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Quality

Abbreviations And Acronyms

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Abstract
This document provides the abbreviations and acronyms to be used throughout the different quality management strategies and methodologies like Six Sigma, TQM, CMM and ISO. All abbreviations are presented in the singular, but are equally applicable to the plural.

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1 Scope

This document provides the abbreviations and acronyms to be used throughout the quality management strategies and methodologies like Six Sigma, TQM, CMM and ISO.

2 Abbreviations and Acronyms

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3 Mu	Three Japanese words that mean waste (muda), strain (muri) and discrepancy (mura).
3P	A 3D model of TQM, having people, product and processes as the 3 axis.
5S	A checklist for good housekeeping to achieve greater order, efficiency and discipline in the workplace. It is derived from the Japanese words seiri, seiton, seiso, seiketsu and shituke. The English equivalents are sort, straighten, scrub (or shine), systematize and standardize. Another popular version of the five S's is sort, simplify, sweep, standardize and sustain.
5 Whys	A simple, but effective technique to get the root of the problem. Mostly it is used in the analyze phase of the Six Sigma DMAIC methodology.
6Ms	The traditional 6Ms are machines, methods, materials, measurements, mother nature (environment) and manpower (people).

A

AA	Abbreviated Analysis
AALA	American Association for Laboratory Accreditation
ABC	Activity Based Costing An accounting technique that allows an enterprise to determine the actual costs associated with each product and service produced by that enterprise without regard to the organizational structure of the enterprise.
Accreditation	Certification by a duly recognized body of the facilities, capability, objectivity, competence, and integrity of an agency, service or operational group or individual to provide the specific service(s) or operation(s) needed.
Accredited Registrars	Qualified organizations certified by a national body to perform audits to the QS-9000 and to register the audited facility as meeting these requirements for a given commodity.
Accuracy	The deviation of a part or measuring system from a known standard. The quantitative measure of the degree of conformance to recognized standards of measurement.
ACF	Autocorrelation Function
ACIL	American Council for Independent Laboratories
Activity measure	A performance value assigned to an activity's primary output.
Activity model	A graphic representation of a business process that exhibits the activities and their interdependencies that make up the business process to any desired level of detail. An activity model reveals the interactions between activities in terms of inputs and outputs while showing the controls placed on each activity and the types of resources assigned to each activity.
Actual Value	The measured value of a feature.
Adequacy	Used in QS-9000, indicates the intent of the standard has been bet, given the scope of the suppliers operation.
Advisor	A person who has developed special expertise in the CQI process. In a CQI team, the advisor is not a team member but a person outside the group who serves as a process guide, teacher of CQI methods, and consultant to the team leader, and who helps connect the work of the team to the organizations overall CQI effort.

Affinity Diagram	A way to organize idea data into coherent patterns or themes. A large number of ideas are generated and then organized into groupings to reveal major themes.
AHP	Analytical Hierarchy Process Developed by Thomas Saaty, the process provides a proven, effective means to deal with complex decision making and can assist with identifying and weighting selection criteria, analyzing the data collected for the criteria and expediting the decision-making process.
AHRQ	Agency for Healthcare Research and Quality
AIAG	Automotive Industry Action Group
AIS	Automated Information System
Alpha Risk	The probability of accepting the alternate hypothesis when, in reality, the null hypothesis is true.
ANOM	Analysis of Means Developed by Ellis R. Ott in 1967 (later enhanced by Edward Schilling), ANOM is a statistical procedure for troubleshooting industrial processes and analyzing the results of experimental designs with factors at fixed levels. It provides a graphical display of data. The analysis was developed the procedure in 1967 because he observed that non-statisticians had difficulty understanding analysis of variance.
ANOVA	Analysis of Variance A statistical test that allows for comparisons of multiple sources of variation, or effects, to determine if any of these sources significantly affect the variability of the outcome being studied.
ANP	Analytic Network Process Based on the Analytic Hierarchy Process, is a system for the analysis, synthesis, and justification of complex decisions with the capability to model non-linear relations between the elements. It allows the decision maker(s) to leap beyond the traditional hierarchy to the interdependent environment of network modeling. The process is designed for problems characterized by the added complexity of interdependencies such as feedback and dependencies among problem elements. Using a network approach makes it possible to represent and analyze interactions, incorporate non-linear relations between the elements, and synthesize mutual effects by a single logical procedure.

