

**TIME STUDY AND WORK MEASUREMENT  
IMPLEMENTATION IN MANUFACTURING INDUSTRY**

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**UNIVERSITI TEKNIKAL MALAYSIA MELAKA  
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**TIME STUDY AND WORK MEASUREMENT IMPLEMENTATION  
IN MANUFACTURING INDUSTRY**

This report submitted in accordance with requirement of the Universiti Teknikal  
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with Honours

By

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## **DECLARATION**

I hereby, declared this report entitled “Time Study and Work Measurement implementation in Manufacturing Industry” is the results of my own research except as cited in the references.

Signature :

Author’s Name : ANIZA NAZIRAH BINTI AZIZAN

Date :

## **APPROVAL**

This thesis is submitted to Faculty of Manufacturing Engineering of UTeM as a partial fulfilment of the requirement for the degree of Bachelor of Manufacturing Engineering.

The member of the supervisor is as follow:

.....

Nor Akramin bin Mohamad

## ABSTRAK

'Kajian Masa dan Penerapan Pengukuran Kerja dalam Industri Pembuatan' adalah satu tajuk projek yang telah dijalankan di Everts (Malaysia) Sdn. Bhd di Ayer Keroh Melaka. Terdapat banyak cara untuk meningkatkan produktiviti dan pengajian masa adalah satu cara untuk mencapainya. Dalam kes ini, terdapat 7 elemen pekerjaan yang telah dijalankan. Selain itu, objektif kajian ini adalah untuk menjalankan kajian masa dan pengukuran kerja di dalam industri perkilangan menggunakan jam randik dan juga untuk menganalisis gerakan di tempat kerja dengan menggunakan Therblig analisis (Simo-Chart). Dalam objektif projek ini juga mencadangkan penyelesaian untuk meningkatkan aliran proses dengan mengurangkan kerja tidak produktif di kalangan pekerja. Masalah timbul apabila syarikat ingin mencari masa yang tepat terutama untuk tugas manual dalam perancangan pengeluaran. Tujuan kajian ini juga ingin mencari prestasi dan 5% elaun yang sesuai diberi untuk setiap proses untuk menjalankan kajian masa jam randik. Terdapat dua kaedah yang digunakan dalam kajian ini yang menggunakan kaedah untuk menjalankan kajian masa dan kaedah untuk menganalisis gerakan di tempat kerja. Gerakan pekerja telah dikaji dengan menggunakan Therblig (Simo-chart) untuk memberikan analisis visual cepat untuk mengenalpasti ketidakcekapan dalam proses, dan perilaku reka bentuk berulang yang dilakukan oleh pekerja. Malah, 4 daripada 7 elemen kerja telah bertambah baik yang dapat mewujudkan waktu standard proses yang melibatkan peningkatan produktiviti perusahaan. Dengan membuat beberapa penambahbaikan, kajian masa pengurangan boleh mengurangkan atau menghapuskan dan usul kedua tangan menggunakan analisis therblig yang terlibat dalam melakukan operasi, corak gerakan tidak cekap dapat dikenal pasti. Projek ini dibangunkan dengan menggunakan kajian masa yang akan digunakan sebagai satu rujukan kepada syarikat untuk meningkatkan produktiviti Industri Pembuatan

## **ABSTRACT**

‘Time Study and Work Measurement implementation in Manufacturing Industry’ is a project title that has been carried out at Everts (Malaysia) Sdn. Bhd in Ayer Keroh Melaka. There are many ways for improving the productivity and time study is one way to achieve it. In this case, there are 7 job elements that has been carried out. The objective of this study is to conduct time study and work measurement analysis in a manufacturing industry using stopwatch and also to analyze the motion in workplace using Therblig (Simo-Chart). In the objective of this project also to suggest a solution to improve the process flow by reducing the unproductive work among the employees. The problem comes when the company want to find a standard time especially for manual task in production planning. The aim of this study also is to find the suitable rating performance and 5% allowances for each process are given in order to conduct the stopwatch time study. There are two method using in this study which use method to conduct time study and method to analyse motion in workplace. Motion of the employees has been studied by using Therblig (Simo-chart) to give a quick visual analysis for identifying inefficiencies in the process, and repeated design behaviour exhibited by the employees. Moreover, 4 out of 7 job element have been improve that can establish the standard time of the process which involve to increase productivity of the company. By making some improvement, the reduction time study can be reduce or eliminate and the motions of the two hands using therblig analysis involved in doing an operation, inefficient motion pattern can be identified. This project was developed by using the time study which will be used as a single source of references by the company to increase the productivity of Industry Manufacturing.

