QUALITY MANAGEMENT INITIATIVES IN MALAYSIA'S MANUFACTURING FIRMS: IMPLICATIONS ON EMPLOYEE INVOLVEMENT, NEW PRODUCT DEVELOPMENT AND QUALITY OF PRODUCTION

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ABSTRACT

This paper explores the implications of quality management on employee involvement, new product development and quality of production in Malaysia's manufacturing firms. Based on the results of research into the implementation of quality management initiatives by 201 manufacturing firms in Malaysia, this paper concentrates on the relationships between quality management and the aforesaid variables. The most significant implication of this paper is that businesses should pay more attention to quality management practices, particularly in Malaysia's manufacturing firms.

Keywords: Quality management, employee involvement, new product development, quality of production

INTRODUCTION

Quality management is seen as a competitive strategy in both manufacturing and service organizations to improve business performance in the global market (Gurnani, 1999). Many companies are now actively implementing the quality management programme to create high quality products and services, and to achieve their business objectives. (Gunasekaran, 1999; Gurnani, 1999). Kuei, Madu and Lin (2001) also contend that better quality would lead to the retention of existing customers and in attracting new customers, which in-turn would increase market share. There are various initiatives in quality management practices that directly led to the creation of a culture that supports change and improvement (Gore Jr., 1999). These initiatives comprise the encouragement of employee involvement, emphasis on empowerment among employees, promote the spirit of teamwork, training and development, and extensive communication.

There are many definitions of quality but none of these definitions can meet with universal recognition. Juran (1993) defines quality as product features that meet customer needs and free from defect. Feigenbaum (1993) defines quality as the comprehensive composite products and services characteristics, involving value chain activities such as marketing, engineering, manufacturing and maintenance to produce products or services that meet customer expectations. In the broader sense, Deming (1986) defines quality as the ability to consistently meet the requirements of the customer. Whichever term or definition is being utilized, it is the principles that count. Dean and Bowen (1994) recognized three quality management principles, which are customer focus, continuous improvement and teamwork.

Quality management has been viewed as a management philosophy that has helped many organizations to achieve world-class status. A study done by Tan and Sia (2001) on quality management initiative in Malaysian companies has proven that customer-focused approach in the operations will increase process efficiency and greater customer satisfaction. The implementation of a quality management programmes is complex and one of the most difficult activities that any company can attempt. It is appropriate that a strong implementation framework is in place before the actual implementation begins to ensure successful quality management initiatives in any organization. One of the most important factors in ensuring the success of adopting quality management initiatives is the formulation of a strong implementation framework before the process of change started (Yusof and Aspinwall, 2000).

Different researchers have offered diverse views of approach on quality management initiatives. The most popular quality management frameworks applied are the ISO 9000 and total quality management. Crosby (1979) discusses fourteen quality steps as a framework for implementing quality management. They are management commitment, quality improvement teams, quality measurement, cost of quality evaluation, quality awareness, corrective action, engaging a zero-defects committee, supervisor training, zero-defects days, goal setting, error cause removal, recognition, quality councils, and doing it over again to achieve quality. Deming (1986) advocates Fourteen Points which are associated with the successful implementation of quality management initiatives. These include constancy of purpose, adopting the philosophy, ceasing mass inspection, refusing to award business solely on price, continuous improvement, training on the job, institute leadership, driving out fear, breaking down barriers, eliminating slogans, eliminating quotas, taking pride in workmanship, self improvement (education and retraining), and putting everybody to work. Saraph, Benson and Schoeder (1989) on the other hand identify eight factors of quality management, which are role of divisional top management and quality policy, role of quality department, training, product/service design, supplier quality management, process management/operating procedures, quality data reporting, and employee relations.

