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## The Obstacles of TQM Implementation in Medan Manufacturing Industries

Sahala Siallagan

### Abstract

This study discusses the barriers in implementing total quality management (TQM) in Medan manufacturing industries. In order to be a competitor in the global market, companies must straighten up by identifying the pitfalls.

A survey of twenty-eight manufacturing industries was conducted in the large-sized organizations having 500 employees and above. Questionnaires and interviews were used to collect data. The response is a hundred percent. Descriptive analysis is applied to infer the data obtained. The study finds some handicaps such as employees, human resources empowerment, QC tools and quality information. Almost all companies apply the quality tools to support their operations but they tend to use basic and easier tools. The organizations are very basic and are not adventurous in using various advanced tools. The QC tools are often not given to all employees. The employees are lack of quality information.  
**Keywords:** Total Quality Management, Continuous improvement, Leadership

### Abstrak

Penelitian ini membahas hambatan-hambatan yang dialami industri di Medan dalam pengimplementasian TQM. Untuk dapat menjadi pesaing di pasar global, perusahaan harus bersungguh-sungguh untuk memperbaiki dengan cara mengidentifikasi masalah-masalah.

Penelitian ini dilakukan terhadap dua puluh delapan industri manufaktur yang memiliki karyawan 500 keatas. Dalam pengumpulan data digunakan angket dan wawancara, seluruh responden memberi jawaban. Untuk menyimpulkan penelitian ini digunakan analisis deskripsi. Hasil temuan penelitian ini adalah terdapat beberapa hambatan, seperti pada karyawan, pemberdayaan tenaga kerja, peralatan QC dan informasi tentang mutu. Hampir semua perusahaan mengaplikasikan peralatan mutu untuk mendukung kelancaran operasi, akan tetapi lebih cenderung menggunakan alat yang lebih mudah dan mendasar. Penerapan pada organisasi-organisasi tersebut sangat mendasar dan tidak berani mengambil resiko dalam penggunaan alat mutu yang maju. Peralatan QC sering tidak diberikan ke semua karyawan. Para karyawan kekurangan informasi tentang mutu.

## 1. Introduction

The competitive edge and consequently the survival of organizations in 21<sup>st</sup> century will depend upon how will they harness their capabilities. Total quality management (TQM) is one of the most popular and durable modern management concepts. Implementation of TQM becomes a top management agenda in many organizations in the pursuit of positive business benefits, such as better product quality, higher customer satisfaction and less quality cost. TQM industry means permanently solving quality problems and laying the foundations for further

improvement in quality performance. 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.

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 since 1997 in Asian countries and a slack business in Indonesia. The economic improvement structure will be the first agenda of the nation at present because the economy is still slowing down. Medan, the capital city of North Sumatra Province

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is also affected by the national situation. Various sectors (banking, construction and industry) are sluggish (BPS Medan and BAPPEDA Medan, 2002).

Asean Free Trade Area (AFTA) which begins in 2004 together with Asia Pacific Economic Cooperation (APEC) in 2010 will create globalization. These events will lead the manufacturing industries to compete against one another. In the midst of striving for industrial development, economic growth and globalization, it is vital for the manufacturing industries of Medan to adopt the concepts of quality products and services, otherwise they could not survive.

This study discusses the obstacles of TQM implementation in Medan manufacturing industries in a better way to run a business and compete in domestic and world markets.

## **2. Literature Review**

### **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, such as performance, reliability, easy to use, attractive, etc. The modern definitions began in the 1930s when Shewhart of the Bell Laboratories introduced statistical quality control in American industries.

Deming, Juran and Crosby were recognized as the top three international leaders of modern quality. Feigenbaum and Ishikawa have also made significant contributions in the quality area. 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. The Deming chain reaction states that quality improvement reduces cost, increases productivity, increases market share and allows firms to stay in business and provides 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 rather than the use of statistical techniques as advocated by Deming and Juran. 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). Evans and Lindsay (1993) add that the 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). Both are necessary for customer satisfaction.