## **DEDICATION**

To my beloved parents,  
Azizan bin Ahmad and Naemah binti Mohd Isa,  
My Supervisor,  
And all my friends those give supporting and encouraging.  
Thanks for everything.



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*In the name of Allah, the Most Gracious and the Most Merciful*

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# **CHAPTER 1**

## **INTRODUCTION**

Chapter one will explain the basic planning of object. This chapter will start with the introduction of this report which describe the motivation for the project and then discusses the problem statement, objective, scope of studies and the project significant of the project. Finally, the organization of the reminder of this report is presented.

### **1.1 Introduction**

Work measurement in a general term to determine the amount of time required to complete a task in application of industrial engineering technique. Work measurement is a productivity of an organization where productivity of an organization must be measured before improvement can be made. This measurement is used to determine whether project have resulted in good improvement. Besides that, work measurement enable a quicker and more economical services or product. The objective of work measurement is to enable realistic schedule of work to be prepared and to eliminate the unnecessary jobs.

There are various way that can be measured and a variety of technique have been established. The basic procedure consist of three stages which are including analysis, data collection and measurement and synthesis. However, the three stages procedure remains common. As the industries rapidly growing, work measurement become more important technique compared to the past. Work measurement can help manufacturers to increase the efficiency and productivity of the workers, thus can eliminate the labour hours and labour cost which is very important in today's modern world.

The uses of work measurement:

1. Work measurement is used in drawing out schedules and planning work.
2. Work measurement is used to determine standard cost and use in balancing production line for new products.
3. Work measurement is used to determine machine effectiveness and to determine time standard for labour cost control.

They are four principal techniques of work measurement are classified in the following belows:

1. Time study
2. Work sampling
3. Pre- determined Motion Time Sytem
4. Analytical Estimating

Time study is one of the method that refers to work measurement in setting the labour standard times. It is very important to increase the efficiently and effectively of the worker and also to understand the important of the human factor. Moreover, it can be know when to estimate prior to production of time and cost. So, it is important to understand the benefits and important of quality improvement since the growing of economic has a significant value in production of network.

## **1.2 Problem Statement**

The issues of this company focuses on the manual packing and it was found that most of works are doing the job manually by employees. The employees arrange the packaging balloon are inconsistent. When company faces on inconsistent of performance, the target is hard to achieve. This is can cause the employees have lack of time and take long duration to complete all the process. Regarding to this project that exist in this case which is there is no standard time that can be referred and labour performance cannot be measured. In addition, due to no standard time, the company also facing problem which in Standard Operation Procedure (SOP) that can be referred. It may cause time loss due to the some operation sequence are not

proper. The second issues is part arrangement can be seen clearly in packaging balloon. The employees might be confuses to arrange the balloon since the place is crowded and messy of work environment. So, it give effect to employees to do the work and result in wasting time. The factor that influences is to improve the suitable process flow in obtain the product.

### **1.3 Objective**

The specific objective of this project include:

- i. To conduct time study and work measurement analysis in a manufacturing industry.
- ii. To analyse motion in workplace using Therblig (SIMO-CHART).
- iii. To suggest a solution to improve process flow.

### **1.4 Scopes**

To ensure the objective will successfully achieve, some of the several important element need to be considered. There are:

- i. This project basically focus on manual packaging process at the Packaging Department at Everts (Malaysia) Sdn. Bhd.
- ii. To apply work measurement analysis to improve production planning.
- iii. To evaluate the labour performance during working at the production line.

### **1.5 Project significance**

The project significance are as follows:

- 1) This research give a lot of opportunity to have an easier method to identifying procedure of standard operation.

- 2) Work measurement becomes more important in industry thus proper knowledge in work measurement resource characteristics is vital to ensure the efficient of labour performance.
- 3) This research explore further to improve the productivity of the manufacturing process in order to help the work study.

