Production Planning and Control (21)

~~(Specification of Production Requirements.)~~

Products are manufactured by the transformation of raw material into finished goods. This whole product is achieved. Planning looks ahead, anticipates possible difficulties and decides in advance as to how the production, must, be carried out. The control phase makes sure that the programmed production is constantly maintained. A production planning & control system has many functions to perform, some, before the arrival of raw materials & tools, & others while the raw materials undergoes processing. The various functions are as follows

1) Planning Phase
   - Prior Planning
     - Forecasting
     - order writing
     - Product design
   - Active Planning
     - Routing
     - Material & tool control
     - Loading
     - Scheduling

2) Action Phase — Dispatching

3) Control Phase
   - Progress Reporting — Data Process
   - Corrective Action
     - Expediting
     - Replanning

Production Planning & Control

Planning
(~~plan your work~~)
- Forecasting
- Routing
- Scheduling
- Loading

Control
(work your plan)
- Dispatching
- Expediting / Follow
- Corrective action

Objectives of Production Planning & Control

- To determine the sequence of operations which will ensure continious production with least possible interruption.
- To issue co-ordinated work schedules of production to the foremen of various workshops.
- To plan plant capacity that will provide sufficient facilities for future production programmes.
- To maintain sufficient inventories of materials to support the continious flow production.
- ~~(To maintain sufficient inventories of materials to support the continious flow production)~~
- To maintain production & employment levels.
- To follow up production schedules to ensure that delivery promises are kept.
- To evaluate the performance of various work and individuals.

...ntages of PPC

1) Efficient use of resources.
2) Achieving economy & cost saving.
3) Co-ordination
4) Avoid bottlenecks & deadlocks.
5) Maintenance of adequate level of Inventories
6) Customer satisfaction.

What Is Production Planning?

Production planning consists of planning production activities in an industrial enterprise before the actual operations starts. It involves deciding in advance what to do, when to do it, where to do it, how to do it and who is to do it. How results are to be evaluated.

It establishes the sequence of operations of each individual item, part or assembly and lays down the schedule of its completion. It involves following steps.

1) Forecasting
2) Routing
3) Scheduling
4) Loading/assignment of work.

Process Planning

It is a necessary step before proceeding to routing, scheduling & loading. Process planning is the preparation of detailed work plan. It determines the most economical method of performing in operation. Process planning ~~before~~ develops the broad plan of manufacturing for the component. The activities which are planed during process planning are as follows

a) Selection of process
b) Selection of materials
c) Selection of machines, tools & equipments.
d) Sequencing of operations.
e) Grade of workmen required.
f) Time required for each operation.

Process Sheet : All the particulars of process planning are entered in a sheet known as process sheet. With the help of process sheet the requirements of men, machine & materials can be estimated. The time required for manufacturing the product can also be estimated.

Process Sheet

Description _____ Component No. _____
Drawing No. _____ Assembly No. _____
Mate. Specification _____ Issued by _____
Lot size _____

S No.	Description of Operation	Machine Code	Tool Code	Labour Code	Speed	Feed	Set up Time	Standard Time

Steps of Production Planning.

Production Planning involves management decision relating to how much to produce, what materials, parts & tools will be needed. What steps should be followed in the production process, within what time limit the production is to be completed and how much work is to be done by each work station production planning is a preproduction activity involving arranging facilities and designing the product system. It is based on sales committments as to quantity, delivery dates, price, quality etc.

Following are the steps/function of Prodⁿ Planning :-

1) Forecasting

Forecasting means estimation of type, quantity and quality of future works like sales. It plays a crucial role in the development of plans for the future. Forecasting is required because threats from introduction of new materials/brands, fashion/Trend change, competitor weather change, general economic trend in the country & foreign threats.

Routing

Routing deals with laying down of path along which mat... have to travel in the process of production. It determines t... sequence in which various operations will be performed. Kimball & Kimball has defined the routing as "Routing is the selection of path or route along which each piece is to travel, being transformed from raw material into finished product

Routing includes the following activities:

i) The volume of production is decided.
ii) Available machinery & machine capacity / characteristics are found out.
iii) Path of flow of material is decided.
iv) On the basis of process sheet, the route sheet is prepared.

