SCOPE OF OPERATIONS MANAGEMENT

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2014 - 2015

1.1- CONCEPT OF PRODUCTION

Production function is 'the part of an organization, which is concerned with the transformation of a range of inputs into the required outputs (products) having the requisite quality level'.

Production is defined as 'the step-by-step conversion of one form of material into another form through chemical or mechanical process to create or enhance the utility of the product to the user'. Thus production is a value addition process. At each stage of processing, there will be value addition. Some examples of production are: manufacturing custom-made products like, boilers with a specific capacity, constructing flats, some structural fabrication works for selected customers, etc., and manufacturing standardized products like, car, bus, motor cycle, radio, television, etc.

1.2- PRODUCTION SYSTEM

The production system is 'that part of an organization, which produces products of an organization. It is that activity whereby resources, flowing within a defined system, are combined and transformed in a controlled manner to add value in accordance with the policies communicated by management'. A simplified production system is shown below:

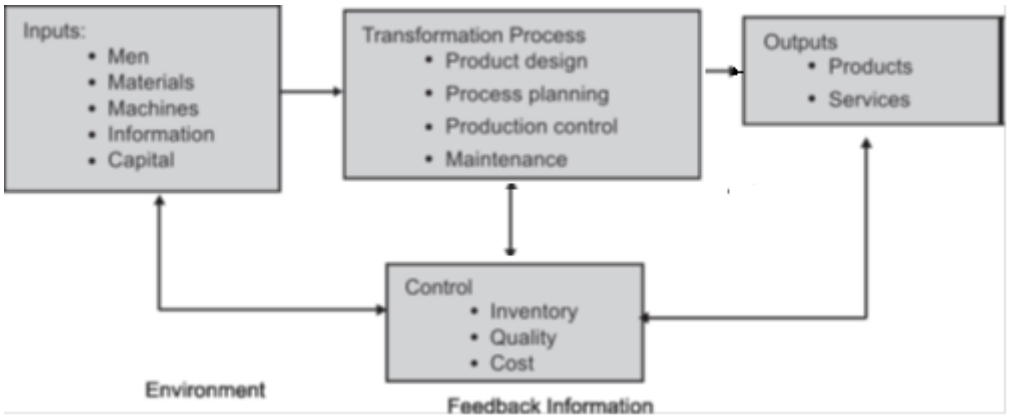

Fig.1 Schematic production system

The production system has the following characteristics:

1. Production is an organized activity, so every production system has an objective.
2. The system transforms the various inputs to useful outputs.
3. It does not operate in isolation from the other organization system.
4. There exists a feedback about the activities, which is essential to control and improve system performance.

1.3- SCOPE OF OPERATIONS MANAGEMENT

Operations Management concern with the conversion of inputs into outputs, using physical resources, so as to provide the desired utilities to the customer while meeting the other organizational objectives of effectiveness, efficiency and adoptability. It distinguishes itself from other functions such as personnel, marketing, finance, etc. by its primary concern for 'conversion by using physical resources'.

Following are the activities, which are listed under Production and Operations Management functions:

1. Location of facilities.
2. Plant layouts and Material Handling.
3. Product Design.
4. Process Design.
5. Production Planning and Control.
6. Quality Control.
7. Materials Management.
8. Maintenance Management.

Fig. 2 Scope of production and operations management

LOCATION OF FACILITIES

Location of facilities for operations is a long-term capacity decision, which involves a long-term commitment about the geographically static factors that affect a business organization. It is an important strategic level decision-making for an organization. It deals with the questions such as 'where our main operations should be based?'

The selection of location is a key-decision as large investment is made in building plant and machinery. An improper location of plant may lead to waste of all the investments made in plant and machinery equipments. Hence, location of plant should be based on the company's expansion plan and policy, diversification plan for the products, changing sources of raw materials and many other factors. The purpose of the location study is to find the optimal location that will results in the greatest advantage to the organization.

PLANT LAYOUT AND MATERIAL HANDLING

Plant layout refers to the physical arrangement of facilities. It is the configuration of departments, work centers and equipment in the conversion process. The overall objective of the plant layout is to design a physical arrangement that meets the required output quality and quantity most economically.

According to James More 'Plant layout is a plan of an optimum arrangement of facilities including personnel, operating equipment, storage space, material handling equipments and all other supporting services along with the design of best structure to contain all these facilities'.

'Material Handling' refers to the 'moving of materials from the store room to the machine and from one machine to the next during the process of manufacture'. It is also defined as the 'art and science of moving, packing and storing of products in any form'. It is a specialized activity for a modern manufacturing concern, with 50 to 75% of the cost of production. This cost can be reduced by proper section, operation and maintenance of material handling devices. Material handling devices increases the output, improves quality, speeds up the deliveries and decreases the cost of production. Hence, material handling is a prime consideration in the designing new plant and several existing plants.

PRODUCT DESIGN

Product design deals with conversion of ideas into reality. Every business organization have to design, develop and introduce new products as a survival and growth strategy. Developing the new products and launching them in the market is the biggest challenge faced by the organizations. The entire process of need identification to physical manufactures of product involves three functions; Design and Marketing, Product, Development, and manufacturing. Product Development translates the needs of customers given by marketing into technical specifications and designing the various features into the product to these specifications. Manufacturing has the responsibility of selecting the processes by which the product can be manufactured. Product design and development provides link between marketing, customer needs and expectations and the activities required to manufacture the product.

PROCESS DESIGN

Process design is a macroscopic decision-making of an overall process route for converting the raw material into finished goods. These decisions encompass the selection of a process, choice of technology, process flow analysis and layout of the facilities. Hence, the important decisions in process design are to analyze the workflow for converting raw material into finished product and to select the workstation for each included in the workflow.

PRODUCTION PLANNING AND CONTROL (PP&C)

Production planning and control can be defined as the process of planning the production in advance, setting the exact route of each item, fixing the starting and finishing dates for each item, to give production orders to shops and to follow-up the progress of products according to orders.

The principle of production planning and control lies in the statement 'First Plan Your Work and then Work on Your Plan'. Main functions of production planning and control include Planning, Routing, Scheduling, Dispatching and Follow-up.

Planning is deciding in advance what to do, how to do it, when to do it and who is to do it.

Planning bridges the gap from where we are, to where we want to go. It makes it possible for things to occur which would not otherwise happen.

Routing may be defined as the selection of path, which each part of the product will follow, which being transformed from raw material to finished products. Routing determines the most advantageous path to be followed for department to department and machine to machine till raw material gets its final shape.

Scheduling determines the program for the operations. Scheduling may be defined as 'the fixation of time and date for each operation' as well as it determines the sequence of operations to be followed.

Dispatching is concerned with the starting the processes. It gives necessary authority so as to start a particular work, which has been already been planned under 'Routing' and 'Scheduling'.

Therefore, dispatching is 'Release of orders and instruction for the starting of production for any item in acceptance with the Route sheet and Schedule Charts'.

The function of **Follow-up** is to report daily the progress of work in each shop in a prescribed proforma and to investigate the causes of deviations from the planned performance.

QUALITY CONTROL (QC)

Quality Control may be defined as 'a system that is used to maintain a desired level of quality in a product or service'. It is a systematic control of various factors that affect the quality of the product. Quality Control aims at prevention of defects at the source, relies on effective feedback system and corrective action procedure.

Quality Control can also be defined as 'that Industrial Management technique by means of which product of uniform acceptable quality is manufactured'. It is the entire collection of activities, which ensures that the operation will produce the optimum quality products at minimum cost. The main objectives of Quality Control are:

1. To improve the companies' income by making the production more acceptable to the customers *i.e.* by providing longlife, greater usefulness, maintainability, etc.
2. To reduce companies cost through reduction of losses due to defects.
3. To achieve interchangeability of manufacture in large-scale production.
4. To produce optimal quality at reduced price.

5. To ensure satisfaction of customers with productions or services or high quality level, to build customer good will, confidence and reputation of manufacturer.
6. To make inspection prompt to ensure quality control.
7. To check the variation during manufacturing.

MATERIALS MANAGEMENT

Materials Management is that aspect of management function, which is primarily concerned with the acquisition, control, and use of materials needed and flow of goods and services connected with the production process having some predetermined objectives in view.

The main objectives of Material Management are:

1. To minimize material cost.
2. To purchase, receive, transport and store materials efficiently and to reduce the related cost.
3. To cut down costs through simplification, standardization, value analysis, import substitution, etc.
4. To trace new sources of supply and to develop cordial relations with them in order to ensure continuous supply at reasonable rates.
5. To reduce investment tied in the inventories for use in other productive purposes and to develop high inventory turnover ratios.

MAINTENANCE MANAGEMENT

In modern industry, equipment and machinery are a very important part of the total productive effort. Therefore their idleness or downtime becomes are very expensive. Hence, it is very important that the plant machinery should be properly maintained.

The main objectives of Maintenance Management are:

1. To achieve minimum breakdown and to keep the plant in good working condition at the lowest possible cost.
2. To keep the machines and other facilities in such a condition that permits them to be used at their optimal capacity without interruption.
3. To ensure the availability of the machines, buildings and services required by other sections of the factory for the performance of their functions at optimal return on investment.