

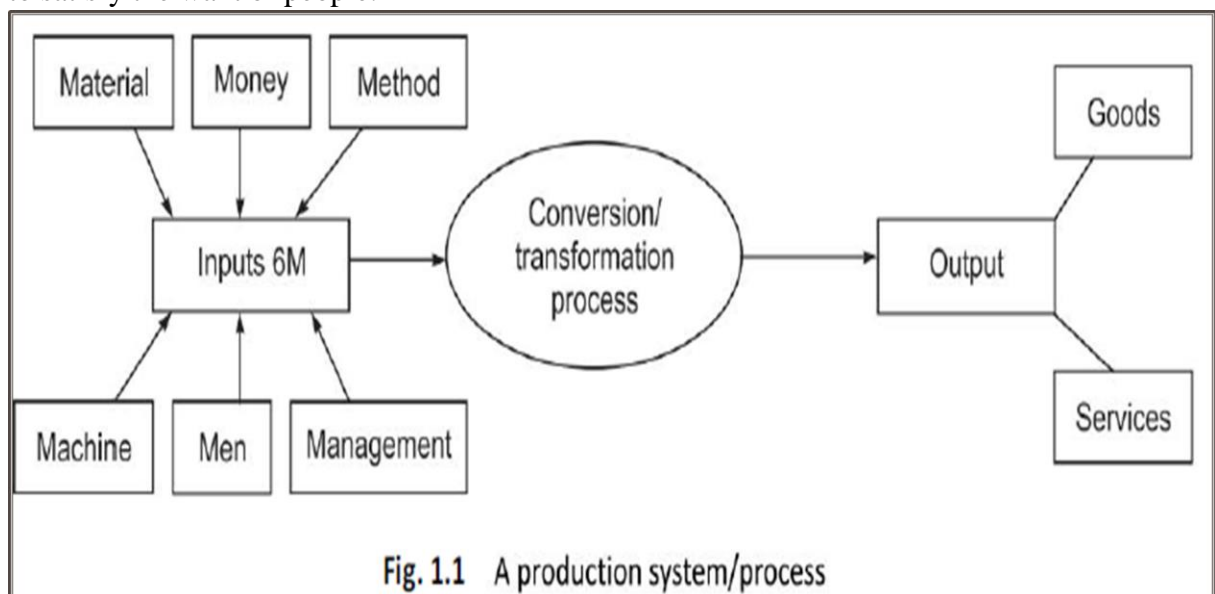
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

