CHAPTER 1
Total Quality Management

Quality is a relative term. As is said “Beauty lies in the eyes of the beholder,” in the same manner quality is perceived differently by different people. In present highly competitive business environment “Quality” is the single most important factor which leads to good economic performance of any organisation. Today, when consumers are quality conscious, leadership in the market can only be attained through delivering better quality products and services. Quality is a concept that should be applied to an organisation as a whole. Quality should be applied to every process, which the organisation carries out, from getting the raw materials through internal operations finally to the customers.

The word “QUALITY” has many different definitions ranging from “conventional” to those that are “strategic”. Conventional definitions of quality usually describe a quality item as; one fits well, is well served or will be of maintenance free for longer time. While strategic definitions of quality i.e., “meeting customer requirements” is often concerned with identifying and satisfying the needs of the customer in a better manner than the competitors.

According to the Oxford dictionary\(^1\), Quality is the standard of something as measured against other things of a similar kind: the degree of excellence of something. Quality is also defined as a distinctive attribute or characteristics possessed by someone or something. The Quality Guru, W.E Deming (1986) asserts that quality of a product or a service can only be defined by the customer. Quality is a relative term, and it will change its meaning depending on the customer’s needs. For effectively satisfying the

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needs of the customer, the manufacturer needs to translate the customer needs into required production specifications and features and come up with an effective plan to produce them. The products produced need to be compared with standards. Continual improvement of this system is essential to improve the quality and in order to cope-up with the ever changing customer expectations and thereby retaining customers.

Quality is customer determination not the manufactures of the marketer’s determination. It is the degree to which a specific product satisfies the wants of a specific consumer. From a marketing perspective the quality of a product depends on how well it fits the patterns of consumer preferences.

Quality is not an absolute value but it can be realised by comparing with standards. Quality of a product highly depends on the effective application of input factors in the conversion process of a product or a service. The input factors for the conversion process included men, machines, materials, and money and manufacturing conditions. The input factors are having a direct impact on the quality of a product. The skill levels of the employee, the type of the machine and equipments used, the quality and type of material used and also the management policy regarding the amount of investment that could be made are having an important role in determining the quality of the final product. The management policy with regards to specifying the desired level of quality of the input factors will have a significant effect on the quality of output produced. The quality of the product is highly influenced by the ability and concern of the management to predict the needs of the customers accurately. The effectiveness of the product design is also an influencing factor of the quality of the output. Apart from this, effectiveness in packaging, logistics, after sales service etc. will have a determining role in deciding the finished goods quality of a product.

In every organisation there are certain standard specifications laid down either by the producer of the consumer, and it is important that the
finished product complies with those specifications. A good quality item is one, which conform to specifications. In a broad sense, Quality is a holistic concept that gives direction to an organisation and links its members. The acceptance and pursuit of common goal of product excellence tend to unite employees in a team sprit that extends beyond quality specifies to productivity and other effects. So, quality could be defined as a measure of how closely a product or service conforms to specified standards. Quality standards may relate to time, materials, performance, reliability, and appearance of any quantifiable characteristics of a product.

It is erroneous to assume that quality means something extra in the product or services delivered to the customers. In reality, quality is an inevitable feature of any product of service which is to be maintained for better satisfying the needs of the customers. Quality is the basis necessity of any product or service.

Organisational Productivity and Quality of the products produced are closely related. Organisations traditionally viewed quality and productivity are essentially as trade offs. That is to achieve significant improvements in productivity some degradation in quality must be accepted or quality could be improved at the expense of productivity. Yet many successful organisations today operate under the philosophy that improved quality results in improved productivity. If quality is viewed in an absolute sense- improved quality equating with absolute goodness or higher tolerances, it may be difficult to improve quality without added cost. On the other hand when quality is viewed as conformance to specifications, a relationship to productivity becomes more apparent. If a product is produced with defects it must be reworked, reprocessed or reproduced. There may be direct and indirect costs resulting from producing defective products and these costs are known as Cost-Of–Quality (COQ). When products are found defective while in production, they must be either repaired or scarped. The costs includes, the cost of producing the items that are scraped, the cost of repairing, and retesting defective products and
all costs of delays, paper work, rescheduling and other difficulties caused by the defective products.

