

S. S. Jain Subodh Management Institute

MBA IInd Semester, (Model Paper & Suggested Answers)

Subject: Operations & Supply Management

Paper Code: M-205

Time: 1 Hour

Max Marks: 10

Note: Attempt any two questions. All questions carry equal marks.

Q1. What do you mean by productivity? Explain the factors that affect the productivity.

Q2. Define work study. Explain in brief the procedure of work study.

Q3. Write short notes on:

- a) Operations strategy
- b) Mass production system

Solution:

Ans 1.

(Marking guidelines: The meaning of productivity is of one mark. The factors affecting productivity contains four marks. The students need to describe at least four factors fetching one mark each.)

Productivity is measure of how much input is required to produce a given output. It is the ratio between the amount produced and the amount of resources used in the course of production. The resources may be any combination of materials, machines, men and money. The concept of productivity measurement is many sided. It can relate to every activity or item on which money is spent to get the final product.

In operations management, productivity can be defined as an index that measures output (goods and services) relative to the input (labor, materials, energy etc.) used to produce. It is usually expressed as the ratio of output to input.

There are three ways to express productivity.

- a) Partial measure – It is concerned with the ratio of output to single input.
- b) Multifactor measure –It is the ratio of output to a group of inputs, but not all inputs.
- c) Total measure –It is used to express the ratio of all outputs to all inputs.

Factors affecting productivity:

The following figure shows the important factors that have an impact on productivity of any production process.

1. **Technical factors:** Productivity largely depends on technical factors. These include proper location, layout and size of the plant and machinery, correct design of machines and equipment, research and development, automation and computerization, etc. If the organization uses the latest technology, then its productiveness will be high.
2. **Production factors:** Productivity is related to the production-factors. The production of all departments should be properly planned, coordinated and controlled. The right quality of raw-materials should be used for production. The production process should be simplified and standardized. If everything is well it will increase the productiveness.
3. **Organizational factors:** Productivity is directly proportional to the organizational factors. A simple type of organization should be used. Authority and Responsibility of every individual and department should be defined properly. The line and staff relationships should also be clearly defined. So, conflicts between line and staff should be avoided. There should be a division of labor and specialization as far as possible. This will increase organization's productiveness.
4. **Personnel factors:** Productivity of organization is directly related to personnel factors. The right individual should be selected for suitable posts. After selection, they should be given proper training and development. They should be given better working conditions and work-environment. They should be properly motivated; financially, non-financially and with positive incentives. Incentive wage policies should be introduced. Job security should also be given. Opinion or suggestions of workers should be given importance. There should be proper transfer, promotion and other personnel policies. All this will increase the productiveness of the organization.
5. **Finance factors :** Productivity relies on the finance factors. Finance is the life-blood of modern business. There should be a better control over both fixed capital and working capital. There should be proper Financial Planning. Capital expenditure should be properly controlled. Both over and under utilization of capital should be avoided. The management should see that they get proper returns on the capital which is invested in the business. If the finance is managed properly the productiveness of the organization will increase.
6. **Management factors :** Productivity of organization rests on the management factors. The management of organization should be scientific, professional, future-oriented, sincere and competent. Managers should possess imagination, judgment skills and willingness to take risks. They should make optimum use of the available resources to get maximum output at the lowest cost. They should use the recent techniques of production. They should develop better

relations with employees and trade unions. They should encourage the employees to give suggestions. They should provide a good working environment, and should motivate employees to increase their output. Efficient management is the most significant factor for increasing productiveness and decreasing cost.

7. **Government factors:** Productivity depends on government factors. The management should have a proper knowledge about the government rules and regulations. They should also maintain good relations with the government.

8. **Location factors:** Productivity also depends on location factors such as Law and order situation, infrastructure facilities, nearness to market, nearness to sources of raw-materials, skilled workforce, etc.

Ans. 2.

(Marking guidelines: The explanation of work study concept carries one mark. The Process of work study is of four marks, half mark for each step in correct order.)

Work study, as the name suggests, is the study of work. Study of work includes human work as well as dignity of work. In general, it is not restricted to shop-floor; but it may be applicable anywhere: for example, kitchen, writing desk, gardening, etc. It concerns itself with the better ways of doing things and control over the output of those things by setting standards with respect to time. F. W. Taylor, Frank Gilberth and Lillian Gilberth were some of the pioneers in the field of work study.

