

IMPLEMENTATION OF QUALITY MANAGEMENT PRACTICES IN MALAYSIAN AUTOMOTIVE INDUSTRIES: A REVIEW

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ABSTRACT

The automotive industry in various countries around the world is in different stages of their quality movements. The importance of Quality Management (QM) practices in the achievement of organizational performance has been highlighted in many studies. The purpose of this paper is to examine the relationship of QM practices and organizational performance between Malaysia and Thailand automotive industry. A conceptual model using Structural Equation Modeling (SEM) has been proposed. This model will be used to study the relationship between QM practices and organizational performance for Malaysia and Thailand automotive industries. Based on the proposed conceptual model and reviewed, research hypotheses are being developed. The paper culminates with suggested future research work.

Keywords: Quality Management, automotive industries, hypothesis, Malaysia, Thailand

INTRODUCTION

In a competitive market, the demand for quality is emerging as the single most critical factor for companies to survive in the ever-expanding global market place. Quality is vital in determining the economic success of manufacturing companies (Garvin, 1988, Curkovic *et al.*, 2000). World-class manufacturing companies gain competitive edge and greater market share through extraordinary levels of performance by providing a quality product with a competitive price as required by demanding customers.

The concept of Quality Management (QM) has been developed as the result of intense global competition. Companies with international trade and global competition have paid considerable attention to QM philosophies, procedures, tools and techniques. A growing number of companies use QM practices as strategic foundation for generating a competitive advantage (Reed *et al.*, 2000) and improving organizational performance (Samson and Terziowski, 1999). However, the implementation of QM has not occurred at the same pace in different regions of the world especially in automotive industries.

CURRENT SCENARIO OF MALAYSIAN AUTOMOTIVE INDUSTRY

Recently, Malaysian automotive industry really feels the threat of this external pressure. Malaysian Rating Corporation Bhd. (2006) has placed the automotive industry on slightly negative outlook following lower sales. Since the realization of ASEAN Free Trade Area (AFTA) in 2005, it shows the impact on Malaysia's car manufacturer sales. Prior to AFTA, most of Malaysian automotive market is protected by the government with instruments such as tariffs, refunds schemes and investment control in order to compete with their overseas competitors. From a positive perspective AFTA would actually drive regional manufacturing integration and cost competitiveness amongst ASEAN countries rather being a threat to them. Based on analysis for the world vehicles market for the year 2000 and projected 2010 by The Malaysian Automotive Association report (2006), as shown in FIGURE 1, ASEAN is the 5th largest market in the world and Malaysia is far behind when compared to Thailand by the year 2010.

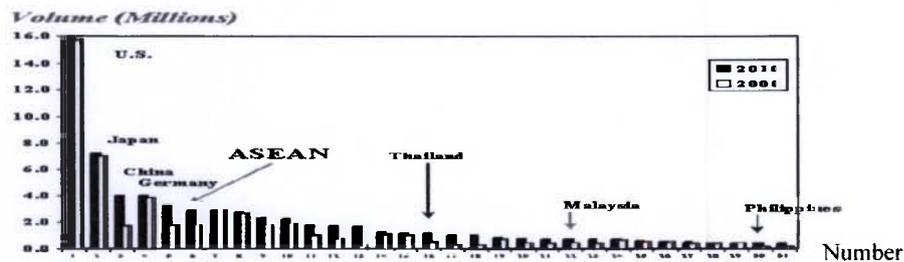


FIGURE 1 The world vehicle market for year 2000 and projected for 2010(The Malaysian Automotive Association, 2006)

Thus, to survive in a competitive market place, QM practices are one of the key issues that can help align organization's to stay competitive. Besides that, based on current situation, comparative study amongst ASEAN countries, especially Thailand, is believed to be useful and good approach to provide an overall perspective and understanding of the main differences and similarities.

LITERATURE REVIEW

The importance of QM in business organizations has increased significantly over the past 20 years. International quality management aims at understanding quality management in global context. The concept of international serves as the motivation for developing a global QM standard for evaluating QM practices within countries (Rao et al., 1999). The practice of QM also affects from the national level to the international level (Kim and Chang, 1995), which helps organizations to compete internationally and gain a competitive edge in the global market (Liu and Kleiner, 2001).

