UNIT-1

INTRODUCTION

1. 1 INTRODUCTION

Quality is an essential factor to be considered in every product or service for the survival of any industry/business, quality is an essential requirement. Without adequate quality, it is not possible by any industry/ or any business to compete in the market. It should be noted that the future of an industry/ business is driven by customers.

At present industries are facing the following challenges:

1. Increasing demands of customers
2. Increasing competition
3. Technological changes
4. Law becoming powerful

It is widely seen that customer's needs and wants are changing continuously. In order to satisfy the demands of the customers, improvement in quality has become a must.

The days of a single manufacturer dominating the market is gone. Now there are a number of manufacturers manufacturing the same/ similar products and due to this each product is facing heavy competition. Unless the product has the quantities to satisfy the customers, it cannot be sold in the competitive market.

Today the technological growth is unimaginable. Rapid changes are taking place especially with respect to the technology used for production. With the help of these new technologies. It is possible to produce products of better quality at lesser production cost. Hence it becomes necessary to produce products by adopting a technology that gives the required quality to the products at the lesser cost.

Moreover, customer awareness has increased due to increase in the level of literacy and due to the stringent customer protection acts. There is every possibility that an unsatisfied customer will go to the court due to the supply of a bad quality product by a manufacturer.

The above challenges have made the industries to look at "quality" of products in a different angle and to take up quality aspect of products seriously.

1.2 NEED FOR QUALITY

1.2.1Product Quality

- Quality management ensures product quality. Some primary aspects of product quality include performance, reliability and durability.
- Through the use of a quality management program, the company can produce a product that performs according to its stated promises. Use quality management programs to improve the quality of a product and to design new products.

- Six sigma has a specific component called DFFS (Design for Six Sigma) which is a methodology to build Six Sigma quality in to a product or service.

1.2.2 Customer satisfaction

- Quality management ensures customer satisfaction. Conduct customer satisfaction surveys to understand the qualities of the product important to the customer.
- The quality management program provides a methodology to use to create the type of product the customer desires.

1.2.3 Increased Revenues

- Quality products and services give the company a spotless reputation in the industry. This reputation allows the company to gain new customers and sell additional products and services to existing customers.
- A quality management program also removes inefficient process within the system. By removing unnecessary processes, employee productivity increases. The employee is spending less time on activities that do not contribute to the product's quality.
- As a result, the employee is producing more work in less time while the company has not increased the salary.

1.2.4Reduce waste

A quality management program helps companies reduce waste. Companies that house inventory are paying for the storage, management and tracking of the inventory.
The costs of having the inventory are built in to the price of the product.

1.2.5Teamwork

- Quality management systems force company departments to work as a team. Different areas of the company become reliant upon one another to produce a quality product that meets and exceeds the customer's expectations.
- A quality system incorporates measures that affect sales, finance, operations, customer service and marketing.
- There are 3 types of teams are available. They are,
    1. Quality improvement team
    2. Natural team
    3. Problem solving team

1.3 EVOLUTION OF QUALITY

- Quality has been evolving for decades. The contribution of American Quality Gurus to this evolution is quiet impressive. The concepts were initially experimented successfully in Japan by the American Quality Gurus.

- In this we will look at the contribution of some of them.

1. DrWalter A Shewhart worked in Western Electric Company and AT& T, USA. He advocated Statistical Quality control (SQC) and Acceptable Quality Level (AQL). AQL is the foundation of six sigma. He is considered as the father of SQC, he developed control charts for quality improvement.
2. Deming W Edwards was invited to Japan to lead the quality improvement. He modified PDCA cycle of Shewhart to the plan, Do, Study and Act cycle. He also advocated extensive use of statistics and control charts and focused on product improvement and service conformance by reducing variation in the process.
3. Joseph M JURAN also joined Western Electric company and developed Western electric Statistical Quality control Hand book. Juran's Quality planning road map consists of following

    a. Identify the customers
    b. Determine their needs
    c. Translate them into your language
    d. Develop a product that can respond to the needs.
    e. Develop processes, which are able to produce those product features.
    f. Prove that the process can produce the product
    g. Transfer the resulting plans to the operating forces.

4. Philip B. Crosby was vice president of International Telephone & Telegraph(ITT) , Crosby 4 absolutes of quality are

    a. Quality is defined as conformance to requirements, not just as goodness.
    b. Quality is achieved through prevention not appraisal.
    c. Zero defects
    d. Quality is measured by the price of non-conformance

5. Armand V Feigenbaum was the president of American society of Quality Control. He suggested the following methodology for cycle time reduction.

    a. Define process
    b. List all activities
    c. Flowchart the process
    d. List the elapsed time for each activity
    e. Identify non-value adding task
    f. Eliminate all possible non-value adding task

1.4 DEFINITION OF QUALITY

The term quality means an excellent product or service that fulfills or exceeds our expectation. If a product or service suppresses our expectation.

DEMING:

Quality is a predictable degree of uniformity and dependability at low cost and suited to the market

JURAN:

Quality is fitness for use

CROSBY:

Quality is conformance to requirements.

ISO:

Quality is the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs.

Quality can be quantified as follows

$$Q=P/E$$

Where
Q = Quality
P = Performance
E = Expectations

If Q>1, then the customer has a good feeling about the product or service. It should be noted that 'P' is to be determined by the organization and 'E' is to be determined by the customer.

The definition of quality in ISO 9000:2000 is, Quality is defined as the degree to which a set of inherent characteristics fulfills requirement

Degree: Quality can be used with adjectives such as poor, good and excellent

Inherent: Existing in something as permanent characteristics

Requirement: Need or expectation that is stated

1.5 DIMENSIONS OF QUALITY

There are two categories of discussing the dimensions of quality.

1. Dimensions of manufacturing quality
2. Dimensions of service quality

1.5.1 Dimensions Of manufacturing Quality

- The important dimension of quality have been taken one by one and have been discussed.. Under the dimension of manufacturing quality there are 9 dimensions. These dimensions can be expressed in terms of cell phones. They are,

(a) Performance

- It is a primary product characteristic,

- It is the extent to which a manufactured product is able to function. Ex: In a television, brightness of the picture

(b) Features

- It is a secondary product characteristic.
- Ex: In a television, added features, such as remote control

(c) Conformance

- It is the ability to maintain the specified quality of design(ie, specifications) or industry standards, workmanship

(d) Reliability

- Reliability is the probability of a product to perform adequately for the period intended under the given operating conditions
- Hence for a product, reliability may be
  - Consistency of performance over time,
  - Average time of the unit to fail, etc.,

(e) Durability

- The literal meaning of durability is hard-wearing.
- It is the useful life of a product (includes repair)

(f) Service

- This dimension of quality is concerned with
  - Resolution of problems and complaints, and
  - Ease of repair

(g) Response

- This dimension of quality is concerned with the human-to-human interface (such as the courtesy of the dealer)

(h) Aesthetics

- It is a sensory characteristic
  - Ex: such as exterior finish

(i) Reputation

- This dimension of quality is concerned with past performance and other intangibles.
  - Ex: such as being ranked first

These dimensions are independent so that a product can be excellent in one dimension and poor or average in another. Very few products exceeds in all nine dimensions.

1.5.2 Dimension of Service quality

The important dimensions of quality have been taken one by one and have been discussed. Under the dimension of service quality there are 8 dimensions. They are,

1. Time

- How long must customers wait for service?

2. **Timeliness**
   - Will a service be performed when promised?
3. **Completeness**
   - Whether all the items in the order are included?
4. **Courtesy**
   - Does friend line employee greet each customer cheerfully?
5. **Consistency**
   - Whether services are delivered in the same fashion for every time for the same customer?
6. **Accessibility and convenience**
   - Is the service easy to obtain?
7. **Accuracy**
   - Is the service performing perfectly?
8. **Responsiveness**
   - Can service personnel react quickly and solve unexpected problems

1.6 BASIC CONCEPTS OF TQM

Meaning of TQM:

Total: Made up of the whole(complete)
Quality: Degree of Excellence a product provides.
Management: It requires be planning and managing.

Definition of TQM:

TQM is the management approach of an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction and benefits to all members of the organization: and society.

Characteristics of TQM:

- TQM is customer oriented
- TQM required a long term commitment for continuous improvement of all process
- TQM is a teamwork
- TQM requires the leadership of top management and continuous involvement.

Basic concepts of TQM

1. **Top management commitment:**

Top management should participate and completely involve in the total quality program. They should ensure their complete commitment to the approach through management meetings, company magazines of newsletters. Also, top management should make sure that everybody within the organization from top to bottom is communicated about the TQM program.

2. **Focus on the customer:**

Achieving customer satisfaction is the heart of TQM. Customers include both internal and external customers. So focus on the customer is the key for any TQM program.

3. **Effective involvement and utilization of the entire work force:**

This concept is sometimes referred as 'principle of employees involvement' or 'respect for people'. TQM is a team work. Total quality recognizes that each person is responsible for the quality of his work and for the work of group. All persons must be trained in TQM, Statistical Process Control (SPC), and other appropriate quality improvement skills so that they can effectively participate on quality teams.

4. **Continuous improvement:**

TQM is based on the quest for progress and improvement. TQM believes that there is always a better way of doing things, way to make better use of the company's total quality resources, a way to be more productive. For this purpose various quality tools and techniques may be used.

5. **Treating suppliers as partners:**

Since the suppliers influence the company's quality, therefore a partnering relationship should be developed between the management and the suppliers.

6. **Establishing performance measures for the processes:**

As we know, quantitative data are necessary to measure the continuous quality improvement activity. Therefore performance measures such as uptime, productivity, sales turnover, absenteeism, percent non-conforming customer satisfaction, etc., should be determined for each functional area. These results can be used for further improvement activities.

The implementation of TQM in an organization requires a substantial cultural change from the previous state of culture.

1.7 DEFINITION OF TQM

Total Quality Management is an enhancement to the traditional way of doing business. It is a proven technique to guarantee survival in world-class competition. Only by changing the

actions of an entire organization be transformed. TQM is for the most part common sense. Analyzing the three words, we have

Total Quality Management (TQM) is an enhancement to the traditional way of doing business.

Total - Made up of the whole

Quality - Degree of Excellence a Product or Service provides.

Management – Art, art, or manner of handling, controlling, directing etc.

Therefore TQM is the art of managing the whole to achieve excellence. TQM is the application of quantitative methods and human resources to improve all the processes within an organization and exceed customer needs now and in the future.

1.8. TQM FRAMEWORK

Figure shows the framework for the TQM system. It begins with the knowledge provided by gurus of quality : Shewhart, Deming, Juran, Feignbanum, Ishikawa, Crosby, and Taguchi. As the figure shows, they contributed to the development of principles and practices and/ or the tools and techniques. Some of these tools and techniques are used in the product and /or service realization activity. Feedback from Internal/ external customers or interested parties provides information to continually improve the organization's system, product and/ or service.

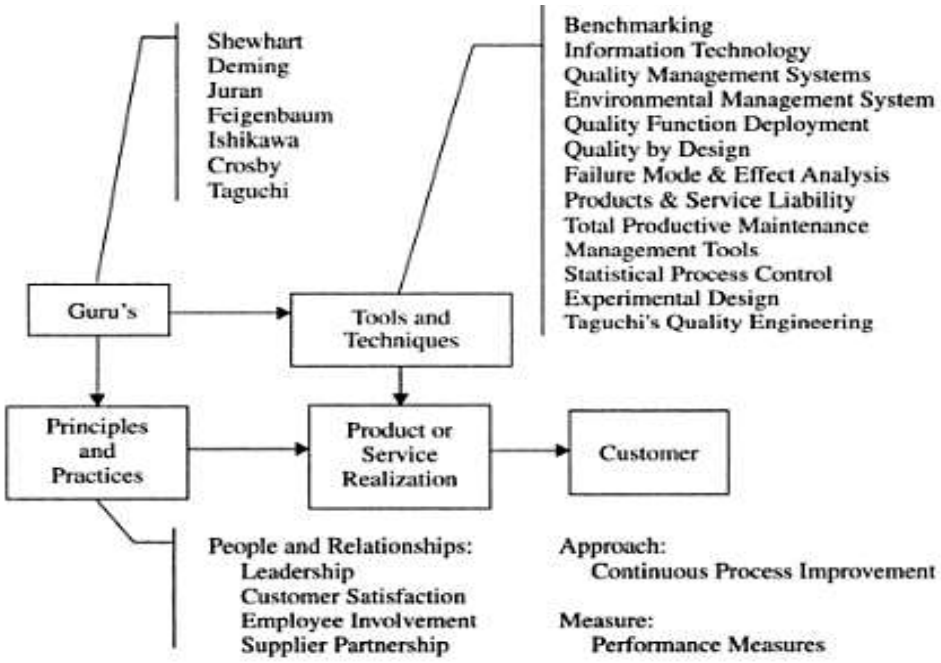

Figure1 TQM frame work

1.9 CONTRIBUTIONS OF DEMING

Dr.w.Edward Deming's considered as thssse father of Japanese quality resolution. He has approached the quality management problem from a statistician's perspective. He proposed 14 points on route to quality through the use of statistical techniques.

Deming defines quality in terms of design, quality of conformance and quality of the sales and service functions. The 14 principles are,

1.Create and publish the aims and purposes of the organization

This principle has the aim to become competitive and to stay in business and to provide jobs.

Management must demonstrate constantly their commitment to this statement. It must include investors, customers, suppliers, employees, the community, and a quality philosophy. The statement is a forever- changing document that requires input from everyone. Organizations must develop a long term view of at least ten years and plan to stay in business by setting long- range goals. Resources must be allocated for research, training and continuing education to achieve the goals; Innovation is promoted to ensure that the product or service does not become obsolete. A family organizational philosophy is developed to send the message that everyone is part of the organization.

2. Learn the new philosophy.

In this new economic age, western management must awaken to the challenge, must learn their responsibilities and take on leadership for change.

Top management and everyone must learn the new philosophy. Organizations must seek never-ending improvement and refuse to accept nonconformance. Customer satisfaction is the number one priority, because dissatisfied customers will not continue to purchase nonconforming products and services. The organization must concentrate on defect prevention rather than defect detection. By improving the process, the quality and productivity will improve. Every one in the organization, including the union, must be helped to improve quality by requiring statistical evidence of conformance and shared information relative to customer expectations.

3Understand the purpose of inspection

Management must understand that the purpose of inspection to improve the process and reduce its cost. For the most part, mass inspection is costly and unreliable. Where appropriate, it should be replaced by never- ending improvement using statistical techniques. Statistical evidence is required of self and supplier. Every effort should be made to reduce and then eliminate acceptance sampling. Mass inspection is managing for failure and detect prevention is managing for success.

4. Stop awarding business based on price alone

The organization must stop awarding business based on the low bid, because price has no meaning without quality. The goal is to have single suppliers for each item to develop a long –term relationship of loyalty and trust, thereby providing improved products and services. Purchasing agents must be trained in statistical process control and require it from suppliers. They must follow the materials throughout the entire life cycle in order to examine how customer expectations are affected and provide feedback to the supplier regarding the quality.

5. Improve constantly and forever the system

To improve quality and productivity, cost decreases constantly.

Management must take more responsibility for problems by actively finding and correcting problems so that quality and productivity are continually and permanently improved and costs are reduced. The focus is on preventing problems before they happen. Variation is expected, but there must be a continual striving for its reduction using control charts. Responsibilities are assigned to teams to remove the causes of problems and continually improve the process.

6. Institute training

Training was conducted in the institute for the job.

Each employee must be oriented to the Organization's philosophy of commitment to never- ending improvements. Management must allocate resources to train employees to perform their jobs in the best manner possible. Every one should be trained in statistical methods, and these methods should be used to monitor the need for further training.

7. Teach and institute leadership.

The aim of supervision should be to help people and machines and gadgets to do a better job.

Improving supervision is management's responsibility. They must provide supervisors with training in statistical methods and these 14 points so the new philosophy can be implemented. Instead of focusing on a negative, fault- finding atmosphere, supervisors should create a positive, supportive one where pride in workmanship can flourish. All communication must be clear from top management to supervisors to operators.

8. Drive out fear, Create trust, create a climate for innovation

Every one may work effectively for the company.

Management must encourage open, effective communication and teamwork. Fear is caused by general feeling of being powerless to control important aspects of one's life. It is caused by a lack of job security, possible physical harm, performance appraisals, and ignorance of organization goals, poor supervision and not knowing the job. Driving fear out of the workplace involves managing for success. Management can begin by providing workers with adequate training, good supervision, and proper tools to do the job, as well as removing

physical dangers. When people are treated with dignity, fear can be eliminated and people will work for the general good of the organization. In this climate, they will provide ideas for improvement.

9. Optimize the efforts of teams, groups and staff areas

Management must optimize the efforts of teams, work groups and staff areas to achieve the aims and purposes of the organization. Barriers exist internally among levels of management, among departments, within departments, and among shifts. Externally they exist between the organization and its customers and suppliers. These barriers exist because of poor communication ignorance of the organization's mission, competition, fear and personal grudges or jealousies. To break down the barriers, management will need a long- term perspective. All the different areas must work together. Attitudes need to be changed; communication channels opened; project teams organized; and training in teamwork implemented. Multifunctional teams, such as used in concurrent engineering, are an excellent method.

10. Eliminate Exhortations for the workforce.

This principle is asked for zero defects and new levels of productivity. Exhortations are used to create relationships. Since the bulk of the causes of low quality and low productivity belong to the system and thus be beyond the power of work force.

Exhortations that ask for increased productivity without providing specific improvement methods can handicap an organization. They do nothing but express managements desire's. They do not produce a better product or service, because the workers are limited by the system. Goals should be set that are achievable and are committed to the long-term success of the organization. Improvements in the process cannot be made unless the tools and methods are available.

11(a). Eliminate numerical quotas for the workforce

This principle is mainly used for substitute leadership.

Instead of quotas, management must learn and institute methods for improvement. Quotas and work standards focus on quantity rather than quality. They encourage poor workmanship in order to meet their quotas. Quotas should be replaced with statistical methods of process control. Management must provide and implement a strategy for never- ending improvements and work with the work force to reflect the new policies.

11(b) Eliminate management by objective

This principle is mainly used for eliminate the management by numbers, numerical goals.

Instead of management by objective, management must learn the capabilities of the processes and how to improve them. Internal goals set by management, without a method, are burlesque. Management by numerical goal is an attempt to management without knowledge of what to do. An excellent analysis supporting this point is given by Castellano and Roehm.

12. Remove barriers that rob people of pride of workmanship

Loss of pride in workmanship exists throughout organizations because

(1) Workers do not know how to relate to the organization's mission.
(2) They are being blamed for system problems.
(3) Poor designs lead to the production of "junk".
(4) Inadequate training is provided.
(5) Punitive supervision exists, and
(6) Inadequate or ineffective equipment is provided for performing the required work.
(7) Restoring pride will require a long- term commitment by management. When workers are proud of their work, they will grow to the fullest extent of their job. Management must give employees operational job descriptions, provide the proper tools and materials, and stress the workers understanding of their role in the total process. By restoring pride, every one in the organization will be working for the common good. A barrier for people on salary is the annual rating of performance.

13. Encourage Education and self – improvement for every one

What an organization needs is people who are improving with education. A long – term commitment to continuously train and educate people must be made by management. Deming's 14 points and the Organization's mission should be the foundation of the education program. Every one should be retrained as the organization requirements change to meet the changing environment.

14. Take action to accomplish the transformation

Management has to accept the primary responsibility for the never- ending improvement of the process. It has to create a corporate structure to implement the philosophy. A cultural change is required from the previous "business as usual" attitude. Management must be committed, involved, and accessible if the organization is to succeed in implementing the new philosophy. Hillerich & Bradsby Co., the makers of the Louisville Sluger baseball bat, have used Deming's 14 points since 1985 and now have 70% of the professional base ball bat market.

1.10 JURAN'S TRILOGY

Dr.Joseph Juran has contributed a lot to a TQM improvement. He is well known for his famous text book Quality control handbook.

Juran divide the quality management into 3 parts.

1. Quality Planning (QP)
2. Quality Control (QC)
3. Quality Improvement (QI)

The concept is given by Juran is referred as Juran Trilogy.

1. Quality planning (QP)

The components of Quality planning are listed below

- Establish quality goals
- Identify customers
- Determine customer needs
- Develop product and/ or service features corresponding to customer needs
- Establish process control and transfer plans to operations.

Planning process is crucial for improvement to become continuous activity with a long term view: The Juran Quality Planning road Map as given below.

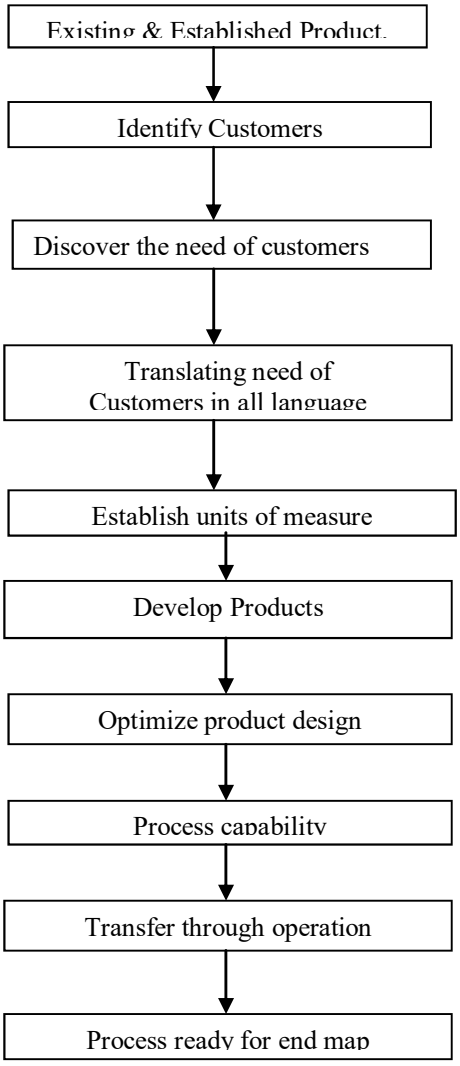

Figure 2 Juran Quality Planning road Map

Quality control

At this stage, control processes are designed to meet and ensure the goals set in the planning stage.
Juran's Quality control Process as shown.

- Choose control subjects, decide items to control
- Choose units of measurement
- Establish standards of performance
- Measure actual performance
- Note difference between performance and standard
- Take action to close the performance gap

.**Quality improvement**

- To find and remedy the basic causes of poor quality
- Aims to higher levels of performance that are significant to current level

Juran's ten steps to improvement are

- Build awareness of the need and opportunity for improvement
- Set for improvement
- Organize to reach the goals
- Provide training
- Carry out project to solve problems
- Report progress
- Give recognition
- Communicate results
- Keep score
- Maintain momentum by making annual improvement part of the regular
- system processes of company

Juran trilogy diagram

It describes the way in which Juran's trilogy is designed to the cost of quality over time which is a cyclic and ever-ending continuous improvement approach. - The sporadic waste should be identified and corrected through whereas the chronic waste requires an improvement process.

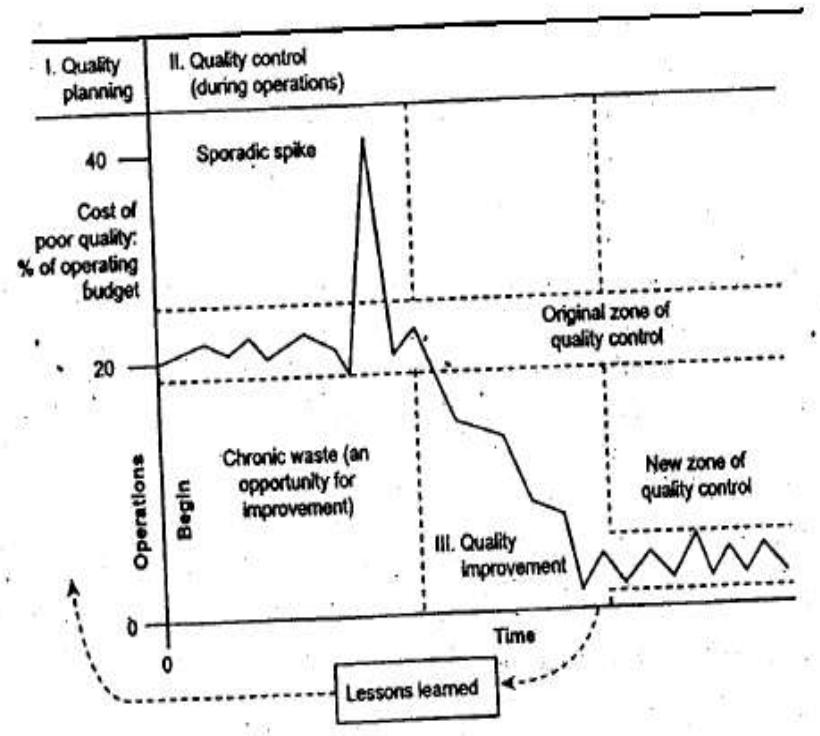

Figure 3 Juran trilogy diagram

Summary of juran's quality trilogy

Quality Planning	Quality Control	Quality Improvement
Identify the customers	Choose control subjects	Prove need for improvement
Determine the customer's needs	Choose unit of measurement	Identify specific projects for improvement
Develop product features	Establish measurement and standard of performance	Organize to guide the projects
Establish quality goals	Measure actual performance	Organize for diagnosis for discovery of cause
Develop a process	Interpret the difference	Diagnose to find the causes
Prove process capability·	Take action on the difference	Provide remedies
		Prove that remedies are effective under operating conditions
		Provide for control to hold gains

1.11 CROSBY'S 14 –POINT PROGARMME

Crosby directed his message to top managers. To help managers understand the seriousness of their quality problems, Crosby provide 2 primary tools-Cost of quality measures and the management maturity grid.

Cost of quality: Which Crosby estimated to between 155 and 20% of sales at most companies.

Top management maturity Grid: It was used for self assessment. It identified five stages of quality awareness:

- Uncertainty: Company failed to recognize
- Awakening:
- Enlightenment: Management openly faced & addressed quality problem
- Wisdom: Prevention was working well, problems were identified early
- Certainty:

1. **Management Commitment**
   - Top management must become convinced of the need of quality improvement and must take its commitment clear to the entire company.
2. **Quality improvement team**
   - Management must form a team of department heads to monitor quality improvement. The team's role is to see that needed action take place in its departments and in a company as a whole.
3. **Quality measurement**
   - Quality measures that are appropriate to every activity must be established to identify areas needing improvement
4. **Cost of quality evaluation**
   - The controller's office should estimate the costs of quality to identify areas where quality improvements would be profitable.
5. **Quality awareness**
   - Quality awareness must be raised among employees. They must understand the importance of product conformance and the costs of non- conformance.
6. **Corrective action**
   - Corrective action must be taken for quality improvement
7. **Zero defects planning**
   - An ad hoc zero defects committee should be formed from members of the quality improvement team

8. **Supervisor training**
    - Power training must be given for quality improvement
9. **Zero defects day**
    - A zero defects day should be scheduled to signal to employees that the company has a new performance standard
10. **Goal settings**
    - Individuals must establish improvement goals for themselves and their groups. Supervisors should meet with their people and ask them to set goals that are specific and measurable.
11. **Error cause removal**
    - Employees should be encouraged to management of any problems that prevent them from performing error-free work.
12. **Recognition**
    - Public, non- financial appreciation must be given to those who meet their quality goals or perform outstandingly.
13. **Quality councils**
    - Quality professionals and team chairpersons should meet regularly to share experiences, problems and ideas.
14. **Do it all over again**
    - To emphasize the never- ending process of quality improvement, the programmed must be repeated. This renews the commitment of old employees and brings new ones into the process.

1.12 BARRIERS TO TQM.

Any organizations will be comfortable in their present state. They are satisfied with the amount of work done, the profits gotten thereof and the perception that the customers are satisfied. These types of organizations will not realize the need for TQM until they start losing their market position. Once the organization starts the TQM process, there will be obstacles to the successful implementation of TQM.

1) **Lack of management commitment**. – Management must consistently apply the principles of TQM.

   All types of organizations, including schools, manufacturing companies, health care organizations, and public organizations, experience low employee participation and interest in their TQM programs when management commitment is missing at any level. Missing or even minimal support from the chief executive officer

and administrators can hinder TQM's successful implementation. For example, TQM will not succeed if upper management is only motivated by outside pressures, such as needing to please the board of directors or meet an accrediting agency's standards. If employees see discrepancies in what management says and what it actually does, they will lose interest and faith in TQM. For successful implementation, the administrative team must have a clearly communicated purpose for adopting TQM, be consistent in its application of TQM principles, and not treat it as the latest management fad.

2) **Do-**Combine & work

3) **Check it**- Conduct review and performance checking

4) **Plan to check act-** Try to eliminate the non- linearities

5) **Inability to change organizational culture**- People change if their needs are met. Remove fear & instill trust.

Many have found that changing a company's culture to reflect TQM is difficult and require a lot of time; W. Edwards Deming has stated that it takes three to five years to fully implement TQM into an organization. First, the fear of change must be removed from the organization, poor labor-management relations must be resolved, and the company's focus must change from the status quo. Unfortunately, in the United States, organizations are impatient and often focus on the quick fix

6) **Improper planning –** Implementation plan ; modify plan as the plan evolves

Another barrier is created by a lack of clarity in the implementation plan and the failure to promote open dialogue among the participants. Many implementation problems can be overcome with proper planning. Three components of a successful TQM plan are:

• Obtaining company wide commitment
• Communicating company vision, mission, and goals
• Providing open communication about the company's new focus

The board of directors or other controlling group must be involved from the beginning. A time frame, such as a Gantt chart, should be developed and posted in public areas so that everyone remains focused on TQM. The plan should remain flexible, however, so that adjustments and improvements can be made as the culture evolves

7) **Lack of continuous training and education –** Training & education are ongoing process

Training and education is an ongoing process that facilitates continuous quality improvement in any organization. Leaders involved in the TQM implementation should identify the educational needs of the organization and be creative in meeting those needs efficiently and cost-effectively. Training and education should be both formal and informal. One health care organization, for example, used a leading consulting group to train its vice presidents to be trainers for the rest of the

organization. This approach demonstrates management's commitment to TQM and ensures the principles are consistently taught to all employees. The vice presidents also continually learn the principles as they teach them. Informal training could include circulating articles on TQM or displaying information about TQM on company bulletin boards.

8) **Incompatible organizational structure and isolated individuals and department –** Use of multi functional teams can break down the barriers of TQM implementation

Autocratic organizational structure and management policies can lead to TQM implementation problems. If organizational structure is a problem, part of the planning process should be restructured with a defined purpose and explicit expected outcomes. When TQM principles are used, the isolation of individuals and departments will dissolve over time. Teamwork is an essential part of the TQM environment, and some success has been realized by managers who used TQM principles to resolve some of the most longstanding turf battles that prevailed in their organizations. Tools such as brainstorming, fishbone diagrams, and workflow diagrams can be successful in identifying the discrepancies and misinterpretations that are often the root cause of such feuds.

9) I**neffective measurement techniques and lack of access to data and results**- Key characteristics of organizations have to be measured for effective decision making.

Having no measurement process or ineffective measurement techniques, failing to maintain accurate and reliable data.

10) **Paying inadequate attention to internal and external customers –** Organizations must understand the changing needs & expectations of customers

Organizations must pay attention to both their internal and external customers so that they can understand the needs and expectations of both types of customers from both perspectives. Too often, managers assume they know what customers need and expect, which results in misdirected efforts and investments. An astute organization makes a high priority of understanding all customers' changing needs and expectations.

11) **Inadequate use of empowerment and team work –** Teams needs training & individuals should be empowered to make decisions.

Complacency in teams will inhibit TQM progress. Ineffective teams that fail to stay focused or complete their tasks are a big expense to organizations. To be effective, teams need trained facilitators, a mission or purpose, a time frame for completing projects, members who represent the functional areas of the process to be improved, and accountability. The mission of the team must not be overwhelming; some tasks might need to be broken down into manageable phases so this is not the case. Whenever possible, teams' recommendations and solutions should be

implemented; this sends a powerful, positive message to employees about the importance of empowerment and teamwork.

12) **Failure to continually improve –** It is tempting to sit back and rest . Lack of continuous improvement would tamper the progress. Even if you are in right track, you will get run over if you just sit there.

Avoid TQM barriers by understanding them

While these barriers occur to varying degrees and with varying frequency, there is little doubt that they exist in every organization. Management must understand that they do exist and should not only deal with them in the implementation process but plan for them as well. The list of barriers can be used in the planning or early implementation phases of TQM to increase awareness and understanding of the principles.

It can be used by organizations that have been involved in TQM for some time to evaluate progress and to improve existing systems. Awareness of these barriers should be emphasized when training organizations in TQM concepts and methods. If these potential problems are understood and prepared for, plans can be made to counter them. Any organization can benefit from a better understanding and knowledge of TQM

1.13 BENEFITS OF TQM

1. **Tangible Benefits**
   - Improved product quality
   - Improved productivity
   - Reduced quality costs
   - Increased market and customers
   - Increased profitability
   - Reduced employee grievances
2. **Intangible Benefits**
   - Improved employee participation
   - Improved team work
   - Improved working relationships
   - Improved customer satisfaction
   - Improved communication
   - Enhancement of job interest
   - Enhanced problem solving capacity
   - Better company image

1.14 MAJOR PILLARS OF TQM

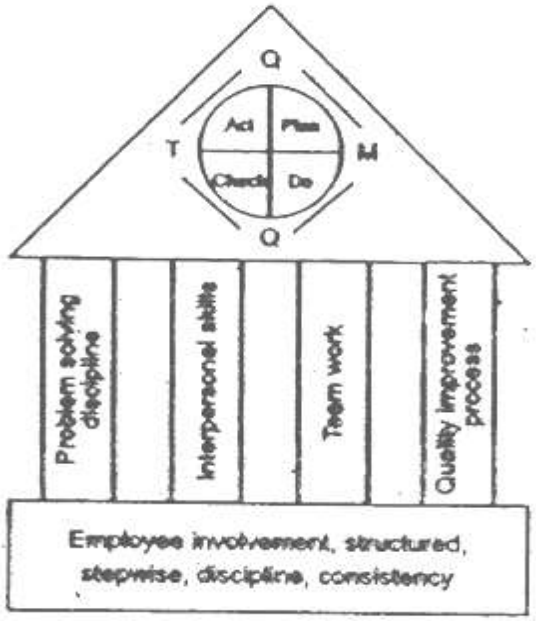

Figure 4 Major pillars of TQM

Problem solving discipline

- Specialist should be present
- Apply different tools to solve
- Find the cause & root one & try to solve them

Interpersonal skills

- The messages should be passed from top to bottom clearly
- The sub-ordinates should have better communication skills

Team work

- All should work in teams to achieve the common goals. There are 3 types of teamwork

1. **Quality improvement program**
    - Conducted continuously every year
    - Conducted continuously by top managers
    - Improve productivity level
    - Eliminate unnecessary activity
    - Reduce wastage & error

2. **Employee involvement**
   - Make the employee to do his work.
3. **Structured stepwise consistency**
   - To establish organization infrastructure
   - Department does not work as independent one.
   - It will affect other departments

1.15 CORE VALUES AND PROSPECTS OF TQM

1. **Visionary leadership**
   - Leader should have a clear vision and mission
2. **Customer driven excellence**
   - The main aim is to satisfy the need of customer
   - Finds the merits & demerits of the product
3. **Organizational & personal learning**
   - Set the personal & over all goals
   - Measure the goals & responsibilities of members
   - Provide specific method to achieve individual goals
4. **Management by fact**
   - Finalize the decision by fact & by ad- hoc technique
5. **Public responsibility & citizenship**
   - Provide good quality product that should not be harm to public
   - Actions should not pollute environment
   - Focus on result & achieving target
6. **Managing the entire departments of organizations**
   a. Managing the whole organization

1.14 IMPLEMENTATION OF TQM

- It requires committed top management & involvement of senior management
- Learn about the various activities of organizations & develop implementation plan
- The time schedule for implementing TQM
- Form a quality council & develop interpersonal skills
- Develop the core values and requires involvement of middle level & front line managers
- Good communication between top and lower sub- ordinates & helps in easier decision making

- Every one in quality awareness program
- Conduct survey of supplier, customer & employee
- Employee should not rush up for good yield
- Develop implementation plan
- Form 3 types of team

2MARK QUESTIONS AND ANSWERS

1.Define quality.

Quality is defined as the degree to which a set of inherent characteristics fulfills requirements Degree means that quality that can be used with adjectives such as poor, good and excellent. Inherent is defined as existing in something especially as a permanent characteristic. Characteristic can be quantitative or qualitative. Requirements is a need or expectation that is stated, generally implied by the organization, its customers, and other interested parties. Quality fulfills or exceeds our expectations. It is quantified as

$$Q = P/E$$

Where,

Q – Quality
P – Performance
E – Expectations.

It is also defined as the degree of excellence a product or service provides.
According to Deming "It is the predictable degree of uniformity, at low cost and suited to the market". According to Joseph Juran "Quality is fitness for use". According to Philip B. Crosby "Quality is conformance to requirements".

2.What are the dimensions of Quality?

The dimensions of Quality are:

1. **Performance –** Primary product characteristics such as the brightness of the picture.
2. **Features –** Secondary characteristics, added features, such as remote control.
3. **Conformance –** Meeting specifications or industry standards.
4. **Reliability –** Consistency of performance over time, average time for the unit to fail.
5. **Durability –** Useful life includes repair.
6. **Service –** Resolution of problems and complaints, ease of repair.
7. **Response –** Human to human interface, such as the courtesy of the dealer.
8. **Aesthetics –** Sensory characteristics such as exterior finish.
9. **Reputation –** Past performance and other intangibles, such as being ranked first.

3.Define TQM?

TQM is a management philosophy which seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service …) to focus on meeting customer needs and organizational objectives. It views organizations as a