
THE QUALITY IMPROVEMENT ASSOCIATE PRIMER

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**QUALITY IS ABOUT PASSION
AND PRIDE**

T. J. PETERS/N. AUSTIN (1986)

Quality Concepts

Quality Concepts (Basics) are presented in the following topic areas:

- Quality definitions
- Quality planning
- Importance of employees
- Systems and processes
- Variation

Quality Defined *

The awareness and pursuit of product and service quality has gained an unprecedented status in American companies. Stated as such, no one is against quality. However, the concept of “quality” is broad and open to varied interpretations. The tough part is defining quality, establishing clear cut quality standards and enforcing adherence to those standards in a consistent manner.

Let's begin with some definitions of quality:

- In most American companies “Beauty is in the eye of the beholder,” so quality is perceived by individuals in their own way.
- Dr. W. Edwards Deming (1986)⁴ said that “Quality control does not mean achieving perfection. It means the efficient production of quality that the market expects.”
- Dr. Joseph M. Juran (1992)¹⁵ defines quality as “Fitness for use.”
- Philip Crosby (1979)³ defines quality as “Conformance to requirements.”
- Dr. Armand V. Feigenbaum (1991)⁶ calls quality “The total composite product and service characteristics of marketing, engineering, manufacturing and maintenance through which the product and service in use will meet the expectations of the customer.”
- The American Society for Quality defines quality as “The totality of features and characteristics of a product that bear on its ability to satisfy a given need.”

* Portions of this Section came from the *CMQ Primer* (Gee, 2005)⁸, *CQT Primer* (Wortman, 2003)²⁰ and *CQE Primer* (Wortman, 2005)²¹.

Determinants of Quality

With any quality definition the needs of a customer must be understood and satisfied. Customers expect a product or service to match or exceed their expectations, supplied on-time, at a price they can afford to pay.

Listed below are some of the attributes and descriptors that consumers associate with quality:

Products

Performance
Features
Reliability
Conformance
Durability
Serviceability
Aesthetics
Perceived quality

Services

Reliability
Responsiveness
Competence
Access/Courtesy
Communication
Credibility
Security/Safety
Knowing the customer

The quality of a product or service should meet high quality standards for:

Reliability The product should perform for its rated life. The service should be predictable.

Serviceability The product should be repaired or replaced in an easy or convenient way. This is a composite product and service attribute.

Maintainability The repair of the product should be easy. Maintainability also impacts service.

Safety The product or service should be safe and provide security where applicable.

Attractiveness The customer may desire this attribute.

The above factors, broken down into more defined elements, may lead to strategic quality goals and plans. Some of these will be adopted for use as part of the strategic business plan. The organization's performance will be affected by the implementation of these goals.

Organizational Quality Steps

For Total Quality to succeed in an organization, a structured process should be used. According to Juran (1992)¹⁵, the process should include:

- **A Quality Council**
- **Quality Policies**
- **Strategic Quality Goals**
- **Deployment of Quality Goals**
- **Resources for Control**
- **Measurement of Performance**
- **Quality Audits**

Establish a Quality Council

The first step is familiar to many companies when establishing major quality projects or programs: establishing a Quality Council. This Quality Council is a steering committee for the quality movement. The Quality Council has responsibility for the growth, control, and effectiveness of Total Quality (TQ), as well as the incorporation of TQ into the strategic business plan. In many companies, the senior staff will form the membership of the Quality Council. In a few companies membership may include respected external individuals, and individuals from different levels of the company. Some of the specific tasks of the Quality Council may include:

- **Develop an educational module**
- **Define quality objectives for each section of the organization**
- **Refine the improvement strategy**
- **Determine and report cost of quality data**
- **Develop and maintain an awareness program**

Quality Policies

Quality policies are guidelines that the organization's employees and management can follow. This is defined in ISO 9000-1 (1994)¹⁴, A.2 "Quality policy: The overall intentions and direction of an organization with regard to quality, as formally expressed by top management."

The Quality Council should play a major role in developing quality policies for the company. In general, quality policies should be concise and meaningful. A quality policy(s) usually has statements that indicate a company will meet or exceed customer expectations, delight the customer, etc. The quality policy can be hung on the wall for customers and suppliers to see.

Organizational Quality Steps (Continued)

Strategic Quality Goals

Strategic quality goals may gain priority and emphasis from the Quality Council, as well as feedback from customers, top management or other organizational levels. The goals, determined to be of a strategic nature, become a part of the strategic business plan. The quality goals are specific, quantified, and scheduled. “We will achieve 95% ratings from all of our designated customers by August, 1997,” would fit a quality goal definition. Quality goals may be linked to product performance, service performance, customer satisfaction, quality improvement, or cost of quality. Having quality goals placed in the strategic business plan, indicates to all employees that quality goals have special importance. The top executives incorporate them as part of their personal goals and the lower organizational levels are responsible for portions of the goals. As a result, all corporate levels will place more emphasis on attaining the goals.

Deployment of Quality Goals

Deployment has the connotation of a military term, since it has been expressed in that environment. The word “deployment” means to spread out, to station, or to move in accordance with a plan. The Quality Council, or upper management, has the initial task of deploying the main strategic quality goals into manageable pieces for the lower levels of the organization.

As each level of the organization (function or team) receives its goals, it is expected that they should review their mission, capabilities, and resources. If the function or team requires additional resources or training, those things must be resolved to accomplish the required objective. Various task teams or natural department teams will now have visible goals and directions.

Resources for Control

For each goal, resources must be secured. The organizational structure must have a basic process for goal setting, goal deployment, training of personnel, goal tracking, goal evaluation and recognition of effort. Through tie-in to the strategic business plan, this may indicate that resources, in the forms of additional staff help, equipment, or external staff, are required for success.

Organizational Quality Steps (Continued)

Measurement of Performance

The measurement of performance must then be addressed, just as other elements of the strategic business plan are measured. Each level of the organization will regularly review as to progress against the goals. This means that the senior executives with quality goals are measured, just as they are measured against earnings per share. At different levels of the organization, reviews are held to measure quality progress. These quality reviews should be held in conjunction with the regular reviews of other strategic goals. In a typical meeting, quality, financial, production, and safety performance might be reviewed. The metrics (measurements) of quality performance must be meaningful for proper goal attainment. Good quality metrics are often determined jointly by key members of management.

Quality Audits

The quality audit is a necessary step in the process to provide independent and unbiased information to all those who have a need to know. Top management, operating departments, and related staffs must know where the system stands in relation to a performance measure. The scope of an audit will be determined by the guidelines set forth by the Quality Council. In the past, a quality audit was an audit of the quality system. A recent trend, is the emergence of the total management system audit. Quality audits can be conducted through internal teams, outside auditors, upper managers, or by the president. The role of the president in the audit process shows the company how important quality is.

Quality Terms and Definitions

The following terms and definitions are pertinent to understanding and communicating quality. They are paraphrased from the *Quality Dictionary* by Tracy Omdahl (1997)¹⁸, ISO 8402 (1994)¹³ and *Glossary and Tables for Statistical Quality Control* by ASQ (1993)¹.

Attribute	A characteristic or property that is appraised in terms of whether it does or does not exist, with respect to a given requirement.
Audit Standard	An authentic description of essential characteristics of audits which reflects current thought and practice.
Auditing Organization	A unit or function that carries out audits through its employees. This organization may be a department of the auditee, client, or an independent third-party.
Batch	A definite quantity of product or material produced under conditions that are considered uniform.
Capability	The ability to perform designated activities and to achieve results which fulfill specified requirements.
Certification	The authoritative act of documenting compliance with agreed requirements.
Characteristic	A property that helps to differentiate between items of a given sample or population. The difference may be either quantitative (by variables) or qualitative (by attributes).
Compliance	A judgment that a product or service meets the requirements of a specific standard.
Contract	An accepted order. The agreed requirements between a supplier and customer transmitted by any means.
Corrective Action	An action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation, to prevent recurrence.
Defect	The nonfulfillment of intended usage requirements. The departure or absence of one or more quality characteristics from intended usage requirements.

Quality Terms and Definitions (Continued)

Dependability	The collective term used to describe the availability of performance and its influencing factors: reliability performance, maintainability performance and maintenance support performance.
Design review	A formal, documented, comprehensive and systematic examination of a design to evaluate the design requirements and the capability of the design to meet the requirement for quality and to identity problems and propose solutions.
Deviation	Written authorization, granted prior to the manufacture of an item, to depart from a particular performance or design requirement of a contract or specification, for a specific number of units or period of time.
Discrepancy	A failure to meet the specified requirement, supported by evidence. (Other words used interchangeably: non-conformance, deficiency, finding.)
Documentation	The use of documentary evidence; the documents used.
Inspection	The process of measuring, examining, testing, gaging or otherwise comparing a unit with requirements.
100% Inspection	Inspection in which specified characteristics of each unit of product are examined or tested to determine conformance with requirements.
Inspection Level	A feature of a sampling scheme relating the size of the sample to that of the lot. Selection of an inspection level may be based on simplicity, unit inspection cost, inspection destructiveness or lot consistency.
Inspection Record	Recorded data concerning inspection results.
Instructions	Detailed, written, or spoken directions given in regard to what is to be done.

Quality Terms and Definitions (Continued)

ISO	The International Organization for Standardization.
Item	An object, tangible or intangible, that can be individually described and considered. Same as unit or individual.
Lot	A definite quantity of a product or material accumulated under conditions that are considered uniform for sampling purposes.
Management Review	A formal quality evaluation, by top management, of the status and adequacy of the quality system in relation to quality policy and objectives.
Measuring and Test Equipment	All devices used to measure, gage, test, inspect, diagnose, or otherwise examine materials, supplies, and equipment to determine compliance with technical requirements.
Nonconforming Unit	A unit of product or service containing at least one nonconformity.
Nonconformity	A departure of a quality characteristic from its intended level or state that occurs with a severity sufficient to cause an associated product or service not to meet a specification requirement.
Objective Evidence	Information which can be verified, based on facts and obtained through observation, measurement, or test.
Organization	A company, corporation, firm, enterprise or institution, or part thereof (whether incorporated or not, public or private) that has its own function(s) and administration.
Precision	The closeness of agreement between randomly selected individual measurements or test results.
Preventive Action	An action taken to eliminate the causes of a potential nonconformity, defect or other undesirable situation, to prevent occurrence.

II. QUALITY CONCEPTS QUESTIONS

- 2.1. The input component in the SIPOC system would typically include:
- Raw materials, electrical power, and human resources
 - Manpower, machines, materials, and methods
 - Specifications, money, and data
 - Kanban cards, takt time, and kaizen methods
- 2.2. Without prior approval, an employee spent \$500 of company money to purchase a device that simplifies work flow in his area. This is an example of:
- Management lack of control
 - Worker waste
 - Employee empowerment
 - Employee involvement
- 2.3. Which of the following quality guru's statement on quality is "conformance to requirements?"
- Dr. Deming
 - Dr. Juran
 - Philip Crosby
 - Dr. Covey
- 2.4. Which one of the following best describes machine capability?
- The total variation of all cavities of a mold, or spindles of an automatic assembly line
 - The inherent variation of the machine
 - The total variation over a shift
 - The variation in a short run of consecutively produced parts
- 2.5. The first and most important quality planning step is:
- Securing resources
 - Defining the objective
 - Defining the specifications
 - Creating the flow chart
- 2.6. Involvement of the quality function during strategic management planning is usually:
- Beneficial to the planning process
 - Counterproductive to efficient production
 - Not important in small organizations
 - Advantageous in minimizing the need for audits
- 2.7. The "quality function" of a company is best described as:
- The degree to which the company product conforms to a design or specification
 - That collection of activities through which "fitness for use" is achieved
 - The degree to which a class or category of product possesses satisfaction for people generally
 - Where the quality department fits in the organizational chart
- 2.8. The best evidence of acceptable quality is:
- Complete compliance to design requirements
 - A low rejection rate
 - A satisfied customer
 - Long-term usefulness
- 2.9. The purpose of a quality manual is to:
- Provide a basis for every quality decision
 - Standardize the methods and decisions of a department
 - Optimize company performance and the effectiveness of the quality department
 - Make it possible to handle every situation in exactly the same manner
- 2.10. A thorough cause-and-effect analysis of quality problems will usually indicate that a major percentage of the basic factors affecting poor quality performance are:
- Operator controllable
 - Management controllable
 - Union controllable
 - Customer controllable