

SUPERVISOR'S APPROVAL

'I hereby acknowledged that I have read this works and in my opinion this works is sufficient in terms of scope and quality for the submission and award of a Bachelor Degree of Management Technology (Technology Innovation) with Honors'

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THE INFLUENCING FACTORS OF TECHNOLOGY ADOPTION
THAT COULD ENHANCE MANUFACTURING PROCESSES IN
PAPER MILL COMPANY: A CASE STUDY OF YEOUNG CHAUR
SHING PAPER MILL SDN. BHD.

TERENCE TAN KAH HAW

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DECLARATION

“I hereby declare that this thesis entitles “The Influencing Factors of Technology Adoption That Could Enhance Manufacturing Processes in Paper Mill Company: A Case Study of Yeoung Chaur Shing Paper Mill Sdn. Bhd.” is my own work except for the quotations summaries that have been acknowledged”

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DEDICATION

This thesis dedicates to my father, Elvis Tan Hua Seng who taught me to solve the pressure and problem when I'm encounter any trouble and issues in my life. It also dedicated to my mother, Monica Hiu Mui Na who taught to accomplished every task and consistent on completing my task in my life. Lastly, it also dedicated for their endless love, support and encouragement.

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Additionally, I would like to thanks my parents Mr. Elvis Tan Hua Seng and Mrs. Monica Hiu Mui Na for their support and patience all the time. They always providing great support in different way throughout my life.

ABSTRACT

The purpose of this research study is to identify the influencing factors of technology adoption that could enhance the manufacturing process in Paper Mill Company, which in Malacca, Malaysia which implement lean manufacturing and adopt new technology during implementation of lean activities. Survey questionnaire were used to collect data. The researcher used quantitative research method to carry out this research. Correlation and regression analysis have been used to understand the relationship between the independent variables which were financial support, government regulations and technical support and dependent variable which is implementation of new technology in enhancing the manufacturing process in paper mill company. The independent variable was predicted in the research that would have a strong relationship with the dependent variables and it could bring an impact toward the implementation process.

In addition, the respondents for this research were from the management level in the company. SPSS software has been used to analyze the data collected from the survey. The results of this study emphasizing importance of financial support, government regulations and technical support toward a successful implementation of new technology in a company. The framework develops through survey conduct in Paper Mill Company in Malacca, Malaysia. Throughout the research study, the researcher found out that all the independent variables and dependent variable that discussed in this research have a significant relationship towards implementation of new technology in enhancing the manufacturing process in paper mill company and each of these variables had been tested in the hypothesis testing section and the results were accepted. In conclude, these variables were important factors and need to be considered while implementing new technology in the company.

ABSTRAK

Tujuan kajian ini adalah untuk mengenalpasti factor yang mempengaruhi pengambilan teknologi yang boleh meningkatkan proses pembuatan di syarikat pembuat kertas tisu yang terletak di Melaka, Malaysia. Proses pengumpulan data akan dijalankan dari kilang yang melaksanakan “lean” dan mengambil teknologi yang baru semasa pelaksanaan “lean”. Soal selidik telah digunakan untuk mengumpul data. Penyelidik menggunakan kaedah penyelidikan kuantitatif untuk menjalankan kajian ini. Korelasi and analisis regresi telah dijalankan untuk memahami hubungan di antara pembolehubah bebas, iaitu sokongan kewangan, peraturan kerajaan dan sokongan teknikal dan pembolehubah bersandar, iaitu pelaksanaan teknologi baru dalam meningkatkan proses pembuatan dalam syarikat. Pembolehubah bebas telah diramalkan dalam penyelidikan yang akan mempunyai hubungan yang kukuh dengan pemboleh ubah bersandar dan ia boleh membawa kesan terhadap proses pelaksanaan.

Di samping itu, responden bagi kajian ini adalah dari peringkat pengurusan dalam syarikat itu untuk mengadar faktor yang mempengaruhi penerimaan teknologi dalam syarikat ini. Perisian SPSS telah digunakan untuk menganalisis data yang diperoleh daripada penyiasatan. Keputusan kajian ini menekankan kepentingan bantuan kewangan, peraturan kerajaan dan sokongan teknikal terhadap kejayaan pelaksanaan teknologi baru ke arah kejayaan pelaksanaan teknologi baru dalam syarikat. Rangka kerja ini membina melalui pengendalian kajian di syarikat pembuatan kertas tisu di Melaka, Malaysia. Sepanjang kajian penyelidikan, penyelidik mendapati bahawa semua pembolehubah bebas dan pembolehubah bersandar yang dibincangkan dalam kajian ini mempunyai hubungan yang signifikan ke arah pelaksanaan teknologi baru dalam meningkatkan proses pembuatan dalam syarikat dan setiap pembolehubah ini telah diuji dalam bahagian

pengujian hipotesis dan keputusan telah diterima. Kesimpulannya, semua pembolehubah ini adalah factor yang penting dan perlu dipertimbangkan semasa melaksanakan teknologi baru dalam syarikat ini.

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LIST OF SYMBOL

H_0	=	H Null (rejected)
H_1	=	H one (accepted)
t_{calc}	=	t calculated
t_{tab}	=	t tabulated
β	=	Standardized Coefficient (beta)
Y	=	The Implementation of New Technology in Enhancing the Manufacturing Process in Paper Mill Company
a	=	Constant
b_1	=	Beta coefficient for X_1
X_1	=	Financial Support
b_2	=	Beta coefficient for X_2
X_2	=	Government Regulations
b_3	=	Beta coefficient for X_3
X_3	=	Technical Support

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CHAPTER 1

INTRODUCTION

1.0 Research Background

In current market, automation in every manufacturing segment is very common in developed country such as German, United States or Japan. Automation brings speed and cut the cost of waiting time to the manufacturing process. This is start with technology adoption where a company have to invent into it to gain the technology. It comes with a minor problem when the automation system going to be implement in the developing countries. The main problem is whether these companies will accept the technology into their manufacturing processes regardless of the initial cost that might cause them unable to get their returns in short-term period.