ANSI	American National Standards Institute
ANSI-RAB NAP	American National Standards Institute - Registrar Accreditation Board National Accreditation Program
AOQ	Average Outgoing Quality The expected average quality level of outgoing product for a given value of incoming product quality.
AOQL	Average Outgoing Quality Limit The maximum average outgoing quality over all possible levels of incoming quality for a given acceptance sampling plan and disposal specification.
APQC	American Productivity & Quality Council
APQP	Advanced Product Quality Planning
AQL	Acceptable Quality Level It is a limit of a satisfactory process average at a particular quality level when a continuing series of lots is considered.
AQP	Advanced Quality Plan
ARC	Appraisal Requirements for CMMI
Arrow Diagram	Another term for a PERT or CPM chart. It is a graphic description of the sequential steps that must be completed before a project can be completed.
AS9100	Quality system requirements for suppliers to the aerospace industry (previously known as AS9000)
ASME	American Society of Mechanical Engineers
ASQ	American Society for Quality
ASQF	Application Specific Qualification Facility
Assessment	An evaluation process including a document review, an on-site audit and an analysis and report.
Assignable Cause	See "Special cause"
ASTM	American Society for Testing and Materials
Attributes	Qualitative data that can be counted for recording and analysis. Examples include characteristics such as the presence of a required label and the installation of all required fasteners.
Audit	An onsite verification activity used to determine the effective implementation of a supplier's documented quality system. Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled
Audit Client	Organization or person requesting an audit.
Audit Conclusion	Outcome of an audit provided by the audit team after consideration of the audit objectives and all audit findings.

Audit Criteria	Set of policies, procedures or requirements used as a reference.
Auditee	Organization being audited.
Audit Evidence	Records, statements of fact or other information which are relevant to the audit criteria and verifiable.
Audit Findings	Results of the evaluation of the collected audit evidence against audit criteria.
Auditor	Person with the competence to conduct an audit.
Audit Program	Set of one or more audits planned for a specific time frame and directed towards a specific purpose.
Audit Team	One or more auditors conducting an audit.
Authoritarian Culture	An organizational culture characterized by the holding of all power (decision making and information) at the top of the organization. The authoritarian organization seeks to maintain the status quo and forces workers to conform, never question or give feedback, play politics, and wait for orders.
Availability	The ability of an item to perform its designated function when required for use.
Average chart (X-bar chart)	A control chart in which the average of the subgroup, represented by the X-bar, is to determine the stability or lack thereof in the process. Average charts are usually paired with range charts or sample standard deviation charts for complete analysis.
Average or Mean	The most common expression of the centering of a distribution. It is calculated by totaling the observed values and dividing by the number of observations.

B

BAM	Business Architecture Modernization A contract vehicle sponsored by the Department of Defense. This contract provides business process reengineering support services focused on the higher order strategic and management assessment functions. Reengineering services include fully qualified BPR experts with functional knowledge in all aspects of process engineering, state of the art analytical tools and time tested methodologies for comprehensive process improvement.
Bar chart	A chart that compares different groups of data to each other through the use of bars that represent each group. Bar charts can be simple, in which each group of data consists of a single type of data, or grouped or stacked, in which the groups of data are broken down into internal categories.
Baseline	The current condition that exists in a situation. Usually used to differentiate between a current and a future representation.
BAT	Best Available Technology
Belt	Belts are Six Sigma project leaders who receive training in the Six Sigma roadmap.
Benchmark Data	The results of an investigation to determine how competitors and/or best-in-class companies achieve their level of performance.
Benchmarking	A systematic process of continuously measuring an organization critical business processes against business leaders anywhere in the world to gain information which will help the organization take action to improve its performance. Steps include planning the study, collecting information, analyzing results and implementing improvements.
Benefit	See "Outcome"
Bias	A systematic error, which contributes to the difference between a population mean of measurements or test results and an accepted reference value.
Bimodal Distribution	A distribution with two identifiable curves within it, indicating a mixing of two populations such as different shifts, machines, workers, etc.
Block Diagram	The block diagram is a simple pictorial representation of a system/subsystems linked

