The Influence of Critical Soft Factors on Quality Improvement and Organizational Performance: Evidence of Malaysia’s Electrical and Electronics Sector

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ABSTRACT

Quality management (QM) is considered to be an important management philosophy that sustains organizations towards continuous quality improvement (QI) and customer satisfaction. The conventional wisdom is that quality improvement leads to higher revenues, decreased costs, and increased profits. This paper examines the influence of the critical soft factors (CSFs) on QI practice and organizational performance. The following soft factors were found to have significant influence on QI practice: management commitment, customer focus, employee involvement, training and education, as well as reward and recognition. Organizational performance was significantly influenced by the following soft factors: management commitment, customer satisfaction, employee involvement, and reward and recognition. QI was positively related to organizational performance.

INTRODUCTION

Business organizations all over the world including Malaysian organizations have to maintain and enhance their competitiveness in the face of fierce global competition, changing markets and technological breakthroughs. Increasingly, battles for competitive superiority are being won by achieving outstanding quality, whether from manufacturing or service businesses and customers demanding high-quality goods and services (Evans and Lindsay, 2002). Therefore, Malaysian organizations will lose ground to competitors if they do not respond to changes. To compete in the global market, Malaysian manufacturers have long realized that they need to produce quality goods and services (Agus and Abdullah, 2000).

The pursuit of organizational effectiveness and success through higher quality in products and services is a dominant theme for organizations throughout the world (Beckford, 1998). Organizations have no other alternative but to continuously improve their quality of products and services. Commitment to continuous QI has become the new way of doing business (Juran, 1981). Therefore, QI plays an important role towards the productivity and performance of an organization. High quality goods and services can provide an organization with a competitive edge and also reduces costs due to returns, reworks, inspections and scrap (Evans and Lindsay, 2002). This idea has also been suggested by Deming (1986) that higher quality implies lower costs and increased productivity, which in turn gives the firm a greater market share and better competitive levels. Overall, QI in organizations aims to increase the organizational performance through customer satisfaction.

Quality management has been applied as a way of improving activities and performance in firms (Powell, 1995; Kaynak, 2003). Several studies have shown the link between quality management practices and improved performance, using both factual data (Easton and Jarrell, 1998; Hendricks and Singhal, 1997, 2001) and perceptual data (Saraph et al., 1989; Powell, 1995; Samson and Terziiovski, 1999; Parajogo and Sohal, 2006). Quality improvement practices can improve company performance on measures such as customer satisfaction, market share, employee performance, profits, and return on investments, cycle times and process costs (GAO, 1999). Several other empirical researches (Buzzel and Wiersema, 1981; Craig and Douglas, 1982; Philips et al., 1983) and more recent findings (Jacobson and Aaker, 1987; Flynn et al., 1997; Forker et al., 1996; Adam et al., 1997) also supported the proposition that better quality has a positive relationship with organizational business performance.
These kinds of studies are scarce in Electrical and Electronics (E&E) firms and their quality improvement practices are important to the performance and continuous survival of Malaysian E&E organizations. Most of the previous empirical studies devoted to quality management focus on manufacturing firms or a combination of manufacturing and service firms, while only a few studies have analysed the link between quality management and performance by E&E organizations (Eng Eng and Yusof, 2003; Agus, 2001). Accordingly, more research on these issues is needed to fill the existing gap in the empirical literature. Because quality process and performance among the E &E sector in Malaysia is still below the level expected to generate the required economic growth for becoming a high tech industrial nation by 2020 (Idris, McEwan and Belavendram, 1996; Best and Rasiah, 2003), then there is an urgent need for more empirical investigations on the critical soft factors that can promote and enhance successful QI practices and performance in these organizations.

The aim of this paper is to examine the influence of critical soft factors (CSF) on quality improvement and performance and also to investigate the link between quality improvement practice and performance in 255 E&E firms in Malaysia. For that purpose, this study examines: (i) the extent to which the six critical soft factors explain quality improvement, (ii) the extent to which the critical soft factors explain organizational performance and (iii) the relationship between quality improvement practices and organizational performance. The contribution of this research consequently lies in the expansion of the link between quality management and performance through the complementation of the empirical results about these issues in the scarce literature dedicated to quality management in the E&E firms.

