CHAPTER – 1: INTRODUCTION

Total Quality Management (TQM) is a philosophy and a set of supervisory principles/parameters that represent a foundation, which continuously upgrade the organization. It encompasses mobilizing the entire organization to match the demand of the users.

TQM has evolved primarily because of the changes in the global economy and also because of demand in market forces. Now a day’s, TQM becomes a major or we can say essential feature of our working methodology though the quality control is being practiced in most of the industries throughout the globe from years. Earlier firms and industries practices traditional and outdated methods by which they are unable to meet the required parameter or quality which in actual they desire to achieve. Also, readily changing technology and customer expectations have already affected organizations worldwide which have promoted the need for taking a new look at quality management (Lakhe and Mohanty, 1994).

Thus, it is the outcome for a new look for quality management. Table 1 (slideplayer.com/slide/9042304/) depicts the periodic changes in quality system that has approached towards total quality management.

TQM focuses on the routine involvement and participation of every individual in any organization in the systematic improvement of quality and it involves each member and group within own part of organization. It also provides the methodology to work and to constantly improve the performance at any level and in every activity by creating positive continuous improvement of the environment based on team work, trust and respect examining the process through which the work gets done in an organized, consistent manner, by applying quantitative method and analytical techniques and expending knowledge and expertise in process improvement. Therefore, Total Quality Management is a procedure to enhance the performance with trust, teamwork and to get the work done in an efficient way by applying techniques.
<table>
<thead>
<tr>
<th>Period</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle ages (1200-1799)</td>
<td>Guides – skilled craftsmen were responsible to control their own products.</td>
</tr>
<tr>
<td>Mid-18th century</td>
<td>Establishment of factories. Increase in productivity. Mass production. Assembly lines. Several workers were responsible for producing a product.</td>
</tr>
<tr>
<td>Industrial Revolution</td>
<td>Production by skilled workers and quality audit by inspectors.</td>
</tr>
<tr>
<td>Early 19th Century</td>
<td>Craftsmanship model of production.</td>
</tr>
<tr>
<td>Late 19th Century</td>
<td>Fredrick Taylor and “Scientific Management”.</td>
</tr>
<tr>
<td>1880s</td>
<td>Quality management through inspection.</td>
</tr>
<tr>
<td>Beginning of 20th Century</td>
<td>Walter-Shewhart introduced statistical process control.</td>
</tr>
<tr>
<td>1920s</td>
<td>Introduction of full-time quality inspection and quality control department. Quality management.</td>
</tr>
<tr>
<td>1930s</td>
<td>Introduction of sampling method.</td>
</tr>
<tr>
<td>1950s</td>
<td>Introduction of statistical quality process in Japan.</td>
</tr>
<tr>
<td>Late 1960s</td>
<td>Introduction of QA.</td>
</tr>
<tr>
<td>1980s</td>
<td>Total Quality Management (TQM).</td>
</tr>
</tbody>
</table>

However, it is an uninterrupted learning/education process, which never stops rather it is a cyclic activity that is never ending activity based on logical extensions and the standard qualities.

1.1 TQM: the Concept Elaborated

TQM is an uninterrupted effort for brilliance by applying the appropriate skills and attitudes among the person involved in order to minimize defects as much as possible and satisfy the clients/users completely always. TQM is a group-wide or we chain linked activity in which each and every involved person should be approached within the firm.

TQM is a technique to improve flexibility and effectiveness of the organization/association and performance on systematic and continuous basis. This is achieved by involving all experts in satisfying all requirements of every customer / users, whether the customer / users is external or internal. Quality management is the basis for management in general. The principles of TQM, like meeting the customer’s / user’s needs, exact assessment, continuous improvement, team work and enthusiasm of the leaders typically for any organization services.
Broadly saying, TQM comprises of three words for managing an organization to achieve excellence:

- Total – everything,
- Quality – degree of excellence,
- Management – art, act or a way of organizing, controlling, planning, and directing to achieve certain goals.

Therefore, TQM is the art of handling the whole to achieve excellence. It is an cohesive organizational approach in satisfying customers/users - both internal and external, by meeting their expectations on a continuous basis through everyone, involved with the organization, working on continuous improvement, in all product/process along with the proper problem solving methodology. It is variously defined by different authors as follows:

Oakland (1989) defines TQM is an “approach to improving the effectiveness and flexibility of business as a whole. It is essentially a way of organizing and involving the whole organization; every department, every activity, every single person at every level”.