	to illustrate the relationships between components/subsystems.
BOA	Bill Of Activity A structured listing of the sequence of activities performed to produce a unit of a product or service. Similar in concept to a bill of materials (BOM), which is a structured list of the components of a product.
BOM	Bill Of Material Total list of all components/materials required to manufacture the product.
BOS	Business Operating Systems
Boundary	The beginning or end point in the portion of a process from a supplier to a customer that will be the focus of the process improvement effort.
Boundary value analysis	A selection technique in which test data are chosen to lie along "boundaries" of the input domain or output range classes, data structures, procedure parameters, etc. Choices often include maximum, minimum and trivial values or parameters.
BPMS	Business Process Management System A nine step model enables companies to model, deploy and manages mission-critical business processes. The model is usually used for lesser mature processes to make them Repeatable & Reliable.
BPR	Business Process Re-engineering
Brainstorming	A group decision-making technique designed to generate a large number of creative ideas through an interactive process. It is used to generate alternative ideas to be considered in making decisions.
Branch analysis (Myers)	A test case identification technique which produces enough test cases such that each decision has a true and a false outcome at least once.
Branch coverage	A test coverage criteria which requires that for each decision point each possible branch be executed at least once.
Breakthrough thinking	A management technique which emphasizes the development of new, radical approaches to traditional constraints, as opposed to incremental or minor changes in thought that build on the original approach.
BS	British Standard
BSC	Balanced Scorecard
BSI	British Standards Institution
Business Process	A collection of related, structured activities that produces a specific service or product for a particular customer or customers.

C

C Chart	Control charts which display the number of defects per sample.
CAI	Computer Aided Inspection
CAPA	Corrective And Preventive Action
Capability	The total range of inherent variation in a stable process. Ability of an organization, system or process to realize a product that will fulfill the requirements for that product.
Capability analysis	Studies the ability of a process to meet established requirements.
CAPD	see also "Central Auditory Processing Disorder"
CAR	Corrective Action Request
CASCO	ISO Committee on Conformity Assessments
Causality	The principle that every change implies the operation of a cause.
Cause and Effect Diagram	Used to explore the possible root causes of a problem. (also known as a fishbone diagram) See "Ishikawa Diagram"
CC	Critical Characteristic
CCB	Configuration Control Board
CE Mark	European Union product safety certification symbol
CEN	European Committee for Standardization
CENELEC	European Committee for Electro-technical Standardization
Center Line	The line on a control chart that represents the average (mean or median) value of the items being plotted.
Central Auditory Processing	A reduced or impaired ability to discriminate, recognize or comprehend auditory informations.
Certificate of Compliance	A document signed by an authorized party affirming that the supplier of a product or service has met the requirements of the relevant specifications, contract, or regulation.
Certificate of Conformance	A document signed by an authorized party affirming that a product or service has met the requirements of the relevant specifications, contract, or regulation.
Certification	The procedure and action by a duly authorized body of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with applicable requirements.
Change control	The processes, authorities for, and procedures to be used for all changes that are made to the computerized system and/or the systems

	data. Change control is a vital subset of the quality assurance program within an establishment.
Characteristic	Distinguishing feature
Characteristic Matrix	An analytical technique for displaying the relationship between process parameters and manufacturing stations.
Check Sheet	A data collection form consisting of multiple categories. Each category has an operational definition and can be checked off as it occurs. Properly designed, the sheet helps to summarize the data, which is often displayed in a Pareto Chart.
CIM	Computer Integrated Manufacturing
CIP	Continous Improvement Process
CMI	Certified Mechanical Inspector
CMM	Capability Maturity Model® Developed by the Carnegie Mellon Software Engineering Institute, this outline of principles guides software processes through five evolutionary stages: initial, repeatable, defined, managed and optimizing.
CMMI	Capability Maturity Model® Integration
CQI	Continuous Quality Improvement
COC	Cost Of Conformance
Collaborative Culture	An organizational culture characterized by a shared vision, shared leadership, empowered workers, cooperation among organizational units as they work to improve processes, a high degree of openness to feedback and data and optimization of the organizational whole versus its many parts.
Common Cause	A source of variation that is always present as part of the random variation inherent in the process itself. Its origin can usually be traced to an element of the system which only management can correct.
Common Cause Variation System	The collection of variables that produce common cause variation and the interaction of those variables.
Competence	Demonstrated ability to apply knowledge skills.
Completeness	The property that all necessary parts of the entity are included. Completeness of a product is often used to express the fact that all requirements have been met by the product.
Compliance	An affirmative indication or judgment that the supplier of a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.

