

Time Study and Optimization of Elevator Components Manufacturing Machines

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Abstract - Nowadays with increasing automation technology everything gets so easy, where automation minimizes human assistance. Time and motion study is the process in which used by very few industries. In this study company is manufacturing based company. Many of the industries utilize different resources to improve their productivity. Main focus of the many industries is the higher production rate in less cycle time but they should have focus on customer satisfaction and their need. In order to increase the productivity with high efficiency in less time there must have a process which will give you all these things at the same time. Time and motion study is defined as analysis method which is design to determine the best way to eliminate repetitive work and time spent by an average worker to complete a given task in a fixed workplace. This study also includes Maynard operation Sequence Technique (MOST). This technique is used to reduce work content and thereby improve the productivity of the process. The purpose of this paper is to discuss that time and motion study with help of suitable technique productivity (MOST) can be improvise in less cycle time. It shows that time and motion study implementation contributes positively towards achieving productivity.

Key Words: Time and motion study, Maynard Operation Sequence Technique, Productivity Improvement, Manufacturing Company.

1. INTRODUCTION

The important thing in order to determine the success and performance of the company is time and it indicates the level of company's performance. The measurement of the product or service successful would be known through time study by work sampling and workers complaint. It shows that time is one of the most important thing which determines company's performance and helps to develop the operation level of the company. Time is defined the as a component that used measurement system that used to evaluate motion of the work element and compare

duration of time event. MOST is designed to be much faster than other measurement techniques. MOST concentrates on the movement of the object.

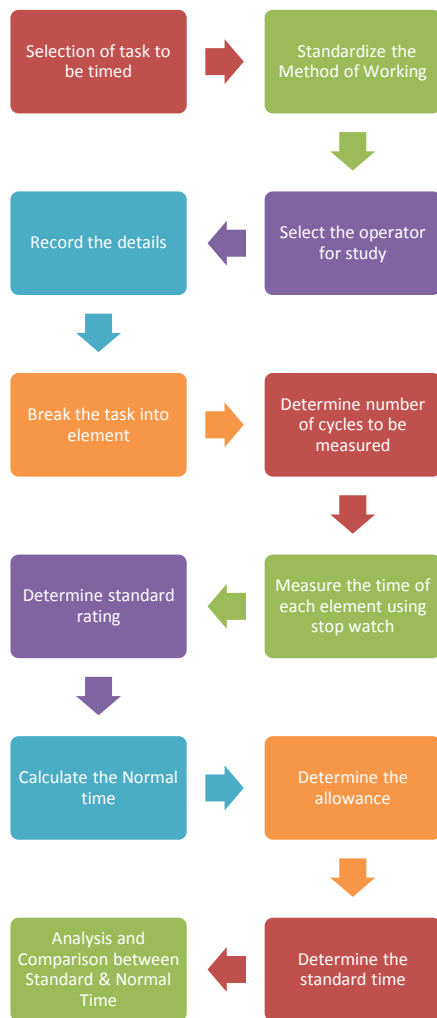
1.1 Problem Statement:

Time and motion study is important characteristics in business to calculate the production rate. The other factors like operation cost, work force, raw material effect the production rate. All these factors will effect differently on each other. Even though, time is most important factor in this rate. This factor involved both the machine and manpower. In this process of manpower has no time standard because we know this process will be influence by many factors. If there is no time standard, any task can be finished out of planned. In this study time standard is determined to know time required for the process so it could be finished in time. In business, both of these elements are important to get the maximum profitable production rate. Hence, with the application of time study and MOST method the changes and improvement could be seen especially in cost and production matter.

1.2 Objectives

- i) The objective in this study is to identify work, time standard to work which involves manpower in manufacturing process and see changes which occurred on cost and company production after Time study and MOST takes place.
- ii) Evaluate the level of awareness of the Time Study and MOST for productivity improvement and their priorities.
- iii) Identify the issues related to the implementation of this study for productivity improvement.
- iv) Target the time for each job can be scientifically estimated.