## **1.5 Organization of report**

The rest of the report is arranged as follows. Chapter 1 presents the problem statement, objective, scope and project significant. Chapter 2 presents Literature Review, Chapter 3 presents Methodology, Chapter 4 presents Result and Discussion lastly Chapter 5 presents the conclusion and recommendation.

### **1.5.1 Chapter 1**

This chapter will briefly explain about the project which will cover the problem statement, objective, scope of the project and project significant. This explanation will describe the concept and idea of the project and how it is applied in the real.

### **1.5.2 Chapter 2**

This chapter will cover the background study about the project based on the knowledge and information which present the concepts that related to research and also discusses the importance of these research. The source of these researches has to be acceptable in the system format such as journals, articles, books and website that are licensed.

### **1.5.3 Chapter 3**

This chapter present the methodolgy of this research in detail. Methodology chapter is a schedule that need to be complete, explain about the process and method that use in project, detailed reports of studies done to achieve aim objective. When the project complete, this chapter explains the procedure that have been taken. It consist of detail development of this current project.

#### **1.5.4 Chapter 4**

This chapter presents the result and the discussion of the study, the result from the data collection that are presented in tables, figures, and graphs discussed elaborately in the chapter. While it describe about details of the related production process. Several observations are also projected from the findings.

#### **1.5.5 Chapter 5**

This chapter summarizes the outcomes of this experiment. The chapter also conclude this thesis with summary of the findings of this research, limitations of findings and suggestions and improvement for future research. It also to conclude the recommendation for future works.

## **CHAPTER 2**

### **LITERATURE REVIEW**

Chapter 2 introduces the fundamental concepts and explanation through search of literature in order to identify method that need to be implemented in company. All the previous researches and references from relevant materials like case study, thesis, journals, will be used to this project. Besides that, it is also talk about the definition, benefits and strategies of work measurement to make work become more efficiently.

#### **2.1 Introduction to Work Measurement**

There are various definitions of work measurement that can be found out in the literature. The name of '*Time Study*' is also called Work Measurement. According to Yusoff *et al.* (2012) described that work measurement is the application of techniques to determine the time that required for a qualified worker to perform a task .Some researcher states that it helps to evaluate worker's effectiveness to develop labour standards for planning and controlling operation and also to determine the specific and reasonable working time quota of each requires Duran *et al.* (2015)

Work measurement is concerned when the time which no work effective is being performed with observation, eliminating and subsequently reduce ineffective time. Based on Kanda (2013), expressed that Work Measurement are recommended gives management with method of measuring time taken in the performances with operations or combination of operation which unproductive time is shown can be separated from efficient time. The result of time study is the standard time (allowance time) to perform a task or job.

## 2.2 Pre-requisite in time study

Pre-requisite is the time worker to perform one work cycle with the given manual task and its depend on the worker which include (his physical size and strength and their mental abilities), the worker pace, the method use which include (hand and body motions, tooling , equipment and work environment), and the work unit. As a prerequisite to develop a standard time for a task or job, this factor must be standardize. According to Mikell Groover (2007), the standardized factor must include;

- 1) The task is performed by a qualified worker.
- 2) The standard performance represent the worker's pace (speed).
- 3) The worker uses method standard.
- 4) The specific task is performed in work unit.

### 1. The task is performed by a qualified worker

Mikell Groover (2007) expressed that a worker is capable to perform a task consistent, practised and proficient at it. Besides, a skilled and well-trained worker can develop by best of experience and the time must required with the job and person to perform a task given. The big mistake that made with a new study personal is time studies are too soon. Before perform the time studies, the fully training of person must given especially to the worker at least two weeks or more on the job prior to the time study. With the new job or task given, predetermined time study are used by Meyers (1992).

### 2. The standard performance represent the worker's pace (speed)

A pace of working that can be kept up by an average worker all through a whole work shift without harmful effects on the laborer's wellbeing or physical health. Besides that, the worker are experience by work shift that includes rest break and occasional interruptions (except break for lunch). Standard performance can be defined to be a pace which can achieve by the majority of workers instead of using allowances. According to Meyers (2002) a normal pace usually comfortable for most people. Time standards can be used for one time only for each job even though the difference of worker can