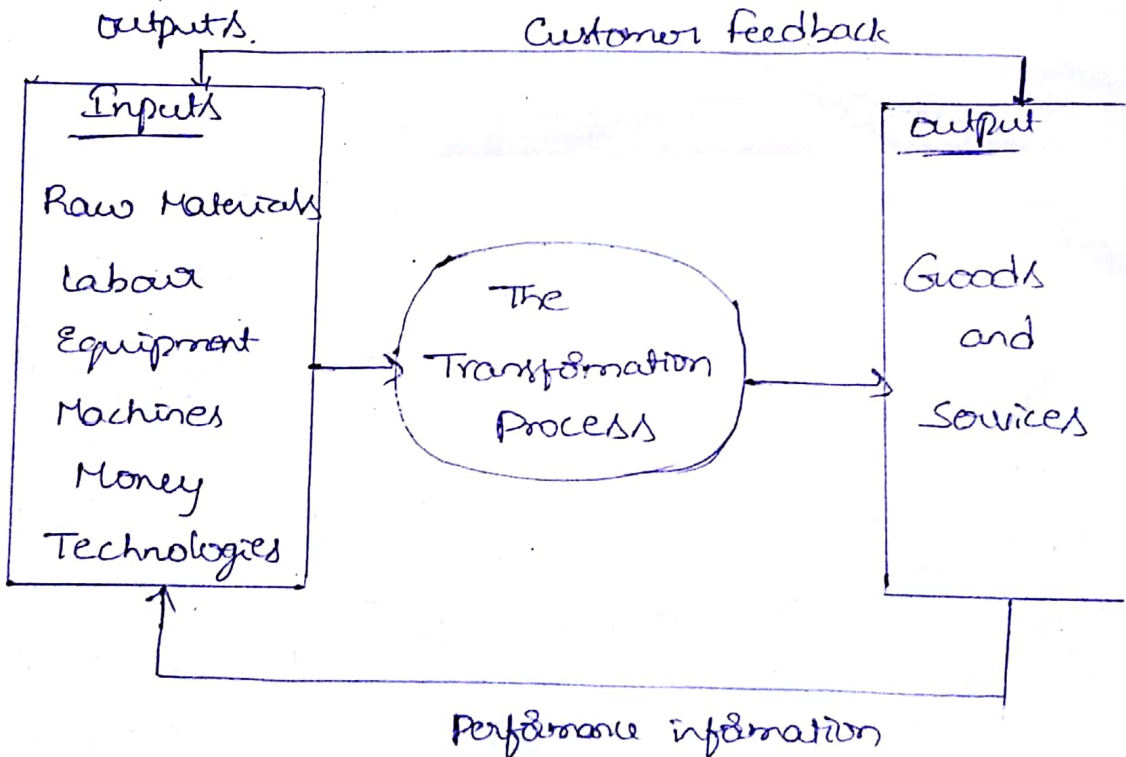


Operation Management :-

Operation management is an area of management concerned with designing and controlling the process of production and redesigning business operations in the production of goods & services.

Operation management is the set of activities that create value in the form of goods and services by transforming inputs into output.