Flyn, Schroeder and Sokakibara (1995) propose seven dimensions of quality management from which a set of 14 perpetual scales are developed, comprise top management support (quality leadership and quality improvement rewards); quality information (process control and feedback); process management (cleanliness and organization); product design (new product quality and interfunctional design process); workforce management (selection for teamwork potential and teamwork); supplier involvement (supplier relationship), and customer involvement (customer interaction). Powell (1995) suggests that complete total quality management programmes tend to incorporate eleven attributes. They are executive commitment; adoption and commitment of total quality management philosophy, increased interaction with customers and suppliers, process management; measurement, employee empowerment, open organization, training, benchmarking, flexible manufacturing, and zero defects mentality. The Malcolm Baldrige Performance Excellence Criteria combine a powerful set of proven principles and management practices that bind an organization together to yield high performance (as cited on the Enterprise website).

In reality all companies talk about the importance of employee's performance. This is supported by Cottam, Ensor and Band (2001) that one way to create growth and sustain organizational performance is to create a proper structure and systems, innovate and to increase the performance of the employees. However, becoming a highly-performing employee demands more than just a debate; it requires an organizational relevant practice that constantly guides organizational members to strive and produce a climate that is conducive to grow individual performance (Ahmed, 1998). There is a long history of research and writing about the positive link between quality management and employee involvement (Tang, Chen and Wu, 2010); quality management and new product introduction (Kumar and Wellbrock, 2009), and quality management and quality production (Battini,Faccio, Alessandro and Sgarbossa, 2012). From the theoretical point of view, the variance of organizational performance would be largely explained through quality management practices since these are originally developed to achieve high quality performance. Prior studies have found that the involvement of employees (Methta, 1999; Da Silva, Kikuo and Tadashi, 2002; Escrig-Tena, 2003), product designs (Li, Andersen and Harrison, 2003; Arawati and Abdullah, 2005; Lewis, 2006; Kanapathy, 2008), and process management in production (Brah and Lim, 2006; Macinati, 2008; Fotopoulos and Psomas, 2009; Jung, Wang and Wu, 2009; Zehir and Sadikoglu, 2010) should be embedded in the quality management programmes.

RESEARCH BACKGROUND

The main aim of this study is to examine the implications of quality management on employee involvement, new product development and quality of production in Malaysia's manufacturing firms. The link between quality management and employee involvement,

new product development and quality of production is a classical theme in management literature. The reason that quality management is now often become the main topic of discussion by both industry and academia, especially those related to improvement and competitiveness. Most of the results from previous studies agree that the implementation of effective quality management has an advantage of improving higher level of quality, productivity and business performance (e.g. Bemowski, 1991; Ahmed, 1998; Terziovski and Samson, 1999; Gunasekaran, 1999; Gurnani, 1999; Arawati and Abdullah, 2000; Kuei et al*.,* 2001; Cottam et al*.*, 2001; Leonard and McAdam, 2002; Sharma and Gadenne, 2002). Given the importance of quality management elements that have been discussed, this study suggests the following hypotheses:

H1: *There is a positive relationship between quality management and employee involvement in Malaysia's manufacturing firms.*

H2: *There is a positive relationship between quality management and new product development in Malaysia's manufacturing firms.*

H3: *There is a positive relationship between quality management and quality of production in Malaysia's manufacturing firms.*

Data Collection Methods

The population of this study comprised of all the manufacturing firms in Malaysia that were registered under the Federation of Malaysian Manufacturers. This study is a non-experimental quantitative study in which a sample survey was used as method of collecting data, or in other words, a seven-point Likert scale questionnaire was used as the instrument of the research. Six hundred questionnaires were mailed at the surrounding areas of the territory of Selangor, Penang, Kedah, Johor, Sabah, Sarawak, and the Federal Territory of Kuala Lumpur and Labuan using disproportionate stratified random sampling, due to the nature of the unit of analysis which was heterogeneous. Out of the 600 mailed questionnaires, only 233 completed questionnaires were returned and 201 were usable for further analysis.

Organization's management representatives were chosen as the target group. These composed of the presidents, executive directors, general managers, accountants or financial controllers, and managers in multi-disciplined (such as, human resource, factory, marketing, sales, administration, etc.). The companies participated in this study have started their operations in between the year of 1950 and 2000. Of the 201 firms in the 16 different industries surveyed, 33 firms were in the electrical and electronics industry, 28 in the chemical and petroleum industry, 27 in the food, beverage and tobacco products, 22 in the fabricated metal, 11 each in the basic metal industry, and paper, printing and publishing, 9 each in transport and plastic products, 17 in the wood products (including furniture), 14 in the non-metallic mineral products, 7 each in the rubber industry, and

textile, wearing apparel and leather products, 3 in the medical, precision and optical instruments, 2 in machinery and 1 in other industry.

In this study, the researchers were trying to unravel the extent of quality development being implemented in the manufacturing sector in Malaysia. As depicted in Table 1, quality was essential with all the 201 firms surveyed with 150 firms leading the way with either a very high level or high of quality development in their firm while 9 firms were recorded to have slightly few quality development incorporated into their businesses.

Table 1 Level of Quality Development

Respondent Companies Characteristics	Frequency	Percentage	Mean	Mode	SD
Level of Quality Development			6.02	7	1.07
Very low	0	0			
Low	1	0.5			
Slightly low	7	3.5			
Uncertain	8	4.0			
Slightly high	35	17.4			
High	69	34.3			
Very high	81	40.3			

Also included in this study was the number of quality activities being undertaken in their respective companies. Out of the 201 surveyed, 80 firms recorded to hold numerous quality activities in their businesses.

Table 2 Quality Activities

Respondent Companies Characteristics	Frequency	Percentage	Mean	Mode	SD
Quality Activities			5.89	6	1.06
Very few	0	0			
Few	0	0			
Slightly few	9	4.5			
Uncertain	11	5.5			
Slightly numerous	37	18.4			
Numerous	80	39.8			
Very numerous	64	31.8			

As indicated in Table 3, the integration of quality activities were being done in majority of the 201 firms surveyed with 65 firms recording high integration while 3 firms were showing fragmented.

Table 3 Integrations of Quality Activities

Respondent Companies Characteristics	Frequency	Percentage	Mean	Mode	SD
Integration of Quality Activities			5.79	6	1.19
Highly fragmented	0	0			
Fragmented	3	1.5			
Slightly fragmented	10	5.0			
Uncertain	11	5.5			
Slightly integrated	44	21.9			
Integrated	68	33.8			
Highly integrated	65	32.3			

FINDINGS

Statistical analyses were conducted using SPSS to calculate descriptive statistics, reliability analysis, correlation and regression.

Factor Analysis

In this study, the quality management is a multidimensional construct. This construct was represented by seven dimensions. They were leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management, and business results. A principle component method with a varimax rotation was utilized in order to reduce a large number of variables to a smaller numbers of factors. After the final run of factor analysis, one factor with eigenvalues more than one was produced, that explained 65.32 of the total variance. The Kaiser-Meyer-Oklin value was 0.81 and the Bartlett test of sphericity was significant at 0.00. Anti-image correlation of the remaining seven items of quality management exceeded 0.50. The communalities of the 7 items ranged from 0.54 to 0.69. The factor loadings for the remaining 7 quality management variables were in the range of 0.74 to 0.85, which indicated above recommended cut-off point value of 0.40 for practical and statistical significance. All the variables were loaded significantly on one factor as conceptualized; therefore the same label was used to label this factor, i.e. “quality management”.

