Production and Productivity(Unit1)

By – Akanksha Tiwari

Difference between Product and Service

Product	Service
Tangible, durable products	Intangible, perishable products
Output can be stored	Output can't be stored
Consumption/use takes more time	Immediate consumption.
Low costumer's involvement	High costumer's involvement
Long response time	Short response time
Available at regional, national and international market.	Local market
Require large facilities	Require small facilities
Capital intensive	Labour intensive
Quality can be easily measured	Quality can not be easily measured
Demand variable on weekly, monthly, seasonally.	Demand variable on hourly, daily, weekly basis

Production

- Production is any process or procedure developed to transform a set of input like men, capital, material, information and energy into a specified set of output elements like finished goods and services in proper quantity and quality.
- 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.

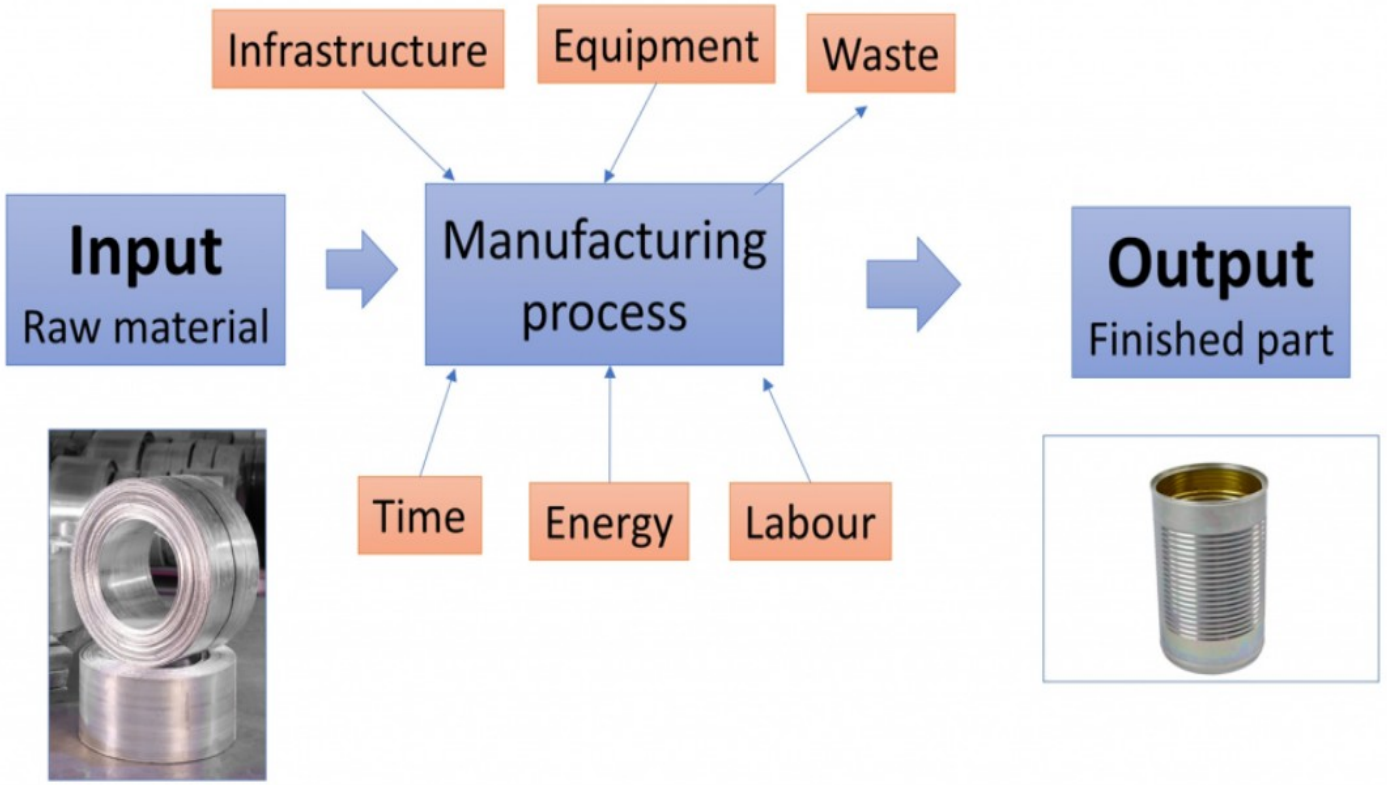
Production System

- 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).
- The production systems can be viewed as a framework of activities within which the creation of values can occurs.
- At one end of the production system are the inputs and at the other end are outputs. Connecting the inputs and outputs are a series of operation or process, storages and inspection.
- The concept of production system is applicable to both production of component and production of services as well.