Kanji (1990) has defined it as “the way of life of an organization committed to customer satisfaction through continuous improvement. This way of life varies from organization to organization and from one country to another but has certain principles which can be implemented to secure market share, increase profits and reduce costs”.

Tobin (1990) says - TQM is “the totally integrated effort for gaining competitive advantage by continuously improving every facet of the organizational culture”.

While according to Berry (1991), TQM process is “a total corporate focus on meeting and exceeding customers’ expectations and significantly reducing costs resulting from poor quality by adopting a new management system and corporate culture”.

3
Zaire and Simintiras (1991) mention that it is the “combination of the socio-technical process towards doing the right things (externally), everything right (internally) first time and all the time, with economic viability considered at each stage of each process”.

However, according to Metreveli, (1998), TQM is “a management philosophy embracing all activities through which the needs of the customer and the community, and the objectives of the organization, are satisfied in the most efficient and cost-effective way by maximizing the potential of all employees in a continuing drive for improvement”.

1.2 Scope of TQM

The scope of TQM covers principles & practices and tools & techniques. They can be depicted well through following figure 1(www.rug.nl/research/portal/files/10216022/c2.pdf). Where, leadership, customer satisfaction, employee improvement continuous improvement, supplier partnership and performance measures forms major principles & practices. While, quantitative and non-quantitative both types of tools comprises to tools & techniques of TQM.

1.3. Principles of Total Quality Management

The following are the main principles of total quality management.

- Top Management
- Training Needs
- Customer Orientation
- Involvement of Employees
- Techniques and Tools
- Corporate Culture
- Continuous Improvements
Sharma, Jain and Pruthi (2013) have explained them as given below:

- **Top Management**: In actual, top level management holds the power over any process in TQM technique, hence it is their responsibility to create good positive working atmosphere for its successful implementation.

- **Training Needs**: Each and every working staff involved person must be trained properly initially and also regular trainings should be provided to them in order have satisfied outcome.
• **Customer Orientation:** As while practicing TQM one of our sole aim is customer satisfaction hence we should take this into account that regular feedbacks and surveys is going on.

• **Involvement of Employees:** As earlier discussed employee and their involvement is one the important pillar of TQM. Hence there should good working environment for them also in order to motivate them they should be rewarded for their loyalty, skill, hard work etc.

• **Techniques and Tools:** Suitable tools and techniques should be used.

• **Corporate Culture:** Here the attention is to be given on culture for the comfort of employee so that he achieves higher levels of quality.

• **Continuous Improvements:** Betterment in every area should be demanded.

The last principle is of immense importance as TQM is customer or user oriented where ultimate goal is to satisfy the needs of customer; hence, continuous improvements needs to be there whether it is service oriented or infrastructure oriented.

**1.3 Pillars of TQM to advance the Organization**

There are five pillars of TQM, namely

- Product
- Process
- System
- People and
- Leadership

These may be depicted through following figure 2 (Charantimath, 2011).
1.5. Six C’S OF TQM

Six Cs – culture, continuous improvement, cooperation, customer and control should be there for proper implementation of a TQM. Sharma, Gupta and Singh (2014) have detailed out them as given below:

**Commitment:** It means a good TQM culture is to be developed in the organization so that the quality improvement may become a normal part of everyone’s job. Hence, a clear support and commitment from the top management should be there, otherwise all will fail without commitment. ‘Quality’, the accountability quality is not associated with performance of a single person as in TQM technique whole work group is interdependent on each other. Since this cannot form an atmosphere for varying attitude and breaking down the hurdles to quality enhancement. Cumulative approach will bring productive outcome.

**Culture:** There should be a modern culture for quality improvement on a regular basis in any organization. Thus, on regular basis training is very essential to bring out the changes in culture and the attitudes. A management accountant is generally concerned with ‘creativity’ and with ‘creative’ accounting and linked pessimistic perceptions. This
may be improved in order to motivate individual contributions and to make ‘quality’ a natural ingredient of everybody’s job.

**Continuous Improvement:** There must be an uninteresting and regular upgrading of each and every practice, policy and procedure associated by top management for the company. Keep in mind that, TQM is a ‘process’ not a ‘programme’ that requires deep and dedicated involvement in the everlasting, long and the never-ending exploration for various new measures should be taken for the betterment of job. We know that, there will be always space for enrichment, may be less or more.