QUALITY MANAGEMENT CONSTRUCTS

Quality management constructs have been investigated extensively (Saraph *et al.*, 1989). To generate distinct generic construct, first defined a list of others constructs proposed in a large set of articles. Then, each construct was analyzed whether it was different or similar to the constructs previously analyzed. This process resulted with the eight following constructs: quality leadership, customer focus and satisfaction, quality information and analysis, human resource development, strategic planning management, quality results, and quality assurance. Table 1 presents, for each generic construct, a list of similar practices proposed by other authors.

TABLE 1 A constructs proposed by other authors

Constructs	Related constructs
Quality leadership (QL)	The role of top management leadership (Saraph <i>et al.</i> , 1989), top management support (Flynn <i>et al.</i> , 1994), top management commitment (Ahire <i>et al.</i> , 1996), management leadership (Yusof and Aspinwall, 2000), leadership (Sila, 2007)
Customer focus and satisfaction (CFS)	The role of quality department (Saraph <i>et al.</i> , 1989), customer involvement (Flynn <i>et al.</i> , 1994), customer focus (Ahire <i>et al.</i> , 1996), customer orientation (Rao <i>et al.</i> , 1999)
Quality information and analysis (QIA)	Quality data and reporting (Saraph <i>et al.</i> , 1989), quality information (Flynn <i>et al.</i> , 1994), quality information and availability (Ahire <i>et al.</i> , 1996), information and analysis (Sila, 2007).
Human resource development (HRD)	Workforce management (Flynn <i>et al.</i> , 1994), employee training (Ahire <i>et al.</i> , 1996), education and training (Reed <i>et al.</i> , 2000), support for human resource development (Sila, 2007), human resource management (Parast <i>et al.</i> , 2006).
Strategic planning management (SPM)	Process design management (Saraph <i>et al.</i> , 1989), process management (Flynn <i>et al.</i> , 1994), design quality management (Ahire <i>et al.</i> , 1996), strategic planning process of quality management (Parast <i>et al.</i> , 2006).
Supplier quality management (SQM)	Supplier involvement (Flynn <i>et al.</i> , 1994), supplier quality management (Ahire <i>et al.</i> , 1996), supplier quality (Rao <i>et al.</i> , 1999, Parast <i>et al.</i> , 2006), supplier quality assurance (Yusof and Aspinwall, 2000), supplier management (Sila, 2007).
Quality results (QR)	Product quality (Ahire <i>et al.</i> , 1996), internal quality results (Rao <i>et al.</i> , 1999), quality results (Parast <i>et al.</i> , 2006), organizational effectiveness (Sila, 2007).
Quality assurance (QA)	Quality assurance of products and service Rao <i>et al.</i> , 1999).

The list above illustrates the foundation of this study constructs, and has strongly inspired the definition of each construct and will be analyzed further.

A PROPOSED CONCEPTUAL MODEL

Based on comprehensive review of previous study, a conceptual model has been proposed to model the relationship between QM practices and organizational performance as presented in Figure 2. This proposed model has adapted the conceptual model proposed by Lin *et al.* (2005), as their successful model in conducting comparison between two countries. However, some amendments especially on QM practices constructs have been made.

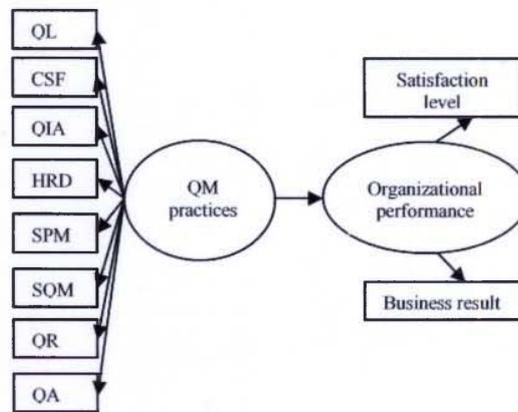


FIGURE 2 A proposed conceptual of QM practices for Malaysian and Thailand automotive industry

Two performance variables will be used to measure organizational performance which are the satisfaction level and business result. For the satisfaction level component items, it includes employee satisfaction, customer satisfaction and supplier satisfaction. A finding from Yoo *et al.* (2006) indicates that higher levels of employee empowerment lead to higher level of organizational performance. A case study conducted by McAdam and Bannister (2001) suggested that the implementation of TQM in a company contributed to a positive working environment and resulted in reductions in employee absenteeism. Jun *et al.* (2006), had found that employee satisfaction have a positive influence on organizational performance.