Work study can be described as a systematic and analytical study of work process and work methods with the objective of increasing efficiency and reducing costs. The main objective of work study is to improve productivity of men, machines and materials. The aim of work study is to determine the best method of performing each operation and to eliminate wastage so that production increases with less fatigue. The work study is also used in determining the standard time that a qualified worker should take to perform the operation when working at a normal place.

Work-study is used to associate two sets of techniques: (i) method study, and (ii) work measurement. These two are distinct approaches, yet they are interdependent.

Method-study concerned with “the way in which work is done (i.e., method)”. It is used to simplify the way to accomplish a work and to improve the method of production. Method-study results in a more effective use of material, plant, equipment and manpower. It employs a systematic approach involving: Select-Record-Examine-Develop-Install-Maintain.

Work-measurement is concerned with the value or work-content of the task itself (i.e., measurement). It is used to determine how long it should take to carry out the job. It also

provides a yardstick for human effort. Work-measurement helps in improved planning and control (manning), and provide a basis for sound incentive scheme. It employs a systematic approach involving: Select-Define-Break jobs into elements-Measure-Establish work unit value.

The outcome of both, method-study and work-measurement, thus results in higher productivity.

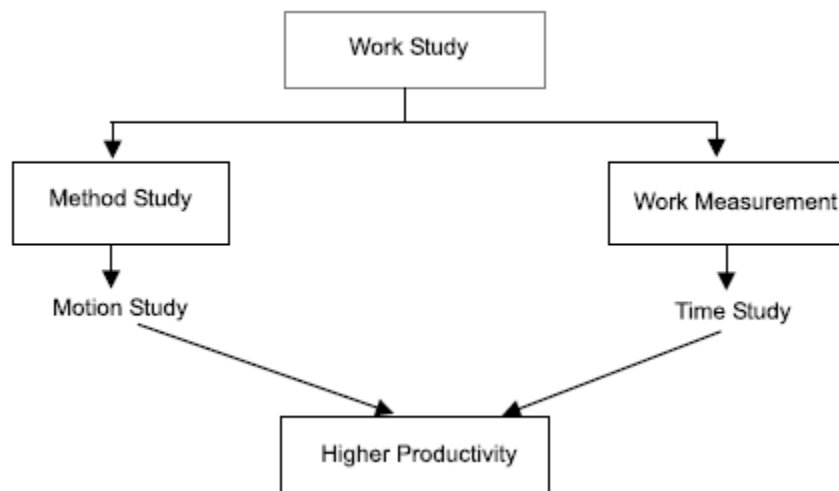
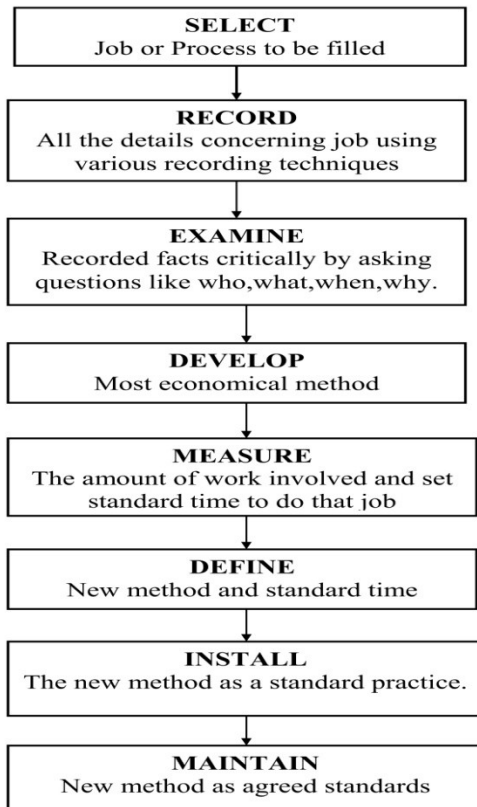


Fig: Techniques of Work Study

Process of Work Study:

The basic procedure of work study is as follows:

1. SELECT Job or Process to be studied;
2. RECORD all the details concerning job using various recording techniques
3. EXAMINE recorded facts critically by asking questions like the purpose of the activity, the place where it is performed; the sequence in which the elements are performed; the person who is doing it; the means by which it is done.
4. DEVELOP most economical method;
5. MEASURE the amount of work involved and set standard time to do that job;
6. DEFINE new method and standard time;
7. INSTALL the new method as a standard practice;
8. MAINTAIN new method as agreed standard.