**Cooperation:** We all know that cooperation among employees is the key for success in every field hence the same goes with TQM technique also guidance and knowledge of experienced employees must be utilized for improving strategies and enhancing performance. The chief principle of TQM is Total Employee Involvement (TEI) . For better and best outcome and quality veteran employees must be used up to fullest and their participation, guidance and mutual aid play a vital role in the betterment of the process and also in framing improved strategies for appropriate performance and quality.

**Customer:** Organizations have to focus on consumer’s requirements and satisfaction of their prospect for everlasting and continued existence of the industry. The requirements of the client are the chief driving force; this is not only limited to the external consumers (in receipt of the final product or service) but the internal consumers (colleagues who receive and supply goods, services or information). Ideal service with zero defects in all that is needed at either internal or external levels. TQM in practice, working focuses completely on the external consumer to the exclusion of internal dealings; they will not endure in the short term unless they promote the mutual respect necessary to preserve morale and employee participation.

**Control:** There must be effective check for supervising and computing the genuine performance of the job. If TQM implementation is to role awareness of current best
practice are essential. However, they require for control mechanisms is regularly overlooked, in practice, in the euphoria of customer/ users service and employee empowerment. Unless procedures are in place improvements cannot be measured and monitored nor deficiencies corrected. Difficulties will unquestionably be faced in the implementation of quality enhancement and it is valuable and illustrative procedure that might be inherited to reduce them in detail.

1.6 Why TQM in Libraries?

Libraries are considered as the most ancient social and cultural institutions in the world. It is seen that the libraries of the ancient times as well as of modern times have one thing in common that is they have a body of information recorded on some type of medium and that information could be retrieved when needed. However, the accessibility of information requires good organizational ability from those who are in charge. But the basic concern is to create a structure of the organization where desired information is retrieved and made accessible efficiently and in a timely manner to the users. Creation and maintenance of such a structure requires an effective management process that facilitates work toward that goal (Kumbar, 2004).

Kumbar further adds that over many centuries libraries have adopted many different management principles from business, industry, religion, and government. They were following traditional management practices, such as vast amounts of information stored in different formats - printed, electronic, audio, video – that required use of the most modern management techniques. But today technologies have changed the social and economic life. The workplaces methodologies are also changed- today's people work at home or on the web with flexible timetables, and more and more virtual communities are emerging in different fields. The most important stakeholders in the library are customers, the providers of subsidies, staff, and other libraries. These stakeholders are interested, for various reasons, in the introduction of TQM.

Thus, the introduction of TQM makes great demands on the staff. The following factors in particular need to be taken into account (Klaassen and Wiersma, 2004):
• TQM involves a process of change and therefore requires of staff that they be ready to play a constructive role in that process.

• TQM requires a basic reorientation from the media stock towards customers and markets. For TQM a result-oriented approach is of vital importance but not the input of resources.

• A strongly hierarchical organization with fragmented responsibilities is not well suited to the introduction of TQM since all staff needs to feel a responsibility for influencing quality.

• The effort necessary for implementing TQM is at the same time rewarding for both staff and the institution: improvement of the institution in which they work, a strengthening of that institution's position, and more opportunity of staff to influence their own work.

1.6.1 Idea of Quality in Library Services

The library as an organization is to offer reference and information sources and amenities to its users. Library services are the combination of the services, process and its delivery. The services in a library are offered from acquisition section, technical section, maintenance section etc., but particularly through circulation and reference department. Thus, various processes are carried out there and thereafter delivered to all the users. Hence, the quality should start from the acquisition section, which must be carried uniformly to circulation section. A user who had an unfriendly experience from the library will tell it to many people, but a good experience will be told to very few.

Therefore it is very vital for the librarians to understand the users, what they want, how they want, and when they want the documents and information. Hence, to carry out all the functions or activities of these sections efficiently, application of total quality management technique is applied. This is depicted in figure 3 (based on Bhatt, 2012).
1.6.2 Quality Improvement in Library Services

It is very simple to create a quality based library in the present information age, if the parent body or concerned authority assists financially. So, it is very significant for the librarians and its parent body to look forward for the existing generation and future generation to cope up with international phenomena. A user must be educated with proper technology in order to use the library services effectively. He or she should gain knowledge of all the services and facilities available in the library and information centre and also of the method to access those efficiently and effectively.

