



UNIVERSITI PUTRA MALAYSIA

**QUALITY SYSTEM IMPLEMENTATION BY SELECTED LOCAL
VENDORS IN THE MALAYSIAN AUTOMOTIVE INDUSTRY**

SHAMINI A/P PATPANAVAN @ PATHMANATHAN

FK 2008 18



**QUALITY SYSTEM IMPLEMENTATION BY SELECTED LOCAL
VENDORS IN THE MALAYSIAN AUTOMOTIVE INDUSTRY**

By

SHAMINI A/P PATPANAVAN @ PATHMANATHAN

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

April 2008



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

**QUALITY SYSTEM IMPLEMENTATION BY SELECTED LOCAL
VENDORS IN THE MALAYSIAN AUTOMOTIVE INDUSTRY**

By

SHAMINI A/P PATPANAVAN @ PATHMANATHAN

April 2008

Chairman : Associate Professor Md. Yusof Ismail, PhD

Faculty : Engineering

Looking at the number of complaints on local cars by public has triggered the possibility of whether suppliers to car manufacturers could be the reason of numerous quality defects on local cars. As quality of product is also determined by the correct quality practice in an organization, the effectiveness of quality systems implementation, ISO 9000, QS 9000 or TS 16949, among local vendors becomes a factor in determining the quality of local cars. It is therefore, a need to address this issue emerges as Malaysia needs to compete aggressively in the automotive market to gain more sales, recognition and respect. The root of the quality problems has to

be identified and either treated or eliminated. The study has only one objective, that is, to study the performance of vendors implementing quality systems.

The research is a case study on selected local automotive vendors. Eight vendors and four car manufacturers were selected for the purpose of analysis. The study consists of both quantitative and qualitative methods. Questionnaires were sent via e-mail or hand to participants and are followed by a personal interview or via telephone conversation once the questionnaire is completed. Additional questions were asked during personal interview to gain more insight on relevant matters. The results were analyzed using the SPSS Software.

The analysis showed that the performance of local cars depends on three parties; the suppliers who manufacture the car components, certification bodies who certify the suppliers and car manufacturers who assemble the cars. The main important issue in assuring quality in an organization is found not due to quality system but the management's commitment to the quality system. Organizations that were studied on practice quality system but the quality practices were not fully implemented. Employers and employees alike do not understand the importance of quality in both work practice and produced parts. Other factors contributing to low quality production of cars includes car manufacturers' leniency towards vendors, low technical know how and technology, attitude, lack of choice in selecting vendors and lack of testing facilities. There is slight difference in quality system implementation between companies that do not perform well and companies that perform well. This is because an organization's performance depends on many other factors too; new part development, man power turnover and lack of technical expertise. There is

difference in supplier expectations between local and foreign car manufacturers. It was also found that effective quality system implementation goes hand in hand with the quality of product produced.



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

**IMPLEMENTASI SISTEM KUALITI PARA VENDOR TEMPATAN YANG
TERPILIH DALAM INDUSTRI AUTOMOTIF MALAYSIA**

Oleh

SHAMINI A/P PATPANAVAN @ PATHMANATHAN

April 2008

Pengerusi : Profesor Madya Md. Yusof Ismail, PhD

Fakulti : Kejuruteraan

Jika dilihat dari segi bilangan aduan yang diterima daripada orang awam terhadap kereta buatan tempatan, satu persoalan wujud sama ada pembekal kepada pengilang kereta merupakan sebab kemerosotan kualiti kereta tempatan. Memandangkan kualiti sesuatu produk ditentukan oleh cara kualiti dipraktis dalam sesuatu organisasi, maka keberkesanan implementasi sistem kualiti ISO 9000, QS 9000 atau ISO/TS 16949 di kalangan para pembekal merupakan suatu faktor dalam menentukan mutu kereta tempatan. Oleh sebab itu, kepentingan untuk mendedahkan isu ini timbul memandangkan Malaysia perlu bersaing sengit dalam pasaran automotif untuk memperoleh lebih banyak jualan dan pengiktirafan. Punca masalah perlu dikenalpasti

dan seterusnya dilupakan. Kajian ini mempunyai hanya satu objektif iaitu mengkaji persembahan para pembekal yang mempraktik sistem kualiti.