When defective products are shipped to customers, the costs will be huge and very difficult to measure, since there may be direct and indirect costs associated with delivering defective products to the customers. These costs can include the cost of product return, product liability suits, settlements, warrantee costs, loss in good will, lost of business etc.

There may be costs associated with that of the activities aimed at finding product that do not conform to specifications before they are being shipped to the customers. This cost include; the cost of inspection, testing and other quality control activities.

The prevention of defects costs include the cost training, documenting the quality performance, analysing the quality trends, revising product designs, making changes to production process, working with suppliers and other activities aimed to improve quality and prevent defects.

Poor quality performance increases the input required to produce a given amount of good output. Rework certainly increases the amount of labour required and probably increase, capital, material and energy inputs as well. Waste and scrap increases the need for tighter inspection and control, which requires added resources. W. E. Deming (1986) cleverly states that “you don’t get ahead by making product and separating good from the bad, because that is wasteful”. An important issue in quality management is that the value received from the expenditures on prevention of defects. There are two schools of thought\(^2\) on this issue of COQ. One is that prevention costs will be outweighed by savings in appraisal and failure costs. This is espoused by such people as Crosby and JM Juran. They believe that, as the defect prevention is increased, the cost of appraisal and failure decrease by much more. This means that the net result is lower total cost, and thus as Crosby suggests, “Quality is free”. On

the other hand, some managers believe that attempting to go beyond a certain point, such expenditures on quality reduce the funds available for other objectives such as, for reducing product development times and updating technology.

The concept of conducting extensive inspection of activities in order to sort-out the defective items is the philosophy of the past. Today the emphasis is on prevention of defects rather than inspection. This requires the collective effort of the employees and the management. For enabling this, the accountability for quality should lie with those doing the work. The role of quality professional has been shifted from an enforcer to a facilitator -one who educates, trains and advises.

Quality can be of three types, viz. Quality Design, Quality of conformance and Quality of performance.

Quality of design is the relevance of the product’s design to its intended purpose. Here the focus is for developing the products with the consumers in mind, their needs and expectations with respect to the product. The quality of design starts with analysing the needs of the customers and developing a product to meet or exceed the expectations of the customers.

The next type of quality is the quality of conformance. It refers to the degree to which the products are conforming to the standards specified in the design. Conforming to the specification laid down by the customers with a high degree of uniformity in the product is expected. Once the specifications are determined though the quality of design study, the organisation must continuously strive to improve the specification so as to improve excellence in that area. The quality of conformance could be improved by training and skills of the employees, worker motivation, efficient machines and management commitment.

Quality of performance focuses on how quality characteristics are determined in quality-of-design, improvement and innovated in Quality-of-
conformance studies, and is performing in the market place. The major tools used here are study after-sales service and service-call analysis. Business organisations with good or excellent quality characteristics typically benefit in a variety of ways - improved goodwill of the organisation, an increased market share, fewer service problems, could command high prices, fewer complaints from customers, lower production costs and higher profit etc.

Quality cannot be considered as a program. It is an outcome that evolves from an organisational culture that is focused on the customer and achieving organisational excellence. The latest and very successful management philosophy is Total Quality Management (TQM) which addresses the concept of product quality, process control, quality assurance, and quality improvement - all of which are aimed at improving all the functions of the organisation through delighting the customer.

