

Production Facilities

Production Planning is a managerial function which is mainly concerned with the following important issues:

- What production facilities are required?
- How these production facilities should be laid down in the space available for production? and
- How they should be used to produce the desired products at the desired rate of production?

Broadly speaking, production planning is concerned with two main aspects: (i) routing or planning work tasks (ii) layout or spatial relationship between the resources. Production planning is dynamic in nature and always remains in fluid state as plans may have to be changed according to the changes in circumstances.

Production control is a mechanism to monitor the execution of the plans. It has several important functions:

- Making sure that production operations are started at planned places and planned times.
- Observing progress of the operations and recording it properly.
- Analyzing the recorded data with the plans and measuring the deviations.
- Taking immediate corrective actions to minimize the negative impact of deviations from the plans.
- Feeding back the recorded information to the planning section in order to improve future plans.

A block diagram depicting the architecture of a control system is shown in [Figure1](#). Important functions covered by production planning and control (PPC) function in any manufacturing system are shown in [Table1](#) along with the issues to be covered.

Types of Production Systems

A production system can be defined as a transformation system in which a saleable product or service is created by working upon a set of inputs. Inputs are usually in the form of men, machine, money, materials etc. Production systems are usually classified on the basis of the following:

- Type of product,
- Type of production line,
- Rate of production,
- Equipments used etc.

They are broadly classified into three categories:

- Job shop production
- Batch production
- Mass production

Job Production

In this system products are made to satisfy a specific order. However that order may be produced-

- only once
- or at irregular time intervals as and when new order arrives
- or at regular time intervals to satisfy a continuous demand

The following are the important characteristics of job shop type production system:

- Machines and methods employed should be general purpose as product changes are quite frequent.
- Planning and control system should be flexible enough to deal with the frequent changes in product requirements.
- Man power should be skilled enough to deal with changing work conditions.
- Schedules are actually non-existent in this system as no definite data is available on the product.
- In process inventory will usually be high as accurate plans and schedules do not exist.
- Product cost is normally high because of high material and labor costs.
- Grouping of machines is done on functional basis (i.e. as lathe section, milling section etc.)
- This system is very flexible as management has to manufacture varying product types.
- Material handling systems are also flexible to meet changing product requirements.

Batch Production

Batch production is the manufacture of a number of identical articles either to meet a specific order or to meet a continuous demand. Batch can be manufactured either-

- only once
- or repeatedly at irregular time intervals as and when demand arise
- or repeatedly at regular time intervals to satisfy a continuous demand

The following are the important characteristics of batch type production system:

- As final product is somewhat standard and manufactured in batches, economy of scale can be availed to some extent.
- Machines are grouped on functional basis similar to the job shop manufacturing.
- Semi automatic, special purpose automatic machines are generally used to take advantage of the similarity among the products.

- Labor should be skilled enough to work upon different product batches.
- In process inventory is usually high owing to the type of layout and material handling policies adopted.
- Semi automatic material handling systems are most appropriate in conjunction with the semi automatic machines.
- Normally production planning and control is difficult due to the odd size and non repetitive nature of order.

Mass Production

In mass production, same type of product is manufactured to meet the continuous demand of the product. Usually demand of the product is very high and market is going to sustain same demand for sufficiently long time.

The following are the important characteristics of mass production system:

- As same product is manufactured for sufficiently long time, machines can be laid down in order of processing sequence. Product type layout is most appropriate for mass production system.
- Standard methods and machines are used during part manufacture.
- Most of the equipments are semi automatic or automatic in nature.
- Material handling is also automatic (such as conveyors).
- Semi skilled workers are normally employed as most of the facilities are automatic.
- As product flows along a pre defined line, planning and control of the system is much easier.
- Cost of production is low owing to the high rate of production.
- In process inventories are low as production scheduling is simple and can be implemented with ease.