Penyelidikan ini merupakan satu kajian kes terhadap para pembekal tempatan yang terpilih. Untuk tujuan analisis, seramai lapan pembekal dan empat pengilang kereta telah dipilih. Kedua-dua kaedah kuantitatif dan kualitatif digunakan dalam kajian ini.

Borang kajiselidik dihantar melalui e-mel atau diberi secara peribidi kepada peserta dan ini diikuti dengan temuramah secara peribadi atau melalui telefon sesudah peserta melengkapkan boring kajiselidik. Soalan-soalan tambahan ditanyakan kepada para peserta dalam perbincangan ketika bertemu untuk memperoleh maklumat secara lebih mendalam untuk perkara yang berkaitan. Keputusan dianalisis dengan menggunakan perisian SPSS.

Keputusan analisis menunjukkan bahawa persembahan kereta tempatan bergantung kepada tiga pihak; pembekal yang membuat komponen-komponen kereta, badan akreditasi dan pengilang kereta. Faktor utama dalam menjamin kualiti produk di dalam sesebuah organisasi didapati bergantung kepada komitmen daripada pengurus organisasi. Organisasi yang dikaji mengamalkan sistem kualiti tetapi tidak dipraktikkan dengan sepenuhnya. Faktor lain yang menyumbang kepada penghasilan kereta yang berkualiti rendah termasuk pengilang kereta yang tidak tegas terhadap pembekal, penggunaan teknologi yang rendah, sikap, kekurangan pilihan dalam memilih pembekal dan kekurangan kemudahan menguji produk. Terdapat sedikit perbezaan dari segi pelaksanaan sistem kualiti antara syarikat yang tidak menunjukkan persembahan yang baik dan syarikat yang menunjukkan persembahan yang tidak baik. Ini kerana, tahap persembahan sesuatu organisasi bergantung kepada

faktor-faktor lain seperti pelancaran komponen baru, kadar pusing sumber tenaga manusia dan kekurangan tenaga mahir teknikal. Terdapat perbezaan dari segi harapan diantara pengilang kereta tempatan dan luar negara terhadap pembekal. Selain itu, keputusan analisis juga menunjukkan bahawa keberkesanan implementasi sistem kualiti bergantung secara langsung dengan kualiti produk yang dihasilkan.



ACKNOWLEDGEMENTS

First, I would like to express my sincere gratitude to Prof Madya Ir. Dr. Md. Yusof Ismail, my supervisor for his continuous guidance and support throughout my thesis writing. He is always there to listen, to advice and to read and reread my writings. He always encourages me and brings out the best in me by forwarding critical questions. Further, I am grateful to Prof. Madya Datin Dr. Napsiah Ismail, my co-supervisor for her constructive ideas and guidance all the way through this thesis. Their invaluable support is highly appreciated.

I give special thanks to my husband, Mr. Pathmanaathan for his love, encouragement and financial assistance. He is the reason I am pursuing my Masters and he is my best research critic. He never likes to read the literature but whenever I meet a dead end, he is there to give the “miracle” ideas which I would have never thought of. His constructive questions kept my mind, hand and eyes looking for more information to answer all doubts regarding the research and thank you for proof reading my thesis.