1.1 Total Quality Management

Total quality Management in an approach for improving both customer satisfaction and the way the organisation do business. Total quality Management brings together all the quality and customer related process improvement ideas and it is people oriented. American Production and Inventory Control Society (APICS) defines Total quality Management as “TQM is based on the participation of all members of an organisation in improving process, products, services, and the culture they work in”. The objective of Total quality Management is to provide a quality product to customer at a lower price. By increasing the quality of the products produced and thereby decreasing the price of the products, the organisation’s growth and profit will obviously increase, which will lead to increase in job security and employment level. Total quality Management is a philosophy that aims at continuous improvement of all the endeavors of the firm, by incorporating the knowledge and experience of workers.
Total Quality Management (TQM)\(^3\) is:

- **Total** = Quality involves all stakeholders and all activities of the company
- **Quality** = Conformance to Requirements (meeting customer Requirements)
- **Management** = Quality can and must be managed effectively and efficiently in all the functions of the organisation and this will lead to Total Quality

TQM is defined as an organisational wide quest for excellent quality in all the endeavors of the organisation. TQM seeks to integrate all organisational functions for meeting the customer needs and organisational objectives. TQM is also defined as a comprehensive and systematic approach to improve the competitiveness, effectiveness and flexibility through planning, organising and understanding each function, by involving everyone in the organisation, irrespective of their structural roles. The main theme of TQM is that all members of the organisation make consistent efforts to achieve the objectives of customer satisfaction through systematic efforts for the improvement of the organisation. The Top management has a decisive, vital, and powerful role in creating a quality culture in their organisation. Effective management is a pre-requisite for improving and sustaining systematic performance results and to improve quality.

An organisation’s top management needs to set direction for the organisation in a customer focused perspective. They should set clear and visible values and high expectations. The direction set by the top management should include the values and expectations of all stakeholders.

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The Top management is required to serve as role models through their ethical behaviour and their personal involvement in planning, communications, training, review of the performance, and rewarding. As role models, senior leaders can reinforce values and expectations, while building, leadership, commitment, and initiative throughout the organisation.

The primary thrust of organisation’s mission is that of delivering better quality products and services to its customers. By embedding Total Quality Management in the mission statement and in the organisation’s corporate philosophy the organisation can ensure the delivery of better quality products. This will also help the organisation to differentiate itself from similar organisations. The Top management must provide a clear mission, goals and set objectives by reinforcing values by emphasising quality and deploy necessary resources for the successful implementation of TQM. The quality culture of the organisation is the reflection of the beliefs and the values of the top management. It is erroneous to implement and practice Total Quality Management without the whole hearted cooperation of the top management. Quality is an outcome that evolves from an organisational culture that is focused on the customer and attaining organisational excellence. As organisation expands in to the global market place, recognition of quality and a corresponding statement of quality policy should be reflected in the organisation’s hierarchy of purposes and hierarchy of strategies. The hierarchy of purposes consists of four types of organisational purposes. It consists of vision, mission, goals and objectives and the hierarchy of strategies has three main components. They are corporate, business and functional level strategies.

An organisation’s top management needs to set direction for the organisation and lead the organisational members to the direction which will lead to the vision and mission of the organisation. It is essential that the top management needs to state the mission of the organisation. The mission is the primary consideration in which the organisational goals, objectives, strategies and polices are based. The primary concern of the
organisation’s mission should be of developing better quality products and services to its customer. By embedding the philosophy of Total quality Management in the mission statement of the organisations, the organisations can ensure the delivery of better quality products to the customer’s, and thereby the organisation would be in a position to differentiate itself from other organisations. By instilling the Total quality Management philosophy in the vision, goals, objectives and in the corporate, business and functional strategies, the organisation’s can reach a position of sustainable competitive advantage; an advantage over its competitors due to their superior ability to deliver products and services at a higher level of quality and customer satisfaction. Normally sustainable competitive advantage comes from a firm’s ability to differentiate its products and/or lower cost structure could be made possible by integrating total quality concept into the value chain. The well accepted and proven theory of value added chain by Michael Porter (1980) clearly states that, for attaining the competitive advantage the organisations need to focus on the links or elements of the value added chain of that organisation. Michael Porter defines value added chain as the various functions involved in the production of a product of service. The five primary links of the value added chain according to Michael Porter are; (1) In-bound logistics (Raw materials) (2) Internal logistics or Internal operations (3) out-bound logistics (finished goods) (4) marketing and sales (5) customer service. By Integrating Total Quality Management among the elements of the value chain will lead to the delivery of better quality products to the customer at lower prices. This will enable the organisation to achieve cost leadership and/or differentiation and thereby attaining sustainable competitive advantage of the organisation in the market.

For attaining competitive advantage the organisation’s need to design the organisational objectives by the incorporating the policy of delivering better quality products and services to the customers in its objectives. The renowned management guru Peter Drucker (1988)
suggests the organisation should set objectives in each of the key Result Areas (KRA'S). The KRA’s include market standing, Innovation, productivity, use of physical and financial Resources, profitability, managers performance and development, worker performance and attitude and public responsibility. The organisations need to set objectives in each of this Key Result Areas to achieve the organisation’s mission. If the organisation incorporates effective quality policy into each of the KRA’s, surely the organisation will be able to satisfy the customers in a better way than the competitors and there by an everlasting competitive advantage could be made possible.

The management should have the unstinting commitment for the effective implementation and maintenance of Total Quality Management in all the purposes and functions of the organisation. Also the top Management is expected not only to provide with the development of purposes and strategies, but also to reinforce their values by emphasising the importance of quality in all statements, and to deploy necessary resources for the successful implementation and maintenance of Total Quality Management efficiently and effectively in their organisation. The quality culture of the organisation is the reflection of values and beliefs of the top management.

The other prerequisite for a robust Total Quality Management system is to develop a good atmosphere of employee participation. The employee participation is a conscious and deliberate act of designing human systems that can not only create conditions conductive to the release of human potential and constructive use of human resource, but also enhances the quality of life of people within the organisation and in the community. For the best in a man to come out, it is necessary for him to know why he is doing certain things, and not others, and thereby the employee participation will satisfy this basic need of the employee. For practicing employee participation the employees should be encouraged to take decision pertaining to their work and they could also be empowered to
make the decisions. This manner of thinking will build a sense of ownership among the employees and encourage them to get involved in their work more intimately. Employees eventually tend to take a greater interest in the overall improvement of the process, leading to significant improvement in the overall effectiveness and efficiency of the organisation. This employee participation demands a paradigm shift in the traditional hierarchical, line and staff structure, to a participative and team oriented organisational structure. This breakthrough requires several organisational and procedural changes in the current driving force of the organisation. The major change that is to happen is that, from a bureaucratic structure to a participative structure which encourages employee involvement and employee empowerment. Total Quality Management demands of team structure which emphasises on sharing of authority among the team members. The essence of team management is employee participation in decision making, sharing authority between the leaders and the subordinates in an effort to increase productivity and employee satisfaction. The most widespread method of Team Management is the Quality circle. Quality circle is a group of employees performing similar work, who meet regularly to learn about the issues relating to the work they do. Quality Circle enables to understand work related problems and issues, because those people close to the problems would be a part of the solutions. Thereby this solution could be implemented by the employees wholeheartedly. The major benefit of employee participation is that the employees are able to spot the areas which require improvement on a continual basis. Also employees must be able to upkeep, and improve the maintenance of the machines and other resources in their work area. Employee participation is a turnaround in the existing organisation, which will lead to the successful implementation and maintenance of Total Quality Management.

Total Quality Management philosophy stresses on developing a long term relationship with its suppliers. In a Total Quality Management the
perspective suppliers are considered as business partners or as a part of the organisation itself. This philosophy of supplier teaming is in contrast with the traditional relationship with the suppliers. Traditionally, an organisation and its suppliers had an antagonistic relationship. In this traditional system the relationship is just superficial and of least importance. Now organisations have realised that the suppliers are no more external entities but are as an integral part of the business process. The logic behind the relevance of the supplier relationship is that, to produce quality output the organisation needs right quality material, right time, right place and in right quantity, and this requires the cooperation of the suppliers. Thus suppliers play a major role in the organisation for ensuring the quality of the product or service. Suppliers’ teaming could be made possible by establishing relationship that balances short term gains with long term considerations. Also it is wise to pool the expertise and resources of the supplier partners to have a synergistic effect. To ensure the good relationship with the suppliers, frequent change of suppliers should be avoided and development of the suppliers is also to be undertaken. The supplier development is done through providing financial assistance, technological assistance and political assistance to the suppliers. And also by inspiring, encouraging, and recognising improvements and achievements by suppliers the organisation can create a commitment by the suppliers towards the organisation. By getting the suppliers involved in the early stage; design and research and development can generate additional ideas for cost reduction. In a Total Quality Management perspective both the customer and supplier can seek out and agree on best-in-class products and process.

Continuous improvement (KAIZEN, Imai, M. 1986) is an integral part of Total Quality Management. Kaizen is a philosophy that promotes continuous improvement throughout all levels of an organisation. The goal is to achieve gradual, unending improvements and higher standards of excellence by building quality into all aspects of the organisation. It is a
gradual, orderly improvement after improvement. Continuous improvement is a business strategy that involves everyone in an organisation working together to make improvements without involving much investment. The Tools like statistical process control (SPC), Quality Function Deployment (QFD), Plan-Do-Check-Action (PDCA) Chart, etc., are the tools available for implementation and monitoring continuous improvement. By using tools and techniques along with a quality orientation will lead to disciplined and continuous improvements in all functions of the organisation. Practice of continuous improvement principle will benefit the organisation by improved organisational capabilities, speed and flexibility in reacting to the environment.

Quality begins with customers and ends with them. Without a good understanding of what the customers want and what the market values, it is futile to establish a good quality management system. Also it is essential that the organisational objectives are linked to the customer needs and expectations and this customer needs are to be communicated throughout to the organisation. In a Total Quality Management perspective focusing on the customer may lead to increased effectiveness in the use of the organisation’s resources to enhance customer satisfaction. This aspect of listening to the voice of customer leads to the emphasis of design quality and defect prevention. The principle of customer satisfaction is applicable not only to the customers outside the organisations but also to the customers inside the organisations too. There are the people, activities and the functions within the organisation are considered as the customers to other people, activities and functions, these customers within to an organisation are called internal customers. For better satisfying the customers, researching and understanding and needs and expectations of both internal and external customers is essential. So it could be asserted that, effectively satisfying the customers is one inevitable principle an organisation needs to do in its pursuit of Total Quality Management.

Benchmarking is another philosophy practiced by the organisation in its journey to implement and practice Total Quality Management.
Benchmarking is a search for the best practices industry. Benchmarking also measures the position of an organisation’s products, services, and processes to establish targets priorities and improvements, leading to competitive advantage and cost reductions. The purpose of Benchmarking is predominantly to change perspective, compare business practices, and challenge current practices and process and to create improved goals and practices, with the focus on customer satisfaction and business results. Another important aspect of benchmarking is to understand how other organisations are able to achieve superior performance and profitability. Benefits of practicing benchmarking include better understanding of the current position of the company. Increasing sensitivity to changing customer’s needs, encouraging innovation and also for establishing realistic action plans.

