

Total Quality Management in Terry Fabric Manufacturing **Pranjali Chandurkar, CTF**

Abstract

The challenge that companies face as the 21st Century gets underway, is to succeed in global economy where competition is fierce and where customers are becoming demanding of quality. Companies must take a global perspective. They must supply products and services that are competitive in both price and quality, and in international as well as in domestic markets. To maintain a competitive edge in such an environment they must continually improve the quality of what they offer. Total Quality Management (TQM) has proven itself as a way of managing and continuously improving quality. Its successful implementation in Japanese firms has been a major factor not only in their success, but also in establishing the levels of quality that customers now expect in whatever they purchase. What is Total Quality Management? What indeed do we mean by quality? Quality may be simply defined as meeting customer requirements. In fact, given the level of competition in today's market place, we might better define it as meeting and improving upon requirements. Total Quality Management, as the name indicates, regards the continuous improvement of customer-oriented quality as both requiring active management and involving the entire company – and often suppliers and customers as well. TQM can be described in practical terms as customer focus, continuous improvement and teamwork. A great deal has been written about TQM, and more scholarly analyses have identified four fundamental orientations of TQM:

Systems, customer, learning and change. From this perspective, TQM is seen as a dynamic economic effort by firms to adapt and survive in dynamic environments.

Introduction to TQM

Total Quality Management is a management approach that originated in the 1950s and has steadily become more popular since the early 1980s. 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. "TQM is a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society.

To be successful implementing TQM, an organization must concentrate on the eight key elements:

- Ethics
- Integrity
- Trust
- Training

- Teamwork
- Leadership
- Recognition
- Communication

Key Elements-TQM has been coined to describe a philosophy that makes quality the driving force behind leadership, design, planning, and improvement initiatives. For this, TQM requires the help of those eight key elements. These elements can be divided into four groups according to their function. The groups are:

- Foundation - It includes: Ethics, Integrity and Trust.
- Building Bricks - It includes: Training, Teamwork and Leadership.
- Binding Mortar - It includes: Communication.
- Roof - It includes: Recognition.

Aim of TQM -One major aim of TQM is to reduce variation from every process so that greater consistency of effort is obtained.

Implementation Process of Total Quality Management

The implementation program of TQM is of nine stages:

Stage 1: understanding the organization system.

Stage 2: developing a strategic plan for the TQM effort.

Stage 3: Planning Assumptions.

Stage 4: specifying strategic objectives.

Stage 5: specifying tactical objectives.

Stage 6: implementation planning.

Step 7: project management.

Step 8: measurement & evaluation

Step 9: evaluation, accountability, follow through, ensuring effective implementation.

Requirements for successful implementation of TQM

TQM is an approach to doing business that attempts to maximize the competitiveness of an organization through the continual improvement of the quality of its products, services, people, processes and environment. It is a customer oriented management system, which seeks to meet or exceed customer expectations by providing defect free goods or services the first time, on time, all the time. Although the ultimate goal is to satisfy external customers without meeting the requirements of the internal customers as well. Therefore, it seeks to meet or exceed the expectations of both internal and external customers. In TQM, the search of improvement is a never ending process. Thus, when the initial goals are met, newer and higher goals are set. Seeking to achieve incremental

improvements continuously is the core stone of TQM. The continuous search for improvement requires the full participation and involvement of all stakeholders of the organization, including managers, employees, suppliers and customers. Particularly significant is the buy-in by employees, without whose support the TQM effort would be fruitless. Partnerships must also be forged with suppliers. In TQM, collaboration through team efforts among workers and departments is encouraged, and quality improvement becomes everyone's responsibility. In organization where the TQM culture is well established, the manager's role changes from being an administrator and controller to that of coach and facilitator. The best principles of TQM are applicable in any organization, whether manufacturing or service, public or private. Properly designed and implemented, TQM can help private firms to attain competitiveness both in domestic and international markets, and it can enable nations to achieve their economic growth objectives. In view of the fact that TQM introduction involves a major change in organization culture and structure, its implementation process should be adapted to the specific situation based on the objective assessment of the external and internal environment in which a firm operated. Even though the implementation process should be tailored to each organization's specific situation, however there are certain necessary conditions for the successful implementation of TQM. These basic requirements are as mentioned below:

- **Top Management Support & Commitment**

The degree of support and commitment by top management is critical for TQM success. Top management must show unwavering support to quality and excellence, and must promote the effort aggressively in order to ensure support among middle managers and workers. A true test of management commitment lies in the amount of resources that are willing to allocate to the TQM implementation effort. Top management's willingness and commitment to accept such change can inspire the entire organization to embrace the TQM process.

- **Long Term Orientation & Persistence**

TQM is a long term oriented process, which demands persistence and patience. It is not a quick fix and it often takes a long time before its impact can be known. Unwavering management support and its persistent guidance are needed in order to steer the organization towards successful implementation.

- **Customer Orientation**

The customers' needs and expectations must be carefully and continuously assessed and understood, and every effort must be made not just to meet those expectations but also to exceed them. This applies both to internal and external customers.

- **Employee Involvement**

TQM success is unthinkable without the full and active involvement of all employees. Workers should be encouraged to utilize their latent innovativeness and creativity should be empowered to make their own decisions in matters related to specific work.

- **Training**

Through, continuous training is a must if the TQM efforts are to succeed. The training offered should include group dynamics, problem solving and task skills training.

Quality Control Tools

Among the most widely used tools are the seven quality control tools (QC7)

- Check sheets,
- Histograms,
- Stratification,
- Pareto diagrams,
- Cause and effect diagrams,
- Scatter diagrams,
- Control charts/graphs.

Such tools must of course be used within a method of investigation. The typical TQM method is the PDCA (plan, do, check, act) Cycle, also known as Deming's Wheel.

Statistical Process Control can be used to measure variation and to indicate its cause. Some variation is tolerated in the output of processes. However, all variation is caused and can therefore be reduced. Knowledge of variation theory is a powerful tool in the ongoing pursuit of quality. Among the most widely used tools are the seven quality control tools (QC7): check sheets,

Tools and techniques

Central to the implementation of TQM is the gradual introduction of tools and techniques with a problem-solving focus. Many of these have been around for a long time, or are derived from traditional tools. Process mapping, where a flowchart is used to show all the steps in a process with the aim of revealing irregularities and potential problems, is not unlike work-study flow diagrams. TQM tools include those that are simple to use, those that most employees can be trained to use, and those, such as Statistical Process Control (SPC), that require specialist training. Statistical Process Control can be used to measure variation and to indicate its cause. Some variation is tolerated in the output of processes. However, all variation is caused and can therefore be reduced. Knowledge of variation theory is a powerful tool in the ongoing pursuit of quality. Among the

most widely used tools are the seven quality control tools (QC7): check sheets, histograms, stratification, Pareto diagrams, cause and effect diagrams, scatter diagrams, and control charts/graphs. Such tools must of course be used within a method of investigation. The typical TQM method is the PDCA (plan, do, check, act) Cycle, also known as Deming's Wheels and other techniques are Total Productive Maintenance (TPM) '5S', Six Sigma, Statistical methods, D.M.A.I.C, Lean Manufacturing ,7 Wastes, Kanban system

Total Productive Maintenance (TPM)

The goal of Total Productive Maintenance is to improve Overall Equipment Effectiveness (OEE) by eliminating the "Big Six Losses"

Breakdown losses

Setup and Adjustment Losses

Idling and Minor stoppage losses

Speed losses

Quality defects and rework

Start-up/yield losses (reduced yield between machine start-up and stable production)

5S.

The five S's are Sort, Set-in-Order, Shine, Standardize, and Sustain.

Together, the five S's work to organize and maintain an organized workplace.

A workplace that has implemented 5S is one that has predictable, repeatable processes.

Six sigma

6 Six Sigma is concerned with reducing variability.

The goal of Six Sigma is a six-sigma level of quality or 3.4 defects per million opportunities.

Then, project teams attack the problems using the DMAIC method: Define, Measure, Analyze, Improve, Control.

7 Wastes

waste of overproduction;

waste of time on hand (waiting);

waste in transportation;

waste of processing itself;

waste of stock on hand (inventory);

waste of movement; and

Waste of making defective products.

Kanban

Kanban is a material and information flow management tool. They are typically cards attached to containers of parts. The cards contain information about the parts and these cards are reused, traveling with parts.

Kanban are used to control the minimal amount of inventory in the system. It is based on a formula that takes into account usage, lead-time to replenish, and a safety factor based on known or probable breakdowns in the system.

Quantities of cards are added or removed based on seasonal changes in demand. Quantities of cards are also removed to make it harder to meet deliveries if there are problems, in effect exposing weaknesses.

Kanban is used as an improvement tool with the aim of removing all slack from the system by eliminating the need for a safety factor through root cause countermeasures of the breakdowns in the system.

The PDCA Cycle

The PDCA Cycle, developed by Deming, one of the great original thinkers of TQM, is an invaluable strategy for improving any situation, from solving a tiny production problem. It consists of 4 steps:

Plan: Gather data on the problem, identify the causes, decide on possible solutions or Counter measures, and develop a plan with targets, and tests or standards that will check whether the countermeasures are correct. This should be done systematically and thoroughly.

Do: Implement the countermeasures.

Check: Check the results of the implementation of the countermeasures against the Standards established in the 'Plan' stage. If the countermeasures do not work, begin the cycle again with 'Plan'.

Act. If the countermeasures are successful, standardize them and put them into regular use.

The resulting standards may then be improved and refined in further cycles of PDCA. The PDCA Cycle is in fact more than a problem-solving strategy. It is essentially a means to continuous process improvement. Kondo, the Japanese TQM expert, has made the critical point that the PDCA cycle is based not on the idea of "get it right first time", but rather on the fact that we rarely do get anything completely right the first time, nor indeed even the second or third times. The PDCA cycle must therefore be continuously applied if quality is to be a real goal. With each application the improvements made must be standardized and become the base for further improvement. Kondo has also emphasized that the PDCA cycle must operate.

ISO 9000

TQM has a close correspondence with the ISO 9000 series of standards, the set of internationally recognized standards of good management practice which ensure that the organization consistently provides products or services that meet the customer's quality requirements. They define the requirements of a quality management system that can be applied in any organization. A company may invite its customers to audit its quality system so that they can be confident the company is able to meet their quality requirements. It may also get an independent quality system certification body to obtain an ISO 9000 certification of conformity. This certificate is a good reference in dealing with potential clients, and reduces the need for customers to conduct their own audits. TQM can assist companies in a very practical way to meet the requirements of ISO certification.

Gurus

A number of original TQM thinkers, in both the west and Japan, have made important contributions to the development and spread of TQM. The chief gurus on the western side are Deming, Crosby and Juran. Deming devised the PDCA Cycle and developed statistical process control. He emphasizes the importance of management and leadership in achieving quality. Major changes in business can only be brought about by an organizational culture dedicated to quality, and such a culture can only be achieved by changing the attitudes of top management. Crosby popularized the Zero Defects concept. He too emphasizes the importance of transforming the culture of an organization, and of gaining individual commitment to quality at each level of the organization. He believes that each organization must create its own quality improvement process plan. His approach has been effective in communicating the need to change attitudes and behavior, and is popular with many managers because of its success in getting organizations started with quality improvement. Juran has developed an approach in which problems are thought of as projects, with all improvements being made project by project. He advocates the annual formation of teams to analyze problems and find solutions to them. This approach helps build communication and teamwork within an organization, and has been successful in organizations in which upper management has been fully involved. The leading Japanese thinkers on quality, including Professors Ishikawa, Kondo, Kano and Taguchi – to name but a few – have ensured that Japan is the country where the development and implementation of TQM has been most widespread.

Conclusion

Total Quality Management is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) to focus on meeting customer needs and organizational objectives. TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve

these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is “Do the right things, right the first time, every time”. TQM is infinitely variable and adaptable. Although originally applied to manufacturing operations, and for a number of years only used in that area, TQM is now becoming recognized as a generic management tool, just as applicable in service and public sector organizations. There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor. TQM is the foundation for activities. The success of any Six Sigma implementation project depends a lot on the level of support that is provided by the top management to Six Sigma teams handling the implementations. Support and commitment is required in the form of time, effort and resources, which are vital for the success of any quality improvement initiative undertaken by an organization.

References:

- R.Subburaj, Total Quality Management, Tata Mc Graw Hill Pub.Com. Ltd. New Delhi, 2009
- B.Purushothama, Effective Implementation of Quality Management System, Woodhead Publishing Ltd, New Delhi, 2010
- H. Lal , Total Quality Management , New Age International Publishers Mumbai, 2009
- G.Vijaykumar; V. L. Sohani, Design and Development of Computer based Training module for Total Quality Management in Textile Industry , The Bombay Textile Research Association Mumbai, 2004