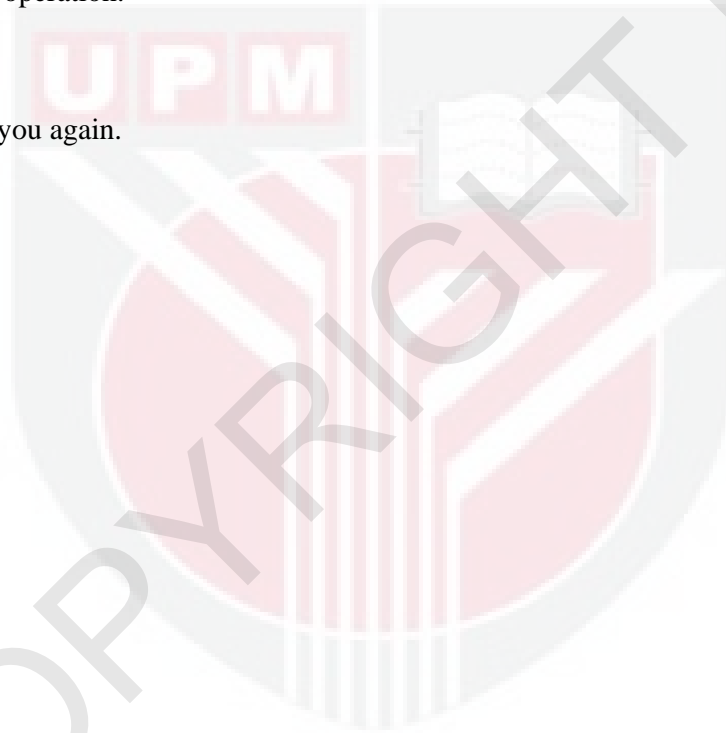
Next, I would like to thank my parents, Mr. and Mrs. Pathmanathan for always being there with me in all the difficulties all throughout my life. To my mom and elder sister, Shanthi, a special thanks for accompanying me in the many visits to the companies which participated in this research. You waited patiently for many hours.

Thank you.

A sincere gratitude goes to my twin sister, Shamila, my cousin Theva Rajah and my friend Miss Nirmeela for reading, proof reading and correcting my grammar and spelling and for the many good advices whenever I am at loss for ideas.

Lastly, my special acknowledgement goes to all participants of the research, car manufacturers and suppliers alike for your time, effort and willingness to share your viewpoint with me. I could have not completed my thesis on time if it was not for your cooperation.

Thank you again.



The thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

Md. Yusof Ismail, PhD

Associate Professor Ir. Dr.
Faculty of Engineering
Universiti Putra Malaysia
(Chairman)

Napsiah Ismail, PhD

Associate Professor Datin Dr.
Faculty of Engineering
Universiti Putra Malaysia
(Member)

AINI IDERIS, PhD

Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 14 August 2008



TABLE OF CONTENTS

ABSTRACT	Page
ABSTRAK	ii
ACKNOWLEDGEMENTS	v
APPROVAL	viii
DECLARATION	x
LIST OF TABLES	xii
LIST OF FIGURES	xv
LIST OF ABBREVIATIONS/ NOTATIONS/ GLOSSARY OF TERMS	xviii
LIST OF ABBREVIATIONS/ NOTATIONS/ GLOSSARY OF TERMS	xix

CHAPTER

1	INTRODUCTION	1
1.1	General	1
1.2	Problem Statement	5
1.3	Research Aim and Objectives	6
1.4	Hypothesis	7
1.5	Significance of the Study	8
1.6	Research Layout	9
1.7	Limitations of the Study	11
2	LITERATURE REVIEW	12
2.1	Topics Outline	12
2.2	ISO/TS 16949 – The New Standard	12
2.3	Comparison between ISO 9000, QS 9000 and ISO/TS 16949	16
2.4	Motives of Accreditation	20
2.5	Benefits of Accreditation	21
2.6	Roles of Accreditation Boards and Certification Bodies in Ensuring Effectiveness of Quality System	22
2.7	Problems Faced during Implementation of Quality Standards	25
2.8	Measuring Manufacturing Performance	27
2.9	Malaysian Automobile Vendors	31
2.10	Proton, Perodua and their Foreign Counterparts	34
2.11	Effectiveness of Quality Systems Accreditation	38
2.12	Summary	42
3	METHODOLOGY	44
3.1	Research Design	44
3.2	Design of Questionnaire	47
3.3	Pre-test of Questionnaire	52
3.4	Case Study Sample	53
3.5	Point Of Contact	54
3.6	Distribution and Collection of Questionnaires	55
3.7	Data Analysis	57



