A STUDY OF
TOTAL QUALITY MANAGEMENT IMPLEMENTATION
IN MEDAN MANUFACTURING INDUSTRIES

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A STUDY OF TOTAL QUALITY MANAGEMENT IMPLEMENTATION IN MEDAN MANUFACTURING INDUSTRIES

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SUATU KAJIAN PELAKSANAAN PENGURUSAN KUALITI MENYELURUH PADA INDUSTRI PENGELUARAN MEDAN

ABSTRAK

Tujuan kajian ini ialah untuk mengenalpasti pelaksanaan pengurusan kualiti menyeluruh (TQM) di industri pengeluaran di Medan dengan menguji hubungan antara amalan TQM (hala tuju kualiti, hubungan dengan pelanggan, hubungan dengan pembekal, proses kawalan dan pengurusan sumber tenaga manusia) dengan prestasi kualiti (kesesuaian mutu dan kepuasan pelanggan) serta juga hubungan antara budaya organisasi dengan amalan TQM. Kaji selidik melibatkan 28 organisasi pengeluaran bersaiz besar. Organisasi bersaiz besar ditakrif sebagai firma yang memiliki 500 pekerja atau lebih. Pengumpulan data dilakukan dengan menggunakan kaedah soal selidik dan temuduga. Respon yang diperolehi ialah 100 %. Berdasar pada analisis data dengan menggunakan statistik nonparametrik, terdapat hubungan yang bererti di antara pembolehubah. Hasil kajian mendapati bahawa semua organisasi (100 %) ada melaksanakan pengurusan kualiti menyeluruh namun pelaksanaannya adalah tidak menyeluruh dari aspek: 1. teori, 2. temuan penyelidik dan 3. penggunaan alatan kualiti. Berdasarkan keputusan kajian dari aspek teori, temuan kajian dan penggunaan alatan kualiti, kajian ini mendapati 46 % organisasi dikategorikan pada pelaksanaan yang tidak lengkap manakala 54 % dalam pelaksanaan yang sederhana. Oleh itu disimpulkan bahawa organisasi pengeluaran di Medan ialah dalam tahap implementasi sederhana. Didapati rintangan yang paling ketara ialah aspek sumber tenaga manusia yang kecekapannya kurang dan juga kesedaran mengenai amalan kualiti di dalam bidang kerja mereka masih minima.

A STUDY OF TOTAL QUALITY MANAGEMENT IMPLEMENTATION IN MEDAN MANUFACTURING INDUSTRIES

ABSTRACT

The objective of this study is to define the implementation of total quality management (TQM) in the manufacturing industries in Medan by examining the relationship between TQM practices (orientation towards quality, linkage with customers, linkage with suppliers, process control and human resources management) and quality performance (quality conformity and customer satisfaction) and also the relationship between organizational culture and TQM practices. A survey of 28 manufacturing companies was conducted in large-sized organizations having 500 employees and above. This study used questionnaires and in-depth interviews to collect the data. Responses are 100 %. Based on data analysis using non-parametric statistics, there were significant correlation between the variables. The study found that all organizations (100 %) had implemented total quality management although not as completely with respect to: 1. theory, 2. findings of the researchers and 3. the usage of quality tools. The conclusions based on theory, findings of the many researchers and quality tools application, the organizations are classified into 46 % as incomplete implementation of TQM while 54 % is classified as partially implemented. It could be inferred that manufacturing organizations in Medan are categorized as partially implemented. The barriers were unskilled human resources and the lack of comprehension in quality application.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Manufacturing is the backbone of any industrialized nation. A country's level of manufacturing activity is directly related to its economic health. Generally, the higher the level of manufacturing activity in a company, the higher the standard of living of its people (Kalpakjian and Shmid, 1991). The word " manufacturing " is derived from the Latin word, *manufactus*, meaning made by hand. In the modern sense, manufacturing involves making products from raw materials by means of various processes, machinery and operations through a well-organized plan for each required activity.

The Statistics Board of Indonesia defines manufacturing industry as an economic activity engaged in processing materials and transforming them mechanically, chemically or by hand into finished products and/or converting them into other goods that have higher value and closer to the ultimate user (Badan Pusat Statistik, 2002).

Total quality management (TQM) is the term used to describe a comprehensive view of quality assurance (Evans and Lindsay, 1993). TQM is an integrative management concept for continuously improving the quality of goods and services delivered through the participation of all levels and functions of the organization. TQM is simply the process of building quality into goods and services from the beginning and making quality everyone's concern and responsibility. The success of TQM depends on the genuine commitment to quality by every member of the organization.

Currently there is hardly any discussions or awareness about the quality of the manufacturing industries in Medan. It can be presumed that this is due to the monetary crisis and a slack of business which is affecting Indonesia. This research will attempt to

study the implementation of total quality management in Medan manufacturing industries.