REVIEW OF LITERATURE

Critical Soft Factors of Quality Improvement

Several studies from the quality management literature have identified key dimensions of quality improvement practices (Saraph et al. 1989; Flynn et al. 1994; Ahire et al. 1996; Rao et al. 1999). These studies show the critical factors of quality management. Alongside these studies there were other general studies carried out specifically in Malaysia (Idris et al., 1996; Agus and Sagir, 2001; Eng Eng and Yusof, 2003). All these authors show common issues which are critical for successful continuous quality improvement in the organizations, these soft factors are: management commitment, customer focus, employee involvement, training, employees’ reward, and relationships with suppliers. Besides these studies, several quality improvement models such as Malcolm Baldridge, European Foundation for Quality Management, and the Deming Prize have also identified critical soft factors such as leadership, process management, training, communication, teamwork, and learning as the key practices for effective quality improvement.

Critical Soft Factors and Performance

Motwani et al. (1994) showed that a significant relationship existed between six of the eight quality factors and quality performance in manufacturing companies in India. Flynn et al. (1994) in their study showed that quality leadership, process management, work force management, quality information, and supplier involvement had the strongest effect on the quality performance measures. Powell (1995) in his study showed that most soft and hard quality factors (e.g. executive commitment, employee involvement and empowerment, zero defects mentality, process improvement) were positively correlated with performance. Based on these findings he stated that the key to quality improvement performance lies not in quality tools and techniques like benchmarking and process improvement, but in intangible, behavioral factors like leadership, organizational skill, and culture. In another study, Adam et al. (1997) found that most of the soft factors such as employee satisfaction, compensation, customer focus, and knowledge of quality were indicated as significant predictors of quality performance. They concluded that quality improvement could be enhanced by a few specific management actions: increasing knowledge about quality, a customer focus, and management involvement.

Samson and Terziovski (1999) found significant positive relationships between organizational performance and leadership, people management, and customer focus. Quazi and Padibjo (1998) found that training, role of quality department, role of top management, and supplier quality management predicted quality performance significantly.
Dow et al. (1999) also found that three out of their nine factors of TQM had a significant positive association with organizational performance. These three critical soft factors are workforce commitment, shared vision, and customer focus.

Quality Improvement and Performance
Several studies on quality improvement such as Deming (1986), Schmidt & Finnigon (1992), Opara (1996) Hendriks & Singhal (1997), Wimsatt (1998) and Christiansen (1995), have indicated that QI practices bring improvement to overall financial performance. Ahire (1996) proposes that QI in organizations can improve product quality and business performance. He also suggested that there was a significant positive relationship between quality improvement and performance. In addition, several other studies also have succeeded in providing evidence that QI practices have a positive effect on financial performance and/or overall performance of organizations (Schaffer and Thomson, 1992; Opara, 1996; Cherkasky, 1992; Agus and Hassan, 2000).

The Theoretical Framework
Flynn et al. (1994) studied the relationships between quality practices and performance. Dividing quality practices into core and supportive practices, they established and tested a theoretical model. They reported the results of a path analysis of a sample of 45 plants in the U.S that showed that a significant and positive path coefficient between top management support and most QI practices. But no significant relationships were found for three quality practices-supplier relationship, process flow management, and statistical control and feedback. In general, quality management infrastructure practices were supportive of core quality management practices, although not all hypothesized relationships were significant. Consistent with expectation, significant relationships were shown to be present between product design process and perceived quality, and between process flow management and percent passed final inspection with no rework. Statistical control and feedback did not show significant relationships with these two quality achievement measures. Nevertheless, the two distinctive characteristics of quality practices, namely core and supportive qualities that they highlighted have provided an important contribution for QI model development and testing, and gave additional insight onto the study of quality practices-performance relationships. This study also suggests that core quality improvement practices act as a mediator in the relationship between critical quality factors (supportive factors) and performance. In other words, critical quality factors affect QI practices, which in turn affect quality performance in organizations. The critical soft factors also affect directly the performance of the organizations. This theoretical foundation proposed by Flynn et al. (1994) was used as the theoretical basis for the current study.

