

APPROVAL

I hereby acknowledge that I have read this thesis and in my opinion this work sufficient in terms of scope and quality for the award of Bachelor Degree of Technopreneurship with Honors.

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Date : 12th June 2014

THE NEW PRODUCT DEVELOPMENT OF CIVIC HYBRID FOR LOW CARBON
AUTOMOBILE:

A Case Study at Honda Malaysia Sdn. Bhd

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DECLARATION

"I hereby declared that the work of this research is mine except for the quotations summaries that have been duly acknowledged"

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Date : 12th June 2014

DEDICATION

Special dedication of this grateful moment to my..

Beloved Parents

Loving Family Members

That always loves me,

My friends, my colleagues

And all faculty members

For all your care, support and believe in me.

Thank you.

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ABSTRACT

Nowadays, the success of automobiles industry becoming more widespread and earn a spot in the worldwide market penetration. One of the automobiles industries that are striving to promote new product development of high technology is Civic Hybrid from Honda. Generally, Honda is one of the world major manufacturers in the automobiles industry that produces hybrid cars that are a merger between conventional car and electric car. Even though Honda has its Civic Hybrid; there is still competition that would threaten Honda business sustainability. Furthermore, a new wave of diesel and petrol powered cars begins to penetrate automobile market such. In this case study, Honda Malaysia Sdn. Bhd. (HMSB) in Alor Gajah, Malacca has been selected as the organization to examine the factors which determine the sustainability of new product development business of Hybrid cars when it needs to compete with all-diesel and petrol powered cars emerged. The research used mix method for both data collection and data analysis. Besides, this research aimed to investigate how the company strategizes the Hybrid cars in order to sustain its market share. Hybrid will become one of the advanced technologies in automobile industry compared to conventional cars. This is proved by introducing the possibility to recharge the batteries by using an external source like normal electric grid. As conclusion, the study shows that new product development of Hybrid technology can replace the use of fossil fuel. Thus, it contributes for low carbon emission.

ABSTRAK

Pada masa kini, kejayaan industri automobil menjadi lebih meluas dan mendapat tempat dalam penembusan pasaran kereta di seluruh dunia. Salah satu industri kereta yang sedang berusaha untuk menggalakkan pembangunan produk baru berteknologi tinggi adalah Civic Hibrid dari Honda. Secara amnya, Honda adalah salah satu pengeluar utama dunia dalam industri automobil yang menghasilkan kereta hibrid yang merupakan penggabungan antara kereta konvensional dan kereta elektrik. Meskipun Honda mempunyai produk Civic Hibrid yang tersendiri, masih lagi terdapat persaingan yang mengancam kestabilan perniagaan Honda. Tambahan pula, gelombang berkuasa baru diesel dan petrol mula menembusi pasaran automobil. Dalam kajian kes ini, Honda Malaysia Sdn. Bhd. (HMSB) di Alor Gajah, Melaka telah dipilih sebagai organisasi yang utama untuk mengkaji faktor-faktor yang menentukan kemampuan perniagaan pembangunan produk baru iaitu kereta hibrid apabila ia perlu bersaing dengan kereta berkuasa diesel dan petrol yang muncul dalam industri automobil. Kajian yang dilaksanakan berbentuk campuran iaitu kualitatif dan kuantitatif bagi pengumpulan data dan analisis data. Selain itu, kajian ini juga bertujuan untuk mengkaji bagaimana syarikat menyusun perancangan untuk mengekalkan kereta hibrid dalam pasaran automobil. Kereta hibrid akan menjadi kereta yang berteknologi tinggi berbanding kereta konvensional. Ini dibuktikan dengan memperkenalkan kemungkinan untuk mengecap semula bateri dengan menggunakan sumber luar seperti grid elektrik biasa. Kesimpulannya, kajian ini menunjukkan pembangunan kereta hibrid dapat menggantikan penggunaan bahan api fosil. Oleh itu, secara tidak langsung ia dapat menyumbang kepada pengurangan pelepasan karbon.