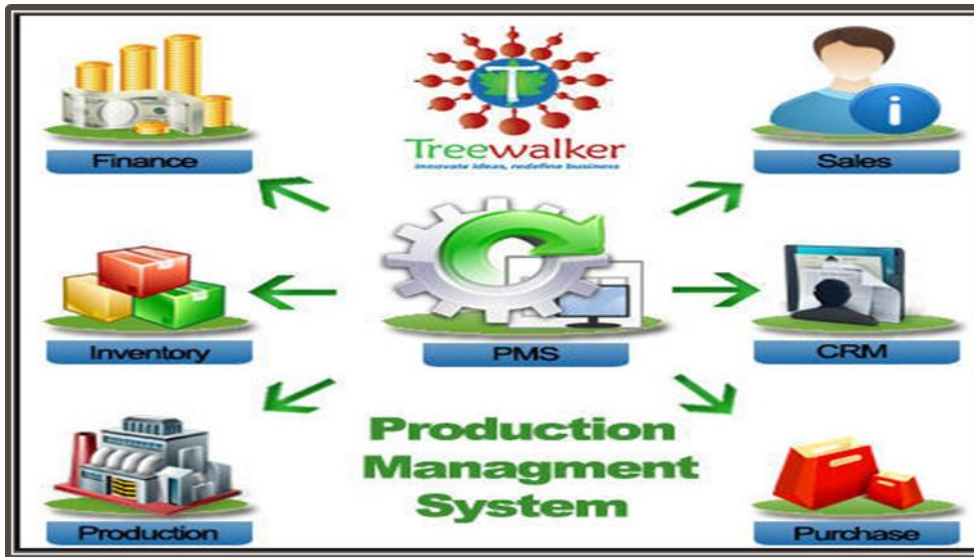
HRD 2104: PRODUCTION, DOMESTIC, SMALL SCALE & INFORMAL SECTOR

01.00: Lesson 5. Production and Productivity

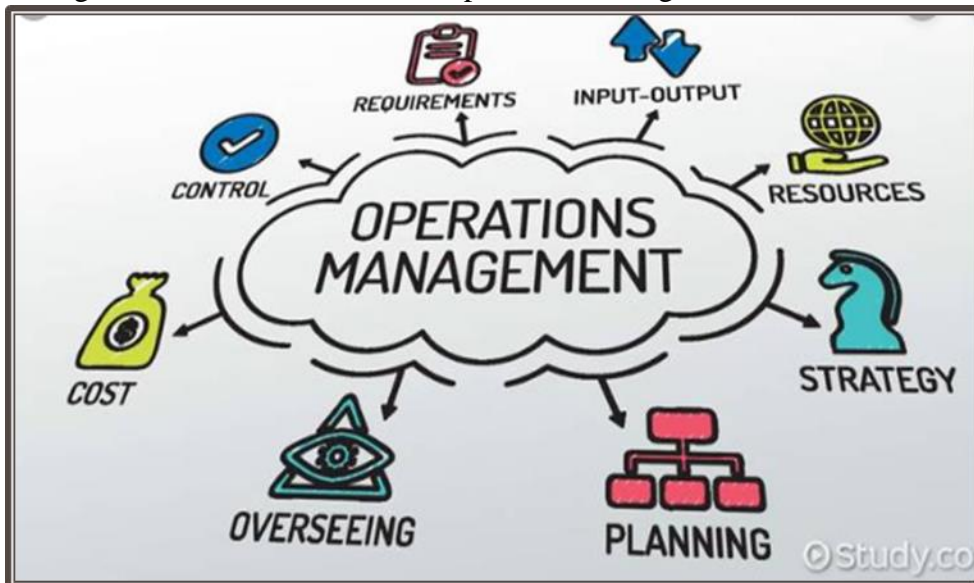
What is Production?

- In any manufacturing system, the job of the production Manager is to manage the process of **converting inputs** into the desired **outputs**.
- **Production Management**
The set of interrelated management activities, which are involved in manufacturing certain products, is called as production management.
- Production Management can be defined as the Management of the conversion process, which converts land, Labour, Capital, and Management inputs into desired outputs of goods and services.
- Means planning, organizing, directing and controlling of production activities.
- Deals with converting raw materials into finished goods/products.
- Brings together **6Ms** (men (Humans), money, machines, materials, methods and markets) to satisfy the want of people.





If the same concept is extended to services management, then the corresponding set of management activities is called as operations management.



- Production is an organized activity of transforming raw materials into finished products.
- Main objective= produce goods at right quality, quantity, time and at minimum cost
- **Operations Management** is concerned with the design and the operation of Systems for manufacture, transport, supply or service.

Organization	Input	Resources	Transformation	Output
Auto mobile Plant	Steel sheets, engine parts	Tools Workers	Fabrication and Assembling	High quality auto mobile
Taxi services	Customers	Driver, taxi, petrol	Driving	Destination
Hospital	Pharmacy In patient Out patient	Doctors Nurses	Health care	Healthy individual



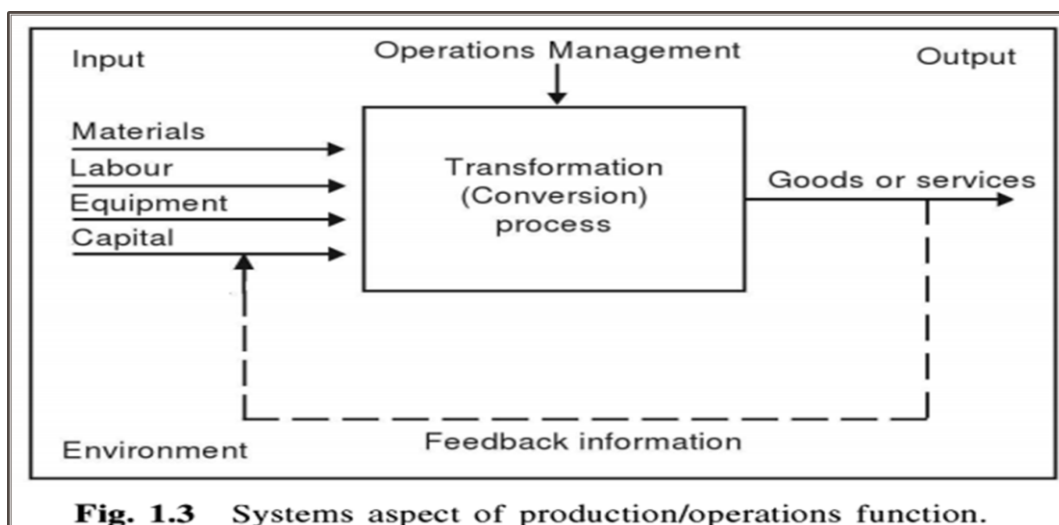
- **Production function** shows the relationship between the input and the output of an organization.
- The production function can be represented by the simple mathematical equation which relates the outputs as the function of inputs, that is

$Y = f(X_1, X_2, \dots, X_n)$ where

Y = Units of output

X_1 = Unit of Labour; X_2 = Unit of machinery, and so on

Characteristics of production



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

Manufacturing is Characterized by tangible outputs (Products), Outputs that Customers Consume over time, Jobs that use less labour and more equipment, little customer contact, no customer participation in the conversion process (In production) and sophisticated methods for measuring production activities and resource consumption as products are made.

- Manufacturing custom-made products like, boilers with a specific capacity,
- Constructing flats, some structural fabrication works for selected customers, etc.
- Manufacturing standardized products like, car, bus, motor cycle, radio, television, etc.

Service is characterized by intangible outputs, outputs that customers consume immediately, jobs that use more labour and less equipment, direct customer contact, frequent customer participation in the conversion process, and elementary methods for measuring conversion activities and resource conversion. Some service is equipment – based like computer software services, Internet services, Telephone services, etc.

Some service is people-based like tax accounting services, hair styling and golf instruction.

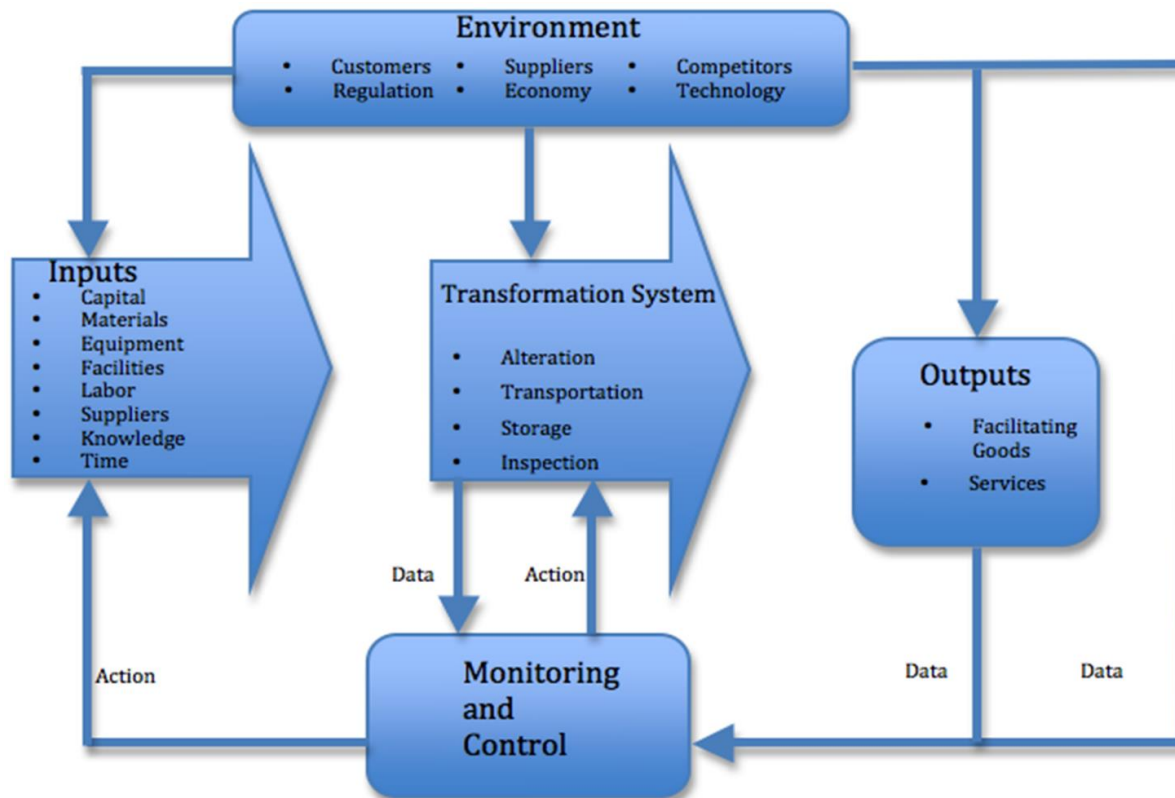
What is Productivity?

