CHAPTER – II

TOTAL QUALITY MANAGEMENT – GROWTH AND DEVELOPMENT
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2.1 Quality - Concept:
The concept of quality has generated use, loss, avoidance and meeting and/or exceeding customer expectations. In other words ‘quality’ is a measure of achievement of an organization in terms of ‘customer satisfaction’. Quality is a continuous and unending process. Organizations have to respond to any change that takes place in any aspect of work.

Indeed, quality is an initiative that allows freedom-without fear-for both the organization and the people in the organization to take charge of continual improvement, so that they both can prosper. Quality is synonymous with ‘high standard’. Quality is then an ideal which is to be achieved in every sphere of life. The very existence of an industry or a profession or any organization depends on its quality. Libraries and librarianship too are no exception.

However, the concept of quality has changed now-a-days from provider oriented to customer oriented and it has now been well established that quality is not what producers define but it is what the customers require.

In 1992, Philip B Crossby broadened his definition of quality adding an integrated notion to it. He says that “Quality meaning getting everyone to do what they have agreed to do and to do it right, the first thing is the skeletal structure of an organization, finance is the nourishment, and relationships are the soul”.1

The definition of quality given by ISO9000 is as follows: “The totality of features and characteristics of a product or service that bear upon its ability to satisfy stated or implied needs”.2

According to the US, Department of Defense, “Doing the right thing right the first time, always striving for improvement and always satisfying the customer”.

W. Edward Deming has stated the following view in his land mark book, out of the crisis, “Quality can be defined only in terms of the agent. Who is the judge of the quality? In the mind of the production worker he produces quality if he can take pride in his work. Poor quality to him means the loss of business and perhaps of his job. Good quality, he thinks, will keep the company in business. Quality to the plant

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manager is the quality numbers out and to meet specifications. His job is also, whether he knows it or not, continual improvement of leadership".³

According to B.K.Dalai and others, Quality means "to meet or exceed the needs and expectations of the customer in the most cost effective way". It has four basic elements, which are (a) Customer expectation (b) Competitor (c) Cost and (d) Technology.⁴

2.2 Quality - Gurus' Definitions:

Diwan Parag in his book "Quality in Totality: A Managers Guide to TQM and ISO 9000" has listed the following Gurus' definitions:

- ‘Fitness for purpose or use’ – Joseph M Juran
- ‘Quality is conformance to requirements’ – Philip B Crossby
- ‘Total composite of product and service characteristics of marketing, engineering, manufacturing and maintenance through which the product and service in use will meet the expectation by the customer’ – A V Feigenbaum.
- ‘Quality is the degree of excellence at an acceptable price and control of variability at an acceptable cost’ - Broh⁵

2.3 Total Quality Management – Concept:

The integration of all functions and processes within an organization with the objectives of achieving continuous improvement in quality of products and services is known as Total Quality Management (TQM). It emphasizes regular interaction among the various components of an organization and considers the defectiveness of the entire system more important than the output of a sub-system. "TQM enables an organization to formulate its policies, functions and processes so that they prove to be most effective in meeting customer’s needs, in eliminating inefficiency and in ensuring that the quality is maintained in all day-to-day jobs. Continuous improvement in quality is a fundamental concept of TQM".⁶
Total Quality Management is a concept which makes quality the responsibility of all people within an organization. All the persons involved are expected to contribute to the overall improvement of the quality. "TQM is the preferred method to increase customer satisfaction. It reduces the defects and increases the productivity. The TQM concept which is used for the industries, factories, companies, business organizations is now being used for the institutions and service organizations".7

The TQM philosophy stresses a systematic, integrated, consistent, organization-wide perspective involving everyone and everything. It focuses primarily on total satisfaction for both the internal and external customers, within a management environment that seeks continuous improvement of all systems and processes.

The key aspects of TQM are the prevention of defects and emphasis on quality in design. TQM is a necessity. It is a journey. It will never end. It is the way to survive and succeed. It is the totally integrated effort for gaining competitive advantage by continuously improving every facet of an organization’s activities.

The basic concepts and principles associated with total quality are represented by the House of Total Quality. As in a well-built house, the major components of the House of Total Quality are

1. the roof or superstructure, consisting of the social, technical and management systems,
2. the four pillars of customer satisfaction, continuous improvement, speaking with facts, and respect for people,
3. the foundation of four managerial levels - strategy, process, project and task management, and
4. the four cornerstones of mission, vision, values and goals and objectives.8
The TQM process aims at galvanizing the entire workforce to pursue the specific corporate goal of achieving customer satisfaction with regards to quality, price and delivery. The strategy used by an organization that adopts TQM philosophy is through usage of techniques such as statistical process control, design of experiments, employee empowerment and team structures and processes.

According to Anjana Goswami, TQM is a philosophy and a process whose output yields clientele satisfaction and continuous improvement. This is a style of management in which the best principles and practices of scientific management and participative management are blended appropriately to achieve success for the organization.

TQM is concerned with integration of all efforts in the organization towards quality and customer care. "TQM represents a customer oriented and quality focused management philosophy. It enhances quality of work-life, employee satisfaction through participation and involvement and consequently the image of the organization. It arises because customer requires products and services which not only meet the performance requirements but also provide satisfaction in terms of safety, durability and pride of ownership".

Dabas and Gill opined that TQM is a holistic and systems approach aimed at satisfying the customer requirements on a continual basis (quality first time, every time, all the time) by involving everyone in the system and at a lower cost (management). TQM has one objective i.e., continuous improvement what the Japanese prefer to call "Kaizen" a philosophy of total life.

Ferrante and Rodriguez say that an organization which wishes to compete in the global market must understand that quality is now an implicit attribute of any product or service. The previous quality control and quality assurance techniques are not valid now any more. To achieve and maintain the required level of quality, a new approach called the Total Quality Management or TQM must be applied.
Gupta and Jain say that the objective of the new concept of quality management is to meet and exceed customer expectations by developing a leadership-driven process for providing a product or service with built-in quality. It also asserts that quality is a first persons job and not of some one else. The new concept of quality management is called the Total Quality Management.13

2.4 TQM - Definitions and Models

The United States Department of Defence defines TQM as “both a philosophy and a set of guiding principles that represent the foundation of a continuously improving organization. TQM is the application of quantitative methods and human resources to improve the materials and services supplies to an organization, all the processes within an organisation and the degree to which the needs of the customer are met, now and in the future”.14

Albert Koller states that in simple terms, “TQM is a system of continuous improvement employing participative management and centering on the needs of the customers. It is more a preventive culture than a management theory”. The definition specify four elements namely, customer needs and service management quality, continuous improvement and participative mangement (Employer-Employee team work) leading to achievement of goals of the organisation and customer satisfaction.15

Rowley defined the TQM as “Managing the entire organisation so that it excels in all dimensions of products and services which are important to the customers. Excellence in a TQM organisation is defined by customer requirements and needs”.16

Feigenbaum defines the TQM as “an effective system for integrating the quality development, quality maintenance and quality improvement efforts of various groups in an organisation so as to enable production and service at the most economical level which allow for full customer satisfaction”.17
A study group of the 1992 Total Quality Forum (who meets annually) defined TQM as "a people focused management system that aims at continual increase in the customer satisfaction of continually lower real cost. Total Quality is total system approach (not a separate area of program) and an integral part of high level strategy. It works horizontally across functions and departments involving all employees, top to bottom, and extends backwards and forwards to include the supply chain and the customer chain".\textsuperscript{18}

Peter Brophy and Hate Coulling states that "TQM is a journey and not a destination' and that the underlying theme must be one of continuous Improvement. Total quality improvement operates within a culture which recognizes that problems and opportunities exist and recognizes the responsibility of the organisation as a whole to resolve problems and exploit opportunities".\textsuperscript{19}

If we look at the meaning of each alphabet of TQM, it can be viewed as-
Total: everyone associated with the company is involved in continuous improvement (including its customers and suppliers). Quality: customers expressed and implied requirements are met fully; Management: Executives who are fully committed.

