CHAPTER THREE
THE CONCEPT OF TOTAL QUALITY MANAGEMENT

The previous chapter reviewed the literature on the research problem. The aim of this chapter is to define the concept of Total Quality Management (TQM). It covers the meaning of quality, definition of TQM, the essential elements and models of TQM.

Meaning of Quality

The term 'quality' has been defined by many quality experts in different ways. The main definitions in the literature are:

ANSI/ASQC Standard A3-1987(draft) recognizes that the word "quality" has multiple meanings. The meaning adopted in the standard is: "The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs."

The European Organization for Quality Control Glossary (1981) has the following definition for quality: "The totality of features and characteristics of a product or service that bear on its ability to satisfy a given need. N.B. with manufactured products quality is mainly determined by quality of design and quality of manufacture."
The Soviet encyclopedia defines quality as follows: "Quality of Products, the aggregate of properties of a product determining its ability to satisfy the needs it was built to satisfy."

The Oxford English Dictionary (1990) defines quality as follows: Quality is the 'degree of excellence' or 'goodness'.

Philip B Crosby (1980) defines quality as 'Conformance to requirements'. According to him, one must know the 'requirements' and be able to translate those 'requirements' into measurable product or service characteristics in terms of numerical specifications. Conformance to 'requirements' means presence of quality. Non-conformance to 'requirements' means absence of quality. He says 'if we have to manage quality, we must define it as conformance to requirements'. 'Quality is measured by the cost of quality, which is the expense of non-conference - the cost of doing things wrong' he emphasizes.

Dr Edwards Deming (1986) defines quality from a statistical perspective as 'reduction in variation' and from customer perspective as 'customer satisfaction'. 'Quality should be aimed at the needs of the consumer, present and future' he adds.

Joseph M Juran (1989) defines quality in two different ways:
First, 'quality consists of those product features which meet the needs of customers and thereby provide product satisfaction'. A 'product feature' is a property which is possessed by a product and which is intended to meet certain customer needs. Product features may be technological, promptness of delivery, ease of maintenance and courtesy of service. Second, 'quality consists of freedom from deficiencies'. A 'product deficiency' takes such forms as late deliveries, field failures of goods, errors in invoices, rework etc. Juran also defines quality as "fitness for use".

Feigenbaum (1993) defines quality as "the total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use will meet the expectations of the customer".

Ishikawa (1985) interprets the term 'quality' in two ways. Narrowly interpreted, quality means 'quality of product'. Broadly interpreted, quality means 'quality of work, quality of service, quality of information, quality of process, quality of division, quality of people including workers, engineers, managers and executives, quality of systems, quality of company, quality of objectives etc.' He also emphasizes on manufacture of products with the quality which can
satisfy requirements of the consumers' and 'consumer orientation'.

According Shewhart (1931), there are two sides to quality: subjective (what the customer wants) and objective (properties of the product, independent of what the customer wants). The subjective concept of quality is closely tied up with the utility or value of the objective physical properties of the thing itself. An important dimension of quality is value received for the price paid.

Taguchi (1979) defines quality as "the loss a product causes to society after being shipped... Other than any losses caused by its intrinsic function". By minimizing loss to society, quality can be maximized. Loss caused by the products or services intrinsic function does not count toward the loss to society.

Searstone (1991) defined quality as 'the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs'. A further definition offered by Griffin (1993) defines quality as the "totality of features and characteristics of products or services that bear on the ability to satisfy stated or implied needs".

The customer-focused definition of quality is said to have grown out of the service marketing literature (Gonroos, 1983; Parasuraman et al, 1985). Quality not
only means conformance to specifications, but also means meeting or exceeding customer expectations (Reeves and Bedner, 1994). Quality is 'whatever the customers say it is, and the quality of a particular product or service is whatever the customer perceived it to be' (Buzzell and Gale, 1987).