Input Output Model

- It is the one of the basic models of a production system.
- A production system is a set of interconnected input-output elements and it is made up of three components parts namely inputs, processes and outputs
- The transforming process can be complicated and the design of an actual input and output system for manufacturing may be expensive and complicated.

Input Output Model



Productivity

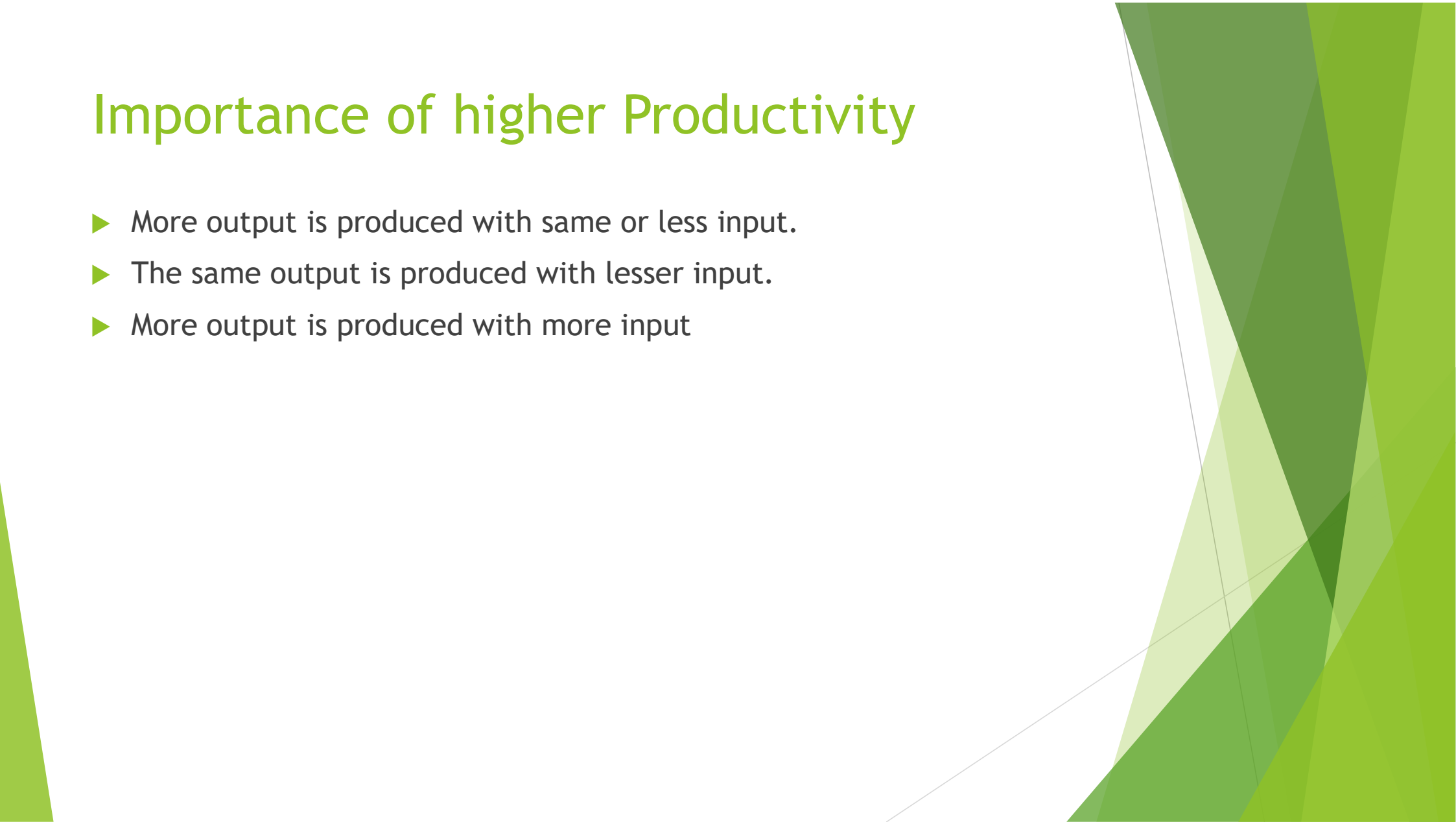
- Productivity of a production system is similar to the efficiency of a machine.
- It is also intended to increase the productivity within the available resources.
- Productivity is a relationship between the output (product/service) and input (resources consumed in providing them) of a business system.
- Productivity may be defined as the ratio between output and input. Output means the amount produced or the no. of items produced and the inputs are the various resources employed like land and building, equipment and machinery, materials ,labour etc.

