

COURSE TITLE
ORGANIZATION AND MANAGEMENT

Chapter 12
PRODUCTIVITY MANAGEMENT

Lecture 12 (week 12)

Concept and Meaning, Difference between productivity and production, Measurement of Productivity, Types of productivity, Factors affecting productivity

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Learning Objective

The main objective of this lecture is to understand about:

- 12.1 Meaning and Concept of productivity management.
- 12.2 Difference between productivity and production
- 12.3 Measurement of productivity
- 12.4 Types of productivity
- 12.5 Factors affecting productivity

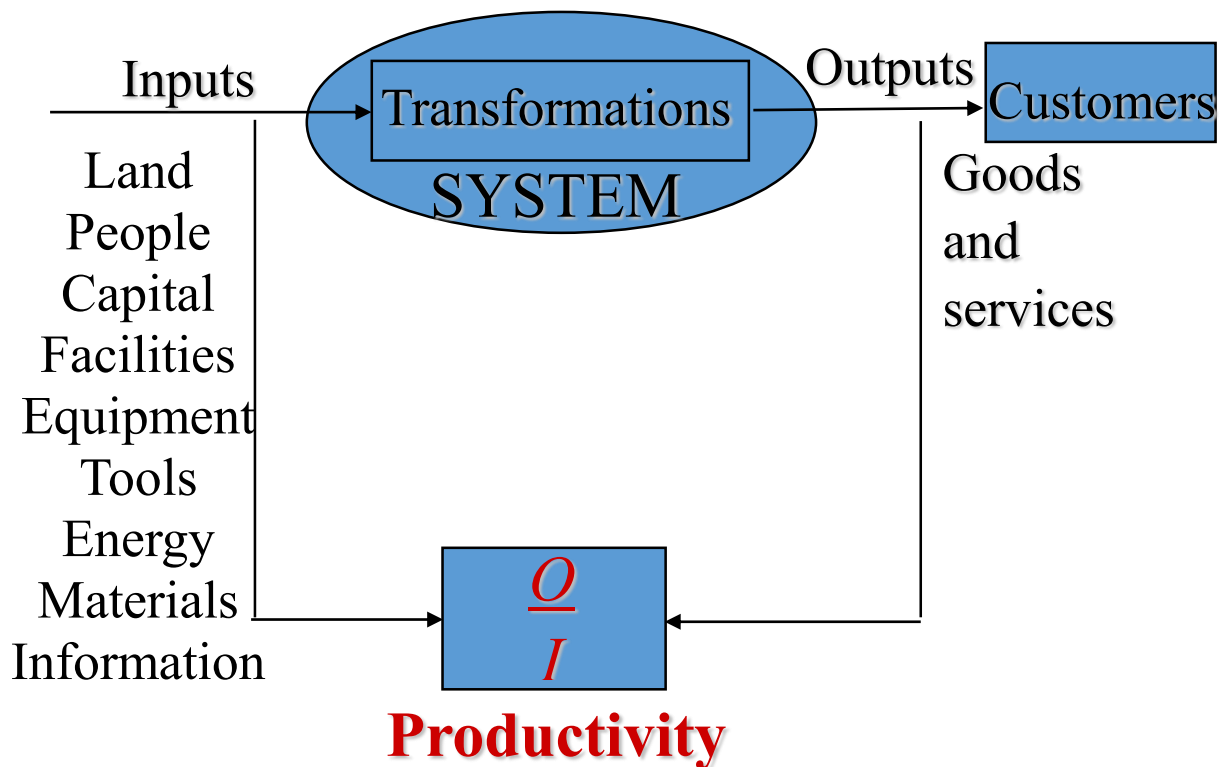
12.1 MEANING AND CONCEPT

In today's competitive environment, organization's growth and success depend on the how well the limited and scarce resources are used. Productivity is a concept that indicates the efficiency of the organization in using the resources and the competitiveness. Productivity can be defined as human efforts to produce more and more with less and less inputs of resources as a result of which the benefits of production are distributed among maximum number of people. [1] Productivity means the balance between all factors of production that will give the maximum output with the smallest effort. Productivity is the relationship between the outputs generated from a system and the inputs that are used to create those outputs. Mathematically,

$$\text{Productivity} = \text{Output/Input}$$

Productivity management is the process of ensuring that an organization is working as efficiently and effectively as possible. Productivity management is the skills that managers and business owners apply to help individuals and teams improve their overall productivity. It involves maximizing the use of resources to achieve the desired goals and outcomes. Productivity management encompasses a wide range of activities, including planning, goal setting, process improvement, resource allocation, and performance tracking. [2] Productivity management is focused on maintaining a measure of doing the right thing effectively, which is outcome-oriented. It involves collaboration across departments and requires a deep understanding of the organization's operations and goals.

Productivity measures how efficiently an organization or its employees convert inputs, like labor and capital, into outputs, like goods or services. [3]



Importance of Productivity Management

1. Improving efficiency

By analysing processes and identifying inefficiencies, productivity management can help businesses improve their workflow and eliminate waste, leading to increased efficiency and productivity.

2. Cost reduction

Through effective productivity management, businesses can identify and eliminate unnecessary expenses, such as excess inventory, overtime pay, or redundant processes, leading to cost savings and increased profitability.

3. Meeting deadlines and goals

Productivity management ensures that projects are completed on time and within budget, which is essential for meeting deadlines and achieving business goals.

4. Competitive advantage

Organizations that prioritize productivity management are often more competitive in their industries, as they can deliver high-quality products or services more efficiently than their competitors.

5. Employee satisfaction

By streamlining processes and reducing wasted time and resources, productivity management can help employees feel more satisfied with their work and can improve overall morale.

6. Innovation and growth

Effective productivity management can free up resources and create a culture of continuous improvement, leading to greater innovation and growth opportunities for the business.

Key Principles of Productivity Management

1. Set Clear Goals

It's essential to have clear goals that are specific, measurable, achievable, relevant, and time-bound (SMART). These goals help to provide focus and direction for the organization, ensuring that everyone is working towards the same objectives.

2. Measure Performance

Organizations need to track their performance regularly to identify areas where they can improve. This includes collecting data on productivity, efficiency, and effectiveness, and using this information to make informed decisions.

3. Focus on Continuous Improvement

Productivity management is an ongoing process of improvement. Organizations need to continually look for ways to optimize their processes, eliminate waste, and streamline their operations to increase efficiency.

4. Encourage Collaboration

Productivity management is not just about individual performance but also about how teams work together. Encouraging collaboration and communication can help to identify opportunities for improvement and drive innovation.

5. Invest in Technology

Technology can play a crucial role in improving productivity. Organizations should invest in tools and systems that help to automate tasks, streamline workflows, and increase efficiency.

6. Empower Employees

Empowering employees' means giving them the tools, resources, and autonomy they need to do their jobs effectively. This includes providing training and development opportunities, giving them ownership over their work, and encouraging a culture of accountability.

12.2 DIFFERENCE BETWEEN PRODUCTION AND PRODUCTIVITY

The concept of productivity and production are totally different. Production refers to absolute output while productivity is relative term wherein output is always expressed in terms of input. The production may rise without the corresponding rise in the productivity and vice versa. If the input remains the same and the production of output increases then there is rise in productivity. [1] Production is a systematic activity to convert raw materials into finished product which have higher value. Production is calculated through the output generated and is independent of the quantity of inputs used for this purpose. The production quantity may be increased by employing more resources like human and machine without considering cost. Increase in production does not always correspond to increase in efficiency.

S.N.	Base	Production	Productivity
1	Meaning	Conversion of input into output	Functional relation between input and output
2	Measurement	Quantitative units like kg, meters etc.	Ration like 4:1 or times
3	Utility	Can directly satisfy the human needs.	Indicator of production which is not for human satisfaction.
4	Increment	Increment in production may not increase in productivity.	Increment in production will surely increase production in long run.
5	Shape and Existence	It has physical shape	Doesn't have physical shape
6	Profit	If production is increased, profit will also increase.	If productivity is increased, ensure higher profit in long run.

12.3 MEASUREMENT OF PRODUCTIVITY

Productivity is the ratio of output to input which is expressed as

$$\text{Productivity} = \text{Output/Input}$$

Output can be measured in three ways:

Output in quantity:

This requires expressing output in physical volume. This way of measuring output is possible when the output is homogeneous.

Output in value:

This requires the output to be expressed in money terms. It is appropriate when the outputs are heterogeneous with different units of measurement.

Value-added output:

Value added is the wealth created by an enterprise through its production or services. Output can be measured in terms of value added. Value addition can be derived in two different methods getting the same result: – Subtraction method and – Addition method

According to subtraction method,

Value addition = net sales – value of purchase from outside + change in inventory

According to addition method,

Value addition = personnel expenses + financial cost + rent + depreciation + taxes + net profit + non-operating expenses

Input refers to resources both tangible and intangible necessary to produce goods and services. Inputs can be classified into LABOUR, CAPITAL, and INTERMEDIATE INPUT. Labour input is the time people invest working on producing goods or services and can be measured in terms of

- Number of employees
- Personnel expenses
- Total man hour worked

Capital input can be measured either in physical volume terms (machine hour) or in money value terms.

Intermediate inputs of an industry are the goods and services (including energy, raw materials, semi-finished goods, and services that are purchased from all sources) that are used in the production process to produce other goods or services rather than for final consumption. Intermediate input consists of purchases of materials, energy, or services which can be measured in physical volume terms or in money value terms.

Importance of measuring productivity

- Achieve more in less time
- Help with scheduling projects
- See whether target is being met or not.
- See if everyone is pulling their weight.
- Higher revenue using fewer resources.

Levels of Productivity Measurement

Productivity is considered a key source of economic growth and competitiveness and, as such, is basic statistical information for many international comparisons and country performance assessments. [4] For example, productivity data are used to investigate the impact of product and labour market regulations on economic performance. Productivity growth constitutes an important element for modelling the productive capacity of economies. It also allows analysts to determine capacity utilisation, which in turn allows one to gauge the position of economies in the business cycle and to forecast economic growth. In addition, production capacity is used to assess demand and inflationary pressures. Measurement of productivity is not limited to firm level only. It is beneficial to other higher levels like industrial, national and international levels also.

- – Productivity measurement at international level
- – Productivity measurement at national level
- – Productivity measurement at industrial level
- – Productivity measurement at company/firm level

Productivity at international level

Productivity at international level is a measure to compare productivity of two or more countries in similar aspects.

Productivity at National level

Productivity is generally measured by economists in order to formulate plans and policies at national level. This measure captures the use of labour inputs better than just output per employee. National productivity = $\text{GDP at factor price} / \text{Active population}$

Productivity at industrial level

Industrial productivity = $\text{values added contribution by industry group} / \text{economically active population of the industry group}$

Productivity at company/firm level

- Partial productivity
- Total factor productivity
- Total productivity

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12.4 TYPES OF PRODUCTIVITY

There are different measures of productivity and the choice between them depends either on the purpose of the productivity measurement and/or data availability. Basically there are three types of productivity or types of productivity measurements

1. Partial Factor Productivity
2. Total Factor Productivity
3. Total Productivity

1. Partial-factor productivity

Commonly referred to as the general definition of productivity, partial factor productivity measures the ratio of total output to a single input. It measures the productivity of each input and determines the contribution of each factor in generating output. It allows managers to determine the contribution of each factor in producing and generating output. Single input factors can be labor, energy, capital, machinery, materials, etc. Partial factor productivity measures provide more accessible references that relate to specific processes, allowing them to make the proper decisions towards productivity management.

Partial-factor productivity is also categorized into different types:

Labor Productivity:

It is the total output ratio based on per hour of work per person. It is mainly used to determine a worker's efficiency when producing a higher value product.

Capital Productivity

It is the measure used to determine the relationship between total output and physical capital used. This includes the different assets used, such as workforce, machines, tools, land, etc., which are essential in production.

Material Productivity

It is the ratio bounded by the total output produced with the per-unit cost of materials used, referred to as total input. This technique is used to measure productivity involving material cost and has a significant role in the cost of production.

Machine Productivity

It is the ratio between total output and total machine hours in operations. This allows managers to measure a machine unit's proficiency at transforming raw materials into finished goods or services.

Personnel Productivity

It measures productivity for employees who don't necessarily work with machines and operations-based work. Productivity is determined by aligning output with the general workforce and their specific functions.

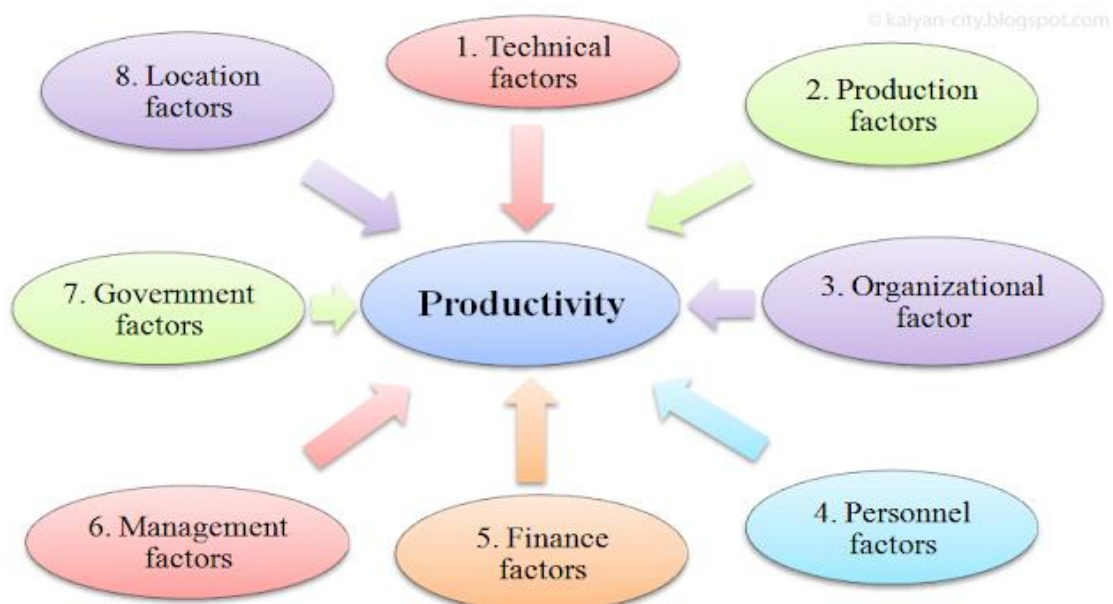
2. Total Factor Productivity

Total factor productivity (TFP) is an economic concept that describes the portion of a company's increased output that cannot be explained by increased capital or labor inputs and thus is considered a measure of operational efficiency. [5] Total factor productivity (TFP) is the portion of output not explained by the amount of inputs used in production. As such, its level is determined by how efficiently and intensely the inputs are utilized in production. This is the ratio of total output to labour + capital inputs.

3. Total Productivity

Total productivity refers to the productivity of all inputs taken together. It is a measure of the output of an industry or economy relative to the size of all of its primary factor inputs. It is the ratio of total output to the sum of all inputs. Inputs and outputs are expressed in physical and real terms. Total Productivity = total tangible outputs/total tangible inputs

12.5 FACTORS AFFECTING PRODUCTIVITY



Factors that affect or influence Productivity.

SOURCE: [6]

Productivity can be affected by the different factors. However it can be broadly classified into two factors i.e. external and internal factors. External factors are those factors which are beyond the control of management. They affect organization's productivity level but organization cannot control them. The external factors include:

1. Structural adjustment
2. Natural resources
3. Government and infrastructure

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Structural adjustment

Changes in social, economic, political, demographic structure of nation directly influence national productivity

Natural resources

Natural resources like manpower, land, energy, and raw materials are important for improving productivity at all levels. In order to improve productivity all these resources should be utilized efficiently and effectively.

Government and infrastructure

- Government policies, strategies and programs have tremendous effect on national and organizational productivity.
- Practices of government agencies
- Rules and regulations like pricing, income, and wage policies
- Transportation and communication
- Power supply
- Financial measure and incentives such as interest rates and tax rates.

Internal factors are those which remain inside and can be adjusted with some ease compare to external factors. However, these factors have very significant role in improving productivity of an organization. These factors can be classified into two groups:

1. Hard factors consisting of product, plant/equipment, technology and materials and energy.

2. Soft factors consisting of manpower, organization system, work methods, and management styles.

1. Hard Factors

Hard factors are quite inflexible towards change.

Product

Product relates to the extent to which it meets output requirement. It must be of “use value” and affordable to the customers.

Plant and equipment

The quality and adequacy of available plant and equipment also affect the productivity level. Good maintenance, conditions of plant and equipment, capacity, use, sophistication, cost and control are the important parameters of plant and equipment.

Technology

The method of performing jobs and producing output also affect productivity.

Materials and energy

Availability, quality, and cost of materials and energy affect the productivity level

2. Soft Factors

Manpower

Competence, ability, experience, commitment and motivation of the employees count significantly. However, with the proper management and leadership these factors can be fostered.

Organization and system

The design of organization and system determines the efficiency and effectiveness of the organization. Organization and system should be dynamic and organic rather than rigid and mechanic.

Work methods

Application of improved technology is necessary for improving productivity. Improvement in work process, human movement, tools used, work place, materials handling, and machines used, work study, industrial engineering and training are main tools of improving work methods.

Management styles

Management is the driving force for improving productivity by way of effective use of scarce resources.

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