1.3 Methodology



2. Literature Review

2.1 Time Motion Study in Determination of Time Standard in Manpower Process

‘Abdul Talib Bon, DaiuanniDaim’

In this study, the company that involve is rice based company. Time study method is used to increase production and identify any improvement that could be made through identify the process that involving manpower is the main source and state the time standard in order to achieve the objectives of increasing production and decreasing the cost. This study includes process observation, interview with discussion, and stop watch time study. Analysis the data and make the improvements. This study is carried out to determine the actual time needed to complete task.

2.2 Productivity Improvements through Motion and Time Study

‘MohdRazali Muhmad and Wan Mahmood’

Over the time period pattern of economic competitiveness has changed globally. This paper consists of many factors that influence the productivity of manufacturing industries. The main issue is how to improve the productivity with efficient work. Motion and time study is one of the important technique into order to achieve the productivity in less cycle time. The purpose of this paper is to discuss the implementation of this Motion and Time Study and analyse the improvements after implementation.

2.3 M.O.S.T - The Most Advances Work Measurement Technique

‘Vivek A. Deshpande’

Purpose of this paper is to include new and most advanced method to understand the intensity of the work and to monitor and improve the utilization of the resources. This method concerned with the intention to provide awareness of the particular work measurement technique called ‘Maynard Operation Sequence Technique’ (MOST). This technique includes determination of sequence, observation of task, formation of table, calculations etc.

4. CALCULATIONS

While doing Time Study, in collection data and analysis after forming the table weight of each job is needed to fill up the table, some parts are long and flexible that they are difficult to weigh. So to calculate the weight of such parts we used the formula given below:

Formula

- To find out the weight of complicated component.

$$\text{Weight} = \text{Volume}(\text{Length} \times \text{Width} \times \text{Height}) \times \text{Specific Density}$$
- For example-
 Component Name- **Vertical Stiffener**
 Length = 2361 mm,
 Width = 137 mm,
 Thickness = 0.8 mm,
 Specific Density Galvanized Iron = 7.85 kg/m³

$$\text{Weight} = 2361 \times 137 \times 0.8 \times 0.00000785$$

$$= 2.031 \text{ kg}$$

4.1 Experimental Validation

Experimentation of our project will be carried out once we get all the data from Time Study and M.O.S.T study. The

experimentation includes that data collection, observation, analysis, good planning and control system, experienced work forces. The recorded time then can be compared with standard time to plot the result with improvement.

5. CONCLUDING REMARK AND SCOPE FOR THE FUTURE WORK

Till now we have concluded that, Time study has many benefits that can be obtained by implementing productivity improvement effort. The main purpose of Time Study is to improve the productivity, increase the job efficiency, quality improvement, reduce the operation time per part, compete in local market and fulfilling market demand. It will also conclude that observation and formation of table makes process bit easy for comparison with standard time.

The scope in future would involve, by the application of Time Study, all the features and criteria which show organization can maximize production and optimize the cost.

REFERENCES

[1] Bon A.T. and Daim D., "Time motion study in determination of time standard in manpower process", Proceedings of EnCon2010 3rd Engineering Conference on Advancement in Mechanical and Manufacturing for Sustainable Environment April 14-16, 2010, Kuching, Sarawak, Malaysia.

[2]Muhamad M.R., Mahmood W., "Productivity improvement through motion and time study", National Conference on Management of Technology and Technology Entrepreneurship (MOTTE 2005) 31st May - 2nd June 2005 Johor Bahru, Malaysia.

[3] Deshpande V.A., "M.O.S.T. The Most Advanced Work Measurement Technique" Asst. Professor in Mechanical Engineering, G. H. Patel College of Engineering & Technology, Vallabh Vidyanagar, Anand, Gujarat-388120, Journal of Engineering & Technology, S. P. University, December 2007, Vol.20, pp 109-113.