QM practices have been shown to enhance organizational performance through customer satisfaction. Edvardsson *et al.* (2000) reported the growing body of research on organization performance between products and services on external customer practices. By gaining a better understanding of customer needs and the use of this knowledge to produce a better product, a customer satisfaction has a direct impact on organizational performance (Johnson and Gustafsson, 2000). However, Johnson and Nilsson (2000) argued that concerning customer

satisfaction, no direct customer measures were available. They suggest it is important to incorporate measures from different sources.

The relationship between buyer and supplier is an important factor in organizational performance. The need to improve supplier's quality and delivery performance while at the same time, reducing the costs of supplied materials and parts has motivated buyers to engage in supplier development activities which has a direct impact on organizational performance (Krause *et al.*, 1998). Empirical studies demonstrate that evaluating supplier performance and providing feedback, result in improved buyer supplier performance (Humpreys *et al.*, 2004) and enhanced product/service quality of the buying firm (Krause *et al.*, 2000).

For the business results component items for organizational effectiveness which include productivity, number of successful new product, cost performance and profitability. QM practices also help to improve in reducing scrap, rework and stabilize the production process. These in turn minimize the production cost and increase productivity (Ahmad and Schroeder, 2002). Through continuous improvement, not only errors and defects can be prevented but also product cycle's times can be reduced, thereby improving productivity and organizational performance (Huang and Lin, 2002).

According to Buzzel and Gale (1987), financial performance or profitability is an important measure of QM outcomes. This was supported with Deming's (1986) argument that quality improvement leads to elimination of waste, reduction of cost and will increase profitability. Recent study by Hoang *et al.* (2006), noted that TQM has a positive impact on the firm's innovation performance. These findings have important implications at improving company's business performance.

RESEARCH HYPOTHESES

To understand the relationship of QM practices on organizational performance in Malaysian and Thailand automotive industries, the following hypotheses will be used and tested. According to the culture free approach in cross-country comparative study, differences in cultural practices do not affect the practice of QM in organizations. Thus, these hypotheses have been developed based on the proposed conceptual model and previous research mainly from Parast *et al.* (2006).

Quality leadership

Previous research in QM practices emphasizes the critical role of leadership in driving overall TQM implementation in the organizations (Flynn *et al.*, 1994). Raghunathan *et al.* (1997) noted that leaders play an important role in how QM practices are projected in a consistent manner where it affects organizational performance and profitability. Accordingly, it is proposed that:

H_{1a}: Quality leadership for QM practices is positively correlated with organizational performance.

H_{1b}: There is no significant difference in quality leadership for QM practices between Malaysia and Thailand automotive industry.

Customer focus and satisfaction

Organization must be knowledgeable in customer requirement and responsive customer needs and measure customer satisfaction through TQM implementation (Raghunathan *et al.*, 1997). Nilsson *et al.* (2001) indicate that customer satisfactions have a greater impact on business results through quality practices. This was support with Lee *et al.* (2003) argument that customer satisfaction positively related to process improvement. Therefore:

H_{2a}: Customer focus and satisfaction for QM practices is positively correlated with organizational performance.

H_{2b}: There is no significant difference in customer focus and satisfaction for QM practices between Malaysia and Thailand automotive industry.

Quality information and analysis

The study conducted by Woon (2004) among Singaporean companies found that the service organizations generally showed a lower level of TQM implementation than the manufacturing organizations in the elements quality information and analysis. Projogo (2005) in his study examines that the significant impact of quality information and analysis of TQM on quality performance. This also support by Lee *et al.* (2003) showed that from empirical study quality information and analysis have a significant effect on process management. Therefore:

H_{3a}: Quality information and analysis for QM practices is positively correlated with organizational performance.

