

PRAGATI



PRODUCTION AND OPERATIONS MANGEMENT

B.B.A. SEMESTER - IV : COURSE CODE 401



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Course Code 401

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Abhyudaya Pragati, 1312 Shivaji Nagar,
Off J.M. Road, Pune – 411005,
Phone : 25512336/37/39 Fax : (020) 25511379
Email : niralipune@pragationline.com

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Sr. No. 15 Arihant Marg,
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SYLLABUS

(New Syllabus w.e.f. June 2014)

B.B.A. Semester – IV

PRODUCTION AND OPERATIONS MANAGEMENT

(Course Code - 401)

1. Introduction :

- Meaning, Nature and Scope of Production Management, Historical Development of Production Management, Objectives of Production Management, Functions of Production Management, Qualities of Production Manager, Responsibilities of Production Manager.
- **Plant Location** : Importance and Factors responsible for Plant Location Decision
- **Classification or Types of Production System** : Job Shop Production, Batch Intermittent Production, Continuous Production and Cellular Production
- **Plant Layout** : Definition, Objectives and Types, Factors influencing Plant Layout

2. Product Design and Product Development

- Definition of Product Design, Factors affecting Product Design, Product Policy of an Organisation
- **Product Development** : Meaning of Product Development, Relationship between research, development and design, Stages of Product Development, Techniques or Tools of Product Development, Factors responsible for Product Development

3. Production Planning and Control :

- Meaning, Nature, Objectives, Functions, Importance and Problems of Production Planning and Control.
- Production Procedure, Factors determining Production Planning and Control, Techniques or Tools of Production Planning and Control.

4. Productivity and Ergonomics :

- **Productivity** : Concept and Definition of Productivity, Importance of Productivity, Measurement of Productivity and Productivity Measurement Models, Techniques of Productivity Improvement, Factors influencing Productivity.
- **Ergonomics** : Introduction and Definition of Ergonomics, Objectives of Ergonomics, Components of Ergonomics.

5. **Quality Management :**

- **Six Sigma** : Introduction and Meaning, Benefits, Steps in implementing Six Sigma.
- **Kaizen** : Introduction and Meaning, Principles, Procedure for Implementation, Benefits and Reasons for failure.
- **Just-in-Time (JIT)**: Introduction and Meaning, Objectives, Benefits, Methodology in Implementation of JIT, Basic Elements of JIT, Enabling JIT to Occur.
- **Quality Circle (QC)** : Introduction and Meaning, Objectives, Benefits, Limitations, Organisation for Quality Circles, Causes of Quality Circle Failure.
- **Total Quality Management (TQM)** : Introduction and Definition, Major Ingredients in TQM, Principles of TQM, Need and Importance of TQM, Limitations of TQM, Dimensions or Characteristics of TQM, TQM Models, Key Issues for achieving TQM Objectives.
- **ISO 9000** : Introduction and Meaning, ISO Standards for Quality System, Factors for selecting an ISO Model, Clauses in ISO, Essential Steps in implementing an ISO.





INTRODUCTION

* Synopsis *

- 1.1 Production Management :** *Meaning, Nature and Scope of Production Management, Historical Development of Production Management, Objectives of Production Management, Functions of Production Management, Qualities of Production Manager, Responsibilities of Production Manager*
- 1.2 Plant Location :** *Importance and Factors responsible for Plant Location Decision*
- 1.3 Classification or Types of Production System :** *Job Shop Production, Batch Intermittent Production, Continuous Production and Cellular Production*
- 1.4 Plant Layout :** *Definition, Objectives and Types, Factors influencing Plant Layout*

1.1

Production Management : Meaning, Nature and Scope of Production Management, Historical Development of Production Management, Objectives of Production Management, Functions of Production Management, Qualities of Production Manager, Responsibilities of Production Manager

Q. 1 : What is Production Management ?

Ans. : Production Management (Meaning) :

- Production management is the process of planning, organising, directing and controlling the activities of the production function.
- Production management is concerned with co-ordination of men, money, materials, machines and methods of production goods.
- In a narrower sense, production management means planning, scheduling and controlling the flow of materials through a plant.
- In Production management, the process of producing products from raw material is managed.
- Production management involves the job of co-ordinating and controlling the activities required to make a product, typically involving effective

control of scheduling, cost, performance, quality and waste requirements.