Importance of higher Productivity

- It helps to cut down cost per unit and thereby improve the profits.
- Gains from productivity can be transferred to the consumers in form of lower priced
- Products or better quality products.
- It would generate more employment opportunity.
- Overall productivity reflects the efficiency of production system.
- The proportional increase in output being more than the proportional increase in input.
- These gains can also be shared with workers or employees by paying them at higher rate.
- A more productive entrepreneur can have better chances to utilized expert opportunities.

Importance of higher Productivity

- More output is produced with same or less input.
- The same output is produced with lesser input.
- More output is produced with more input



Productivity Measurements

- Productivity may be measured either on aggregate basis or on individual basis, which are called total and partial measure.

Total productivity index/Measure = Total Output/ Total Input

So, Total Output = Total production of goods or services

And Total Input = Labour + material + capital + energy+ management.

- Multifactor productivity (MFP) is a measure of economic performance that compares the amount of output to the amount of combined inputs used to produce that output. Combinations of inputs can include labor, capital, energy, materials, and purchased services.
- Productivity of each resource can be measured separately.

Productivity Measurements

Example. 2.1. **Calculation of productivity :**

	Plant A	*Plant B*
No. of workers	200	300
No. of items produced per unit time	10	20
Therefore productivity	$= \frac{10}{200} = \frac{1}{20}$	$= \frac{20}{300} = \frac{1}{15}$

Productivity Measurements

Problem 1.13
John Lucy makes wooden boxes in which to ship motorcycles. John and his three employees invest
40 hours per day making the 120 boxes.
(a) What is their productivity?

Productivity = Units Produced / Input Used = 120 / 40 = 3 boxes/hour

(b) John and his employees have discussed redesigning the process to improve efficiency. If they
can increase the rate to 125 per day, what would be their new productivity?

Productivity = Units Produced / Input Used = 125 / 40 = 3.15 boxes/hour

(c) What would be their increase in productivity?

IncreaseProductivity = 5 boxes / 40 hours = 0.125 boxes/hour

Productivity Measurements

Problema 1.16

David Upton is President of Upton Manufacturing, a producer of Go-Kart tires. Upton makes 1000
tires per day with the following resources:

Labor: 400 hours @ $12.50 per hour
Raw material: 20,000 pounds per day @ $1 per pound
Energy: $5,000 per day
Capital: $10,000 per day

(a) What is the labor productivity for these tires at Upton Manufacturing?
Unit produced: 1000 tires
Input used: 400 hours/day

Productivity = Units Produced / Input Used = 1000 / 400 = 2.5 tires/day

(b) What is the multifactor productivity for these tires at Upton Manufacturing?

*MultiFactor productivity = Output / Multifactor inputs = 1000 / (12.50*24 + 20000 + 5000 + 10000) = 0.02833 tires/dollar*

(c) What is the percent change in multi-factor productivity if Upton can reduce the energy bill by $1,000 without cutting production or changing any other inputs?

*MultiFactor productivity = Output / Multifactor inputs = 1000 / (12.50*24 + 20000 + 4000 + 10000) = 0.02915 tires/dollar*
*percent change = (new productivity - old productivity)*100 - 100 = 2,89 %*

Factors affecting productivity

- A - Factors affecting National productivity
  - 1-Human Resources
  - 2- Technology and Capital Investment
  - 3- Government Regulations
- B – Factors affecting productivity in manufacturing and service
  - 1- Product or system design
  - 2 – Machinery and equipment
  - 3- The skill and effectiveness of worker
  - 4- Production Volume