H_{3b}: There is no significant difference in quality information and analysis for QM practices between Malaysia and Thailand automotive industry.

Human resource development

Deros *et al.* (2006) noted that human resource development is one of the critical success factors in benchmarking practice which will drive in improving business and management process. Sanchez-Rodriguez *et al.* (2006) noted that people management were significantly and positively correlated with purchasing operational performance (POP). Accordingly:

H_{4a}: Human resource development for QM practices is positively correlated with organizational performance.

H_{4b}: There is no significant difference in human resource development for QM practices between Malaysia and Thailand automotive industry.

Strategic planning management

Curkovic et al. (2000) in his study show that there is indeed a strong relationship between strategic planning in TQM with environmentally responsible manufacturing. While Feng et al. (2006) in his comparative study found that there is significant impact on strategic planning in TQM practice with organizational performance, however the impact is the same for both Singaporean and Australian firms. Therefore:

H_{5a}: Strategic planning management for QM practices is positively correlated with organizational performance.

H_{5b}: There is no significant difference in strategic planning management for QM practices between Malaysia and Thailand automotive industry.

Supplier quality management

Effective supplier quality management is facilitated by a corporative relationship with suppliers. Lee (2004) addressed that by adoption supplier management in TQM programs can help Chinese small manufacturers to achieve competitive advantages in both domestic and international markets. This argument also supported by Temtine and Solomon (2002) study, found that SMEs should be assisted in the use of systematic supplier management programs as this will consequently lead to the consideration of TQM as a means of achieving competitive advantage in long run. Accordingly:

H_{6a}: Supplier quality management for QM practices is positively correlated with organizational performance.

H_{6b}: There is no significant difference in supplier quality management for QM practices between Malaysia and Thailand automotive industry.

Quality results

In the MBNQA, it has been shown that improving internal quality management practices lead to improvement in internal and external quality result (2003). Adam *et al.* (1997) noted that quality improvement positively correlates with financial performance which is significantly related to business performance. Therefore:

H_{7a}: A quality result for QM practices is positively correlated with organizational performance.

HTM: There is no significant difference in quality result for QM practices between Malaysia and Thailand automotive industry.

Quality assurance

Lin *et al.* (2005) noted that quality assurance is significantly related with supplier selection strategy where it could improve the management supply chain networks performance. Lakhali *et al.* (2006) reported that there is a significant relationship

between use of statistical quality techniques and organizational performance. Therefore:

H_{8a}: Quality assurance for QM practices is positively correlated with organizational performance.

H_{8b}: There is no significant difference in quality assurance for QM practice between Malaysia and Thailand automotive industry.

Based on the above hypotheses, Fig. 3 shows a summary of the hypotheses for the proposed conceptual model.

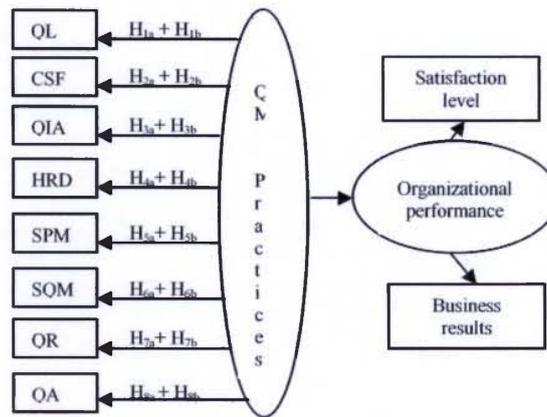


FIGURE 3 Research hypotheses

CONCLUSIONS AND FUTURE RESEARCH

Many studies have been performed to identify critical success factors for successful implementation QM practices. However, no previous study had tried to investigate the relationships between QM practices and organizational performance, especially amongst ASEAN countries. A conceptual model has been proposed to examine the relationships between QM practices and organizational performance for Malaysia and Thailand automotive industry. Based on proposed model and a previous studied, research hypotheses are being developed. The next step of this study is to design a questionnaire, which will be used for pilot study data collection in Malaysia and Thailand automotive industry.