Definitions of Production Management :

(a) Edwood Buffa : "Production management deals with decision-making related to production processes so that the resulting goods and services are produced according to specifications in the amounts and by the schedule demanded at minimum cost."

(b) H. A. Harding : "Production management is concerned with those processes which convert the inputs into outputs. The inputs are various resources like raw materials, men, machines, methods etc. and the outputs are goods and services."

Q. 2 : State the Nature of Production Management.

Ans. : Nature of Production Management :

(a) Concerned with Planning, Organising, Directing and Controlling :

- Production Management is concerned with planning, organizing, directing and controlling of production systems so as to produce goods of desired quality at minimum cost and at the right time.
- It involves decision-making concerning production processes in order to produce goods or services according to specifications of quality at minimum cost and as per the demand schedule.

(b) Co-ordination of Different Elements of the Production Function :

- Production management co-ordinates the different elements of the production function.
- Production management takes the decision as to the selection and design of production process, in order to produce the desired goods at minimum cost and at the right time.
- Production management comprises all the activities right from design and layout of production facilities till finishing the product for despatch to the warehouse or customers.

(c) Looks after Every Step of Production Process :

- Production management looks after each and every step in the process of production. It involves the establishment of standards, the choice of equipment and tools, the control of cost and quality and the evaluation of performance.
- It establishes the harmonious relationship between the product, the plant, the conversion process and the people so as to achieve pre-determined targets.

Q. 3 : Explain the Scope of Production Management.

Ans. : Scope of Production Management :

(a) Selection of Site and Layout :

- It is a basic consideration. Plant should be located at such a place where production and distribution costs are minimum. After locating the site, the machines, equipment and other facilities have to be laid out.
- A good plant layout facilitates the flow of materials at the desired speed.
- Plant layout deals with the arrangement of machines.

(b) Production Planning and Control :

- It deals with the determination and regulation of production processes and includes the functions like scheduling, despatching, following etc.
- It also includes quality control.

(c) Execution of Plans :

- Production management directs the activities of production department with a view to execute the production plans, policies and decisions.

(d) Provision of Plant Services :

- Plant services are the ancillary arrangements which contribute indirectly to the production function. The plant services should be provided in sufficient quantity and at proper places so that the production can be carried on efficiently.

Plant services are of two types :

(i) Production Services : Which includes power house, tool room, store keeping, material handling, repair services etc.

(ii) Employee Services : Which includes canteen, recreation room, parking area, toilets etc.

(e) Method of Supply :

- The standard methods should be devised for performing the repetitive functions efficiently. The unnecessary movements should be eliminated and suitable positioning of the workers for different processes should be developed.
- Such methods should be devised with help of time and motion study.

(f) Inventory Control :

- It deals with the control over raw materials, work in progress, finished products, stores, supplies, tools etc. The management of these items is closely related to production function and so is included in production management.

- The raw materials supplies etc. should be purchased at right time of right quality, in right quantity from right source and at right price. The store-keeping is also an important aspect of inventory control.

(g) Quality Control :

- The long-run success of the business largely depends on its ability to maintain the quality standard as decided by the management and accepted by customers.
- The quality standards are prescribed in terms of specifications, tastes, size, colour, shape etc.
- The quality control is maintained by testing the actual production and to ascertain whether it conforms to the set standards. Various statistical techniques are used for the effective quality control.

Q. 4 : Explain the Historical Development of Production Management. OR Describe the Evolution from Production to Operations Management.