- **Productivity** is nothing but the reduction in wastage of resources such as Labour, Machines, Materials, Power, time, Capital, etc.,
- **Productivity** can also be defined as a human endeavor (effort) to produce more and more with less and less inputs of resources so that the products can be purchased by a large number of people at affordable price.
- **Productivity** implies development of an attitude of mind and a constant urge to find better, cheaper, easier, quicker, and safer means of doing a job, manufacturing a product and providing service.
- Productivity aims at the maximum utilization of resources for yielding as many goods and services as possible, at lowest possible cost.
- Productivity processes more efficient works involving less fatigue to workers due to improvements in the Layout of plant and work, better working conditions and simplification of work.
- It is a matter of common knowledge that higher productivity leads to a reduction in cost of production, reduces the sales price of an item, expands markets, and enables the goods to compete effectively in the global market.
- Productivity yields more wages to the workers, shorter the working hours and greater leisure time for the employees.

- In fact, the strength of a Country, prosperity of its economy, standard of living of the people and the wealth of the nation are very largely determined by the extent and measure of its production and productivity.
- By enabling and increase in the output of goods or services for existing resources, productivity decreases the cost of goods per unit, and makes it possible to sell them at lower prices, thus benefiting the Consumers while at the same time leaving a margin for increase in the wages of the workers.

What is the difference between Productivity and Production?

- Production of any commodity or service is the volume of output irrespective of the quantity of resources employed to achieve the level of output.
- Production in an industry can be increased by employing more labour, installing more machinery, and putting in more materials, regardless of the Cost of Production
- Increase of production does not necessarily mean increase in productivity.
- Higher productivity results when we put in production system an element of efficiency with which the resources are employed.
- The combined input of a number of factors such as Land, Materials, Capital and Labour gives an output in an industry.
- The ratio between output and the factors of input is usually known as productivity.



Productivity may also be considered as a measure of performance of the economy as a whole.

Some firm's redefined productivities as effectiveness or value to customer divided by efficiency or cost to producer.

$$\text{Productivity} = \frac{\text{Output Value}}{\text{Input Value}}$$

Partial productivity Management

Partial Productivity measurement is used when the firm is interested in the productivity of a selected input factor. It is the ratio of output values to one class of input.

$$\text{PPM} = \frac{\text{Outputs}}{\text{Labour Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Material Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Capital}}$$

Exercise:

Find out the Partial Productivity of a company given the following. Assume all the values are in constant Ksh. With respect to a base period.

	Output	Ksh.15,000
	Labour input	Ksh.4,500
	Capital input	Ksh.4,500
	Energy input	Ksh. 1,500
	Material input	Ksh 3,000
	Other inputs	Ksh. 750

Solution:

$$\begin{aligned} \text{PPM} &= \frac{\text{Outputs}}{\text{Labour Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Material Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Capital}} \\ \text{PPM} &= \frac{15,000}{4,500} = 3.3, \quad \frac{15,000}{3,000} = 5, \quad \frac{15,000}{4,500} = 3.3 \end{aligned}$$

$$\text{PPM} = \frac{15,000}{750} = 20, \quad \frac{15,000}{1,500} = 10,$$

Total Factor Productivity

$$\text{TFP} = \frac{\text{Net Outputs}}{\text{Labour Input} + \text{Capital}} = \frac{15,000 - 9750}{9000} = 0.58$$

Total Productivity

$$\text{PPM} = \frac{15,000}{14250} = 1.05$$

$$\text{PPM} = \frac{\text{Outputs}}{\text{Labour Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Material Input}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Capital}}$$

Multi-factor Productivity Measurement is used when the firm is interested to know the productivity of a group of input factors but not all input factors.

$$\text{MFPM} = \frac{\text{Outputs}}{\text{Labour+Capital}} \quad \text{or} \quad \frac{\text{Outputs}}{\text{Labour + Material}}$$

Total Productivity Measures

Total Productivity measures deals about composite productivity when it is interested to know about the overall productivity of all input factors. This technique will give us the productivity of an entire organization or even a nation

$$\text{TPM} = \frac{\text{Outputs}}{\text{Inputs}} \quad \text{or} \quad \frac{\text{Net Outputs (Goods and Services Provided)}}{\text{All resources used (Labour + Capital)}}$$

What is effectiveness of Efficiency of the organization?