TQM Models:

TQM has also defined in the form of models. Following are some of the important TQM models:

TQM Pyramid: The Oakland’s model of the TQM defines, “TQM as a pyramid representing five distinct components as management commitement, customer-supplier chain, quality systems, SPC tools and teamwork”.\textsuperscript{20}

The model identifies that a good quality management system, statistical process control and teamwork are the essential requirements for identifying and meeting the customer needs.
THE OAKLAND MODEL OF TQM

The Building Blocks of the TQM: The TQM model proposed by Zaire looks at TQM at three levels. The foundation is formed by the continuous improvement, added-value management and employee involvement. The pillars of the model constitute Statistical Process Control (SPC), Statistical Quality Control (SQC), user-supplier chain, management control system, advanced manufacturing systems and workplace design. The top level of the model is formed by quality planning, leadership and vision for the world class competitiveness.\textsuperscript{21}
Interactive Environment model of TQM: The Interactive Environment model of TQM seeks a clear, concise and objective description of the situations in which an organisation functions. Here, the figure indicates a framework for understanding the concept of interactive environment in which the business system operates. As indicated in the figure, the external environment has several sub-systems such as supplier environment, customer environment, economic and technological environment. Each of these environments views quality in different perspectives and
channelises its efforts in that direction. Integration of horizontal and vertical systems and functions of the organization helps in channelising the objectives in the main stream and thus reduces the pressure on control system. The outcome of this will be a defect free product and service meeting the customer expectations.22

**EFFECT OF INTERACTIVE ENVIRONMENT ON BUSINESS**

2.5 TQM Genesis:

In the early 1900s, F.W. Taylor, the ‘Father of Scientific Management’ emphasized on quality by including product inspection and gauging in his list of fundamental areas of manufacturing management. G.S. Radford’s contributions were notions of involving quality consideration early in the product design stage and linking together high quality, increased productivity and lower costs. In 1924, W. Shewhart introduced statistical control charts to monitor production. Around 1930, H.F. Dodge and H.G. Roming introduced tables for acceptance sampling. During the 1950’s the quality movement evolved into quality assurance. W. Edwards Deming
introduced Statistical Quality Control (SQC) methods to Japanese manufacturers to help them rebuild their manufacturing base after the Second World War and to enable them to compete in the world markets. In the mid 1950's Armand Fiegenbaum proposed Total Quality Control which enlarged the focus of quality control from manufacturing to include product design and incoming raw material. During the 1960s, the concept of 'Zero-defects' gained favour. Philip B Crossby, who was the champion of 'Zero-defects' concept focused on employee motivation and awareness. In the 1970s, quality assurance methods were used in services such as government operations, health care, banking etc. In the late 1970s, there was a dramatic shift from quality assurance to a strategic approach to quality.

The US Quality Revolution:

The decade of the 1980s was a period of remarkable change and growing awareness of quality by consumers, industry and the government. During the 1950s and 1960s, when 'Made in Japan' was associated with inferior products, US consumers purchased domestic goods and accepted their quality without question. During the 1970s, however, increased global competition and the appearance of high quality products in the market led US consumers to consider their purchasing decisions more carefully. They began to notice difference in quality between Japanese and US made products and they began to expect and demand high quality and reliability in goods and services at a fair price. Consumers became more apt than ever before to compare, evaluate and choose products critically for total value-quality, price and serviceability.

In 1985, NASA announced an excellence award for quality and productivity. The Malcolm Baldrige National Quality Award was established by the Act of Congress in 1987. From the late 1980s and through 1990s, interest in quality grew at an unprecedented rate, companies made significant strides in improving quality. By
1989, Florida Power and Light was the first non-Japanese company to be awarded Japan's coveted Deming Prize for quality. By the mid 1990s, thousands of professional books had been written on quality management and quality related consulting and training had blossomed into an industry and companies began to share their knowledge and experience.

Quality movement in Japan:

In 1950, through the efforts of W Edward Deming the Statistical Quality Control (SQC) approach was introduced in Japan and was taken up enthusiastically by engineers and plant managers as well as top management of industries. A large number of engineers were trained in SQC techniques. By 1960, in the course of 10 years, the proportion of industrial firms using SQC and the associated methods had become larger than that in USA or in any other country of the world. The result was a spectacular improvement in quality coupled with an appropriate reduction in cost of production which made it possible for Japan enter the world market on competitive terms and become a major exporting country in a very short time. Training of SQC personnel is essential but not enough. Japan has shown that it is necessary and possible to make SQC a truly management movement. K. Ishikawa of the Tokyo University also contributed significantly to the quality movement in Japan. From 1950 to 1970, in the course of 20 years of quality movement in Japan, the per capita income has increased roughly by four times. During the same period, per capita national income in India increased less than 20 percent.

Quality movement in India:

The quality movement was consolidated in the 1980s in the Indian industries and also brought about a synergy of resources by the pioneering efforts of Confederation of Indian Industries (CII). Walter Shewart, the father of Statistical
Quality Control, visited India for a short period of three months during 1947-48 and initiated the SQC movement through visits to factories, personal discussions and lectures. W Edward Deming who taught the Japanese the means of applying the Plan-Do-Check-Act cycle (Known as Deming Cycle) came to India in the early 1950s. While the Japanese attributed their success to the learnings from two American Gurus, Deming and Juran, the rest of the world was lagging behind until the 1970s when the effect began to hurt their businesses. The formal launch of TQM movement in the US in the early 1980s triggered a movement for quality in India and in 1982 the quality control circle was born. Among some of the companies launching quality control circles first were public sector undertakings-Bharath Electronics and Bharath Heavy Electricals. A movement also began in Nasik with the umbrella of CII when a small group of companies began to practice some of the quality circle techniques and showed some results. Later, CII provided a focus and an impetus to the quality movement by forming the TQM division in 1987.

The year 1987 brought the ISO9000 standards into reality and visible strategies emerged from the European market to set a global trend towards standardizing and certifying quality systems. Since the European market was big market for Indian Industries, CII organized training courses for ISO9000 in 1989. Two years later in 1991, the first company in India got certified to ISO9000. From then onwards, the movement has gathered momentum and today more than 500 companies have secured ISO9000 certification. The TQM movement today encompasses not only engineering industries, but also servicing and information technology industries. CII worked with the Government of India to initiate a drive to create awareness on quality and customer orientation in State and Central Government Departments, Financial Institutions, Banks, Railways, Textile
Corporations, Leather Institutions and Educational Institutions including IITs and IIMs. Also, 'National Quality Council for India' was promoted and integrated into an overall thrust for a national movement. CII organized the launch of a National Quality campaign in 1992, led by the Prime Minister of India and the 'Quality Summit' organized by CII has now become an annual feature across the country.

According to Shridhara Bhat the future thrust of the quality movement in India would be in the following areas:
1. Application research where we need to understand the relationship of what has to be done with the context in which it needs to be done. This requires a depth of the understanding and will be possible through synergy of industry and academics.
2. Grooming of facilitators through local people being trained as facilitators of TQM/ISO9000 in every organisation willing to implement it.
3. Experience sharing to understand the means to get organizational performance through TQM
4. ISO9000 certification for small scale industries which are exporters or potential exporters
5. Environmental protection, safety and consumer protection by the industrial organizations through highly focused effort on quality enhancement".23

2.6 Principles of TQM:

Gerald F Smith enlists the following basic principles of the Total Quality Management:
1. “Strive for quality in all things
2. The customer is the criterion of quality
3. Improve the process or system by which products are produced
4. Quality improvement is a continuous, never-ending activity
5. Worker involvement is essential
6. Ground decisions and actions in knowledge
7. Encourage teamwork and cooperation". 24

1) The first principle, Strive for quality in all things proclaims the importance of quality or excellence in human activities and creations. The Greeks valued arete or excellence for its own sake. Excellence is especially important in economic activities. Modern production methods fragment work into simple operations having partial and temporary outputs. In the post world war II, American economy, driven by pent-up demand, rewarded companies that got goods out the door, irrespective of quality. Industrial economists argued that defective products should be tolerated since the costs of preventing defects exceeded the benefits of doing so. The quality movement successfully challenged this assumption. Its claim that ‘quality is free’ is based on evidence that the costs of poor quality are greater than had been assumed and that significant quality improvements can be achieved at low cost.

2) TQM’s second principle is that, the customer is the criterion of quality. In an exchange economy, most of what one produces is produced for others. Product users decide whether a product is of acceptable quality. A quality product satisfies pertinent user needs. TQM’s second principle highlights the fact that product specifications are only a surrogate criterion for quality. While necessary for manufacturing purposes, if specifications don’t reflect the needs of product users, they define a failure.

3) A focus on the process or system by which products are produced is TQM’s third principle. TQM tries to prevent defective products from being manufactured, rather than inspecting for defects and correcting them later. The quality movement and W
Edward Deming especially argued that poor quality usually results from systemic failings and consequently is the responsibility of the management, not workers. While this transformed traditional labor bashing into management bashing, it drew attention to the systems and processes by which things get done in organizations.

4) The fourth fundamental claim of TQM is that *quality improvement is a never ending activity*. This claim is expressed by the Japanese word *Kaizen*, by the fifth of Deming's celebrated "fourteen points" and by the overused aphorism "Quality is a journey, not a destination". The ultimate goal of zero defects cannot always be reached, but one can always come closer. Even if all product defects were eliminated, there would still be costs to reduce. Japanese quality circles have demonstrated that significant progress can be achieved through an accumulation of large and small advances. The quality movement promotes a culture of continuous improvement and an unrelenting commitment to doing better.

5) TQM's fifth principle is the need for worker involvement. Efforts to improve quality may start with top management but to be successful, they must involve all members of the organisation. TQM implies a participative style of management, one that removes barriers between workers and overseers, encouraging people to manage them. In this respect, the quality movement conforms to trends in management practice. Worker involvement improves motivation; people work harder when they feel they are important parts of the organization. More importantly, workers know what is going on, how the system operates, and how it can be improved.

6) TQM's sixth principle is the demand that decisions and actions be grounded in knowledge. TQM promotes knowledge-based management, encouraging organizations to learn. Surveys help to determine customer needs, experiments identify optional settings of product and process variables. When defects occur, their
causes must be diagnosed through intensive data collection and analysis, proposing and testing casual hypotheses, and evaluating action alternatives for their effectiveness and potential side effects. Possibilities suggested by feelings must be confirmed by facts. It is no accident that the saying “In God we trust, all others need data” came out of the quality movement.

7) TQM’s seventh and final foundational principle is the need for teamwork and cooperation. This need exists at several levels. Teamwork must prevail among line employees, where work groups can help each person to perform effectively. Equally important is the need for teamwork among the organizational sub-units. Cooperation between labour and management is needed within organisations. Each side must renounce the “blame game” and work with the other for the benefit of the whole. Finally, TQM endorses teamwork across organizational boundaries, with suppliers, customers and other outside stakeholders. Companies should develop long-term relationships with suppliers, helping them learn how to satisfy the company needs. Firms should develop closer relationships with their customers, keeping abreast of changing product requirements. TQM tempers unwarranted competitiveness in our economic system, recognizing that cooperation often enables mutual gain.

These seven foundational principles of TQM are a significant contribution to management thought and practice. Every organisation can profit from adherence to these principles.

Kano(1993) outlines four principles underlining the concept of TQM as:

- “Customer satisfaction; putting quality first
- The PDCA cycle; process oriented production; doing it right the first time
- Emphasis on the use of data
Employees' commitment; management is not the monopoly of the managers, and every employee has a share in managing the enterprise.²⁵

2.7 Characteristics of TQM:

Characteristics are symbolically represented in a form of a diamond as shown below.

![Characteristics diamond of TQM](image)

1) Totality means that the effort is all encompassing. This implies that all areas and all functions, all activities, and all employees are striving for optimum quality all the time. Then the quality target is 100% and not 99.9%.

2) The second important characteristic of the TQM is well thought through documentation. It does not necessarily mean a file of papers detailing the quality activities. In essence, it is an integrated People-Machine-Information (PMI) relations that make the TQM effort happen. It is the proper dissemination of the PMI relationships to all persons that constitutes good documentation. The dissemination of information means that each person can visualize his/her own work assignments and responsibilities in a quality activity, the quality processes and decisions to which she/he has a relationship, the relevant quality processes and decisions made by others,
the machine-man interfaces and the information inputs and outputs. It is this self visualization which tends to a total quality effort.

3) The third characteristic of the TQM effort is 'improvements'. The ability to bring improvements in all quality activities of the company is the corner stone of a TQM initiative. This has lead to the development of a specific sub activity under TQM umbrella known as CPI (Constant Process Improvement). It is formally defined as "A systematic approach taken by all employees to achieve the highest levels of quality and competitiveness through continuous improvements of operations, products and services".

4) The fourth and final characteristic of the TQM initiative is 'solid foundation'. This provision of foundation comes from the company's organizational structure and systems. If the company is organized well then it enables the broad scope of quality activities to be properly managed. This is because good organizational systems equip management and employees of the company to come to grips to customer-requirements-to-customer-satisfaction quality activities. Therefore, today the goodness of quality organizational systems dictates the make-or-break situation as to whether the organisation achieves its goals of much improved product quality at much reduced quality costs.²⁶

K C Dabas and N S Gill assessed the following characteristics for TQM in library and information centres:-

1. TQM is a management philosophy to guide the librarians in meeting the challenges of the time

2. TQM starts at the top management of library.

3. TQM calls for strategic planning based on vision, mission, goals and objectives of academic libraries
4. TQM calls for every one to be skilled and knowledgeable (HRD)
5. TQM requires organization-wise involvement
6. TQM requires quality as a strategic priority along with other priorities
7. TQM promotes teamwork
8. TQM focuses on the users
9. TQM recognizes internal and external users of library
10. TQM aims to instill a “Prevention not an inspection” ethic
11. TQM is a process and activities based approach
12. TQM emphasizes the importance of measurement through the measuring rod of user satisfaction
13. TQM reduces the total cost of meeting user requirements
14. TQM is a disciplined, continuous and system approach

R P Mohanty and R R Lakhe identified the following characteristics of TQM;
1. TQM is customer oriented
2. TQM requires a long term commitment for continuous improvement of all processes
3. The success of TQM demands the leadership of top management and continuous involvement
4. Responsibility for establishment and improvement of systems lies with the management of an organisation.
5. TQM is a strategy for continuously improving performance at all levels and in all areas of responsibility.

The following key characteristics of TQM are recognized by Dalai and others;

➢ To become customer-driven rather than self focused
➢ To concentrate on process rather than be pre-occupied with results
➢ Use workers, heads in addition to their hands
➢ Alignment (external and internal)
➢ Total involvement, continuous improvement, and leadership commitment
➢ TQM is a human relations-oriented philosophy that requires fundamental changes in people management, treating them as an ever-appreciating asset.\(^{29}\)

### 2.8 Objectives of TQM:

Anjana Goswami identified the principal objectives of Total Quality Management as follows:

1. "Continuous Improvement of the organisation which is equal to or greater than that of any competitor.
2. Continuous and relentless cost reduction
3. Continuous and relentless quality improvement
4. Total participation i.e., creating an organisation whereby everyone is working towards making the organisation the best in its area of activity and to capitalize on the sense of achievement and working in a world class organisation".\(^{30}\)

Mohanthy and Lakhe described the basic objectives of TQM as follows:-

TQM as 'a pragmatic long term systems approach initiated and driven by the top management to bring about a total change of culture and interlink and integrate everyone, every function, every process and every activity of the organisation through involvement, participation and cross functional management to meet the dynamic needs of the customer and to create a loyal but at the same time a diversified customer base'.