The final factor analysis run was on employee involvement, new product development and quality of production which were presented by fifteen items. They were employee involvement (5 items), quality of production (5 items), and new product development (5 items). These constructs are also a multidimensional construct. On the last run, the factor analysis was still producing three factors with eigenvalues more than one, which

explained 76.36% of the total variance. The Kaiser-Meyer-Oklin value was 0.86 and the Bartlett test of sphericity was significant at 0.00. Anti-image correlation of the remaining ten items of the three constructs exceeded 0.50. The communalities of the 13 items ranged from 0.51 to 0.85. The factor loadings for the remaining 13 organizational performance variables were in the range of 0.69 to 0.87, which indicated above recommended cut-off point value of 0.40 for practical and statistical significance. The variables were loaded significantly on three factors as conceptualized; therefore the same labels were used to label these factors.

Reliability Analysis

The Cronbach's alpha for each of the dimensions of organizational factors, quality management, employee involvement, new product development and quality of production are presented in Table 4. The Cronbach's alpha value for quality management is 0.91. Meanwhile, employee involvement, new product development and quality of production produced an alpha coefficient in between 0.88 and 0.93.

Table 4 Reliability Analysis (N=201)

Construct	No. of Items	Cronbach's Alpha
Quality Management	7	0.91
Employee Involvement	5	0.93
New Product Development	5	0.88
Quality of Production	3	0.91

Means, Standard Deviations and Correlations

Hence, the degree of consistency between multiple measurements of variable in this study is high. All items required seven-point Likert-style responses, ranging from 1 (strongly disagree) to 7 (strongly agree). A Likert rating from 5 to 7 were grouped as "agree", a rating of 4 as a "neutral" opinion, and a rating of 1 to 3 were grouped as "disagree". Table 5 presents the scores of all the variables applied in this study, along with all means and standard deviations. Results show that the mean scores for each of all of the constructs in this study varied from 5.10 to 5.70, indicating that respondents had a high opinion of all the dimensions. The standard deviation for these components ranged from 0.64 to 1.00.

Table 5 Means, Standard Deviations and Correlations

Variables	Mean	SD	1	2	3	4
Quality Management	5.73	0.64	1.00			
Employee Involvement	5.32	0.70	0.40**	1.00		
New Product Development	5.07	1.00	0.40**	0.46**	1.00	
Quality of Production	5.64	0.91	0.48**	0.57**	0.35**	1.00

*** Correlation is significant at the 0.01 level (2-tailed)*
** Correlation is significant at the 0.05 level (2-tailed)*

In order to measure the degree of the linear relationship between two variables, the Pearson correlations coefficient was performed. Cohen (1988) interprets the correlation values as: small/weak when the correlation value is r = 0.10 to 0.29 or r = -0.10 to -0.29, medium/moderate when the value is r = 0.30 to 0.49 or r = -0.10 to -0.29 and large/strong when the value is r = 0.50 to 1.0 or r = -0.50 to -1.0 large. As shown in Table 5, the results indicate that quality management has a significant and positive correlation with the three aforementioned dimensions. More specifically, quality management correlates moderately with employee involvement ($r = 0.40$, $p < 0.01$), new product development ($r = 0.40$, $p < 0.01$), and quality of production ($r = 0.48$, $p < 0.01$).

Hypothesis Testing

Hypotheses 1, 2 and 3 were examined to investigate whether there were a positive relationship between quality management and employee involvement, new product development and quality of production in Malaysia's manufacturing firms. In order to test the relationship between quality management and employee involvement, new product development and quality of production, the multiple regression analysis was employed. Table 6 shows that 16.30% of the total variance in employee involvement was explained by quality management ($R^2 = 16.30$, $p < 0.01$). The results indicates quality management has significant influences on employee involvement ($\beta = 0.40$, $p < 0.01$). As depicted in the same table, 15.80% of the total variance in new product development was explained by quality management ($R^2 = 15.80$, $p < 0.01$). The result indicates that quality management had significant influences on new product development ($\beta = 0.40$, $p < 0.01$). The results in Table 6 also reveals that 22.70% of the total variances in quality of production were explained by quality management ($R^2 = 22.70$, $p < 0.01$). With $\beta = 0.48$, $p < 0.01$, the result indicates that quality management has significant influences on quality of production. Therefore, all the hypotheses were supported.

Table 4 Regression Analysis

Variables	Std. Coefficient Beta (β)	Sig.
Employee Involvement	0.40**	0.00
New Product Development	0.40**	0.00
Quality of Production	0.48**	0.00

*Significant levels: **p < 0.01, *p < 0.05*

DISCUSSION, IMPLICATIONS AND CONCLUSION

The multi regression analysis results confirmed that quality management had a substantial influence on organizational performance, which were consistent with the previous studies. Hypothesis 1 ($\beta = 0.40$, $p < 0.01$), 2 ($\beta = 0.40$, $p < 0.01$), and 3 ($\beta = 0.48$, $p < 0.01$) are all supported. The findings showed that quality management was associated with employee involvement, new product development and quality of production in Malaysia's manufacturing firms. There was a long history of research and writing about the positive link between quality management and employee involvement (Tang et al., 2010); quality management and new product development (Kumar and Wellbrock, 2009), and quality management and quality of production (Battini et al., 2012).

From the theoretical point of view, the variance of organizational performance would be largely explained through quality management practices since these were originally developed to achieve high quality performance. Prior studies found that the involvement of employees (Methta, 1999; Da Silva et al., 2002; Escrig-Tena, 2003), product designs (Li et al., 2003; Arawati and Abdullah, 2005; Lewis and Lalla, 2006; Kanapathy, 2008), and process management in production (Brah and Lim, 2006; Macinati, 2008; Fotopoulos et al., 2009; Jung et al., 2009; Zehir et al., 2010) should be embedded in the quality management programmes. This study motivates managers to invest in the time and resources to implement quality management programs in their respective organizations. Based on the results of this study, the implementation of quality management practices is associated with enhanced organization performance. This signals the importance of ensuring a supportive organizational environment for the effective implementation of quality management as this can be seen from trend of manufacturing firms in Malaysia towards adopting quality initiatives. In Table 1, 92 per cent of the respondents from the unit of analysis of this study declared had been certified to the ISO 9000. 75.1 per cent of the respondents claimed that the level of quality development in their companies was high, while 90 per cent affirmed that quality activities in their companies were abundant. As stated in Table 2, 88 per cent of the respondents said that most of their processes their respective companies were integrated with quality activities.

Evidence from this study suggests that organizations should develop an environment of support, which includes fostering support among co-workers, for the effective implementation of quality management. According to Oakland (2005), if employees do not feel there is sufficient acknowledgement and support from the organization and from colleagues with whom they work, then firms may not acquire the benefits of quality management initiatives. The results of the study also clearly indicate that firms cannot consider quality management simply a passing administrative fashion for achieving sustainable competitive advantage over time. Therefore, quality management cannot be dismissed as just an administrative trend, because it provides a typical organisational resource on which firms may build a durable competitive advantage (Juran, 1993; Kaynak, 2003; Oakland, 2005).

Managers can find in quality management practices a tool to promote innovation (Perdomo-Ortiz, Gonzalez-Benito and Galende, 2006; Hoang, Igel and Laosirihongthong, 2006; Martinez-Costa and Martinez-Lorente, 2008) and improve organizational performance (Terziovski and Samson, 1999; Sun, 2000; Sila, 2007). Managers should also understand the logical sequence between quality objectives, innovation objectives, and organizational goals. From a theoretical perspective, the findings of this study provide implications for how the resource based view tenets work when it comes to quality management. To the extent that resource based view logic focuses on the role of resources in terms of their impact on differential firm performance, the results of the present studies suggest that quality management initiatives is proven to be a potential means to create sustainable competitive advantage.

To sum up the findings, this study provides evidence on the relationships between an effective implementation of quality management and employee involvement, new product development and quality of production. The results of this study demonstrate that all of the three hypotheses related to the relationship between quality management and employee involvement, new product development and quality of production were positive implying that quality management is a must in manufacturing firms in Malaysia.

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