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REFERENCES

- Adam, J. E.E., Corbett, L.M., Flores, B.E., Harrison, N.J., Lee, T.S., Rho, B.H., Ribera, J., Samson, D., and Westbrook, R. (1997) An international study of quality improvement approach and firm performance, *International Journal of Operations and Production Management*, 17, pp. 842-873
- Ahire, S.L., Golhar, D.Y., Waller, M.A., (1996). Development and validation of TQM implementation constructs. *Decision Science*. 27 (1) pp 23-56.
- Ahmad, S. and Schroeder, R.G. (2002) The importance of recruitment and selection process for sustainability of total quality management. *International Journal of Quality & Reliability Management*, Vol. 19 No.5, pp. 540-550
- Buzzell, R.D. and Gale, B.T., (1987). *The PIMS principles: Linking strategy to performance*. The Free Press, New York, NY
- Curkovic, S., S. Melnyk, R. Calantone, and R. Handfield. (2000). Validating the Malcolm Baldrige national quality award framework through structural equation modeling, *International Journal of Production Research* 38(4). 765-791.
- Deming, W.E., (1986) *Out of the crisis*. MIT press, Cambridge, MA
- Deros, B.M., Yusof, S.M., and Salleh, A.M., (2006) A benchmarking implementation framework for automotive manufacturing SMEs. *Benchmarking: An International Journal* Vol. 13 No.4, pp. 396-430
- Edvardsson, B., Johnson, M.D., Gustafsson, A., and Strandvik, T. (2000). The effects of satisfaction and loyalty on profit and growth: product versus services. *Total Quality Management*, 11, pp. 917-927
- Evans, J.R., and Jack, E.P., (2003) Validating key results linkages in the Baldrige performance excellence model, *Quality Management Journal* 10 (2), pp. 7-24
- Feng, J., Prajogo, D.I, Tan, K.C. and Sohal, A.S., (2006) The impact of TQM practices on performance: A comparative study between Australian and Singaporean organizations. *European Journal of Innovation Management*. Vol. 9 No. 3. pp. 269-278
- Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations Management*, Vol. 11, pp 339-366.
- Garvin, D.A. (1988). *Managing Quality: The Strategic and Competitive Edge*. New York: The Free Press.

- Hoang, D.T., Igel, B., and Laosirihongthong, T. (2006). The impact of total quality management on innovation: Findings from a developing country. *International Journal of Quality & Reliability Management*, 23(9) 1092-1117.
- Huang, Y.S. and Lin, B.M.T. (2002) An empirical investigation of total quality management: a Taiwanese case. *The TQM Magazine* 14 (3), pp. 172-181
- Humphreys, P.K., Li, W.L. and Chan, L.Y. (2004) The impact of supplier development on buyer supplier performance, *Omega*, Vol. 32 (2), pp. 131-143
- Johnson, M.D., and Gustafsson, A. (2000). *Improving customer satisfaction, loyalty and profit: an integrated measurement and management system*. San Francisco, CA: Jossey-Bass
- Johnson, M.D., and Nilsson, L. (2000). *The impact of reliability and customization on customer satisfaction for goods versus services*. Ann Arbor, MI: University of Michigan Business School
- Jun, M., Cai, S., and Shin, H., (2006) TQM practice in maquiladora: Antecedents of employee satisfaction and loyalty. *Journal of Operations Management*. 24 pp. 791-812
- Kim, K.Y., and Chang, D.R. (1995) Global quality management: a research focus, *Decision Science*, 26 (5), pp. 561-568
- Krause, D.R., Pagell, M., and Curkovic, S., (1998) Purchasing strategy: An empirical analysis. *Proceeding of the Decision Science Institute*, pp. 1227-1229
- Krause, D.R., Scannell, T.V., Calantone, R.J., (2000) A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance. *Decision Sciences* 31 (1), pp. 33-35
- Lakhal, L., Pasin, F., and Limam, M., (2006) Quality management practice and their impact on performance, *international Journal of Quality & Reliability Management*. Vol. 23 No. 6 pp. 625-646
- Lee, C.Y., (2004). TQM in small manufacturers: an exploratory study in China. *International Journal of Quality & Reliability Management*. 21(2). 175-197.
- Lee, S.M., Rho, B.H., and Lee, S.G. (2003) Impact of MBNQA criteria on organizational quality performance, *International Journal of Production Research*, 41 (9) pp. 2003-2020

