

SUPERVISOR'S APPROVAL

I/We* hereby declare that have read this works and in my/our * opinion this works is sufficient in term of scope and quality for the submission of Bachelor of Technopreneurship with Honours

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NEW PRODUCT DEVELOPMENT PROCESS IN BIEICHI TECHNOLOGY
- A TECHNOLOGY WHICH CONVERTS PLASTICS INTO FUELS

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This report submitted in fulfilment of the requirement for the degree of Bachelor
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DECLARATION

“I declare that this project is the results of my own research accept as cited in the reference. The research project has not been for any degree and is not concurrently submitted in candidature of my other degree.”

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DEDICATION

I dedicate my dissertation work to my family and friends. A special thanks to my loving mother, Madam Ismawarni Binti Azhar, my brother Mr. Heri and also my sister whose words of encouragement and push for tenacity ring in my ears / who have been my constant source of inspiration, they have given unconditional support with my studies.

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ABSTRACT

This paper discusses about the new product development process in Bieichi technology. In order to introduce Bieichi technology in Malaysia, the researcher focus on two important issues namely as; (1) The activities that involve new product development process in Bieichi technology, and (2) Support support been given by Ministry of Science, Technology and Innovation (MOSTI), National Solid Waste Management Department (JPSPN) and Syngas Sendirian Berhad (Sdn Bhd) after being develop. In this study, the researcher will conduct the case study in qualitative research method, which included the questionnaire technique to identify activities involve in Bieichi technology in MOSTI, JPSPN and Syngas Sdn Bhd. On the other hand, this dissertation also will propose the innovation suggestion to enhance Bieichi technology. As a conclusion, the Bieichi technology might be implement in Malaysia as a way to reduce negative effect from plastic waste.

Keyword: New product development process, Bieichi technology, MOSTI, JPSPN, Syngas Sdn Bhd, plastic waste.

ABSTRAK

Kajian ini membincangkan proses pembangunan produk baharu bagi teknologi Bieichi. Dalam usaha untuk memperkenalkan teknologi Bieichi ini di Malaysia, penyelidik telah memberikan tumpuan kepada dua (2) isu penting iaitu; (1) Aktiviti-aktiviti yang terlibat dalam penciptaan Bieichi; dan (2) Sokongan yang diberikan oleh Kementerian Sains dan Inovasi (MOSTI), Jabatan Pengurusan Sisa Pepejal Negara (JPSPN) dan Syngas Sendirian Berhad (Sdn Bhd) selepas teknologi ini dibangunkan. Dalam kajian ini, pengkaji akan menjalankan kajian kes menggunakan kaedah penyelidikan kualitatif termasuk teknik soal selidik bagi mengenal pasti aktiviti-aktiviti yang terlibat dalam pembangunan teknologi Bieichi di MOSTI, JPSPN dan Syngas Sdn Bhd. Selain itu, kajian ini juga akan mencadangkan beberapa cadangan inovasi kepada Bieichi. Kesimpulannya, teknologi Bieichi ini mungkin akan dilaksanakan di Malaysia sebagai satu cara untuk mengurangkan kesan negatif daripada sisa plastik.

Kata Kunci: *Proses pembangunan produk baharu, Bieichi teknologi, MOSTI, JPSPN, Syngas Sdn Bhd, Sisa Plastik.*

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LIST OF ABBREVIATION

MOSTI	=	Ministry of Science, Technology and Innovation
JPSPN	=	National Solid Waste Management Department
Syngas Sdn Bhd	=	Syngas Sendirian Berhad
CEO	=	Chief Executive Officer
Corp	=	Corporation
PIC	=	Product Innovation Chart
MOSTE	=	Ministry of Science, Technology and Environment
ICT	=	National Information Communication Technology
JKT	=	Department of Local Government
PPSPPA	=	Solid Waste and Public Cleansing Management Corporation

PET	=	Polyethylene Terephthalate
HDPE	=	High Density Polyethylene
LDPE	=	Low Density Polyethylene
PP	=	Polypropylene
PS	=	Polystyrene
PVC	=	Polyvinyl Chloride
Kg	=	Kilogram
TPM	=	Technology Park Malaysia
SIRIM	=	Standards and Industrial Research Institute of Malaysia
MTDC	=	Malaysian Technology Development Corporation
NICE	=	National Innovation Conference and Exhibition
KLCC	=	Kuala Lumpur Convention Centre

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

New product development process is a template or maps which can be used to describe and guide those activities required to bring a new product from an idea or opportunity, to a successful market launch (Baker and Hart, 2007). Using new product development process, it can make the consumer to buy the product and at the same time it can make the organization tend to create new product in the market. The consumer will buying this product because of the product can solve their product. In addition, the organization will create a new product to the market due to this activities is a key source of growth for the organization. Thus, by developing new product, the customer can solve their problem and at the same time the organization can increase their profits.