Effectiveness	Efficiency
<ul style="list-style-type: none"> • Effectiveness is the degree of accomplishment of the objectives that is: How well a set of result is accomplished? How well the resources utilized? • Effectiveness is obtaining the desired results. It may reflect output quantities, perceived quality or both. • Effectiveness can also be defined as doing the right things. 	<ul style="list-style-type: none"> • Efficiency occurs when a certain output is obtained with a minimum of inputs. • The desired output can be increased by minimizing the down times as much as possible (down times are coffee breaks, machine failures waiting time, etc.) • But as we decrease downtimes the frequency of occurrence of defective products will increase due to fatigue. • Efficiency can be defined as doing things right. Operational efficiency refers to a ratio of outputs to inputs (like land, capital etc.)

Purpose and Benefits of Productivity

For Management <ul style="list-style-type: none"> • To earn good profits • To Sell More • Better utilization of resources • Be competitive in the market • To build reputation 	For Workers <ul style="list-style-type: none"> • High wages • Better life standard • Job security • Better satisfaction
For Consumers <ul style="list-style-type: none"> • Good quality of the product • More satisfaction 	For Government <ul style="list-style-type: none"> • High Profits • Goods for foreign exchange • Goods for export • Better utilization of resources • Increase per Capita income • Better Development

Factors Affecting Production

Technical factors

Including the degree of mechanization, technical know-how, raw materials, layout and the Methods and techniques of work determine the level of technological, Development in any industry Technological.

Industrial Factors

Organization factors include various steps taken by the organization towards maintaining better industrial relations such as delegation, decentralization of authority, efficiency, participation in management, organizational efficiency, proper personnel policies relating to selection, placement, promotion, wage salary levels, incentives, merit rating, job evaluation, training and provision for two-way communication and supervision.

Work Environment

The importance of proper work environment and physical conditions on the job has been emphasized by industrial psychologists and human engineers. Better work environment ensures the greatest ease at work through better ventilation and light arrangement, improved safety devices, reduction in noise and introducing suitable rest-pause.

Other factors

Natural Factors: Physical, geographical and climatic conditions influence the productivity at large. Abundance of natural resources affects the productivity and similarly climate affects the efficiency of workers to a great extent.

Managerial Factors; the industrial productivity is influenced very much through managerial ability and leadership. The managerial ability of utilizing the available resources to the maximum, organizing capacity, foresightedness, decision-making ability and entrepreneurship are certain factors that contribute to productivity.

Government Policy; Government policies towards industry also contribute to industrial productivity. Taxation policy, financial and administrative policy, tariff policy and protection policy affect the productivity to a large extent.

INCREASING PRODUCTIVITY OF RESOURCES

Increasing productivity of resources implies, getting more number of goods (output) from the same amount of resources (input). Increasing productivity is possible through:

(1) Material: Industries in which the cost of raw material is a big percentage of the cost of finished goods, higher productivity can be achieved through proper use of materials, i.e., by reducing scrap. Sometimes a little change in the design of the component or component layout may save a lot of

Material. Productivity of materials can also be increased by using correct process, properly trained workers, suitable material handling and storage facilities and proper packaging. All these factors reduce scrap rate.

(2) *Labour*. A little change in the design of component parts, so as to facilitate final assembly, can increase the number of products assembled per day with the same amount of labour. Work methods, if improved through work-study techniques, can substantially increase the rate of production.

(3) *Plant Equipment and. Machinery*: Productivity can be increased through improved tools

(4) *Land and Building*: Provision of space and location matters

References:

1. Management Theory and Practice By G.A. Cole
2. Essentials of Management by Koontz, H & O Donned 7th Edition

Study Questions:

1. *Define productivity and explain its meaning with suitable examples. How is it different from production and profitability?*
2. *What are the different methods to measure productivity?*
3. *Describe the various kinds of partial productivity measurement.*
4. *State the benefits of increasing productivity to :*
(a) Management (b) Workers (c) Society
5. *Explain the importance of productivity.*
6. *Describe the various techniques of improving productivity.*
7. *What measures would you suggest to improve productivity of a firm?*

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