Quality defined according to the consumer perspective refers to aspects of a product or a service that bring satisfaction to the consumer in terms of meeting performance expectation. Similarly, quality defined according to the producer's or provider's perspective refers to aspects of the product or the service that bring satisfaction to the producer or the provider in terms of meeting specific requirement and cost reduction.

Quality is seen as being made of eight critical dimensions: performance, reliability, conformance, durability, features, aesthetics, serviceability and perceived quality (Garvin, 1988). Schonberger (1990) included attributes such as quick response, quick-change expertise, humanity and value along with the Garvin's eight attributes to define quality.

The views of Vuori (1982) and Maxwell (1984) on quality include the concept of humanity. Humanity here implies the provision and delivery of health care which
is sensitive to the complexity of individual needs, including human dignity.

The six ‘core’ definitions (Galloway, 1996) of quality which cover its most accepted uses in commerce are:

1. **Transcendent**: Quality as innate excellence, a property possessed by an object and recognized rather than identified or measured.

2. **Meeting customer requirements**: The product or service meets the requirements of the customer. This is a design-focused definition that presumes that customer requirements can be clearly identified and specified. Sometimes it is expressed as fitness for purpose.

3. **Conformance to specification**: The product or service received by the customer meets their specification. This is an operation-centered approach that presumes that the specification is correct.

4. **Free from errors**: When applied to the delivered product/service, this is equivalent to conformance to specification, but when applied to the operations process it becomes a waste reduction issue. Should ‘right first time’ be the aim, or should inspection be used to prevent defects reaching the customer?

5. **Value for money**: Quality is relative to price. A utility model approach that argues that ‘good’ quality
is proportional to the net utility received by the buyer.

6. Exceeding customer requirements: The 'delight' school of thought, which suggests that every service experience must be better than the last to justify the label 'high quality'.

Uche Nwabueze (2001) has offered a more systematic definition of quality: Quality is defined as not being put in a position where you have to say sorry to the customer or consumer for failing to meet his/her needs; quality, therefore, is about providing consistent 'value' to the customer.

Thus, different quality experts have presented different perspectives about quality which conveys essentially the same message.

**Definition of Total Quality Management**

A definition of total quality was endorsed in 1992 by the chairs and CEOs of nine major U.S. corporations with deans of business and engineering departments of major universities and recognized consultants:

Total Quality (TQ) is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. TQ is a total system approach (not a separate area or programme)
and an integral part of high-level strategy; it works horizontally across functions and departments, involves all employees, top to bottom, and extends backward and forward to include the supply chain and the customer chain. TQ stresses learning and adaptation to continual change as keys to organizational success.

The foundation of total quality is philosophical: the scientific method. TQ includes systems, methods, and tools. The systems permit change; the philosophy stays the same. TQ is anchored in values that stress the dignity of the individual and the power of community action. (Amy Zuckerman, 1997).

Total Quality Management (TQM) occurs when the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services (Sashkin and Kiser, 1991). According to Wilson (1992), TQM refers to a structured system for creating organization-wide participation in planning and implementing a continuous improvement process that meets and exceeds customer needs. Kanji and Asher (1993) described TQM as being about the continuous performance improvement of individuals, of groups and of organizations.
In the 1990s the definitions of TQM have emphasized on a holistic view of the entire organization with respect to quality. More recently, TQM is defined by Lindsay and Patrick (1997) as "A person focused management system with the main target of continually increasing customer satisfaction at the lowest cost". TQM is a comprehensive systematic approach which comprises both horizontally and vertically, across all departments and functions, all employees of an organization and their interfaces (customers and sub customers, etc.). TQM is defined as a management system in continuous change, which is constituted of values, methodologies and tools, the aim of which is to increase external and internal customer satisfaction with a reduced amount of resources (Hellsten and Klefsjo, 2000).

