

QUALITY IMPROVEMENT IN THE MODERN BUSINESS ENVIRONMENT

(45)

Dimensions of Quality:

1. Performance - Will the product do the intended job?
2. Reliability - How often does the product fail?
3. Durability - How long does the product last?
4. Serviceability - How easy is it to repair the product?
5. Aesthetics - What does the product look like?
6. Features - What does the product do?
7. Perceived Quality - What is the reputation of the company or its product?
8. Conformance to Standards - Is the product made exactly as the designer intended?

Definition of Quality:

1. Traditional - Quality means fitness for use.
There are two general aspects of fitness for use:
quality of design & quality of conformance.
2. Modern - Quality is inversely proportional to variability.
3. Quality Improvement - Quality Improvement is the reduction of variability in processes & products.
Excessive variability in process performance often results in waste.
Alternate and frequently very useful definition is that quality improvement is the reduction of waste.
Particularly effective in service industries.

Quality Engineering Terminology

1. Every product possesses a no. of elements that jointly describe what the user or consumer thinks of as quality. These parameters are called quality characteristics. Sometimes these are called critical-to-quality (CTQ) characteristics. They may be of several types:
 - Physical - length, weight, voltage, viscosity
 - Sensory - taste, appearance, color
 - Time Orientation - reliability, durability, serviceability.

2. Quality Engineering is the set of operational, managerial and engineering activities that a company uses to ensure that the quality characteristics of a product are at the nominal or required levels and that the variability around these desired level is minimum.

There is a certain amount of variability in every product, consequently, no two products are ever identical.

Sources of this variability include differences in materials, differences in the performance and operation of the manufacturing equipment and differences in the way the operators perform their tasks.

Since variability can be described in statistical terms, statistical methods play a central role in quality improvement efforts.

Quality characteristics are often evaluated relative to specifications.

For a manufactured product, the specifications are the desired measurements for the quality characteristics of the components and subassemblies that make up the product, as well as the desired values for the quality characteristics in the final product.

In the service industries, specifications are typically in terms of the maximum amount of time to process an order or to provide a particular service.

3. A value of a measurement that corresponds to the desired value for that quality characteristic is called the nominal or target value for that characteristic.

4. The largest allowable value for a quality characteristic is called the upper specification limit (USL) and the smallest allowable value for a quality characteristic is called the lower specification limit (LSL).

5. A specific type of failure is called a non-conformity. A nonconforming product is considered defective if it has one or more defects, which are nonconformities that are serious enough to significantly affect the safe and effective use of the product.

Statistical Methods for Quality Control and Improvement:

Three major areas of statistical and engineering technology-

1. statistical process control

2. design of experiments

3. acceptance sampling.

A control chart is one of the primary techniques of statistical process control (SPC).

The center line represents where the process characteristic would fall if there are no unusual sources of variability present.

The control chart is very useful process monitoring technique, when unusual sources of variability present, sample averages will plot outside the control limits.

A designed experiment is an approach to systematically varying the controllable input factors in the process & determining the effect these factors have on the output product parameters.

One major type of designed experiment is the factorial design, in which the factors are varied together in such a way that all possible combinations of factor levels are tested.

Designed experiments are major off-line quality control tools.

The routine adjustment such that future values of the product characteristics will lie approximately on target is called engineering control, automatic control or feedback control.

Acceptance Sampling — connected with inspection & testing of product.

Outgoing Inspection is the inspection operation that is performed immediately after production.

Incoming Inspection is the inspection operation in which lots of batches of product are sampled as they are received from the supplier.

Items in a rejected lot are typically either scrapped or recycled or they may be reworked or replaced with good units. This is called rectifying inspection.

The primary objective of quality engineering efforts is the systematic reduction of variability in the key quality characteristics of the product.

Management Aspects of Quality Improvement:

quality Planning, quality assurance, quality control and improvement.

1. Quality Planning: It is a strategic activity and it is just as vital to an organization's long term business success as the product development plan, the financial plan, the marketing plan and plans for the utilization of human resources. It involves identifying customers [voice of the customers - VOC].
2. Quality Assurance: It is the set of activities that ensures the quality levels of products and services are properly maintained and that supplier & customer quality issues are properly resolved. Documentation of the quality system is an imp. component. It involves four components - policy, procedures, work instructions and specifications and records.
3. Quality control and improvement: It involves the set of activities used to ensure that the products and services meet requirements and are improved on a continuous basis.

Quality Philosophy and Management Strategies:

The deming philosophy is an imp framework for implementing quality and productivity improvement.

• Deming's 14 points are.

1. Create a constancy of purpose focused on the improvement of products and services.

2. Adopt a new philosophy that recognizes we are in a diff economic era.
3. Do not rely on mass inspection to control quality.
4. Do not award business to ~~the~~ suppliers on the basis of price alone but also consider quality.
5. Focus on continuous improvement.
6. Practice modern training methods and invest in on-the-job training for all employees.
7. Improve leadership & practice modern supervision methods.
8. Drive out fear.
9. Break down the barriers b/w functional areas of the business.
10. Eliminate targets, slogans and numerical goals for the workforce.
11. Eliminate numerical quotas and work standards.
12. Remove the barriers that discourage employees from doing their jobs.
13. Institute an ongoing program of education for all employees.
14. Create a structure in top management that will vigorous advocate the first 13 points.

Deming's Seven Deadly Diseases of Management -