Route Sheet :- It is a map or the blueprint of the manufacturing process in a production unit. A route sheet determines the sequence or order of arrangement of various departments in a facility.

For a new product, the routing procedure consists of following

1) To analyse the product into constituent parts & then decide which part is to be manufactured and which is to be purchased.
2) To analyse the product into components and to determine the type, grade, quality / quantity of materials to be used
3) To determine the manufacturing operations and their sequence of performance.
4) To decide the required process time for each operation & to decide type & no. of machines necessary to produce parts.
5) To determine the lot size of ordered quantity.
6) To determine scrap factor
7) To design job cards, Inspection cards, Tool ticket etc

Loading

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After the route has been established, the work can be loaded against the concerned machines and equipment. Loading deals with the quantity of work assigned to a machine or a worker. It consists of the assignment of the work to the operators at their machines or work places as per the route chalked out. So, loading determines who (men or machine) will do the work as routing determines where & scheduling determines when it shall be done. The total time required to perform the operation is computed by multiplying the unit operation times given on the standard process sheet by the number of parts to be proce This total time is then added to the work already planne on the workstation. This is the function of loading, and it results in a tabulated list or chart showing the planned. The objectives of loading are as follows:-

i) To check the feasibility of production programmes
ii) To plan new work orders on the basis of spare capacity available
iii) To balance the workload in the plant
iv) To assist in fixing of suitable delivery promises

The load chart help in assessing the spare capacity. If the load charts indicate sufficient spare capacity efforts should be directed through the sales department to obtain more orders for the utilization of the spare capacity. Underload of certain departments may also arise from ineffective planning. In such a case, the remedy lies in proper planning. But if, on the other hand, there is an overload in any work station, action on any one or more of the following lines may be taken;

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a) Rearrangement of overtime work
b) Introduction of an additional shift
c) Transfer of operation to another shop
d) Subcontracting of the excess work load.

Scheduli

Scheduling

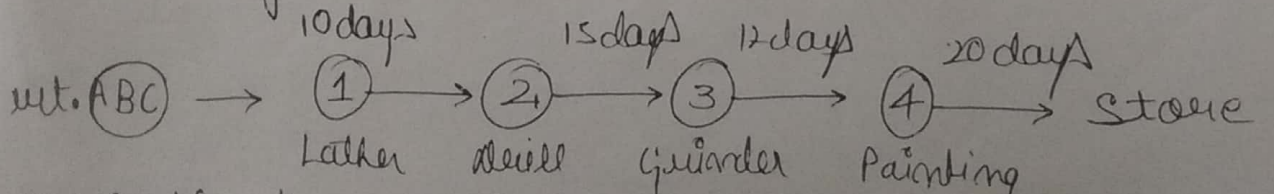
In brief; scheduling means - when and in what sequence the work will be done. It involves deciding as to when the work will start and in a certain duration of time how much work will be finished. It is concern with the time table of production. Scheduling arranges the different manufacturing operations in order of prior fixing the time x date for the commencement and completion of each operation.

Objectives In Scheduling

- Meeting customer due dates
- Minimize job lateness
- Minimize response time
- Minimize completion time
- Maximize machine / Labor utilization
- Minimize idle time
- Minimize work-in-progress inventory

Scheduling for each job should be integrated with routing. It is difficult to route an item efficiently through a plant previously designed schedules and it is equally difficult to prepare schedules w/o determining the routing / sequence of operations. The other information required to draw production schedule include :-

a) date of delivery
b) time interval required to manufacture
c) Past production records
d) Production capacity
e) availability of workforce, equipments, materials etc
f) Sales forecast



* gram :- Routing & Scheduling chart.

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There are 3 types of scheduling as follows:-

1) Master Schedule :- Master schedule gives the no. of units of different products to be produced for the whole year. It gives the units of production for every month for different products.