Such a definition has the following features:

1) TQM is a pragmatic long-term systems approach: TQM is not a randomized approach. It is a concept which can be adopted and practised through proper
planning, systematic evaluation and allocating responsibilities and resources. It is also not a one-time strategy but a long term continuous approach.

2) TQM is initiated and driven by top management: TQM is a strategic direction and it can be triggered only by the top management. Developing organizational vision, mission, philosophy, strategies, objectives and plans is the responsibility of the top management. Top management, therefore needs to be involved in TQM and the quality improvement process and should lead the new way of thinking to begin innovations.

3) TQM aims at bringing about a total culture change in every facet of the organisation: TQM creates an organizational culture which is conducive to continuous improvement. Treating every other person receiving help as a customer and directing all efforts to satisfy his needs is the primary purpose of every person in the organisation.

4) TQM interlinks and integrates the various sub-systems of the organisation: Each department in the organisation strives for excellence and tries to achieve its set objectives. However, in most cases these departments conflict either in their objectives or approaches. TQM tries to break down the barriers between the departments and integrates the objectives of various departments with the main objective of the organization so as to follow the same common, unified approach for meeting the customer requirements.

5) TQM requires involvement, participation and cross-functional management: The objectives of TQM can not be achieved unless there is participation of all, at different levels in the problem solving process. In a conventional system, the employees of one department rarely get a chance to interact and understand the problems of other
departments. By forming cross-functional quality improvement teams, TQM overcomes this barrier.

6) TQM aims at meeting the dynamic needs of the customer and creates a loyal and diversified customer base: TQM recognizes customers both as internal as well as external. It also recognizes that the needs of these customers vary across the population and also with time. To meet these expectations it is essential to make a continuous effort to identify the customers, their needs and expectations and then develop strategies to meet them. Through this it tries to create a diversified and loyal customer base which promotes the profitability of the organization and helps to withstand any competition.31

2.9 TQM Gurus:

A guru, according to the Oxford Dictionary, is “a respected and influential teacher or authority”. A quality guru certainly should have these traits in addition to being a charismatic individual whose concept and approach to quality within business and life has made a major and lasting impact.

The TQM revolution is led by several gurus in Japan and the USA. Some of them made their mark in Japan in 1950s. Although many individuals have made substantial contributions to the theory and practice of Quality Management, three individuals – W. Edward Deming, Joseph Juran and Phillip B Crossby are regarded as the Management Gurus in the quality revolution. These three quality gurus together with Masaaki Imai led the development of the current set of management tools within the ‘Total Quality Management’. Other individuals who have helped to shape current thinking in quality management include Armand V Feigenbaum, Kaoru Ishikawa; Genechi Taguchi; Leonard & Sasser; Adam, Hershauer and W Ruch; James Harrington; Shigeo Shingo, Walter A Shewhart, and Yoshio Kondo,

Key contributors to Total Quality Management
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1) **W Edward Deming and TQM**

W E Deming, considered the Father of Japanese quality revolution, approaches the problem of quality management from a statistician's perspective. Deming's major influence on the Japanese began when he was invited by the Union of Japanese Scientists and Engineers (JUSE) in June 1950. He proposed a new thinking stressing on improving quality in manufacturing through the use of statistical quality control techniques.

*Deming's 14 points for management*: Deming summarized his views on management and its relationship with quality in his 14 points for management.

1) *Create constancy of purpose towards improvement of product and service, with an aim to become competitive, stay in business and provide jobs.*

2) *Adopt the new philosophy for economic stability*. We are in a new economic age, created by Japan. Western managements must awaken to the challenge, must learn their responsibilities and take on leadership for change.

3) *Cease dependence on inspection to achieve quality*. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4) *End the practice of awarding business on the basis of price tag.* Instead, minimize total cost move towards a single supplier for any one item on a long-term relationship of loyalty and trust.

5) *Improve constantly and forever the system of production and service, to improve quality and productivity and this constantly decreases costs.*

6) *Institute modern methods of training on the job for all the employees, including management to make better use of all employees.*

7) *Adopt and institute modern methods of supervision and leadership.* The responsibility of managers and supervisors must be changed from sheer numbers to quality. Improvement of quality will automatically improve productivity.

Management must ensure that immediate action is taken on the reports of inherited defects, maintenance requirements, poor tools, fuzzy operational definitions and other conditions detrimental to quality.

8) *Drive out Fear, so that everyone may work effectively for the company.*

9) *Breakdown barriers between departments.* People in research and design, sales and production must work as a team to foresee the problems they may encounter during production, use and service as well.

10 *Eliminate slogans, exaltations and target for the work force that ask for zero defects and new level of productivity.*

11) *Eliminate work standards on the factory floor.* Substitute leadership, Eliminate management by objectives. Eliminate management by numbers, numerical goals.

12) *Remove barriers to pride of workmanship.* The responsibility of supervisors must be changed from stressing sheer numbers to quality. Remove barriers that rob people in management and engineering of their right to pride of workmanship. This means, interalia, abolishing of the annual merit rating and management by objective.
13) *Institute a scheme of vigorous programme of education and self-improvement.*

14) *Top Management's Commitment.* Top managers' actions communicate the true importance of quality and TQM throughout the firm. For TQM to succeed, a firm's top managers must publicly demonstrate their strong commitment to ensure continuous quality improvement and innovation and they must openly practice what they preach.32

2. *Joseph M Juran and TQM*

   J M Juran is the founder and chairman emeritus of Juran Institute. He has pursued a varied career in management as an engineer, industrial executive, government administrator and management consultant. He is considered to be one of the early leaders in the quality field and has helped to build the conceptual basis for quality management. Juran defines quality as 'Fitness for use'. This fitness can be achieved through quality of design, quality of conformance, availability and field service. In 1940, Juran highlighted managerial responsibility for quality and emphasized that quality was achieved through people rather than techniques. He stressed both the management and technical aspects of quality management. He detailed three basic steps to quality improvement.

1) *Quality Control:* The totality of all means by which to establish and achieve standards i.e. gaining conformance by preventing occurrence of defects.

2) *Quality Improvement:* Using structured annual improvement plans, systematic training programs involving the whole organisation and senior management leadership.

3) *Managerial and Technical break through:* By setting goals, establishing plans, for meeting these goals providing resources to evaluate progress against these goals and
executing the projects to attack chronic problems in order to encourage good products.33

3. Philip B Crossby and TQM

Philip B Crossby is the Chairman of the Board of Philip Crossby Associates Inc. an international quality management consulting firm. He is best known for his focus on people oriented issues and stress on changing the executive behaviour. Western managements have been strongly influenced by the philosophy of Crossby. He is the principal exponent of 'zero-defects' concept. He defines quality as conformance to requirements and feels that higher quality results in reduction of costs and increase in profits.

Crossby’s 14 steps for Quality Improvement

1) *Management commitment*: Specify management’s stand and strategies on quality.

2) *The Quality Improvement Team*: To initiate, run and monitor the quality improvement programme.

3) *Quality measurement*: Systems that permit objective evaluation and corrective action.

4) *Cost of Quality*: The definition and measurement systems for cost of quality.

5) *Quality awareness*: Quality awareness at all levels in the company for raising quality reputation of the company.

6) *Corrective Action*: Corrective action on the identified problems.

7) *Zero Defects Planning*: To examine the various activities that must be conducted in preparation for formally launching the Zero Defects Programme.

8) *Supervisor Training*: In order to ensure their participation and performance in quality improvement programme.

9) *Z D Day*: To create realization among employees that there has been a change.
10) **Goal Setting**: To encourage individuals for accomplishment of quality goals.

11) **Error-Cause Removal**: To give the individual employee a method of communicating to management the situations that make it difficult for the employee to meet the pledge to improve.