4	RESULTS AND DISCUSSION	59
4.1	Measuring Quality Performance	59
4.2	Questionnaire Responses	59
4.3	Profile of Respondents	60
4.4	Questions to Vendors	63
4.5	Questions to Car Manufacturers	85
4.6	Summary of Findings	100
4.7	Discussion	103
4.8	Validity of Research Results	123
5	CONCLUSION AND RECOMMENDATIONS	125
5.1	Quality System Implementation in the Malaysian Automotive Industry	125
5.2	Recommendations for Future Research	128
	REFERENCES/ BIBLIOGRAPHY	131
	APPENDICES	137
	BIODATA OF STUDENT	168
	LIST OF PUBLICATIONS	169

LIST OF TABLES

Tables		Page
2.1	Benefits of Adopting ISO/TS 16949	16
2.2	Problems Encountered when Using ISO 9000	16
2.3	Differences between ISO 9000 and QS 9000	18
2.4	Concerns of Vehicle Manufacturers and Suppliers towards QS 9000 Quality System Standard	19
2.5	Benefits of ISO/TS 16949 Compared to QS 9000	20
2.6	Benefits of ISO 9000	22
2.7	Types of Barriers to Quality System Implementation	26
2.8	Barriers at Different Stages of Quality System Implementation	26
2.9	The Multi Dimensions of Quality, Time, Flexibility and Cost	29
2.10	List of Performance Measures	30
2.11	Top Three Vehicles per Segment in Initial Quality Study	37
4.1	Involvement in Questionnaire Survey and Interview	60
4.2	Performance Measures	64
4.3	Comparison with Competitors	65
4.4	Motives of Accreditation (Quality Managers/ Executives)	66
4.5	Motives of Accreditation (Supervisors)	68
4.6	Actions Taken by Management to Show Commitment	73
4.7	Ways to Involve Employees in Ensuring Success of Quality System	74
4.8	Evaluation of Quality System Implementation Constraints	75

Tables	Page	
4.9	Benefits of Accreditation	76
4.10	Impact of Quality System on Organization	79
4.11	Effectiveness of Quality System Implementation versus Relevance of Standard	80
4.12	Quality System Practices	81
4.13	Reasons for Low Quality of Malaysian Cars	82
4.14	Opinion on Certification Bodies	83
4.15	Impact of Quality System on Organization (Good Vendors)	84
4.16	Impact of Quality System on Organization (Not Good Vendors)	85
4.17	Comparison between Foreign and Local Vendors	88
4.18	Main Problems Faced by Car Manufacturers with Vendors	90
4.19	Key Factors in Selecting Vendors	91
4.20	Reasons for Terminating Vendors	92
4.21	Effect of Quality System on Vendor Performance	93
4.22	Improvement on Vendor Performance	94
4.23	Vendors' Implementation and Enforcement of Quality System Requirements	95
4.24	Proper Implementation of Product Quality System Guarantees Quality of Product	96
4.25	Criteria Used to Judge Performance of Vendors	97
4.26	Summary of Findings (Car Manufacturers)	100
4.27	Summary of Findings (Vendors)	101

Tables	Page
B1	Types of Questions 160
C1	References Used For Questionnaire (Vendor) 162
C2	References Used For Questionnaire (Car Manufacturers) 162
E1	Commitment and Support from Top Management 167
	* Title Cross Tabulation
E2	Commitment and Support from Operators * Title Cross Tabulation 167
E3	Commitment and Support from Managers * Title Cross Tabulation 167
E4	Commitment and Support from Engineers * Title Cross Tabulation 167