1.2 Background of Study

The economic improvement structure of Indonesia will be the first agenda of the nation at present because the economy is still slowing down (BAPPENAS, 2004). Medan, the capital city of North Sumatra Province is also affected by the national situation. Various sectors (banking sector, construction sector and industry sector) in the economy activities are sluggish (*Badan Pusat Statistik Kota Medan* and *Badan Perencanaan Daerah Kota Medan,* 2002). Before the crisis, industrial sector contributed the biggest amount for the Gross Regional Domestic Product. However in the midst of 1997 the economic tragedy in Asian countries had ruined the economic system of Indonesia. Since then Indonesia experiences difficult times. Rupiah depreciation to the dollar US up to 600 % on February 1998. This affects Indonesian economy greatly. The effect of the crisis is that many companies are bankrupt, especially for industries which import raw materials from abroad (Badan Pusat Statistik, 2000).

Asean Free Trade Area (AFTA) which is expected to commence in 2004 together with Asia Pacific Economic Cooperation (APEC) in 2010 will make a globalized economy. The free trade without country restriction will force the organizations to compete. These events will lead to the manufacturing industries competing with one another. In the midst of striving for industrial development, economic growth and globalization, it is vital for the manufacturing industries to adopt the concepts of quality in order for them to survive. The globalization, which tends to liberalize trade, will be a challenge to Medan manufacturing industries. Therefore, they should improve their

performance to compete with the products of competitors including Malaysia, Thailand and Singapore. Kolarik (1999) cited quality as applied to the products turned out by industry to mean the characteristic or group or combination of characteristics which distinguishes one article from another or the goods of one manufacturer from those of competitors or one grade of product from a certain factory from grade turned out by the same factory. Pertaining to the above issue, this research will examine the implementation of TQM in manufacturing industry organizations of Medan and how is the profile of TQM practices.

1.3 Formulation of Study

It can be deduced from previous discussions that quality awareness is urgently needed. Under the circumstances, TQM should be embodied in the current situation for successful competition. The problem of the study is formulated as follows: What is the model of total quality management practices in Medan manufacturing industries? The model followed by these companies may be traditional, modern or advanced quality practices. The traditional performance measures are based on traditional accounting systems, such as: return on investment, return on sales, purchase price variances, sales per employee, profit per unit production and productivity (Ghalayini, et al. 1997). They added the modern performance tends to global competition that changed to customer requirements. Implementation of new technologies and management, such as: computer integrated manufacturing (CIM), just-in-time (JIT), optimized production technology (OPT) and total quality management (TQM) is required for modern one. The new customer requirements and associated technologies/philosophies are needed for the advanced practices (Ghalayini, et al. 1997).

1.4 Objectives of the Study

This research studies the factors related to quality in manufacturing industries and examines the implementation of total quality management in Medan manufacturing industries. The objectives are:

1. To assess the implementation of TQM.
2. To define the profile of TQM practices.
3. To determine the relationship between TQM practices and quality performance.
4. To investigate the relationship between organizational culture and TQM practices.

1.5 Motivation

Manufacturing industry output does not only subscribe to the income of the government but also to the livelihood of the workers. This is because hundreds and even thousands of labor forces are supported by the manufacturing industries. Each company should continuously improve the quality of performance to conform to the customers' needs. Today's Indonesian society especially the Medan communities, have the economic knowledge in deciding to buy quality rather than low cost products. The consumers also have the choice of buying imported goods rather than local products. This is further supported in marketplace where a variety of products from China can be found. It is crucial that domestic manufacturing organizations are able to compete in order to survive in today's globalized economy. The growth of economy will be much better if the quality of manufacturing goods are emphasized.

1.6 Scope of the Study

The population of the research is manufacturing industries in Medan. This study is focused on the large-sized companies. A large-sized company would have 500 or

more employees (Ettlie and Stoll, 1990). It is assumed that large companies are more concerned with the awareness of quality management rather than smaller industries. In addition, the good performance of the large-sized organizations could be a model for the smaller ones. Ismail, et al. (1998) found that from the perspective of competitive advantage, firms are better management being big rather than small. *Badan Pusat Statistik* (2000) defined manufacturing industries are classified based on the number of persons engaged without considering the use of machine as well as the value of capital owned by that particular industry. Thus, this research is carried out according to the above classification. According to the Industry and Trade Board of Medan, there are 28 companies with 500 or more employees in Medan area as shown in Appendix M.

Industrial classification of Indonesia as well as Medan is based on the International Standard Industrial Classification of all Economic Activities (ISIC). The ISIC has been modified according to the local condition to become *Klasifikasi Lapangan Usaha Indonesia (KLUI).* TQM practices study is applied to all the 28 companies. However, ISIC 34 and ISIC 36 with 500 or more employees are not available in Medan. The research studies the TQM practices in manufacturing related to application of quality techniques, quality tools and their obstacles.