12) **Recognition**: To appreciate those who participate

13) **Quality Councils**: To bring together the professional quality people for planned communication on a regular basis.

14) **Do it over again**: To emphasise that the quality improvement programme never ends.\(^3\)

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4. **Masakki Imai and TQM**

Masaaki Imai, the Chairman of the Cambridge Corporation, an international management consultancy firm, based in Tokyo, brought together the management philosophies, theories and tools as a single concept – *Kaizen* which he says, has been responsible for Japan's economic success. *Kaizen* is a Japanese name for a 'formal system to promote continuous improvement'.

Kaizen: *Kaizen* begins with the notion that an organization can assure its long term survival and success only when every member in the operating system and throughout the firm, actively pursues opportunities to identify and implement improvements every day. *Kaizen* sets no conditions for the magnitudes of improvement. In fact, it often favours small, incremental improvements by understanding the functions of the current system and its weaknesses or relative inefficiencies. Furthermore, small improvements gain returns for the firm without the need for large, initial investments to fund major innovations like a new, automated assembly line. The quality improvement perspective of *kaizen* is best described by an old saying, "Every day and in every way, we are getting better and better".
Kaizen lays emphasis on daily, incremental improvement for three guiding principles:

1) *Process view of the System:* The process analysis could affect a process for making a product or a process for designing a product among other processes.

2) *Stress comes from people:* Kaizen program relies heavily on peoples knowledge of their firm’s processes and their insights and intuition to conceive improvements. Success requires discipline, employee participation, skill development and effective communication.

3) *Constant sense of Urgency:* A successful kaizen programme depends on unceasing awareness of the need for change. Everyone must feel that they can improve their performances and never accept a current process, however, good and sufficient.

5. **A V Feigenbaum and TQM**

Armand V Feigenbaum is the founder and president of General Systems Company, an international engineering company that designs, implements and installs total quality systems. According to him the quality of products and services is directly influenced by Nine Ms as described below:

1) *Markets:* To meet the increased competition, growing customer demands and opening of new markets, business needs to be flexible.

2) *Money:* Keeping in view the large investments needed for automation and mechanization, the way to increase profits is through reduction of quality costs.

3) *Management:* The top management has to shoulder the responsibility of insuring quality measurement requirements throughout the process flow and the quality of service after the product has reached the customers.
4) *Men*: The increased technical expertise and organisation of new fields requires specialized knowledge resulting in division of responsibility for product quality. This requires focus on numerous business operating systems.

5) *Motivation*: The need to increase participation and involvement of one and all through encouraging positive recognition, sense of belonging and accomplishment. Use of quality training and education programmes for improved communication and building quality consciousness.

6) *Materials*: The need to use special metals and alloys and work them to closer limits.

7) *Machine and Mechanization*: The use of complex manufacturing equipment which depend more on quality of material fed into it for cost reduction and increasing production volume.

8) *Modern Information Methods*: The evolution and use of computer technology for the collection, storage, retrieval and manipulation of information on a large scale.

9) *Mounting Product Requirements*: The advances in the intricacies of engineering designs demands a close control over manufacturing process”.

6. Kaoru Ishikawa and TQM

Kaoru Ishikawa was a Japanese Quality authority until his death in 1989. He acknowledged Deming’s and Juran’s influence in his thinking. However, Ishikawa must be recognized for his own contribution to TQM. He was instrumental in the development of the broad outlines by Japanese quality strategy, the concept of CWQC, the audit process used for determining whether a company will be selected to receive the Deming Prize, team based problem solving and a variety of problem solving tools that any worker could use. Some key elements of his philosophy are:

1. Quality begins with education and ends with education.

2. The first step in quality is to know the requirements of customers
3. The ideal state of quality control occurs when inspection is no longer necessary.

4. Remove the root cause not the symptoms

5. Quality control is the responsibility of all workers and all divisions

6. Do not confuse means with the objectives

7. Put quality first and set your sights on long-term profits.

8. Market is the entrance and exit of quality.

9. Top management must not show anger when facts are presented by subordinates

10. 95% of problems in a company can be solved with simple tools for analysis and problem solving

11. Data without dispersion information (variability) are false data".37

7. Genichi Taguchi and TOM

Genichi Taguchi, a statistician and a leading consultant to Japanese and American High Technology companies, proposed a method of analyzing quality. It is known as “Total loss function”. He stresses on the total loss to society which a poor quality product or service can cause. His other major contribution to quality thinking is focus on attention on the original design phases of product or service. Taguchi developed statistical methods called, ‘off-line’ quality control which concentrates on the design process and this is referred to as “design of experiments”. By “off-line quality control” he means optimizing production processes and product property parameters in such a way as to minimize item-to-item variations in the product and its performance. Though difficult to understand, Taguchi’s methods have proved to be very successful in cutting the defect rates and costs.

Conventionally, quality control activities centre on final inspection sampling or on control charts and process control. This is known as “on-line quality control".37
Taguchi pushed the process upstream to focus on product and process design. This is known as “off-line quality control”.

Taguchi’s seven points are stated as:

1. “Product quality is measured by the total loss to society created by that product.
2. Continuous quality improvement and cost reduction are necessary to survive in world competition
3. Quality improvement requires continual and repeated reduction of variation in the product/process performance around the standard nominal values.
4. Quality loss is frequently proportional to the square of the deviation of the performance from the nominal value.
5. Product and process design can have an important impact on a product’s quality and cost.
6. Performance variation can be reduced by suitable adjustment of the product’s parameters and or the process parameters.
7. The appropriate parameter settings that reduce variation can be identified with the appropriate statistically designed experiments”.

8. J S Leo Nard & W E Sasser and TQM

Leonard and Sasser identified certain factors which can be manipulated by management to improve quality. These factors for success are:

1. Top management’s strategic support for quality.
2. Organisation-wide analysis to identify factors that affect quality
3. Responsibility for quality to every major segment within the organisation
4. Open participation by employees in quality improvement
5. Collection of quality data
6. Developing a professional quality assurance staff
7. Designing performance systems compatible with enhancing quality
8. Employee training and development

9. E Adam, J Hershauer and W Ruch and TQM

They proposed a comprehensive model of quality performance in their book *Productivity and Quality* which adopts organizational theory perspective towards quality. It conceptualizes how certain behavioral and technical factors are related to quality performance. The major focus of the model is on:

1. Employee training and orientation
2. Product design
3. Defining product service quality characteristics
4. Effective purchasing to improve quality
5. Participation of employees
6. Effective communication
7. Reused structure

10. H James Harrington and TQM

H James Harrington in his book *The Improvement Process* stresses that quality grows out of a management style and is not just a series of techniques or worker motivation. Based on his practical experience at IBM, he makes it clear that the only approach to quality that will succeed is to make it the predominant way of life in the organization. “He outlines the roles of different levels of management in the improvement process and considers the supervisor as the key to successful implementation of the improvement process”.

11. Shigeo Shingo and TQM

Shigeo Shingo had interest in scientific management very early in his career. Later on he took interest in the application of statistical quality control. His
contribution to quality management, however, arose from a personal realization that statistical methods detect errors too late in the manufacturing process. What is needed is to identify errors as they happen and to correct or deal with them right away. To this end, Shingo proposed his own version of ‘Zero Defects’. This is called *Pokayoke* in Japanese which means ‘fool proofing’. The idea is to handle errors as they occur. Initially potential error sources in the manufacturing process are identified. All potential points of error must be located and at each point, monitoring of error is undertaken. To produce perfect quality the first time, every time, operation managers must identify all the opportunities for error and eliminate them. They must design parts and process that make the desired results inevitable. This goal guides *PokaYoke* or fool proofing. *PokaYoke* tries to change either the process or its resources to eliminate the need to rely on human experience and accumulated knowledge.

12. **Walter Shewhart and TQM**

Walter Shewhart, a mathematician at Bell Laboratories, specialising in statistics, recognized that the variability associated with manufactured component dimensions followed a normal distribution. He reasoned that one could track component dimensions to determine whether they were starting to drift out of normal range. He recognized that as long as the dimensions remained in the normal range, their variability was under control. Shewhart identified the difference between common (or chance) causes and special (or assignable) causes of variation in the manufacturing process. He developed a simple but powerful tool i.e. the control chart to separate the change causes and assignable causes of variation. This tool is also known as “Statistical Process Control” which is defined as a process used to monitor standards making measurements and taking corrective action as a product or service being produced. Even though the methods of statistical quality control were introduced by
Walter Shewart in 1924 itself, in the following years W. Shewhart, Dodge and Romig did early work on the concept of acceptance sampling. Much of Shewart’s thinking on these techniques was published in 1931 in his book *Economic Control of Quality of Manufactured Product* in which he introduced the basic concepts of Statistical Quality Control (SQC), including the control chart. W Shewart is rightly known as the father of ‘SQC’. “Thinking statistically is a basic part of the TQM philosophy. Much of the challenge in implementing continuous improvement is centred on controlling the ongoing processes by statistical methods, by detecting the assignable causes of variation and eliminating them by the use of control charts”.

Usefulness of Quality Gurus’ ideas:

Quality Gurus’ ideas are results of their life-time understanding and experience about quality. The ideas have been tested by thousands of organizations world-wide before people recognized their originators as Gurus. The ideas are ‘profound knowledge’ that could be used by every individual and organization, and their values are tremendous. Each guru offers one unique idea to advance knowledge of solving quality-related problems. To solve real-life problems, one has to be able to understand, sequence, and synthesise the messages from different gurus to come to a useful conclusion. It is worth while to review the main ideas of the quality gurus:

1) W Edward Deming introduced concept of variation to the Japanese and also a systematic approach to problem solving which later became known as the management issues and produced his famous 14 points. He summarized his 70 years experience in his system of profound knowledge.

2) Joseph M Juran focused on quality control as an integral part of management control. He believes that quality does not happen by accident, it must be planned and
quality planning is part of the trilogy of planning, control and improvement. He warns that there are no shortcuts to quality.

3) Philip Crossby is best known in relation to the concepts of ‘Do it Right First Time and Zero defects’. He based his quality improvement approach on fourteen absolutes of Quality Management, and Quality Improvement Processes.

4) Masaaki Imai is known for his concept of Kaizen meaning continuous improvement. Imai’s concept of Kaizen has been largely responsible for Japan’s economic success. Three guiding principles of kaizen are 1) Process view of the system 2) Stress comes from people and 3) Constant sense of urgency.

5) A V Feigenbaum views quality as a stratgic business tool and coined the phrase ‘Total Quality Control’. He promoted the importance of shifting quality responsibility to everyone in the organisation and developing cost of quality approach.

6) Kaoru Ishikawa’s three main contributions to quality were 1) the simplification and spread of technical statistical tools (the seven tools of quality control) as a unified system throughout all levels of Japanese companies 2) his input to the company-wide quality movement, and 3) his input to the quality circle movement.

7) Genichi Taguchi advocated that to improve quality one must look upstream at the design stage because that is where quality begins. Taguchi is well known for his ‘Quality loss function’ called ‘Taguchi’s quality loss function, which estimates the loss to society from the failure of a product to meet its target value for a particular performance characteristic.

8) Shigeo Shingo created the PokaYoke system to ensure zero defects in production by preventive measures.

9) Walter Shewhart recognized that the variability associated with manufactured component dimensions followed a ‘normal distribution’. He advocated the use of
statistical process control (control charts) to monitor the on-going process and to ensure that the process is operating in the 'State of Statistical Control'. He also did some early work on acceptance sampling technique along with Dodge and Romig.

10) Yoshine Kondo identifies that quality is more compatible with human nature than cost and productivity. He developed a four point approach to motivation which makes it possible for work to be reborn as a creative activity.

2.10 ISO 9000:

It is observed from the article "Need and application of ISO 9000 in the libraries with a special reference to CFRI: A case study" published in the University News has emphasized the main objectives of ISO 9000 as follows:

"ISO9000 is one of the most widely recognized quality management tools for effective quality management and for achieving greater customer satisfaction, being adopted by almost every quality conscious company of the world. ISO9000 is a series of quality system standards formulated and published by international organization for standardization. It provides for development and operation of quality management system, applicable to all types of organizations, which can consistently meet the quality requirements of every kind of products and services".41

ISO9000 is not a quality assurance system; it is rather a system for managing activities in an organization that affect quality. Any quality management system worth its name cannot be setup overnight. Apart from organization commitment and dynamic leadership, the quality management system to be effective, needs a team of alert, dedicated, trained personnel to implement the system and to maintain its once sustained basis.
ISO 9000 Origin

The international Organisation for Standards (ISO) was established in 1946 with an objective of fostering trade and commerce among member countries. The actual standards are prepared by ISO Technical committees. They are helped by over 30,000 specialists in their fields. ISO technical committees are numbered serially as they are established. ISO/TC-176 is the 176th ISO Technical Committee and was formed in 1979 to address the need for standards in Quality Management and Quality Assurance. ISO/TC-176 completed the development of the ISO9000 core series of standards in 1987.

This series was introduced in 1987 by the ISO in Geneva and revised in 1994. This series is a set of generic standards that state the requirements for an acceptable quality management system. The standards are of two types. The Conformance Standards consist of ISO9001, ISO9002 and ISO9003. The Guidance Standards consist of ISO9000 and ISO9004. The ISO9000 is a guidance standard for selecting the appropriate conformance standard. The ISO9004 is a guideline for quality management and quality system requirements.

The Indian Standard IS14000 and the British Standard BS5750 are equivalent standards to the ISO9000 and they are set by the Bureau of Indian Standards and the British Standards Organisations respectively. For running a business within India the IS14000 is enough, but presently, it is not recognized outside India. The ISO9000 series has earned international acceptability and has become popular to compare quality at the international level. This serves as an indicator of the capability of a supplier to manufacture product/provide services of consistent quality. It eliminates the need for multiple assessment of a supplier by various purchasers.
Structure of the ISO 9000:

Of the three conformance standards, the ISO9001 is the most complete. It includes 20 requirements namely:

1. Management responsibility
2. Quality system
3. Contract review
4. Design control
5. Document and Data control
6. Purchasing
7. Control of customer supplied products
8. Product identification and traceability
9. Process control
10. Inspection and testing
11. Control of inspection measuring and test equipment
12. Inspection and test status
13. Control of non-conforming products
14. Corrective and preventive action
15. Handling, storage and packaging
16. Control of quality
17. Records
18. Internal quality audits
19. Servicing
20. Statistical techniques

The ISO9002 is the same as the ISO9001 except that there are no requirements for design control. The ISO9003 is for final inspection and test only. The section of
the ISO9000 series which is most relevant to the library and information services is the element of 4.5 of the ISO9001, which is meant for document and data control which covers:

- Updating national and international standards
- Review and approval of different quality systems documents
- Availability of the latest issues and
- Removal of obsolete documents

The philosophy of the Quality Assurance System is that quality is the hallmark of every operation and customers are the focus of everything we do. Quality means meeting the requirements of the customer without error first time and every time. Hence, all the activities are written down and work is accomplished according to the written procedures.

Benefits of the ISO 9000

1. Customer orientation
2. Marketing advantage
3. Recognition
4. Confidence creation
5. Consistency in quality
6. Legal aspects
7. Productivity improvement
8. Improves financial performance
9. Creates an effective QMS
10. Brings clarity
11. Traceability
12. Documented
13. Demonstrability
2.11 TQM for Service Organizations:

Service Sector, in fact is a generic term which covers many industries such as health care, education, banking, libraries, insurance, hotels, transport, to name a few. A large number of people involved in these sectors are white-collar staff. A direct interaction with customers is involved. The customers also vary in their social, cultural and economic background and thus in their expectations. The needs and priorities put forward by the customers and efforts made by the institutions/industries under the same category to meet these also change. The reactions to services can be gathered directly as well as indirectly through surveys.

Services have been defined in various ways. However, there is no general agreement regarding what service encompasses. According to Stanton (1986) services are those separately identifiable, essentially intangible activities that provide 'want-satisfaction' and that are not necessarily tied to the sale of a product or another service. To produce service may or may not require the use of tangible goods. However, when such use is required, there is no transfer of the title to these tangible goods.

Payne (1996) defines service as an activity that has some element of intangibility associated with it, which involves some interaction with customers or with property in their possession and does not result in a transfer of ownership. A change in condition may occur and production of the service may or may not be closely associated with a physical product.
Service Quality:

Berry\textsuperscript{45} et al (1989) defined 'Service Quality' as the conformance of service to customer specifications. Competitive quality requires designing, implementing and continuously adapting systematic transformations to provide efficient, extraordinary value added outcomes that are important to a wide range of organizational stakeholders.

Kessler\textsuperscript{46} (1995) defines total quality service as 'Customer Satisfaction'. Customers must be satisfied during the 'moments of truth' while they are interacting with an organization. Satisfied customers are retained. A 5 percent increase in customer retention increases profits by 80-95 percent in select services.

The four characteristics most commonly ascribed to a service are:

1) \textit{Intangibility}: Service is to a large extent abstract and intangible
2) \textit{Heterogeneity}: Service is non-standard and highly variable
3) \textit{Inseparability}: Service is typically produced and consumed at the same time with customer participation in the process.
4) \textit{Perishability}: It is not possible to store services in an inventory.

The service system, therefore, is an integration of all these components, involving a large number of white-collar staff working with a purpose to satisfy the varying needs of customers. Service is a work performed for some one else.

The quality dimensions in a Service Sector involve

1) \textit{Time dimension}: The time required to execute a service determines the quality of service. The time dimension includes arrangement time, waiting time, service and delay time.
2) \textit{Cost dimension}: The cost of service to the satisfaction of the customer decides the quality of service.
3) \textit{Error dimension}: The amount of error, their nature and time and cost associated in rectifying them decides the quality of service.
4) *Psychological dimension*: Service involves dealing with people and thus the extent to which they are satisfied with the quality of service depends on understanding, politeness and efficient service. ⁴⁷

**2.12 Garvin’s Eight Dimensions of Quality for Service Sector:**

Garvin identified eight attributes or dimensions which characterize a quality product or service for the customer. These are:

1) **Performance**: It is pertained to the primary operating attributes of the product or service. For a car, for example, they would include acceleration, top speed, miles per gallon, size and comfort. For a library they would include availability of books from stock, access to databases, access to subject experts, somewhere to sit and work and so on.

2) **Features**: These are the secondary operating attributes, which add to a product or service in the customer’s eyes but are not essential to it. For a car they might include a free sun-roof or alloy wheels, for a library they might range from free use of a stapler to provision of a lift for the able-bodied as well as the disabled. It is not always easy to distinguish performance characteristics from features, especially, as what is essential to one customer may be an optional to another. Nevertheless, there is a valid distinction to be made.

3) **Reliability**: Customers place high value on being able to rely on a product or service. For products this usually means that they perform as expected (or better). For example, a key issue for a car buyer is the probability of avoiding breakdowns or even minor malfunctions, so reliability is often at the top of the list of issues when car league tables are compiled. For libraries, a major issue is usually availability of advertised services. For example, is a working photocopier available or are the ‘out of order’ notices in use again?

4) **Conformance**: This was one of the key contributions of TQM Guru Taguchi. The question is whether the product or service meets the agreed standard. This may be a
national or international standard or locally determined service standard. The standards themselves, however they are devised, must of course relate to customer requirements. It is interesting that service standards for libraries are now starting to emerge.

5) **Durability:** The normal definition of durability is the amount of use the product will provide before it deteriorates to the point where replacement or discard is preferable to repair. This is applicable to libraries if we bear in mind that the answer may be ‘infinity’ for those items which are literally irreparable. For most customers, however, the library issues will centre on the question of the rate of obsolescence of information and hence on how up-to-date the information provided. It may be appropriate under this heading, therefore, to consider the age of the library's book stock or the frequency of update of a CD-ROM database.

6) **Serviceability:** When things go wrong, how easy will it be to put them right? How quickly can they be repaired? How much inconvenience will be caused to the customer and how much does the repair cost? This last question will include not just the cost of the repair itself, but the inconvenience and consequential losses the customer faces. In general, libraries didn't have to give a great deal of attention to these issues in the past but they could be of major importance if, for example, an online information service which is provided on a commercial basis suddenly goes wrong. With the increased use of IT-based systems libraries can be vulnerable to catastrophic failures. The ‘Serviceability’ issues also occur, for example, in interlibrary loan services if the wrong item is supplied, no matter whose fault it may be. The item of serviceability also includes such factors as whether the customer is treated with courtesy when things go wrong.

7) **Aesthetics:** While this is a highly subjective area, it can be of prime importance to a customer. Is the service area clean and well designed? Is it welcoming? Does it appear user friendly or as someone put it ‘user lethal’? Everyone has come across
libraries which look old, worn, gloomy, and generally uncared for. Equally we all also know libraries which are bright, well designed, welcoming and fresh. There are customers who prefer the former of course and others who would rather have a dog-eared and annotated text than a book fresh from the publisher. Nevertheless, all the customers judge a library as much by its aesthetics as by its services.

8) Perceived quality: This is one of the most interesting attributes because it recognizes that all customers make their judgments on incomplete information. They do not carry out detailed surveys or examine the library's performance in answering reference enquiries over a six months period. Most users do not read the library's mission statement or service standards, or even the 'welcome' leaflet. However, they will quickly come to a judgment about the library based on their pre-conceptions as users and on the reputation of the library among their colleagues and acquaintances.

Customer Driven Quality:

Quality is judged by customers. All product and service characteristics that contribute value to the customer and lead to customer satisfaction, preference and retention must be the focus of an organisation's management system. Value and satisfaction may be influenced by many factors throughout the customer's overall purchase, ownership and service experiences. These factors include the organisation's relationship with customers that helps build trust, confidence and loyalty. This concept of quality includes not only the product and service characteristics that meet basic customer requirements, but it also includes those features and characteristics that differentiate them from competing offerings. Such differentiation may be based upon new or modified offerings, combinations of product and service offerings, customization of offering, rapid response or special relationships. Customer-driven quality is thus a strategic concept. It is directed toward customer retention, market-share gain and growth. It demands constant sensitivity to changing and emerging customer and market requirements and the
factors that drive customer satisfaction and retention. It also demands awareness of
developments in technology and of competitors' offerings, and rapid and flexible
response to customer and market requirements. Success requires more than defect
and error reduction, merely meeting specifications or reducing complaints.
Nevertheless, defect and error reduction and elimination of causes of dissatisfaction
contribute to the customers' view of quality and are important parts of customer-
driven quality. In addition, the organization's success in recovering from defects and
errors (making things right for the customer) is crucial to building customer
relationships and to customer retention. Levels of Customer Satisfaction:

A customer is defined as the person or unit receiving the output of a process of
the system. The customer may be an immediate, intermediate or ultimate customer.
It may be a person or a process. Customer satisfaction is when the customer is
satisfied with the service and it meets his needs, wants and expectations. To further
understand customer satisfaction, we must also look deeper into the levels of specific
satisfaction. To understand the levels of customer satisfaction it is essential to
recognize the levels of customer expectations which in a sense define the basic
ingredients of quality. There are at least three levels of customer expectations about
quality.

(a) Level 1: The expectations are very simple and take the form of assumptions, 'must
have' or 'take it for granted'. For example, I expect the bank to deposit my money
into my account and to maintain my balance correctly.

(b) Level 2: The expectations are a step higher than in Level 1, and they require some
form of satisfaction through meeting requirements and/or specifications. For
example, I went to the bank and the bank teller was very friendly, informative and
helpful with my transactions.

(c) Level 3: The expectations are much higher than in Level 1 or 2 and they require
some kind of delightful service that is so good that it attracts me to it. For example,
the bank officer not only treated me with respect and answered all my questions, but
just before we shook hands to close the deal for my house loan, he gave me a house warming gift.50

2.13 TQM – Implementation:

A study of TQM implementation approaches of various organizations reveal some of the commonly adopted approaches as follows:
- to adopt and apply a few specific quality management techniques to promote TQM
- to adopt the philosophy of any one of the internationally recognized quality management
- to visit and study the quality management practices adopted by various companies and formulate a comprehensive plan for the individual needs.
- to randomly select some of the techniques of quality management as desired by senior management and work on these
- to use the experience of organizations is a particular national setting, mostly Japan.

However, while developing the TQM approach and implementation strategy, many organizations introduce a wide range of TQM related activities simultaneously throughout an entire organisation. Some of these activities are
- Quality awareness and quality skills training for all employees.
- Creation and deployment of strategic quality goals
- Formation of many quality improvement teams to work on various processes that need improvement
- Determination of customer requirements and satisfaction indicators
- Empowerment and greater involvement for employees.

Though these activities contribute in achieving the TQM goals, the user organizations must know the strengths and weaknesses of these for effective execution. Moreover, they should be able to use them in a strategic framework. Though there is no blueprint for successful implementation of the TQM, an established sequence of steps or tactics within a strategic framework should help achieve better results.
Furthermore, a strategic framework helps to ensure a process that is more result-oriented than activity-oriented. Keeping this in view, we propose a strategic framework for implementing the TQM as outlined in the following figure. This framework should serve as a guide for directing the focus of quality enhancement tools.

Framework for implementing the TQM

1. Identify the degree of commitment, key interests and list down the long term changes required
2. Define the objectives of TQM
3. Identify resources available and develop understanding of organizational system with quality system
4. Specify Top Management commitment through quality policies procedures and processes
5. Create companywide awareness and participative work environment by emphasizing customer-oriented values, encourage quality commitment.
6. Design plans, develop specifies about future
7. Identify key issues and constraints on implementation, develop strategies for implementation.
8. Identify and allocate resources, execute plans, build momentum for change
9. Implement and monitor
10. Measure benefits in terms of increased customer satisfaction
11. Review and reward

Pre requisites for implementing the TQM

i) The ten commandments of the TQM
ii) The four pillars of the TQM
iii) The four ‘e’s of the TQM
i) **The ten commandments of the TQM:** The ten commandments (guiding principles) to ensure that no important steps have been neglected in formulating corporate strategies are:

1) Approach  
   Management led

2) Method  
   Prevention not detection (of defects)

3) Objective  
   Total customer satisfaction

4) Measure  
   The costs of quality

5) Standard  
   Right first time

6) Scope  
   Ownership and commitment

7) Theme  
   Continuous Improvement

8) Ability  
   Training and Education

9) Communication  
   Cooperation and Teamwork

10) Reward  
    Recognition and Pride.

ii) **The four pillars of the TQM:**

![Diagram of four pillars](image)

The ten principles of the TQM set the rules to be followed in acquiring it. On the other hand, there is a need for a systematic approach so that the ten principles can be bounded together smoothly. Oakland originated the idea of a 3-cornerstone model. The proposed four pillars model brings customer requirements into the system. This makes the approach to the TQM more complete. The pillar-satisfying the customer is
vital because it explicitly addresses customers' requirements. Without it, the TQM would have no objective. The interpretation of the four pillars is:

P1: Satisfying Customers: The aim of the TQM is not just to meet customers requirements (expected needs). It is concerned about customer satisfaction (satisfying implies needs). The customer requirements may include availability, delivery, reliability, maintainability and cost effectiveness, amongst many other features. Only the smooth functioning of the internal customer-supplier chain will ensure that the quality is built into each stage of the business for the benefits of the external customers. The importance of satisfying the internal customers' needs can never be over-emphasised.

P2: System/Process: For many organizations, the first step in creating a total quality environment is likely to be the establishment of a quality management system such as ISO9000 series. Establishing such a system is the initial building block. The TQM relies on an effective quality management system which ensures that preventive measures are in place and the culture of continuous improvement exists to enable the processes to deliver quality products and services. Good processes will produce good products.

P3: People: It is vital for the management in a total quality organization to capture the hearts and minds of everybody within the organization, starting at the top and permeating via a chain of customer/supplier relationships throughout the whole organization and beyond. Therefore management commitment, training, team work, leadership, motivation, empowerment etc. would have a vital and complementary role to play in establishing a total quality environment.

P4: Improvement Tools: There is no organization that cannot be improved. A vital part of the TQM is to recognize the need for continuous improvement. The ISO9004-4 Guide line for quality improvement should be tangible help.
The 4cs of the TQM: Implementation of the TQM and improvement of a company's quality system heavily rely on people. Human dimension is inevitably incorporated in each of the stages of the TQM model, and is the driving force behind the philosophy of total quality in business as well as in life. It all starts with an individual's belief in actualization through doing things with responsibility and pride, continuous learning, group work and contribution to common goals. As much as many successful quality programmes should be based on the Deming's cycle, the implementation of the TQM also requires from foundations in an organisation's human resources through a full application and integration of 4cs of the TQM; commitment, competence, communication and continuous improvement.

Commitment: Commitment to quality at work is defined as a decisive personal or organizational choice to follow through on an agreed upon plan of action. Workers will be committed to quality to the extent that management is committed. If the management is not committed to train the workers, they cannot produce the goods or services to the customers' requirement. Everyone is committed to something to some extent. Their commitments vary according to their importance and their ability to meet them.

Competence: Along with commitment, quality goals require actions and attitudes based on competence. Competence is based on knowledge. No matter what type of job we are doing, we must be competent to do it. We must possess certain specific measurable skills, sound education, good intuitive judgment, an ability to apply related knowledge to solve problems and a responsible attitude. Competence and quality work go hand in hand, because competent people make sure they successfully meet requirements. Without competence, employees cannot build quality into a product or service.

Communication: The purpose of communication is to achieve mutual understanding. The definition of communication comes from the Latin word 'Communis' meaning, 'Common'. Communication exists in most groups, families, companies or among friends. The following figure illustrates how quality communication works. It shows
the cycle of communication – sender, message, receiver and feedback. Each column represents the important considerations for each of the four activities. Apart from their own responsibilities, the sender is responsible for the message and the receiver is responsible for the feedback.

**Quality Communication model**

<table>
<thead>
<tr>
<th>Sender</th>
<th>Message</th>
<th>Receiver</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
<td>Standards</td>
<td>Interpretation</td>
<td>Ideas</td>
</tr>
<tr>
<td>Direction</td>
<td>Requirements</td>
<td>Implementation</td>
<td>Suggestions</td>
</tr>
<tr>
<td>Goals</td>
<td>Expectations</td>
<td>Participation</td>
<td>Problems</td>
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<tr>
<td></td>
<td>Training</td>
<td></td>
<td>Challenges</td>
</tr>
</tbody>
</table>

A common understanding and mutual agreement can not take place with one-way messages. Too often we send a message and assume it is received and understood the way we intended.

Continuous Improvement (Kaizen): Continuous Improvement is a programme, a philosophy and a strategy to improve the quality of goods and services of an organization. Everything deteriorates with use. Maintenance programmes check the inevitable decline, but do not improve processes. *Kaizen* involves process changes. Renewal of a process can result in a major improvement in performance. Team work and competence in problem solving are the foundation for *kaizen*. By adopting a structured methodology, the organization ensures effective problem solving and decision making. By eliminating various root causes of problems in the process, variation decreases, thus increasing the quality of the output.52
2.14 References:


