Quality Management Practice and Organisational Performance in Manufacturing Industry: A Conceptual Framework

Zaharuzaman Jamaluddin, Ahmad Mahir Razali and Zainol Mustafa

Abstract

The purpose of this paper is to develop the conceptual framework on quality management (QM) practice and organisational performance (OP) for the manufacturing industry in Malaysia. This study investigates the QM practice elements which cover aspect of hard and soft quality factors in manufacturing processes environment. A conceptual relationship on QM practices and OP process from literatures is considered. These findings further verified through a survey which involved the quality practitioner from selected manufacturing industries. The research model which consists of QM practice and OP, is measured using the following six indicators: management commitment, training, process management, quality tools, continuous improvement and organisational performance. The results of the study can be used by managers in manufacturing companies to consider and adapt their QM practices and performance assessments towards increasing competitiveness. The review helps future researchers and practitioners to choose appropriate QM factors. The paper suggest generic conceptual research model in order to examine these relationships in manufacturing companies. Previous research shows there is a research gap related to QM practices involving hard quality factor particularly quality tools and continuous improvement in the manufacturing process in Malaysia.

Keywords: Quality management, organisational performance manufacturing

INTRODUCTION

Quality management (QM) is one that needs be emphasized by the organisations to remain competitive in a systematic and planned manner. In the manufacturing industry it is important to produce quality products through higher accuracy in manufacturing process. The competent process management will ensure production costs are at the minimum with fewer production defect and shorter production time. Higher quality implies lower costs and increased productivity, which in turn give the organisation a greater market share and better competitive fitness (Evans & Lindsay, 2002). As decision-makers realise the importance of high-quality production in establishing and maintaining a globally competitive position, the level of interest in research on quality management has correspondingly increased (Yeung et al., 2005; Abdullah et al., 2008). Flynn et al. (1995) describe that quality management practices as critical activities that are expected to lead, directly or indirectly, to improved quality performance and competitiveness. The content of quality management practices has been steadily expanding since the quality revolution began in Japan in 1950s (e.g. Flynn et al., 1995; Lakhal et al., 2006; Tari et al., 2007; Su et al., 2008). Currently, QM practices consist of not only traditional quality management methods such as quality measurement and control, but sets of quality programs and philosophies such as in TQM and ISO 9000 quality systems (Su et al. 2008). Wilkinson (1992) divided the factors of quality management into two different groups called soft and hard factors. ‘Hard’ quality management factors are more technique-and tool-oriented; these include statistical process control, quality function deployment, and other production and quality improvement
techniques. Instead, ‘soft’ quality management factors involved with a characterised of customer awareness and management of human resources.

This paper is to develop the conceptual framework on QM practice and OP processes for the manufacturing industry in Malaysia. This study investigates the QM practice elements which cover aspect of hard and soft quality factors in manufacturing process environment.

LITERATURE REVIEW

The statement related to quality has been defined in different ways by different authors. Gurus of QM practices such as Garvin, Juran, Crosby, Deming and Feigenbaum all provided their own definitions of quality concepts. Garvin (1987) defined quality by investigative their eight principle dimensions: performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Juran (1951) defined quality as “fitness for use” and focused on trilogy of quality planning, quality control and quality improvement. Similarly, Crosby (1996) defined quality as “conformance to requirements or specifications” that is based on customer needs. He recognized 14 steps for zero defects quality improvement plan to achieve performance improvement. According to Deming (1986), quality is a predictable degree of uniformity and dependability, at a low cost and suited to the market. He also identified 14 principles of quality management to improved productivity and performance of the organisations’ performance. He contributed to the quality literature by introducing a cause and effect diagram to analyse quality problems. Feigenbaum (1983) introduced the concept of organization-wide total quality control and defined quality as the total composite product and service characteristics of marketing, manufacturing and maintenance through which the product and service in use will meet the expectations by customer. He also stresses that total quality management covers the full scope of the product and service life cycle from product conception through production and customer service. In other words, quality is a continuing process to improve the product and service quality of the organization in order to meet customer satisfaction.

