

MALAYSIAN TECHNICAL COOPERATION PROGRAMME

SYSTEM DEVELOPMENT FOR SMALL AND
MEDIUM ENTERPRISE
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PRODUCTION ANALYSIS

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Productivity Drives National Development



PROCESS ANALYSIS PART 1

BASIC CONCEPT OF PRODUCTION MANAGEMENT

Production is a process by which inputs are converted into outputs in the more efficient manner, at least cost and providing most value to the consumer.

BASIC CONCEPT OF PRODUCTION MANAGEMENT

The function of Production management is to produce goods that.

1. Required quantity (P)
2. According to the quality specifications that meet customer's needs (Q)
3. At the least cost (C)
4. Deliver them speedily (D)
5. In a safe manner (S)
6. While ensuring that morale of employee remain high (M)



Productivity Drives National Development



BASIC CONCEPT OF PRODUCTION MANAGEMENT

To achieve these, the 4 inputs to production, namely workers, machines, materials and methods must be well coordinated.

BASIC CONCEPT OF PRODUCTION MANAGEMENT

Fundamentals of production management is therefore made up of

- 1. Human Resource Management**
- 2. Machine and Facility Management**
- 3. Material Management**
- 4. Method Management**
- 5. Information Management (Production planning, scheduling and control)**

BASIC CONCEPT OF PRODUCTION MANAGEMENT

The production system and control points usually vary according to the type of production

- a) Job shop-type production
- b) Intermittent batch (or lot) production
- c) Continuous mass production
- d) Continuous process production

PROBLEM COMMONLY ENCOUNTERED ON THE SHOPFLOOR

- a) Dirty, messy shopfloor
- b) High volume of WIP (Work-in-Process)
- c) Badly arranged workplace layout
- d) Bad work postures
- e) Unpleasant and even unhealthy work environments
- f) Absence of important data required for effective production management e.g. on quality, machine utilisation, standard times etc.
- g) Congestion, bottlenecks and delays
- h) Excessive material handling and so on

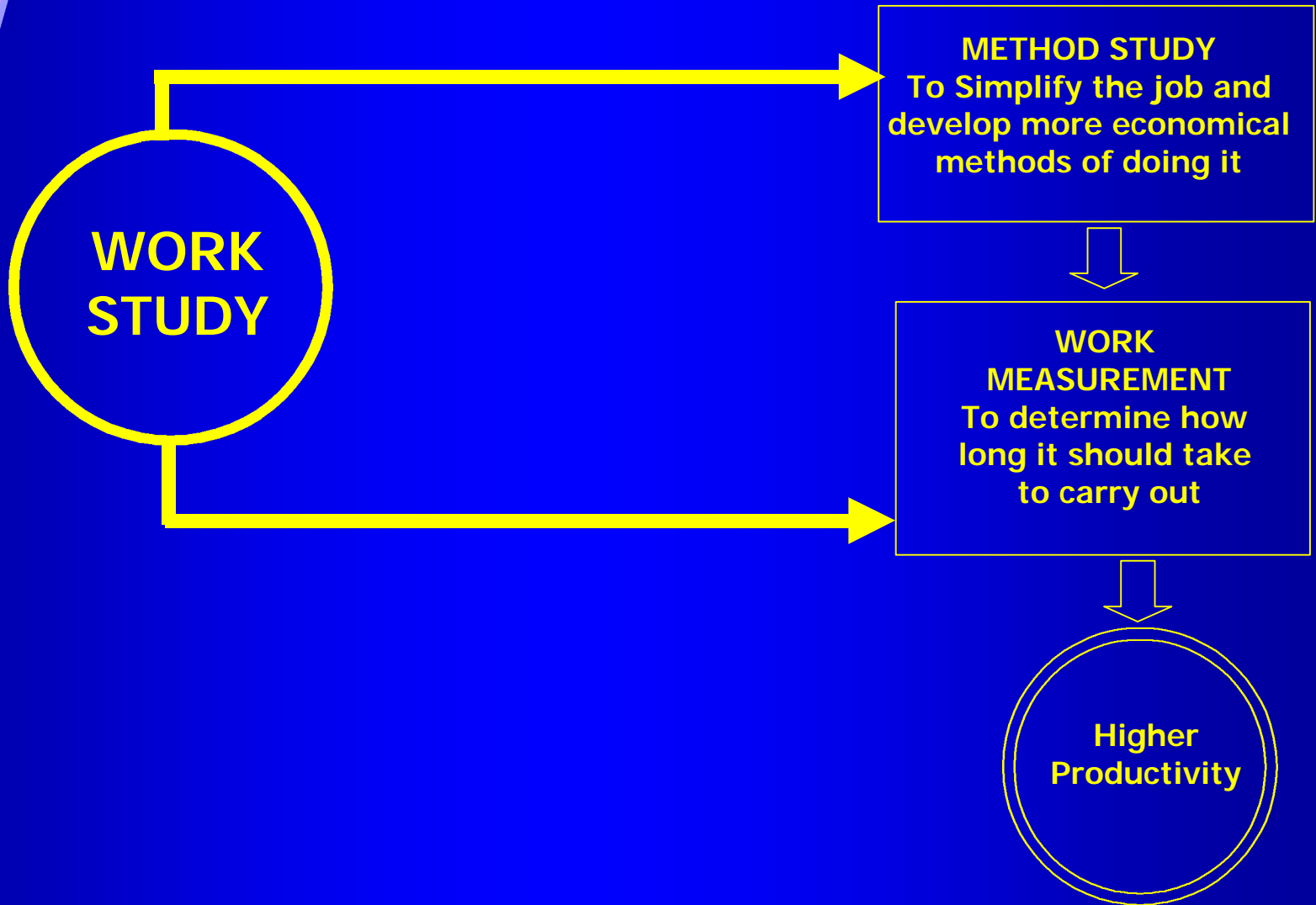
One of the most effective tools available for solving typical shopfloor problems such as those mentioned above is the technique known as Work Study. (or basic IE)

WHAT IS WORK STUDY?

The study is defined by the International Labour Office, ILO, as:

“Techniques which are used in the examination of human work in all its contexts, and which lead systematically to the investigation of all the factors which affect the efficiency and economy of the situation being reviewed, in order to effect improvement”.

WORK STUDY



COMPONENTS OF WORK STUDY

Methods Study aims to simplify the job and develop more economical methods of doing it.

Work Measurement aims to determine how long it should take to carry out a particular job.

Taken as a whole, Work Study aims to improve productivity through the systematic analysis of existing operations, processes and work methods.

WHY WORK STUDY

As a management tool, there are many reasons why work study is very useful for improving work methods on the shopfloor of SME's:

- (i) It involves little or no capital expenditures on plant and equipment
- (ii) It is systematic. It ensure that all facts and information are collected and analysed.
- (iii) Savings are obtained immediately
- (iv) It can be applied everywhere, including in the office

METHOD STUDY - OBJECTIVES

The main objectives of Method Study are:

- (i) The improvement of processes and procedures**
- (ii) The improvement of factory, shopfloor and workplace layout**
- (iii) Economy of human effort and reduction of unnecessary fatigue**
- (iv) Improvement in the use of materials, machines and manpower**
- (v) The development of a better working environment**

THE BASIC PROCEDURE OF METHOD STUDY

The basic procedure for Method Study is made up of seven simple steps:

- | | |
|-----------------|---|
| SELECT | The work to be studied |
| RECORD | All the relevant facts about the present method by direct observations |
| EXAMINE | Those facts critically and in ordered sequence, using the techniques best suited to the purpose |
| DEVELOP | the most practical, economic and effective methods, having due regard to all contingent circumstances |
| DEFINE | the new method so that it can always be identified |
| INSTALL | That method as standard practice |
| MAINTAIN | That standard practice by regular routine checks. |

METHOD STUDY PROCEDURE

Step 1. Select

Economic considerations play an important part in selecting a problem for study. It is obviously a waste of time to start a study if the economic importance of the job is small, or if it is one that is not expected to run for very long time.

In this respect, two techniques commonly applied by Quality Control can be very useful. These are:-

- (I) The Pareto Diagram
- and (ii) The fish-bone Diagram (or cause - and Effect Diagram)

METHOD STUDY PROCEDURE

Step 2: Record

At this point, the actual investigation into the method begins; **RECORDING** all the facts relevant to the existing method. The success of the whole procedure depends on the accuracy with which facts are recorded, because they provide the basis of both the Critical Examination and the Development of the improved method. It is therefore essential that the record be clear and concise

METHOD STUDY PROCEDURE

Step 2. Record (2)

Some useful charts for recording are:-

- (a) Flow Process Chart
- (b) Outline Process Chart
- (c) Flow Diagram
- (d) Multiple Activity Chart
- (e) Two-handed Process Chart

Using these techniques, the process is set out in sequence (sometimes on a time scale). Process charts are the most useful tool in the field of method improvement.

METHOD STUDY PROCEDURE

Step 2. Record (3)

Some points should be remembered when making process charts:

- i) Charting gives a complete picture of what is being done. It helps the mind to understand the facts and their relationship to one another.
- ii) The details which appear on the chart must be obtained from direct observation.
- iii) A high standard of accuracy and neatness should be maintained

METHOD STUDY PROCEDURE

Step 3. Examine (1)

In this step, the activities recorded by the process charts are critically examined in order to identify areas of wastages and to develop alternatives.

Use the 5WIH questioning technique and the principles of ERCS (Eliminate, combine, rearrange and simplify).

METHOD STUDY PROCEDURE

Step 3. Examine (2)

"5W1H" This refers to a questioning technique by means of which critical examination is conducted. Each activity is subjected in turn to a systematic and progressive series of questions.

FACTS	REASONS	ALTERNATIVES	IMPLICATIONS	SELECTION FOR DEVELOPMENT
PURPOSE What is being	Why is it achieved?	What else can be achieved?	What are the advantages of each Alternative?	What can be selected for development?
MEANS How is it achieved?	Why that why?	How else can it be achieved	- do -	- do -
SEQUENCE When is it achieved?	Why then?	When else can it be achieved?	- do -	- do -
PLACE Where is it achieved?	Why there? Can it be achieved	Where else	- do -	- do -
PERSON Who achieves it?	Why that person	Who else can achieves it?	- do -	- do -

METHOD STUDY PROCEDURE

Step 3. Examine (3)

"ERCS"

- Eliminate** unnecessary parts of the job
- Combine** wherever possible or
- Rearrange** the sequence of operation for more effective results
- Simplify** the operation

METHOD STUDY PROCEDURE

Step 4: DEVELOP

As a consequence of applying the “5W1H” and “ERCS” principles a better method will be developed.

Hence the step Develop goes hand-in-hand with step 3, examine.

METHOD STUDY PROCEDURE

Step 5 - DEFINE (1)

At this stage, approval is sought from management to implement the improved method. A report may have to be written. It is useful to adopt a written standard practice or some kind of process instruction.

- i) This records the improved methods for future reference
- ii) It can be used to explain the new method to management, foremen and operatives
- iii) It is an aid to training and retraining operatives

METHOD STUDY PROCEDURE

Step 5 - DEFINE (2)

In presenting the report to management, it is important to include the following:-

- i) Summary of costs incurred - this is especially so where capital investment is involved
- ii) An activity plan to indicate the various stages for installing the new method.

METHOD STUDY PROCEDURE

Step 6 - INSTALL

When installing the new method, the reactions of the workers are very important. People are more likely to be receptive to the idea of change if they know and understand what is happening than if they are merely told to conform. Hence education and training workers for the method must be considered during the step "install".

METHOD STUDY PROCEDURE

Step 7 - MAINTAIN

In this final step, we ensure that the new method is fully understood and implemented smoothly.

Human nature being what it is, workers and foremen will tend to allow a drift away from the method laid down. Problems may even arise that entail further changes in the method: hence maintaining is an Important step

BASIC WORK STUDY EQUIPMENT

The following are some equipment which is needed to carry out a proper work study:

- i) A clipboard
- ii) A stopwatch
- iii) Check sheets (or Study Forms)
- iv) A small calculator
- v) Measuring Tape