Ans. 3.

(Marking guidelines: Each short note carries two and half marks. Students are advised to explain the concept properly.)

Ans. 3a) Operations Strategy

Operations strategy is the plan that specifies the design and use of these resources to support the business strategy. This includes the location, size, and type of facilities available; worker skills and talents required; use of technology, special processes needed, special equipment; and quality control methods. It is the role of operations strategy to provide an overall plan for the use of all these resources.

The role of operations strategy is to provide a plan for the operations function so that it can make the best use of its resources. Operations strategy specifies the policies and plans for using the organization's resources to support its long-term competitive strategy. The operations strategy must be aligned with the company's business strategy and enable the company to achieve its long-term plan.

Developing an operations strategy:

Once a business strategy has been developed, an operations strategy must be formulated. This will provide a plan for the design and management of the operations function in ways that support the business strategy. The operations strategy relates the business strategy to the operations function. It focuses on specific capabilities of the operation that give the company a competitive edge. These capabilities are called competitive priorities.

Competitive Priorities

Competitive priorities are the capabilities that the operations function can develop in order to give a company a competitive advantage in its market. The competitive dimensions of operations are cost, product quality and reliability, delivery speed, delivery reliability, coping with demand change, flexibility, and new product introduction speed. Central to the concept of operations strategy is the notion of operations focus and trade-offs.

Operations managers must work closely with marketing in order to understand the competitive situation in the company's market before they can determine which competitive priorities are important. There are four broad categories of competitive priorities:

1. **Cost** - Competing based on cost means offering a product at a low price relative to the prices of competing products. The need for this type of competition emerges from the business strategy. The role of the operations strategy is to develop a plan for the use of resources to support this type of competition.
2. **Quality** - Quality as a competitive priority has two dimensions. The first is *high performance design*. This means that the operations function will be designed to focus on aspects of quality such as superior features, close tolerances, high durability, and excellent customer service. The second dimension is *product and service consistency*, which measures how often the product or service meets the exact design specifications.
3. **Time** - Making time a competitive priority means competing based on all time-related issues, such as rapid delivery and on-time delivery. Rapid delivery refers to how quickly an order is received; on-time delivery refers to the number of times deliveries are made on time. When time is a competitive priority, the job of the operations function is to critically analyze the system and combine or eliminate processes in order to save time. Often companies use technology to speed up processes, rely on a flexible workforce to meet peak demand periods, and eliminate unnecessary steps in the production process.
4. **Flexibility** - There are two dimensions of flexibility. One is the ability to offer a wide variety of products or services and customize them to the unique needs of clients. This is called *product flexibility*. A flexible system can quickly add new products that may be important to customers or easily drop a product that is not doing well. Another aspect of flexibility is the ability to rapidly increase or decrease the amount produced in order to accommodate changes in the demand. This is called *volume flexibility*.

Examples of companies adopting low cost operations strategy are Wal-Mart, Southwest Airlines etc.

Ans.3 b) Mass production system

Mass production is a method of production that uses a standardized process of creating interchangeable parts in large quantities for a low price. In other words, a standard process for making products is repeated so each time the product is finished it is exactly the same as all the other parts. The parts are then said to be interchangeable. Whether you use the first part created or the millionth part, they should be exactly the same, with no variation in the outcome.

Mass production decreases the amount of time that workers spend on each individual product. This can allow manufacturers to lower the cost per unit--if the production of each unit is cheaper, its price can be as well. With mass production, manufacturers are also able to increase the amount of units produced and are able to control product quality because the process of producing the good does not vary. Mass production occurs when the product is highly standardized and units can be made in a single flow, each like the last, in one long continuous process. Of course, this allows the business to produce units very quickly and often use raw materials as efficiently as possible. However, the higher rate of production is matched by a reliance on all machines equally. If equipment breaks down, the entire process is halted. Worse, if equipment malfunctions, then all products become defected until the problem is found.

The use of mass production is prominent in the automobile, oil, paper, and lumber industries. Some other examples of mass production involve producing electronic items, like washing machines, mobile phones, computer systems, refrigerators, microwave ovens, etc.

Benefits of mass production include:

- Lower cost per unit
- Decreased time producing products
- Increased output
- Quality control

Disadvantages of mass production:

- Wasted resources
- Less variety in products
- More investment in raw materials
- Technology dependence