Quality management practices generally refer to a coordinated and integrated set of operational processes that delivery quality, which is defined as-all of the features and characteristics of a product or service that affect its ability to meet specific needs. These include organisational responsibilities, resources, procedures and structures (Yeung et al., 2005). Based on our literature review on quality management and performance (Samson & Terziovski, 1999; Yusof & Aspinwall, 2000; Kaynak 2003; Agus, 2005; Tari et al., 2007; Su et al., 2008), commonly encountered constructs or factors, such as management commitment, training, process management, quality tools, continuous improvement and organisational performance, were also used in this research. The above six constructs were derived from the comparison of quality management practices and their performance across different studies, as shown in Table 1. The scope of this research is based on literature review of 17 QM articles which related to manufacturing organisation published between 1998 to 2008. Thus, this study investigate the common factor or dimension from 17 QM articles which are management commitment, training, process management, quality tools, product design, supplier management, customer focus, continuous improvement and organisational performance. However the factors of product design, supplier management and customer focus were not included in this study because the researcher’s is focusing on the manufacturing process at production floor.

QM Practices Factors

Chrusciel and Field (2003) defined top management commitment as an active and visible support or commitment from the management of the organization, often in the form of a champion for the organization. Management commitment has been identified as one of the major determinants of successful of quality management implementation (Ahire, 1996). Manager acts as a driver of quality management implementation, creating values, goals and systems to satisfy customer satisfactions and improve an organization performance. Yusof and Aspinwall (2000), Kuei et al. (2001), Kaynak et al. (2003), Agus (2005), Yeung et al. (2005), Dermirbag et al. (2006), Abdullah et al. (2008), and Su et al.
Quality Management Practice and Organisational

(2008) have research management commitment as one of key factor of quality management in their studies.

Table 1: Comparison of quality management and performance construct across different studies in year 1998-2008

<table>
<thead>
<tr>
<th>No.</th>
<th>Yeung et al., 2005</th>
<th>Demirbag et al., 2006</th>
<th>Feng et al., 2006</th>
<th>Lakhal et al., 2006</th>
<th>Tari et al., 2007</th>
<th>Abdullah et al., 2008</th>
<th>Arumugam et al., 2008</th>
<th>Su et al., 2008</th>
<th>This study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Top management leadership</td>
<td>Role of top management</td>
<td>Leadership Strategic Planning</td>
<td>Top management commitment &amp; support</td>
<td>Leadership</td>
<td>Management commitment</td>
<td>Leadership</td>
<td>Top management commitment</td>
<td>Management commitment</td>
</tr>
<tr>
<td>2</td>
<td>Learning and teamwork</td>
<td>Training Employee relation</td>
<td>People management</td>
<td>Employee training Employee participation</td>
<td>Learning Human resource management</td>
<td>Training and education Employee involvement</td>
<td>People involvement</td>
<td>Employee training Employee involvement</td>
<td>Training</td>
</tr>
<tr>
<td>4</td>
<td>Quality system procedure</td>
<td>Quality data and reporting</td>
<td>Information and analysis</td>
<td>Statistical quality techniques</td>
<td>Quality tools and techniques</td>
<td>Feedback</td>
<td>Information analysis</td>
<td>Statistical process control</td>
<td>Quality tools</td>
</tr>
<tr>
<td>5</td>
<td>Supplier management</td>
<td>Supplier quality management</td>
<td>Supplier management</td>
<td>Supplier management</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Customer focus</td>
<td>Customer focus</td>
<td>Customer focus</td>
<td>Customer focus</td>
<td>Customer focus</td>
<td>Customer focus</td>
<td>Customer focus and satisfaction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
<td>Continuous improvement</td>
</tr>
<tr>
<td>9</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
<td>Supplier relationship</td>
</tr>
</tbody>
</table>

This study
Quality Management Practice and Organisational

Training refers to a planned effort by a company to facilitate employees’ learning of job-related competencies and these competencies include knowledge skills or behaviors that are critical for successful job performance (Noe, 2008). People in the organisation should be continually trained and be given adequate training and education training on work procedure and concept of quality which include team skills and problem solving techniques (Agus, 2005). Only when employees are trained in the quality concepts and tools they can understand the quality related issues. Employees should be regarded as valuable long-term resources worthy of receiving education and training throughout their career (Zhang, 2000). Yusof and Aspinwall (2000), Kuei et al. (2001), Kaynak et al. (2003), Dermirbag et al. (2006), Lakhal et al. (2006), Abdullah et al. (2008) and Su et al. (2008) have identify training as one of key factor of quality management in their studies.

