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Bachelor of Technology Management (Innovation Technology)

Signature : .....

Supervisor's Name : Mislina Binti Atan @ Mohd Salleh

Date : .....

Signature : .....

Supervisor's Name : PM Dr. Norfaridatul Akmaliah Binti Othman

Date : .....

INNOVATION CAPABILITIES, PERCEPTION AND ON MECHANISM OPEN  
INNOVATION IN MANUFACTURING INDUSTRIES

NOR HASHIKIN BINTI ZINI

THIS REPORT IS SUBMITTED IN PARTIAL FULFILMENT OF THE  
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“I admit that this report is the result of my own except the summarized and quotes  
that I have explained the sources”

Signature : .....

Name : NOR HASHIKIN BINTI ZINI

Date :

## DEDICATION

Dedication to my parents, supervisor and friends

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## ABSTRACT

The purpose of this study is to develop a framework to explore the relationship of innovation capabilities and perception toward of open innovation. This study applies four concepts that are technological, managerial, operational, and transactional. In addition, this research employs an empirical study by means of the questionnaire survey method to verify the hypotheses and to investigate its manufacturing industries implications. The empirical results show that technological, managerial, and operational would positively significant with manufacturing industries. While, transactional would negatively significant with manufacturing industries. Besides, this study demonstrates that the relationship between innovation capabilities and perceptions of open innovation in manufacturing industries. Hence, this study investing resource mechanism opens innovation that significant to implement in innovation capabilities. This study summarizes the literature review has been obtained from legal source in will support the topic and give evidence according the research. In order to achieve the objective of the research, survey is conducted by sending out questionnaires to respondents.

## ABSTRAK

Tujuan kajian ini adalah untuk membangunkan satu rangka kerja untuk meneroka hubungan keupayaan inovasi dan persepsi ke arah inovasi terbuka. Kajian ini mengaplikasikan empat konsep iaitu teknologi, pengurusan, operasi, dan transaksi. Di samping itu, kajian ini menggunakan satu kajian empirikal dengan menggunakan kaedah soal selidik untuk mengesahkan hipotesis dan untuk menyiasat kesan terhadap industri pembuatan. Hasil kajian menunjukkan bahawa teknologi, pengurusan dan operasi adalah positif signifikan dengan industri pembuatan. Walaupun, transaksi adalah negative signifikan dengan industri pembuatan. Selain itu, kajian ini menunjukkan bahawa hubungan antara keupayaan inovasi dan persepsi inovasi terbuka dalam industri pembuatan. Oleh itu, sumber kajian mekanisme inovasi terbuka sesuai untuk dilaksanakan dalam keupayaan inovasi. Kajian ini meringkaskan kajian literatur yang telah diperolehi daripada dalam sumber undang-undang akan menyokong topik dan memberikan keterangan menurut penyelidikan itu. Dalam usaha untuk mencapai objektif kajian ini, kajian dijalankan dengan menghantar soal selidik kepada responden.

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## LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
ASEAN	Association of Source-East Asia Nation
P&G	Procter and Gamble
R&D	Research and Development
CVC	Corporate Venture Capital
SPSS	Statistical Package Social Science



## CHAPTER 1

### INTRODUCTION

#### 1.1 INTRODUCTION

Malaysia is classified as a middle-income country which later many toward high income country by 2020. In recent years, Malaysia has been transformed from an agro-based economy to a manufacturing economy, and now in the midst of knowledge-based economy. Manufacturing industries is expected contribute a vital role to the GDP growth. Gross Domestic Product (GDP) is an indicator in determine the economics of countries. Malaysia is ready to moves towards industrialized nation as state in vision 2020. It is importance for manufacturing industries to change their strategy and skill to follow the vision 2020. However, Malaysia is the fastest growing economy amongst Association of South-East Asian Nation (ASEAN) countries. Malaysia has been able to keep concomitant and compete with other in ASEAN country. Malaysia has also participated in partnerships for the implementation of economic strategies such as regional growth triangle (UNDP, 2005).

Manufacturing industries is one of sectors which provide an anchor support to national economy. It is can contribute in GDP growth facts. However, the added value given by this sector is still low, particularly in processed product sector. Most the processed of product are still imported by other country. This includes raw materials and even part of product. Malaysia has been transform to knowledge-based economy will give advantage to promoting investment and developing products in the new segment for manufacturing industries (Muhammad, Mohd, 2006).

Manufacturing sector in Malaysia need build innovation capabilities and to adopt open innovation strategies to be a leading growth sector. Besides, manufacturing industries will be able to provide job opportunities for people in Malaysia and can raise the value added in each of productivity incurred.

Manufacturing industries needed to develop constantly new services, product, technology, and business model. This manufacturing industries need to be innovative perhaps by an adopting open innovation. Before this, company more focus internal sources using traditional „closed“ model of innovation unlike Research & Development (R&D), produced patent and technology. Open innovation is a method of approach used for many countries to launched process of innovation from internal and external. Open innovation can help industries to using ideas from the outside to be used in the process of R&D outside of their operating habits.

