THE IMPACT OF TOTAL QUALITY MANAGEMENT (TQM) PRACTICES ON INNOVATION PERFORMANCE

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DEDICATION

Dedicated to my beloved father and mother, family,
Supervisor, friends and especially to my fiancée.

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Assalamualaikum and all praise to Allah S.W.T, the Benevolent of His blessing and guidance for giving me inspiration to complete this thesis. I wish to express my sincere appreciation to my supervisor, Dr. Choi Sang Long for the encouragement guidance, critics and commitment.

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ABSTRACT

The purpose of this study is to investigate the relationship between total quality management (TQM) practices and innovation performance in the manufacturing industry context. The method of confirmatory factor analysis was applied refine the TQM practices and innovation performance scales for empirical analysis in Rawang, Selangor. The correlation coefficient analysis by Person's method and regression analysis was applied to test the theoretical models. This study confirms the results of previous studies that considered TQM as a set of practices. It confirms that TQM practices have a positive impact on the organization's innovativeness. It discovers that all variables of TQM practices enhance organization innovativeness, especially people management has showed the highest positive impact on the organization's innovation performance. The sample of this study was random. Future research should examine the TQM practices and relationship with innovation performance with other constructs in different settings. The study assessed the concept of "Product Innovation" and "Process Innovation" with the company boundaries. Future research should measure the innovativeness of organization including the "Marketing Innovation" and "Service Innovation" within the boundaries of the specific industry. The unclear evidence found in this study on the impact of the organization's leadership on innovation needs to be further investigated. The findings are useful for business managers in developing countries such as Malaysia, who want to enhance business performance through implementing TQM practices that support their organization's product and process innovation efforts.

ABSTRAK

Tujuan kajian ini adalah untuk mengkaji hubungan antara amalan pengurusan kualiti menyeluruh (TQM) dan prestasi inovasi dalam konteks industri pembuatan. Kaedah analisis faktor pengesahan telah digunakan untuk menghalusi amalan TQM dan mengukur prestasi inovasi untuk analisis empirikal di Rawang, Selangor. Analisis “correlation coefficient” oleh Pearson’s dan kaedah analisis “regression” telah digunakan untuk menguji model teori. Kajian ini mengesahkan bahawa hasil kajian sebelum ini dianggap TQM sebagai satu set amalan. Ini membuktikan bahawa amalan TQM mempunyai impak yang positif kepada inovasi organisasi. Ia mendapati bahawa semua pembolehubah amalan TQM meningkatkan organisasi inovasi, terutama pengurusan manusia telah menunjukkan kesan positif yang paling tinggi kepada prestasi inovasi organisasi. Sampel kajian ini adalah secara rawak. Kajian akan datang harus mengkaji amalan TQM dan hubungannya dengan prestasi inovasi dengan konstruk lain dalam persekitaran yang berbeza. Kajian ini dinilai konsep "Inovasi Produk" dan "Proses Inovasi" dengan sempadan syarikat. Kajian akan datang perlu mengukur inovasi organisasi termasuk "Inovasi Pemasaran" dan "Inovasi Perkhidmatan" dalam sempadan industri yang tertentu. Bukti yang tidak jelas terdapat dalam kajian ini mengenai kesan kepimpinan organisasi terhadap inovasi perlu disiasat dengan lebih mendalam lagi. Penemuan berguna untuk pengurus perniagaan di negara-negara membangun seperti Malaysia, yang ingin meningkatkan prestasi perniagaan melalui melaksanakan amalan TQM yang menyokong produk dan inovasi proses untuk organisasi mereka.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

In this section, it discusses the basic information that relates to the impact of total quality management on innovation especially on the background of the study. Furthermore, a problem statement that will be investigated in this study has produced research objectives and research questions.

