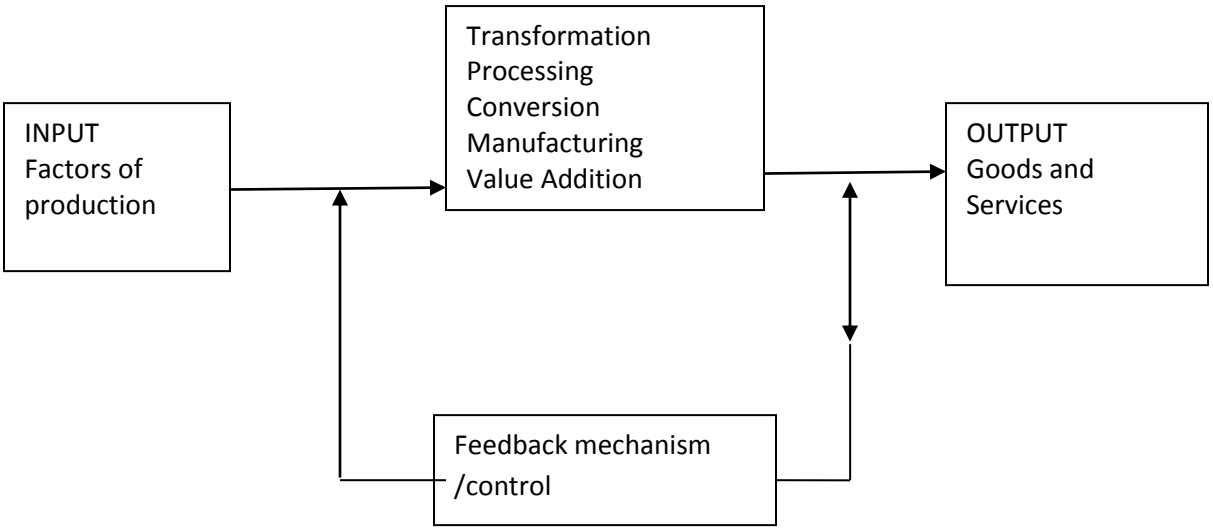
BA: 331: PRODUCTION AND OPERATION MANAGEMENT

1. Introduction

Production and Operation Management (POM) is the planning, staffing and controlling of activities of production system i.e. those portions of organization that converts input into products and services. In general production systems take in raw materials (input) or generally factors of productions i.e. capital, land, equipment's, entrepreneurships, buildings, goodwill markets etc. and produce products and services for the consumers. It encompasses that part of an organization that is concerned with the design, planning and control of resources for the provision of goods and services with the broad spectrum of the organization. POM which evolved from the field of production or manufacturing is concerned with selecting, designing and updating systems that produce the organization products and services and with operating those systems.

FIG 1 Summary of production function



Why should we study P.O.M.:

1. Studying POM gives us a systematic approach to improving efficiency by determining each workers skill and learning ability for best placement.

2. Since POM activities are mainly at the lower level of organizational hierarch, i.e. the shop floor- comprising mainly the superintendent and the lower middle management.

Concentrating POM studies at the shop level is quiet strategic since this is where most management problems of the day are found.

3. Operation systems of organization take up largest part of its financial assets, personnel and expenses and studying POM helps them to make accurate estimates of these inputs.

4. POM enhances productivity which is good measure of economic growth.

5. Competitiveness of a nations good and services can be improved and sustained if POM strategies are used in the production function.

6. Poverty alleviation as a result of jobs creation through POM technologies in the production system.

7. POM plays a major role in the MSE Micro and Small Scale Enterprises sector especially in this era of liberalization.

8. Cost minimization and cost efficiency as the core function of the firms that have thrived in business is the domain culture a fare of POM.

9. Cost consciousness, introduction of new varieties and ways of doing things as a never ending company culture are firmly rooted in POM environments. These practices endure competitiveness.

10. Research and Development (R&D) especially in product design for new market are tasks that have emanated from the evolving practices in POM.

11. POM practices enable recycling of non-sellable by-products to reduce loses hence maximize profits.

12. POM enhances quality in products and at the same time ensures efficiency in production through technology transfer or adoption of technology.

13. Through the Jua Kali sector and the associated POM activities it is hoped that the industrialization dream of Kenya by the year 2020 will find a Conner stone.

2. HISTORICAL EVOLUTION OF POM

The abolition of slave trade and the exodus of farm laborers to the cities provided a large workforce for the rapidly developing urban industrial workers. The end of civil wars witnessed the beginning of modern forms of capital through establishment of joint stock companies, others built industrial empires. These entrepreneurs and the vast

accumulation of capital in this period (1865-1900) created a great United States (US) productive capacity. By 1900 all these developments increased capital and productive capacity, the expanded urban workforce as a result of the end of slave trade, new western markets and an effective national transportation system, set the stage for the great production explosion of the early 20th Century.

a. Scientific management

The social and economic environment of the new century gave rise to new methods of management which in turn developed into massive POM management. i.e. the ability of managers to develop new philosophies of management which involved scientific investigation, experimentation analysis and improving and reforming things on the basis of fact. This was known as Scientific Management or today's Management Science 1875-1925.

One of the key contributors of Scientific Management thought was Fredrick Taylor (1856-1915). He brought into focus and popularized the nation of efficiency and productivity as had never been done before. Taylor observed workers soldering or loafing, poor management and lack of harmony between workers and managers in Mieval Steel Company and developed the following:-

1) A shop system which was a systematic approach to improving labor efficiency, each workers skill, strength and learning ability for job placement.

2).Standard output per worker on each task was set. The expected output or each job for planning and scheduling work and for comparing different methods of performing tasks was laid out.

