

UNIT-2

OPERATIONS MANAGEMENT

WORK STUDY:

work study is concerned with finding better ways of doing and avoiding waste in all forms. It is the study of work which examines both the method of work duration.

Work study on one hand examines the method of doing the work and on the other hand determines the time required to do the work.

There are two branches of work study-

1. method study (motion study)
2. work measurement (time study).

OBJECTIVES OF WORK STUDY:

The prime function of work study is to increase productivity and reduce wastages through the optimum usage of human, machine and material resources available to the organization.

The specific objectives are-

- Efficient use of human effort.
- Reduce manufacturing cost.
- Fast and accurate delivery dates.
- To reduce training time and improve safety to workers.
- To standardize method, material and equipment used in production process.
- Uniform and improved production flow.
- Saving and efficient use of resources by increasing output and reducing wastage.

METHOD STUDY(MOTION STUDY) :

The means of improving ways and means of doing things is called method study. Motion study is basically concerned with findings the best way of doing work.

The study of methods of accomplishing a job by the movement of human limbs and eyes etc is termed as study. This a part of method study.

STEPS IN METHOD STUDY:

- Select the method to be studied.
- Collection, recording and presentation of necessary information and relevant facts of the present method.

- Analyze the facts of the existing method critically.
- Developing new methods. This is the most important step in method study. This can be done in four ways.
 - ✓ Eliminating all unnecessary movements or activities.
 - ✓ Combine operations or elements.
 - ✓ Change the sequence of operation so that the work delay is reduced.
 - ✓ Simplify the necessary operations activity to reduce the work content or time consumption.
- Install new improved method.
- Maintain the method as a standard practice.

OBJECTIVES OF METHOD STUDY (ADVANTAGES):

- Optimum utilization of materials, manpower, machine and equipment.
- Improved methods and standardized procedures.
- Better working conditions and neat and clean environment.
- Less fatigue to workers.
- Better workplace layout.
- Efficient planning of the section.
- Efficient utilization of men, machines and materials
- Efficient and fast material handling.
- Better product quality.
- Reduce health hazards.

TYPES OF CHARTS USED IN METHOD STUDY:

1. charts indicating process sequence:

- Outline process charts
 - Considers only operations and inspections
- two handled process chart (left and right process chart)
 - records activities of both hands of workers
- flow process chart (detailed chart which records all the events it is three types
 - flow process chart (material type) – shows the sequence of flow of materials.
 - Flow process chart (man type) – movements of employees
 - Flow process chart (equipment chart) – sequence of usage of equipments.

2. charts using same style:

- multiple activity chart
 - activities of men, machines or both on a common time scale
- man machine chart
 - movements of men and machines on a common time scale.

- SIMO chart(simultaneous motion)
 - Body movements of men on a common time scale)
- Travel chart
 - Movement of material between departments

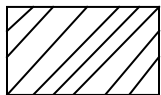
3. Diagrams Indicating movements:

- Flow diagrams
 - Path of men, materials and equipments
- String diagrams
 - Use of string, colored lines to trace the path of men, materials, machines etc.,
- Two and three dimensional models
 - Layout of work place or plant
- Cycle graph
 - Movement of hand obtained through the light emitted by small bulbs attached to the operators fingers.
- Chrono cycle graph
 - cycle graph using flash lights, usually a camera is used record high speed, short cycle operations.

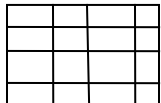
Symbols used in activity charts:



---- blank rectangle is used to show that one of the two, either man or machine is idle.



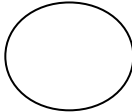
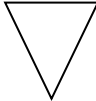
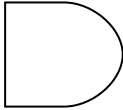
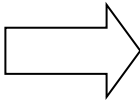
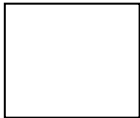
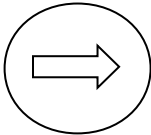
---- a striped rectangle shows a combined activity i.e., man and machine are busy.



--- rectangle with parallel and vertical lines shows period of independent activity
for man/machine is busy.

The charts are generally represented by symbols to produce a better picture and quick understanding of the process.

THE SYMBOLS USED IN PROCESS CHARTS ARE:

Event	Symbol	Description
Operation		It represents an action. It indicates a main step in the process. Ex . pressing, grinding, polishing.
Storage		Representing stage when material awaits an action. Ex. Holding, storing, stocking, or retaining.
Delay or temporary storage		Indicates delay or a temporary hurdle in the sequence of operations. Ex. waiting for transport or operation etc.,
Transport		Indicates movement of men, materials from one place to another. Eg: movement, travelling etc.,
Inspection		Represents an action of inspection or checking for quality and quantity. Verification or checking
Operation and transportation		

WORK MEASUREMENT (TIME STUDY):

Once the method is established, the next thing to do would be to set the standard times for the work. This aspect of work study is called the time study.

It is concerned with the determination of the amount of time required to perform a unit of work._

OBJECTIVES OF TIME STUDY (ADVANTAGES):

- It determines the most efficient method which takes the least time besides the man power required for the job.

- It results in effective labour control.
- Provides a basis for proper balancing of the work distribution.
- It helps in calculating delivery dates.
- It helps to compare the work efficiency of different operators.
- It provides basis for manpower planning.
- It is used for arriving at job schedules for production planning purpose.
- It helps in dividing equipments.

WORK MEASUREMENT PROCEDURE:

- Select or identify the job to be timed.
- Obtain all the necessary information.
- The whole job is broken down into smallest possible measurable elements.
- Time is determined for each of the elements using appropriate technique and recorded.
- Calculate the standard or allowed time.

TECHNIQUES OF WORK MEASUREMENT:

Stop Watch Method:

Measuring time by stop watch is a good old method and is adapted to measure time for elements. Presently instead of mechanical watches, electronic watches are being used.

Synthesis from standard data:

It is estimating the standard time on the basis of previous experience of similar jobs. In this method, work is subdivided into elements for which standard times are available from previously established time studies and these predetermined elements times are totaled with appropriate allowances to compute the standard time for the job as a whole.

Pre determined motion:

It is the technique where times established for basic human motion are used to compute the time for a job at a define level of performance.

Analytical estimation:

It is a technique where time establishment from knowledge and practical experience of the elements concerned are used to compute the time for a job at a defined level of performance.

Comparative estimating:

It is a technique in which the time for a job is evaluated by comparing the work with the work in a similar series of jobs or bench marks, the work content of which has been measured.