1.1 Background of the study

Quality management has been discovered in the late of the 1920's that showed the improvement of the productivity when decision making of the workers' participation was involved. Some of the first seeds of quality management were planted as the principles of scientific management swept through U.S. industry. The historical evolution of TQM has taken place in 4 stages, namely Quality Inspection, Quality Control, Quality Assurance and Total Quality Management which were in the year of 1980's. There are a lot of definitions that has been created by the various authors about the total quality management (TQM). Feigenbaum and Ishikawa was possibly the greatest contributor to the development of the total quality management (TQM) term. The rest had recognized the quality management gurus such as Crosby, Deming and Juran that shaped the dimensions, practices and mechanism, which underpinned the concepts (Lorente, Dewhurst, & Dale, 1998). The definition of total quality management (TQM) by Crosby (1979) has defined fourteen steps for quality

of improvement. The ten common steps are top management support, customer satisfaction, supplier relationship, workforce management, employee attitude and behavior, product design process, process flow management, quality data and reporting, the role of the quality department and benchmarking. But a few authors like Mehra, Hoffman, & Sirias (2001) suggested that business implementing TQM should focus on five elements of practices, which were the human resources (HRs), management structure, quality tools, supplier support, and customer orientation. In their quest to explore the future of TQM, they explored the managerial thinking process in reference to incoming quality challenges and associated improvements. Their findings led them to conclude that the organizational emphasis of tomorrow will be shifting towards four main focuses area for the improvement of quality. These main focuses area are customer focus, process focus, innovation focus and environment focus.

Total quality management (TQM) is an approach to improve the competitiveness, effectiveness and flexibility of a whole organization. It is essentially a way of planning, organizing and understanding each activity, and depends on each individual at each level. For an organization to be truly effective, each part of it must work properly together towards the same goals and recognitions that each person and activity is affected by others. The Total quality management (TQM) is also a process of making people's lives by bringing everyone into the processes of improvement, so that the results of doing things are achieved in less time. The methods and techniques used in total quality management (TQM) could be applied throughout any organization. They were equally useful in the manufacturing, public service, health care, education and hospitality industries (Oakland, 2003). Total quality management (TQM) is important thing to measure the success of a business organization. According to the Hoang, Igel, & Laosirihongthong (2006), quality could be considered as the key factor of strategic to achieve the business success. In order to emphasize the competitiveness and also to enhance the business performance, company worldwide, large and small, manufacturing and service sectors should implement the principle and norms of total quality. TQM could also be defined as philosophy of an organization-wide requiring

all employees at every level of an organization to focus on their efforts and also to help improve of each business organization activities (Mehra, Hoffman, & Sirias, 2001).

Most of the authors in this TQM area have their own definitions. Following the thoughts from Powell (1995), TQM became well known as part of business thinking as quarterly financial results and also yet the TQM's role as a strategic resource remained almost unexamined in strategic management research. While Lorente, Dewhurst, & Dale (1998) stated that TQM became a key management issue and level of competition had increased that led to the increase of quality and importance to organizations. But Akao (1991) said that TQM produced such managerial innovations as quality circles, equity circles, supplier partnerships, cellular manufacturing, just-in-time production, and hosing planning in Japan. Besides that, the concept of TQM had transferred from being measured as a unnecessarily non-factor on the competition to the market, to being the compulsory factors as a strategic resource of the organizations. It meant that the TQM transferred from being a one-perspective characteristic of the product to become the multi-perspectives characteristic, which had to be managed and implemented which led to a dynamic capability of the organizations (Perdomo-Ortiz, Benito, & Galenda, 2006).

The main reason for the origin of the term TQM could probably be a substitution of the previously used term of Total Quality Control (TQC), the word "control" by "management" with the reasoning that quality was not just a matter of control, it should be managed. This was reinforced by Deming's (1982) view that sampling inspection should be suppressed and also by Crosby (1979) who made the point that control was not necessary when a zero defected level was achieved. The term "control" was sometimes understood as meaning control over the workforces' activities, and this was clearly not the aim of TQM (Godfrey, Dale, Marchington, & Wilkinson, 1997).