The effective and successful Total Quality Management programmes demands substantial investment in Education and training. The top management is to be first educated regarding the required charges needed in the organisation and the potential benefits that can be derived out of implementing Total Quality Management. The process of education on Total Quality Management continues until the lowest level in the organisational hierarchy has been educated about Total Quality Management. Providing continuous training to the employees of the organisation is an important pillar of effective implementation and practice of TQM. Communicating the need for alternative procedures, new methods of empowerment and the benefits that are likely to accrue to the organisation is just one aspect of training. The other aspect relates to educating all the employees in using the new quality control tools and techniques to be adopted for quality improvement. At the operational level, several new quality control tools are available and employees need to be trained in using these tools. Supervisors require training in problem solving approaches and working in small group improvement teams. Skills in identifying problem areas, setting targets for improvement, participating in the improvement process, facilitating the
process and monitoring and guiding them over time are the important new skills that Supervisors and middle managers need in a TQM training programme. Training and development has been highlighted by many initiatives as a critical success factor. In successful organisations the training is planned through need analysis, use of databases, training at load levels, and peer assessments for calculation.

There are a number of tools that an organisation can use for problem solving and process improvement. These tools aid in data collection and interpretation, and provide the basis for decision-making. These tools are; flow chart, check sheet, histogram, pareto analysis, scatter diagram, control chart, cause and effect diagram and run chart. Organisations compulsorily need to give training to all the employees in using and analysing these tools.

The organisations that wishes to practice TQM are expected maintain a Value Engineering department or a value analysis team. Value Analysis refers to an examination of the function of parts and materials in an effort to reduce the cost and improve the performance of a product. Typical questions that could be asked as a part of the analysis include; could a cheaper part of material be used? Is function necessary? Can the function of two or more parts of components be performed by a single part of a lower cost? Can a part be simplified? Could product specification be relaxed, and could standard parts be substituted for non standard parts? When taken beyond cost reduction, value improvement is strongly linked to quality improvement. Many value improvement ideas can be developed that include brainstorming and suggestion program. Other value improvements are often available through a more disciplined approach that involves a systematic assault on unnecessary costs. A good value analysis results in a cost effective design which maximises value for target customers. Value Engineering succeeds only when the top management provided a mandate for such exercises and demands better performance.
The first and foremost benefit an organisation derives out of implementing TQM is customer satisfaction. When customers get a good quality product in their hands which conform to their requirements and reliability will lead to repeated purchase of the product and this repeated purchase will enhance the customers to speak about the product more positively. The other benefit of TQM is the reduction in the cost of manufacturing. A wrong perception about quality is that increased quality results in increased costs and diverged productivity. But in reality increased quality will decrease cost and increase productivity of the organisation. Also increase in quality will reduce failures, wastages, reworks etc.

The implementation and maintenance of Total Quality Management tools will naturally require some investment. The managers can justify the amount invested for TQM by comparing with the organisational performance derived from investing for TQM. The organisational performance refers to the output obtained from processes, products and services that permits evaluation and comparison relative to goals, standards, past results and to others. Most organisations have a wide variety of performance measures and elaborate systems for collecting, recording, analysing and displaying them. Performance measures provide the right direction for the organisation in achieving what it intends to achieve as quality, product service, process etc. Performance measures quantitatively tell managers something important about the products, services, and the process that produce them. While implementing TQM the managers need to analyse the corresponding effect on the organisational performance.

It is essential that the top management need to be aware of the impending changes and benefits of implementing Total Quality Management. Only out of such understanding can be brought whole hearted commitment of the top management. Philip Crosby (1979) clearly points out that ‘Quality is free’, but quality is not a simple task, it is the outcome of a systematic and comprehensive plan to deliver quality products to the customers. Organisation needs to put a lot of care to
manage the quality well. By preventing in non-conformances the customers can be satisfied. Merely meeting the requirements of the customers, a company cannot remain in the Market. Analysing the organisational performance derived out of practicing TQM needs to be weighed with the respective organisational performance.

For attaining sustainable competitive advantage the organisation needs to practice TQM systematically in all the functions and elements of the organisation. The TQM practice enables the organisation to delight and retain the customers which makes the customers to act like a company’s spokesperson.

An attempt is made to discuss the concept of ISO 9000 certification and the relationship between TQM and ISO 9000 certification in the forthcoming chapter.