According to (Hall and Khan, 2003), technology adoption is can be costly as the cost incurred during the adoption. This involve a decision where comparing the results of uncertain benefits of the new invention along with the uncertain costs of adopting it. Based on the information, there will be a decision-making session for the companies to decide whether they should stay in current situation as the company stay with the old technology which will be obsolete in the future or take the risk of the implement the new technology adopt from developed country which could enhance their productivity and sustain their business in long-term.

As a degree student in UTeM (Universiti Teknikal Malaysia Melaka) and the experience from the internship program that the researcher has been participated in paper making company, my research project is to find out the impact of technology adoption which technology adoption in enhancing the productivity of manufacturing process in Paper Mill Company. The researcher will conduct a case study at Yeong Chaur Shing Paper Mill Sdn. Bhd. where he had worked with the company during the internship program. The researcher able to get involved into Lean Manufacturing project with the consultant from Federation of Malaysian Manufacturers (FMM). This project allowed the researcher to acquire the information on how the system actually works and from there he will be able to come out with few theories that he studied to apply it into the technology adoption.

The researcher used theory of Lean Manufacturing for continuous improvement in process of implement the new technology from developed countries into manufacturing process. Hanover,B. (2006) state that lean manufacturing is largely about eliminating waste, and there were 7 primary wastes that Lean seeks to eliminate which is overproduction, waiting time, transporting, over-processing, motion, defects. The technology adoption is based on the 7 waste in lean manufacturing theory. Motion, transporting and waiting were the waiting time for processing which may delay other processes in manufacturing and movement of handling the material. As lean manufacturing focus on reducing cost and continuous improvement for enhancing the efficiency of the production, automatic handling system would widely impact productivity of the company.

The processing of adopting new technology involved in many factor that the company have to go through. Based on Hall and Khan. (2003), innovation diffusion results from a series of individual decisions to begin using the new technology, decisions which were the result of a comparison of benefits and costs of adopting the new invention. The statement shows that the comparison between the benefits of adopting new technology and the cost were essential before begin any sort of technology adoption especially for the long-term run for the company.

Technology adoption has two different perspectives which were demand-side and supply side for Yeong Chaur Shing Company, it will be more to the demand-side perspective of adopting the technology. On demand-side perspectives, there were two main conditions for the technology adoption, (Moreno.R and Suriñach.J, 2014) being aware of the new technology and being able to adapt the new technology while considering the profitability and cost of technology adoption. Discussion among the top management is crucial before the technology adoption process could be proceed through consideration of time and cost in decision-making. Therefore, my research study will be focusing on collecting information regarding the technology for automatic handling system and bringing it to the company and make comparison before and after of the implementation of the new technology.

1.1 Problem Statement

The problem that studied in this research project is concerning the lack of technology support in the manufacturing process which cause a waste of cost and time of Yeong Chaur Shing Company in the long run. The main problem is the company has operated with the same technology over 10 years which is inefficient for the manufacturing process.

The lack of technology support lead to overload of Work-In-Process (WIP) in warehouse and extra task needed to perform throughout the process to complete certain task. Time and cost were wasted on performing these non-value added action. Without the efficient system in monitoring manufacturing process, there will be no proper schedule for the certain processes such as material handling or transferring finished goods. Extra operator will be required to perform these task to ensuring the smoothness of the operation flow. Due to this problem, it will increase the rate of downtime in the converting department as sometimes lack of operators to complete the tasks which were important for certain processes.

Lastly, when the process being idle for longer period, it will lead to extra cost in completing the process within the timeframe due to slow productivity. This condition might increase the overtime cost. If these problem could be solved, the company could reduce the unnecessary cost.

Therefore, technology adoption that could improve and enhance company productivity was recommended in this research study. The implementation of new technology able to reduce time and cost needed for the manufacturing process. This could enhance the company's manufacturing process which lead to high efficient worker in the company and lower downtime for the process. Hence, the researcher would like to study and identify the influencing factors of new technology adoption that could enhance the manufacturing process in Yeong Chaur Shing Company.

1.2 Research Questions

1. What were the main influencing factors that could affect the new technology adoption in enhancing productivity of the manufacturing processes in the company?
2. How is the relationship between the influencing factors and the implementation of new technology in enhancing the manufacturing processes?
3. Which of these influencing factors become limitations to the company in adopting new technology?

1.3 Research Objectives

1. To determine the main influencing factors that could affect the new technology adoption in enhancing productivity of the manufacturing processes in the company.

2. To find out how is the relationship between the influencing factors and the implementation of new technology in enhancing the manufacturing processes.
3. To identify which of the influencing factors become the limitations to the company in adopting new technology.

1.4 Scope of the Study

This research will be focusing on a case study in Yeong Chaur Shing Paper Mill Sdn. Bhd. which in Melaka due to the process of data collection will be easier to get access to as the geographic factor and transportation problem. As a previous employee during the internship program, the relationship between staff and manager allows the researcher to be more convenient to collect certain data regarding the operation process and the management staff were more likely to assist with the researcher on answering the questionnaire. Therefore, the targeted respondents were focusing on management level in the company, due to the questionnaire were asked regarding the research title and it was suggested that management level in the company could provide accurate and useful data for the research study. For the application of the theory in this research, lean manufacturing, technology adoption theory and other related material were used throughout the research study.

1.5 Limitations of the Study

Time Constraint

The time was limited for us in our project, and it will become a challenge to the researcher in completing it within the given time frame.