In the last of two decades, the TQM term was not used, but now with the definition that has been created by the various authors, TQM has become the key management issue. At the end of the 20th centuries, TQM system of management appeared to be well-accepted (Lorente, Dewhurst, & Dale, 1998). Total quality management (TQM) can be implemented in the various organizations or institutes, whether it is a profit or non-profit organizations, primary or secondary schools, universities or colleges, health care, financial services or law firm and many more. It is because all these types of organizations actually have their own customers, and customers should be provided with satisfied services to achieve their needs. TQM factors and characteristics are not only implemented to the organizations, but it must be put sustainable elements to make the TQM perpetual in idealism of the organizations. This will lead to the continuous improvement. Even though there are various definitions of total quality management (TQM), Rahman (2004) showed that total quality management (TQM) was an approach of management for improving the organizational performance that included several both technical and behavioral topics.

According to Oakland (2003), the impact of total quality management (TQM) on organization is to ensure that the management adopted a strategic overview of quality. The approaches must also focus on developing a problem-prevention mentality, but it was easy to underestimate the effort that was required to change attitudes and approaches. Many people would need to undergo a complete change of 'mentality' to unscramble their intuition, which rushed into the detection or an inspection mode to solve quality problems.

Nowadays, the Innovation elements are compulsory for the organizations to gain the competitive advantages. The important role of innovation is to further project economic growth and prosperity. There must be a number of enabling factors for an economy to be innovative in order to spur the process. These factors among others include expert workforce, world-class universities and research institutions, a fluid capital market, open society and vibrant innovative culture. The above factors normally take some time to develop and it has to be shaped, empowered and

enhanced by a series of government policies. The appropriate innovation policy challenge for a country is closely associated with the level of development which is worth pursuing so that we are neither left behind in economic development nor continuously dependent on technology transfer. The innovative capability of the country must be developed in order to move up the value chain.

Although the current relationship between innovation performance TQM and company performance have been established, researches on the relationship between TQM practices and product or process innovation performance have not been conducted in details. This is even more apparent among organizations in Malaysia. The recent global economic crisis, which originated from USA, had not spared the Malaysian economy (Lee, Ooi, Tan, & Chong, 2010).

Researchers believed that this study on impact of total quality management and innovation performance could bring a lot of benefits to the organizations and institutions whether in the services or manufacturing sectors. The firms could gain benefits such as to improve competitiveness, increase adaptability to the global markets, significantly reduce costs or wastes, and improve management communication and many more. This is because by applying the TQM practices they will be able to identify the elements that can encourage their employees to improve the productivity and innovation among themselves as well as competitiveness in an organization. Furthermore, this study will focus on the selected services and manufacturing organizations by distributing the questionnaires.

1.2 Problem statement

A total quality management practice has become the important elements of the organizations nowadays. It is because the TQM practices can be considered as a key strategic factor in achieving business success. However, most of the organizations and institution nowadays are not just strictly focus on the quality itself, but they focus also to the innovative management and product that they will produce for the customers' attraction. In the last decades, a lot of authors studied about the relationship between the total quality management (TQM) and innovation. Their findings showed that there were two perspectives, which were positive and negative perspectives. Based on those issues, that is the reason why the researchers tried to investigate the relationship between the total quality management (TQM) practices on the organization innovation performance and the impact of the particular elements to the innovation performance in the context of Malaysian organizations.

The level of TQM practices is very important to the organizations that implement the technological innovation capabilities. This is because it's easy to identify and measure levels of successful organizations. According to the finding of Dale & Lascelles (1997), the levels could be used as a positioning model to aid organizations in identifying their weaknesses and help them taking the next steps forward in the continual challenge of continuous improvement. The levels are also helpful in highlighting different perceptions of progress at different levels of the organization, with respect to continuous improvement.