LIST OF FIGURES

Figures		Page
1.1	Research Layout	10
2.1	Model of a Process-Based Quality Management System	15
3.1	Steps Taken to Conduct the Case Study	45
4.1	Motives of Accreditation (Quality Managers/ Executives)	67
4.2	Least Concerns for Accreditation (Quality Managers/ Executives)	67
4.3	Motives of Accreditation (Supervisors)	69
4.4	Least Concerns for Accreditation (Supervisors)	69
4.5	Commitment and Support from Top Management	71
4.6	Commitment and Support from Operators	71
4.7	Commitment and Support from Managers	72
4.8	Commitment and Support from Engineers	72
4.9	Accreditation Cost Benefits	77
4.10	Description of Quality Representative	78
4.11	Opinion on Quality of Malaysian Cars	82
4.12	Comparison between Requirements and Expectations of Local and Foreign Car Manufacturers	83
4.13	Improvement in Products Produced by Vendors	86
4.14	Performance Evaluation on Local Vendors	87
4.15	Performance Evaluation on Foreign Vendors	88

LIST OF ABBREVIATIONS

AFTA	: ASEAN Free Trade Agreement
AIAG	: Automotive Industry Action Group
ANFIA	: Associazione Nazionale Fra Industrie Automobilistiche (Italy)
AVSQ	: Associazione nazionale dei Valutatori di Sistemi Qualità (Italy)
CBU	: Complete Built Vehicles
CMSS	: Component, Material, Strength and Safety
COP	: Customer Oriented Processes
CP	: Control Plan
CPM	: Critical Path Method
EAQF	: Evaluation d'Aptitude à la Qualité pour les Fournisseurs
EFQM	: European Foundation for Quality Management
FIEV	: Fédération des Industries des Équipements pour Véhicules (French Vehicle Equipment Industries Association)
FIFO	: First In First Out
FMEA	: Failure Mode and Effect Analysis
FMM	: Federation of Malaysian Manufacturers
HVAC	: Heating, Ventilation and Cooling
IATF	: International Automotive Task Force
IQS	: Initial Quality Study
ISO	: International Organization for Standardization
JAMA	: Japan Automobile Manufacturers Inc.
JIT	: Just-In-Time

MAA	: Malaysian Automotive Association
MACD	: Mileage Accumulation Chassis Dynamometer
MATRADE	: Malaysia Automotive Component Parts & Accessories
MIDA	: Malaysian Industrial Development Authority
MITI	: Ministry of International Trade and Industry
MPV	: Multi Purpose Van
NAM	: Naza Automotive Manufacturing
NAP	: National Automotive Policy
OEM	: Original Equipment Manufacturers
PDPC	: Process Decision Program Chart
P.E Ratio	: Price-Earnings Ratio
PERODUA	: Perusahaan Otomobil Kedua
PERT	: Program Evaluation and Review Technique
PROTON	: Perusahaan Otomobil Nasional
PSA	: Peugeot-Citroen
QMS	: Quality Management System
R.O.C.E	: Return On Capital Employed
R.O.E	: Return On Equity
R.O.O.A	: Rigorous Object-Oriented Analysis
RWTUV	: Rheinisch-Westfälischer Technischer Überwachungsverein
SGS	: Société Générale de Surveillance
SIRIM QAS	: Standards & Industrial Research Institute of Malaysia - Quality Assurance System
SMMT	: Society of Motor Manufacturers and Traders

SOP	: Standard Operating Procedures
SPC	: Statistical Process Control
SPSS	: Statistical Package for Social Science
TPS	: Toyota Production System
TQM	: Total Quality Management
UNECE	: United Nations Economic Commission for Europe
US	: United States
USA	: United States of America
VDA	: Confederation of German Automobile Manufacturers
VDA-QMC	: Verband der Automobilindustrie- Qualitäts Management Center
7QC	: 7 Quality Control Tools

CHAPTER 1

INTRODUCTION

1.1 General

Malaysia is a fast developing third world country. It has grown from an agricultural to an industrialized nation. The Malaysian industry could be divided into three main sectors; manufacturing, buildings and designs and service. Manufacturing was the second fastest growing sector after services in year 2005 (Malaysian Industrial Development Authority, 2005). Manufacturing includes food products, textile, tobacco, petroleum and rubber products, iron and steel, electrical and electronics, transport equipment and many more (Malaysian Industrial Development Authority, 2005).

