

# Production Plan & Control

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**Abstract:-** Production Planning & Control includes various manufacturing phases, comp, functioning and relationship of production planning and control with other departments. Apart from this it includes various manufacturing methods of production processes and management policies for meeting demands of customers, work distribution among workers and centralization. In this paper we have included various phases of production. An overview of production planning and control about systems and management has been introduced.

**Key Words:** Manufacturing Phases, Management Phases & Strategy.

## 1. INTRODUCTION

Manufacturing, a branch of industry, is the application of tools and processes for the transformation of raw materials into finished products. The manufacturing sector is closely connected with engineering and industrial design. Some industries, such as semiconductor and steel manufactures use the term fabrication instead. Manufacturing includes all intermediate processes required for the production and integration of a product's components.

The term manufacturing system refers to a collection or arrangement of operations and processes used to make a desired product or component. It includes the actual equipments for composing the processes and the arrangement of those processes. In a manufacturing system, if there is a change or disturbance in the system, the system should accommodate or adjust itself and continue to function efficiently. Normally the effect of disturbance must be counteracted by controllable inputs or the system itself.

## 2. STAGES OF PRODUCTION PLANNING & CONTROL

The stages of Production planning and control has three phases:

1. Planning Phase
2. Action Phase
3. Control Phase

### 2.1 PLANNING PHASE

Planning is an exercise of intelligent anticipation in order to establish how an objective can be achieved or a need fulfilled in circumstances, which are invariably restrictive. Production planning determines the optimal schedule and sequence of operations economic batch quantity, machine assignment and dispatching priorities for sequencing. It has two categories of planning:

A. Prior planning

B. Active planning

#### A) PRIOR PLANNING

Prior planning means pre-production planning. This includes all the planning efforts, which are taking place prior to the active planning.

##### A.1 Product development and Design

The process of developing a new product with all the features, which are essential for effective use in the field, and designing it accordingly. At the design stage, one has to take several aspects of design like, design for selling, design for manufacturing and design for usage.

##### A.2 Forecasting

It is an estimate of demand, which will happen in future. Since, it is only an estimate based on the past demand, proper care must be taken while estimating it. Given the sales forecast, the factory capacity, the aggregate inventory levels and size of the work force, the manager must decide at what rate of production to operate the plant over an intermediate planning horizon.

##### A.3 Aggregate planning

The aim is to find out a product wise planning over the intermediate planning.

##### A.4 Material requirement and Planning

It is a technique for determining the quantity and timing for the acquisition of dependent items needed to satisfy the master production schedule.

#### B) ACTIVE PLANNING

##### B.1 Process planning & Routing

It is a complete determination of the specific technological process steps and their sequence to produce products at the desired quality, quantity and cost. It determines the method of manufacturing a product selects the tools and equipments, analyses how the manufacturing of the product will fit into the facilities. Routing in particular prescribes the flow of work in the plant and it is related to the considerations of layout, temporary locations for raw materials and components and materials handling systems.

## B.2 Material Planning

A material planning is a process which determines the requirements of various raw materials/subassemblies by considering the trade-off between various cost components like, carrying cost, ordering cost, shortage cost, and so forth.

## B.3 Tool's Planning

It determines the requirements of various tools by taking process specification (surface finish, length of the job, overall depth of cut etc.), material specifications (type of material used, hardness of the material, shape and size of the material etc.) and equipment specifications (speed range, feed range, depth of cut range etc.).

## B.4 Loading

Loading is a process of assigning jobs to several machines such that there is a load balance among the machines. This is relatively a complex task, which can be managed with the help of efficient heuristic procedure.

## B.5 Scheduling

Scheduling is the time phase of loading and determines when and in what sequence the work will be carried out. This fixes the starting as well as the finishing time for each job.

## 2.2 ACTION PHASE

### 2.2.1 Dispatching

Action phase has the major step of dispatching. Dispatching is the transition from planning phase to action phase. In this phase, the worker is ordered to start manufacturing the product. The tasks which are included in dispatching are job order, store issue order, tool order, time ticket, inspection order, move order etc.

### 2.2.2 Job Order

The job order number is the key item which is to be mentioned in all other reports/orders.

### 2.2.2 Store Issue Order

It gives instruction to stores to issue materials for manufacturing the product as per product specifications. As per tooling requirements for manufacturing the product, the tool Order instruct the tool room to issue necessary tools.

### 2.2.3 Time Ticket

It is nothing but a card which is designed to note down the actual time taken at various processes. This information is used for deciding the costs for future jobs of similar nature and also for performing variance analysis, which helps to exercise control.

Job order is the official authorization to the shop floor to start manufacturing the product. Generally, the process sequence will contain some testing and inspection. So, these are to be instructed to inspection wing in the form of inspection order for timely testing and inspection so that the amount of rework is minimized. The manufacture of product involves moving raw materials/subassemblies to the main line. This is done by a well-designed materials handling system. So, proper instruction is given to the materials handling facilities for major movements of materials/subassemblies in the form of a move order. Movements which involve less distance and fewer loads are managed at the shop floor level based on requests from operators.

## 2.3 CONTROL PHASE

### 2.3.1 Progress Reporting

In progress reporting, the data regarding what is happening with the job is collected. Also, it helps to make comparison with the present level of performance. The various data pertaining to materials rejection, process variations, equipment failures, operator efficiency, operator absenteeism, tool life, etc., are collected and analyzed for the purpose of progress reporting. These data are used for performing variance analysis, which would help us to identify critical areas that deserve immediate attention for corrective actions.

### 2.3.2 Corrective Action

The tasks under corrective action primarily make provisions for an unexpected event. Some examples of corrective actions are creating schedule flexibility, schedule modifications, capacity modifications, make or buy decisions, expediting the work, pre-planning, and so on. Due to unforeseen reasons such as, machine breakdown, labor absenteeism, too much rejection due to poor material quality etc., it may not be possible to realize the schedule as per the plan. Under such condition, it is better to reschedule the whole product mix so that we get a clear picture of the situation to progress further. Under such situation, it is to be re-examined for selecting appropriate course of action. Expediting means taking action if the progress reporting indicates deviations from the originally set targets. Pre-planning of the whole affair becomes essential in case the expediting fails to bring the deviated plan to its right path.

## 4. CONCLUSION

As we have seen, that during production planning & control various phases need to be considered and planned well in advance before design of product & accordingly make a product which will be the best one in market. Planning is the main objective before any production which must be considered. Production phases give a clear idea about which machineries should be used during production, cost optimization & labor required.

## REFERENCES

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