The relationship between total quality management practices and innovation performance are important for the organizations to compete and gain the competitive advantages. Due to lack of studies about this relationship, there are unsustainable results and findings showed in the previous studies. Based on the results of Singh & Smith (2004), there was insufficient evidence related between total quality management (TQM) practices and innovation. On the other hand, the positive correlations between total quality management (TQM) and innovation performance

had been shown by the studies of Prajogo & Sohal (2001, 2003). On the other hand, Prajogo & Sohal (2004) stated that there was an insufficient contribution about the relationship between TQM and the innovations, especially in the empirical studies were rare. This means, the exploration of the relationship between TQM practices and innovation did not really establish well and that is the reason why there were a few different results and analysis as well as the conclusion from the previous studies. According to one of the authors Crawford (1998) who argued the mindset of continuous improvement, one of the main Japan economic stalemates experiences is the obstacle to innovation. He considered that this mentality reflected in order to avoid the embarrassment resulting from potential failures associated with radical changes. The point is to make the continuous improvement strategy as well not necessarily to work in markets, which constitute high-risk investment.

However, the results were almost the same that there were no significant relationships between quality management and innovation performance conducted in 2006 by Prajogo and Sohal when the factors of technology management and research and development (R&D) management were also considered (Prajogo & Sohal, 2006). After that, in the same year (2006) but in different published article, both of these researchers found that, the TQM was positively and significantly related to differentiation strategy, and it only partially mediated the relationship between differentiation strategy and three performance measures (product quality, product innovation, and process innovation). In particular, this result suggests that the direct effects of a differentiation strategy on both product and process innovation are stronger than that between TQM and these two performance measures. What can be inferred from this link is that while TQM is considered as a set of practices through different strategy that can be implemented, under TQM, however, differentiation was more directed to quality performance rather than innovation performance (Prajogo & Sohal, 2006). The implication is that TQM needs to be complemented by other resources to more effectively realize the strategy in achieving a high level of performance, particularly innovation.

In the 2010, a few Malaysian researchers revealed the results that leadership, strategic planning, customer focus, information and analysis, human resource management, and process management were positively associated with product innovation performance. Information and analysis were perceived as a dominant TQM practice in improving firm's performance on product innovation. This analysis was especially vital for senior managers of E&E companies who wanted to establish innovation capability. Senior managers could focus their efforts on TQM practices as a means of maximizing organizational gains via product innovation in the context of a competitive environment (Lee, Ooi, Tan, & Chong, 2010). This showed that, most of the previous results indicated a positive relationship between Total Quality Management (TQM) and Innovation performance. However, the results were still inconsistent and inability to sustain the positive relation whether TQM practices were confirmed positive relations with the innovation performance or not because the relationship between TQM in innovation performance and company performance had been established, research on the relationship between TQM practices and product or process innovation performance had not been conducted in details. This was even more apparent among organizations in Malaysia.

According to Hovgaard & Hansen (2004) there were multiple definitions and perspectives of quality. Early research in the field primarily examined quality from the perspective of "conformance to specifications". Researcher and practitioners increasingly recognized the errors of this view in that it failed to address the multidimensional nature of quality. Conformance to specification was one of the key dimensions of quality. The rest included reliability, durability, and customer satisfaction. Further, for researchers were interested in exploring the impact of quality on organizational performance, there were numerous potential dimensions that could be explored with respect to organizational performance. In today's business environment, many had argued that innovation must be added to the growing list of essential organizational performance metrics.

Based on the study of Cormican & O'Sullivan (2004), the organizations were still suffering from an inability to sustain innovation in the long-term period. It was because that the innovation of organization research had been done in an unconvincing and inconsistent approach, and was characterized by low levels of explanation. As a consequence, organization unsuccessful in capturing ideas in a broad vision, understanding and so they were incompetent to transform these into practical means (Adams, Bessant, & Phelps, 2006).

