

## **SUPERVISOR'S AND PANEL APPROVAL**

“I/We hereby acknowledge 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 Technopreneurship with Honours”

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IMPEDIMENT FACTORS OF ADOPTING ADVANCED TECHNOLOGY  
AMONG ELECTRONIC INDUSTRIES IN JOHOR

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This Report Submitted In Partial Fulfillment of The Requirements For The Award  
Bachelor Degree of Technopreneurship With Honours

Faculty of Technology Management and Technopreneurship  
Bachelor Degree of Technopreneurship  
Universiti Teknikal Malaysia Melaka

JUNE 2018

## DECLARATION

“I hereby declare that this thesis entitle “Impediment Factors of Adopting Advanced Technology among Electronic Industries in Johor” is my own work except for the quotations summaries that have been duty acknowledged”

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Date : .....

## **DEDICATION**

I dedicated this research to my beloved father, Mr Masazlan bin Maswan and mother, Mrs. Norbaya binti Rasidi which raise me up until now and always give me support for me to pursue my studies. Also a special thanks to my supervisor, Dr Norain binti Ismail who help me a lot to completing my research and have taught me to be more strong and firm in order to gain a knowledge. Study is not only about what are been write and read, but also need to explore and asking other people especially in completing a research. Other than that, thanks to my friends and panel for helping me throughout the project towards accomplishing my thesis.

## ACKNOWLEDGEMENT

Firstly, I am grateful to Allah for giving an opportunity and health despite my pack schedule as a final year student with an assignment and presentation which necessary for me to complete this research. I also would like to express my gratitude to my parents, Mr Masazlan bin Maswan and Mrs. Norbaya binti Rasidi for their support and motivation which can also strengthen me during I feel like to give up my studies due to uninterested course I had taken. Without them, I don't think I can completing my research. Apart from that, a special gratitude to Dr Norain for giving me a chance to be under her supervisee for the continuous support and teach me right away to write my thesis. Other than that, Dr Norain also straight point out my mistakes and correcting them that really help me a lot to give a better understanding regarding my research. Also thanks to Dr Nusaibah as my panels for giving such an insightful comments and I take it as an opportunity for me to be better in preparing research next time. If I had a chance to further my studies in the next level. To my fellow friends who also being there with me struggling completing the research, we all had such a beautiful moments together to be remembered for all this four years after graduation. Especially to Mohd Aidil bin Hasim, Afiq Thaqif bin Saad and Nur Adibah Bariah binti Mohd Halmi, which really help me a lot whether in moral support and encouragement. I am grateful to them for enlightening me the first glance of research. Last but not least, for all the faculty members and staff thanks for the support and services provided and I really hope it can be improved despite the technical problem we had faced.

## ABSTRACT

As a vehicle that allow most people to participate in a rapidly changing, technology adoption is important because it is where the technology has become the central to daily lives. Other than technology adoption also can customize people's daily task and job. Unable or resist the adoption of technology will increasing the limit or ability to participate in the financial and convenience benefits associated with technology in a full. By understanding what factors influencing to adopt the technology can helps to predict and manage under what, why and how conditions which leads to the resistance. Actually, there is no clear definition of technology adoption but this can be relate with a few theory such as technology transfer, technology acceptance model and technology diffusion. Usually, people will thinks that technology is something that related with computer and internet. Obviously, technology is an application of scientific knowledge for practical purposes, machinery and devices also the branch of knowledge that deal with engineering and applied sciences. Nowadays, there are so many technology has upgraded from the old one and already used in daily lives especially in a developed country such as Japan, South Korea, and United States. Purpose of this study is to identify the impediment factors which lead to resistance among electronic industries in Johor state. Technology is a wide field to be explained in details. This research focusing in electronic industries because this industries are widely used a technology to produce an electronic product which can be the other material for the other product. For instance, surface mounting technology machine that produce a printed circuit board. That PCB will be used as a material for the other product. That is the reason why technology in electronic industries should adopt an advanced technology to fulfil the request and market demand in industries. Impediment factors that occurs in adopting advanced technology basically in terms of budget. But this research will dig more depth the frequent barriers which happened in electronic industries. Research method used for this research is

qualitative because this topic need a descriptive and explanatory which interview is a method in gaining data collection. A guideline in adopting advanced technology will be an outcome for this research with a purpose can help electronic industries in gaining knowledge about technology and to increasing the profit of business.

**Keywords : technology adoption, impediment factors, electronic industries**

## ABSTRAK

Sebagai sebuah medium yang membolehkan kebanyakan orang berpartisipasi dalam perubahan pantas, penggunaan teknologi adalah penting kerana di mana teknologi telah menjadi pusat kehidupan seharian. Selain daripada itu, penggunaan teknologi juga boleh menyelesaikan tugas harian. Tidak mampu atau menolak penggunaan teknologi akan meningkatkan had atau keupayaan untuk mengambil bahagian dalam faedah kewangan dan kemudahan yang berkaitan dengan teknologi sepenuhnya. Dengan memahami faktor-faktor apa yang mempengaruhi untuk mengadopsi teknologi ini dapat membantu untuk meramalkan dan mengurus di bawah apa, kenapa dan bagaimana keadaan yang menyebabkan rintangan. Sebenarnya, tidak ada definisi yang jelas tentang penggunaan teknologi, tetapi ini boleh dikaitkan dengan beberapa teori seperti pemindahan teknologi, model penerimaan teknologi dan penurunan teknologi. Biasanya, manusia beranggapan bahawa teknologi adalah sesuatu yang berkaitan dengan komputer dan internet. Jelasnya, teknologi adalah aplikasi pengetahuan saintifik untuk tujuan praktikal, jentera dan peranti juga cabang pengetahuan yang berurusan dengan kejuruteraan dan sains gunaan. Pada masa kini, terdapat begitu banyak teknologi yang telah dinaik taraf dari yang lama dan telah digunakan dalam kehidupan seharian terutama di negara maju seperti Jepun, Korea Selatan, dan Amerika Syarikat. Tujuan kajian ini adalah untuk mengenal pasti halangan dan faktor yang menyebabkan rintangan di kalangan industri elektronik di negeri Johor. Teknologi adalah bidang yang luas untuk dijelaskan secara terperinci. Penyelidikan ini memberi tumpuan kepada industri elektronik kerana industri ini banyak menggunakan teknologi untuk menghasilkan produk elektronik yang boleh menjadi bahan lain untuk menghasilkan sesuatu produk. Contohnya, mesin pemasangan permukaan teknologi yang menghasilkan papan litar bercetak. PCB akan digunakan sebagai bahan untuk produk lain. Inilah sebab mengapa teknologi dalam industri elektronik harus menggunakan teknologi canggih untuk memenuhi



permintaan dan keperluan pasaran dalam industri. Halangan dan faktor yang berlaku dalam mengguna pakai teknologi canggih pada asasnya dari segi anggaran. Tetapi kajian ini akan menggali lebih mendalam halangan yang kerap berlaku dalam industri elektronik. Kaedah penyelidikan yang digunakan untuk penyelidikan ini adalah kualitatif kerana topik ini memerlukan deskriptif dan penjelasan wawancara yang merupakan kaedah dalam mendapatkan pengumpulan data. Garis panduan dalam mengadaptasikan teknologi canggih akan menjadi hasil untuk penyelidikan ini dengan tujuan dapat membantu industri elektronik dalam memperoleh pengetahuan mengenai teknologi dan meningkatkan keuntungan perniagaan.

**Kata kunci: teknologi adopsi, faktor halangan, industri elektronik**

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

This chapter will be provide the overview of the study the impediment factors of adopting advanced technology among electronic industries in Johor. Other than that, this chapter also discuss and explain about the problem statement, research question, research objective, scope, significant of research and the limitations of research also the method use for this research. The definition of research also will be explained in this chapter since the researcher need to read and go through many journal to be refer. Technology adoption is not a new thing in Malaysia, but since people already feel comfortable with current technology, it is quite hard to them getting used with the improvement and innovation of technology. Thus, there are many article can be found through internet about technology adoption and the citation in the year 1975 also can be found. This shown that technology adoption is no longer a new thing in technology area but in Malaysia, electronic industries still not used with it. As from the definition of technology adoption, sociological model which describes the acceptance also adoption of a new product or innovation. All this things has their own lifecycle and consist of a few characteristics such as demographics and psychological. Constant technological changes simultaneously also affected not only the industry but with human daily life too. There are many article, journal and website has been going through to find a precise and detail information about technology adoption among electronic industries in Malaysia. With that reference, this study can provide many information also help from the research methodology which consists of two methods,

qualitative and quantitative. However, to adopt a new things especially involving cost and risk, many industries do not want to face the consequences if there is no guarantee especially if it will affect their profit and economic conditions. So this research wants to overcome the impediment factors rise in electronic industries by preparing the strategies which can be used not for this industries but also for others that intend to do a technology adoption.

## **1.2 Research Background**

Nowadays, many new and advanced technology had been develop to help improving human job and task. Since many advanced technology can be used especially in electronic industries but still there are firm stuck with the old technology and not replace with the new one. Impediment factors can be defined as reason or things that prevent someone to implement that matters. The reason of this study to identify what are the impediment factors which lead them from adopting advanced technology in the electronic industries. According to Stephen L. Parente from Northeastern University, in the article title 'Barriers of Adoption Technology and Development' actually different country different size of barriers of technology adoption. Malaysia is still in develop stage and many new things need to be adopted especially in the industries that can be generate profit to country. From the article also states which to adopt more advanced technology, the amounts of investment need to be increase and this reason maybe one of the barriers for adopting advanced technology. Furthermore, this reason or factor which causes to the barriers still need to do a depth research for this project.

Technology field faces a differences from time to time because there is always a new things in many industries that still need to be improved. General meaning for technology is to easier human task and improve the quality of life in producing a manufacture product. Malaysia provided many industries which to help increasing economic condition and providing job for the citizen. But adopting the new technology has been narrow to specific technology for many industries or firms. Mostly an article stated that impediment factors to adopting technology whether in education,

pharmaceutical or electronic agreed that most significant factor is they lack of time to learn new technology. But in this study, further research will be made to ensure this factor is suitable to be cited as most impediment factors because there are any other factors which can causes this phenomenon.

When discussing about technology, it is a wide field and has varies of specifications and many developer also innovator come out with the new technology in the technology life cycle period. As we can see nowadays, many technology not only in electronic industries which will be focus in this research but also in other industries such as management, manufacturing, health, food and many more. It can't be denied that cost involved also one of the most impediment factor in this electronic industries to adopt advanced technology. Start-up costs and maintenance costs which require high amount makes them hesitate to implement it. This factor being the reason why this research is carry by the researcher since it will be a waste and useless if they just stick with the old technology. If costs being the most significant factor for electronic industries, productivity of their output also will be affected since advanced technology invented to increase the productivity and help this industries more efficient. Consequently, the exact amount of cost involved in this industries may be difficult to obtain for this research since this things quite privacy for their company or firm.

Electronic industries is one of the main contribution for Malaysia gross domestic product (GDP) and still have a high request from other country for import and export activity. Then why there are still many company does not want to do the improvement if adopting new technology can give them a high productivity and also increasing the request from customer? This questions will be answered in this study and it is the main things to do the research based on the problem and resistance from the industry itself. The competitive dimensions of manufacturing as a statements especially in terms of cost, quality, dependability, and flexibility that firm shall compete through its manufacturing capabilities in the global competition. (Voss, 2005; Miltenburg, 2008). Since Malaysia is a developing country, the global competition in any aspect should be aware by the industries other than that always look for a chances to increasing the productivity. One of the way by adopting an advanced technology. Adopting an advanced technology does not mean by fully adopt it, since it can be

adopted following the level which is necessary according to the technology that equipment has been used.

There is no specific data or statistics to be confirm about the percentage being used in Malaysia electronic industry, but most of the company involved in this category of this industry using a technology in the production. Until the technology has reached its maximum level due to daily operation and non-stop process, the machine cannot fully operate. Significantly, electronic industry contribute to Malaysia output about 26.94%, while exporting is 48.7% following the employment for citizens around 32.5%. This statistics already shown how important electronic industry to Malaysia exporting activity besides this industry provide job to the Malaysian. Research conducting regarding this topic also consider how far this matter can contribute and beneficial to the industry. Malaysia also compete with other country that produce electronic product likes South Korea, Taiwan, China and USA.

### **1.3 Research Statement**

Advanced technology in electronic industries one of way to help them overcome the problem rises and also can give more benefits such as increasing the output and time speed of the machine. Even nowadays, there are still a few company which involved in electronic industries still using an old technology that already 20 years and above. Most of the company still stuck with that technology and did not implement the advanced technology provided. This problem become an impediment factors why the industries still insist with the current machine and technology. Other than that, lack of knowledge and capital for investment involved also become a problem for the industries which may lead to serious issue.

An organization usually not perfectly fits with the technology and this is necessary to undergo an adaptive process (Leonard-Barton, 1988). In order to achieve the productive and efficient work surrounding also increasing the profit, an organization in electronic industries should make a change and acknowledge about advanced technology. The scope for this research is to identify and studying more

depth about the barriers in electronic industries to adopt an advanced technology. Whether the barriers can be overcome or not, it depends on that firms to make a decision after the research has completed. In terms of location may not be a problem to do this research since all the places converge at one area. But, the result in getting information and data maybe a problem or facing a difficulties since they have to achieve the output targeted every day and don't have enough time to entertain any research conducted if they find that it will not become a beneficial things to them.

Targeted people or respondent for this research highly recommended towards top level management since technology adoption is not a simple things and need an updated information and knowledge. Middle and low level management also can be the responded for this research since qualitative method has been used but just an additional info in how the technology especially the machine is used during the manufacturing process. The research purposely to find a significant impediment factors from adopting advanced technology in electronic industries. In the end of the research, a guideline or recommendation can be produce so that based on that the industries can gain a knowledge and the researcher also give them a contribution from this project. All of this statement for the research being a reason why this topic must be carry out so that people aware about the advanced technology which already appear and simultaneously keep changing from time to time.

#### **1.4 Research Objective**

- i. To identify what are the impediment factors of adopting advanced technology among electronic industries in Johor.
- ii. To study the most influence impediment factors of adopting advanced technology among electronic industries in Johor.
- iii. To recommend a strategies for electronic industries on adopting advanced technology as a reference before implement it.

## 1.5 Research Questions

Research questions for this research are:

- i. What are the impediment factors of adopting advanced technology among electronic industries in Johor?
- ii. What is the most influential impediment factors of adopting advanced technology among electronic industries in Johor?
- iii. What are the strategies can be recommend before adopting advanced technology that can help electronic industries?

## 1.6 Significant of Study

Significant of study for this research focus on only for electronic industries at Johor state since to get an accurate and precise data as the time given for completing this research about 6 months. Main topic for this research to identify the impediment factors of adopting advanced technology among electronic industries in Johor. This study also want to know the technology being used in electronic industries at Johor state and to gather the information why adopting advanced technology is need for this industries. The effectiveness and efficiency of advanced technology already been prove by the other country which give a positive feedback to this advanced technology until many article related to implement advanced technology by an experience researcher. Other than that, this research also wants to study about advanced technology also how the process will be conducting in electronic industries and learn about the process. It will be a very useful experience and knowledge if one day the researcher get a chance to be a part of innovation team in this industry, thus this research can be used and develop it. As from the collecting information and a few article already going through, there are many advanced technology in electronic industries such surface mounting technology (SMT), computer numerical control (CNC), computer aided manufacturing (CAM) and computer aided design (CAD). All of this technology being used by most of manufacturing industries in order to facilitate

the production process. Besides, with this technology the industries can easily detect any defect and correcting it before undergo the next stage in the process.

### **1.7 Limitation of research**

As for the limitations for the research, this research may have a difficulties in order to find an interviewee. Qualitative methods focusing on a group of interviewee which interview will be conducted. Since the main focus groups for this research is top level management, any formal letter and proposal need to give them first to make an appointment. Recommended interviewee just four company which should be involved and if more company can contribute in this research then, it is good to the data because it has a diversifying of knowledge and information. Some of them would give an excuses they not having time and busy with their job but in facts they rather to waste time doing other matters than spending some time to help the research. Other than that, this research is vivid to obtain the information from electronic industries top level management since they experience it and know every problem also their opinion can help to identify the significant impediment factors for this research. Malaysia employee in electronic industries still lack of knowledge in adopting advanced technology and the question might not be give a brief understanding for them. All of this problem stated become a limitations for the research.

### **1.8 Importance of the study**

The outcome of this research is too provide a guideline and structure in adopting advanced technology for electronic industries. Besides, want to spread the knowledge about technology and acknowledge the industry, fresh graduate project useful for them maybe not now but in the future can be as a reference for this industries. The outcome of this research not only useful for electronic industries but also for other manufacturing industries because technology will faced a changes throughout the year and has wide field. Furthermore, using this guideline and

structural of adopting advanced technology, electronic industry can improve the current technology more wisely and consider many things since they already have a guidance. Besides that, from this project also a relationship from the industry and university can be build. Through this relationship, university can contribute their findings and research in other hand the industry can offer many jobs to fresh graduate as long as they meet the requirement as an employee. This matter also should not be neglected since rate of unemployment of fresh graduate getting increase throughout the year.

### **1.9 Methodology Adopt**

Methodology of research consist of two method, quantitative and qualitative. Precisely, for this research conducting a qualitative method by interviewing a targeted groups or respondents in electronic industry. Basically, often associated with an interpretive philosophy, is a qualitative research (Denzin and Lincoln, 2011). In this research, interpretive philosophy are the impediment factors of adopting advanced technology. It is subjective matters since the researcher need to expressed about the phenomenon that being carry and study. According to Research Method books, by (Saunders, Lewis and Thornhill 2016), approach to theory development for qualitative research design commence with an inductive approach. This approach has apply because a naturalistic and emergent research design is used to come out with a theory or to grow and widen the richer theoretical perspective than already exist in the literature. Since this qualitative method looks relevant for this research, that is the reason why the researcher carry out this type of methodology.

### **1.10 Summary**

For summarizing this chapter all the subtopic mentioned hopefully can give a clue and some information to the readers about the research that being carry out. This research looks significant and relevant to the current phenomenon of manufacturing