![Diagram of Library and Total Quality Management]

**Figure 3: Library and Total Quality Management**

Thus, user satisfaction survey is an effective tool that provides both quantitative as well as qualitative data for improvement of the service quality. It is a very important part of libraries for process and measure the user satisfaction performance.

The main steps to measure users’ satisfaction are:

- Conducting sample survey
Data collection
Process and analysis of data
Interpret and present the data
Finding out the result

By using the results, the librarians can take new steps for the development of library. Thus, regular surveys enable the librarians to understand the changes in user's satisfaction and to plan the services accordingly.

1.6.3 Control on Quality in Library Services

Quality control is a system of maintaining standards in manufactured products by testing a sample of the output against the specification. It is the company’s responsibility to deliver services and product that satisfy the users. In the ideal situation the features, advantage and benefits of company products fit the customer expectation. When company’s product does not provide the customer satisfaction the product would not sell and the company makes efforts through debates, advertisement and control of quality and public relation. The same system applies in case of library. It is for uninterrupted betterment of services and systems in any library.

The management of quality in libraries as a management method allows the improvement of performance and it should be the object of interest for the managers of these services. In this context, the identification of indicators that may be taken into account the social-economic and political context and that permeate the reality of the information services is essential for the quality proposals.

It is observed that the libraries have changed speedily from storehouses of books and journals to the powerhouses of knowledge and information science in the middle of 20th century. But as the existence of libraries is dependable totally on users’ satisfaction, a quality service is needed that is said to be one which satisfy’s the user’s expectation resulting in a good experience. The libraries were mainly concerned with collection development and processing throughout the history, where library professionals gave less importance to the quality of service, product and never checked, whether the users
were satisfied or not. But gradually the economic and social changes have encouraged the libraries to develop services. The staff plays a great role in the commitment of the users.

Further, it is enriched with the availability of the introduction of information & communication technology in library field particularly from the last decade of 20th century. The library’s main objective being a service organization is to provide the right documents on right time, information and services to its users. Thus, only the user’s satisfaction survey will facilitate the assessment of the quality of services and products offered.

There are various methods, techniques and tools are available so as to control measures and improve the quality of the library services. Thetools like LIBQUAL, SERQUAL and TQM help them to evaluate the services, make decisions, to improve services and to achieve a better quality. However, the network equipped environment offers libraries’ opportunities and challenges in many areas including collection development, services and management.

1.7 Users’ Satisfaction

There are two types of definition for the “customer (user) satisfaction” concept, based on different approaches. First is the process-oriented approach that considers consumer satisfaction as the difference between expected satisfaction and achieved satisfaction, whereas the second approach is the outcome-oriented approach that regards satisfaction as an attribute extracted from a product or service after its consumption (https://www.igi-global.com/dictionary/user-satisfaction/31229). However, more commonly the users’ satisfaction is grounded on many factors like:

- Source: A source of up-to-date information, knowledge, accessing facilities and assistance.
- Faculty: The library should unify its facilities, visible to the users; otherwise they may not have it and get dissatisfied.
• Accessibility: The library resources and services should be easily accessible. Books should be arranged in shelves in proper classified order, so the users can locate books quickly. For automated library the electronic database like OPAC will help the users to figure out the books in stacks.

• Tangibles: The tangibles (noticeable things) of libraries, namely the building, furniture and other physical amenities, collection, library team, equipment etc. should be adequate and appropriate and useful for the users.

• Courtesy / Friendliness: The staff of the library should be very courteous and friendly with the users.

• Physical appearance / atmosphere/ cleanliness/ comfort: The appearance of library, its amenities, collection, team and services should be attractive and pleasant. A welcoming atmosphere should be must.

• Furniture: floor, racks, documents should be neat and clean.

• Process- Communication / Reliability: The administering part of the library should be dependable and efficient that suffices the anticipations of the users.

Further, the way of communication, assistance and guidance also greatly affect the satisfaction of the users. However, it is experienced that if something goes incorrect that can be very easily learned from the users, so the users’ complaints can be taken as good measure of user satisfaction.

1.8 Steps for Staff in order to meet the Users’ Needs

The following steps are needed to meet out the user's needs in any library (Usor and Okon, 2016).