Component	Any raw material, substance, piece, part, software, firmware, labeling, or assembly which is intended to be included as part of the finished, packaged, and labeled device.
CONC	Cost Of Non-Conformance
Concession	Permission to use or release a product that does not conform to specified requirements. See also "Waiver"
Conformance	An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.
Conformity	The fulfilling by an item or service of specification requirements. Fulfillment of a requirement
Continual Improvement	Recurring activity to increase the ability to fulfill requirements.
Control Chart	A graphic representation of a characteristic of a process, showing plotted values of some statistic gathered from that characteristic, and one or two control limits. A display of data in the order that they occur with statistically determined upper and lower limits of expected common cause variation. It is used to indicate special causes of process variation, to monitor a process for maintenance, and to determine if process changes have had the desired effect.
Control Flow Diagram	A diagram that depicts the set of all possible sequences in which operations may be performed during the execution of a system or program. Types include box diagram, flowchart, input-process-output chart and state diagram.
Control Limit	A line (or lines) on a control chart used as a basis for judging the significance of the variation from subgroup to subgroup. Variation beyond a control limit is evidence that special causes are affecting the process. Control limits are calculated from process data and are not to be confused with engineering specifications. Expected limits of common cause variation. Sometimes they are referred to as upper and lower control limits. They are not specification or tolerance limits.
Control Plans	Control Plans are written descriptions of the systems for controlling parts and processes. They are written by suppliers to address the important characteristics and engineering requirements of the product. Customer

	approval of control plans may be required prior to production part submission.
COPIS	Customer, Output, Process, Input, Supplier A term used for an outside-in approach, used when completing a high level map of what a customer experiences.
COPQ	Cost Of Poor Quality Consists of those costs which are generated as a result of producing defective material.
COQ	Cost Of Quality
Correction	Action to eliminate a detected nonconformity.
Corrective Action	Action to eliminate the cause of a detected nonconformity or other undesirable situation.
Corrective Action Plan	A plan for correcting a process or part quality issue.
COSA	Client Organization and Strategy Assessment An internal review conducted for each client considered to have the potential for a long-term relationship. The purpose of the review is to develop a strategy and action plan for managing the client relationship and for identifying and pursuing new opportunities.
CoSQ	Cost of Software Quality An approach to software quality that entails outlining the economic benefits of delivering good-quality software.
Count chart (C Chart)	An attributes data control chart that evaluates process stability by charting the counts of occurrences of a given event in successive samples.
Count-per-unit chart (U chart)	A control chart that evaluates process stability by charting the number of occurrences of a given event per unit sampled, in a series of samples.
COV	Components Of Variation
Coverage analysis	Determining and assessing measures associated with the invocation of program structural elements to determine the adequacy of a test run. Coverage analysis is useful when attempting to execute each statement, branch, path or iterative structure in a program.
Cp	Commonly used process capability index
Cp/Cpk	Capability Ratio/Capability Index
CPK	Capability Analysis Indice
CPM	Critical Path Method
CQA	Certified Quality Auditor
CQE	Certified Quality Engineer
CQI	Continuous Quality Improvement The culture, strategies and methods necessary for continual improvement in

	meeting and exceeding customer expectations.
CQMgr	Certified Quality Manager
CRE	Certified Reliability Engineer
CTC	Crtitical-To-Customer is the input to the quality function deployment activity, for the customer requirements side of the analysis.
CTQ	Critical-To-Quality is the key measurable characteristics of a product or process whose performance standards or specification limits must be met in order to satisfy the customer. Usually it must be interpreted from a qualitative customer statement to an actionable, quantitative business specification.
Customer	The receiver of an output of a process, either internal or external to an organization or corporate unit. A customer could be a person, a department, a company, etc.
Customer Data Table	A tool for translating customers words into requirements, quality indicators and features of the product or service.
Customer Satisfaction	Customers perception of the degree to which the customer's requirements have been fulfilled.

