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

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Abstract

The purpose of this paper is to develop the conceptual framework of quality management (QM) practice and organizational 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 the manufacturing process's 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 organizational performance. The results of the study can be used by managers in manufacturing companies to consider and adapt their QM practices and performance assessments toward increasing competitiveness. The review helps future researchers and practitioners to choose appropriate QM factors. The paper suggests a 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, organizational performance manufacturing

1.0 INTRODUCTION

Quality management (QM) is one that needs be emphasized by the organizations to remain competitive in a systematic and planned manner. In the manufacturing industry, it is important to produce quality products through higher accuracy in the manufacturing process. The competent process management will ensure production costs are at the minimum with fewer production defect and a shorter production time. Higher quality implies lower costs and increased productivity, which in turn give the organization a greater market share and better competitive fitness (Evans & Lindsay, 2002). As decision-makers realize 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 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 characterized of customer awareness and management of human resources.

This paper is to develop the conceptual framework of QM practice and OP processes in 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.

2.0 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 improve productivity and performance of the organizations' performance. He contributed to the quality literature by introducing a cause and effect diagram to analyze 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 of the 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 delivers 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 organizational responsibilities, resources, procedures and structures (Yeung et al., 2005). Based on our literature review of 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 organizational 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 the manufacturing organization published between1998 to 2008. Thus, this study investigates 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 organizational 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.

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

No.	Grandzol & Gershon, 1998	Samson & Terziovski, 1999	Yusof & Aspinwall, 2000	Zhang, 2000	Kuei et al., 2001	Kaynak et al., 2003	Projogo & Sohal, 2003	Conca et al., 2004	Agus, 2005
1	Leadership	Leadership Strategic Planning	Management leadership	Leadership	Top management leadership	Management leadership	Leadership Strategic planning	Leadership	Top management commitment
2	Learning Employee fulfilment	People management	Education and training	Education and training	Training Employee relation	Training Employee relations	People management	Learning Employee management	Training Employee focus
3	Process management	Process management	System and Process	Process control and improvement	Process management	Process management	Process management	Process management	Process improvement
4		Information and analysis	Improvement tools and techniques	Evaluation	Quality data and reporting	Quality data and reporting	Information and analysis		Zero defects Benchmarking
5			Measurement and feedback	Product design	Product design	Product/service design			Quality measurement
6	Cooperation		Supplier quality assurance	Supplier quality management	Supplier quality management	Supplier quality management		Supplier management	Supplier relations
7	Customer focus			Customer focus	Customer relation		Customer focus	Customer focus	Customer focus
8	Continuous improve-ment	Continuous improvement	Continuous improvement system					Continuous improvement	
9	Operational and financial	Organisational performance		Business performance	Organisational performance	Firm Performance	Quality performance	Firm performance	Product quality Business Performance

No.	Yeung et al., 2005	Demirbag et al., 2006	Feng et al., 2006	Lakhal et al., 2006	Tari et al., 2007	Abdullah et al., 2008	Arumugam et al., 2008	Su et al., 2008	This study
1	Top management leadership	Role of top management	Leadership Strategic planning	Top management commitment &support	Leadership	Management commitment	Leadership	Leadership Top management commitment	Management commitment
2	Learning and teamwork	Training Employee relation	People management	Employee training Employee participation	Learning Human resource management	Training and education Employee involvement	People involvement	Employee training Employee involvement	Training
3	Process control and improvemen t	Process management	Process management		Process management	Process management	Process management	Quality information and measurement	Process management
4	Quality system procedure	Quality data and reporting	Information and analysis	Statistical quality techniques	Quality tools and techniques	Feedback	Information analysis	Statistical process control	Quality tools
6	Supplier management	Supplier quality management		Supplier quality management	Supplier management	Supplier relationship	Supplier relationship		-
7	Customer focus		Customer focus	Customer focus	Customer focus	Customer focus	Customer focus	Customer focus and satisfaction	-
8				Continuous support	Continuous improvement		Continual Improve-ment	Continuous improvement	Continuous improvement
9	Operational and financial	Organisational performance	Quality performance	Organisation al performance	Quality outcome	Organisational performance	Quality performance	Quality performance Business performance	Organisational performance

2.1 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 success in quality management implementation (Ahire, 1996). Manager acts as a driver of quality management implementation, creating value, goals and systems to satisfy customer satisfactions and improve an organization's 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. (2008) have research management commitment as one of the key factor of quality management in their studies.

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 qualityproduct. 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), Demirbag 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), Demirbag 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's 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 organization. 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 areas in which improvements can be made. Customers may be internal or external, depending on whether they are located within or outside the organization. Internal customers are working towards external customer satisfaction (Chang, 2005). Several authors suggest that continuous improvement can play major role in the success of organizational 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 researchers.