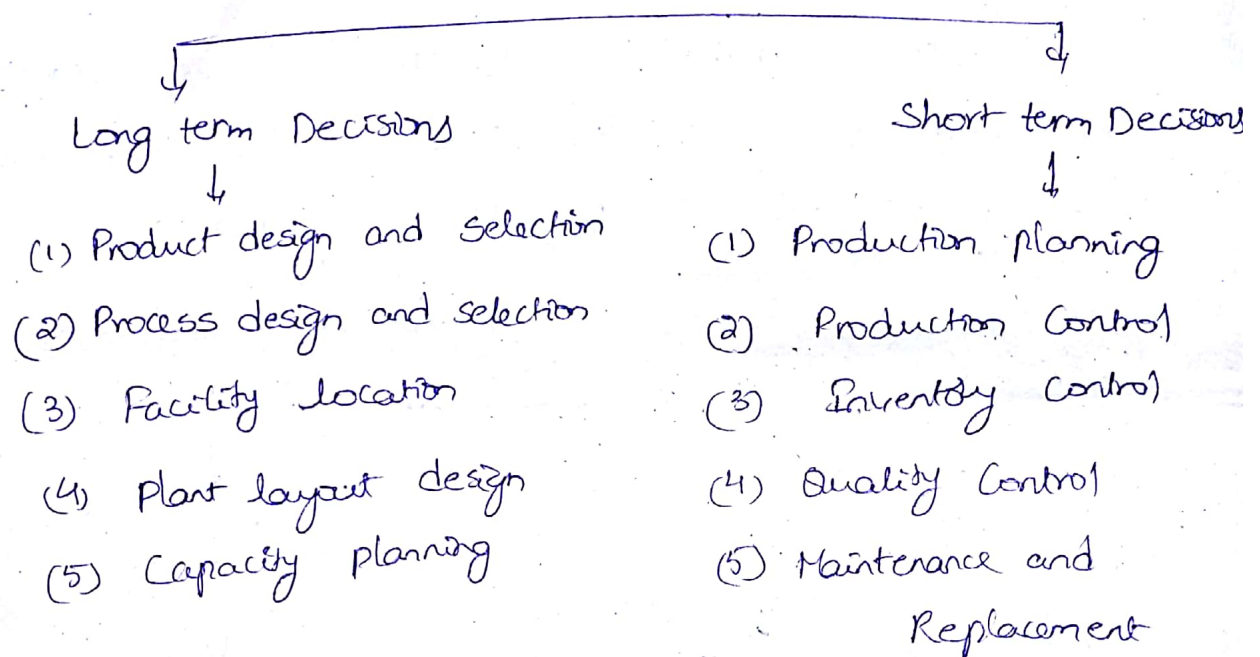
Operation management transforms inputs to outputs.



Scope / Objectives of operation management :-

The main aim of operations management is to increase the customer satisfaction at the least cost. As such, its scope includes long term strategic decisions and short term planning.

Scope of Operations Management



Importance / Significance of Operations Management :-

- Improving better supplier management
- Elimination of unproductive resources / wastes.
- Increasing the productivity
- Gaining competitive advantages over the competitors
- Producing efficient products / services which satisfies the customers.

Work Study :-

(2)

one of the most powerful tools to in improving Productivity is work study.

work study is :-

- * The systematic examinations of the methods of carrying on activity
- * To improve effective use of resources
- * To set up standards of performance.

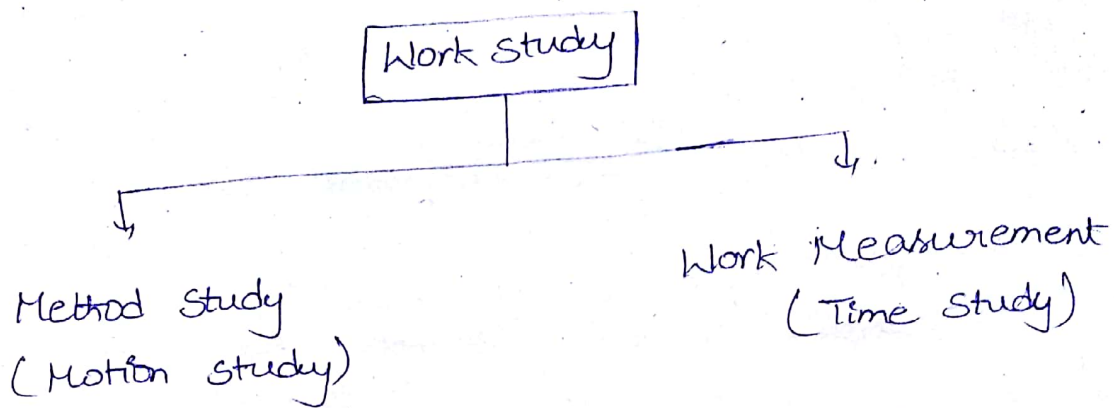
Actually, work study investigates the work done in an organisation and it aims at finding the best and most efficient way of using available resources, i.e., men, material, money and machinery. Every organisation tries to achieve best quality production in the minimum possible time.