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ABBREVIATIONS

HMSB	=	Honda Malaysia Sdn. Bhd.
PSM	=	Projek Sarjana Muda
CSR	=	Corporate Social Responsibility
R & D	=	Research and Development
NMC	=	New Model Centre
H ₂ O	=	Water Vapor
IMA	=	Integrated Motor Assist
UNECE	=	United Nations Economic Commission for Europe

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A hybrid vehicle is a vehicle that uses two or more distinct power sources to move the vehicle. Hybrid model is generally had additional variants to the already existing line up of gasoline cars. Generally, hybrid cars get power with a combined working of the internal combustion engine, an electric motor, and hi-powered batteries in order to save fuel and reduce greenhouse emissions. Companies that offer hybrid cars are very few. Commonly, the cost of producing a hybrid vehicle is more expensive than the cost of producing a non-hybrid. Honda is one of the major manufacturers of hybrid variants. When Honda decided to merge its hybrid technology into an existing passenger car, the obvious choice was the Civic.

According to Christensen et al (2013), there is a relation that industries create hybrids for predictable reasons, including because the business case for the purely disruptive technology is not compelling at first to industry leaders, whereas implementing a hybrid as a sustaining innovation allows incumbents to satisfy their best customers. There are millions of cars on the road in the world today, and their inefficiencies are harming the environment and costing the planet of its natural resources. The internal combustion has been used as a means of propulsion for decades. However, it is inefficient, and its byproducts are causing harm to the environment. The issues like a global warming, unburned hydrocarbons being released into the atmosphere, air quality, and the diminishing reserves of oil are all raising concerns and instigating a need for more efficient means of transportation.

Automotive engineers have been designing vehicles for maximum fuel efficiency. However, the internal combustion engine has its limited efficiency. Design engineers have introduced several alternatives, including the hybrid electric vehicle, and the use of biodiesel fuel in internal combustion engine. The hybrid electric vehicle is intended to serve as an alternative to the internal combustion engine powered vehicle, which the hybrid electric vehicle is more efficient and therefore less harmful to the environment.

1.2 Research Questions

From a social perspective, the increased fuel efficiency from hybrid technology has several substantial benefits. Environmentally, hybrids emit less tail-pipe emissions which help decrease air pollution and mitigate global warming concerns.

According to Macy (2009), all the vehicle manufacturers are working on better hybrids or better technology to replace hybrids. This is a common situation in business. Certainly, any new gains in technology will make the old technology worthless. However, currently there is no time frame or when the alternatives technologies will arrive on the market. Until then, the hybrid is the best option. Technology is always changing and there is profit to be made in selling hybrids until the alternatives arrive.

However, there is still competitive that would threaten Honda business sustainability. Furthermore, a new wave of conventional petrol and diesel powered cars begins to conquer automobile market.

By referring to this research, the research questions of the study are stated as below:

- i. What are the factors to sustain the Hybrid cars when it needs to compete with conventional petrol and diesel powered cars?
- ii. How does Honda strategize the Hybrid cars in order to sustain in the automobile market?
- iii. What are the innovative solutions in order to remain the Hybrid cars for business sustainability?

1.3 Research Objectives

The objective of this research is to investigate the factors for sustainability of Hybrid cars when it needs to compete with electric cars due to a new wave of

conventional petrol and diesel powered cars begins to trickle and conquer into the world automobile market. Besides, the research also investigated of how Honda strategizes for Hybrid cars in order to achieve in the market sustainability.

The objectives of the study are stated as below:

- i. To examine the factors for sustainability of Hybrid cars when it needs to compete with conventional petrol and diesel powered cars.
- ii. To investigate how Honda strategize the Hybrid cars in order to sustain in the automobile market.
- iii. To propose the innovative solutions in order to remain the Hybrid cars for business sustainability.

1.4 Scope

The scope of this research is to investigate the factors for sustainability of Hybrid cars when it needs to compete with electric cars due to a new wave of conventional petrol and diesel powered cars begins to trickle and conquer into the selected of automobile market. Besides, the scope of this research also will investigate how the company of Honda strategizes the plans for hybrid cars in order to sustain in the automobile market. The main location is conducted at headquarter of Honda Malaysia Sdn. Bhd (HMSB) at Alor Gajah, Malacca to gain adequate and comprehensive information.

