

QUALITY MANAGEMENT

MEANING AND DEFINITION OF QUALITY:

A measure of excellence or a state of being free from defects, deficiencies and significant variations. It is brought about by strict and consistent commitment to certain standards that achieve uniformity of a product in order to satisfy specific customer or user requirements.

ISO 8402-1986 standard defines quality as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs."

If an automobile company finds a defect in one of their cars and makes a product recall, customer reliability and therefore production will decrease because trust will be lost in the car's quality.

14 PRINCIPLES OF QUALITY(DEMING'S)

1. Create constancy of purpose for improving products and services.
2. Adopt the new philosophy.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier.
5. Improve constantly and forever every process for planning, production and service.
6. Institute training on the job.
7. Adopt and institute leadership.
8. Drive out fear.
9. Break down barriers between staff areas.
10. Eliminate slogans, exhortations and targets for the workforce.
11. Eliminate numerical quotas for the workforce and numerical goals for management.
12. Remove barriers that rob people of pride of workmanship, and eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement for everyone.
14. Put everybody in the company to work accomplishing the transformation.

1. Create constancy of purpose

Strive for constant improvement in products and services, with the aim of becoming competitive and ensuring consistency in the way business is done, which will ensure retention of employment. Do not just make adjustments at the end of the production process, but evaluate if improvements are necessary during the process and get started immediately.

2. The new philosophy

A new (economic) time offers new chances and challenges, and management must take responsibility for being open to such changes. Without change, a company can not sustain itself in a time when innovation occurs every day.

3. Cease dependence on inspection

End the dependence on inspections and final checks to ensure quality. It is better that quality checks take place during the process so that improvements can be made earlier. This section links back to the first point, which promotes the importance of interim improvements.

4. End 'lowest tender' contract

Move towards a single supplier for any one item. Stop doing business and negotiate with suppliers based on the lowest price. It is worthwhile in the long term to build a good and long-standing relationship with suppliers, which fosters trust and increases loyalty. An organisation should be able to rely on their suppliers; they supply the parts for the production line and are the first link to a high quality product.

5. Continually seek out problems

Improve constantly and forever. Continuous process improvement of production and service results in improved quality and productivity, which in turn leads to cost reduction. This part also relates to the first and third points. Improved quality leads to less waste of other raw materials, which subsequently has a cost-effective effect.

6. Institute training on the job

Training and development of employees is necessary for the survival of an organisation. By integrating it into the organisation, it will be considered as normal for the employees, as part of their Personal Development Plan.

7. Institute supervision

Adopt and institute leadership. Leadership needs to be stimulated. By leading and supervising, managers are able to help employees and make machines work better. Their helicopter view ensures that they can see everything that happens on the workplace. They will also have to delegate more tasks so that they can fully focus on the big picture.

8. Drive out fear

Fear is paralysing. Therefore, fear must be eliminated on the work floor so that everyone can work effectively for the company, feel safe and take risks. Transparent communication, motivation, respect and interest in each other and each other's work can contribute to this.

9. Break down barriers

By eliminating the boundaries between departments, cooperation can be better and different expert teams will understand each other better. This can be done by, for example, the creation of multifunctional teams, each with an equal share and open to each other's ideas

10. Eliminate exhortations

Remove 'stimulating' slogans from the workplace. Such slogans, warnings and exhortations are perceived as being patronising. Quality and production problems do not arise from the individual employee, but from the system itself.

11. Eliminate targets

No more focus on achieving certain margins; that impedes professionals from performing their work well and taking the necessary time for it. Rushing through the work can cause production errors. Managers should therefore focus on quality rather than quantity.

12. Permit pride of workmanship

Let employees be proud of their craftsmanship and expertise again. This relates back to the eleventh point. Employees feel more satisfaction when they get a chance to execute their work well and professionally, without feeling the pressure of deadlines.

13. Institute education

Integrate and promote training, self-development and improvement for each employee. This directly connects to the sixth point. By encouraging employees to work for themselves and to see their studies and training as a self-evident part of their jobs, they are able to elevate themselves to a higher level.

14. The transformation is everyone's job

Transformation is the work of everyone. Set forth concrete actions to implement and realise transformation and change throughout the organisation.

QUALITY CIRCLE

Meaning of Quality Circles:

Conceptually Quality Circles can be described as a small group of employees of the same work area, doing similar work that meets voluntarily and regularly to identify, analyse and resolve work related problems.

This small group with every member of the circle participating to the full carries on the activities, utilising problem solving techniques to achieve control or improvement in the work area and also help self and mutual development in the process.

Characteristics of Effective Quality Circles:

1. The atmosphere should be informal, comfortable and relaxed. The members should feel involved and interested.
2. Everyone should participate.
3. The objectives should be clear to the members.
4. The members should listen to each other.
5. The group should feel comfortable even when there are disagreements.
6. The decisions should generally be taken by a kind of consensus and voting should be minimum.
7. When an action is required to be taken, clear assignments should be made and accepted by all the members.
8. The leader should not dominate the group. The main idea should not be as to who controls but how to get the job done.
9. Until a final solution is found and results are attained feedback is necessary.

Objectives of Quality Circles:

- (i) To improve quality, productivity, safety and cost reduction.
- (ii) To give chance to the employees to use their wisdom and creativity.
- (iii) To encourage team spirit, cohesive culture among different levels and sections of the employees.
- (iv) To promote self and mutual development including leadership quality,

(v) To fulfill the self-esteem and motivational needs of employees.

(vi) To improve the quality of work-life of employees.

Implementation of Quality Circles in an Organisation:

(a) Few managers representing production, quality control, design, process planning form the Quality Circle (Q.C.) steering committee. This acts as a policy making body and will monitor the Q.C. in the Organisation.

(b) Top management must attend the orientation courses designed for them.

(c) A committed top and middle management is necessary.

(d) A facilitator must be appointed, who serves as a link between top management, Q.C., steering committee, middle management circle leaders and circle members. Facilitator will coordinate training courses; get the support from all concerned including top management Q.C., steering committee, circle leader and circle members to help the circle leader in conducting the meetings, and to provide necessary resources.

Steps for Setting up Quality Circles:

(i) First of all Managers, Supervisors and Foremen must be made to understand the concepts and activities of Q.C.

(ii) Management's total support and commitment should be made known to everyone in the organisation.

(iii) Steering committee is formed with the top management personnel to give direction to Quality Circle activities.

(iv) A facilitator (or sometimes known as promoter) is selected from the senior management level, who will serve as coordinator and advisor to the circle.

(v) Supervisor and foreman are then trained to act as Q.C. leaders.

(vi) Members of each circle must be selected from the persons who are doing similar type of work or belong to the same department or section.

(vii) Membership to the circle is voluntary.

(viii) First few meetings of the circle are held with a view to train them.

(ix) To start with, only one to two circles should be formed in an organisation, and then increase the number gradually as more and more experience is gained.

(x) Meetings must be held regularly, may be once in a week initially and once in a month on completion of basic training of members.

(xi) Everyone's suggestion or problem matching with the circle's objectives is discussed.

(xii) Total participation of team members must be encouraged.

(xiii) Recommendations of the circle must be considered and decisions should be taken without delay.

Benefits of Quality Circles (Q.C.):

1. Through the forum of Q.C. the chronic problems-of organisations which really create hurdles in work get resolved by the grass root employees of organisation, whose knowledge and experience otherwise is not fully utilized.

2. With such a capable work force, any organisation can easily undertake more difficult and challenging assignments for its growth and profit.

3. As the employees gain experience they take more challenging projects, in due course they undertake projects on cost reduction, material handling, quality improvement, preventing wastage, improving delivery schedule, improving customer service, improving inspection and test methods, preventing accidents improving design and process etc.

4. Cost reduction.

5. Increased productivity.

6. Improved quality.

7. Better communication.

8. Better house-keeping.
9. Increased team work.
10. Smooth working.
11. Better mutual trust.
12. Greater sense of belongingness.
13. Increased safety.
14. Better human relations.

KAIZEN (CONTINUOUS IMPROVEMENT)

“Kaizen” refers to a Japanese word which means “improvement” or “change for the better”.

Kaizen is defined as a continuous effort by each and every employee (from the CEO to field staff) to ensure improvement of all processes and systems of a particular organization.

“Change is for good”.

Kaizen means “continuous improvement of processes and functions of an organization through change”.

. Kaizen brings continuous small improvements in the overall processes and eventually aims towards organization’s success. Japanese feel that many small continuous changes in the systems and policies bring effective results than few major changes.

Five S of Kaizen

“Five S” of Kaizen is a systematic approach which leads to foolproof systems, standard policies, rules and regulations to give rise to a healthy work culture at the organization. You would hardly find an individual representing a Japanese company unhappy or dissatisfied. Japanese employees never speak ill about their organization. Yes, the process of Kaizen plays an important role in employee satisfaction and customer satisfaction through small continuous changes and eliminating defects. Kaizen tools give rise to a well organized workplace which results in better productivity and yield better results. It also leads to employees who strongly feel attached towards the organization.

Let us understand the five S in Detail:

1. **SEIRI** - SEIRI stands for Sort Out. According to Seiri, employees should sort out and organize things well. Label the items as “Necessary”, ”Critical”, ”Most Important”, “Not

needed now”, “Useless and so on. Throw what all is useless. Keep aside what all is not needed at the moment. Items which are critical and most important should be kept at a safe place.

2. **SEITON** - Seition means to Organize. Research says that employees waste half of their precious time searching for items and important documents. Every item should have its own space and must be kept at its place only.
3. **SEISO** - The word “SEISO” means shine the workplace. The workplace ought to be kept clean. De-clutter your workstation. Necessary documents should be kept in proper folders and files. Use cabinets and drawers to store your items.
4. **SEIKETSU-SEIKETSU** refers to Standardization. Every organization needs to have certain standard rules and set policies to ensure superior quality.
5. **SHITSUKE or Self Discipline** - Employees need to respect organization’s policies and adhere to rules and regulations. Self discipline is essential. Do not attend office in casuals. Follow work procedures and do not forget to carry your identity cards to work. It gives you a sense of pride and respect for the organization.

Total Quality Management

Total Quality management is defined as a continuous effort by the management as well as employees of a particular organization to ensure long term customer loyalty and customer satisfaction.

ELEMENTS \ PRINCIPLES OF TQM:

1. **Customer-focused:** The customer ultimately determines the level of quality. No matter what an organization does to foster quality improvement—training employees, integrating quality into the design process, or upgrading computers or software—the customer determines whether the efforts were worthwhile.
2. **Total employee involvement:** All employees participate in working toward common goals. Total employee commitment can only be obtained after fear has been driven from the workplace, when [empowerment](#) has occurred, and when management has provided the proper environment. High-performance work systems integrate [continuous improvement](#) efforts with normal business operations. Self-managed work [teams](#) are one form of empowerment.
3. **Process-centered:** A fundamental part of TQM is a focus on process thinking. A process is a series of steps that take inputs from suppliers (internal or external) and transforms them into outputs that are delivered to customers (internal or external). The steps required to carry out the process are defined, and performance measures are continuously monitored in order to detect unexpected variation.
4. **Integrated system:** Although an organization may consist of many different functional specialties often organized into vertically structured departments, it is the horizontal processes interconnecting these functions that are the focus of TQM.
 - Micro-processes add up to larger processes, and all processes aggregate into the business processes required for defining and implementing strategy. Everyone must understand the vision, mission, and guiding principles as well as the quality policies, objectives, and critical processes of the organization. Business performance must be monitored and communicated continuously.

- An integrated business system may be modeled after the [Baldrige Award](#) criteria and/or incorporate the [ISO 9000 standards](#). Every organization has a unique work culture, and it is virtually impossible to achieve excellence in its products and services unless a good [quality culture](#) has been fostered. Thus, an integrated system connects business improvement elements in an attempt to continually improve and exceed the expectations of customers, employees, and other stakeholders.
5. **Strategic and systematic approach:** A critical part of the management of quality is the strategic and systematic approach to achieving an organization's vision, mission, and goals. This process, called strategic planning or strategic management, includes the formulation of a strategic plan that integrates quality as a core component.
 6. **Continual improvement:** A large aspect of TQM is [continual process improvement](#). Continual improvement drives an organization to be both analytical and creative in finding ways to become more competitive and more effective at meeting [stakeholder](#) expectations.
 7. **Fact-based decision making:** In order to know how well an organization is performing, data on performance measures are necessary. TQM requires that an organization continually collect and analyze data in order to improve decision making accuracy, achieve consensus, and allow prediction based on past history.
 8. **Communications:** During times of organizational change, as well as part of day-to-day operation, effective communications plays a large part in maintaining morale and in motivating employees at all levels. Communications involve strategies, method, and timeliness.

Statistical Quality Control

Statistical quality control refers to the use of statistical methods in the monitoring and maintaining of the quality of [products](#) and [services](#).

1. [Acceptance sampling](#) can be used when a decision must be made to accept or reject a [group](#) of parts or items based on the quality found in a sample.
2. [Statistical process control](#) uses graphical displays known as control charts to determine whether a process should be continued or should be adjusted to achieve the desired quality.

Acceptance sampling

Assume that a consumer receives a shipment of parts called a lot from a producer. A sample of parts will be taken and the number of defective items counted. If the number of defective items is low, the entire lot will be accepted. If the number of defective items is high, the entire lot will be rejected. Correct decisions correspond to accepting a good-quality lot and rejecting a poor-quality lot. Because sampling is being used, the probabilities of [erroneous](#) decisions need to be considered. The error of rejecting a good-quality lot creates a problem for the producer; the probability of this error is called the producer's risk. On the other hand, the error of accepting a poor-quality lot creates a problem for the purchaser or consumer; the probability of this error is called the consumer's risk.

The design of an acceptance sampling plan consists of determining a sample size n and an acceptance [criterion](#) c , where c is the maximum number of defective items that can be found in the sample and the lot still be accepted. The key to understanding both the producer's risk and the consumer's risk is to assume that a lot has some known [percentage](#) of defective items and compute the probability of accepting the lot for a given sampling plan. By varying the assumed

percentage of defective items in a lot, several different sampling plans can be evaluated and a sampling plan selected such that both the producer's and consumer's risks are reasonably low.

Statistical process control

Statistical process control uses sampling and statistical methods to monitor the quality of an ongoing process such as a production operation. A graphical display referred to as a control chart provides a basis for deciding whether the variation in the output of a process is due to common causes (randomly occurring variations) or to out-of-the-ordinary assignable causes. Whenever assignable causes are identified, a decision can be made to adjust the process in order to bring the output back to acceptable quality levels.

Control charts can be classified by the type of data they contain. For instance, an \bar{x} -chart is employed in situations where a [sample mean](#) is used to measure the quality of the output.

Quantitative data such as length, weight, and [temperature](#) can be monitored with an \bar{x} -chart.

Process variability can be monitored using a range or R -chart. In cases in which the quality of output is measured in terms of the number of defectives or the proportion of defectives in the sample, an np -chart or a p -chart can be used.

All control charts are constructed in a similar fashion. For example, the centre [line](#) of an \bar{x} -chart corresponds to the mean of the process when the process is in control and producing output of acceptable quality. The vertical axis of the control chart identifies the scale of measurement for the [variable of interest](#). The upper horizontal line of the control chart, referred to as the upper control limit, and the lower horizontal line, referred to as the lower control limit, are chosen so that when the process is in control there will be a high probability that the value of a sample mean will fall between the two control limits. Standard practice is to set the control limits at three standard deviations above and below the process mean. The process can be sampled periodically. As each sample is selected, the value of the sample mean is plotted on the control chart. If the value of a sample mean is within the control limits, the process can be continued under the assumption that the quality standards are being maintained. If the value of the sample mean is outside the control limits, an out-of-control conclusion points to the need for corrective action in order to return the process to acceptable quality levels.

ISO

international organization for standardization(ISO) is a specialized agency for standardization.it is a worldwide federation of national standards bodies in more than 100 countries. ISO is based in geneva has over 200 technical committees to prepare international standards.ISO has a main objective of coordination and unification of international standards.