A process may be described as a transformation of inputs (resources) into output (goods or services) (Armistead et al., 1995). Process management is the set of technical and behavioral practices emphasizing the management of processes, or means of actions, rather than results (Grandzol & Gershon, 1998). It requires knowledgeable individuals who are able to manage in the increasingly complex process oriented environment. The process management in this study refers to planning, implementing, controlling and continuously improving the processes, producing a quality product. Authors such as Grandzol and Gershon (1998), Samson and Terziovski (1999), Kuei et al. (2001), Kaynak et al. (2003), Projogo and Sohal (2003), Conca et al. (2004), Dermirbag et al. (2006), Feng et al. (2006), Tari et al. (2007), Abdullah et al. (2008), Arumugam et al. (2008) have suggested process management as a factor in examining QM practices.

Quality management is not only achieved through usage of the above mentioned factors, but it is supported by practicing quality management tools and techniques. Literature refers to recent studies regarding quality tools factor, such as those of Yusof and Aspinwall (2000), Kuei et al. (2001), Kaynak et al. (2003), Agus (2005), Dermirbag et al. (2006), Lakhal et al. (2006), Tari et al. (2007), Su et al. (2008). A single tool is a device with a clear function and it usually applied on its own, whereas a technique has a wider application management cannot be ensured without the application of appropriate tools either management or statistical. Firms with greater implementation of these quality tools can improve their business results. These tools are required in any firm irrespective of its business size. A wide range of SPC tools such as Pareto charts, cause-effect diagram and control charts are used to monitor quality (Ahire et al., 1996).

Bhuiyan and Baghel (2005) identify continuous improvement as a culture of sustaining the improvement by aiming the elimination of waste in all systems and process of an organisation. It involves everyone working together as a team to make improvements with minimum expenses. The continuous improvement cycle consists of establishing customer requirements, meeting the requirements, measuring success, and continuing to check customers’ requirements to find area in which improvements can be made. Customers may be internal or external, depending on whether they are located within or outside the organisation. Internal customers are working towards external customer satisfaction (Chang, 2005). Several authors suggest that continuous improvement can play major role in the success of organisational performance (Grandzol & Gershon, 1998; Samson & Terziovski, 1999; Yusof & Aspinwall, 2000; Conca et al., 2004; Tari et al., 2007; Arumugam et al., 2008; Su et al., 2008). Table 2 presents the details list of QM practices factors identified by researcher.

Table 2: QM Practice Factors identified through literature

<table>
<thead>
<tr>
<th>Factors</th>
<th>Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management commitment</td>
<td>Yusof and Aspinwall, 2000; Kuei et al., 2001; Kaynak et al., 2003; Agus, 2005; Yeung et al., 2005; Dermirbag et al., 2006; Lakhal et al., 2006; Abdullah et al., 2008; Su et al., 2008</td>
</tr>
<tr>
<td>Training</td>
<td>Yusof and Aspinwall, 2000; Zhang, 2000; Kuei et al., 2003; Kaynak et al., 2003; Agus, 2005; Dermirbag et al., 2006; Lakhal et al., 2006; Abdullah et al., 2008; Su et al., 2008</td>
</tr>
</tbody>
</table>

13
Performance Factors

A large number of studies have examined the relationships between quality management practices and the impact of such practices on performance. This study reported a positive relationship between quality management practices and organisational performance (Samson & Terziovski, 1999; Kuei et al., 2001; Kaynak, 2003; Conca et al., 2004; Demirbag et al., 2006; Lakhal et al., 2006; Abdullah et al., 2008). The empirical evidence suggests quality management practices bring increased quality and productivity. On the other hand, high quality product could bring more satisfied customer, increased sales, and enlarged marker share. Quality performance enhanced profitability through reductions in cost and increase of market share. We have given this construct separate status in our study, as the dependent variable.

