

**A STUDY ON TQM'S TOOLS AND TECHNIQUES FOR QUALITY  
IMPROVEMENT: THE CASE OF MALAYSIAN MANUFACTURING  
INDUSTRY**

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A STUDY ON TQM'S TOOLS AND TECHNIQUES FOR QUALITY  
IMPROVEMENT: THE CASE OF MALAYSIAN MANUFACTURING  
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Technology Management (Innovation) with Hons.

Faculty of Technology Management and Technopreneurship  
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JUNE 2015

## DECLARATION

“I declare that this project is the result of my own research except as cited in the references. The research project has not been for any degree and is not concurrently submitted in candidature of any other degree.”

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Date : 26<sup>ST</sup> JUNE 2015

## DEDICATION

This research paper is lovingly dedicated to my parents, Encik Mohd Isa Bin Muharam and Puan Piah Binti Kasil, who have been my constant source of inspirations and they have given unconditional support with my studies. I am honoured to have them as my parents. Thank you for giving me a chance to prove and improve myself through all my walk of life. To my siblings and family thank you for your endless love, prayers and encouragement towards me. Not forgetting, to those who indirectly contributed in this research, your kindness means a lot to me. Thank you very much.

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Thank you very much.

## ABSTRACT

The present study aims to explore the current TQM tools and techniques adopted by manufacturing organizations in Malaysian. The main objective of this paper is to provide empirical evidence on operational performance and understanding of the Total Quality Management and its role towards business survival and competitiveness. First, several studies about the evolution of TQM tools and techniques, implementation of quality control in Malaysian manufacturing companies and identify the factors that influence the selection of quality control techniques in these companies. The first chapter will discuss the background of the study, which will cover the objectives, aims, scope, limitations and the significance of this research. All of this lead readers to have a clear view of what the researcher is all about and what are the key elements being investigated to create this chapter. The second chapter will emphasize a more theoretical view related to this research and an overview of quality control and its implementation in organizations. Theories will be taken from books, journals and article to create literature review that will answer the research question and research objectives, both will be stated later. The third chapter includes the research design, what method that is going to be used in order to collect primary data to be analysed later. This is followed by the description of four selected companies in this study, including their products and company backgrounds. The application of quality control in each company is then presented. The selection factors of TQM tools and techniques for quality improvement in the companies to apply quality control and challenges faced by companies in implementing quality control are discussed. The data gathered were analysed by using descriptive analysis. The finding shows that there is a significant relationship between Operational Performance (dependent variable) and the Quantitative & Qualitative (independent variables).

## ABSTRAK

*Kajian ini bertujuan untuk mengkaji alat dan teknik pengurusan kualiti dalam bidang pembuatan yang diguna pakai oleh organisasi di Malaysia. Objektif utama kajian ini adalah untuk menyediakan bukti mengenai prestasi operasi dan pemahaman tentang Pengurusan Kualiti Menyeluruh dan peranannya ke arah peningkatan prestasi perniagaan dan daya saing. Pertama, beberapa kajian mengenai evolusi alat dan teknik, pengurusan kualiti, pelaksanaan kawalan kualiti dalam syarikat-syarikat pembuatan Malaysia dan mengenal pasti faktor-faktor yang mempengaruhi pemilihan teknik kawalan kualiti dalam syarikat-syarikat ini. Bab pertama akan membincangkan latar belakang kajian, yang akan meliputi objektif, matlamat, skop, had dan kepentingan kajian ini. Semua ini membawa kepada pembaca mempunyai pandangan yang jelas tentang apa yang diselidik adalah tentang dan apakah elemen utama dalam siasatan untuk membuat bab ini. Bab kedua akan menekankan pandangan yang lebih teori yang berkaitan dengan kajian ini dan gambaran keseluruhan kawalan kualiti dan pelaksanaannya dalam organisasi. Teori akan diambil dari buku-buku, jurnal dan artikel untuk membuat kajian literatur yang akan menjawab soalan-soalan kajian dan penyelidikan objektif, kedua-duanya akan dinyatakan kemudian. Bab ketiga termasuk reka bentuk kajian, apa kaedah yang akan digunakan untuk mengumpul data primer untuk dianalisis kemudian. Ini diikuti dengan penerangan mengenai empat syarikat terpilih dalam kajian ini, termasuk produk mereka dan latar belakang syarikat. Penggunaan kawalan kualiti di setiap syarikat ini kemudiannya diuraikan. Faktor-faktor pemilihan alat dan teknik pengurusan kualiti, peningkatan kualiti dalam syarikat-syarikat untuk meningkatkan kawalan dan cabaran yang dihadapi oleh syarikat dalam melaksanakan kawalan kualiti yang berkesan. Data yang dikumpul dianalisis dengan menggunakan analisis deskriptif. Dapatan kajian menunjukkan bahawa terdapat hubungan yang signifikan antara Prestasi Operasi (pembolehubah bersandar) dan kuantitatif & kualitatif (pembolehubah bebas).*