### **2.2 Quality Concept**

Manufacturers encouraged by the competitive industry era to compete with the others have to concern to quality aspect. Quality concern will positively impress on the products through both cost and profit. The quality concept began in early 1900s in the United States, when Taylor introduced new approaches to improve the work of unskilled workers in industrial organizations. During 1950s two noted consultants Juran and Deming introduced statistical quality control techniques to the Japanese during Japan's rebuilding period. 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.

### **2.3 T Q M**

TQM evolved from statistical process control theories pioneered by Dr. Walter A. Shewhart in the Bell Telephone Laboratories of AT&T in 1924. His theories, originally designed for the manufacturing sectors, were also applied by practitioners in the service industries and became the basis of Dr. W. Edward Deming's work. An American by nationality, successful implementation of TQM by Deming did not occur in the U.S, but in Japan during the 1980s. It was his success in Japan that led

to the sudden growth of interest in TQM in American industry.

TQM is a management philosophy that is intended to empower every member of the organization. It is intended to promote continuous, sustained and long term improvement in quality and productivity and to eliminate employee's fear of change. Its basic principle is that cost of prevention is less than the cost of correction. Jones and Hand (1989) suggest that TQM is not just another management fad; it is capable of delivering real competitive advantage. The TQM approach integrates the fundamental techniques and principles of quality function deployment, statistical control and existing management tools in a structured manner. By establishing a quantified deliverable cost benefit, TQM can help management to measure the effectiveness and efficiency of the use of resources across the organization.

As Irani, et al. (2003) restated the statement of Zairi in their study that TQM can be defined as the agreed company-wide and plant-wide operating work structure, documented in effective, integrated technical and managerial procedures, for guiding the co-ordinated actions of the people, the machines and the information of the company and plant in the best and most practical ways to assure customer quality satisfaction and economical costs of quality. Thus, it can be concluded that TQM itself is the desired culture of an organization committed to customer satisfaction through continuous improvement. Many organizations have already realized that their only way of surviving in today's competitive global market is to become a successful total quality organization.

The TQM implementation process begins with senior management's and the most important is the CEO's commitment. The importance of the senior management role cannot be overstated. 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 principal reasons for the failure of quality improvement efforts. The European Foundation for Quality

Management (EFQM) defines TQM as: "All manners in which an organization meets the needs and expectations of its customers, personnel, financial stakeholders and society in general". Geraedts, et al. (2001) imply that the definition is fairly abstract since TQM can be considered a philosophy rather than a model or a method. Many definitions are therefore used to describe it. However, it is widely accepted that TQM is based on three principles:

- Customer focus; every decision is taken with the customers needs in mind.
- Continuous improvement; continuous efforts to improve the organization, its products and its services.
- Integral approach; TQM concerns every aspect of the organization.

Tari and Sabater (2003) cite that experience has shown that some firms fail when they implement TQM because the implementation cannot be successful without the use of suitable quality management methods, such as tools and techniques for quality. According to the literature on TQM, there are two components in a TQM system: the management system and the technical system, or the "soft" and "hard" part. The hard part includes production and work process control techniques, which ensure the correct functioning of such processes (process design, the ISO norm, the seven basic quality control, etc.) while the soft part includes principles and practices (leadership, employee involvement, customer satisfaction, etc.). Referring to the findings of Tari and Sabater that tools & techniques and TQM have a positive correlation.

Lee, et al. (2003) restate the theory of Becker in Human Capital that the basis of human capital theory lies in the concept that individuals possess skills, experience and knowledge which have economic value to the firm. Individuals enhance their capital through education as well as from learning that occurs on-the-job and off-the-job training. Training ranges from formally organized activities such as apprenticeships and other training programs to the informal processes of learning on-the-job through experience. The education alone is insufficient to adequately prepare individuals for skills required for the job. Graduation from school is usually the end of a more

general and preparatory stage and the beginning of a need for more specialized and often prolonged of training or acquisition of occupational skills as employees enter the labor force. Education and training are necessary for quality improvement as recognized by Deming, Crosby, Juran and

Malcolm Baldrige National Quality Awards (MBNQA).