The principles of TQM implementation are measured using the critical factors, including quality policy, policy of the organization and philosophy. These factors are also based on Juran philosophy. The management is examined by factors such as commitment, customer involvement, communication between management and employees and the empowerment of human resources. Process control in the organizations is evaluated by factors such as documented procedures and supplier involvement. Total involvement is measured by quality conformance, customer satisfaction and reaction to customer complaints. The tools used in the companies are

assessed by factors, such as application of tools and basic tools. Quality implementation is measured by factors, namely continuous improvement environment and creating quality culture. TQM principles are appraised by philosophy possession and innovation to achieve quality. By the means of unstructured questions, barriers and supports for implementation of TQM are being investigated.

Table 1.1 Classification of Manufacturing Industries

ISIC	SECTOR
31	Food, beverage and tobacco
32	Textile, garments and leathers
33	Wood and wood products
34	Paper and products, printing and publishing
35	Chemical, petroleum, coal and products, rubber and plastic products
36	Non metallic mineral products
37	Basic Metal
38	Fabricated metal products, machinery & equipment
39	Other manufacturing Industries

1.7 Keywords Definition

Many terms used in this research are synthesis of literature and opinion of experts in quality. The terminologies are:

Leadership

- The process of influencing a group toward the achievement of a goal (Reitz, 1977).

- A process of giving purpose (meaningful direction) to collective effort and causing willing effort to be expended to achieve purpose (Jacobs and Jaques, 1990).
- Top management plays a critical role in achieving quality performance and quality management practices (Crosby, 1996; Deming, 1986; Garvin, 1988; Juran, 1986).

Continuous Improvement

- To redistribute responsibility, authority and decision making, regarding tactical or limited-scale improvements, down to the operations level-it essentially empower the work force (Imai, 1986).
- A process-based initiative, compatible with a process-based organization (Kolarik, 1999).

Total Quality Management

- The art of managing the whole to achieve excellence (Besterfield, 2001).
- An integrative management concept for continuously improving the quality of goods and services delivered through the participation of all levels and functions of the organization (Evans and Lindsay, 1993).

Human Resources Management

- Training, education, reward, good environment and satisfaction of work force are to be concept to improve the quality (Crosby, 1996; Deming, 1986).

Relationship to Supplier and Customer

- A substantial portion of quality problems will be due to the supplier. To succeed the quality product, a partnership of supplier is required. The supplier must demonstrate

technical capability and capacity to the quality improvement (Crosby, 1996; Besterfield, 2001).

- The relationship with customer is to be a concept to satisfy the customer's needs through meeting the quality and servicing (Garvin, 1988;Besterfield, 2001).

1.8 Organization of Thesis

This thesis is presented in five chapters consisting of introduction, literature review, research methodology, data analysis and results, discussion and conclusion. The introduction chapter describes the needs of quality performance for the competitive products and services. Chapter two discusses the literature review on quality concepts, TQM and the history of Indonesian quality development, which are related to the current project.

Chapter three is the research methodology including research type, questionnaire type, hypothesis, data analyzing method, reliability, validity and statistical analysis. The preliminary study, profile of population, reliability analysis, data description, hypothesis testing, quality tools application and Strengths Weakness Opportunities Threats (SWOT) analysis are presented in chapter four. The thesis ends with discussions, conclusion and suggestion for future studies in chapter five.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter will present the concepts and definitions of quality from conventional definitions to modern ones. The principles, critical factors and quality tools of total quality management are also described in this chapter. Finally, the development of Indonesian quality and the comparison with other countries will be presented.

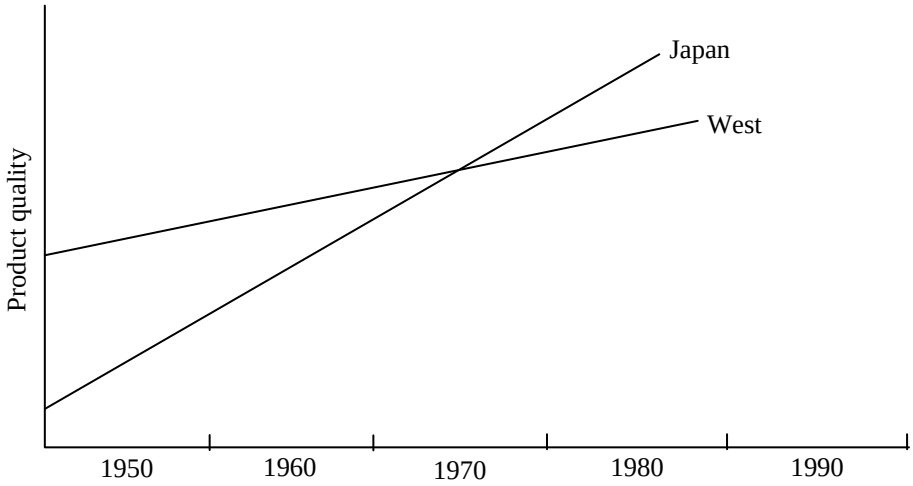
The ISO 9000 and the comparison between ISO standard and TQM will be discussed briefly. Based on the previous researches, the ISO standard is considered to be more of the process of quality improvement. Many factors which contribute to the failure of TQM implementation, including internal and external factors, will also be explained in this chapter.

2.2 Quality Concept

Manufacturers are encouraged by the competitive industry era to compete with each other in terms of the quality aspect. Quality concern will positively impress on the products through both cost and profit. Productivity cost related to manufacturing process must be a good conformity of quality and based on defect prevention and certainly will minimize cost and therefore will increase the profit. It can be noted that products produced with good quality will satisfy the customers. Customers might have consumed the quality products and reasonable price eagerly. It means producing the right goods and services of the right quality at the right price and at the right time. Thus, it could increase sales on the marketplace and furthermore raise the turnover of the company.

The quality concept began in the early 1900s in the United States when Frederick W. Taylor introduced new approaches to improve the work of unskilled workers in industrial organizations. Taylor known as “the Father of Scientific Management” outlined two important quality principles, firstly, that the workers should have standard tools and conditions to complete the task and secondly, failure to complete the task is a high loss and should be personally costly.

During 1950s two prominent consultants Joseph Juran and W. Edwards Deming introduced statistical quality control techniques to the Japanese during Japan’s rebuilding period after the second world war. Being inspired by Juran and Deming, Japanese companies made significant penetration into Western markets, primarily due to the higher quality levels of their products during 1970s. The result is that Japanese product quality exceeded Western quality and continues to improve at a greater pace (see Figure 2.1).



(Source: JM. Juran, “Product Quality – A prescription for the west”, Management Review, June/July 1989 quoted by Evans and Lindsay, 1993)

Figure 2.1 Japanese and Western: A contrast

Until now the Japanese still adheres to the concept of quality by improving the market development. They changed their working mindset from price competition to quality

competition. The quality concept of customer satisfaction has been fundamental to the Japanese success.

2.2.1 Quality Definition

There are many different definitions on quality from the conventional to the modern ones. The conventional definition of quality describes the characteristic of the products, as performance, reliability, ease of use, attractive, etc. (Gaspersz, 1997).
The modern definitions began in the 1930s when W.A. Shewhart of the Bell Laboratories introduced statistical quality control in American Industries.

W. Edwards Deming, Joseph Juran and Philip Crosby were recognized as the top three international leaders of modern quality. Deming's philosophy is based on improving products and services by reducing uncertainty and variation in which statistical thinking is the foundation of his philosophy. He advocates a radical culture change in organizations that is embodied in his "14 points". The Deming chain reaction states that quality improvement reduces cost, increases productivity, increases market share and allows firms to stay in business and provide jobs. Juran's philosophy seeks to provide change with the current American management system. Quality is defined as fitness for use and the quality trilogy planning, control and improvement, provides a program for quality assurance in organizations. Crosby's approach to quality is summarized in his Absolutes of Quality Management. He places more emphasis on behavioral change rather than the use of statistical techniques as advocated by Deming and Juran. A.V. Feigenbaum and Ishikawa have also made significant contributions in the quality area. Feigenbaum coined the term "total quality control" and was responsible for developing cost of quality approaches. Ishikawa was instrumental in the Japanese quality movement, particularly in advocating a company-wide quality control approach,

the use of quality circles and problem-solving tools, such as cause and effect diagrams (Evans and Lindsay, 1993).

There are many assumptions about quality, from the simple definitions till the complicated ones. Some definitions are listed below.

Quality is fitness for use (Juran, 1989).

Quality is conformance to requirements (Crosby, 1996).

Quality should be aimed at the needs of the consumer, present and future (Deming, 1986).

Quality is the total composite product and service characteristics of marketing, engineering and maintenance through which the product and service in use will meet the expectations of the customer (Feigenbaum, 1991).

Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs (ISO 9000).

The American National Standards Institute (ANSI) and the American Society for Quality Control (ASQC) 1978, define **quality** as the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs.

The European Foundation for Quality Management (EFQM) defines **quality** as to meet the needs and expectations of the customers, personnel, financial stakeholders and society (Geraedts, et al., 2001).

Based on the definitions above, it can be concluded that quality is focused on customer. Customer focused quality is driven by customer satisfaction and has become the principle definition of quality from a managerial perspective. Quality is meeting and exceeding customer needs and expectations. Quality is defined by product specifications and achieved by manufacturing. The most applicable definitions are fitness for use (the

design perspective) and conformance to specifications (the manufacturing perspective) where both are necessary for customer satisfaction (Evans and Lindsay, 1993).

2.2.2 Quality Evolution

In accordance with the development of technology and the ideas of authors, the differences of opinion on definition of quality has undergone an evolution. In the early 1900s, Frederick W. Taylor led a new philosophy of production. By decomposing a job individual work tasks, inspection tasks, which led to the creation of separate quality department in production organizations. However, Walter A. Shewhart considered the use of statistics as a vital in the effort to improve quality (Evans and Lindsay, 1993). He developed control charts to track performance over time thereby providing workers with the ability to monitor their work and predict when they were about to exceed limit and possibly produce scrap.

Different from the conventional definition of quality, Crosby's approach to quality were basically built around four fundamental beliefs:

1. Crosby defines quality as "conformance to requirements, not elegance".
2. The quality system for suppliers attempting to meet customers' requirements is to do it right the first time-prevention, not inspection.
3. The performance standard is zero defects.
4. The measurement of quality is the cost of quality.

The literature concerning performance measurement can be grouped into two phases. The first phase began in the 1880s and ended in the 1980s. This phase emphasized financial measures of performance such as profit, return on investment and productivity. The second phase started in the early 1980s as a result of global

competition that changed customer requirements and forced the implementation of new technologies and philosophies of production and management. According to Ghalayini, et al. (1997) the traditional performance measures are based on traditional accounting systems. Return on investment (ROI), return on sales (ROS), purchase price variances, sales per employee, profit per unit production and productivity are examples of traditional performance measures. They argued such performance measures have many limitations (Ghalayini, et al., 1997).

2.3 T Q M

Total quality management (TQM) is an enhancement to the traditional way of doing business. It is a proven technique to guarantee survival in world-class competition (Besterfield, 2001). Only by changing the actions of management will the culture and actions of an entire organization be transformed. Besterfield (2001) defined Total means made up of the whole; Quality means degree of excellence a product or service provides; Management means act, art or manner of handling, controlling, directing, etc. Therefore, TQM is the art of managing the whole to achieve excellence. TQM is defined as both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization (Besterfield, 2001). Further more Besterfield stated that TQM requires six basic concepts:

1. A committed and involved management to provide long-term top-to-bottom organizational support.
2. An unwavering focus on the customer, both internally and externally.
3. Effective involvement and utilization of the entire work force.
4. Continuous improvement of the business and production process.
5. Treating suppliers as partners.

6. Establishing performance measures for the processes.

TQM requires a cultural change. Table 2.1 below compares the previous state with the new TQM state for typical quality elements. As can be seen from the table, this change is substantial and will not be accomplished in a short period time.

Table 2.1 New and Old Quality Cultures

QUALITY ELEMENT	PREVIOUS STATE	T Q M
Definition:	Product-oriented	Customer-oriented
Priorities:	Second to service and cost	First among equals of service and cost
Decisions:	Short-term	Long-term
Emphasis:	Detection	Prevention
Errors:	Operations	System
Responsibility:	Quality control	Everyone
Problem Solving:	Managers	Teams
Procurement:	Price	Life-cycle costs
Manager's Role:	Plan,assign,control,and enforce	Delegate, coach, facilitate and mentor

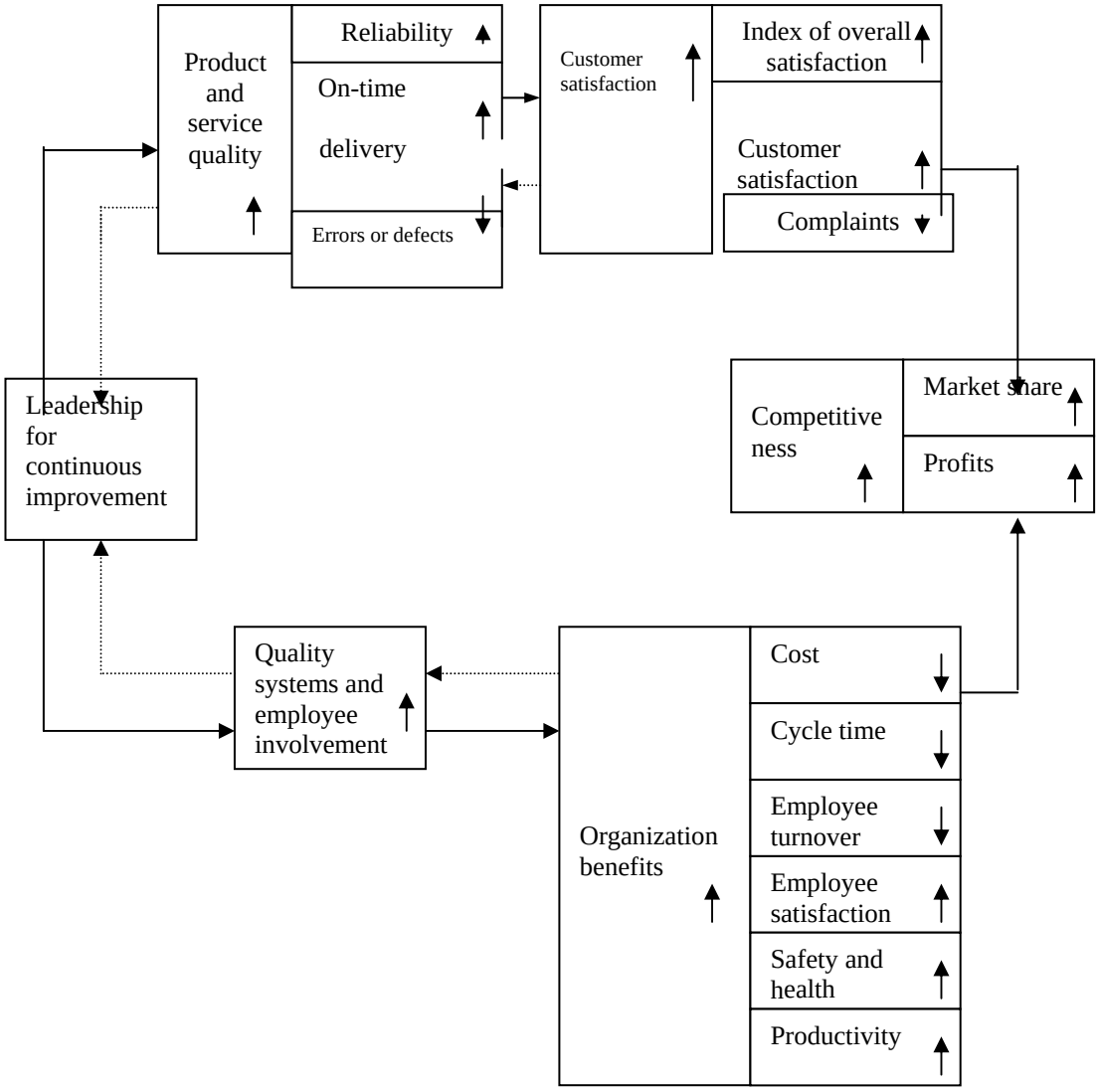
(Source: Besterfield, 2001, TQM: Principles and Practices)

In every organization, effective quality management must be a total, company-wide effort that is aimed at the avoidance of problems through the planning and engineering of products, processes and methods, the identification of problems that inevitably will arise, correction of these problems and continuous improvement of quality performance. The term "total quality control" was coined by Feingenbaum to

denote this managerial effort. The Japanese adopted Feingenbaum's concept and renamed it "company-wide quality control". They used the concept very successfully to compete in the world markets. The concept created by Feingenbaum became a forerunner to TQM. The language of statistics provides a common basis from which we can understand total quality control. While TQM does not require that everyone obtains advanced degrees in statistics, it does require that everyone understands the basic vocabulary of statistics and process control.

The manufacturing industry has developed TQM concept, first applied in Japan and followed by the United States, which demonstrated increased productivity, decreased product cost and improved product reliability. TQM is an effort that involves every organization in the industry to improve performance. TQM approaches were also institutionalized in the Malcolm Baldrige National Quality Award (MBNQA) which quickly became a focus of product quality improvement efforts in many firms. MBNQA competition indicated that companies adopted TQM practices achieved better employee relations, higher productivity, greater customer satisfaction, increased market share and improved profitability.

The General Accounting Office (GAO) (1991) has developed a general framework for describing total quality management, as shown in Figure 2.2. The solid line shows the direction of the total quality processes to improve competitiveness. This begins with a leadership dedicated to improving products and services as well as the quality systems. Improvements in these areas lead to customer satisfaction and benefits to the organization, both of which improve competitiveness. The dotted lines show the information feedback necessary for continuous improvement. The arrows in the boxes show the expected direction of the performance indicators.