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**LIST OF SYMBOLS**

<b>SYMBOL</b>		<b>MEANING</b>
t	=	t value
p	=	significant
$\beta$	=	Beta



**LIST OF ABBREVIATIONS**

<b>NAME</b>	<b>ABBREVIATION</b>
Total Quality Management	TQM
Operational Performance	OP
Quality Management	QM
Statistical Process Control	SPC
Quality Function Deployment	QFD
Failure Mode and Effects Analysis	FMEA
Design of Experiments	DoE
Statistical Package for the Social Sciences	SPSS
Multiple Regression Analysis	MRA
Pearson's Product Moment Correlation Coefficient	PMCC
Universiti Teknikal Malaysia Melaka	UTeM

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

Total Quality Management (TQM) has received worldwide attention and is being adopted in many industries, particularly in developed countries such as Malaysia. TQM has evolved primarily because of the changes in the global economy and also because of demand in market forces. Although control of quality has been practiced in many industries for several years, the adoption of TQM as a major preoccupation of businesses worldwide is very recent. The traditional control methods being implemented in industries to ensure quality have not yielded the results that were expected of them. Furthermore, rapidly changing technology and customer expectations have already affected organizations worldwide and thus have promoted the need for taking a new look at quality management. In this study the researcher intends to discuss how TQM can be adopted in organizations that are replacing existing quality control systems to promote competition and growth.

Total Quality Management are no longer fads or slogans but have become the survival issues of the 21st century. Companies that have adopted quality management practices have experienced an overall improvement in corporate performance including better employee relations, higher productivity, greater customer satisfaction, increased market share, and improved profitability. While each company developed its practices in a unique environment with its own opportunities and problems, there were common features in their quality management systems. These features included continuous improvement process, a flexible and responsive

corporate culture, fact-based decision making, and partnerships with suppliers. It is important to note that many different kinds of companies benefited from putting specific TQM practices in place; however, none of these companies reaped those benefits immediately. Allowing sufficient time for results to be achieved was as important as initiating a quality management program.

Quality can be very misunderstood concept. For some, to many, improved quality means that there must be more inspection. Others believe that the only important quality issues have to do with manufacturing operations. There has been a strongly held belief that quality costs both time and money. Some organizations would argue that if one wants a higher quality product, it will take longer to design and manufacture and it will cost more. Interestingly, all of these beliefs have been proven to be wrong. Inspection does not improve quality, and it turns out that real quality issues pervade the entire organization. Finally, many companies are now demonstrating that high-quality products can be produced more rapidly and at a lower cost which is by applying TQM tools and techniques.

Total Quality Management (TQM) has been introduced and used during the last decades by organizations all over the world to develop a quality focus and improve organizational performance. TQM is necessary to reach competitiveness, however, the way to achieve this is not easy. TQM consists of a wide range of concepts regarding to quality. Most of the studies in TQM implementation focus on the concept of TQM. There are few studies in the literature that directly suggest an implementation of TQM tools and techniques and TQM implementation is still problematic for many organizations. Quality management has long been recognized as a source of competitive advantage and one of the most important drivers of global competition. TQM involves both quantitative and qualitative methods (Human Decision Making). TQM integrates fundamental management techniques, existing improvement efforts, and technical tools. It is important to understand this duality of tools (quantitative and qualitative methods) and philosophy (people issues). Doing one without the other will not be successful. The integration of tools and techniques is critical if TQM is to be something other than overlay program.

A few researchers tried to identify the impact of TQM implementation on firms' performances in both industrialized and developing countries that the majority of these study concluded that TQM positively impacts firm performances depending on the degree of its implementation. In spite of this, TQM implementation is still problematic for many organizations and yet firms report less than optimal results. In order to answer the quest, this study will identify the problem during TQM tools and techniques practices in Malaysian manufacturing industry and configure with the implementation of TQM tools and techniques in manufacturing industry.

## **1.2 Background of Study**

Total Quality Management (TQM) is a management strategy aimed at embedding awareness of quality in all organizational processes (Siddiqui, Haleem, & Wadhwa, 2009). TQM defined by the Deming Prize Committee of the Union of Japanese Scientists and Engineers (JUSE, 2010) as: "a set of systematic activities carried out by the entire organization to effectively and efficiently achieve the organization's objectives so as to provide products and services with a level of quality that satisfies customers, at the appropriate time and price". There are many proposed tools and techniques to achieve the TQM promises. Generally, a technique can be considered as a number of activities performed in a certain order to reach the values (Hellsten & Klefsjo, 2000). On the other hand, tools sometimes have a statistical basis to support decision making or facilitate analysis of data. Bunney and Dale (1997) reported that on the subject of quality management, there are many studies that agree on the vital role of the use and selection of quality management tools and techniques to support and develop the quality improvement process. However, they emphasized that organizations do encounter a range of difficulties in their use and application of quality management tools and techniques.