TQM requires a cultural change. Table 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 1 New and Old Quality Cultures**

QUALITY ELEMENT	PREVIOUS STATE	TQM
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

#### **2.4 Tools and techniques for quality improvement**

Many tools, methods and models have been developed world wide in order to give substance to the concept of TQM. In Europe, the model for Business Excellence issued by the European Foundation for Quality Management has gained broad acceptance among both profit and non-profit making organizations. Statistical methods provide problem-solving tools to the TQM process. The organizations provide teams with the tools to identify the causes of quality problems, to communicate in a precise language that can be understood by all team members, to verify, to repeat and to

reproduce measurements based on data, to determine the past, present and to a lesser degree, the future status of a work process and to make decisions on facts that are based on data rather than opinions and preferences of individuals or group. The most commonly used statistical methods in the TQM process are: failure mode and effect analysis (FMEA), statistical process control (SPC), quality function deployment (QFD), benchmarking, design of experiment (DOE) and quality control circle (QCC). Seven simple control tools are also used extensively to improve quality. These basic tools fit quite well within the creative problem-solving process. Table 2 below shows the seven tools in the context of this problem-solving process.

Table 2 Problem solving and the seven quality improvement tools

Problem – Solving Step	Useful Tools
Understanding the mess	Flowcharts
Finding facts	Check sheets
Identifying problems	Pareto analysis
	Histogram
Generating ideas	Fishbone diagrams
Developing solutions	Scatter diagrams
Implementation	Stratification

Forza and Filippini (1998) cite the tools are weak when only used by quality control specialists, but they become extremely powerful when the whole staff (and in particular the shop-floor workers) learn how to use them and apply them to their own activities. Furthermore, Deming (1993) states that statistical methods are very important for manufacturing industries in order to improve quality.

### 3. Data analysis procedure

This research was conducted in Medan manufacturing industry, which is the third largest manufacturing industries in Indonesia. Population are large-sized

companies listed in Manufacturing Industrie of Medan Directory. The large-sized organizations are defined as having 500 employees or more (Ettlie and Stoll, 1990). According to the directory, there are twenty-eight companies in this category. Because of the small amount of companies only, hence this study uses a total sample. This means that data are obtained from all population.

The population in this research are the organizations with Industrial Classification of Indonesia and as well as Medan based on the International Standard Industrial Classification of All Economic Activities (ISIC). The organizations classifications included in this study are shown in Table 3 below.

Table 3 Manufacturing industry classification in Medan

ISIC	SECTOR	TOTAL
31	Food, beverage & tobacco	7
33	Wood & wood products	4
35	Chemical, petroleum, coal, rubber & plastic products	
	Base Metals	9
37	Fabricated metal products, machinery & equipment	2
38	Other manufacturing industries	1
39		5
		28

Data collection in this study is by means of questionnaires and interviews. The questionnaires consist of unstructured and structured questions. For structured questions, answers are provided using the Likert scale of 1 to 5. The Likert scale of 5 points is used to enable the respondents to answer easily. The questions measuring QC tools application in the companies are also included. While the unstructured questions are related to SWOT analysis. The researchers directly conveyed the questionnaires to the respondents, gave them one week to complete it and personally collected back. When the questionnaires were taken back, interviews were being conducted. The response rate is one hundred percent. The reliability of test instrument in this study is tested by Cronbach's Alpha. The validity of test instrument is not analyzed statistically. Validity indicates whether a test measures what it says it measures (Moore, 1983). Data processing conducted on the questionnaires and completed by respondents is analyzed by using descriptive statistics.