Respondents are mainly divided into two groups. First category consists of the management associates who are included executives and clerks. Fifteen respondents are selected for this category. Second category consists of technical associates who are included engineers and technicians. Fifteen respondents from second category are targeted. This is because the management set up the company policy, manage the company, while the technical side do the new product development. Both categories are playing an important role to answer the questions of interview and fill the questionnaire when it will distribute in order to support the research and gain adequate and comprehensive information from them.

1.5 Limitation

Two limitations are identified in this study. Firstly, the case study is to investigate the factors for sustainability of Hybrid cars when it needs to compete with electric cars due to a new wave of conventional petrol and diesel powered cars begins to trickle and conquer into the selected of automobile market. Therefore the result and outcome of the study is only applicable for Honda Malaysia Sdn. Bhd. However, due to the compliance with external validity, the findings of the research could be generalized to the automobile industry, which will produce hybrid cars.

1.6 Summary

As all know, hybrid models are generally additional variants to the already existing line up of gasoline cars which blend the power of a gas engine with an electric motor and batteries. But the two power trains can be combined in a variety of ways whereas some more efficient than others. Not many companies that are offer hybrid cars and Honda is one of the major manufacturers of hybrid variants. Furthermore, the cost of producing a hybrid vehicle is more expensive than the cost of producing non-hybrid vehicle.

Regarding to the topic of New Product Development of Civic Hybrid for Low Carbon Automobile: A Case Study in Honda Malaysia Sdn. Bhd; that focused on investigate the factors for sustainability of Hybrid cars when it needs to compete with a conventional petrol and diesel powered cars begins to trickle and conquer into the world automobile market. Besides, focused also to know how the company strategizes the plans for Hybrid cars in order to sustain in the market sustainability and what the innovation solutions in order to protect the Hybrid cars in for business sustainability.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses about the overview of new product development of hybrid cars for low carbon automobile. This chapter also will be stated, which consisting the theories related of the new product development, hybrid, and sustainability, factors to sustain the hybrid cars, and how the company strategizes the hybrid cars in automobile market. For this chapter also, the researcher discussed more about the factors to sustain the hybrid cars and the company strategizes. Lastly, the researcher will come out with theoretical framework that has been draft based on the section listed.

2.2 New Product Development

Zhang et al (2008) mentions the new product development planning and strategy identifies the portfolio of products to be developed. To assist technology managers in identifying core technologies, product development objective, and right technical strategy, the core technological decision frame, objective decision-making method, and technical strategy analyzing method incorporating different tools. According to Daisho (2010), based on the current situation, it is predictable that future developments will advance toward new hybrid vehicles and fuel cell vehicles by overcoming the disadvantages with earlier electric vehicles. At the same time, advanced component technologies created through development of electric vehicles, such as improvement in the motor, battery, and control systems will be utilized. Hence, by the development of advanced vehicles, the hybrid passenger cars have the potential significantly to improve fuel economy.

2.3 Sustainability

According to Gulliksson et al (2011), the obvious reason if anyone care about sustainability is that caring is a better alternative than not caring. Sustainability was described in “Our common future” from 1987. This UN report, which is also called Brundtland report (United Nations, 1987), says that:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within two key concepts:

the concept of „needs“, in particular the essential needs of the world’s poor, to which overriding priority should be given; and

the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.”

More focused at technological change Frenken, Hekkert, and Godfroij (2004) analyze the R&D portfolios of carmakers and conclude that the current developments may lead to a premature lock-in of a suboptimal alternative propulsion technology in the future. Also, Van der Hoed et al (2004, 2007) and Hekkert & Van der Hoed (2004) emphasize the development of fuel cell and hybrid vehicle technologies to achieve sustainability.

In short, there are three main reasons for technological change in the automobile industries which are increasing regulation, consumer demand, and new technological possibilities. The success of the current technological change requires not only the knowledge and efforts of carmakers but also „other assets or capabilities, which are often obtained from complementary assets that are specialized“ (Arora & Gambardella, 1990).