Although the definitions of TQM vary, all of the previous definitions include the concepts of TQM, namely continuous process improvement, people orientation, and a strong customer focus. TQM is a continuously evolving management philosophy for all types of organizations which involves a systematic, consistent, organization-wide holistic perspective comprising everyone and everything.

As positive customer relation becomes a critical component in an organization, it has become clear that
effective service strategy must go beyond guest relations programmes to the establishment of an organization-wide culture of service excellence that permeates administrative priorities, strategic planning, policies and procedures, physical design, and staff attitudes and behaviors (Zemke, 1987; Hofmann, 1987). Such approaches have been referred to as "total quality management" or "continuous quality improvement".

Approaches to Total Quality Management

Many individuals have made substantial contributions to the theory and practice of quality management. These include the well-known "gurus": W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby, as well as many other consultants. A brief description of the different approaches to total quality management is presented in the following section.

1. W Edwards Deming:

Dr Edwards Deming (1986) approached quality from a statistical perspective emphasizing the reduction of variation through statistical process control techniques. He propounded the following principles:

- PDCA cycle (Plan, Do, Check, and Act)
- Quality through constancy of purpose
- No inspection
• Continuous improvement
• Barrier-less communication
• Pride of workmanship and
• Continuous training

A management commitment to a complete transformation of the current practices is absolutely necessary for survival and competitive advantage of any organization and this necessity is revealed by the Deming's fourteen management principles. The 14 management principles are:

1. Create constancy of purpose for continual improvement of product and service.
2. Adopt the new philosophy for economic stability.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on price tag alone.
5. Improve constantly and for ever the system of production and service.
6. Institute training on the job.
7. Adopt and institute modern methods of supervision and leadership.
8. Drive out fear.
10. Eliminate the use of slogans, posters and exhortations.

11. Eliminate work standards and numerical quotas.

12. Remove barriers that rob the hourly worker of the right to pride in workmanship.

13. Institute a vigorous programme of education and retraining.

14. Define top management’s permanent commitment to ever-improving quality and productivity.

A useful overview of his work has been provided by Walton (1991).

2. Joseph M Juran:

Joseph M. Juran (1989) emphasized that quality issues need to be addressed through management action and suggested the use of a cyclic process of quality management, linking quality planning, quality control and quality improvement in what he termed the ‘quality trilogy’.

Quality planning

According to Juran, quality does not happen by accident; it must be planned. Special training must be provided in how to plan for quality. He produced a ‘Quality planning road map’, the first step of which was to identify who the customers are. As soon as a level of quality has been attained, there are immediate negative
influences and hence chances of deterioration of quality. In this context, the second part of quality trilogy, that is, quality control plays a vital role.

**Quality control**

Control is the process of detecting and correcting adverse change, as soon as it happens, so that the status quo is maintained. Only a process in control is predictable and hence receptive to efforts for further improvement. Juran says that chronic quality losses amount to more than 80% of all losses, and are management controllable through management action on the system itself. This leads to the third stage of quality trilogy, namely, quality improvement.

**Quality improvement**

In order to reduce chronic waste and achieve a new improved zone of quality control, a quality breakthrough is required. Breakthrough is an improvement which takes us to an unprecedented level of performance; it is an organized creation of beneficial change.

Juran developed his ideas to show how each of the three elements of quality trilogy could be realized by taking key actions. Juran did not assume that these elements would just happen of its own accord, but looked in detail at how managers could bring about change. In particular, Juran recognized both internal and external customers as having needs.
3. Philip B Crosby:

Philip B. Crosby (1979) offered a somewhat different approach from that of Deming and Juran, and moved towards a more holistic view of quality management. Crosby is best known for two concepts: 'Do it right the first time' and 'zero defects'. Central to the development of these two concepts was the basic philosophy of ultimate management responsibility. His belief was that leadership set the tone for quality and employees followed that lead. His belief that the ultimate organizational responsibility for quality rested with management was so firm that it became the first of his 14 steps to quality improvement:

1. **Management commitment**- Senior management has to demonstrate a commitment to quality.