• Being accountable for the total service quality to all the users, both the technical staff and frontline staff available in the library should serve the users

• Services should be provided to the users in the most effective way.

• Maximum benefits to all the users form collection and facilities should be provided.
• Stay close to the users so that the library can recognize the users' needs; tastes; interests etc. Without listening to them and services without users' interest would be a mere wastage.
• Users should be treated well, informed well and acknowledged well about the services provided to them.

Thus, it can be said that total quality management is must for developing customer based services in the libraries.

1.9 Significance of study

The scope of the study is to carry out in depth research of efficacy of TQM in library services of IIT Delhi, IIT Roorkee and IIT Kanpur and suggest measures, if any, for improvement in quality of library services for the users from different angles in the information technology driven era.

The study will also useful for librarians, information managers and other inter-disciplinary staff, who are occupied in planning for improvement of systems of the library. It will provide right track in guiding them in all those areas that impact and affect their interests. The comparative results of the study will very useful for library professionals, software developers, librarians and faculty members in for the occupationists of library and information science field to make them vibrant among other professions in the contemporary technology driven era. It is also being adopted in academic libraries throughout the country, especially in higher education institutes.

1.11 Limitation and Scope of Study

The Indian Institutes of Technology (IITs) are autonomous public institutes of higher education in India. The Institutes of Technology Act, 1961 lists twenty-three such institutes located at Bhilai, Madras, Delhi, Dhanbad, Dharwad, Goa, Guwahati, Jammu, Kanpur, Kharagpur, Bombay, Roorkee, Bhubaneswar, Gandhinagar, Hyderabad, Indore, Jodhpur, Mandi, Palghat, Patna, Ropar, Tirupati and Varanasi.
There are 23 IITs in our country, but it is very difficult task to cover all of them. Hence, three IITs, namely IIT Delhi; IIT Roorkee and IIT Kanpur are considered as sample for the study. The efforts are made to conduct an in-depth study of them for total quality management.

1.12 Main Objectives of the Study

Total quality management in libraries are play vital role in modern era. Efficiency of work are also depends on quality of works in library, knowledge and behavior of library professionals with library users. For this study I have selected most well-known three libraries, namely Central Library of IIT Delhi; P.K. Kelkar Central Library of IIT Kanpur and Mahatma Gandhi Central Library of IIT Roorkee.

This study has been commenced keeping the following objectives in view:

i. To critically analyze the utilization of library software by the selected IIT’s libraries and their operation to make specific suggestions for improvement.

ii. To probe the role of OPAC in the increased custom of library recourses in certain libraries under study.

iii. To highlight the role of library software in the augmentation and up gradation of services of libraries under study.

iv. To investigate the staff strength in handling application of library software in the selected IITs libraries.

v. To observe the application and status of various modules of library automation software in the designated libraries.

vi. To observe the satisfaction level of the users with the overall amenities provided through computerized library system.

vii. To measure the impact of training provided by the technology professionals to staff of selected libraries.
1.13 Hypotheses

The libraries of any organization are considered as the heart of that organization and so is the case with IITs libraries.

Thus, the following hypotheses are developed to study the efficiency and usage of total quality management (TQM) in library services of IIT Delhi, Roorkee and Kanpur:

i. There is a considerable difference in the awareness of library software among the users of IITs.

ii. The usage of OPAC is much higher in the libraries of IIT Delhi and IIT Kanpur than in the library of IIT Roorkee, as IIT, Delhi and IIT, Kanpur are the old ones.

iii. The library users in IIT Kanpur library are well-versed with the advanced search techniques in OPAC because IIT Kanpur is supposed to be ahead of computer technology, than the users of IIT Delhi and IIT Roorkee.

iv. The library staff in IIT Delhi is more efficient and equipped in handling the software than their counterparts in the libraries of IIT Roorkee and Kanpur.

v. All the selected IITs libraries are using all the modules that are available in library software respectively.

vi. The user satisfaction level with respect to the overall services of automated library system is higher in IIT Delhi than in IIT Roorkee and Kanpur.

vii. There is a requirement to provide additional training to the staff of libraries by the software experts for efficacious use of the modules of library software.

1.14 Chapter Planning

The present thesis will be developed on the following pattern.

- Introduction
- Review of Literature
- Research Methodology
- Observations
• Results and Discussion
• Conclusion and Future Scope of the Study
• References
• Appendix