Quality is a universal value and has become a global issue. In order to survive and be able to provide customers with good products, manufacturing organizations are required to ensure that their processes are continuously monitored and product quality is improved. The manufacturing organization applies various quality control

techniques to improve the quality of the process by reducing its variability. A range of techniques is available to control product or process quality. These include seven statistical process control (SPC) tools, acceptance sampling, quality function deployment (QFD), failure mode and effects analysis (FMEA), six sigma, and design of experiments (DoE). While the development of quality has always been spearheaded by developed countries, Malaysia has not been left behind in quality development. The Malaysian Government implemented its Umbrella Project in 1990, with the aim of upgrading technical levels and product quality among industry, through SIRIM. The project aims to promote the gradual introduction of quality among industry based on ISO 9000 with the technical assistance of foreign affiliates and other advanced manufacturing companies.

Thus, this research will be divided into five chapters and will be present the origin and evolution of TQM tools and techniques, implementation of quality control in Malaysian manufacturing companies and identify the factors that influence the selection of quality control techniques in these companies. The first chapter will discuss the background of the study, which will cover the objectives, aims, scope, limitations and the significance of this research. All of this lead readers to have a clear view of what the researcher is all about and what are the key elements being investigated to create this chapter. The second chapter will emphasize a more theoretical view related to this research and an overview of quality control and its implementation in organizations. Theories will be taken from books, journals and article to create literature review that will answer the research question and research objectives, both will be stated later. The third chapter includes the research design, what method that is going to be used in order to collect primary data to be analysed later. This is followed by the description of four selected companies in this study, including their products and company backgrounds. The application of quality control in each company is then presented. The selection factors of TQM tools and techniques for quality improvement in the companies to apply quality control and challenges faced by companies in implementing quality control are discussed.

### 1.3 Problem Statement

A large number of statistical tools and techniques are applied in manufacturing and service firms. Quantifying and improving quality requires the use of specific methods or tools. Tools are not to solve the existing or would be problems, but as a means of identifying the problems or strengths in specific terms through systematic manners and the users must understand the applicability of a particular tool before being applied. A technique on the other hand, has a wider application than a tool and is understood as a set of tools. This often results in a need for more thought, skill, and training to use techniques effectively. Techniques can be thought of as a collection of tools which are necessary for the effective use of the technique. [Shamsuddin, Ahmed and Masjuki, Hassan, 2003]

Total Quality Management is a structured system for satisfying internal and external customers and suppliers by integrating the business environment, continuous improvement, and breakthroughs with development, improvement, and maintenance cycles while changing organizational culture. Total Quality is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company's operations, with processes being done right the first time and defects and waste eradicated from operations.

In every manufacturing industry, producing quality products or service is necessary for generating satisfactory profits. In production management, it's important to continually monitor quality performance standards to ensure customer retention and allow for the possibility of expansion in the future. To do this properly, manufacturer must be equal parts detective and problem solver. It is become responsibility to discover how to streamline processes, reduce errors and waste and raise overall quality so that a higher percentage of manufacturer product gets to market, where it can increase company's bottom line selection and develop the quality improvement process by implement TQM tools and techniques. However, the real problems lies on that organizations which is encounter a range of difficulties in their use and application of quality management tools and techniques. To counter this

issue, manufacturer need to devise a plan and measure its impact with the appropriate TQM tools and techniques practices.

From the problem statements above, this study will investigate about TQM tools and techniques is a factor of quality improvement. They have both specialist and universal applications. If they are not used in a systematic manner, quality improvements are likely to be random and spontaneous rather than comprehensive. The need for an improved understanding of the critical factors for effective and successful tools and technique implementation is becoming more important. However it is the variety and by their nature complexity, that often can create difficulties in their selection, application and effective use. Thus, this paper is to investigate the difficulties associated with the use of TQM tools and techniques, critical factors for effective TQM practices and specific issues related to TQM tools and techniques implementation. For the purpose, the survey and interview approach will be used as the methodology to evaluate the critical success factors for effective and successful implementation of TQM tools and techniques in Malaysian's manufacturing industries.

#### **1.4 Research Questions**

Iron triangle consists of three main elements which is the research topic, research question and research objective. To form research question, the researcher need to understand this topic first and how to achieve it. In order to make this study, the researcher would like clarify more in the research question and research objective. To have further information on the TQM tools and techniques for quality improvement in Malaysian manufacturing industry, the researcher have identified several research question and research objectives. In this study, the researcher will intend to answer the following question: