourable supplier relations.
8. Development of personnel.
9. Maintenance of regular records.

### **B. Secondary Objectives:**

1. Favourable reciprocal relations.
2. New materials and products.
3. Make or buy decision.
4. Standardisation.
5. Product improvement.
6. Inter-departmental harmony.
7. Forecast. *Estimating future* *flows of the product's feedback*

**These objectives may now be briefly described:**

**1. Low price:**

This is one of the most important objectives of materials management. It means that the materials or services as received by the company should be purchased at the lowest possible cost.

**2. High inventory turnover:**

This means that the average inventory locked up is low compared to the sales volume. Inventory means idle money and, therefore, the lower it is, the higher will be the profit. Storage and carrying cost of inventory will, therefore, also be lower if the volume is small. Low cost acquisition and possession. This means that the materials are acquired and kept in stores at a low cost.

**3. Continuity of supplies:**

One of the main objectives of proper (scientific) materials management is to ensure that there is no disruption in supply which might hamper the smooth flow of production. Continuity of supply is necessary to ensure uninterrupted production.

**4. Consistency of quality:**

Materials of the right quality have to be bought. Otherwise the quality of the end-product may suffer. Hence, the quality will have to be good and consistent.

**5. Low payroll cost:**

Like any other department, the materials department should be run at the lowest possible cost.

**6. Favourable supplier relations:**

As the name signifies, in order to ensure continuity of supply and consistency of quality, it is necessary to have a favourable supplier/buyer relation.

**7. Development of personnel:**

Regular developments are taking place in the materials management field. It is necessary that the persons dealing with materials management are appraised of the latest ideas and trends. Hence, the development and training of personnel engaged in materials functions is absolutely essential.

**8. Maintenance of regular records:**

For any efficiently run department it is necessary to have good, updated and easily accessible records.

**B. Secondary Objectives:**

**1. Favourable reciprocal relations:**

It sometimes pays to buy materials from the companies to whom the end products are sold. This is called reciprocal relationship. A good materials management department should encourage such reciprocal relationships with other companies.

## 2. New materials and products:

The materials manager is always in touch with the outside world. He acts as an information centre for the management and informs the management, not only about the materials and products which his company requires, but also about the development of new products produced by its competitors.

## 3. Make or buy decision:

The decision as to whether an item should be made from within the company, i.e., with its own resources, or purchased from outside (external) sources is a very important one.

The materials department, along with the help of the engineering department, by taking the pros and cons of making or buying, should buy from outside sources only if it is economical to do so.

## 4. Standardisation:

Materials required by the company and bought from outside should be standardised so as to have a fewer number of materials. This will reduce total inventory.

## 5. Product improvement:

The materials department should also help the company in improving the quality of the end product by suggesting various alternative methods.

## 6. Inter-departmental harmony:

The materials department should have a good relationship with the other departments inside the company.

## 7. Forecast:

The materials department has to prepare the materials budget and forecast of payments. The department will also forecast the prices of materials to be purchased.

## ❖ Manpower Planning

Manpower Planning which is also called as Human Resource Planning consists of putting right number of people, right kind of people at the right place, right time, doing the right things for which they are suited for the achievement of goals of the organization. Human Resource Planning has got an important place in the arena of industrialization. Human Resource Planning has to be a systems approach and is carried out in a set procedure. The procedure is as follows:

- Analysing the current manpower inventory

*in the orgs*

*current employees working*

- Making future manpower forecasts
  - Developing employment programmes
  - Design training programmes
- forecasting estimating demand  
recruitment selection procedures & placement  
to improve skills, capabilities, knowledge of workers. Plans
- Steps in Manpower Planning**

### 1. Analysing the current manpower inventory-

Before a manager makes forecast of future manpower, the current manpower status has to be analysed. For this the following things have to be noted-

- Type of organization
- Number of departments HR, Finance, Marketing [Maths, Commerce Mgt, BEd, BCom, BCA] computers
- Number and quantity of such departments
- Employees in these work units (Prof under each dept)

Once these factors are registered by a manager, he goes for the future forecasting.

### 2. Making future manpower forecasts-

Once the factors affecting the future manpower forecasts are known, planning can be done for the future manpower requirements in several work units.

The Manpower forecasting techniques commonly employed by the organizations are as follows:

**1. Expert Forecasts:** This includes informal decisions, formal expert surveys and Delphi technique.  
 gathering a panel of experts  
 engaging several round of question  
 principal about manpower planning decisions

**2. Trend Analysis:** Manpower needs can be projected through extrapolation (projecting past trends), indexation (using base year as basis), and statistical analysis (central tendency measure).

**3. Work Load Analysis:** It is dependent upon the nature of work load in a department, in a branch or in a division.  
 type of work, type of responsibility

**4. Work Force Analysis:** Whenever production and time period has to be analysed, due allowances have to be made for getting net manpower requirements. (Amount req for living) salaries

**5. Other methods:** Several Mathematical models, with the aid of computers are used to forecast manpower needs, like budget and planning analysis, regression, new venture analysis.

### 3. Developing employment programmes-

proper recruitment & selection procedures & placement  
 Once the current inventory is compared with future forecasts, the employment programmes can be framed and developed accordingly, which will include recruitment, selection procedures and placement plans.

### 4. Design training programmes-

These will be based upon extent of diversification, expansion plans, development programmes, etc. Training programmes depend upon the extent of improvement in technology and advancement to take place. It is also done to improve upon the skills, capabilities, knowledge of the workers.  
 Smart boards, ERP, attendance through card or thumb

## ❖ Importance of Manpower Planning:

1. Key to managerial functions- The four managerial functions, i.e., planning, organizing, directing and controlling are based upon the manpower. Human resources help in the implementation of all these managerial activities. Therefore, staffing becomes a key to all managerial functions.
2. Efficient utilization- Efficient management of personnel's becomes an important function in the industrialization world of today. Setting of large-scale enterprises require management of large scale manpower. It can be effectively done through staffing function.
3. Motivation- Staffing function not only includes putting right men on right job, but it also comprises of motivational programmes, i.e., incentive plans to be framed for further participation and employment of employees in a concern. Therefore, all types of incentive plans become an integral part of staffing function. *Incentives, Employee of the month (Banking sector)*
4. Better human relations- A concern can stabilize itself if human relations develop and are strong. Human relations become strong through effective control, clear communication, effective supervision and leadership in a concern. Staffing function also looks after training and development of the work force which leads to co-operation and better human relations.
5. Higher productivity- Productivity level increases when resources are utilized in best possible manner. Higher productivity is a result of minimum wastage of time, money, efforts and energies. This is possible through the staffing and its related activities (Performance appraisal, training and development, remuneration)

## ❖ Need of Manpower Planning

Manpower Planning is a two-phased process because manpower planning not only analyses the current human resources but also makes manpower forecasts and thereby draw employment programmes. Manpower Planning is advantageous to firm in following manner:

1. Shortages and surpluses can be identified so that quick action can be taken wherever required.
2. All the recruitment and selection-programmes are based on manpower planning.
3. It also helps to reduce the labour cost as excess staff can be identified and thereby overstaffing can be avoided.
4. It also helps to identify the available talents in a concern and accordingly training programmes can be chalked out to develop those talents.
5. It helps in growth and diversification of business. Through manpower planning, human resources can be readily available and they can be utilized in best manner.
6. It helps the organization to realize the importance of manpower management which ultimately helps in the stability of a concern.

## ❖ Material planning

en ITC → FMCG, Hotels, paper & packaging

(Tobacco)

*Material planning*

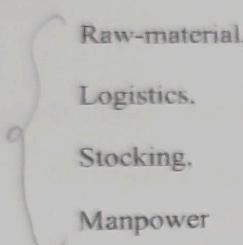
Material planning is a scientific technique of determining in advance the requirements of raw materials, ancillary parts and components, spares etc. as directed by the production program. It is a sub-system in the overall planning activity. There are many factors, which influence the activity of material planning. These factors can be classified as macro and micro systems.

1. Macro factors: Some of the macro factors which affect material planning, are price trends, business cycles, Govt. import policy etc.
2. Micro factors: Some of the micro factors that affect material planning are plant capacity utilization, rejection rates, lead times, inventory levels, working capital, delegation of powers and communication.

*Material Planning*

"Material Planning is a scientific way to determine the requirements of the raw material, components, spares, and other items that fulfills the production needs."

by P. Gopalkrishnan



### ❖ Objectives of Material Planning:

1. Ensure best possible production, *with best raw material & manpower*.
2. Least wastage, *Management of waste*.
3. Quality control, *Inspection*.
4. Maintain just-in-time, *maintaining inventory as per need* (*lead time should be less*)
5. Maintain strict delivery schedule.
6. To ensure that raw materials are readily available for production and products are readily available for delivery to consumers.
7. To sustain the lowest raw materials and finished product levels in store.
8. To organize manufacturing, delivery schedules, and purchasing activities.

MRP refers to the basic calculations used to determine components required from end item requirements. It also refers to a broader information system that uses the dependence relationship to plan and control manufacturing operations.

"Materials Requirement Planning (MRP) is a technique for determining the quantity and timing for the acquisition of dependent demand items needed to satisfy master production schedule requirements."

### ❖ Objectives of MRP

Material planning is a scientific technique of determining in advance the requirements of raw materials, ancillary parts and components, spares etc. as directed by the production program. It is a sub-system in the overall planning activity. There are many factors, which influence the activity of material planning. These factors can be classified as macro and micro systems.

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"Material Planning is a scientific way to determine the requirements of the raw material, components, spares, and other items that fulfils the production needs."

by P. Gopalkrishnan

{ Raw-material,  
Logistics,  
Stocking,  
Manpower

#### ❖ Objectives of Material Planning:

1. Ensure best possible production, with best raw material & manpower.
2. Least wastage, Management of waste.
3. Quality control, Inspection.
4. Maintain just-in-time, maintaining inventory as per need. (Lead time should be less)
5. Maintain strict delivery schedule.
6. To ensure that raw materials are readily available for production and products are readily available for delivery to consumers.
7. To sustain the lowest raw materials and finished product levels in store.
8. To organize manufacturing, delivery schedules, and purchasing activities.

MRP refers to the basic calculations used to determine components required from end item requirements. It also refers to a broader information system that uses the dependence relationship to plan and control manufacturing operations.

"Materials Requirement Planning (MRP) is a technique for determining the quantity and timing for the acquisition of dependent demand items needed to satisfy master production schedule requirements."

#### ❖ Objectives of MRP

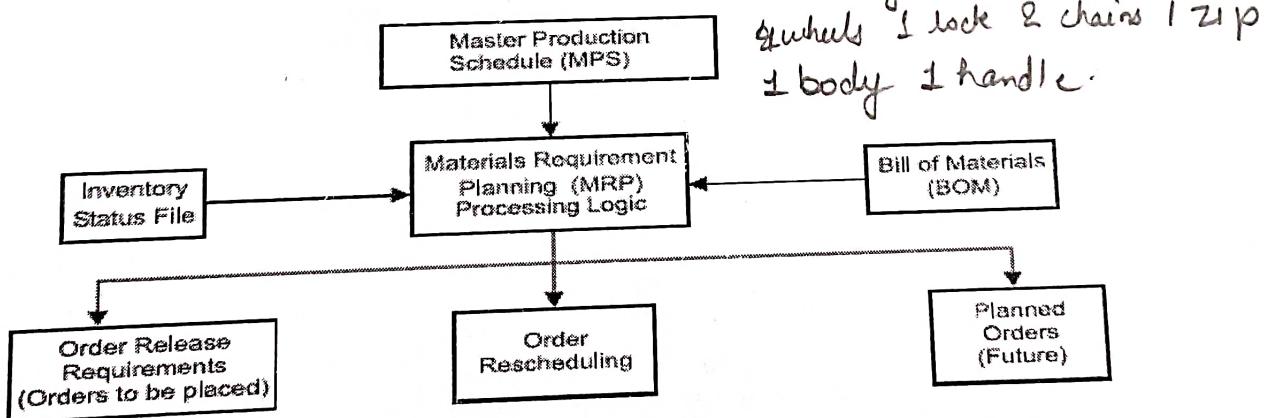
- 1. Inventory reduction:** MRP determines how many components are required when they are required in order to meet the master schedule. It helps to procure the materials/ components as and when needed and thus avoid excessive build up of inventory. *(Doesn't include overstocking of inventory)*
- 2. Reduction in the manufacturing and delivery lead times:** MRP identifies materials and component quantities, timings when they are needed, availabilities and procurements and actions required to meet delivery deadlines. MRP helps to avoid delays in production and priorities production activities by putting due dates on customer job order.
- 3. Realistic delivery commitments:** By using MRP, production can give marketing timely information about likely delivery times to prospective customers. *(Real time)*
- 4. Increased efficiency:** MRP provides a close coordination among various work centers and hence help to achieve uninterrupted flow of materials through the production line. This increases the efficiency of production system.

