

A Study on Production Management

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Abstract:

This research paper is a general overview of production management. This paper covers various definitions related to the same and study on production management and production planning control. This paper is segmented into two parts. The first part covers study about importance of production management to the business firm and to customers and

society along with its various functions. Secondly, we have discussed objective of production planning and control and its elements and requirements of efficient production planning and control.

Keywords:

Production; management; planning; control; quality ; cost

Introduction

Production management means planning, organising, directing and controlling of production activities. Production management deals with converting raw materials into finished goods or products. It brings together the 6M's i.e. men, money, machines, materials, methods and markets to satisfy the wants of the people. Production management also deals with decision-making regarding the quality, quantity, cost, etc., of production. It applies management principles to production. Production management is a part of business management. It is also called "Production Function." Production management is slowly being replaced by operations management. The main objective of production management is to produce goods and services of the right

quality, right quantity, at the right time and at minimum cost. It also tries to improve the efficiency. An efficient organisation can face competition effectively[1]. Production management ensures full or optimum utilisation of available production capacity.

Production Management

Definition of production management

According to Elwood Spencer Buffa, "Production management deals with decision-making related to production processes so that the resulting goods or service is produced according to specification, in the amount and by the

Importance of Production Management

The importance of production management to the business firm:

1. Accomplishment of firm's objectives: Production management helps the business firm to achieve all its objectives. It produces products, which satisfy the customers' needs and wants. So, the firm will increase its sales. This will help it to achieve its objectives.
 2. Reputation, Goodwill and Image: Production management helps the firm to satisfy its customers. This increases the firm's reputation, goodwill and image. A good image helps the firm to expand and grow.
 3. Helps to introduce new products: Production management helps to introduce new products in the market. It conducts Research and development (R&D). This helps the firm to develop newer and better quality products. These products are successful in the market because they give full satisfaction to the customers.
 4. Supports other functional areas: Production management supports other functional areas in an organisation, such as marketing, finance, and personnel. The marketing department will find it easier to sell good-quality products, and the finance department will get more funds due to increase in sales. It will also get more loans and share capital for expansion and modernisation. The personnel department will be able to manage the human resources effectively due to the better performance of the production department.
 5. Helps to face competition: Production management helps the firm to face competition in the market. This is because production management produces products of right quantity, right quality, and right price and at the right time. These products are delivered to the customers as per their requirements.
 6. Optimum utilisation of resources: Production management facilitates optimum utilisation of resources such as manpower, machines, etc. So, the firm can meet its capacity utilisation objective. This will bring higher returns to the organisation.
 7. Minimises cost of production: Production management helps to minimise the cost of production. It tries to maximise the output and minimise the inputs. This helps the firm to achieve its cost reduction and efficiency objective.
 8. Expansion of the firm: The Production management helps the firm to expand and grow. This is because it tries to improve quality and reduce costs. This helps the firm to earn higher profits. These profits help the firm to expand and grow.
- The importance of production management to customers and society**
1. Higher standard of living: Production management conducts continuous research and development (R&D). So they produce new and better varieties of products. People use these products and enjoy a higher standard of living[2].

2. Generates employment: Production activities create many different job opportunities in the country, either directly or indirectly. Direct employment is generated in the production area, and indirect employment is generated in the supporting areas such as marketing, finance, customer support, etc.
3. Improves quality and reduces cost: Production management improves the quality of the products because of research and development. Because of large-scale production, there are economies of large scale. This brings down the cost of production. So, consumer prices also reduce.
4. Spread effect: Because of production, other sectors also expand. Companies making spare parts will expand. The service sector such as banking, transport, communication, insurance, BPO, etc. also expand. This spread effect offers more job opportunities and boosts economy.
5. Creates utility: Production creates Form Utility. Consumers can get form utility in the shape, size and designs of the product. Production also creates time utility, because goods are available whenever consumers need it.
6. Boosts economy: Production management ensures optimum utilisation of resources and effective production of goods and services. This leads to speedy economic growth and well-being of the

nation.schedule demanded and at minimum cost."

Functions of Production Management

The components or functions of production management are as follows:



Figure 1: Functions of Production Management

1. Selection of Product and Design: Production management first selects the right product for production. Then it selects the right design for the product. Care must be taken while selecting the product and design because the survival and success of the company depend on it. The product must be selected only after detailed evaluation of all the other alternative products. After selecting the right product, the right design must be selected. The design must be according to the customers' requirements. It must give the customers maximum value at the lowest cost. So, production management must use techniques such as value engineering and value analysis.
2. Selection of Production Process: Production management must select

the right production process. They must decide about the type of technology, machines, material handling system, etc.