2) Parts Scheduling :- Parts schedule gives the no. of units of different parts to be produced for the given product. The schedule is prepared for a month. It gives the details of production for every week. Parts schedule is prepared on the basis of master schedule.

3) Machine loading schedule : Machine loading schedule includes allocating workload for various machines. It is the time table for the working of various machines. This schedule is prepared for a period of one week. It gives details of machine loading for every day of the week. This scheduling is prepared on the basis of parts schedule.

Gantt Chart : It was designed by Henry L. Gantt. It is a graphical representation of scheduling. Gantt charts can be prepared for master scheduling parts scheduling and Machine loading schedule.

It gives time table for the production of various parts of a product for a period, it also gives a time table for the working of various machines for a time period.

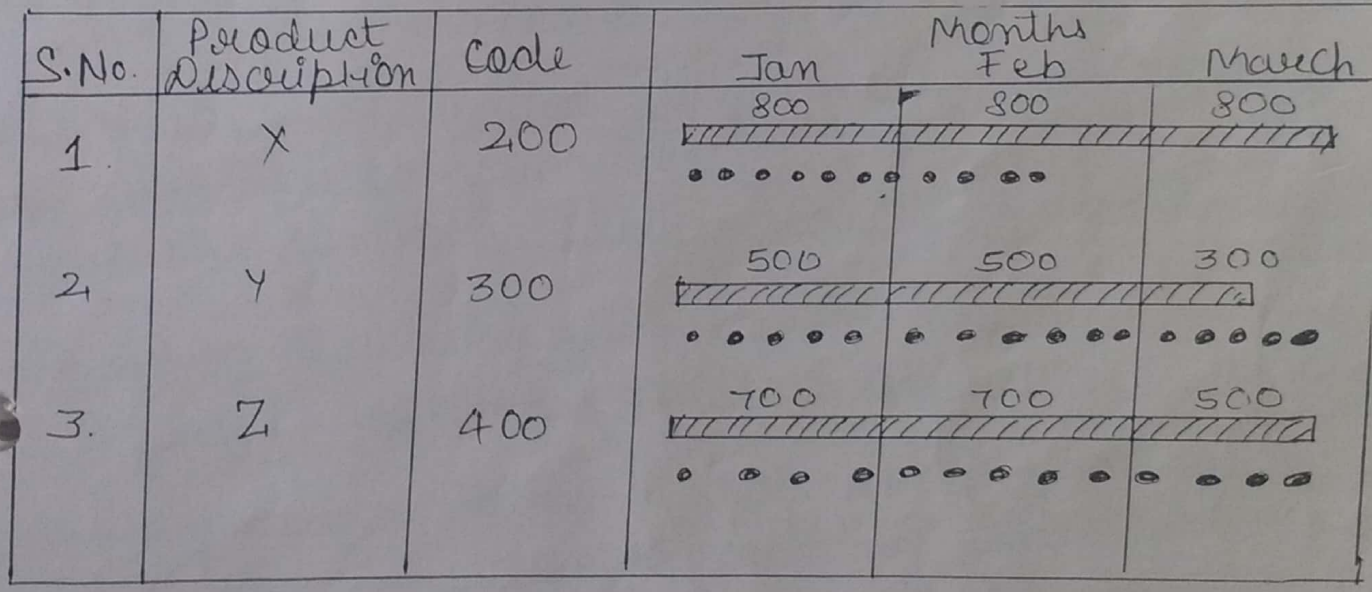
Master Schedule :- On the basis of sales forecast the production quantity of various components & products are decided for a year. The products to be produced are given in terms of number of units. (Say 750 unit of gear box. 200 units of electric motor) A list of products to be produced in different months is prepared. This is called Master schedule.

A specimen of master schedule in the form of Gar chart is given below:

Gantt Chart

Master schedule for the quarter ending March 201(

S.No.	Product Discription	Code	Months Jan	Feb	March
1.	X	200	800	800	800
2.	Y	300	500	500	300
3.	Z	400	700	700	500



This chart gives schedule for 3 different products. It shows the Schedule of production for 3 months. In the Gan chart, the planned output is shown by hatched ste The actual output is recorded by dotted strip.