### ❖ MRP System (Material Requirements Planning)

The inputs to the MRP system are:

- (1) A master production schedule, *[Demand of which item is high]*
- (2) An inventory status file and
- (3) Bill of materials (BOM). *(The list of items required to create sub assembly product is called BOM)*

Using these three information sources, the MRP processing logic (computer programme) provides three kinds of information (output) for each product component: order release requirements, order rescheduling and planned orders.



### 1. MASTER PRODUCTION SCHEDULE (MPS)

MPS is a series of time phased quantities for each item that a company produces, indicating how many are to be produced and when. MPS is initially developed from firm customer orders or from forecasts of demand before MRP system begins to operate. The MRP system whatever the master schedule demands and translates MPS end items into specific component requirements. Many systems make a simulated trial run to determine whether the proposed master can be satisfied.

## 2. INVENTORY STATUS FILE

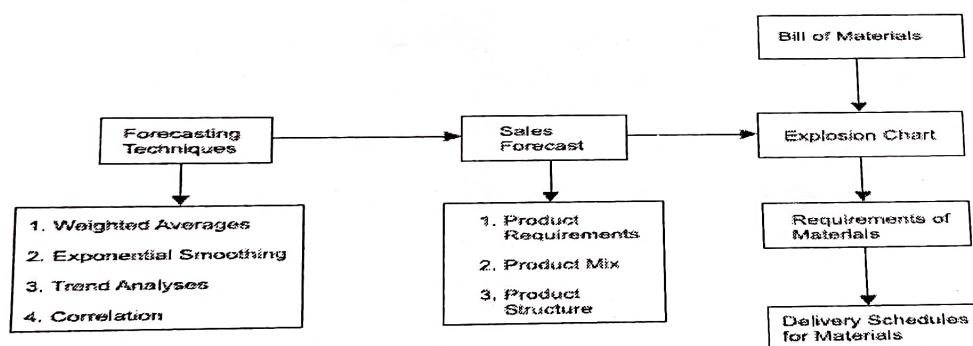
Every inventory item being planned must have an inventory status file which gives complete and up to date information on the on-hand quantities, gross requirements, scheduled receipts and planned order releases for an item. It also includes planning information such as lot sizes, lead times, safety stock levels and scrap allowances.

## 3. BILL OF MATERIALS (BOM)

BOM identifies how each end product is manufactured, specifying all subcomponents items, their sequence of build up, their quantity in each finished unit and the work centers performing the build up sequence. This information is obtained from product design documents, workflow analysis and other standard manufacturing information.

### ★ Techniques of Material Planning

One of the techniques of material planning is bill of material explosion. Material planning through bill of material explosion.



The basis for material planning is the forecast demand for the end products. Forecasting techniques such as weighted average method, exponential smoothening and time series models are used for the same. Once the demand forecast is made, it is possible go through the excuse of material planning. Bill of materials is a document which shows list of materials required, unit consumption location code for a given product. An explosive chart is a series of bill of material grouped in a matrix form so that combined requirements for different components can be done requirements of various materials are arrives at from the demand forecast, using bill of materials, through explosion charts. Thus material requirement plan will lead to be the development of delivery schedule of the materials and purchasing of those material requirements.

available production schedule meets production goal.  
Make necessary changes, take corrective action.  
Individual work centres  
Technique → forward start to finish  
Backward finish to start

## ❖ Capacity Requirements Planning

Capacity requirement planning forms part of the operational stage of the planning process and works in conjunction with a manufacturing requirement planning (MRP) system. A detailed capacity requirement plan provides an operational level overview for the production cell and assists the operations manager with identifying all of the elements that will be required to deliver the output.

For the operations manager to accept the capacity plan they may need to take into account, materials, machine production time, machine change over time and tooling, maintenance and downtime, along with manpower availability and skill, so that shift work can be assigned and resources can be used efficiently.

The operational team will feedback their ability to meet the planning requirements to the planning team, who will then look to ensure materials or components required for the production process are made available in time and in full via the procurement team. The planning team will then confirm the capacity plan and the materials requirement plan and generate a works order which will then be passed to the production team.

Design of the production system involves planning for the inputs, conversion process and outputs of production operation. The effective management of capacity is the most important responsibility of production management. The objective of capacity management (i.e., planning and control of capacity) is to match the level of operations to the level of demand.

Capacity requirements planning are the process of determining whether a company's available production capacity can meet its production goals. Also known as CRP, capacity requirement planning first looks at the company's planned manufacturing schedule. This method then weighs the schedule against the company's production capabilities to see if meeting the capacity is realistic. If the company finds that its production capacity is inadequate, it may alter its production goals or take other steps to bring production capabilities in line with capacity. CRP goes hand in hand with manufacturing requirement planning, which ensures a company has the physical assets to meet production needs.

## Steps for Capacity Requirements Planning? Advanced up-to-date

First, it's important to note that capacity requirements planning can only be as accurate as the data used. If a company is still relying on spreadsheets and/or disparate systems, there's a chance they won't have the most accurate and up-to-date data to use in the planning process. A company that uses advanced, connected software will yield more valuable information to work with, since their system will provide real-time data and a thorough look into operations across the company.

Regardless, the following steps should be followed when determining capacity requirements.

### Step 1: Assess Current Capacity

**Vendor performance** - how well vendor meets the req. of their contract (on-time delivery, quality, specifications)

To determine your current capacity, you'll need to collect information such as time studies and live data collection on equipment capabilities. You should look at the number of hours and shifts available, as well as absenteeism estimates and supply chain variables, like vendor performance, lead time and inventory.

### **Step 2: Develop a Strong Demand Plan**

An accurate demand plan is an important next step. Supply chain planning software will provide the most accuracy, since it allows for aggregated demand forecasting, calculating work center capacity by production time, identifying bottlenecks, planning "what if" scenarios, master scheduling and more.

a stage where ~~flow of goods gets prevented through supply chain~~

### **Step 3: Determine Capacity Modification Requirements**

With an understanding of capacity and a demand plan, you'll now need to look at where adjustments are needed to meet demand. Additional shifts or overtime may be required. You may need to outsource certain production aspects. Purchasing additional equipment may also be needed if the demand will be consistent.

#### **❖ Capacity planning in Material and production Management**

Capacity planning is to be carried out keeping in mind future growth and expansion plans, market trends, sales forecasting, etc. It is a simple task to plan the capacity in case of stable demand. But in practice the demand will be seldom stable. The fluctuation of demand creates problems regarding the procurement of resources to meet the customer demand. Capacity decisions are strategic in nature. Capacity is the rate of productive capability of a facility. Capacity is usually expressed as volume of output per period of time.

Production managers are more concerned about the capacity for the following reasons:

Sufficient capacity is required to meet the customers demand in time.

- ✓ Sufficient capacity is required to meet the customers demand in time.
- ✓ Capacity affects the cost efficiency of operations.
- ✓ Capacity affects the scheduling system.
- ✓ Capacity creation requires an investment.

Capacity planning is the first step when an organization decides to produce more or new products.

#### **▪ Process of Capacity Planning**

Capacity planning is concerned with defining the long-term and the short-term capacity needs of an organization and determining how those needs will be satisfied. Capacity planning decisions are taken based upon the consumer demand and this is merged with the human, material and financial resources of the organization.

Capacity requirements can be evaluated from two perspectives long-term capacity strategies and short-term capacity strategies.

#### **1. LONG-TERM CAPACITY STRATEGIES**

Long-term capacity requirements are more difficult to determine because the future demand and technology are uncertain. Forecasting for five or ten years into the future is more risky and difficult. Even sometimes company's today's products may not be existing in the future. Long range capacity requirements are dependent on marketing plans, product development and life-cycle of the product. Long-term capacity planning is concerned with accommodating major changes that affect overall level of the output in long-term. Marketing environmental assessment and implementing the long-term capacity plans in a systematic manner are the major responsibilities of management. Following parameters will affect long range capacity decisions.

**2. Multiple products:** Company's produce more than one product using the same facilities in order to increase the profit. The manufacturing of multiple products will reduce the risk of failure. Having more than one product helps the capacity planners to do a better job. Because products are in different stages of their life-cycles, it is easy to schedule them to get maximum capacity utilization.