Table 2: QM Practice Factors identified through literature

Factors	**Researchers**
1. Management commitment	(Yusof and Aspinwall, 2000; Kuei et al., 2001; Kaynak et al., 2003; Agus, 2005; Yeung et al., 2005; Demirbaget al., 2006; Lakhal et al., 2006;Abdullah et al., 2008; Su et al., 2008)
2. Training	(Yusof and Aspinwall, 2000; Zhang, 2000; Kuei et al., 2001; Kaynak et al., 2003; Agus, 2005; Demirbaget al., 2006; Lakhal et al., 2006; Abdullah et al., 2008; Su et al., 2008)

3. Process management	(Grandzol and Gershon, 1998; Samson and Terziovski, 1999; Kuei et al., 2001; Kaynak et al., 2003; Projogo and Sohal, 2003; Conca et al., 2004; Demirbaget al., 2006; Feng et al., 2006; Tari et al., 2007; Abdullah et al., 2008; Arumugam et al., 2008)
4. Quality tools	(Yusof and Aspinwall, 2000; Kuei et al., 2001; Kaynak et al., 2003; Agus, 2005; Demirbaget al., 2006; Lakhal et al., 2006; Tari et al., 2007; Su et al., 2008)
5. Continuous improvement	(Grandzol and Gershon, 1998; Samson and Terziovski, 1999; Yusof and Aspinwall, 2000; Conca et al., 2004; Tari et al., 2007; Arumugam et al., 2008; Su et al., 2008)

2.2 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 organizational 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 market 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

Author(s)	**Performance indicators**
Samson and Terziovski, (1999)	Customer satisfaction, Employee morale, Productivity, Quality of output, Delivery
Kuei *et al.* (2001)	Cost savings, Earning growth, Productivity, Employee satisfaction, Sales growth
Kaynak *et al.* (2003)	Inventory Management, Quality performance, Financial and market
Conca *et al.* (2004)	Revenue, Profit, Yield, Competitive
Demirbag *et al.* (2006)	Revenue growth, Profit, Investment amount, Product development, Market
Lakhal *et al.* (2006)	Financial, Operational, Product quality
Abdullah *et al.* (2008)	Cost efficiency, Productivity, Process efficiency

3.0 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 organizational performance in the Malaysian manufacturing industry.

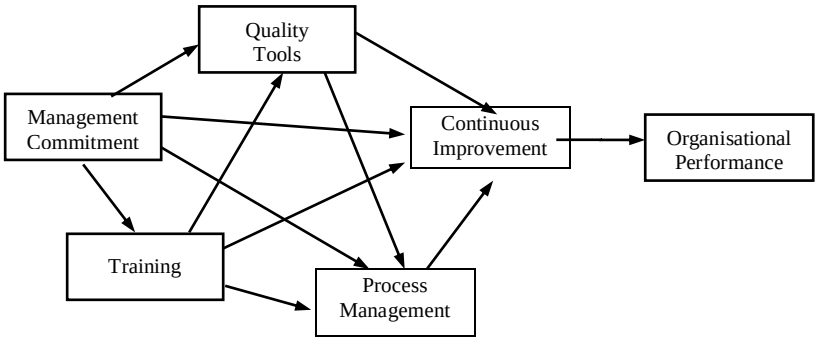

Figure 1: Proposed model of the relationship between Quality Management Practices and Organisational Performance

3.1 Identify QM Practices and OP Relationship

Management support and commitment are playing an important role for a successful implementation of quality tools (Bunney & Dale, 1997; Tari et al., 2007). Continuous improvement is supported by the commitment shown by management towards the involvement of employees (Yeung et al., 2005). It is management effort to provide necessary training for employees in the use of new principles and tools and creates a work environment conducive 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 organization should be continually trained and be given adequate training and education on work procedures and concepts of quality which include team skills and problem solving techniques. When employees are trained in quality concepts and tools, they can understand quality related issues, 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 the 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 organization are used in most efficient and effective manner to achieve desired performance (Conca et al., 2004). Process management helps to ensure that variation is kept within acceptable range and the efforts on continuously 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 organizational 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).

3.2 Indicator of the Measure Factors

In order to study the relationship between QM practices and organizational 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, employee reward and recognition, 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 analytical 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, data collection process, project management, quality team to carry out project, quality improvement program and work procedure for quality control are implemented 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 indicator tools 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 organized 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 characterized 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 4: Factors and indicators identified in these studies

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

4.0 CONCLUSION

This paper examines QM practice 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 basis 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 organizations 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 assist an organization in understanding and implementing QM practice, but will also provide a solid foundation for future research.

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