2. **The quality improvement team**- A team needs to be set up to guide the process of quality improvement.

3. **Measurement**- To avoid frustration and hassle, one needs a clear method of measurement.

4. **The cost of quality**- Quality costs need to be identified objectively, pulled together and fed into the regular management process formally, and treated as a positive rather than a threatening item.
5. **Quality awareness**- Through an adequate system of communication, awareness about quality should spread throughout the organization.

6. **Corrective action**- Corrective activities need to be based on analysis of past data so that the causes of problems are determined and taken care of permanently.

7. **Zero defects planning**- The concept of Zero defects will be taken seriously when the top management is committed to zero defects through proper planning.

8. **Employee education**- An improvement in quality education can result in quantum leaps in improvement. Crosby summarizes the entire education process in what he calls' the six Cs': Comprehension, Commitment, Competence, Communication, Correction, and Continuance.

9. **Zero defects day**- Crosby recommends that a Zero defects day is planned to reward serious efforts which will act as a reminder of the importance of quality and as a demonstration of the commitment towards the zero defects principle.

10. **Goal setting**- The immediate cause of measurement is goal setting and in the context of quality, that goal is zero defects.

11. **Error cause removal**- The permanent removal of causes of error requires team effort through proper communication.
12. Recognition- The recognition process needs to be planned carefully and developed gradually without any bias.

13. Quality council- All quality professionals can be brought together in one group under the name of the quality council.

14. Do it all over again- Quality improvement has to become the culture of the company which can only happen when the effort becomes a continuous process.

4. Kaoru Ishikawa

The concept of company-wide quality control is strongly associated with Professor Kaoru Ishikawa (1985), known as the 'Father of Quality Circles'. He is a pioneer in Japan of certain quality tools such as the cause and effect diagram (Ishikawa or fishbone diagram), and movements such as quality circles. Ishikawa viewed open group communication and participation as important things for an effective application of the cause and effect technique. He advocated the following principles:

- Quality is a company-wide issue and must be an all-pervasive influence on the way every issue of business is conducted.
- Seven simplified tools of quality control (pareto analysis, fishbone diagram, stratification, tally charts, histograms, scatter diagrams and control
charts) to be used by all the people in an organization.

- Quality circles.

With these tools of quality control, Ishikawa argued, managers and staff can tackle and solve the problems related to quality.

5. Genichi Taguchi:

Taguchi's (1979) approach focuses on a statistical method that zeros in rapidly on the variations in a product that distinguish the bad parts from the good. The concept of robust design was described by him as "study all factors that can hamper uniformity between products and their long-term stable performance and build in safeguards at the product design stage itself. In other words, robust design". Taguchi's eight-point approach is presented below:

1. Identify the main function, side effects and failure modes.
2. Identify noise factors and the testing conditions for evaluating quality loss.
3. Identify control factors and their alternate levels.
4. Design the matrix experiment and define data analysis procedures.
5. Conduct the matrix.
6. Analyze data, determine optimum levels of control factors, and predict performance under these levels.
7. Conduct the verification experiment and plan future actions.

6. **Shigeo Shingo**

Shigeo Shingo (1986) propounded the concepts of Just-in-Time (Moving goods, components, and documents to the correct and useful place, only at a time when the movement needs to take place), Zero-defect (eliminating sources of error in each task so that it is impossible to perform the task wrongly), and Single Minute Exchange of Die (minimizing machine set-up time) through proper design of equipment.

7. **Feigenbaum**

Feigenbaum (1983) advocates a total quality approach to quality including everybody, whether they are involved in any process/manufacturing or not. He stresses the need for quality-mindedness throughout the organization which needs a serious programme of quality education and participation, aimed at stimulating and building up responsibility and interest in quality. For this complete support of the top management is crucial. Feigenbaum defines total quality system which encapsulates most of the principles he believes in:
Total quality System is the agreed company-wide and plant-wide 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.