3. **Selecting Right Production Capacity:** Production management must select the right production capacity to match the demand for the product. This is because more or less capacity will create problems. The production manager must plan the capacity for both short and long term's production. He must use break-even analysis for capacity planning.
4. **Production Planning:** Production management includes production planning. Here, the production manager decides about the routing and scheduling.
5. **Routing** means deciding the path of work and the sequence of operations. The main objective of routing is to find out the best and most economical sequence of operations to be followed in the manufacturing process. Routing ensures a smooth flow of work.
6. **Scheduling** means to decide when to start and when to complete a particular production activity.
7. **Production Control:** Production management also includes production control. The manager has to monitor and control the production. He has to find out whether the actual production is done as per plans or not. He has to compare actual production with the plans and finds out the deviations.
8. **Quality and Cost Control:** Production management also includes quality and cost control. Quality and Cost Control are given a lot of importance in today's competitive world. Customers all over the world want good-quality products at cheapest prices. To satisfy this demand of consumers, the production manager must continuously improve the quality of his products. Along with this, he must also take essential steps to reduce the cost of his products.
9. **Inventory Control:** Production management also includes inventory control. The production manager must monitor the level of inventories. There must be neither over stocking nor under stocking of inventories. If there is an overstocking, then the working capital will be blocked, and the materials may be spoiled, wasted or misused. If there is an understocking, then production will not take place as per schedule, and deliveries will be affected.
10. **Maintenance and Replacement of Machines:** Production management ensures proper maintenance and replacement of machines and equipment's. The production manager must have an efficient system for continuous inspection (routine checks), cleaning, oiling, maintenance and replacement of machines, equipment's, spare parts, etc. This prevents breakdown of

machines and avoids production halts.

Production System

Meaning of production

Production can be explained as an act of either manufacturing or mining or growing of goods (commodities) generally in bulk for trade. Production is a method employed for making or providing essential goods and services for consumers. It is a process that puts intangible inputs like ideas, creativity, research, knowledge, wisdom, etc. in use or action. It is a way that transforms (convert) tangible inputs like raw-materials, semi-finished goods and unassembled goods into finished goods or commodities[3].

Meaning of system

System is an arrangement or assembly of inter-dependent processes (activities) that are based on some logic and function. It operates as a whole and is designed (build) with an intension to achieve (fulfil) some objective or do some work. Huge systems are often a collection (assembly) of smaller sub-systems.

Definition of production system

Production system may be defined as, "The methods, procedure or arrangement which includes all functions required to accumulate (gather) the inputs, process or reprocess the inputs, and deliver the marketable output (goods)." Production system utilizes materials, funds, infrastructure, and labour to produce the required output in form of goods.

Meaning of production system

Production system consists of three main components viz., Inputs, Conversion Process and Output.

1. **Inputs** include raw-materials, machines, man-hours, components or parts, drawing, instructions and other paper works.
2. **Conversion process** includes operations (actual production process). Operations may be either manual or mechanical or chemical. Operations convert inputs into output. Conversion process also includes supporting activities, which help the process of conversion. The supporting activities include; production planning and control, purchase of raw-materials, receipt, storage and issue of materials, inspection of parts and work-in-progress, testing of products, quality control, warehousing of finished products, etc.
3. **Output** includes finished products, finished goods (parts), and services.

The three components of a production system are depicted in this diagram.

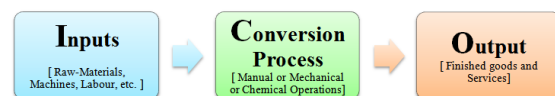


Figure 2

Hence, we can say that, production system is a union or combination of its three main components viz., Inputs, Conversion Process, and Output. In short, everything which is done to produce goods and services or to achieve the production objective is called production system.

Production Planning

Production planning means to fix the production goals and to estimate the resources which are required to achieve these goals. It prepares a detailed plan for achieving the production goals economically, efficiently and in time. It forecasts each step in the production process. It forecasts the problems, which may arise in the production process. It tries to remove these problems. It also tries to remove the causes of wastage. Production planning determines the ways and means of production. It shows the direction. It is based on sales forecasting. It is a pre-requisite of production control[4].

Definition of Production Planning

According to Ray Wild, "Production Planning is concerned with the determination, acquisition and arrangement of all facilities necessary for future operations."