Finally, nowadays by providing the linkage between TQM and innovation performance is necessary in an organizations as it provides a theoretical platform including a practical platform for the service and manufacturing organizations, because these are the efforts to gain sustainable competitive advantage as well as to generate the wealth income for the organizations.

1.3 Research Questions

The focus of this study is the relationship between the quality management system with the innovation performance that has been implemented by the organization whether in services or manufacturing sectors. In the previous discussion, the total quality management (TQM) practices have become the key success to the business performance. Innovation also is part of the elements that will support the organization to be more competitive in the market share. The following research questions will explore in the manufacturing companies in Malaysia, especially in Rawang, Selangor area:

1. What is the level of total quality management (TQM) practices in the organization?
2. What is the relationship between total quality management (TQM) practices and innovation?
3. What are the total quality management (TQM) practices that contribute most to the innovation performance?

1.4 Research Objectives

The researcher has propose three objectives of this study which as follow:

1. To identify the level of total quality management (TQM) practices in the organization.
2. To examine the relationship between total quality management (TQM) practices with innovation performance.
3. To identify the total quality management (TQM) practices that contributes most to the innovation performance.

1.5 Scopes and limitation of study

The context of this study is the practices of total quality management (TQM) implementation in the manufacturing and service organizations, because these two sectors are among the main contributors of the Malaysia Gross Domestic Product, Therefore, the involvement of both sectors in innovation will generate higher Malaysia GDP for the nation economic growth. Other than that, both of these sectors are commonly used in the previous studies related to the innovation performance. The sample from the population of this study covers some areas in Rawang, Selangor, Malaysia. The limitation of the sample is due to the lack of financial support for this study. The other limitation is the time factor. Since this study needs to be completed within four-month time frame, the allocated time is insufficient for the research to cover the impact of TQM practices on the manufacturing and service companies in Malaysia as a whole. In other words, the short period of research time eliminates the possibility of a large-scale research beyond the focused area.

This study has some limitation. First, it is based on a convenience sample that included organizations in Rawang, Selangor. However, the sample chosen does not decrease the significance of the findings because as shown previously, the participated respondents are only 83 out of 105 of the TQM practitioners in Rawang business organizations following the ISO 9001 standard. This may limit the ability to generalize the findings to the entire population. A convenient sample was the only option available so that the study could be carried out in Rawang, Selangor. It can be inferred that having a personal relationship in crucial to obtain a sufficient number of responses, and random sampling in the FMM directories would have limited the available data severely.

The second limitation is related to measuring the innovativeness as this study assessed the concept of product innovation and process innovation within the company boundaries.

Finally, the unclear evidence found in this study on the influence of leadership needs to be further investigated. Specifically, the related findings are, the relationship between the number of new product and services, its level of newness and the specific support to each for better leadership should be explored in further studies.

Generally, there are lots of quality management (TQM) elements proposed by the authors of the previous studies. In this study, the total quality management (TQM) practices chosen by the researcher may be primarily among those that contributed the most in the innovation performance based upon the previous research results. Therefore, the result of this study may not totally applicable for fields other than manufacturing and services, since different field may have different TQM practices, which can be more efficient to enhance the innovation performance.

1.6 Significance of the Study

The rationale of this study is to investigate the impact of the implementation TQM practices on innovation towards the organization achievement. The achievement will encompass both quality and capability as the parameters. The reason is TQM has played an important function in the development of modern management practices. It is because quality is considered as a key strategic factor in achieving business success. The implementation of effective TQM practices can enhance the competitive position and improve business performance of the companies worldwide regardless the scale, as well as to the manufacturing and service organizations (Dean & Evans, 1994).

The findings of this study will encourage the organizations in service or manufacturing sector to implement the total quality management (TQM) practices to improve the company productivity, generate wealth revenue, and ultimately leads to Malaysia economic development. This TQM is the most basic and great practices

that flexible to the all types of organizations. Moreover, such flexibility brings more competitive advantages for the companies that implement TQM practices in their work system.

