



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**TIME STUDY METHOD IMPLEMENTATION AT JECMETAL
INDUSTRIES SDN. BHD.**

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering (Manufacturing Process) (Hons.)

by

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2012



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: Time Study Method Implementation at Jecmetal Industries Sdn. Bhd.

SESI PENGAJIAN: 2011/12 Semester 2

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APPROVAL

This report is submitted to the Faculty of Manufacturing Engineering of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Manufacturing Engineering (Process) (Hons.). The member of the supervisory is as follow:

.....

DEDICATION

I want to dedicate this project to my lovely mama Mrs. Fatimah Binti Mahat, my best buddies Mohd. Hilmi B. Shahroom, Nurhidayah Bt. Muhamad Dahari, Juana Bt. Imran and also to all my friends for being with me and helping me in each and every difficulty I faced during the completion of this project and to my supervisor Dr. Nur Izan Syahriah Bt. Hussein and all those who taught me, trained me and polished my abilities.

ACKNOWLEDGEMENT

Great deals appreciated go to the contribution of my faculty - Faculty of Manufacturing Engineering (FKP). Not to forget, I also would like to express my gratitude to the supervisor from faculty FKP in giving opinions, and providing guidance in preparing this FYP. Especially my supervisor that has encourage, support and help me in completing this program to success and give me advice and share with me their experiences.

Last but not least I would like to thank the Engineering Department staffs and other staffs at Jecmetal Industries Sdn. Bhd. especially Mr. Razali and Mr. Yeo Soon Heng those who work together in helping me preparing this FYP.

Thank you.

ABSTRAK

Projek ini menerangkan mengenai isu utama dalam Jecmatal Industries Sdn. Bhd. Isu utama yang perlu untuk diatasi adalah untuk menyusun semula masa kitaran dalam mengeluarkan produk, tumpuan diberikan di bahagian pengeluaran. Kaedah yang digunakan adalah pemerhatian, latihan dan temu bual tidak formal untuk mendapat maklumat daripada syarikat. Projek ini mencadangkan satu teknik yang menggunakan masa kajian. Objektif projek ini adalah untuk mengenal pasti dan memahami proses operasi bagi jelas mendokumenkan kerja tertentu proses. Di samping itu, projek ini juga mencadangkan analisis kajian masa dan melaksanakan sistem prosedur kajian masa ini untuk mengurus dan mengurangkan kitaran masa bagi setiap produk. Data yang diambil telah diolah dengan menggunakan sebuah perisian. Perisian yang dipilih adalah Microsoft Excel 2010, ini adalah kerana perisian ini lebih mesra, mudah untuk dikendalikan, murah dan mampu untuk digunapakai. Keputusan telah menunjukkan pengurangan untuk jumlah keseluruhan masa seragam bagi produk yang telah dipilih. Berdasarkan kajian yang diperolehi dengan menggunakan kaedah kajian masa, syarikat akan memperolehi keputusan yang baik untuk meningkatkan penghasilan produk. Untuk perancangan masa akan datang, kaedah kajian masa ini boleh diperbaiki dengan melaksanakan teknik-teknik dengan lebih terperinci bagi menentukan tahap prestasi pekerja dan elaun yang diberikan. Selain itu, kaedah kajian masa ini dapat ditingkatkan dari masa ke semasa dan juruteknik perlu melihat dan mendalami tentang sumber bagaimana untuk menggunakan formula bagi mendapatkan jumlah masa seragam yang sebenar.

ABSTRACT

This project describes on the main issue in the Jecmatal Industries Sdn. Bhd. The major issue need to be overcome is to rearrange or handle the cycle time in producing a product focus on production department. The method that were used was observation, training and informal interviews on gaining the information from the company. The project propose one technique which are apply time study method. The objective of this project are to identify and understand the process operation for clearly documenting a particular job of the process. Besides, this project also suggest time study analysis and implement the system of procedures of time study method in order to handle and reduce cycle time of product. The data handling with using a software. The Microsoft Excel 2010 has chosen as the software because it is friendly software, and also cheap and affordable. From the result shows that decreasing number of total standard time of selected product. Based on the review by using time study method, the company can get good result in order to increase the productivity. For the future work, the time study method can be improved by implemented the techniques more details in order to determine the suitable performance rating and allowances. Besides that, time study method can be improved time to time and the time study technician should look for detail information from sources on how to apply the formula to finding the total standard time.

DEDICATION

I want to dedicate this project to my lovely mama Mrs. Fatimah Binti Mahat, my best friend Mohd. Hilmi B. Shahroom, Nur Hidayah Bt. Muhamad Dahari and Juanna Binti Imran and also to all my friends for being with me and helping me in each and every difficulty I faced during the completion of this project and to my supervisor Dr. Izan Syahriah Bt. Hussein and all those who taught me , trained me and polished my abilities.

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Last but not least I would like to thank my friends especially those who work together in helping me preparing this FYP.

Thank you.

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LIST OF ABBREVIATION AND NOMENCLATURE

| | |
|------------|---------------------------------------|
| All | - Allowances |
| Avg. | - Average Time |
| CAD | - Computer-Aided Design |
| CAM | - Computer-Aided Manufacturing |
| CNC | - Computer Numerical Control |
| D | - Job difficulty adjustment factor |
| EDM | - Electrical Die Sinking |
| Freq. | - Frequency |
| HC | - Headcount |
| ID | - Identity |
| No. | - Number of Process |
| OEM | - Original Equipment Manufactures |
| P | - Pace rating factor |
| PR&D | - Personal, rest and delay |
| PR | - Performance Rating |
| PTMS | - Predetermine Motion Time Systems |
| PTSS | - Predetermined Time Standard Systems |
| Qty. | - Quantity |
| RF | - Rating Factor |
| SMED | - Single Minutes Exchange Die |
| Std. Hours | - Standard hours |

CHAPTER 1

INTRODUCTION

This chapter will explain the basic planning of the project. This chapter would start with the company details, problem statement, objective, scope of studies and activity planning. According to the situation occurred at this company so that, the time study has proposed in order to overcome the situation. The details on how to deliver the method of time study will be showed in the other chapter.