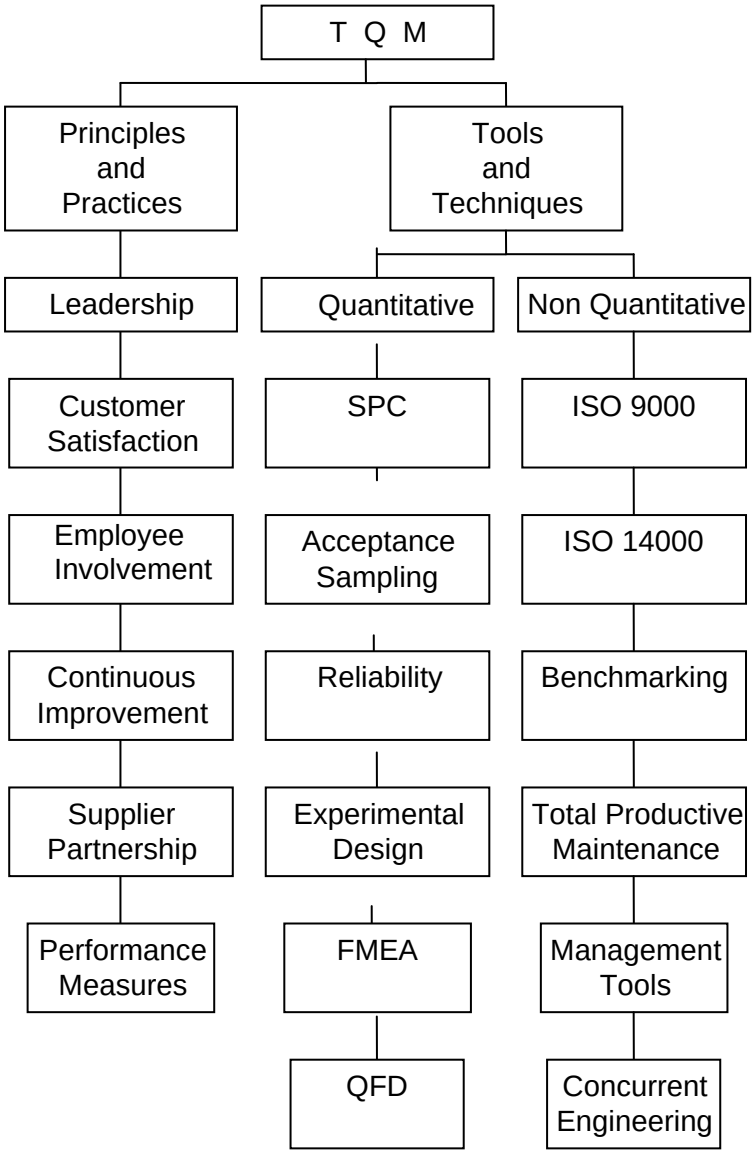


(Source: U.S. General Accounting Office, "Management Practices: U.S. Companies Improve Performance Through Quality Efforts", GA/NSIAD-91-190, May 1991)

Figure 2.2 Total quality management model

Besides manufacturing industry, other sectors also adopted TQM as their concept. For instance, NASA had implemented the TQM and had received the President's Award for quality and productivity improvement in 1989.

The purpose of TQM is to provide a quality product to customers, which will, in turn, increase productivity and lower cost. With a higher quality product and lower price, competitive position in the marketplace will be enhanced. Besterfield (2001) revealed that recent evidence suggests more corporations are recognizing the importance and necessity of quality improvement if they are to survive domestic and worldwide competition. Quality improvement is not limited to the conformance of the product to specifications, it also involves the quality of the design of the product and the process. TQM is not something that will occur overnight. There are no quick remedies. It takes a long time to build the appropriate emphasis and techniques into the culture.



(Source: Dale H. Besterfield – Scope of the TQM activity

Quality Control, 2001)

Figure 2.3 Scope of the TQM activity

The entire scope of the TQM activity is shown in Figure 2.3. The TQM consists of hard and soft tools. Principles, leadership, customer satisfaction, employ involvement, continuous improvement, supplier partnership and performance measure are considered as soft tools. While hard tools comprise of quantitative and non quantitative tools, such as: ISO, benchmarking, SPC, FMEA, QFD, etc.

2.3.1 Principles of Total Quality Management

TQM industry means permanently solving quality problems and laying the foundations for further improvement in quality performance (Slack, 1991). TQM has become increasingly popular as organizations focus more on improving the quality of their products, services and internal operations to increase their competitiveness and value to customers. TQM has the same substance with strategic quality management (SQM) but different on emphasis. SQM emphasizes on well-managed quality as a strategy for business success, whereas TQM emphasizes on high-quality management as the principle issue. Juran (1989) defined SQM as a systematic approach for setting and meeting quality goals throughout the company. On the other hand, the BSI standards defined TQM as a management philosophy and company practice that aims at harnessing the human and material resources of organization in the most effective way to achieve the objective of the organization (BS 7850, 1992).

The principles of TQM are embodied in the following (Evans and Lindsay, 1993):

1. Business success can only be achieved by understanding and fulfilling the needs of customers.
2. Leadership in quality is the responsibility of top management.
3. Statistical reasoning with factual data is the basis for problem solving and continuous improvement.
4. All functions at all levels of an organization must focus on continuous improvement to achieve corporate goals.
5. Problem solving and process improvement are best performed by multi functional work teams.
6. Continuous learning, training and education.

Various viewpoints used by companies to the quality have the same concept such as strategic objectives, management and workers commitment, continuous improvement, customer focused, training and etc. Toyota, who invented what in the west called “just-in-time”, never used that term themselves – they call their approach “The Toyota System”. Likewise, the company of Astra International in Indonesia describes their approach as Astra Total Quality Control (Sato, 1998).

2.3.2 Critical Factors of TQM

Implementing TQM needs to be a totally integrated, continuous and open system based on the commitment from top management and employees, as well as the communication with customers (Chin et al. 2002). Quality management requires factors as baseline to implement TQM. Yusof and Aspinwall (1999) cited the need for an improved understanding of the critical factors for successful TQM implementation is becoming more important. They proposed 10 factors as the model on their study, such as: management leadership, continuous improvement system, education and training, supplier quality management, systems and processes, measurement and feedback, human resources management, improvement tools and techniques, resources, work environment and culture. There are some their new factors comparing to the previous studies. Resources, for instance, has not previously been identified as a critical factor. They argued working environment and culture are also important factors for successful TQM implementation. On another study, Yusof and Aspinwall (2000) found that management leadership was the first priority for TQM implementation. This is because the Managing Directors and Quality Directors/Managers are directly involved in the process and have first hand knowledge of quality implementation in the companies. The second priority was employee training. They indicated that training is crucial for

changing the prevalent working attitude and culture of the employees towards a new thinking for quality.