Additionally, manufacturing industries have to identify their innovation capabilities before moving towards open innovation. It is important to know the capabilities that can be done by them to adopt open innovation strategy. Innovation capabilities will improve and manage existing technologies in the manufacturing industries as well as the ability and knowledge required for the creation of new ones. In a modern environment, the industries will be controlled by the high-tech applications with rapid changes. This is important for industries to develop innovation their ability, to be able to provide the companies to achieve sustainable competitive advantages, (Romijin, Albaladejo, 2002).

Furthermore, manufacturing industries can adopt the way of open innovation to implement new strategies in their company. Procter & Gamble Co. (P&G) is one of the companies that succeed in bringing the concept of open innovation in their strategies. P & G has managed to create more than 2,000 agreements with their partners around the world (Ozkan, 2015). Procter & Gamble Co use the method in open innovation to help them to drive employee productivity.

## 1.2 BACKGROUND OF THE STUDY

Open innovation is a concept put forward by Henry Chesbrough (Chesbrough, Henry, 2003). Open innovation come through strategies of innovation. There are other names for open innovation such as crowdsourcing or co-creation. In a world that has a lot of information, the company will not just rely on their own research activities and will looking for out other sources of information (Chesbrough, Henry, 2003). Many companies looking for input from resource person outside their organizations to solve their problems and risks. Open innovation can help companies to monitor productivity of employee, customer loyalty and appropriate ways to work better through observation of other inputs.

The concept of open innovation is covering all the difference ways including equipment, technology, and platforms that allow companies to use resources from outside their organization to make internal process or product improvement. Therefore, it includes different mechanism such as collaborative R&D, technology transfer, licensing, open source software and the source of large-scale (crowdsources). The opportunities offered by open innovation enables companies to get new technology, problem solving and the mechanism must be compatible with the concept of the company. Additionally, open innovation involves knowledge, experience and expertise of outside companies that can be used to add values to the company.

Open innovation has two dimension, technology exploration or outside-in and technology exploitation or inside-out open innovation (Chesbrough et al., 2006; van de Vrande et al., 2009). Outside-in open innovation means that companies need to monitor the external environment for them to bring the outside into the company's technology resources and knowledge into the R&D department. Inside-out means that company does not have to depends entirely on internal factors only to develop the technology on the market, but should find more appropriate external organizations to commercialize the existing technology. Company need to combine the technology exploitation and technology exploration to get maximum value from their technological capabilities or other capabilities competencies (Chesbrough and Crowther, 2006; Lichtenthaler, 2008). (van de Vrande et al., 2009).

The manufacturing industries in Malaysia need adopt an open innovation in their companies to the increasing globalization and increasing competition to create a sustainable competitive advantage without allowing companies are not innovative. Open innovation can ensure that all internal and external resources obtained will assist the company in improving innovative capacity (Linton & Walsh, 2004). That's why companies in the manufacturing industries needed to develop new product constantly, services, business models, technology and know-how.

Open innovation process has three major phases (Van der Meer, Han, 2007). This includes concept phase, development phase and implementation. Open innovation concept rising with technology transfers and was debated that open innovation mostly has been used at company with technology element (Lichtenthaler, Ulrich & Holger Ernst, 2009). Concept phase in open innovation definable as a strategy recognition to create organizational climate that is suitable to make open innovation, inspiration from member of the organization and research activity.

Manufacturing industries has a few specific abilities to create and carry every innovation task carried out in company. Therefore, important innovation capabilities in launching open innovation. Innovation capabilities is firm degree which could bring to innovation in company (Calantone et al., 2002) and represent concept of various dimensions, (Wonglimpiyarat, 2010; Forsman, 2011).

Additionally, innovations capabilities involve are skill and knowledge to improving existing technology, and creates new technology, (Lall, 1998). Innovation capabilities need to be developed through always find, scan, pioneering and implement new opportunity in and outside company (Hii and Neely, 2000), and environmental demand (Mintzberg et al., 2003). This will help manufacturing industries to adopt mechanism of open innovation. Market changes and causes technology increase in supplier between their competitors which manufacture high technology product. To exist and perform, every firm must have some specific capabilities to attract their customer.

The aim of this research is to examine the relationship between innovation capabilities and perception of open innovation in manufacturing industries. Besides, the purpose of this research is to determine the acceptance of open innovation for

manufacturing industries. The scope of research will covers manufacturing industries in Malacca.

### 1.3 PROBLEM OF STATEMENT

Manufacturing industry is one of the major contributors to Malaysia economic growth after services industry. Governments want to make manufacturing industry as engine of country's economic growth to fulfill vision 2020. Manufacturing industry had showed that they important in national economic growth. Additionally, to achieve vision 2020, country needs to change towards that more developed by use new strategies in manufacturing industry use.

Manufacturing industries have innovation capabilities to change their strategies. Innovation capabilities are ability and usually are made in company or industry level, (Amit and Schoemaker, 1993, p. 35; Birchall and Tovstiga, 2005). Based on past research, they only conduct research use the size average company in manufacturing industries. Analysis of the innovation ability as a whole cannot be infected because the number of respondents is limited, while the manufacturing industry produces a wide range of products and they have resources, capabilities and performance varies.

