

**AN IMPROVED METHOD TO REDUCE DEVELOPMENT TIME FOR NEW
MODELS OF PROTON**

By

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**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirement for the Degree of Master of Science**

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DEDICATION

This thesis is dedicated to my mother and father, Hajjah Anisah Bt. Che Mood and Haji Nik Mohamed Bin Awang who always encouraging me to follow my dreams. Also to my wife and children, Hajjah Noryusnizar Bt. Ishak, Nik Muhammad Irfan and Nik Nurleen for believing in me and supporting me although I was busy with my work and study at the same time. Last but not least, to my parents in law and all my brothers and sisters who always encourages me to do the best.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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Automotive industry in the world mostly depends on the new product development to enable it to stay in business. Therefore, car manufacturers should emphasis on various strategies and concepts that can be accepted by the local as well as overseas customers. This is particularly important in the automotive industry where radically shortened product development cycle time remains a crucial differentiating factor between the best performing companies and the rest of the industry. Every company seems to believe that time compression is always to be pursued, along with high quality products and low cost. Hence, a study of strategic methods to reduce development time for new model in automotive industry is presented in this thesis.

The approach taken are by studying the existing practice in car development and suggesting various ways for method improvement. Car making process involved concept initialization, drawings, prototypes, trials and mass production. Throughout the research, factors of 4M (Man, Method, Material and Machine) are focused as the most important criterion in order to achieve the manufacture's implementation objectives. The research started by identifying current problems by using 4M techniques. Then, data collection for new car model project implementation program in terms of time scheduling, product development process and production strategy was thoroughly studied and analyzed. By using the same 4M tools, a proposal was recommended to improve the existing practice in automotive manufacturing environment. The results are summarized in a table through SWOT analysis and by implementing these suggestions, it is hoped that car manufacturers can reduce the new car development time significantly. The thesis also recommends some important points for future research especially in term of project implementation and strategy.

**Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains**

**KAEDAH PEMBAIKAN UNTUK MENGURANGKAN MASA
PENGELUARAN MODEL BARU UNTUK PROTON**

Oleh

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Industri automotif di seluruh dunia kebanyakannya bergantung kepada penghasilan produk baru untuk sentiasa kekal dalam persaingan. Oleh yang demikian, syarikat pembuat kereta perlu mencari berbagai strategi dan konsep yang boleh diterima oleh pelanggan dalam dan luar negara. Ini amatlah penting untuk automotif industri kerana kitaran pengeluaran kereta baru amatlah bergantung kepada singkatnya masa yang diperlukan dan merupakan faktor utama yang membezakan syarikat yang terbaik atau sebaliknya. Setiap syarikat

sependapat bahawa penyingkatan masa perlulah diutamakan disamping kualiti yang tinggi dengan kos yang lebih murah. Oleh itu, satu kajian mengenai kaedah-kaedah strategik untuk mengurangkan masa pembangunan model baru dalam industri automotif dipersembahkan dalam tesis ini. Pendekatan yang diambil adalah dengan mengkaji amalan yang sedia ada dalam pembangunan kereta dan mencadangkan pelbagai kaedah penambahbaikan. Proses pembuatan kereta melibatkan pengenalan konsep, lukisan kejuruteraan, prototaip, percubaan dan sehinggalah pengeluaran besar-besaran. Sepanjang penyelidikan, faktor 4M (Manusia, Metod, Meterial dan Mesin) difokuskan sebagai kriteria penting untuk memenuhi objektif implimentasi pengeluaran. Kajian dimulakan dengan mengenalpasti masalah yang dihadapi sekarang dengan menggunakan teknik 4M. Kemudian, pengumpulan data untuk penghasilan projek kereta baru dari segi jadual masa, proses pembuatan dan strategi pengeluaran dikajidan dianalisa secara mendalam. Dengan menggunakan kaedah 4M yang sama, satu cadangan telah dikemukakan untuk memperbaiki segala kelemahan dalam amalan pembuatan automotif sekarang. Semua keputusan kajian diringkaskan dalam satu jadual melalui analisis SWOT, dan diharapkan pengeluar-pengeluar kereta dapat mengurangkan masa pembangunan kereta baru dengan jayanya. Tesis ini juga mencadangkan beberapa perkara yang penting untuk diteruskan dalam kajian akan datang terutamanya projek implimentasi dan strategi.

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I certify that an Examination Committee met on 3 May 2006 to conduct the final examination of Nik Mohd Zuki Bin Nik Mohamed on his Master thesis entitled “An Improved Method to Reduce Development Time for New Models of Proton” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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DECLARATION

I hereby declare that the thesis 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 UPM or other institutions.

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LIST OF ABBREVIATIONS

2D	Two Dimensions
3D	Three Dimensions
4M	Man, Method, Material and Machine

AFTA	ASEAN Free Trade Area
APQP	Advance Product Quality Planning
BOM	Bill of Material
CAD	Computer Aided Design
CAE	Computer Aided Engineering
CAM	Computer Aided Manufacturing
CCFT	Cross Cup Feeder Transfer
CNC	Computer Numerical Control
Consult	Consultant
DQCM	Design Quality Confirmation Meeting
Eng	Engineering
EO	Engineering Order
F/S	Feasibility Study
F1	Prototype Phase 1
F2	Prototype Phase 2
FMEA	Failure Mode and Effect Analysis
IBD	International Business Division
ICT	Information, Communication and Technology
Manuf	Manufacturing
NG	No good
P0	Pilot Trial Phase 0
P1	Pilot Trial Phase 1

PCR	Product Change Request
PDM	Product Data Management
PLC	Product Life Cycle
PP	Pre-Production
Purch'g	Purchasing
QC	Quality Control
QD&T	General Dimension and Tolerance
RnD	Research and Development
SE	Simultaneous Engineering
SWOT	Strength, Weaknesses, Opportunity and
TQM	Total Quality Management
TWB	Tailor Welded Blank
WTO	World Trade Organization