1.7 Operational definitions

An operational definition is a description of variables, terms or object in terms of the specific process or set of validation tests used to determine its existence, duration, and quantity. Properties described in this method must be publicly accessible so that it can be measured and tested by other researchers in the future. At the level of operational definition, this study has specified and proposed the elements of the definitions of construct that will be used. The elements are as follows.

1.7.1 Total Quality Management (TQM)

Numerous definitions have been given for Total Quality Management (TQM) by quality gurus, practitioners and academician. Besterfield (1995) defined TQM as both a philosophy and a set of guiding principles that represents the foundation of a continuously improving organization. It integrates fundamental management techniques, existing improvement efforts and technical tools under a disciplined approach. Using a three-word definition, Wilkinson and Wither (1990) defines TQM as (Ho S. K., 1999):

Total	: Every person is involved (its customers and suppliers)
Quality	: Customer requirements are met exactly
Management	: Senior executives are fully committed

Berry (1991) defined TQM process as a total corporate focus on meeting and exceeding customer's expectations and significantly reducing costs resulting from poor quality by adopting a new management system and corporate culture (Yusof, 1999). Wolkins, (1996) outlined TQM as a tool to integrate fundamental management techniques, existing improvement efforts and technical tools under a disciplined approach focused on continuous improvement.

All these definitions actually yield to the same conclusion that strong emphasis must be given towards achieving excellence in organizations. However, there is no solid rule on how TQM should be implemented. As Kanji (1990) had described that TQM is:

> *"The way of life of an organization committed to customer satisfaction through continuous improvement. This way of life varies from organization to organization and from one country to another but has certain principles, which can be implemented to secure market share, increase profits and reduce costs."*

Total quality management (TQM) is a widespread and structured approach in organizational management that pursues to develop the quality of products and services through constant improvements in response to continuous feedback. According to Antony, Leung, Knowles, & Gosh (2002), the indicators of successful TQM practice includes improved employee involvement, improved communication, increased productivity, and improved quality and less reworks. Other than that, improved customer satisfaction, reduced cost of poor quality, and improved competitive advantages will lead to the success of TQM implementation as well. Other definition is from Rahman (2004) who defined that total quality management (TQM) is an approach of management for improving the organizational performance that includes several technical and behavioral issues.

In this study, TQM is the major and important variable that consists of good practices that can make the organizations to be well managed. TQM is a tool for the organizations to measure the performance as well as the implementation level of the TQM practices. By measuring the implementation of TQM practices in the

organization will help in fulfilling the objective of this study. This study has focused on five TQM practices, which are Leadership, Strategic Planning, Customer Focus, Process Management and People Management.

1.7.2 Leadership

Leadership is the ability to adapt to the setting so everyone feels empowered to contribute creatively to solve problems. Winston & Patterson (2006) has defined that leadership is the people who selects, equips, trains and influences the followers who have diverse gift, abilities, and skills. Leadership also focuses the followers to the organization's mission and objectives causing the followers to willingly and eagerly expend spiritual, emotional, and physical energy in a concerted coordinated effort to achieve the organizational mission and objectives. In this study, leadership is regarded as one of the important elements that can give the impact to the organizations to be more innovative. This is because the innovative leadership will lead the organization towards innovation performance.

1.7.3 Strategic Planning

Strategic planning refers to the decisions made by the general manager of an organization on behalf of its owner for the purpose of increasing its performance in every aspect of its operation. The strategic management process is a complex and can only be done by a person who knows every internal aspect of an organization and able to provide information and predict the outcomes of a every decision and its alternative. Strategic management is the elements that cover the strategic planning which are linked to the information and analysis. These two elements will reflect the edging phases, planning and evaluation of the process. Mostly it will be conducted by the organizations to develop their objectives and action plan (Hill & Jones, 2001).