Usually, every industrial develop their company by using resources from internal to create a new technology to be is applied to their own product, (Ahlstrom, 2010; Wyld & Maurin, 2009). Most of industries use closed innovation strategy as their key strategy. This case because there are a few factor which related like lack of financial resources and afraid to risk. Besides, if industry use strategy in internal level to build innovation process had cause they limit interaction with external environment. Industry needs to use new strategies to deal with their competitors in the globalization. Therefore, industry have to come into and adopt open innovation strategy to reduce rely their R&D source to make their industries are well-informed and innovative hightly, (Rohrberk, Holzle, & Gemunden, 2009).

Manufacturing industries is the one industries need to adopt open innovation strategies and implement the strategies. This because, manufacturing industries needs to help government to increase the Gross Domestic Product (GDP) and compete with other industries in globalization. The issue arise is what are factors for innovation capabilities of manufacturing industries, does the readiness mechanism to adopt open innovation in manufacturing industries, and what are relationship innovation capabilities and perception of open innovation in manufacturing industries

#### **1.4 RESEARCH QUESTION**

Malaysia nowadays is holding a key role in achieving knowledge-based economy to stimulate innovation in the creative industries. Open innovation is a one of strategies need to implement at all industries in Malaysia. Manufacturing industries is an industry that needs have new way and adopt new source internal and external to help government in generate high income. Based on reason above the research question for study area:

1. What are the factors for innovation capabilities of manufacturing industries?
2. What are relationship innovation capabilities and perception of open innovation in manufacturing industries?
3. Which are the significance mechanism open innovations in implementing innovation capabilities?

#### **1.5 RESEARCH OBJECTIVE**

The objective of this research is to enhance the innovation capabilities and open innovation in manufacturing industries. There are three research objectives based on this research:

1. To determine innovation capabilities that significant to manufacturing industries.

2. To examine the relationship of innovation capabilities and perception of open innovation in manufacturing industries.
3. To determine the significance mechanism open innovation in implementing innovation capabilities.

## **1.6 SCOPE AND LIMITATION OF THE STUDY**

The researcher will focus on determine the acceptance of open innovation for manufacturing industries. The research will be conduct in Malacca and the Batu Berendam Free Trade Zone company manufacturing industries in Malacca.

This paper is divided into five chapters where the Chapter One will focus on the introduction of the research, followed by Chapter Two which will discuss the literature review in the various opinions of the previous researcher which is related to this study. Then, the Chapter Three will focus on the methodology whereas the empirical result and analysis of the result will be discussed in the Chapter Four. Finally in Chapter Five, the study will focus on the conclusion and recommendation for overall of this study.

## **1.7 KEY ASSUMPTIONS**

The researcher assume respondent will be open minded to answer every part of the questionnaires and understand the question that researcher ask. Besides, the researcher assumes the cooperation from respondent during the distribution of questionnaire. In addition, the researcher also assumes this research is practical and useful for all manufacturing industries in future of Malaysia.

## **1.8 SIGNIFICANT OF THE STUDY**

Importance of this study is to become as the reference to manufacturing industries players especially in Malaysia uses an open innovation as a strategy of their companies or industries to improve performance and profit. Besides, this study will provides benefit to reader in increase the knowledge, and as a guideline to their study. The findings of this study will to determine the acceptance of open innovation for manufacturing industries.

Besides, manager can monitor the process of open innovation if company need to adopt this strategies. Manager can use this research as a guideline to them gets additional information about open innovation.

In addition, the study will offers recommendation for future researcher to continue the research related to this field in advance. Then the manufacturing industries should benefit from this study as well and understand open innovation as a best strategy to developing a companies or industries at Malaysia.

## **1.9 SUMMARY**

Manufacturing industries has made significant progress and is now the main contributing industries to the Malaysia economy in term of contribution to GDP, exports and employment, its further development depend on how the industries addresses the challenge ahead, (Mohd, Muhammad, 2006). So, Malaysia need make improvement in all industries to become higher level industries. Open innovation will generate sustainability and create manufacturing industries competitive advantage. Through the open innovation, manufacturing industries can emerge follow the step and application than have in open innovation.

The companies should make a high level effort in implement of open innovation successfully. The implementation of open innovation and the development of man methods have been put into practice, (P.Talaga, 2009). After all method that analyzed, there are three main approaches, (Albors, J., Ramos, J.C, Hervas, J.L., 2008). The method can be listed as working with experts inside and outside the company, customer involved in the innovation process for companies organized by a system of rewards innovation, and collect ideas and projects. Open innovation will generate sustainability and create a more competitive manufacturing industries.

Besides, open innovation can be defined with the use of inflows and outflows of knowledge among many partners to accelerate innovation, (Arogo, 2012:60). In short, open innovation emphasizes the importance of using knowledge from the outside environment and the inside of the turn changes the process of innovation,