Based on Flynn’s model, literature review and other theoretical ideas and discussions, this study develops a theoretical framework that incorporates the importance of critical soft factors for organizational QI and performance. The theoretical framework that involves the relationships between the critical soft factors, QI and performance is presented in Figure 1 and the three hypotheses are provided accordingly.

Figure 1. The Theoretical Framework

H1: Critical soft factors are positively related to quality improvement.
H2: Critical soft factors are positively related to organizational performance.
H3: Quality improvement is positively related to organizational performance.
METHODOLOGY

Population and Sample
The population comprised 676 E&E firms from West Malaysia while a sample of 350 firms was selected randomly from the Federal Malaysian Manufacturers (FMM) list in 2004. A structured questionnaire with closed questions was sent by post to all 350 E&E firms. Firstly, a pre-test was carried out with 15 firms. This pre-test helped to improve the structure and content of the questionnaire. Secondly, a total of 275 managers responded, (although 20 of the questionnaires received had incomplete responses and were therefore removed from the analysis). Thus, the research is based on data from 255 respondents. Preliminary analysis was conducted to check for any violations in normality, equality of variances and linearity. The data from the sample fulfilled all of the assumptions allowing for parametric tests to be conducted.

The primary data for the study was collected through survey method by using standardized, structured self-administered questionnaires. The individual managers representing each firm comprised the unit of analysis for the study. The first questionnaire to measure the six critical soft factors was adopted from Zhang et al. (2000). The second questionnaire to measure quality improvement practices was adopted from Fynes and Voss (2001). Organizational performance was measured based on 9 productivity performance indicators adopted from the Malaysian National Productivity Corporation (NPC, 2005). A ten point Likert scale was used for measuring the six critical soft factors and organizational performance. Cronbach Alphas in our study were 0.96, 0.90 and 0.97 for overall critical soft factors, quality improvement and organizational performance, respectively. Finally, a total of 255 questionnaires were collected comprising the final sample of the study.

FINDINGS AND DISCUSSION

The Relationship between Critical Soft Factors and Quality Improvement
Based on the stepwise regression method used, only five predictor variables were found to be significant in explaining QI. They are management commitment (X1), customer satisfaction (X2), employee involvement (X3), training & education (X4) and reward & recognition (X5). Supplier relationship (X6) was excluded because it did not contribute in significance (t = 0.367, p = 0.714) to the variation of the dependent variable (QI). As depicted in the coefficients table (see Table1), the estimate of the model coefficient for b0 is 1.992, b1 is 0.160, b2 is 0.152, b3 is 0.479, b4 is 0.056 and b5 is 0.200. Therefore, the estimated model is as follows:

Y (QI) = 1.992 + 0.160 (X1) + 0.152 (X2) + 0.479 (X3) + 0.056 (X4) + 0.200 (X5) + e

Where: e = Error

The R-squared of 0.938 implies that the five predictor variables explained 93.8% of the variation in quality improvement. The ANOVA table shows that the F-statistic (748.342) is extremely large and the corresponding p-value is highly significant (0.0001) or lower than the alpha value of 0.05. This indicates that the slope of the estimated linear regression model line is not equal to zero confirming that there is a linear relationship between QI and the five-predictor variables.

<table>
<thead>
<tr>
<th>CSFs</th>
<th>B (Unstandardized Coefficients)</th>
<th>Std. Error</th>
<th>Beta (Standardized Coefficients)</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.992</td>
<td>0.152</td>
<td>13.136</td>
<td>0.0001</td>
<td>0.0001</td>
</tr>
<tr>
<td>Management Commitment</td>
<td>0.160</td>
<td>0.026</td>
<td>0.141</td>
<td>6.109</td>
<td>0.0001</td>
</tr>
<tr>
<td>Customer Focus (X2)</td>
<td>0.152</td>
<td>0.035</td>
<td>0.193</td>
<td>4.353</td>
<td>0.0001</td>
</tr>
<tr>
<td>Employee Involvement</td>
<td>0.479</td>
<td>0.037</td>
<td>0.556</td>
<td>13.058</td>
<td>0.0001</td>
</tr>
<tr>
<td>Training &amp; Education</td>
<td>0.056</td>
<td>0.028</td>
<td>0.064</td>
<td>2.021</td>
<td>0.0440</td>
</tr>
<tr>
<td>Reward &amp; Recognition</td>
<td>0.200</td>
<td>0.021</td>
<td>0.294</td>
<td>9.668</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Notes:  R = 0.968; R² = 0.938; Adj. R² = 0.936
Table 1 also indicates that the largest beta coefficient is 0.479, which is for employee involvement. This means that this variable makes the strongest contribution to explaining the dependent variable (QI), when the variance explained by all other predictor variables in the model was partialed out. It suggests that one standard deviation increase in employee involvement is followed by a 0.479 standard deviation increase in QI. The Beta value for reward and recognition is the second highest (0.200), followed by management commitment (0.160). It means that one standard deviation increase in management commitment and reward and recognition are followed by 0.160 and 0.200 standard deviation increases in QI respectively. Fourth is customer focus (0.152) while training and education is fifth place (0.056). Thus, hypothesis one (H1) is supported. This is because only one critical factor did not contribute significantly (supplier relationship).

This finding supports the studies of Saraph et al. (1989), Flynn et al. (1994), Badri et al. (1995), Black and Porter (1996), Ahire et al. (1996), Grandzol and Gershon (1998), Quazi and Padibjo (1998), Rao et al. (1999) and Conca et al. (2004) and also a few Malaysian studies (Idris et al., 1996; Agus, 2001; Eng Eng and Yusof, 2003). However, supplier relationship is not a significant predictor in explaining QI. This is because this variable was considered as least important as supported by the studies of Eng Eng and Yusof (2003) in Malaysian E&E firms, and Yusof and Aspinwall (1999) in UK companies who found that most of the small sized firms adopted very low level of supplier relationship, hence in affecting QI.

The Relationship between Critical Soft Factors and Organizational Performance

Based on the stepwise method used, only four predictor variables were found to be of significance in explaining OP. The three-predictor variables are management commitment (X1), customer satisfaction (X2), employee involvement (X3) and reward & recognition (X5). The remaining two predictor variables, training & education (X4), and supplier relationship (X6) were excluded because they did not contribute in significance (t < 1.96, p > 0.05) to the variation of the dependent variable (OP). As depicted in the coefficients table (see Table 2), the estimates of the model coefficients for b0, b1, b2, b3, b4, b5, b6 is 1.335, 0.223, 0.920, 0.774, 0.192, 0.056 and 0.134. Therefore, the estimated model is: Y (OP) = 1.335 + 0.223 X1 + 0.920 X2 + 0.774 X3 + 0.134X5 + e

Where: e = Error

The R-squared of 0.256 implies that the four predictor variables explain about 25.6% of the variance in organizational performance. The ANOVA table revealed that the F-statistics (28.752) is large and the corresponding p-value is significant (0.0001) or lower than the alpha value of 0.05. This indicates that the slope of the estimated linear regression model line is not equal to zero confirming that there is linear relationship between OP and the four predictor variables.

Table 2. Regression Coefficients of Critical Soft Factors with Organizational Performance

<table>
<thead>
<tr>
<th>Critical Soft Factors</th>
<th>B (Unstandardized Coefficients)</th>
<th>Std. Error</th>
<th>Beta (Standardized Coefficients)</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.335</td>
<td>0.603</td>
<td>2.215</td>
<td>0.028</td>
<td></td>
</tr>
<tr>
<td>Management Commitment (X1)</td>
<td>0.223</td>
<td>0.088</td>
<td>0.167</td>
<td>2.535</td>
<td>0.012</td>
</tr>
<tr>
<td>Customer Focus (X2)</td>
<td>0.920</td>
<td>0.122</td>
<td>0.996</td>
<td>7.519</td>
<td>0.0001</td>
</tr>
<tr>
<td>Employee Involvement</td>
<td>0.774</td>
<td>0.136</td>
<td>0.764</td>
<td>5.691</td>
<td>0.0001</td>
</tr>
<tr>
<td>Reward &amp; Recognition</td>
<td>0.134</td>
<td>0.119</td>
<td>0.146</td>
<td>4.356</td>
<td>0.0025</td>
</tr>
</tbody>
</table>

Notes: R = 0.506; R² = 0.256; Adj. R² = 0.247

As depicted in Table 2, the largest beta coefficient is 0.920, customer focus. This variable has made the strongest contribution to explaining the dependent variable (OP), when the variance explained by the other predictor variables in the model were partialed out. It suggests that one standard deviation increase in customer focus is followed by a 0.920
standard deviation increase in OP. The Beta value for employee involvement is the second highest (0.774). It means that one standard deviation increase in employee involvement is followed by a 0.774 standard deviation increase in OP. These findings partially support hypothesis two (H2) which indicates a positive association between three out of six critical soft factors and organizational performance. Previous studies also had demonstrated that QI practices would lead to higher levels of organizational performance (Badri et al., 1995; Adam et al., 1997; Quazi et al., 1998; Easton and Jarrell, 1998; Dow et al., 1999; Rao et al., 1999; Das et al., 2000; Singles et al., 2001; Tsekouras et al., 2002; Wayhan et al., 2002; and Kaynak, 2003). However, the findings also show that training & education and supplier relationship were not significant predictors of OP and this result supports previous studies (Eng Eng & Yusof, 2003) in Malaysia that found that most of Malaysian E&E firms have a low level of adoption in training and supplier relationship especially the smaller firms.

**Relationship between Quality Improvement and Organizational Performance**

The relationship between QI and OP was investigated using Pearson product-moment correlation coefficient (r). Preliminary analysis was performed to ensure non violation of the assumptions of normality and linearity. There was a strong positive linear relationship found between OP and quality improvement practice \((r = 0.588, p = .0001)\). The positive correlation coefficient of 0.588 indicates that as the score for QI increases so does the rating for organizational performance. Hence, it would seem logical to say that organizational performance (OP) is more apt to increase when QI increases. This finding conforms to the earlier research findings of Christiansen and Lee (1994); Powell (1995); Flynn et al. (1995a, b); Ittner and Larcker (1996); Hendricks and Singhal (1996, 1999, 2001); Dow et al., (1999); Samson and Terziiovski (1999), Agus and Sagir (2001) and Kaynak (2003) that found a strong positive relationship between QI and organizational performance. In this sense, this study empirically demonstrated that OP increases when organizations implement more quality improvement practices.

**CONCLUSIONS**

This study highlights the relationship between critical soft factors, quality improvement and organizational performance. Five out of six critical soft factors in this study were shown to have a very high positive significant influence on QI practice, and only four critical soft factors showed a positive significant effect on organizational performance among the E&E firms. QI showed a moderate positive linear relationship with organizational performance. This study provides evidence that QI practices have a significant effect on overall organizational performance. For QI practices to impact organizational performance, it is essential that such practices be supported by critical soft factors. This further indicates that the firm managers need to focus more on these critical soft factors to achieve higher organizational performance.

The significance of this study is that one can learn more about the critical soft factors for effective QI implementation especially in Malaysian business organizations. Armed with this knowledge, organizational leaders and managers can prepare themselves, their employees, and their organizations for the consequences of change, to the benefit of all stakeholders in the organization.

Future studies could include E&E firms from East Malaysia (the states of Sabah and Sarawak) in order to provide a better and broader overall generalization to the findings of the study. This study can be expanded to include other member countries in ASEAN such as Singapore, Thailand, Brunei and Thailand in order to make comparisons in terms of QI practices and performance. This study can also be replicated for implementation in the public sector, which would provide further validation and reinforcement of the instruments used in the study. Since this is a cross-sectional study, it is recommended that future studies embark on longitudinal research that could provide more valuable contributions to theory development and refinement in the fields of quality management and HRD. Future research could also examine issues such as customer perceptions of quality and performance and could embark on examining the interrelationships between critical soft and hard factors of quality improvement and their joint contributions to organizational performance. Empirical study in comparing the soft factors and hard factors of TQM is needed in order to identify which aspects contribute significantly to promoting QI practices in business organizations especially in the Malaysian context. There
may be other critical soft factors worth considering for the expansion of this study such as communications (Black and Porter, 1996), teamwork (Yusof and Aspinwall, 1999) and quality culture (Ahire et al., 1996) in relation to quality improvement and performance. The study can be further widened to include the public and other industries such as utilities, automotive, textiles, metals, and construction.

REFERENCES