D

Data Collection	Gathering facts on how a process works and/or how a process is working from the customer's point of view. All data collection is driven by knowledge of the process and guided by statistical principles.
DCP	Dynamic Control Plan/Dimensional Control Plan
Decision coverage	A test coverage criteria requiring enough test cases such that each decision has a true and false result at least once, and that each statement is executed at least once.
Decision matrix	A tool used to evaluate problems, solutions or ideas. The possibilities are listed down the left-hand side of the matrix and relevant criteria are listed across the top. Each possibility is then rated on a numeric scale of importance or effectiveness (e.g. on a scale of 1 to 10) for each criterion, and each rating is recorded in the appropriate box. When all ratings are complete, the scores for each possibility are added to determine which has the highest overall rating and thus deserves the greatest attention.
Decision table	A table used to show sets of conditions and the actions resulting from them.
Defect	The non-fulfillment of intended usage requirements. Non-fulfillment of a requirement related to an intended or specified use.
Deming Cycle	A visualization of the CQI process usually consisting of four points: Plan, Do, Check, Act linked by quarter circles. The cycle was first developed by Dr. Walter A. Shewhart but was popularized in Japan in the 1950 by Dr. W. Edwards Deming.
Demings 14 Principles	The foundation of Deming's philosophy. The points are a blend of leadership, management theory, and statistical concepts which highlight the responsibilities of management while enhancing the capacities of employees.
Dependability	The state of being counted on or trusted. Collective term used to describe the availability performance and its influencing factors: reliability performance, maintainability performance and maintenance support performance.
Design and Development	Set of processes that transform requirements into specified characteristics or into the specification of a product, process or system.

Design Input	The physical and performance requirements of a device that are used as a basis for device design.
Design Review	A proactive process to prevent problems and misunderstandings. A formal, documented, comprehensive, and systematic examination of a design to evaluate the design requirements and the capability of the design to meet these requirements and to identify problems and propose solutions. A documented, comprehensive, systematic examination of a design to evaluate the adequacy of the design requirements, to evaluate the capability of the design to meet these requirements, and to identify problems.
Design Validation	Testing to ensure that product conforms to defined user needs and/or requirements. Design validation follows successful design verification and is normally performed on the final product under defined operating conditions. Multiple validations may be performed if there are different intended uses. Establishing by objective evidence that device specifications conform with user needs and intended use(s).
Design Verification	Testing to ensure that all design outputs meet design input requirements. Design verification may include activities such as design review, performing alternate calculations, understanding tests and demonstrations and review of design stage documents before release.
Detection	A past-oriented strategy that attempts to identify unacceptable output after it has been produced and separate it from the good output.
Deviation	The difference between the actual measured dimension and the nominal dimension.
Deviation Permit	Written authorization, prior to production or provision of a service, to depart from specified requirements for a specified quantity or for a specified time. Permission to depart from the originally specified requirements of a product prior to realization.
DFA	Design For Assembly
DFM	Design For Manufacturing
DFMA	Design For Manufacturability and Assembly A simultaneous engineering process designed to optimize the relationship between design

