

Chapter 1-Quality

Total Quality Management is management approaches that originated in the 1950's and has steadily become more popular since the early 1980's. It is a proven technique to guarantee survival in world-class competition. Only by changing the actions of management will the culture and actions of an entire organization be transformed. It 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.

Some of the examples of companies who have implemented TQM include Ford Motor Company, Phillips Semiconductor, SGL Carbon, Motorola and Toyota Motor Company.

Definition-

TQM 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".

Basic Concepts in TQM:

- A committed and involved management to provide long term, top to bottom organisational support.
- A focus on customer, both internally and externally.
- Effective utilisation & involvement of the work force.
- Continuous improvement of the business & production process.
- Treating suppliers as partners.
- Establish process measures for the process.

Definition of Quality:

As per ISO – 9000:2000: Quality means “The degree to which a set of inherent characteristics fulfills requirements”. Here,

Quality also means a totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs. In some references,

Dimensions of Quality:

Quality has different dimensions; these dimensions are somewhat – Independence. Therefore a product can be excellent in one dimension and average or poor in another.

1. **Conformance:** It is one of the dimensions of Quality. It means Meeting the specifications of the customer or Industry standards, workmanship. When new designs or models are developed, dimensions are set for parts and purity standards for materials. These specifications are normally expressed as a target or “center”; deviance from the center is permitted within a specified range.
2. **Performance:** It refers to Primary product functions or characteristics, subjective preferences for eg. clarity of voice received in mobile phone. In service businesses—say, fast food and airlines—performance often means prompt service.
3. **Features:** Features are those characteristics of product or services that supplement the basic function of the product. Example includes free drinks on a plane.
4. **Durability:** Lifetime of the products, which include repairs. Durability can be defined as the amount of use one gets from a product before it deteriorates. After so many hours of use, the filament of a light bulb burns up and the bulb must be replaced.
5. **Reliability:** The probability of a product performing its intended duty under stated conditions without failure for a given period of time. This dimension reflects the probability of a product malfunctioning or failing within a specified time period. Example could be reliability of war equipment.
6. **Serviceability:** speed, courtesy, competence and ease of repair for a product. In those cases where problems are not immediately resolved and complaints are filed, a company’s complaint-handling procedures are also likely to affect customers’ ultimate evaluation of product and service quality.
7. **Reputation:** Customer’s perception about the product which can be understood from a market research survey.
8. **Aesthetics:** The external finish given to a product to attract the customer. For eg. For food, it could be tastes natural, good aroma, and looks appetizing.
9. **Response:** Human to Human interface, such as the courtesy of the dealer.

These dimensions were proposed to define strategic quality analysis by breaking down the word quality into manageable parts.

Importance of Quality:

- ✚ Good quality of goods and services can provide an organization with competitive edge.
- ✚ Good quality reduces costs due to product returns, rework and scrap.
- ✚ Good quality increases productivity, profits and other measures of success such as brand image, product image and company goodwill.
- ✚ Most importantly, good quality generates satisfied customers today and tomorrow.
- ✚ Good quality creates an atmosphere for high employee morale, which improves productivity.

What is a Quality Plan?

A quality plan is a document, or several documents, that helps you schedule all of the tasks needed to make sure that you meet the needs of your customer. It will include the definition of quality targets and milestones when these will be achieved together with the internal and external reviews will be undertaken to ensure that this has happened.

Quality plans should define:

- Objectives to be attained (for example, characteristics or specifications, uniformity, effectiveness, aesthetics, cycle time, cost, natural resources, utilization, yield, dependability, and so on)
- Steps in the processes that constitute the operating practice or procedures of the organization
- Allocation of responsibilities, authority, and resources during the different phases of the process or project
- Specific documented standards, practices, procedures, and instructions to be applied
- Suitable testing, inspection, examination, and audit programs at appropriate stages
- A documented procedure for changes and modifications to a quality plan as a process is improved
- A method for measuring the achievement of the quality objectives
- Other actions necessary to meet the objectives

Essential components of a Quality Plan:

Responsibility of Management:

This describes how the management is responsible for achieving the project quality. Since management is the controlling and monitoring function for the project, project quality is mainly a management responsibility.

Document Management and Control:

Documents are the main method of communication in project management. Documents are used for communication between the team members, project management, senior management, and the client.

Therefore, the project quality plan should describe a way to manage and control the documents used in the project. Usually, there can be a common documentation repository with controlled access in order to store and retrieve the documents.

Requirements Scope:

The correct requirements to be implemented are listed here. This is an abstraction of the requirements sign-off document. Having requirements noted in the project quality plan helps the quality assurance team to correctly validate them.

This way, quality assurance function knows what exactly to test and what exactly to leave out from the scope. Testing the requirements that are not in the scope maybe a waste for the services provider.

Design Control:

This specifies the controls and procedures used for the design phase of the project. Usually, there should be design reviews in order to analyse the correctness of the proposed technical design. For fruitful design reviews, senior designers or the architects of the respective domain should get involved. Once the designs are reviewed and agreed, they are signed-off with the client.

With the time, the client may come up with changes to the requirements or new requirements. In such cases, designed maybe changed. Every time the design changes, the changes should be reviewed and signed-off.

Development Control and Rigor:

Once the construction of the project starts, all the processes, procedures, and activities should be closely monitored and measured. By this type of control, the project management can make sure that the project is progressing in the correct path.

Testing and Quality Assurance:

This component of the project quality plan takes precedence over other components. This is the element which describes the main quality assurance functions of the project. This section should clearly identify the quality objectives for the project and the approach to achieve them. .

Risks & Mitigation:

This section identifies the project quality risks. Then, the project management team should come up with appropriate mitigation plans in order to address each quality risk.

Quality Audits:

For every project, regardless of its size or the nature, there should be periodic quality audits to measure the adherence to the quality standards. These audits can be done by an internal team or an external team. .

Sometimes, the client may employ external audit teams to measure the compliance to standards and procedures of the project processes and activities. .

Defect Management:

During testing and quality assurance, defects are usually caught. This is quite common when it comes to software development projects. The project quality plan should have guidelines and instructions on how to manage the defects. .

Training Requirements:

Every project team requires some kind of training before the project commences. For this, a skill gap analysis is done to identify the training requirements at the project initiation phase. The project quality plan should indicate these training requirements and necessary steps to get the staff trained. .