1.7.4 Customer Focus

Customer focus refers to the orientation of an organization towards serving its clients' needs. Having a customer focus is certainly a strong contributor to the overall success of a business and it means that every action taken is tailored to ensuring customer satisfaction and retention. A definition of customer focus was proposed by Daghfous & Barkhi (2009) which is ensuring that the customer's expectation is fulfilled. To a greater level, customer delight is achieved if the expectation is exceeded as a result of good product and service.

1.7.5 Process Management

Process management is defined as the mechanistic dimensions and it is significantly related to the quality performance. This process management emphasizes standardization, process control, documentation, and the efficiency. In the manufacturing, the goal of process management is to reduce the process variation by creating the quality in the production process (Flynn, Schroeder, & Sakakibara, 1995). Otherwise, the low quality manufacturing process will result in a higher scrap rate and rework rate, which will lead to higher resource consumption to produce qualified products (Ahire & Dreyfus, 2000).

1.7.6 People Management

People management is known as human resource management (HRM). It encompasses the tasks of recruitment, management, and providing ongoing support and direction for the employees of an organization. According to the definition by Ho, Duffy, & Shih (2001), the researchers had indicated that human resources management, which includes the employee training and employee relation, was

positively related to the improvement of the organization in term of mediated through utilizing quality data and reporting. Most of previous studies found that, employees/human resource management contributes the good implementation of innovation in the organization. Therefore, the researcher has chosen the aspect of people management as a part of TQM practices to be investigated considering its significance in the organization innovation performance.

1.7.7 Innovation

Innovation can be referred to renewing, changing or creating more effective processes, products or ways of doing things. The definition of innovation includes process and service dimensions of innovation in addition to the product (Utterback, 1994). The term of innovation is often represented by a new high-tech device or "gadget". In the other words, the terms of technology, invention, and innovation are often used synonymously (Cooper, 1998). Based on the study of Prajogo and Sohal on innovation performance, the researchers have developed the construct for measuring product innovation and process innovation on the basis of several criteria, which are conceptualized and used in previous empirical studies of innovation.

In this study, the innovation performance is not merely focusing on the product itself, it is also measured in term of the process of production. Conducting the investigation on product manufacturing is fundamental because the innovation performance is not entirely generating the profit from the product. It is also determined by how the product is made. This is because the significant of relationship of TQM practices and the innovation performance is one of the purposes of this study. This study will focus on the Product Innovation and Process Innovation to relate with the TQM practices.

1.7.8 Product Innovation

Product innovation is the creation and subsequent introduction of a good or service that is either new, or improved on previous goods or services. This is broader than the normally accepted definition of innovation to include invention of new products, which, in this context, are still considered innovative. This product innovation is a measurement of innovation capability of the organizations in terms of the level of newness or novelty of new products. This product innovation commonly used the latest technological innovation in their new product development. The speed of development in the new product also will consider as the product innovation as well due to the number of new product that has been introduced the in the market share or the number of new products that is the first entrance to the market share (Prajogo & Sohal, 2003).

1.7.9 Process Innovation

A process innovation is an implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. Process innovation is one of the technological competitiveness of the organization innovation performance. It is the latest technology used in processing products. Besides that, the speed of an adoption of technological innovation can be increase by using the latest technology. In this research, process innovation will be measured in term of the rate of change processes, techniques and technology (Prajogo & Sohal, 2003). Specifically, the process innovations that are investigated are mainly involved in the logistics department, which is the flow of product or service from the factory to customer delivery. Delivery methods are associated with the physical movement of the product from the factory floor to the end user. This includes any system that is implemented in improving the process of producing the products, delivery of the

product to the customer such as computer systems, tracking systems and any associated equipment.

service, and process innovation with the help of quality management practices. Therefore, there is a need for paying ample attention and focus on people management, process management, and customer focus, a climate for innovation along with an analysis system towards a continuous process management these managers can develop in-house innovation further which will benefit companies as a whole.

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