- Lin, C., Chow, W.S., Madu, C.N., Kuei, C.H., and Yu, P.P. (2005). A structural equation model of supply chain quality management and organizational performance. *International Journal of Production Economics*. Vol 96, pp 355-365.
- Liu, V.C. and Kleiner, B.H. (2001) Global trends in managing innovation and quality, *Management Research News*, 24 (3&4), pp. 13-16
- Malaysian Rating Corporation Bhd. for 2006. [Website] URL: http://www.marc.com.my/MARC/DOCS/marc_def.pdf [Accessed on 12th November 2006]
- McAdam, R., and Bannister, A. (2001) Business performance measurement and change management within a TQM framework. *International Journal of Operations and Production Management*, 21 (1&2), pp.88-107
- Nilsson, L., Johnson, M.D., and Gustafsson, A. (2001). The impact of quality practices on customer satisfaction and business results: product versus service organizations. *Journal of Quality Management*, 6, 5-27.
- Parast, M.M., Adams, S.G., Jones, E.C., Rao, S.S. and Raghu-Nathan, T.S. (2006). Comparing Quality Management Practices between the United States and Mexico. *Quality Management Journal*. 13(4). 36-49.
- Projogo, D.I., (2005) The comparative analysis of TQM practices and quality performance between manufacturing and service firms. *International Journal of Service Industry Management* Vol 16 No.3, pp. 217-228
- Raghunathan, T.S., Rao, S.S. and Solis, L.E., (1997). A comparative study of quality practices: USA, China and India *Industrial Management & Data Systems*. 97(5) 192-200.
- Rao, S.S., L.E. Solis, and Raghu-Nathan. (1999). A framework for international quality management research: Development and validation of a measurement. *Total Quality Management* 10(7). 1047-1075.
- Reed, R., Lemak, D.J., and Mero, N.P. (2000). Total quality management and sustainable competitive advantage. *Journal of Quality Management*, 5, 5-26.
- Samson, D., and Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 17, 393-409.
- Sanchez-Rodriguez, C., Dewhurst, F.W. and Martinez-Lorente, A.R. (2006). IT use in supporting TQM initiatives: an empirical investigation. *International Journal of Operations & Production Management*. 26(5) pp 486-504.

N. Muhamad et al.

- Saraph, J.V., Benson, P.G. and Schroeder, R.G. (1989). An instrument for measuring the critical factors of quality management. *Decision Science*. Vol 20 pp 810-829.
- Sila, I. (2007). Examining the effects of contextual factors on TQM and performance through the lens of organizational theories: An empirical study. *Journal of Operations Management*. Vol 25 pp 83-109.
- Temtime, Z.T. and Solomon, G.H. (2002) TQM and the planning behaviour of SMEs in developing economies. *The TQM Magazine*. Vol.14. No. 3. pp. 181-191
- The Malaysia Automotive Association 3Q 2006. [Website] URL:
http://www.searchandmarkets.com/report/360686/malaysia_automotive_report.htm
[Accessed on 6th November 2006]
- Woon, K.C. (2000) TQM implementation: Comparing Singapore's service and manufacturing leaders. *Managing Service Quality*, Vol. 10 No 5, pp. 318-331
- Yoo, D.K., Rao, S.S. and Hong, P. (2006). A Comparative Study on Cultural Differences and Quality Practices: Korea, USA, Mexico and Taiwan. *International Journal of Quality & Reliability Management*. 23(6). 607-624.
- Yusof, S.M. and Aspinwall, E., (2000). Critical success factors for total quality management implementation in small and medium enterprises, *Total Quality Management*, 10 (4,5) pp. 803-809.