### Table 3: Organisational performance measure proposed by different authors

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Performance indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samson and Terziovski, (1999)</td>
<td>Customer satisfaction, Employee morale, Productivity, Quality of output, Delivery</td>
</tr>
<tr>
<td>Kuei et al. (2001)</td>
<td>Cost savings, Earning growth, Productivity, Employee satisfaction, Sales growth</td>
</tr>
<tr>
<td>Kaynak et al. (2003)</td>
<td>Inventory Management, Quality performance, Financial and market</td>
</tr>
<tr>
<td>Conca et al. (2004)</td>
<td>Revenue, Profit, Yield, Competitive</td>
</tr>
<tr>
<td>Demirbag et al. (2006)</td>
<td>Revenue growth, Profit, Investment amount, Product development, Market</td>
</tr>
<tr>
<td>Lakhal et al. (2006)</td>
<td>Financial, Operational, Product quality</td>
</tr>
</tbody>
</table>
THEORETICAL FRAMEWORK

A review of the previous empirical studies on QM practices suggests that researchers have defined QM practices construct in numerous ways although they are complementary to each other. In this study, we decided to use one of these models or framework for the QM practices construct. The framework developed by Tari et al. (2007) was selected as representing the core of QM practices construct in this study. The relationships suggested in the research model (see Figure 1) are drawn from studies in the literature on QM practices and OP. Therefore, based on the analysis of past research, the purpose of this study is to identify the relationship between QM practices and organisational performance in Malaysian manufacturing industry.

![Figure 1: Proposed model of the relationship between Quality Management Practices and Organisational Performance](image)

**Identify QM Practices and OP Relationship**

Management support and commitment are playing important role for a successful implementation of quality tools (Bunney & Dale, 1997; Tari et al., 2007). Continuous improvement is support by commitment shown by management towards the involvement of employees (Yeung et al., 2005). It is management effort to provide necessary training for employee in the use of new principles and tools and creates a work environment conductive to employee involvement in the process of change (Flynn et al., 1995; Kaynak, 2003). To manage quality, employee must effectively measure and make use quality data (Ahire & Dreyfus, 2000; Kaynak, 2003). To use the quality tools effectively, production workers should have an adequate knowledge regarding their usage. Also training may have positive impact continuous improvement. This is due to the fact that continuous improvement is based on constant training on project management skill and statistical knowledge (Zhang, 2000; Tari et al., 2007).

People in the organisation should be continually trained and be given adequate training and education training on work procedure and concept of quality which include team skills and problem solving techniques. When employees are trained in quality concepts and tools, they can understand quality related issue, which helps towards subsequent improvement (Flynn et al., 1995; Kaynak, 2003; Tari et al., 2007). Quality tools directly affect process management by informing workers about changes in process so they can take immediate corrective actions (Flynn et al., 1995; Kaynak, 2003). Based on the literature discussed above it can be said that Quality tools promote process management. Process Management is a systematic approach in which all the resources of an organisation are used in most efficient and effective manner to achieve desire performance (Conca et al., 2004). Process management helps to ensure that variation is kept within acceptable range and the efforts on continually reducing process variation lead to continuous quality improvement. Then, process management practices have positive effects upon the continuous improvement of quality (Anderson et al. 1995; Yeung et al., 2001; Tari et al., 2007). The relationship between continuous improvement and organisational performance is consistent with the study of Grandzol and Gershon, (1998). This link is also corroborating the findings of Yeung et al. (2001), Tari et al. (2007) and Arumugam et al. (2008).
Indicator of the Measure Factors

In order to study the relationship between QM practices and organisational performance, the indicators to measure the entire variable have to be established. The measure of management commitment was composed of five items mainly based on the scales proposed by Kaynak (2003) and Tari et al. (2007). The five indicators were financial support, reward and recognition to employee, quality activities align with business strategy and communication between management and employee related to quality activities. The measure of training was composed of five items mainly based on the scales proposed by Kaynak (2003). The five indicators were problem-solving skill, training hour, training budget, statistical and analysis software. The respondents were asked their opinion on whether the training they received meets the quality goals of the organization. Process management variables were improvement activity tracking by managers, process data collection, project management, quality team to carried out project, quality improvement program and work procedure for quality control are implement in the organization. These six indicators were adapted from Kaynak (2003) and Tari et al. (2007).

The question for quality tools are related to the usage in quality improvement project. The quality tools indicators were process flow diagram check sheet, cause and effect diagram, run chart, pareto chart, histogram and control chart. These seven indicators were adapted from Tari et al. (2007).

Continuous improvement is organised by five indicators such as waste/scrap reduction, process improvement, conformance, quality improvement and quality culture. These indicators were adapted from Tari et al. (2007). Organisational performance is characterised by five indicators such as profitability, productivity, product quality, cost efficiency and customer satisfaction. These indicators were adapted from Kaynak (2003) and Tari et al. (2007). Henceforth, all the predetermined factor or variable would be transformed into statistical indicators through appropriate items to measure. Indicators or variables are the items in the questionnaire used to observe the factors or constructs. The summary six factors and the indicators are shown in the following table.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Management commitment</td>
<td>Financial, reward, recognition, strategy, communication</td>
</tr>
<tr>
<td>2. Training</td>
<td>Problem-solving skill, training hour, training budget, statistical, analysis software</td>
</tr>
<tr>
<td>3. Process management</td>
<td>Activity tracking, process data, project management, quality team, quality improvement, work procedure</td>
</tr>
<tr>
<td>4. Quality tools</td>
<td>Process flow diagram, check sheet, cause and effect diagram, run chart, pare to chart, pareto chart, pareto chart, pareto chart</td>
</tr>
<tr>
<td>5. Continuous improvement</td>
<td>Waste/scrap reduction, process improvement, conformance, quality improvement, quality culture</td>
</tr>
<tr>
<td>6. Organisational performance</td>
<td>Profitability, productivity, product quality, cost efficiency, customer satisfaction</td>
</tr>
</tbody>
</table>

CONCLUSION

This paper examines QM practices element which cover aspect of hard and soft quality factors in manufacturing process environment. This paper suggests six theoretical propositions that can serve as a basic for a systematic relationship between QM practices and OP. Therefore a generic conceptual research model is suggested in order to examine these relationships in manufacturing companies. This proposed model can assist organisation in deciding with QM practices to implement in order to improve OP. Furthermore, in studies examining the relationship between QM practices and performance result,
those practices that are found to have a positive impact on business result could be recommended to managers.

In Malaysia transformation economy, manufacturing experience rapid development in production and operational ability, including widely implementing quality and productivity programs. Manufacturing companies are facing intense competition since the product must have the features of high quality and low price. Enhance quality outcome and reduce waste/scrap is the key to realize the expected effect of implementing QM practices. The findings of this study would also assist the Malaysia Productivity Corporation and other relevant government agency in Malaysia by using the results of this study as an improvement instrument or strategy in order to improve and enhanced the performance of manufacturing industry in Malaysia. It is hoped that the research presented in this article will not only assists an organisation in understanding and implementing QM practice, but will also provide a solid foundation for future research.

References


Evans, J. R., & Lindsay, W. M. (2002). *The management and control of quality* (5th ed.). South Western, Nashville, TN.


The authors

Zaharuzaman Jamaluddin
Faculty of Science and Technology
Universiti Kebangsaan Malaysia (UKM)
Selangor
e-mail: zaharu_z@yahoo.com

Ahmad Mahir Razali
Faculty of Science and Technology
Universiti Kebangsaan Malaysia (UKM)
Selangor

Zainol Mustafa
Faculty of Science and Technology
Universiti Kebangsaan Malaysia (UKM)
Selangor