1.1 Introduction

This final year project title was taken from the industrial problem faced by Jecmetal Industries Sdn. Bhd. The main focused of the project was to reduce the cycle time for production line. Nowadays, Cycle time become more important as production quantities grow. The better the process, the shorter the cycle time. How short a given production cycle time can be was based primarily on the quality of processing that goes into the operation. The overall project will discuss about cycle time rearrangement techniques for this company that can be applied after a good process has been developed.

Basically, the problem to be solved is to obtain an optimal solution in terms of cost, time and reliability for product development involves the huge amount of data and the computational complexity. In manual approaches this was an impossible problem, developed data was needed, generated the very large number of plans, then analysed and then evaluated, this was an impossible manual task. A simple product

may have many components, alternative components, component manufacturers and component suppliers or distributors.

For company developing the management in manufacturing their engineers plays an important role. As those are prepared to design workstations, develop efficient and effective work methods, establish time standards, balance assembly lines, estimates labour costs, develop effective tooling, select proper equipment, and layout manufacturing facilities. However, the most important aim was how to train production workers in these skills and techniques so they can become motion and time conscious. The manufacturing management and engineers only design and prepared the skills but, the production workers who are going to implement it in the operation. So the objective of this project can only be achieved if the production workers are knowledgeable about quality time management.

1.2 Company Background



Figure 1.1: Company View

The Company was established for OEM since 1985 and located in Muar, Johor, Malaysia. With more than 20 years of experience in production of machined parts,

and assemblies, Jecmetal Industries Sdn. Bhd. was equipped with advanced technology equipment and process to provide manufacturing services for precision machined parts manufacturing, parts integration into sub-assembly and equipment assembly. Besides variety in product and process capabilities in components manufacturing, the company also provide a wide range of manufacturing services customized to individual customer needs.

The organization emphasize in providing value added services beyond parts making and assembly. Jecmetal is lead towards providing supply chain management for assemblies, strategic inventory control, prototyping, design validation, design modification and functional testing. It is the company's mission to achieve a high level of integration with its customer to provide services that were critical to the growth and success of its customers.

1.2.1 Premise and Facility

Jecmetal Industries facility is located in Muar, 500 m from the town of Muar. Address for Jecmetal Industries is Jecmetal Industries Sdn Bhd, K96 Kawasan Perindustrian Tanjung Agas, 84000 Muar, Johor, Malaysia.

The facility and infrastructure was geared towards providing versatile, flexible and reliable manufacturing services to customers with low to medium volume and high mix orders. In order to support OEM industries the company facility was aim towards providing versatile manufacturing needs. A wide range of tools and in other words process equipment is provided to cater for the different parts design. The company is willing to invest on latest technology equipment with high level of automation and employs latest manufacturing technology of CAD CAM and supported by advanced manufacturing system.

It was goal of the company to continuously investing in process field to cater for the increase in process demand of the industry. The in-house installation process was being able of a supporting part that requires machines of milling, turning, grinding,

wire-cut and EDM. Based on the strategic alliance with other companies that provide finishing and treatment requirement, Jecmetal is capable of providing the full range of parts fabrication requirement and assemblies.

1.2.2 Process and Products

This company manufacture product with different type of process by using different types of machines. The machine use to focus on reduction cycle time in this project is the CNC milling machine. They have many types of CNC milling machine in this company so it is quite easy to make an analysis. CNC Milling machines are available in various types of jobs of different sizes and batch quantities. CNC milling machine can do the cutting process to remove material from a block metal or plastic by a rotating tool. Essentially, milling process was totally different from turning process where usually the material removed by both the end and the side of the cutting tool. Besides, this equipment are capable of handling parts from 3 axis to 5 axis with high precision requirement, producing products ranging from very small to large size of 1 x 2 meter. There are many types of product produce by this company, such consist of Semi-conductor equipment, Industrial automation, Industrial controls and Optical and aerospace.

1.3 Problem Statement

The major issue of this company was that the employees have lack of experience in managing the quality of time. The flow of scheduling plan was too long instead of fulfilling the demand of customers that manufactures quickly responds to their wants and needs, deliver perfect quality products on time. Based on the review, if the cycle time could be minimized as it can to increase the production rate and reduce cost. The factor influences in this problem was to determine the suitable process flow in obtain in a product.

Cycle time reduction was important in Jecmetal industries. Some problem may occur when there was no reducing of cycle time such as:

- i. The product does not produce on time cannot meet the customer satisfaction or expectation.
- ii. Company profits reduce due to wastes and customer dissatisfaction.
- iii. The market share will reduce due to increase of cycle time production.
- iv. The company will not have the continuous improvement due to lack of any information about the production planning.

The other difficulties encountered when there were urgent parts the supervisor decided to slot-in it in the already running process. It would mean the running process will stop but in the same time the machine was use to complete the other product in a way to complete the urgent product needs by the customer. This situation will affect the production planning and increase the duration in completing the running product.

1.4 Objectives

The specific purposes of this final year project are:

- i. To identify and understand the process operation for clearly documenting a particular job of the process.
- ii. To suggest time study analysis in order to reduce cycle time of product.
- iii. To implement procedures of time study method into the system.