Objectives of Production Planning

1. Effective utilization of resources: Production planning results in effective utilization of resources, plant capacity and equipment's. This results in low-cost and high returns for the organization.
2. Steady flow of production: Production planning ensures a regular and steady flow of production. Here, all the machines are put to maximum use. This results in a regular production, which helps to give a routine supply to customers.
3. Estimate resources: Production planning helps to estimate the resources like men, materials, etc.

The estimate is made based on sales forecast. So production is planned to meet sales requirements.

4. Ensure optimum inventory: Production planning ensures optimum inventory. It prevents over-stocking and under-stocking. Necessary stocks are maintained. Stock of raw material is maintained at a proper level in order to meet the production demands. Stock of finished goods is also maintained to meet regular demands from customers.
5. Coordinate activities of departments: Production planning helps to coordinate the activities of different departments. For e.g. the marketing department coordinates with the production department to sell the goods. This results in profit to the organization.
6. Minimize wastage of raw materials: Production planning minimizes wastage of raw materials. It ensures proper inventory of raw materials and materials handling. This helps to minimize wastages of raw material. It also ensures production of quality goods. This results in minimum number of rejects. So proper production planning and control results in minimum wastage.
7. Improve the labour productivity: Production planning improves the labour productivity. Here, there is maximum utilization of manpower. Training is provided to the workers. The profits are shared with the workers in the form of increased wages and other incentives.

Workers are motivated to perform to their best. This overall result in an improved labour efficiency.

8. Help to capture the market: Production planning helps to give delivery of goods to customers in time. This is because of regular flow of quality production. So the company can face competition effectively, and it can capture the market.
9. Provide a better work environment: Production planning provides a better work environment for the workers. Workers get improved working conditions, proper working hours, leave and holidays, increased wages and other incentives. This is possible because the company is working very efficiently.
10. Facilitate quality improvement: Production planning facilitates quality improvement because the production is checked regularly. Quality consciousness is developed among the employees through training, suggestion schemes, quality circles, etc.
11. Result in consumer satisfaction: Production planning helps to give a regular supply of goods and services to the consumers at fair prices. It results in consumer satisfaction.
12. Reduce the production costs: Production planning makes optimum utilization of resources, and it minimizes wastage of raw materials. It also maintains optimum size of inventories. All this contributes to reduce the production costs.

Steps in Production Planning and Control

According to the British Standards Institute, there are four stages, steps, techniques or essentials in the process of production planning and control.

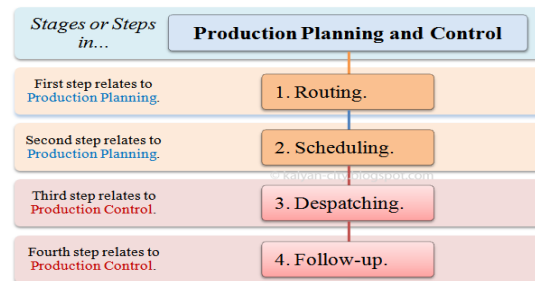


Figure 3

The four stages or steps in production planning and control are:

- i. Routing,
- ii. Scheduling,
- iii. Despatching, and
- iv. Follow-up.

Initial two steps i.e. Routing and Scheduling, relate to production planning.

Last two steps i.e. Despatching and Follow-up, relate to production control.

1. Routing

Routing is the first step in production planning and control. Routing can be defined as the process of deciding the path (route) of work and the sequence of operations.

Routing fixes in advance:

- i. The quantity and quality of the product.
- ii. The men, machines, materials, etc. to be used.
- iii. The type, number and sequence of manufacturing operations, and
- iv. The place of production.

In short, routing determines 'What', 'How much', 'with which', 'How' and 'Where' to produce.

Routing may be either very simple or complex. This depends upon the nature of production. In a continuous production, it is automatic, i.e. it is very simple. However, in a job order, it is very complex.

Routing is affected by the human factor. Therefore, it should recognize human needs, desires and expectations. It is also affected by plant-layout, characteristics of the equipment, etc.

The main objective of routing is to determine (fix) the best and cheapest sequence of operations and to ensure that this sequence is followed in the factory.

Routing gives a very systematic method of converting raw-materials into finished goods. It leads to smooth and efficient work. It leads to optimum utilization of resources; namely, men, machines, materials, etc. It leads to division of labour. It ensures a continuous flow of materials without any backtracking. It saves time and space. It makes the work easy for the production engineers and foremen. It has a great influence on design of factory's building and installed machines.