While the approaches of TQM vary from organization to organization and from individual to individual, based on which guru one adheres to (Juran, 1964; Crosby, 1979; Feigenbaum, 1983; Deming, 1986; Imai, 1986), there seems to be a general consensus about the essential elements of TQM (Scott, 1989). First, TQM is geared to the continuous improvement of quality in an organization. Secondly, TQM is based on customer expectations, and on meeting and anticipating customer requirements. Thirdly, TQM requires an organization's long-term commitment. Fourthly, TQM is management driven. Fifthly, TQM requires successful integration of all the employees. Sixthly, TQM is focused on collaborative teamwork. Seventhly, TQM in its application aims at changing the attitudes as well as the behaviors of its work force. Lastly, TQM is aimed at achieving a harmony between technology and people.
Essential Elements of TQM

There are debates concerning the various elements of TQM. Crosby (1984), Deming (1982), and Juran (1989) have provided models for using TQM. The six common elements in these models are, namely,

- Commitment of the institution for quality concept which emphasizes the participation and support of all employees from the top leadership to the newly hired, in the TQM process.

- Importance of customer needs in all the improvement activities.

- Need to base decisions on data and constantly seeking ways to improve processes, rather than pinpointing the mistakes committed by the employees. Structured problem solving based on data, produces better results than problem solving based on hunches alone.

- Encouraging team work and solving group problems, because, a well coordinated team can accomplish more than an individual because of the collective and diverse knowledge available.

Carman et al. (1996) and Deming (1982) advocated that a top down commitment is very much essential for TQM practice and argued that leadership's support is an
essential element in the practice of TQM. According to Davidson (1997), communication is another common element that is necessary for TQM efforts. He stresses that each TQM effort has to be well communicated to all those who are directly involved and will be affected by TQM efforts.

Models of TQM

Total Quality Management models are nationally and internationally recognized quality standards that provide discipline, external assessment and a clear process for changing over to TQM. Formal registration or award for an institution conveys the message to potential customers that the institution takes quality aspects seriously, and that its policies, procedures and practices conform to the national and international standards of quality.

There are a number of TQM practice models and methods that encompass the systematic approach of total quality. For example, the ten-step model for monitoring and investigation; the FOCUS-PDCA model, the Ten-Key Lessons for Quality Improvement, and the Quality Improvement Framework (Baird, Cadenbead, & Schmele, 1993). Baird et al. have developed a TQM Practice Model that incorporates many of the TQM key concepts and provided a guide to implement TQM programme. The
essential steps in the model include: - 1. executive level commitment; 2. transformation of the culture; 3. planning quality; 4. organizing quality; and 5. investigating quality.

There are many quality criteria for self-assessment that have been developed for the performance excellence of organizations. These quality criteria are incorporated in the form of excellence awards, namely, the Deming Prize in Japan, the Malcolm Baldrige National Quality Award (MBNQA) Model in the United States, the European Foundation for Quality Management (EFQM) Excellence Model in Europe, the Australian Business Excellence Award and the Rajiv Gandhi national quality Award in India. These models often guide the elements of TQM practices and link with organizational performance. A brief description of these TQM models follows the discussion.

DEMING AWARD

The Deming Prize was instituted in 1950 in recognition of Deming's achievements in introducing statistical quality control. The Deming Prize, with its longest history is awarded by the Japanese Union of Scientists and Engineers (JUSE) to individuals and companies with outstanding TQM for the overall
performance. There are three categories of Deming Prizes:

1. The Deming Prize awarded to individuals
2. The Deming Application Prize awarded to companies, and
3. The Deming Factory Prize.

The Deming prize checklist reveals important TQM areas ranging from policy, organization, training, information collection and analysis, standardization, quality control and assurance to planning for the next cycle of TQM. The check list shows that a quality control (QC) audit is actually an audit of the overall management system. The whole process ensures that organizations will focus on all TQM areas for continuous improvement, from strategies to skills and operations. A company is eligible for the Japan Quality Control Prize five years after it has received the Deming Prize.

