
Improving Productivity Using Work Study Technique

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Abstract

This paper focuses on the crucial side of productivity improvement with the proper use of work study technique combined with motion and time study in the activities of the manufacturing enterprises. The work study technique concept is used by the enterprises to reduce work in progress inventories and also to diminish the waste of available resources like man, machine, materials, space, etc. to reach in the competitive global market. In the today's world, quality with quantity is the main approach for an industry to retain its existence in the competitive market. Since, the technique of work study is very much required for management to understand its actual application not only from angle of productivity/ financial improvement or proper utilization of resource, but also should address critically the soft side of workers psychology.

Key words: *Improvement, Inventories, Productivity, study*

INTRODUCTION

Work study is generic term for those techniques which are used in the examination of human effort in its entire context and which lead to systematic investigation of all the factors affecting the efficiency and economy of a situation under review in order to effect improvement. Productivity is the ratio between output and input. The input elements in productivity are man, machine, materials, land, capital, energy, etc. and output should be goods and services. The linkage between work study and productivity is shown in fig. 1.

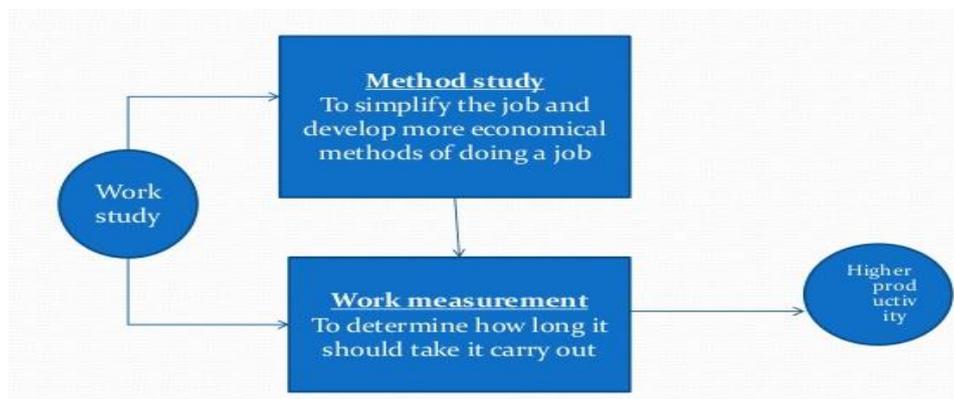


Fig. 1

LITERATURE REVIEW

Productivity improvement is one of the core strategies towards manufacturing excellence and it also is necessary to achieve good financial and operational performance. To increase productivity, two important function of productivity management are: installation of most effective method of performing the operation and the control of resources –mainly plant and labour required in carrying out the operation. The application of science to business problems, with the use of time-study methods in standard setting and the planning of work, was pioneered by Frederick Winslow Taylor, with emphasis on fair day work At present all process is considered from the angle of productivity to reduce the non-value activities to give optimized output to the possible extent. It is a total concept that addresses the key elements of competition, for example is innovation, cost, quality and delivery (Erlendsson, J. 2006).

IMPORTANCE OF PRODUCTIVITY

Productivity improvement is one of the best strategies towards manufacturing excellence and it also is necessary to achieve good financial and operational performance. It enhances customer satisfaction and reduce time and cost to develop, produce and deliver products and service. Productivity has a positive and significant relationship to performance measurement for process utilization, process output, product costs, and work-in-process inventory levels and on-time delivery. Improvement can be in the form of elimination, correction (repair) of ineffective processing, simplifying the process, optimizing the system, reducing variation, maximizing throughput, reducing cost, improving quality or responsiveness and reducing set-up time.

CASE STUDY

An air duct manufacturing enterprise, located in the district of Hooghly, West Bengal, India where manufacturing is done through blow moulding technology. After blow moulding process, it requires to remove excess material. This system is done manually. The company used to get huge order but they cannot reach at the dead line of the customer. For that reason the higher authority of the industry want to follow mechanism of work study technique.

METHODOLOGY

At first, the Manufacturing Enterprises units have been observed. Thereafter, a particular operation of the enterprise is observed minutely. The past record of product is observed. The skillness of the worker is noted and the interaction with the hierarchy of the production unit is also done. In this way, the main cause of work study is analyzed for the improving productivity.