#### 5. Findings

The large-sized companies in Medan have implemented total quality management although not as completely as the theory even the findings of researchers. They are not based on traditional management or family-style management which is now outdated and incompatible with their new operating philosophies. They strive to achieving quality performance, whether they want to or not because the organizations have to compete with imported products. The study finds that all organizations apply the quality tools to support their operations. But they tend to use basic and easier tools, such as flowchart, histograms, cause and effect diagrams, Pareto analysis, control chart, scatter diagram, check sheet, benchmarking and SPC which provide problem-solving tools for TQM process. The seven basic tools and benchmarking are used by all companies. SPC is applied by 31 % organizations. The usage of QFD is 10 %, DOE's application is 22 % and QCC's application is 29 % industries. FMEA is not used by any of the organizations. Descriptions of quality tools practiced in companies is given in Table 4 below.

**Table 4 Quality tools application**

Applied at Department/Division							
Quality Practice	Product Orga. (%)	QC/QA Orga. (%)	Market Orga. (%)	Sale Orga. (%)	Admin. Orga. (%)	Purchase Orga. (%)	R & D Orga. (%)
FMEA	-	-	-	-	-	-	-

#### 4. Results

The reliability of the test instrument is average in 0.9398. A measurement instrument will be reliable if the coefficient 0.7 or above, even though the coefficient of 0.5 is acceptable for minimum reliability of the instrument (Sekaran, 1992). Preliminary study was conducted to prove the validity and reliability of the instrument used while improving the language so that it is easily understood.

The implementation of TQM requires thorough organizational transformation, especially in the areas of operation mode, organization structure and corporate culture. The complexity and difficulty of TQM implementation predestinate organizing to be the most fundamental and important factor. Data description related to the theory describes that the companies in Medan have commitment, team involvement, customer oriented, based on prevention not detection, focus on quality, continuous improvement and quality tools application.

SPC	3	11	2	7	2	7	1	3	2	7	1	3	1	3
QFD	1	3	2	7	-	-	-	-	-	-	-	-	-	-
BENCH MARK	7	25	10	36	12	43	11	39	-	-	-	-	-	-
DOE	3	11	3	11	-	-	-	-	-	-	-	-	-	-
QCC	8	29	-	-	-	-	-	-	-	-	-	-	-	-
7 BASIC TOOLS	6	21	11	39	14	50	13	47	26	93	27	97	16	58
NOT USED	-	-	-	-	-	-	3	11	-	-	-	-	11	39
TOTAL	28	100	28	100	28	100	28	100	28	100	28	100	28	100

Referring to the completeness of QC tools application on each organization, it can be described that 13 (46 %) companies are classified in incompleted and 15 (54 %) are in simply implemented. This illustrated that the quality tools usage and application in Medan industries are very basic and are not adventurous in using various more advanced tools. The application of quality tools are not only in technical department, like product department, QC/QA department, but also in non-technical department, like marketing, sale, purchase, administration and R & D relating to the needs of operation. This study indicates most of quality tools are applied by technical department.

The study of Tamimi and Sebastianelli (1998) found several factors working against TQM implementation. The major barriers cited by samples are included not linking management's compensation to achieve quality goals and lack of training in

areas such as group discussion, communication technique, quality improvement skill, problem identification and problem-solving. Moreover, Kekale and Kekale (1995) argue that perceiving TQM narrowly as a set of tools and technique has proven to be one of the primary failures of TQM implementation. Similarly, in this study, Medan manufacturing industries also face problems in quality implementation such as employees, human resources empowerment, QC tools and quality information.

Often organizational principles are implemented in manufacturing without analyzing the required workers' competence. The main problem with regards to human resources are employees' low level of education and skill. Based on education and skill, Indonesian work forces are categorized into 5 % skilled workers and 95 % unskilled workers. The low level of human resources skill is based on education. Indonesian



Statistic Board (2002) indicates of 100.8 million work forces, 58 % are primary school, 36.5 % are secondary and 5.5 % are tertiary (Suara Pembaruan, 2003). Due to the substantial lay-offs in Indonesia as well as Medan, employees are apprehensive about the security of their jobs. This is caused by economy crisis since 1997. Conversely, they hardly ever receive reward for good results at work.

