

Chapter Two: Literature Review

2.1 The Concept of Total Quality Management (TQM)

TQM is only one of many approaches to getting work done and accomplishing goals. Several experiences have shown that by using a TQM approach, organizations can increase their capacity to do work, increase the quality of work done and, at the same time, hold staffing levels and budgets at historical levels. This is possible because:

- The organization recognizes that the vast majority of problems are caused by people doing the wrong things right: work that should never be done, even though it is done very well.
- The organization recognizes that those problems are caused by ineffective systems and procedures. That recognition extends to the belief that the people who do the work are best able to fix these systems and procedures.
- The organization recognizes that in order to unleash the talents of everyone in the company, people must be provided with opportunities to learn new skills and to practice those skills. The organization also believes that given the opportunity, people willingly participate in designing the organization of the future.

Philip Crosby (1979) argued that quality is neither intangible nor immeasurable. Instead it is a strategic imperative that can be used to improve the bottom line. Quality is defined as "conformance to requirements," not "goodness." Terms such as good, excellent, beautiful, exclusive, are subjective and vague. When quality is defined as

conformance to requirements, subjectivity disappears. Any service, product or process that conforms to its requirements is a quality service, product or process. If requirements are not met, non-conformance results. Requirements define the output, the input or the process itself by providing descriptions of process characteristics in a manner that promotes mutual understanding and agreement between customers and their suppliers.

Requirements are based on customer expectations and are integrated into each of the activities of a work process flow. Often, customer expectations are expressed in terms of convenience, comfort, ease of use, and aesthetics. For example, a customer may want a piece of equipment that is "state of the art" or information that is "up to date." When this happens, the suppliers must use the knowledge of the processes involved to translate those needs or desires into specific requirements.

A researcher in the quality literature can experiences bafflement in the meaning of TQM and the differences between TQM and quality-associated activities such as quality assurance, quality control and quality management. This confusion leads, in many cases, to the use of these expressions interchangeably. Therefore, it is very important to have a clear definition and understanding of each of these concepts.

The American Society of Civil Engineers (ASCE) defines "quality assurance (QA) in its publication "Quality in the Constructed Project" (1990) as "A program covering activities necessary to provide quality in the work to meet the project's requirements. QA involves establishing project-related policies, procedures, standards, training, guidelines, and systems necessary to produce quality. The design professional and constructor are responsible for developing an appropriate program for each project."

On the other hand, ASCE defines quality control (QC) as "The specific implementation of the QA Program and it includes checking and reviewing design and construction related activities. Effective QC reduces

the possibility of changes, mistakes and omissions, which in turn results in fewer conflicts and disputes."

The most common problem with a quality assurance program is that the contractor/vendor assumes that his QA program is not based on 100% assurance. As long as this is the impression of the contractor/vendor, he will never have a working QA program. One element of quality, which the contractor/vendor seems to always forget, is the element that requires him to examine any problem fully and determine the cause of the problem for complete elimination of the same problem in the future. If this element of quality was fulfilled, then eventually the contractor/vendor would have a 100% defect-free quality assurance program. As long as a contractor/vendor aims for anything less than 100%, his quality assurance program will never attain a status of 100%, nor will it ever be a fully implemented quality assurance program. In addition, as long as owners expect less than 100% from the contractor/vendor, they will never be supplied with the quality required, and as long as owners continue to waive the required quality by allowing anything less than the requirements in the specifications, they will continue to receive sub-standard, or sub-specification materials.

QA and QC may be considered as separate sub-elements of TQM. However, QA and QC do not represent the only elements of TQM. TQM is a much more comprehensive and broader concept. QA and QC are applied during project implementation while TQM is a strategical philosophy adopted by an organization and implemented at all times, even if the organization is waiting to perform a new project.

The keywords of the TQM concept are: quality, total, and management. "Quality" has been defined in many different ways. Among these definitions are the following (Flood, 1993):

1. ASCE defines quality as the conformance to predetermined

requirements.

2. The British Standard defines quality as the totality of features and characteristics of a product, service or process, which bear on its ability to satisfy a given need from the customer's viewpoint.
3. Crosby (1979) defines quality as conformance to requirements. This can be achieved by "doing it right the first time."
4. Deming (1986) defines quality as a predictable degree of uniformity and dependability, at low cost and suited to the market.
5. Taguchi defines quality as the minimum loss imparted by the product to society from the time the product is shipped.
6. Feigenbaum (1991) defines quality as a way of managing the organization.
7. Juran defines quality as fitness for use.
8. Hoshin defines quality as correcting and preventing loss, not living with loss.
9. Flood, (1993) in his book "Beyond TQM," defines quality as "meeting The customer's (agreed) requirements, formal and informal, at the lowest cost, first time, every time." This definition consolidates different definitions of quality in one, more or less, comprehensive statement.

The second important term is "total". The term total quality indicates how TQM is a company-wide effort. In fact, TQM involves everyone's effort in the organization in order to improve performance. This makes TQM an instrument that considers quality as a strategic objective for an organization (Burati, 1990). In other words, TQM can be achieved through an integrated effort among personnel at all levels, to increase customer satisfaction by continuously improving performance. The integrated effort among personnel can be achieved by having effective and comprehensive management.

This leads to the third keyword "management." The responsibility for management is everyone's, as "total" implies. In other words, everyone

should be responsible for managing their own jobs and this integrates managers with their workers and everyone else in the organization.

The essence of TQM is to achieve customer satisfaction, cost effectiveness, and defect-free work. TQM does this through focusing on process improvement, customer and supplier involvement, teamwork, training and education.

TQM is a culture advocating a total commitment to customer satisfaction, through continuous improvement and innovation in all aspects of the business. The customer, in the TQM culture, does not mean only the final recipient of the organization's end product or services. The customer is also every individual or department within the organization (Logothetis, 1992). The TQM culture varies from one company to another and from one industry to another. However, the TQM culture, regardless of its differences from one company to another, aims to achieve common objectives; namely removal of waste, reduction of costs, improvement of reputation and increased market share. As can be observed, TQM objectives are dynamic in their nature and this dictates continuous updating and upgrading (Logothetis, 1992).

Benefits of Introducing TQM

The most important benefits of introducing TQM into a company are the following (Fox, 1993):

1. It makes the company focus clearly on the needs of its market. This is essential for a company to survive in the competitive market.
2. It helps in achieving a top quality performance in all areas, not only in the final product or service quality. In fact, achieving top quality performance in all areas reflects substantially on the final product or service quality, since quality is a continuous chain.

3. It assists in implementing the simple procedures necessary for the achievement of quality performance.
4. It helps, critically and continuously, in examining all processes to remove non-productive activities and waste.
5. It determines the required improvements and develops a measure of performance.
6. It provides full, detailed understanding of the competition and develops an effective competitive strategy.
7. It develops the team approach to problem solving.
8. It develops good procedures for communication and recognition of outstanding work.
9. It reviews continuously the processes to develop the strategy of never ending improvement
10. Management objectives, such as customer satisfaction, meeting specifications, larger market share, higher productivity, zero defects, increase in sale and decrease in costs, can be achieved by embodying TQM ethics in all aspects of the organization.

The Difficulties of Implementing TQM

The implementation of TQM into an organization requires fundamental organizational culture change. Changing an organization's culture is a very difficult task, which often faces resistance. The challenge of implementing TQM is due to the fact that TQM is not a slogan, nor a tool, nor a program; it is an organization paradigm. The concept of TQM is broad enough to be the framework or foundation of an organization's culture. Therefore, implementing TQM might be dealing with replacing, rather than

modifying, the organization's culture. Furthermore, the transformation from the traditional Western paradigm to the TQM paradigm is a radical change. Glover, (1992) showed the significant differences between the two management approaches.

A study conducted by Longenecker and Scazzero, (1993) revealed that managers and supervisors in the organization that they surveyed were reluctant to change their behavior to support the critical organizational endeavor of implementing TQM. The reason for this is that it is difficult, even in normal times, for managers in any organization to change their management style and behavior. The main reasons for their reluctance to change include the following:

1. senior management's lack of commitment to the process, as evidenced by their failure to practice TQM;
2. too many changes in too short a time;
3. mixed signals in terms of the pressure to get immediate results without reduced production output;
4. too little assistance in redefining roles;
5. little positive feedback on individual performance, while criticism and negative feedback are plentiful.

Among the other difficulties in implementing TQM is the failure to have some means of monitoring and managing the overall progress of TQM implementation, and the failure to provide skills training immediately before TQM is applied. Finally, regarding TQM as only an internal process and thus failing to involve suppliers, subcontractors, and others in the process chain creates a major difficulty in implementing TQM.

Brown, et al., (1994) identified what they believe are the reasons for TQM implementation failure. Organizations go through three identifiable phases during the pursuit of TQM. These phases are:

1. Start-up: This is the initial stage where workers at all levels get themselves acquainted with the basic principles of TQM. This phase involves, also, implementing quality improvement projects using the tools and techniques of TQM.
2. Alignment: In this phase, the organization realizes that it must align its organizational systems and practices to support quality and team work.
3. Integration: In the third phase, the organization integrates TQM principles into every aspect of the organization's operations.

Each phase has its own challenges and common mistakes. Table 1 lists the common reasons for TQM failure in each phase.

Table 1. Reasons for TQM failure (Brown, et al 1994)

No.	Phase	Reasons for TQM failure
I.	Start-up	1. Lack of management commitment 2. Poor training and pacing 3. Wasted education and training 4. Lack of short-term, bottom line result.
II.	Alignment	1. Divergent strategies 2. Inappropriate measures 3. Outdated appraisal methods 4. Inappropriate rewards
III.	Integration	1. Failing to transfer true power to employees 2. Maintaining outmoded management practices 3. Poor organization and job design 4. Outdated business systems

Lakhe and Mohanty (1994a) discussed a case study of TQM implementation. The major obstacles of implementation were:

- a. inadequate knowledge and information about TQM;
- b. doubts of employees about management's intentions;
- c. failure of management to maintain interest and commitment over a long period of time;
- d. difficulty in measuring the effectiveness of TQM;
- e. poor internal communication;
- f. difficulty in assessing customer expectations and satisfaction;
- g. insufficient training resources.