ANALYSIS

Product defect is due to

- i) No proper record is kept of the defective products.
- ii) The statistical interpretation and trend analysis is not done.
- iii) Negligence on the part of concern personals to find the root cause of the defect.
- iv) The control over incorrect operation is not done.
- v) Inadequate flow control is present.
- vi) No alarming system is there when at first using operation is done on the product.

IMPORTANCE OF WORK STUDY

1. It is a means of enhancing the production efficiency of the firm.
2. It is a technique to identify non-value adding operations by investigation of all the factors affecting job.
3. It is a systematic procedure oriented technique to establish time standards.
4. It has lot of universal application.

WORK STUDY AND SUPERVISOR

The work study man is going to face difficult problems because of supervisor or foreman's attitude. Foreman is a manager of the shop floor to workers and success of work-study in all its phases depends on him as it is he / she who it's going to co-operate with the work-study man.

Before the work study begins, the whole purpose of work-study and procedures involved in the work-study must be carefully explained to the foreman so that he understands exactly what is being done. This facilitates the work of work-study man as he / she is going to convey and convince the workers regarding the purpose and benefits of work study. Thus the work-study man has to establish trust and friendship and sell his idea to get the acceptability of the foreman.

WORK STUDY AND WORKER

Work study brings about the improvements through changes in the methods, procedures and

also some habits. This change, the workers always perceive it as a threat to their job security and their familiarity. Any change is always resisted by human beings as there is lot of uncertainty is associated. Thus the management and work-study man should be able to gain the acceptability and confidence of the workers by making them understand the need for the change and how this change is going to benefit both the workers and their organization. Now the workers' attitude towards work is changing fast workers no more tolerate boredom and monotony on the work. So a greater responsibility now rests on the management to constructively channelize their efforts into constructive outlets by providing them an opportunity and climate where in workers will feel affiliated, work to their full potential. In this contest, work study from the workers' point of view is getting special attention.