Ans. : Historical Development of Production Management : The major contributors to the development of production management are as under :

- (a) Adam Smith (1776) :** Recognised economic gains from Division of Labour.
- (b) Charles Babbage (1883) :** Supplemented Smith's ideas about production organisation and economics.
- (c) F.W.Taylor (1859-1915) :** Scientific management, production, organization, labour control layout, production control studies and investigations.
- (d) Walter Shewhart (1931) :** Statistical quality control.
- (e) L.H.C. Tippett (1934) :** Development of work sampling.

Post World War II Developments (1950) :

- (i) Linear Programming and other methods,
 - (ii) Mathematical models,
 - (iii) High speed computers,
 - (iv) Simulation of production problems,
 - (v) Automation,
 - (vi) Human Engineering.
- Production Management is related with production and it is a branch of management science. The development of production management is extremely rapid. By production (manufacturing), we mean transformation of inputs into output through a production system in order to supply the goods to people. In the past, the production activities was very limited as the needs of the people were few. At that time, the

education was limited only to literature and language. But today, the situation has changed tremendously.

- 'Adam Smith' was the first man to recognise the 'Production Economics' in 1776, when the factory system was in its infant stage.
- By the start of 20th century, the position of workers and that of workplace was not satisfactory. Managements attitude equated the sensibilities of man to that of machine and implemented cost reduction policies by brute force. Emphasis was mainly on the quantity of production with attention on gross physical improvement, usually to the detriment of worker dignity. Despite the lack of social concern, so many production concepts inaugurated including departmentalized plant layouts, division of labour for training and work study, more orderly material flow, improved cost recording procedures and incentive wage plans.
- Events at the start of twentieth century, shaped the foundations of production studies to make the subject more compatible with the mechanistic attitudes on the physical sciences. Undoubtedly, *F.W. Taylor* was the most outstanding historical figure in the development of management techniques. He was both a thinker and writer.
- As Taylor started his career as a worker, he carried out and analysed thousands of tests to identify the relevant variable of production. He characterized a new scientific approach and his new philosophy was that the scientific method should be applied to all managerial problems. The method of work should be determined by management through investigation and not by workers themselves.
- '*Taylor*' actually proved himself in the pioneering experiments. He developed general philosophy and did not give much importance to specific philosophy. As Taylor's attitude was very much compromising, his philosophy was criticized very much by great thinkers and writers. The science of production management in Taylor's spirit was very slow to develop.

Operations Management :

- Operations management refers to the planning, co-ordination and control of all the activities concerned with the conversion of inputs into output. Inputs consists of raw materials, energy, labour, machinery and other productive resources. These inputs are transformed into output through appropriate systems, design planning and control. Output comprises products and services. For example, the output of an automobile assembly plant may be a car.

- Operations management is not peculiar to a production organization. Rather it is found in all types of organizations including airlines, railways, roadways, insurance firms, banks, advertising agencies, hotels and restaurants, hospitals etc. Its scope is very wide.

Q. 5 : State the Objectives of Production Management.

Ans. : Objectives of Production Management :

- (a) **Effectiveness Objective** : Producing the right kind of goods and services that satisfy customers' needs.
- (b) **Efficiency Objective** : Maximising output of goods and services with minimum resource inputs
- (c) **Quality Objective** : Ensuring that goods and services produced conform to pre-set quality specifications.
- (d) **Lead Time Objective** : Minimising throughput-time- the time that elapses in the conversion process- by reducing delays, waiting time and idle time.
- (e) **Capacity Utilisation Objective** : Maximising utilisation of manpower, machines, etc.
- (f) **Cost Objective** : Minimising cost of producing goods or rendering a service.

Q. 6 : Explain the Different Functions of Production Management.

Ans. : Functions of Production Management : The various important functions to be performed by production management are as follows :

(a) Production Planning :

- Production planning is the main function of production management. It facilitates the supply of goods at a proper time to execute the order received by the company. It also helps to control over the production process.
- The function of production planning involves the decision regarding when, what, how and why to produce goods.
- Production management forecasts the sales or demand for the products of the company and make the necessary arrangements to meet the demand at the proper time. Thus, production Management tries to maintain a proper balance between demand and supply.

(b) Production Control :

- After planning, the next function of production management is to control the various factors of production in an efficient manner so that the goods are produced at the lowest possible cost and according to the requirements and satisfaction of the customers and are supplied to them on delivery dates in the ordered quantity.

- This function calls for scheduling the required work, providing necessary instructions to production department and checking the progress of production regularly.

(c) Quality Control :

- The production management is also responsible for maintaining the specific quality of the production.
- It should take such steps to produce the goods according to specifications and to minimise the amount of defective work. The defective work (production) should be sorted out and sold quickly.

(d) Method Analysis :

- There may be so many alternatives for producing a product. As all the alternatives do not work equally, some may be more economical than others.
- The production management study these various alternatives and analyse them in right perspective in order to choose the best one. This activity is called as 'Method Analysis'.
- 'Method analysis' improves the productivity of the concern and minimizes the cost of production.

(e) Inventory Control :

- Production management controls over the cost of production by reducing the waste of man and material, so as to make the best use of material.
- For this purpose, it has to determine the economic lot size, economic order quantity, reorder levels etc., so that the problem of over and under stocking of materials may not arise. This involves the physical and financial control over materials.
- It also includes the procurement of raw materials.

(f) Plant Layout and Material Handling :

- Plant layout is an arrangement of machines and equipment in such a manner so as to maintain the regular flow of production.
- An efficient plant layout aims at efficient material handling which in turn reduces wastage of men, materials and reduces the cost of production.
- The production management has to ensure that efficient material handling system and proper plant layout are designed and developed.

(g) Work Measurement :

- One of the main function of production management is to control and reduce the labour cost per unit.

- At different levels of production, the labour cost per unit differs. Here, work measurement is necessary. Work measurement means the level of performance of work by a worker. If any worker works below the fixed level, by work measurement techniques, his performance must be improved through positive or negative incentives.
- Time and motion studies are the work measurement techniques.

(h) Other Functions :

- Apart from the above main function, the production management has to perform certain other functions such as Cost Control, Standardization, Storage, Price Analysis, Engineering Economics etc.

Q. 7 : State the Various Qualities of Production Manager.

Ans. : Qualities of Production Manager :

- (a) **Intelligence** : Intelligence forms a very important and essential quality for a production manager.
- (b) **Flexibility** : A good production manager should possess flexibility which will enable him to modify the production planning procedure to suit the changing conditions.
- (c) **Imagination** : Imagination forms a very engulfing and important quality of a good production manager.
- (d) **Enthusiasm and Perseverance** : A production manager should be an enthusiastic person which will enable him to do various things and that also in well planned manner. For a person to be enthusiastic for any activity he does, perseverance plays a very important role.
- (e) **Resourcefulness** : A resourceful production manager will be able to face the various odd situations surrounding him or the organisation and come out of them in a successful manner.
- (f) **Communication Ability** : Good communication ability has a very important fundamental base which involves one's ability to listen to others with patience.
Communication ability forms the basis of giving instructions by production manager to his workers, communicating various decisions of the management, resolving conflicts etc.
- (g) **Self Control** : A good production manager should not lose his temper and remains calm in every adverse situation. He should handle all the barriers in the production process with adequate self control.

Q. 8 : State the Responsibilities of Production Manager.

Ans. : Responsibilities /Role of Production Manager :

- (a) To strategically plan an increase in the company's productivity by making optimum use of available resources.

- (b) To participate in all the stages of production in a factory of a company.
- (c) To maintain standards in quality, and ensure that there are no slips.
- (d) To carefully designed company's production programme.
- (e) To create a time-bound production schedule and make sure that the manufacturing is timely and standardised.
- (f) To implement the ways for enhancing the production of goods and thereby, increase the sales and profit margins of the organisation.
- (g) To take decisions regarding purchase of equipment and machinery for the production unit.
- (h) To oversee the repairs and maintenance of all the production equipments.
- (i) To undertake training of production team members.
- (j) To co-ordinate with all other departments and ensure that the production does not get held up due to any reason.

1.2**Plant Location : Importance and Factors responsible for Plant Location Decision**

Q. 9 : Write a Note : Plant Location.

Ans. : Plant Location :

- Plant location is an important decision which decides the fate of the business. In the past, much importance was not given to the selection of appropriate location and the decisions in this regard were mainly governed by the individual preferences of the entrepreneurs and social customs. This resulted in failure of many organizations, which otherwise could have been successful.
- The degree of significance for the selection of location for any enterprise mainly depends on its size and nature.
- The selection of location is an important activity for the success of the business and requires careful analysis.
- The selection of location is of prime importance both for new and already established enterprises.
- The choice of location is vital for any new firm for its success.

Q. 10 : State the Importance of Plant Location.

Ans. : Importance of Plant Location :

- (a) A good location may reduce the cost of production and distribution to a considerable extent. The reduction in cost of production helps in

- elevating either the competitive strength or the profit margin of the business.
- (b) Locating a business may involve a large, relatively permanent investment. If the site selection is not proper, all the money spent on factory building, machinery, and their installation will go in waste and the owner will have to suffer a great loss.
 - (c) Location fixes some of the physical factors of the overall plant design. For example, heating and ventilation requirements, storage capacity for raw-material, taking into consideration their local availability, transportation need for raw materials and finished goods, power needs, costs of labour, taxes, land construction, fuel etc.
 - (d) Location of plant determines the nature of investment costs to be incurred and also the level of many operating costs.
 - (e) Government sometimes plays an important role in the choice of the location keeping in view the national benefits.
 - (f) Probably no location is so perfect as to guarantee success. But bad locations can be so bad as to bankrupt a company.

Q. 11 : Describe the Various Factors affecting Plant Location Decision.

Ans. : Factors affecting Plant Location Decision :

(a) Availability of Raw Material :

- As far as possible the site selected should be near the source of raw materials, so that the cost of transportation can be reduced due to shorter lead time.

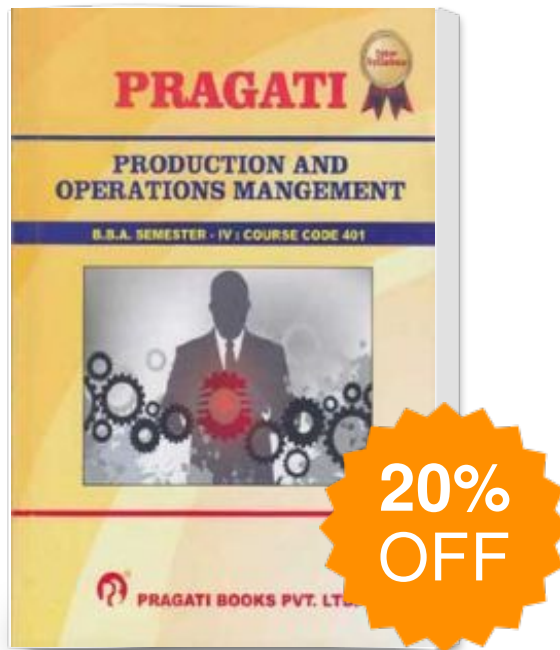
(b) Proximity to Markets :

- The cost of transporting finished goods, and distribution etc. will be greatly reduced if the factory is located near the market.
- Nearness to market is an important factor in the following cases :
 - (i) Industries using light raw-materials of high value.
 - (ii) Industries producing perishable, fragile or heavy products.
 - (iii) For the industries providing technical advice and services (such as tool and die companies) this will help in ensuring prompt service to customers.
- If the product enjoys scattered market then nearness of the market is not a deciding factor in the selection of site.

(c) Availability of Labour :

- Availability of right kind of labour force in required numbers at reasonable rates is also a deciding factor in selection of site.

Production & Operations Management



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