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DECLARATION

I hereby declare that the project is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at USM or any other institutions.

(Signature)

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DATE : 17/02/2010

RESEARCH AND DEVELOPMENT (R&D) IN THE AUTOMOTIVE INDUSTRY IN MALAYSIA: A CASE OF R&D ACTIVITIES AND ISSUES AT THE PROTON COMPANY

By

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Research report in partial fulfillment of the requirements for the degree of Master of Business Administration

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DEDICATION

To the All Mighty for His love and strength

This thesis is dedicated to my parents, beloved wife, son and my father in law, the late Buzri Yahya Merican for their endless love, support and encouragement

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ABSTRAK

Dalam pasaran dinamik, firma perlu melakukan evolusi perniagaan daripada kaedah tradisional kepada kaedah kontemporari bagi tujuan memperbaiki kualiti pengeluaran. Lazimnya, usaha ini melibatkan program penyelidikan dan pembangunan untuk memperkenalkan teknologi baru bagi produk pengeluaran yang baru. Berdasarkan kepada perspektif perindustrian automotif, program penyelidikan dan pengeluaran merupakan salah satu aktiviti kritikal yang mempunyai banyak tahap pemprosesan bermula daripada cetusan pemikiran (brainstorming) kepada ujian kenderaan. Penyelidikan kes ini memperkenalkan proses dalam program penyelidikan dan pembangunan serta isu-isu semasa yang dihadapi oleh industri automotif khususnya syarikat Proton. Oleh itu, analisis yang komprehensif telah dijalankan untuk memperlihatkan kekuatan, peluang kelemahan dan ancaman bagi syarikat Proton secara menyeluruh dan bagaimana syarikat proton sepatutnya menguruskan segala isu berkaitan pengurusan dan operasi syarikat.

RESEARCH AND DEVELOPMENT (R&D) IN THE AUTOMOTIVE INDUSTRY IN MALAYSIA: A CASE OF R&D ACTIVITIES AND ISSUES AT THE PROTON COMPANY

ABSTRACT

In a dynamic market, firms need to evolve from traditional methods of doing business to contemporary methods that aims at improving the quality of the output. This effort will usually include research and development programmes to introduce new technologies for the new output model. From an automotive industry's perspective, research and development programme is one of the key critical activities that consist of many levels of processes, beginning with brainstorming until vehicle testing. This case study presents the process in research and development (R&D) programme and the current issues encountered by the automotive industry that focuses on Proton. Thus, comprehensive analysis has been conducted to reveal all the strengths, opportunities, weaknesses and threats and how the Proton Company should manage the management and operational issues.

CHAPTER 1

INTRODUCTION

1.1 Preliminary Note

This study is about the research and development (R&D) processes and current issues encountered by the national car maker, Perusahaan Otomobil Nasional, (hereinafter referred to as "Proton Company"), one of the industry that struggling in Malaysia. The global issue pertaining to the automotive industry was briefly elaborated by the researcher and the national issue was also brought up as a rational of the case study.

The current approach by the Government in this automotive industry is summarized in this case study. The researcher described briefly the provision funds allocated and the ninth plan period introduced by the Government to the automotive industry. Besides, the researcher studied the research and development (R&D) facilities available at Proton Company beginning from clay modeling until vehicle testing. Apart of these facilities, the researcher is also interested to analyze the processes which involve concept development, design development, engineering development and testing development.

Having all the facilities and capabilities in place, the Proton Company had embarked in the automotive industry since the 1980's in Malaysia. In order to facilitate all the processes in manufacturing of vehicles, the Proton Company was forced to operate a department called the Research and Development (R&D) Division. This division is the backbone to the future of the Proton Company. The activities involving research and development (R&D) have been conducted by Proton to enhance the usage of high

technology in the development process of new vehicles. New technologies are adopted to introduce new models of cars from time to time. However, along the line of the research and development (R&D) process, the Proton Company has encountered many issues especially in implementing the research and development (R&D) facilities and processes. The researcher has described and discussed some of the critical issues in Research and Development (R&D) at the Proton Company exclusively in this study. Finally, the researcher has utilized business tools to evaluate all the critical issues in the automotive industry and specifically the Proton Company. Some of the constructive recommendations have been summarized in the final chapter of this study.

1.2 Background of the Case Study

For many years, the automotive industry has been described as an industry that has destroyed, rather than created, value. Issues encountered are such as inefficiency in marketing, costly inventories, overcapacity, low customer satisfaction and loyalty. The automotive industries have launched numerous initiatives in attempt to boost profitability and their shareholders value. From product innovation and new services, to lean manufacturing and customer relationship management, these efforts have touched on many of the problems, but yet to provide an overall solution on how to enhance value.

Many researchers have described and presented their research in automotive matters on different issues such as Matthew Fletcher and Steven K.C. Poh (1997), Chips Yap (2002), Deepak Balu (2004), and Nayan Kanwal (2008). In this study, the researcher intends to

investigate and reiterate the issues that have been previously highlighted by other researchers.

1.3 Problem Statement

The successful performance or growth of the automotive industry is largely determined by the distinctive competencies and competitive advantage that has been earned or developed by the Proton Company against its rivals.

According to Barney (1991), for a resource to be a potential source of competitive advantage, it must allow the firm to adapt and implement strategies that will improve its efficiency and effectiveness. Therefore, the Proton Company needs to explore how their resources can be transformed into competencies and competitive advantages that will put them in an advantageous position against their competitors.

In pursuing the process of exploration and transformation of resources into competencies and competitive advantages, the Proton Company faces diverse challenges and problems. The major stimulus of this study is to investigate the research and development process, facilities and current issues occurring in the research and development programmes. On the other hand, the researcher is keen to investigate the government's involvement in research and development (R&D) activities whose involvement is vital for Proton's growth.

1.4 Research Design

Case study research is becoming increasingly accepted as a scientific tool in management research. (Evert, 2000). In this research, a case study was chosen because it is an appropriate methodology for a research project aimed at understanding the complex organizational problems that cannot be handled using quantitative methods. In particular, the case study method was deemed suitable because this research focuses on the process functions and qualitative issues in the automotive industry. The selection of the case study for this research was based on the robust changes in technology as well as the continuous improvement in new designs especially in research and development processes. It is acknowledged here that a single case study has limitation in terms of generalization of the research findings, particularly from a statistical point of view. On the other hand, this study was conducted at the preliminary stage in exploring the topic which then could be expanded to other issues pertaining to the automotive industry.

1.5 Significance of the Studies

According to the Ninth Malaysia Plan, there are vast investment opportunities arising from high value-added and technology-intensive activities in the automotive industry that remains untapped.

A study was conducted by Rasiah (1997) related to the research and development in the automotive industry. The researcher's dissertation, however, is trying to dissect the process within the research and development of the automotive industry as the case of the

Proton Company. He was trying to highlight the research and development process and its significance to the company itself.

This study will be analyzing the research and development process from a qualitative view point. Hence, the research questions would most likely be asked using the following questions:

- What are the research and development facilities available at Proton Company?
- What are the Research and Development (R&D) issues and problems encountered by Proton Company?
- What are the recommendations for the issues discussed?

CHAPTER 2

INDUSTRY PROFILE AND ANALYSIS

2.1 Industry Profile

2.1.1 The Underlying Issues of an Automotive Industry: A Brief Recap from the Historical Milestones

In the 1940s, during World War II (WWII), automotive factories were used to assemble military vehicles and weapons. After WWII, the economies of most European and some Asian-pacific countries, such as Japan, were destroyed and this required the development of new production and business strategies such as those of Toyota (a car company), which began to develop what is now known as Just in Time (JIT) manufacturing. Most of the first models produced were similar to the pre-war designs. Therefore, it took some time for the plants to revamp their operations to produce new designs and models. (Donald, 2005).

According to Donald from the same source, in the 1950s and 1960s, more technological innovations through research and development, such as fiberglass bodies were introduced by the vehicle developers to meet the demand of the growing consumers' interest for vehicle comfort, look, and feel. Car designs were highly influenced by emerging safety and environmental regulations.

According to Renee (2005), the Japanese created a new Blue Ocean by challenging the United States (U.S) automobile industry with the introduction of small and efficient vehicles in the 1970s. Vehicles with various models were introduced by the Japanese such as Honda, Toyota and Nissan.

During the oil crisis period in the United States (U.S), most of the consumers changed their minds and began to look for economical vehicles which matched the Japanese vehicles. Almost overnight, the Japanese became heroes in the consumers' minds.

The above facts has been supported by the author, (Donald, 2005), who mentioned that foreign cars like the Japanese Honda Civic started appearing in the United States (U.S.) market. He also added that, the Honda Civic was marketed and well-received by consumers as a fuel efficient and low-emission vehicle in the United States (U.S.) during the 1970s when the high oil prices had taken place.

In the 1980s, the U.S. automotive industry began losing their market shares to the higher quality, affordable, and fuel efficient cars from Japanese automakers. In response to this market share loss, U.S. automakers began focusing on improving quality through the Research and Development process by adopting different Japanese manufacturing management philosophies, such as JIT (Just In time). Although their adoption of JIT and other philosophies helped improve the quality of U.S. vehicles, it did not fully bridge the gap between the quality of U.S. and Japanese cars. This gap remained because U.S. automakers tried applying JIT techniques without full understanding of the whole Japanese manufacturing system, while Japanese

automakers had decades to develop, refine and master their JIT approach. (Donald, 2005)

Another significant paradigm in the 1980s was the global nature of vehicle manufacturing. Automakers started assembling vehicles around the world. This trend accelerated in the 1990s with the construction of overseas facilities and mergers between multinational automakers. Due to this global expansion, automakers had a greater capacity to penetrate new markets quickly and at lower costs. The increased product offerings in many markets led to consumers having a wide range of vehicles as choice. Consumers desired vehicles that were less harmful to the environment, which led to the introduction of hybrid vehicles by Japanese automakers in the late 1990s. (ibid)

In the current decade, the recent trend of increased sophistication among consumers has led automakers to identify new and more specialized markets with diverse customer bases. Therefore, automakers have to penetrate new emerging markets abroad. According to (Donald, 2005), establishment of global alliances and commercial strategic partnerships with foreign automakers are the other trends to penetrate new emerging markets such as in Southeast Asia and Latin America.

2.1.2 The Underlying Issues of an Automotive Industry: Prior to Establishment of the Proton Company in Malaysia

The automotive industry in Malaysia started in the 1960s. Prior to that decade, majority of the cars used on Malaysian roads were imported in the CBU (Completely Build unit) form.

In 1963 through the recommendation of the Colombo Plan experts, the Government of Malaysia began to encourage the establishment of the automotive industry. The policy of encouraging assembly for automobiles and the manufacture of component parts were announced in May 1964. Assembly plants were set up later in the 1960's in order to provide employment and to substitute import of automobiles. (Arshad, 2004).

To further develop the local automotive industry and to encourage vehicles to be assembled locally, the Government has adopted a few policies. The policies include requirement that certain parts and components of a vehicle to be manufactured locally, imposing import taxes and enforcing a tariff system on CBU imports. (ibid)

Apart from the protective tariffs that were announced in February 1966, all distributors and dealers were required to obtain import licenses that had to be renewed every six months. In 1967, the Government approved the operation of six assembly plants and by December the same year, Swedish Motor Assemblies Sdn. Bhd. began its production. (ibid).

Initially, the assembly plants were mainly joint venture projects between European automobile manufacturers and local partners who were previously their local distributors. Apart from the Swedish Motor Assemblies which assembled Volvo, there were also Asia Automobile Industries Sdn. Bhd. which assembled Peugeot and Mazda vehicles and Tan Chong Motors which assembled Nissan cars (then known as Datsun).

Even though there was a local content requirement to promote the growth of components manufacturing, the effort was not very successful. Until the early 1980s, there were about 15 assemblers that produced vehicles for European and Japanese manufacturers. There were too many makes and models, causing the demand for a particulars component to be low, leading to the difficulty for the manufacturers to achieve the economies of scale.

In addition to the demand and supply issue, imports were still very high as the inputs for the assembly plants came mainly from imported CKD (Completely Knocked Down) form. The level of technology transfer was still low and this issue led to the development of human resources in the industry.

Thus, the government had taken precautionary plans in the second phase of the development in the automotive industry with the launching of the National Car Project, Perusahaan Automobil Nasional (PROTON), in 1984. The project was conceived in order to guide the automotive industry in increasing the level of technology and the development of intellectual property of the industry.

The PROTON project, which was a joint-venture programme with Mitsubishi Motors Corporation of Japan, began its production with the PROTON Saga model in 1985. As it had integrated manufacturing facilities, promoted industrial linkage and having a national brand, it was given preferential tax and duty rates.

2.2 Company Profile

2.2.1 Automotive Industry in Malaysia and Proton's Milestones

The history of Malaysian automotive industry goes back to the early 1960's, where the Malaysian government developed a policy to promote an integrated automobile industry to strengthen Malaysia's industrial base. The main objectives of the government in promoting an automobile assembly industry were to reduce imports, save foreign exchange, create employment, develop strong links with the rest of the economy, and transfer industrial technology. The government's efforts were fully reimbursed whereas the industry managed to move into the manufacture of motor vehicles and component parts in the 1980's and 1990's.

The PROTON project, which was a joint-venture programme with Mitsubishi Motors Corporation of Japan, began its production with the PROTON Saga model in 1985. Proton took a major step in upgrading its engineering capabilities with the acquisition of Lotus Group International Limited, a British automotive engineering company and manufacturer of luxury sports car in October 1996. This step allowed Proton to gain great engineering expertise, which will enable them to improvise and come up with new models that are globally competitive and innovative.

Based on the technology and parts from Mitsubishi, production of the first model, the Proton Saga began in September 1985 at its first manufacturing plant in Shah Alam, Selangor. Initially the components of the car were entirely manufactured by Mitsubishi but gradually local parts were being used as technologies were transferred and skills were gained. Victoriously, the 100,000th Proton Saga was produced in January 1989. (http://wikicars.org)

In 1993, a model called Proton Wira was introduced based on the Mitsubishi Lancer/Colt. More than 220,000 units were sold between 1996 and 1998. Proton Perdana based on the Mitsubishi Eterna, was first produced in 1994, intended for the higher end market. (ibid)

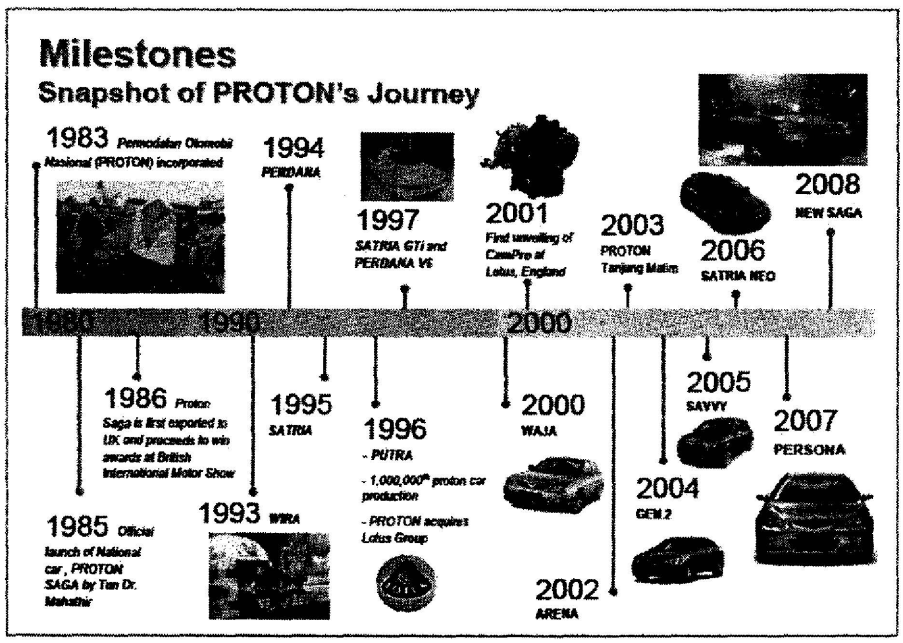
By 2002, Proton held a market share of over 60 per cent in Malaysia, which was reduced to barely 30 percent by 2005 and was expected to further reduce in 2008 when AFTA (Asian Free Trade Area) mandates reduce import tariffs to a maximum of five percent. Proton Waja (Proton Impian in UK) was the first car model designed internally by Proton. It was launched on February 8, 2004.

With the acquisition of Lotus technologies in 1996 from Bugatti, Proton has gained an additional source of engineering and automotive expertise. This agenda led to the production of Proton Gen-2 which was code named Wira Replacement Model (WRM) before its launch. The Gen-2 is the first of cars to be manufactured and assembled at the new manufacturing plant in Tanjung Malim, Perak, which is part of Proton City's development project. The plant was opened in 2004. On June 8, 2005

Proton introduced the second model to be manufactured in Tanjung Malim, the 1,200cc, 5-door supermini, 'Proton Savvy'. Both the Gen-2 and Savvy, were models that MG Rover was looking to rebadge when the British firm entered into collaboration talks with Proton. However these joint-venture talks were unsuccessful and MG Rover subsequently collapsed.

In December 2004, Proton purchased a majority of shares in MV Agusta of Italy. MV Agusta is the manufacturer of MV Agusta, Husqvarna, and Cagiva motorcycles. A year later, Proton sold off its 57.7 percent shares in MV Agusta to another Italian company for a token of one Euro. Due to heavy debts by MV Agusta, the selling enabled Proton to write off the losses off its book. (http://wikicars.org)

In October 2004, Proton announced that an understanding has been reached with Volkswagen AG of Germany to establish a strategic partnership. Under the tie-up, the two car makers are expected to exploit each other's strengths. Proton would gain access to Volkswagen's superior technical capabilities and technology. In return, Volkswagen may utilise Proton's spare capacity at the latter's Tanjung Malim plant to assemble cars for export to the South-East Asian market, where the German auto giant has a weak presence. Furthermore, the tie-up may see Volkswagen assisting in distribution of Proton vehicles in China while Proton does the same for Volkswagen in South-East Asia. Nonetheless, none of the parties announced detailed and concrete plans for the partnership. On January 13, 2006, Volkswagen announced that negotiation of the partnership has failed because Volkswagen's plans were different and clashed with the terms and condition that proton offered.



(source: http://www.islamgrid.gov.my)

Diagram 1: Proton's Milestones

2.2.2 Human Development in the Proton Company

The national car project in Malaysia has contributed to human resource development. According to the terms of their joint venture agreement, Mitsubishi Motor Corporation (MMC) was responsible for plant construction, training and supervision of preparations for production and technical assistance in localisation. The national car project has required that all Proton staffs (engineers, researchers, designers, managers, and mechanics) be trained according to Japanese standards and procedures.

Based on the article published, TED case study (2001), Malaysian employees of Proton from production workers to managers have been sent to MMC in Japan since

1983 for training. Up to 1991, around 500 of them had been sent to Japan for training, while another 178 went in 1992. Proton employees have received training in various aspects of car manufacturing such as production control, welding, painting, trim and final, maintenance, tooling, stamping engineering and quality control.

The Proton workforce has been trained in Japan as well as in Malaysia, and is still supervised by the Japanese. Many specialists from MMC have also been dispatched to the Proton plant to train Proton employees in Malaysia. According to the same article of the TED case study, 200 Japanese specialists from MMC were in Malaysia to provide training under the Technical Assistance Agreement with Proton from the period of 1991 and 1992 alone.

The tabulated schedule below is a summary of the manpower available at Proton industry in Malaysia as at October 2008.

PROTON Organization
Group Manpower Status

Company	Manpower Status
Perusahaan Otomobil Nasional Sdn Bhd	[illegible]
Proton Edar Sdn Bhd	[illegible]
PROTON Tanjung Malim Sdn Bhd	[illegible]
Miyazu (Malaysia) Sdn Bhd	[illegible]
Lotus Group International Ltd	[illegible]
Overseas Subsidiaries*	[illegible]
TOTAL	[illegible]

** Overseas Subsidiaries include Proton Edar Indonesia, Proton Cars Australia, Proton Cars UK, and Proton Singapore*
** Latest as October 2008.*

Source: (source: http://www.islamgrid.gov.my)
Diagram 2 : Manpower available at Proton industry in Malaysia as at October 2008.

2.2.3 Value Proposition

PROTON was incorporated on 7 May 1983 with three primary national policy objectives:

- To spearhead the automotive industrialization process and manufacturing industries;
- To acquire/upgrade technology and industrial skills within the automotive manufacturing industry; and
- To strengthen the international competitiveness of Malaysia's industrial capability (Audited Report 2008)

2.2.4 Mission

Committed to be the best automotive parts distributor and providing the highest quality services available while creating value for customers.

2.2.5 Vision

To transform PPCSB (Proton Parts Centre Sdn Bhd) into a prominent and a world class logistic company

2.2.6 Government's Involvement in the Proton Company

2.2.6.1 Provision in the Government's Budget

According to an article published by Motor Trader on 10 March 2009, the Government is allocating RM60 billion as a second stimulus package to help the private sector survive the economic downturn which is expected to be severe. RM200 million of the RM60 billion will be used as an 'Automotive Development Fund' to assist the domestic automotive industry to sustain and move forward in current and future economic climates. . Hopefully this effort will spark further initiative from the industry to boost their sales and will directly contribute to more revenue and market share locally.

Additionally, the Government is also initiating a car-scrapping scheme which should help to boost the sales of Proton and Perodua models. The scheme provides a RM5,000 discount to the owner of a vehicle of any brand that is more than 10 years old if the owner trades it in for a new Perodua or any other Proton model. It is understood that this discount will not be entirely borne by the government and will be partly funded by the two car makers as well. According to an industry source, there are at least 4.8 million cars that are more than 10 years old, a large number of them Peroduas and Protons.

2.2.6.2 The Ninth's Plan Period (2005 -2010)

The automotive industry in this country has contributed significantly to Malaysia 's industrial development. Under the Second Industrial Master Plan (IMP2) period,

investments have increased substantially and this has contributed to the development of technology and enhancement of engineering capabilities.

However, competition will inevitably become greater in future, especially since several global auto manufacturers are already making their presence felt, with the introduction of budget cars to meet the specific needs of liberalized markets.

The National Automotive Policy (NAP)'s announcement early this year has put in place several objectives and measures to assist companies to plan and strategise their activities in order to optimize their production operations and expand their share in the regional and global markets.

To meet the objectives of NAP , measures provided by the Government under the Ninth Malaysia Plan include :

- the development of existing and new automotive clusters;
- building up technical , engineering and R&D capabilities; and
- the establishment of a special RM500 million Automotive Development Fund.

According to Chips Yap (2006) in her article "Malaysia's new approach to developing the auto industry", NAP offers various incentives to foreign companies to build their vehicles in Malaysia (for domestic sales as well as exports) and to collaborate with local companies, particularly vendors. While working together, the government wants foreign partners to assist Malaysian vendors to develop relationships with their own overseas supplier base and gain greater international linkages. Those that can facilitate this process effectively will receive incentives under the Industrial Adjustment Fund.

2.3 Literature Review

Research and development is very essential to be focused and analyzed as it determines the impact of the industry's performance. In general, research and development means discovering new knowledge about products, processes, and services, and then applying that knowledge to create new and improved products, processes, and services that fulfill the market needs.

According to the business dictionary, research means systematic investigative process employed to increase or revise current knowledge by discovering new facts. It is divided into two general categories: (1) Basic research, inquiry aimed at increasing scientific knowledge, and (2) Applied research, effort aimed at using basic research for solving problems or developing new processes, products, or techniques.

Many definitions are used to describe development but the only definition that is related to the automotive industry from the business dictionary is, extension of the theoretical or practical aspects of a concept, design, discovery, or invention.

One of the most comprehensive concepts of research and development is to be found in the definition formulated by Bragg (2002) which can be divided into two parts. Research is a planned search for the discovery of new knowledge. Obviously, the intention of research is that it will result in improvement in an existing product or process. Development is the enhancement of existing products or processes or the creation of entirely new ones.

This particular research is very much interested in studying the current practice adopted for the research and development in the automotive industry. It looks at both external and internal factors in a single study which seems to be very interesting. Due to this, the study will be narrowed down by focusing on the research and development facilities and processes which lead to a firm's performance.

Additional reference from The Promotion of Investments Act 1986 defines research and development (R&D) as "any systematic or intensive study carried out in the field of science or technology with the objective of using the results of the study for the production or improvement of materials, devices, products, produce or processes but does not include:

- quality control of products or routine testing of materials, devices, products or produce;
- research in the social sciences or humanities;
- routine data collection;
- efficiency surveys or management studies; and
- market research or sales promotion.

In addition to the research and development as a major topic of discussion in this study, the researcher also introduces some business tools to analyze the discussion topic such as SWOT, TOWS and PESTLE analysis. Each of the analysis has been discussed separately by the researcher for better understanding and easy comparison purposes.

SWOT analysis was developed by Ken Andrews in the early 1970's. The successful strategies address four elements which comprise of the company's strengths, weaknesses, opportunities and threats in its competitive environment. This set of four elements used by a firm to gain competitive advantage, is often referred to as a SWOT analysis. (http://www.bookrags.com)

Thompson (2008) defines SWOT analysis as a simple but powerful tool for sizing up a company's resource capabilities and deficiencies. This tool was extensively applied by the researcher in the case analysis in this study.

In addition, the TOWS analysis was incorporated by the researcher in this study which gives greater impact of the better understanding of the SWOT analysis. According to Barnat (2005), the TOWS Matrix was proposed by Weihrich as a conceptual framework for a systematic analysis that matches the external threats and opportunities with the internal weaknesses and strengths of the organization. The TOWS Matrix indicates four conceptually distinct alternative strategies, tactics and actions. The TOWS are acronym in which 'T' stands for threats, 'O' for opportunities, 'W' for weaknesses and 'S' for strengths. According to the researcher, the TOWS analyses are used to analyze the external environment of the Proton Company. This analyses will be comprehensively will be elaborated by the researcher in this study later.

The researcher also includes the PESTLE analysis to comment the overall research in this study. PESTLE stands for Political, Economic, Social, Technical, Legislative and

Environment. It is a strategic planning technique that provides a useful framework for analyzing the environmental pressures on a team or an organization.

According to Morrison (2008), PESTLE analysis can be used as a framework for looking outside the organization to hypothesize what may or may not happen. It is a useful framework used to ensure that some of the basic factors are not overlooked or ignored.

According to the researcher, PESTLE analysis provides a view of what is occurring in the external world that helps the manager of the organization to decide whether to enter or leave the product development in a manufacturing process. For example, new model of Proton cars are excellent vehicles with high technologies, but a PESTLE analysis might show the analysis differently. Looking at the environmental point of view, the manufacture of vehicles that require the use of high technologies of parts and components would increase the tax and the whole price of the cars and finally it is rejected by society. Further analysis of this PESTLE will be described by the researcher in the analysis of this study.

CHAPTER 3

RESEARCH METHOD

3.1 Introduction

This research is developed from a qualitative point of view which consists of critical description based on the analyzed issues and problem statements. The research method helps the researcher to obtain and collect all the data related to the case study. The research methods used for this dissertation purpose are carried out by searching the related topic literatures, technical papers, marketing reports, annual reports, conferences proceedings, product data sheets, product brochures, web pages, journals, magazines and books.

3.2 Interview

The qualitative research interview seeks to describe the meanings of the central themes to the life of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say. (Kvale, 1996). Open-ended interview questions are prepared for all interviewees. All the data in this approach can be easily analyzed and compared.

The researcher had initially arranged a set of questions to be asked during the interview with the Research and Development Manager of the Proton Company (Hishammudin Nawawi). However, during the time of this research being conducted, the R&D manager was very busy with the launching of the new Proton Exora into the Malaysian market. Alternatively, the interview questions had been posted to the interviewee and the researcher managed to obtain all the results of the interviewed questions. (Appendix)

3.3 Secondary data

Secondary data is information gathered for the purposes of completing a research project. A variety of secondary information sources were available to the researcher such as gathering data from general business publications, magazines and newspaper articles, annual reports, academic publications, and library sources. The researcher had gained most of the said resources from online basis. However the researcher found difficulty in obtaining some of the internal information of the company due to some rights and intellectual issues. However, most of the required information was successfully gathered by the researcher during data collection.

3.4 Survey (as a supplement to extensive reviewed literatures and interviews)

The researcher had prepared a simple questionnaire (which is available at the appendix) and distributed to selected drivers who were randomly selected. The survey method is deemed to be sufficient in obtaining the relevant data that answered the research questions and objectives. Furthermore, the survey method is a popular and most common strategy in business and management research. This primary data was used by the researcher as an extensive review of literature pertaining to the automotive industry, Malaysian economic outlook and subjects that are related to the Proton Company.