Hence, for this research, the researcher will conduct a research by using new product development process as the variable for this research. The researcher will study on what activities that involves in new product development process for new technology. In addition, the researcher will relate this process with one (1) green technology that has in the market. The technology is Bieichi. Bieichi is a technology that comes from Japan. This technology can convert plastic into fuel without producing dangerous chemical to environment. Therefore, by relating the new product development process with Bieichi technology, the researcher will study on what activities that involve in developing this technology.

The researcher chooses this technology is because, the researcher want to reduce problem that has from plastic waste. The researcher figured out that, due to uncontrolled used for plastic, the environment getting negative impact from it. Dangerous chemical was produce by burning the plastic, the whole area in landfills became a toxic area due to chemical that been produce after it been planted, and also marine creature die due to plastic entanglements make the researcher believes only recycling plastic back can solve these problem. Moreover, by converting this plastic into something valuable especially fuel, it can help on speed up the process for solving this problem.

Ultimately, in the end of the research, the researcher will analyze all activities that involves in new product development in Bieichi technology. Next, the researcher will study the support been given by Ministry of Science, Technology and Innovation (MOSTI), National Solid Waste Management Department (JPSPN) and Syngas Sdn Bhd after being develop. Lastly, the researcher will suggest some innovation suggestion for enhance the ability of Bieichi technology. Thus, the development and support for Bieichi technology will study by the researcher for this research.

1.2 Problem Statement

In year 1977, polymer been introduce into the market as an alternative way to replace paper (SPI, 2014). Cheaper cost, less energy and can be produce in large quantities without using large sources, makes this polymer become one of the important material in the market. Moreover, due to this polymer can create basic product like bottle, plastic bag, bottle cap and others, it makes this material always been used in production of certain product.

After using it in several decades, the scientist found that plastic takes around 20 to 1,000 years to decompose by earth (Ocean Crusaders, 2014). In addition, scientist figured out that if plastic been burn, it will produce benzene dioxin, a chemical that dangerous if been inhale by human. Besides, if these plastic wastes are

throwing to the sea, it can kill a number of marine lives. According to Ocean Crusaders (2014), 100,000 marine creatures die a year due to the plastic entanglements.

To reduce the negative effect of plastic waste, Akinori Ito, (Chief Executive Officer) CEO of Blest Corporation (Corp), create a technology that can converting plastic into fuel (Blest Co. Ltd, 2014). The technology is known as Bieichi technology. Bieichi technology is a technology that use simple concept in generating fuel from the plastic. Using temperatures controlling electric heater to melt the plastic, it can turn the plastic back into oil without producing dangerous chemical to the environment. Then, this fuel can be process for producing fuel and it can be used as a source of fuel for car, motorbike, generator, boiler, stove and other (Maliki et al, 2012).

The researcher believes that Bieichi technology is one of the brilliant technology that been created by Akinori Ito and his team. Using this technology, it can help to reduce negative effect that cause from use of plastic. Due to this, the researcher want to introduce this technology in Malaysia. To achieve this goal, the researcher will study on how to develop this technology. Moreover, the researcher will identify what support been given by MOSTI, JPSPN and Syngas Sdn Bhd after this technology being develop. Therefore, the problem from plastic waste can be reduce by using Bieichi technology.

1.3 Research Question

There are few research questions for this research. To complete this research, the researcher will identify what are the activities involves in new product development process in Bieichi technology. Then, the researcher will conduct a case study on how does MOSTI, JPSPN and Syngas Sdn Bhd support for promoting this technology after being develop. Lastly, the researcher will study on what are the innovative suggestions to enhance the Bieichi technology.

Hence, the research question for this research are:

- 1.3.1 What are activities involves in new product development process in Bieichi technology?
- 1.3.2 What support been given by Ministry of Science, Technology and Innovation (MOSTI), National Solid Waste Management Department (JPSPN) and Syngas Sdn Bhd for promoting Bieichi technology after being develop?
- 1.3.3 What are the innovative suggestions to enhance the Bieichi technology?

1.4 Research Objectives

The objective for this research are to identify all activities for new product development process in Bieichi technology. This activities consist of an idea into the dispose the product. Then, the researcher will investigate support will been given by MOSTI, JPSPN and Syngas Sdn Bhd for promoting this technology after being develop. Lastly, the research will propose innovative suggestions to enhance the Bieichi technology.

Hence, the research objective for this research are:

- 1.4.1 To identify activities that involve in new product development process in Bieichi technology.
- 1.4.2 To investigate support been given by Ministry of Science, Technology and Innovation (MOSTI), National Solid Waste Management Department (JPSPN) and Syngas Sdn Bhd for promoting Bieichi technology after being develop.
- 1.4.3 To propose innovative suggestion to enhance the Bieichi technology.

1.5 Scope of the Study

The scope of this research are to examine activities that involve in new product development process in Bieichi technology. From how the product team generate the idea into the Bieichi technology been dispose will be study by the researcher. Besides, the researcher will study promotion mix as a tool for promoting Bieichi technology.

This study will be conducted at the headquarters of MOSTI, headquarters of JPSPN and headquarters of Syngas Sdn Bhd, in order to gain adequate and comprehensive information.

1.6 Limitation and Key Assumptions of the Study

The researcher found that there has three (3) limitations in this research. Firstly, the researcher cover from idea generation until disposal of this technology in term of theory only. The tangible of Bieichi are not been cover by the researcher.

Secondly, the research assumed that all respondent provided the honest and correct answer when the respondents are being interview by the researcher.

Last but not least, the researcher only covers about the process of new product development for Bieichi technology. The effect from using Bieichi technology to the environments are not been cover by the researcher.

1.7 Importance of the Study

This study will give two (2) benefits after the researcher completed this research. Firstly, this research can be used as a reference to the other scholar. Other scholar can use new product development process by the researcher as a tool for developing new product to the market.

Secondly, by making this research, the concept of Bieichi technology which is converting plastic back into fuel can be apply by the MOSTI, JPSPN and Syngas Sdn Bhd. The agencies can analyze this technology as a potential way to reduce the effect of plastic waste to the environment. Thus, problem that happen from plastic can be reduce by recycle it back into fuel.

1.8 Summary

New product development process is one (1) of the method that help in creation of new product into the market. This model can turn the idea into the potential valuable product in the market. Thus, this model can help the development of Bieichi technology. In addition, the case study is focused on the process that involved in new product development for Bieichi technology, and also supports will be given by MOSTI for promoting this technology after being develop. Therefore, this research can help in reducing problem from plastic waste.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses about the theory of new product development process by other scholars. This chapter will stated or related the theories that has in new product development process and also strategies to promoting new product to the market. Lastly, the researcher will come out with theoretical framework for this research in the Theoretical Framework section.

2.2 Review of New Product Development

According to Baker and Hart (2007), new product development process are a template or maps which can be used to describe and guide those activities required to bring a new product from an idea or opportunity, through to a successful market lunch. Bhuiyan (2011) mentioned that, the new product development process differs from industry to industry and from organization to organization. The organization will choose suitable new product development model in developing new products.

Peter and Jr. (2013) stated that, the reason why the organization used new product development is to create a new product into the market. This product is important in order to solve consumer problem or to give a variety product to the market. Crawford and Benedetto and Benedetto (2011) mentioned that, the new product consist with six (6) categories. The categories are:

- i. ***New-to-the world products.*** Product that are inventions and create a whole new market
- ii. ***New-to-the organization products.*** Products that take the organization into a category new to it but not to the world
- iii. ***Additions to existing product lines.*** These are products that extend existing product lines to current market.
- iv. ***Improvements and revisions of existing products.*** These are current products that are made better.
- v. ***Repositioning's.*** Product that are retargeted for a new use or application.
- vi. ***Cost reductions.*** These are new products that simply replace existing products in a line, providing the customer similar performance but at a lower cost

2.2.1 New Product Development Process

There has few model that been created by others scholar for process in new product development (Morse and Babcock, 2010; Crawford and Benedetto, 2011; Palmer, 2008; Kotler, 2008). In this section, the researcher will review new product development process by Crawford and Benedetto. In this model, Crawford and Benedetto (2011) stated that, new product development process consist with seven (7) stages. Each stages has its own function in developing an idea into the commercialization. The stages are:

- i. New product strategy
- ii. Idea generation
- iii. Screening
- iv. Concept development and testing
- v. Business analysis
- vi. Product testing
- vii. Commercialization