Objectives of Work study :-

- * To analyze the present method of doing a job, systematically in order to develop a new and better method.
- * To measure the work content of a job by measuring the time required to do the job for a qualified worker and hence to establish standard time.
- * To increase the productivity by ensuring the best possible use of human, machine and material resources and to achieve best quality product.

Service at minimum possible cost.

(4) To improve operational efficiency.



(1) Method Study :-

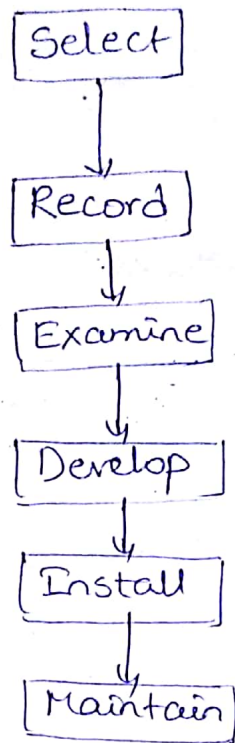
"Work methods analysis or method study is a scientific technique of observing, recording and critically examining the present method of performing a task or job or operation with the aim of improving the present method and developing a new and cheaper method"

Objectives of Method Study :-

- (1) Improvement of processes and procedures
- (2) Improvement in the design of plant and equipment.
- (3) Improvement of layout (work place layout)
- (4) Improvement in the use of men, materials and machines
- (5) Economy in human effort and reduction of unnecessary fatigue.
- (6) Improvement in safety standards
- (7) Development of better working environment.
- (8) Efficient and fast material handling

Method Study procedure:-

(3)



(1) Select:- select the work worth studying and define the objectives to be achieved. An objective may be to reduce the manufacturing cost, or to reduce bottlenecks or to reduce fatigue incurred by the workers in order to increase their efficiency.

(2) Record:- Record all relevant facts about the job or process or operation using suitable charting techniques. R

(a) Process charts:-

(i) Outline process chart

(ii) Flow process chart (Man type, Material type, an

(iii) Two handed process chart

Equipment type

(iv) Multiple activity chart.

(b) Diagrams :

- (i) Flow diagram
- (ii) String diagram
- (iii) Cyclegraph
- (iv) Chronocyclegraph.

(c) Motion and film Analysis

- (i) Simo chart
- (d) Models, etc.

(3) Examine's - Examine the recorded events critically and in sequence. Critical examination involves answer to a number of questions. An activity can be eliminated, simplified or combined with another. The basic questions are,

Purpose. what is done?

Person who does it?

place where it is done?

Means How is it done?

Sequence when is it done?

Alternative ways of doing, what else could be done, who else could do it, where else it could be done, how else it could be done, and when else it could be done.

Best Method of doing. what should be done, who should do it, where it should be done, how it should be done, and when it should be done

(4) Develop :- ~~The~~ Develop the best method as ⁽⁴⁾ resulted from critical examination and record it. The developed method should be,

- (i) Practical and feasible.
- (ii) Safe and effective
- (iii) Economical
- (iv) Acceptable to design, production control, quality control and sales departments.

(5) Install :- Install the (best) developed method. Installation involves three phases, namely - planning, arranging and implementing. During first two stages the programme of installation and a time table, are planned and the necessary arrangements of resources, equipments, tools and instructions to workers, over time, etc, are made. The implementation installation involves the introduction of developed method as standard practice.

(6) Maintain :- ~~Use~~ Maintain the new method, i.e., ensure the proper functioning of the installed method by periodic checks and verifications.

Work Measurement / Time Study :-

Work Measurement may be defined as the application of different techniques to measure and establish the time required to complete the job by a qualified worker at a defined level of performance.