The transport industry comprises of three sub-sectors; automotive, aerospace and marine transport (Malaysian Industrial Development Authority, 2005). According to the Malaysian Industrial Development Authority (MIDA) Report 2005, the automotive sector is the largest sector in the transport equipment industry. An excerpt from the report says that the automotive sector includes the manufacture/assembles of motor vehicles, including motorized two-wheelers, reconditioning/reassembling/ rebuilding/ conversion of motor vehicles and the manufacture of components and parts, including coach and vehicle bodies. Only organizations that are involved in car manufacturing are investigated in this study.

The transport equipment industry (automotive, aerospace and marine transport) has contributed significantly to Malaysia's industrial development. Its contributions

include investments in parts and components manufacturing, new assembly plants, creation of support industries (distribution, logistics, financing, insurance and car dealership) and in technology development. (Business Times, The New Straits Times Press, 2006).

The birth of Malaysia's first national car project, Perusahaan Otomobil Nasional (Proton) in 1984 was the brainchild of Malaysia's fourth Prime Minister, Tun Dr. Mahathir Muhammad who is also currently [2007] its advisor. Eight years later in 1992, Malaysia's second national car, Perusahaan Otomobil Kedua Sdn. Bhd. (Perodua) was established.

Proton to date has produced, Proton Saga, Iswara, Wira, Satria, Tiara, Perdana, Waja, Juara, Gen-2, Savvy and Satria Neo while Perodua has manufactured Kancil, Kelisa, Kembara, Rusa, MyVi and ViVa. Naza Automotive Manufacturing Sdn. Bhd. (NAM) has so far assembled Spectra, Ria, Citra and Sorento. On the other hand, foreign car manufacturers like Honda, Toyota, Ford, Mazda, Volvo, Mercedes Benz, Nissan, Hyundai and BMW also assemble their cars in Malaysia (Malaysian Automotive Association (MAA), December 2006).

For Malaysian car manufacturers to compete in the global market, the quality of car make should be of high standard. Quality is essential to gain customers' confidence in the local product. Previously, during the initial stages of establishment of the car manufacturing industry in Malaysia, car components, parts and accessories were directly imported from Japan and Europe and assembled in Malaysia. To develop the local automotive industry, the government has encouraged localization. It is stated in a report by the Assistant Director, Automotive Unit of Industries Division, Ministry

of International Trade and Industry in 2001 that to develop the local automotive industry and to encourage vehicles to be assembled locally, the government has adopted a few policies. The policies include requiring a certain percentage of a vehicle to have parts and components that are manufactured locally, imposing import taxes and putting a tariff system on Complete Built Unit (CBU) imports. (Siti, 2001).

According to the Malaysian Industrial Development Authority (MIDA) Report 2005, 60%-90% of components in local cars are manufactured by local vendors. Malaysia's aim towards localization is good as it can lower the cost price of cars and customers are able to purchase them at more affordable prices. However, there are doubts emerging from localization. According to Datuk Sharir Abdul Samad, the Member of Parliament for Johor Baharu, localization is said to be making Proton not competitive. Cars are becoming more expensive due to high local content and quality of cars is not up to the standard (Berita Wilayah, October 2005).

Today's customers are becoming more discerning in their purchase decisions. It is often dictated by factors such as reliability, prices and good after sales service, quality, resale or depreciation values, overall performance, engine capacity and styling (The Star, 17 May 2006). Therefore, any setbacks in quality of the vehicle would have an impact on the customer's choice of vehicle purchase.

To produce high quality product, the sub-components that go into it should be of high quality too. In Malaysia, small and medium enterprises are the main suppliers to large automotive manufacturers. Therefore, to assure quality products from a large manufacturing system, assurance must be made at the suppliers' (Ahmed and