The quality control tools are often not given to all employees. Since it is believed that quality tools are for management use only, the tools are usually used solely by managers. In Japan, a highly collectivistic culture, a process approach is widely adopted. Quality tools are available to all Japanese first line employees and foremen. The paucity of quality information will affect the quality awareness of employees.

## 6. Discussion

The strength of the quality tools does not depend on easily used or not, but depends on the problems. Lam (1996) states that most of the samples in his research apply the simple tools. The tools should be available to all first line employees, foremen and managers. Training conducted by the companies can enrich skills, experience and knowledge to develop the quality improvement. The organizations must pay attention for training since low level education and skill of the employees. Ghobadian and Gallear (2001) found training initiatives featured heavily on their study.

Lack quality information could be overcome by publishing booklet or bulletin. It will be a challenge for Indonesian government to conduct workshops and seminars. Because it is costly if it is held by the organizations itself.

## 7. Conclusion

Total quality management (TQM) is an enhancement to the traditional way of doing business. TQM is considered by many organizations as an important quality and business performance improvement tool. It is a proven technique to guarantee survival in world-class competition. As with most management interventions TQM has not been without its barriers. Despite most of the companies have supports to implement TQM by the commitment of senior managers but some of them are in doubt about development of indigenous technology which lead to a lack of innovation and product improvement. The most dominant barriers towards TQM in Medan Manufacturing industries is the human resources. They feel a lack of theoretical of TQM. The problems include a paucity of skill and job security. Medan faces stringent competition from neighboring countries, like Malaysia and Singapore. In order to survive the manufacturing industries in Medan should strive in achieving quality improvement by approaching the yield problem in a holistic way. It is believed the organizations will be in a better way to run a business and compete in domestic and world markets.

## References

- BPS Medan and BAPPEDA Medan 2002 *Pendapatan Regional Medan Tahun 1993- 2001*.
- Deming, 1993. *The New Economics or Industry Government, Education*. MIT Press, Cambridge, MA
- Ettlie, E., Stoll, W. Henry, 1990. *Managing the Design Manufacturing Process*. Mc Graw-Hill, Inc., USA.
- Evans, James, R., Lindsay, William, M., 1993. *The Management and control of quality*. West Publishing, USA.
- Forza, Cipriano, Filippini, Roberto, 1998. *TQM impact on quality conformance and customer satisfaction: a causal model*. International Journal Production Economics 55, 1- 20.
- Geraedts, H.P.A., Montenarie, R., Rijk, P.P., 2001. *The benefits of total quality management*. Computerized Medical Imaging and Graphics 25, 217-220.
- Irani, Z., Beskese, A., Love, P.E.D., 2003. *Total quality management and corporate culture: constructs of organizational excellence*. Journal of Quality Management 23, 1-8.
- Jones, Bellis, R., Hand, M., 1989. *Are total quality management programmes a fact or a management fad?*. Management Accounting 67, 36-37.
- Kekale, T., Kekale, J., 1995. *A mismatch of cultures: a pitfall of implementing a total quality approach*. International Journal of Quality and Reliability Management 12 (9), 210-220.
- Lam, Simon, S.K., 1996. *Applications of quality improvement tools in Hongkong: an empirical analysis*. The TQM Magazine, M.C.B., University Press, England 7 (6), 657-680.
- Lee, Hoon, Soon, Phan, H. Phillip, Tan, W.Y. Gilbert, 2003. *Impact of the Asian economic crisis on training intentions and outcomes*. Human Resources Management Review 13, 467- 486.
- Moore, W. Gary, 1983. *Developing and Evaluating Educational Research*. Little, Brown & Company, Canada.
- Sekaran, Uma, 1992. *Research Methods for Business: A Skill- Building Approach*, 2<sup>nd</sup> edn. John Willey & Son Inc., New york.