3) Incentive pay systems were installed to increase productivity and relieve foremen from their traditional function of driving workers.

Strong recommendations of Taylor that are still used for good performance today are:-

a) Systematic planning as a distinct management responsibility that must precede production activity.
b) Control system as sensing mechanisms to maintain established procedure and performance standards.

c) Standards as benchmarks with which to compare management and workers performances.
d) Scientific or analytical investigation of business problems rather than intuitive decision making.

b. Human relations movement (1960-1960)

This was mainly by Elton Mayo through the Hawthorn studies which began majorly by industrial engineer. This established the relationship between the physical environment and workers productivity. The researchers realized that human factors affected by the productivity. That psychological and sociological factor affected not only human motivation and attitude but also productivity. From the work of this behaviors came the gradual change in the way managers thought about and treated workers.

c. Era of operation research (or) and computers (1960)

The advent of OR and Computers has also been a positive development. OR seeks to replace intuitive decision making for large complex problems with approach that identify the optional or best alternative through analysis. Operation managers, like other managers of other functional areas in an organization have adopted the approaches and techniques and of operations research to improve their decision making.

The entering of the use of computers in POM has a reality reduced the cost of it replaced most of the areas of HR. requirement. In 1960 companies began to use specific soft wares that provided operation managers with analysis of their operations, forecasting, linear programming and scheduling are prominent POM areas that have greatly been made efficient by use of specific application for software analysis.

In the 1970 and 1980's, manufacturing planning and control software was developed, installed and used by many companies. The use of computers formed the basis of manufacturing information systems which are intended to provide operation managers with information to manage operations more effectively. Information from such diverse areas as demand forecast, purchasing inventories, scheduling and shop floor control are integrated into one information system. Such information systems are used to store massive quantities of data to manipulate and retrieve this data as managers may

require. Those systems have improved the quality of information available to operation managers. Material Requirement Planning (MRP) System is example of such systems.

2. CHARACTERISTICS OF POM

Production

Normally, production system follow three steps, these are input, transformation & output. In a production system, we can input anything like human resource, capital material, capital, material services, land and energy and by transformation process we will transform it into other product. The following are some of production system characteristics.

a).System discrimination

Production system is involved on input and output, it does not consist of any waiter connection involving it's all phase that is connecting with the technology. All other phases that are related with manufacturing are a production system environment.

b).Inter relationship among systems

Production is a process and it has a way to perform and those have close relationship with each other.

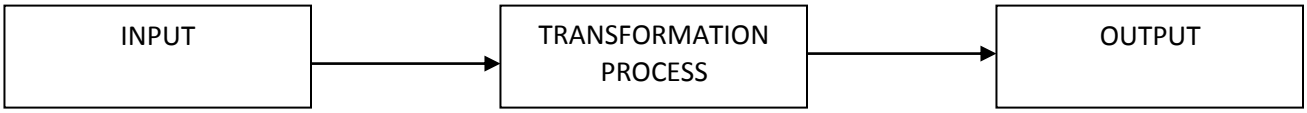
c).Stratum formulation

A production system normally consists of hierarch of the organization, and those are related with the size of the organization and the function of the organization. Stratum is normally related to the size, hierarch, and functions of the organization.

Production and operations management as a transformation process.

Production and operations management (POM) is about the transformation of production and operational 'inputs' into 'output' that when distributed meets the needs of customers.

FIG 2 Transformation process



POM incorporates many tasks that are interdependent, but which can be grouped under fine main headings namely product, plant, process, programs and people.

1. Products

Marketers in business must ensure that a business sells products that meet customers' needs and wants .The role of production and operations is to ensure that the business actually makes the require product in accordance to with plan. The role of product in POM therefore concerns areas such as Performance, aesthetic quality, reliability and quantity, production cost and delivery dates.

2. Plant

To make product, plant of some kind is needed. This will comprise the bulk of the fixed assets of business. In determining which plant to use, management must consider areas such as:

a. Future demand (volume and timing)
b. Design and layout of the factory, equipment and offices.
c. Need for (and cost of) maintenance.
d. Health and Safety (of operation equipment)
e. Environmental issues (creation of waste products)
f. Product and Reliability of equipment

3. Process

There are many ways of producing a product. Management must choose the best process or series of processes. They will consider:-

a. Available capacity
b. Available skulls
c. Type of production
d. Layout of plant and equipment
e. Safety
f. Production cost
g. Maintenance requirement

4. Programs

The production program concerns the dates and rimes of the products that are to be produced

5. Specialization

If the production system expands its area of production and large number of hierarchy and each start performing specialized function. Then the interrogation function of the specialization will give you the maximum output or benefit.

6 Increase of entropy

Everything is changing in our life day by day. Therefore we need to cope with those changes. We will change our old employee by new ones, replace our machines with new ones and change our technology by new technology for suitability of our production.

7 Isofinality

Normally we have an aim to reach our goals and to reach these goals, we will use various kinds of ways, and there is no boundary to make a function in such a way. Here the main topic is to gain the ultimate goal and there will be a lot of approaches to convert the input to output.

Characteristics of operating system

Generally, when a new computer system is installed, operational software which is suitable to that hardware is purchased. Users want reliable operational software that can effectively support their processing activity. Though operating system software varies between manufacturers, they have similar characteristics: Modern hardware, because of its sophistication, requires that operating system must meet certain specific standards. For example, considering the present state of the field an operating system must support some online processing functions normally associated with operational software these are:-

a). **Job Management**

A very important responsibility of operating system software is the scheduling of jobs to be handled by a computer. The operating system set up the order in which programs