MALCOLM BALDRIGE NATIONAL QUALITY AWARD (MBNQA)

The MBNQA was instituted in 1987 by the United States Congress to recognize US companies that excel in quality achievement and quality management. It is designed to promote awareness to quality, understanding the requirements of quality and sharing of information on successful strategies and the benefits derived from

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implementation. The award is given to organizations in the categories of manufacturing, service and small business. The evaluation is done on a 1000-point system categorized under seven parts as- leadership, strategic planning, human resource development and management, process management, information and analysis, customer and market focus, and business results. A detailed description of MBNQA is presented in Chapter four.

THE EUROPEAN QUALITY AWARD (EQA)

EQA was developed by the European Commission and the Award was instituted at the 1991 European Foundation for Quality Management (EFQM). The European Foundation, formed in 1988 has 200 pan-European organizations aims to stimulate and assist European companies in their development of total quality. The aim of EFQM and the award is specifically geared to encourage the development of TQM. EQA is a single annual award presented to the most successful TQM practices in Europe. The EQA checklist consists of nine criteria namely, leadership, policy and strategy, people management, resources, process, people satisfaction, customer satisfaction, impact on society and results. The intention of the award is to provide an award for
the European community comparable to the Japanese Deming Prize and US Baldrige award.

**THE AUSTRALIAN QUALITY AWARD**

This award also called the Australian Business Excellence Award has been instituted by the Australian Quality Council. Being the premier business award of Australia, it showcases the organizations that have achieved business excellence across the seven categories, namely, leadership and innovation, strategy and planning process, data information and knowledge, people, customer and market focus, process, product and services, and business results. The framework of Australian Business Excellence model has been designed to help public/private/big /small enterprises to develop an understanding of the concepts and principles behind the business excellence philosophy. The framework links to a number of systems including ISO 9000:2000, Investors in People, Balanced Scorecard, business Process Re-engineering and Organizational Performance Measurement.

**THE RAJIV GANDHI NATIONAL QUALITY AWARD**

The Rajiv Gandhi National Quality Award was instituted by the Bureau of Indian Standards (BIS) in
1991, with a view to encouraging Indian manufacturing and service organizations to strive for excellence and giving special recognition to those who are considered to be the leaders of quality movement in India. The award is an annual feature on the basis of financial year. This award is intended to generate interest and involvement of Indian Industry in quality programmes. It enables the organization to assess its own level of commitment to quality. It also indicates the extent to which this commitment is being deployed through every level of the organization and in all areas of activities. Further, after the process of self assessment is completed, the organization will be in a position to analyze its strengths and weaknesses.

The assessment for large scale organization will be made on the basis of nine parameters, namely, leadership; policies, objectives and strategies; human resource management; resources; processes; customer focused results; employee satisfaction; impact on environment and society; and business results. The assessment of small scale organization will be made on the basis of six parameters, namely, leadership; human resource management; processes; customer focused results; impact on environment and society; and business results.
There are five awards consisting of one for large scale manufacturing organizations, one for small scale manufacturing organizations, one for large scale service sector organizations, one for small scale service sector organizations, and one for BEST OF ALL. In addition there are seven commendation certificates each for large and small scale manufacturing organizations as per different industrial sectors. Further there are five commendation certificates each for large scale and small scale service organizations in the sectors comprising of finance, healthcare, information technology, utilities and others.

**Summary**

This chapter described the different definitions of quality offered by various quality gurus. It briefly covered the definitions of Total Quality Management (TQM) and the essential elements of TQM. Finally, the different models of TQM including the Deming Prize, the Malcolm Baldrige National Quality Award, the European Foundation for Quality Management, the Australian Award and the Rajiv Gandhi National Quality Award have been briefly discussed.