It is concerned with the determination of the amount of time required to perform a unit of work. It is very important for promoting productivity of an organization.

Objectives of work Measurement :-

- (1) Determine the time required to do a job; thus it compares alternative methods and establishes the fastest method.
- (2) decides man power required for a job; It helps in man power economy.
- (3) To decide equipment requirements
- (4) Provides information for effective production planning and maintenance procedures.
- (5) To decide realistic labour budgeting and Provides a basis for standard costing system.
- (6) Provides a basis for fair and sound incentive Schemes.
- (7) results in effective labour control.

Uses of Work Measurements :- (Advantages)

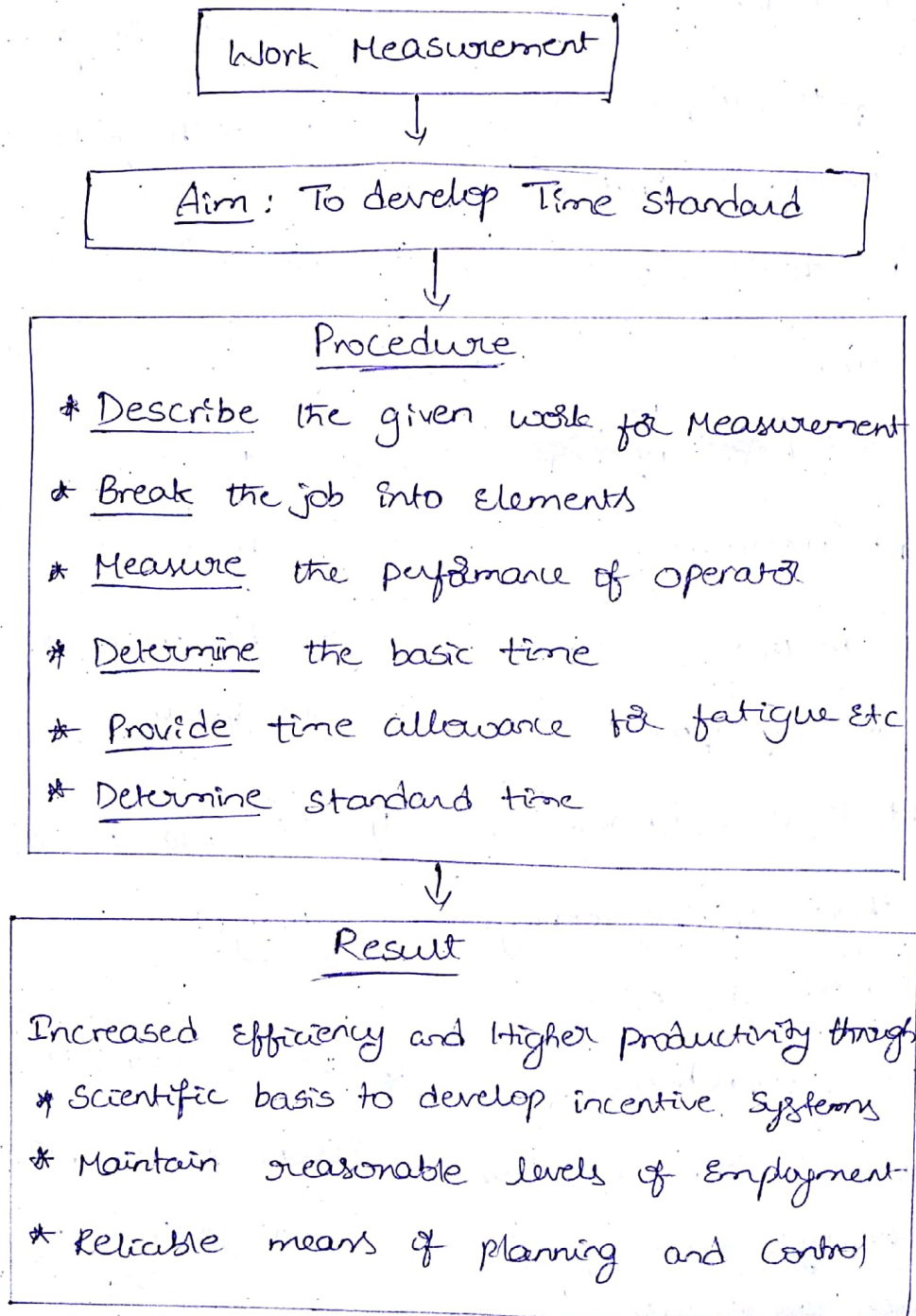
- (1) It is used in planning work and in drawing out schedules
- (2) It is used to determine standard costs.
- (3) It is used as an aid in preparing budgets.
- (4) It is used in balancing production lines for new products.