**3. Phasing in capacity:** In high technology industries, and in industries where technology developments are very fast, the rate of obsolescence is high. The products should be brought into the market quickly. The time to construct the facilities will be long and there is no much time as the products should be introduced into the market quickly. Here the solution is phase in capacity on modular basis. Some commitment is made for building funds and men towards facilities over a period of 3-5 years. This is an effective way of capitalizing on technological breakthrough.

**4. Phasing out capacity;** The outdated manufacturing facilities cause excessive plant closures and down time. The impact of closures is not limited to only fixed costs of plant and machinery. Thus, the phasing out here is done with humanistic way without affecting the community. The phasing out options makes alternative arrangements for men like shifting them to other jobs or to other locations, compensating the employees, etc.

## 2. SHORT-TERM CAPACITY STRATEGIES

Managers often use forecasts of product demand to estimate the short-term workload the facility must handle. Managers looking ahead up to 12 months, anticipate output requirements for different products, and services. Managers then compare requirements with existing capacity and then take decisions as to when the capacity adjustments are needed. For short-term periods of up to one year, fundamental capacity is fixed. Major facilities will not be changed. Many short-term adjustments for increasing or decreasing capacity are possible. The adjustments to be required depend upon the conversion process like whether it is capital intensive or labor intensive or whether product can be stored as inventory. Capital intensive processes depend on physical facilities, plant and equipment. Short-term capacity can be modified by operating these facilities more or less intensively than normal. In labor intensive processes short-term capacity can be changed by laying off or hiring people or by giving overtime to workers. The strategies for changing capacity also depend upon how long the product can be stored as inventory.

The short-term capacity strategies are:

- Inventories:** Stock of finished goods during slack periods to meet the demand during peak period.
- Backlog:** During peak periods, the willing customers are requested to wait and their orders are fulfilled after a peak demand period.

- 3. Employment level (hiring or firing): Hire additional employees during peak demand period and layoff employees as demand decreases.
- 4. Employee training: Develop multi-skilled employees through training so that they can be rotated among different jobs. The multi-skilling helps as an alternative to hiring employees.
- 5. Subcontracting: During peak periods, hire the capacity of other firms temporarily to make the component parts or products.
- 6. Process design: Change job contents by redesigning the job.

## ❖ Benefits of Capacity Requirements Planning

CRP planning provides many benefits to manufacturers, especially when automated software is used to simplify the process and utilize more accurate data. Some benefits include:

**Cost monitoring:** CRP allows a company to better monitor costs.

**Flexibility:** Because CRP is linked to demand forecasting, capacity can be looked at for seasonal trends, and production requirements can be anticipated.

**Growth planning:** This planning, especially when backed with accurate data from a CRP system, is valuable to company decision makers when it comes to determining if new locations are viable based on capacity and/or demand forecasting.

**Improved human capital management:** Reliable demand forecasts allow companies to ensure they have not only the right number of staff but also the right skill sets for the required capacity.

**Increased customer service levels:** CRP helps companies produce quality items on time, which leads to happier customers. lead time delivery on time.

**Improved profitability:** Capacity requirements planning and demand forecasting reduce gaps in the manufacturing process that could lead to an unwise use of resources.

**Continuous improvement opportunities:** Effective CRP requires closely looking at business areas that may not have always received proper attention. This gained visibility can lead to awareness of other improvements to make.

BBA I<sup>th</sup>  
Material Management

Important Questions from Unit II

- 1) Material Requirement planning is both an inventory control and scheduling techniques." Discuss.
- 2) Write short notes on the following  
(a) Material Planning (b) Capacity requirement planning
- 3) What is Material Requirement Plan? Explain the material requirement planning process.
- 4) Write short notes on the following  
(i) Manpower planning (ii) Capacity planning
- 5) What do you understand by Material Management in detail.  
What are its objectives? Discuss
- 6) What is Capacity? Discuss step by step procedure adopted by business organizations in capacity requirement planning
- 7) Discuss the importance of manpower planning for materials management. How is material planning done?
- 8) Distinguish between materials planning & capacity Requirements planning. How is objectives of materials management served by these two planning. What factors influence
- 9) Define Material planning?  
the material
- 10) Define Capacity Requirement planning. Elaborate the process of Capacity Requirement planning.