So, routing is an important step in production planning and control. Production planning starts with it. Read article on procedure of routing in production[5].

2. Scheduling

Scheduling is the second step in production planning and control. It comes after routing.

Scheduling means to:

- i. Fix the amount of work to do.
- ii. Arrange the different manufacturing operations in order of priority.

- iii. Fix the starting and completing, date and time, for each operation.

Scheduling is also done for materials, parts, machines, etc. So, it is like a time-table of production. It is similar to the time-table, prepared by the railways.

Time element is given special importance in scheduling. There are different types of schedules; namely, Master schedule, Operation schedule and Daily schedule.

Scheduling helps to make optimum use of time. It sees that each piece of work is started and completed at a certain predetermined time. It helps to complete the job systematically and in time. It brings time coordination in production planning. All this helps to deliver the goods to the customers in time. It also eliminates the idle capacity. It keeps labour continuously employed.

So, scheduling is an important step in production planning and control. It is essential in a factory, where many products are produced at the same time.

3. Dispatching

Dispatching is the third step in production planning and control. It is the action, doing or implementation stage. It comes after routing and scheduling[6].

Dispatching means starting the process of production. It provides the necessary authority to start the work. It is based on route-sheets and schedule sheets.

Dispatching includes the following:

- i. Issue of materials, tools, fixtures, etc., which are necessary for actual production.
- ii. Issue of orders, instructions, drawings, etc. for starting the work.

- iii. Maintaining proper records of the starting and completing each job on time.
 - iv. Moving the work from one process to another as per the schedule.
 - v. Starting the control procedure.
 - vi. Recording the idle time of machines.
- Dispatching may be either centralized or decentralized:
- i. Under centralized dispatching, orders are issued directly by a centralized authority.
 - ii. Under decentralized dispatching, orders are issued by the concerned department.

4. Follow-up

Follow-up or expediting is the last step in production planning and control. It is a controlling device. It is concerned with evaluation of the results.

Follow-up finds out and removes the defects, delays, limitations, bottlenecks, loopholes, etc. in the production process. It measures the actual performance and compares it to the expected performance. It maintains proper records of work, delays and bottlenecks. Such records are used in future to control production.

Follow-up is performed by 'Expeditors' or 'Stock Chasers'.

Follow-up is necessary when production decreases even when there is proper routing and scheduling. Production may be disturbed due to break-downs of machinery, failure of power, shortage of materials, strikes, absenteeism, etc.

Follow-up removes these difficulties and allows a smooth production[7].

Requirements of Efficient Production Planning and control

In order to achieve an efficient system of production control, the following points must be given due considerations:

1. **Sound Organization:** The system of production planning and control should be backed by a sound organization structure. There should be proper delegation of authority and everybody should be clear about his responsibilities in his unit.
2. **Standardization:** Standard material tools, equipment's and procedures should be adopted for the smooth working of the production system. The workers should be given adequate training in the use of materials, tools and equipment's.
3. **Preliminary Appraisal:** Preliminary appraisal is essential to understand the areas where there are possibilities of bottlenecks.
4. **Continuous Checking:** Production control is a continuous process. In order to avoid higher wastages, it is essential to carry out checking of various processes when they are in working order. Continuous checking will help to keep the production system effective and in line with the requirement of the situation.
5. **Feedback:** Significant variations at different levels of production must be pointed out to the manager concerned. Limits should be laid down up to which the deviations

from the standards are to be tolerated.

6. Flexibility: Sufficient flexibility should be ensured to meet emergencies which may arise because of power failure, breakdown of machinery, etc. Production plans should not be rigid.
7. Up-to-date Information: The persons concerned with control of production should have up-to-date knowledge about the quantity of work-in-process, availability of various types of materials, unused plant capacity, etc.
8. Improvement: Production control should also concentrate on bringing about the improvement in work methods. Alternative methods may be tried to handle peak load. The improve methods should be applied after sufficient instructions to the workers.

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Conclusion

Product management is an organizational lifecycle function within a company dealing with the planning, forecasting, and production, or marketing of a product or products at all stages of the product lifecycle. It is mandatory for the growth of company. A survey tells that production managers of today appear to have more education than before, little else seems to have changed over many years. Production managers continue to have a wide range of responsibilities and appear to be happy with their job, status, and remuneration. Production managers feel they need further training in computer skills, accounting, and business management. Production management helps a company or organisation to achieve the production goals and takes the company to new height.