(5) work measurement is used in determining machine effectiveness. (5)

(6) To establish supervisory objectives and to provide a basis for measuring supervisory efficiency.

(7) To determine time standards to be used as a basis for labour cost control.

Work Measurement procedure :-



Difference between Method Study and work measurement :-

Method Study

Work measurement

- 1) The systematic maintenance and key examination of the ways to perform task & job with an aim of to improve is considered as Method Study.
 - 2) It deals with elimination of unnecessary work of a job (&) operation.
 - 3) It usually reviews the methods, layout and equipment.
 - 4) It is also known as methods of engineering & work design.
 - 5) It comprehensively determines the collection of analysis techniques which deals with improvement of men and machines effectiveness.
- (1) It facilitates qualified worker to perform a task at a specified rate of working through application of techniques.
 - (2) It deals with the investigation and unnecessary time involved.
 - (3) It measures work load on the basis of time standards.
 - (4) It is called as time study.
 - (5) It is considered as essential for planning and control of operations.

Process charts

(6)

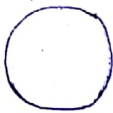

A process chart is a classification and graphic representation of production activities in a plant.

Through these charts the whole process can be systematically analyzed by subdividing the various operations and material moments constituting the production process and then their effectiveness.

The study of these charts can reveal the operation that can be eliminated rearranged or simplified to achieve economy in production.

Process charts symbols —

charts are generally represented by symbols because symbols produce a better picture and quick understanding of the facts. Process charts use the following five basic symbols to record different types of events.

Event	Symbol	Description
1. operation		This involves performing an action which changes the current form of the product.
2. storage		This involves putting away ready products for storage. <u>Example</u> — When the bottled drinks are put into the store after inspection.

3. Transport



This involves moving the product or parts thereof from one location to another. example - Moving the bottled drinks to the inspection section.

4. Delay



This arises when the product waits for next stage in the process. example - When there is a defect spotted in a specific batch of bottled drinks.

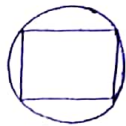
5. Inspection



This involves checking whether the quality and quantity of the product is satisfactory or not.

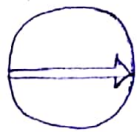
Additional symbols -

(1) operation - cum - Inspection



This occurs when inspection is taken place during the production process.

(2) operation - cum - Transportation



This occurs when assembly is taking place while the spares are transported by the belt conveyer.

Process charts are three types -

(1) outline process chart.

(2) Flow process chart.

(3) Two handed process chart.

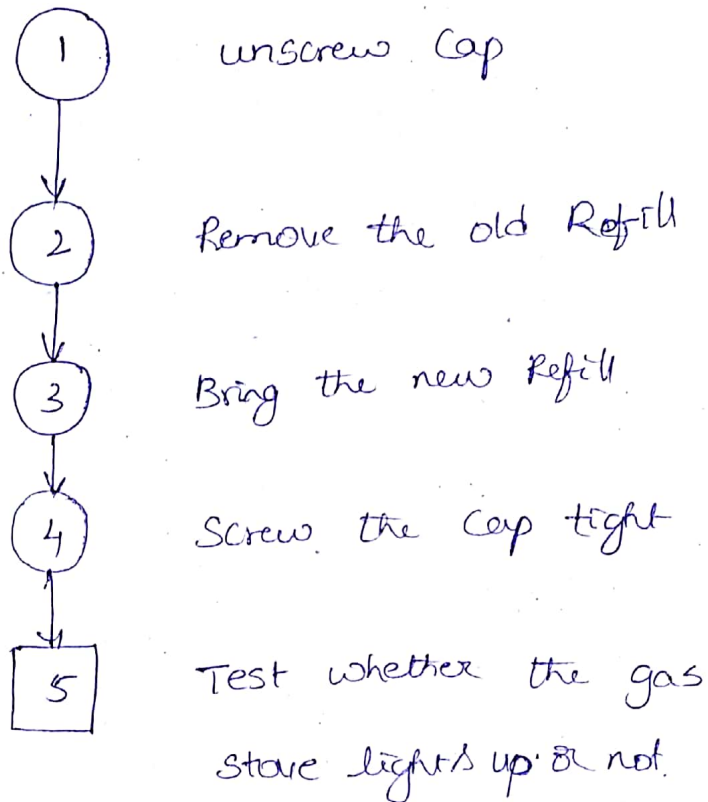
(1) Outline Process Chart :- outlines main events sequencewise. It consider only operation and inspections in the given job.

Example :- Refilling the gas cylinder at home.

Task :- Replacing the used gas cylinder with a new one.

chart begins with :- unscrew Cap

chart ends with :- screw Cap



○ 4 operations

□ 1 Inspection

(2) flow process chart :- This is a detailed version of the outline process chart and it records all the events. The modern flow process chart

Provides information about the time taken for all the events and the distance involved for movement of work, materials, machinery, and men.

The flow process chart can be of three types:

- (1) Man type → Records only what the man does
- (2) Material type → Records only what happens to materials
- (3) Equipment type → Records only what happens to the equipment.

The following flow process chart is typically presentation of information pertaining to an existing sequence of operations relating to making a screw.

Flow Process chart :- example - 1

Name of the Component :- Screw

Department :- Manufacturing

NO	Description of the process	Symbols					Distance in meters	Time in minutes	Remarks
		○	□	⇒	D	▽			
1.	MS rods from stores								
2.	To lathe						45	20	By hand trolley
3.	Turning operation								
4.	To Inspection department						20	5	By hand trolley
5.	Inspection								
6.	To boring machine						14	8	By hand trolley
7.	Boring operation								
8.	Inspection								on the shop floor
9.	To lathe for thread cutting						3	5	By hand
10.	Thread Cutting								
11.	To Inspection department						15	10	By hand trolley
12.	Inspection								
13.	To heat treatment section						10	5	By hand trolley
14.	Heat treatment								
15.	Inspection								
16.	To stores						20	10	By van

Summary

Activity	Existing
operation	4
Inspection	4
Transportation	7
Delay	0
Storage	2









Example - 2 :- Material type flow process chart

Activity	Symbols	Distance moved	Time	Remarks
1) Casting lying in foundry store		-	-	-
2) Moved to gas cutting machine		10	3	By trolley
3) wait, cutting machine being set.		-	5	-
4) Risers cut		-	20	-
5) wait for trolley		-	10	-
6) Moved to machine shop		20	6	By trolley
7) Inspected before machining		-	15	-









(3) Two hand process chart - This records the activities of the left hand and right hand (of an operator) as related to each other. For certain jobs such as typing, watch repair, nail hitting, cooking, and so on, it is but common to find the operator using both hands.

Let us see how both the hands of the operator are involved in the simple job of nail hitting as shown below.

Job: Nail Hitting

	Left hand	Symbols		Right hand
		left hand	Right hand	
1	pick up nail			pick up the hammer
2	Put the nail at the required point on the box			Idle
3	Hold			Strike
4	Idle			Inspect

Summary ✓

left hand	Right hand
 2	 2
 1	 1
 1	 nil
 nil	 1