The critical factors in this research are leadership, process control, relationship with suppliers and customers, human resources management, quality conformity, customer satisfaction and organizational culture.. These also are related to the Malcolm Baldrige National Quality Award (MBNQA) framework and some of them are similar to critical factors of studies above.

2.3.2 (a) Leadership

Leadership has different meanings depending on different points of view. Leadership is frequently confused with motivation. Motivation is the internal desire to act in order to meet felt needs. Leadership, often dependent on a focal person who is motivated to lead, is centered on the leader providing a motivating climate for a group within an organization through task design and attention to desired outcomes. Thus if motivation can be said to be internally directed, leadership can be seen as externally focused. Leadership can be defined as the right to exercise authority and the ability to achieve results from subordinates under one's authority. Current leadership theory is focusing on contingency approaches, which state effective leadership depends on three variables: the leader, the led and the situation (Evans and Lindsay, 1993).

In this context, the leadership is attached to management in order to solidify the function of leadership. Management leadership plays an important role towards of the success of a company. In addition, the entire management team needs to become leaders. Besterfield (2001) stated that there are 12 behaviours or characteristics that successful leaders demonstrate,

1. They give priority attention to external and internal customers and their needs.

2. They empower, rather than control subordinates.
3. They emphasize improvement rather than maintenance.
4. They emphasize prevention. “An ounce of prevention is worth a pound of cure”.
5. They encourage collaboration rather than competition.
6. They train and coach, rather than direct and supervise.
7. They learn from problems.
8. They continually try to improve communications.
9. They continually demonstrate their commitment to quality.
10. They choose suppliers on the basis of quality, not price.
11. They establish organizational systems to support the quality effort.
12. They encourage and recognize team effort.

According to the MBNQA, the leadership category examines how senior executives create and sustain clear and visible quality values along with a management system to guide all activities of the company toward quality excellence. Upper management should set goals and plans for integrating quality principles and practices into their organization. They must be committed to involving all employees in improving the organization by training them properly and rewarding them for their efforts in quality improvement. Leadership requires communicating quality values throughout the organization and establishing a measurement system to determine how well these quality values are adopted. A study indicates that Deming Prize winners have obtained a sharp focus on quality through some core concepts including emphasizing the role of top management (Evans and Lindsay, 1993).

The TQM implementation process begins with senior management and most important, the chief of executive officer (CEO) commitment. Leadership is essential during every phase of the implementation process and particularly at the start. In fact,

indifference and lack of involvement by senior management are frequently cited as the principle reasons for the failure of quality improvement efforts. As documented by quality gurus (e.g. Deming, Juran), management leadership is an important factor in TQM implementation because it improves performance by influencing other TQM practices (Ahire and O'shaughnessy, 1998).

With the use of TQM implementation framework based on seven core elements given by Tummala and Tang (1996) i.e. customer focus, leadership, startegic quality planning, design quality, speed & prevention, people participation, fact-based management planning and continuous improvement; senior management must first identify customer requirements and then translate them into quality goals and strategic, as well as operational plans. Senior management must also determine how to involve all levels of employees and suppliers to achieve quality and operational performance objectives. Only then will quality becomes everyone's job. Moreover, TQM in the construction process study conducted by David and Murat (1997) asserted that the success of a TQM program first of all depends on management practices. TQM is a culture and philosophy that must permeate an organization as the method of management. It can thrive only under a senior management that establishes TQM as a top priority. They further stated only if supported by this commitment and understanding, can senior management lead the company toward the realization of higher quality in its undertakings.

2.3.2 (b) Process Control

Effective and efficient production system and the process share several fundamental features. They are directed through common purpose such as vision,

mission, core values and process. Process control represents a strategic means by which the organizational vision and mission are addressed and supported within the core values set out by the organization. Output refers to and describes the products and by-products of process. Input refers to the resources, such as materials, supplies, energy, information and so on, needed to execute the process. Process control focuses on results. Kolarik (1999) implies that process control includes three elements: measurement, comparison and correction. The elements of the process fundamentals triad involve measurement of both strategic and tactical parameter, e.g. calibrating real-time or recent operational positions. These measurements are compared to their respective target values. Appropriate action is taken, when necessary, to bring parameter being measured back to its target.

Process control refers to business and production activities of all organizations. The process is the interaction of some combination of people, materials, equipment, method, measurement and the environment to produce an outcome such as a product, service, or an input to another process. In addition to having measurable input and output, a process must have value-added activities and repeatability. It must be effective, efficient, under control and adaptable. Meeting or exceeding expectations of downstream customers improves the process. For instance, the better the oxyacetylene weld is made, the less grinding is required, making the appearance of the finish paint more pleasing. Total quality management requires that all personnel think of their jobs in terms of processes (Geotsch and Davis, 1998).