PROPOSED MODEL

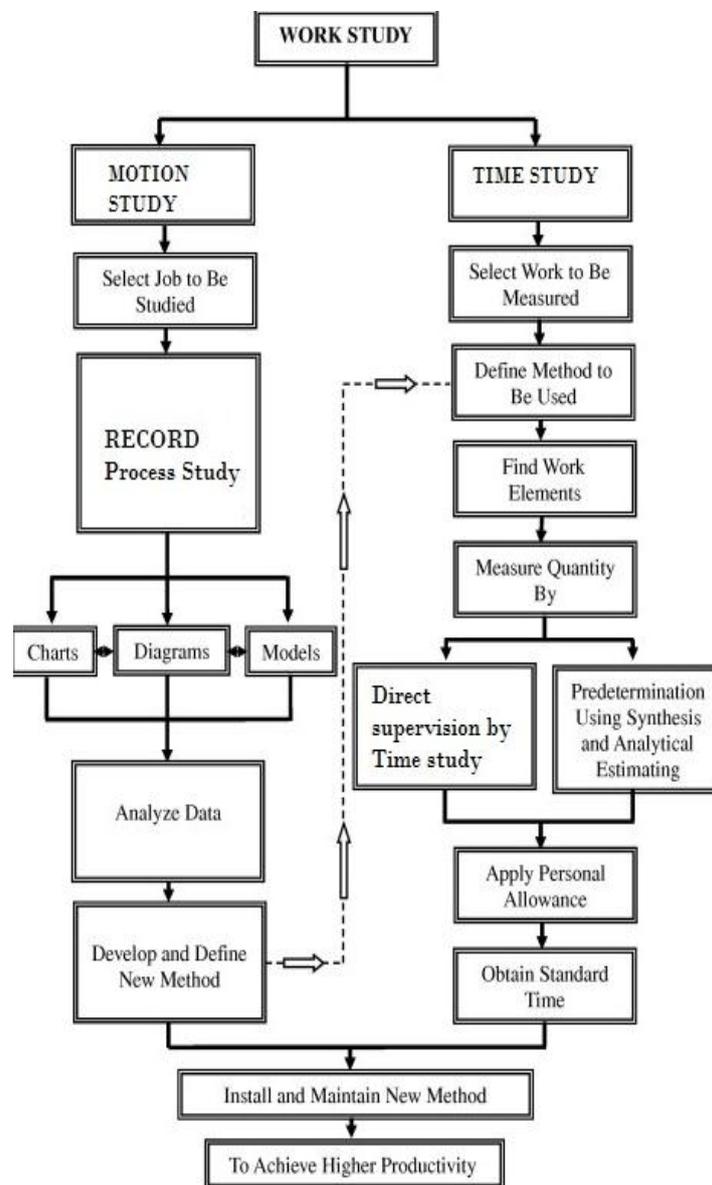


Fig. 2: Proposed Model

For work-study, the motion and time study are to be done. For motion study, the specific job is to be selected; the process of study is to be recorded. That is done by charts, diagrams or models. After that data analysis is to be made. Then a new model is to be developed and defined regarding the concerned job.

For time-study, the selected work is to be measured by the application of new method and then work elements are to be identified. The measurement can be done by Direct Supervision and predetermined using synthesis and analytical estimating by applying personal allowance. The standard time is to be calculated.

Ultimately new method is to be installed and to be maintained that will result in higher productivity.

INFLUENCE OF METHOD STUDY AND TIME STUDY ON PRODUCTION ACTIVITIES

The basic objective of production management is to manufacture the right quantity and quality of goods at the predetermined time and pre-established cost. Work study is a tool to achieve this objective. During the product design and process design, the methods of manufacture are fixed and process planning is done using the standard times and standard method. Method analysis guide with respect to how the work is to be best accomplished and time standards indicate how long it will take to complete the job.

Process analysis and standard times, helps to have a control on quality and quantity manufactured. Based upon the standard times, standard cost are determined and this helps the analysis of variance between actual and standard costs. Product cost which is a function of method and standard time and cost control is very much essential to be in competition. Thus, work-study applied in right spirit helps to accomplish the production objectives.

CONCLUSION:

The manufacturing unit by doing work study can make effective utilization of resources. Work study which comprises of method study and work measurement will fulfill these requirements. By method study, one can determine the most effective method of performing the job, the most logical layout for manufacturing facilities, uninterrupted flow of material throughout the organization; will help to complete the job in least possible time and at optimum cost. Work measurement on the other hand determines the time required by an operator to complete the operation of job for the standard method at the defined level of performance.

Thus, work-study is the most effective tool to enhance productivity because of the fact that it is a straight-forward way of increasing productive efficiency of the organization and considers all the factors influencing productivity.

REFERENCES

- [1] An Effort to Apply Work and Time Study Techniques in A Manufacturing Unit for Enhancing Productivity;
International Journal of Innovative Research in Science, Engineering and Technology; ISSN: 2319-8753
- [2] Barnes, R.M. 1980. Motion and Time Study: Design and Measurement of Work. John Wiley and Sons 7th edition. ISBN: 0471059056.
- [3] Diane Galarneau and Cécile Dumas, About productivity Spring 1993 (Vol. 5, No. 1) Article No. 5
- [4] Doty, L.A. 1989. Work Methods and Measurement for Management. Thompson Learning. ISBN: 053
- [5] I.L.O Document, Geneva 1969, printed by impression couleijrs weber, 2501 bienne, Switzerland.
- [6] Pidd M. 1977, 'The operational research method', in Operational Research for Managers, S.C. Littlechild (ed.), Philip Allan, Oxford.
- [7] Productivity Improvement in Manufacturing Industry Using Industrial Engineering Tools; *IOSR Journal Of Mechanical and Civil Engineering (IOSR-JMCE)* e-ISSN: 2278-1684, p-ISSN: 2320-334X PP 11-18
- [8] Prof. S. B. Khedkar, Prof. R. D. Thakre, Prof. Y. V. Mahantare, Mr. Ravi Gondne, Study of Implementing 5S Techniques in Plastic Moulding, International Journal of Modern Engineering Research(IJMER) Vol.2, Issue.5, Sep.Oct. 2012,ISSN: 2249-6645
- [9] Meyer, D. 1978, GRASP - A Patient Information and Workload Management System, MCS, Morganton, NC.
- [10] Mohit Bhattacharya, Jawahar Publishers and Distributors-" New Horizon of Public Administration".

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