	function, manufacturability, and ease of assembly.
DFMEA	Design Failure Mode and Effects Analysis An analytical technique used by a design responsible engineer/team as a means to assure, to the extent possible, that potential failure modes and, their associated causes/mechanisms have been considered and addressed.
DFSS	Design For Six Sigma Describes the application of Six Sigma tools to product development and Process Design efforts with the goal of "designing in" Six Sigma performance capability. This can also apply to process redesign efforts at the Improve phase of a Six Sigma project.
DIN	Germany Standards Institute
Distribution	The population (universe) from which observations is drawn, categorized into cells, and form identifiable patterns. It is based on the concept of variation that states that anything measured repeatedly will arrive at different results. These results will fall into statistically predictable patterns. A bell-shaped curve (normal distribution) is an example of a distribution in which the greatest number of observations occurs in the center with fewer and fewer observations falling evenly on either side of the average.
DMADV	A data-driven quality strategy for designing products and processes as an integral part of a Six Sigma quality initiative. It consists of five phases Define, Measure, Analyze, Design and Verify.
DMAIC	Cyclic continuous improvement model for Six Sigma consisting of the steps Define, Measure, Analyze, Improve and Control A systematic, closed-loop process for continued improvement that eliminates unproductive steps, focuses on new measurements and applies technology for improvement.
Document	Information and its supporting medium.
Documentation	Written material defining the process to be followed (e.g. test procedure, quality manual, operation sheets).
DOE	Design Of Experiments A methodology for designing experiments to test the effect of multiple process parameters on a given process outcome. The methodology allows for multiple factors to be tested during one experimental run.

DPMO	Defects Per Million Opportunities DPMO is the average number of defects per unit observed during an average production run divided by the number of opportunities to make a defect on the production under study during that run normalized to one million.
DPO	Defects Per Opportunity DPO represents total defects divided by total opportunities.
DPU	Defects Per Unit DPU is the average number of defects observed when sampling a population.
Durability	The probability that an item will continue to function at customer expectation levels, at the useful life without requiring overhaul or rebuild due to wearout.

E

EC	European Community
Economic Analysis	A formal method of comparing two or more alternative ways of accomplishing a set objective, given a set of assumptions and constraints and the costs and benefits of each alternative, such that the economic analysis will indicate the optimum choice.
Effectiveness	Extent to which planned activities are realized and planned results achieved.
Efficiency	Relationship between the result achieved and the resources used.
EFTA	European Free Trade Association
EFQM	European Foundation for Quality Management
EIA/IS	Electronic Industries Alliance Interim Standard
EMAS	Environmental Management Audit Scheme
EN	European Standard
Entity	The representation of a set of real or abstract things (people, objects, places, events, ideas, combination of things, etc.) that are recognized as the same type because they share the same characteristics and can participate in the same relationships.
Entity Relationship Diagram	A diagram that depicts a set of real-world entities and the logical relationships among them.
EQS	European Committee for Quality System Assessment and Certification
ERP	Enterprise Resource Planning It allows companies to standardize their data, streamline their analysis process and manage long term business planning with greater ease.
Error guessing	Test data selection technique. The selection is to pick values that are likely to cause errors.
Error seeding	The process of intentionally adding known faults to those already in a computer program for the purpose of monitoring the rate of detection and removal, and estimating the number of faults remaining in the program.
ESI	European Software Institute
Establish	Define, document (in writing or electronically), and implement.
ETSI	European Telecommunications Standards Institute
EWMA	Exponentially Weighted Moving-Average A control chart to detect small process shifts.
Expectations	Customer perceptions about how a product or service will meet their needs and requirements; expectations for a product or

service are shaped by many factors; including the specific use the customer intends to make of it, prior experience with a similar product or service and representations and commitments made by marketing and advertising.

F

Facilitator	See "Advisor"
Fault Tree Analysis	FTA The identification and analysis of conditions and factors which cause or contribute to the occurrence of a defined undesirable event, usually one which significantly affects system performance, economy, safety or other required characteristics.
FEA	Finite Element Analysis A technique for modeling a complex structure. When the mathematical model is subjected to known loads, the displacement of the structure may be determined.
Feasibility	A determination that a process, design, procedure, or plan can be successfully accomplished in the required time frame.
Feigenbaum, Armand Vallin	Dr Armand V Feigenbaum is the originator of Total Quality Control. The first edition of his book "Total Quality Control" was completed whilst he was still a doctoral student at MIT. His work was discovered by the Japanese in the 1950s at about the same time as Juran visited Japan. This discovery came about firstly via his role as Head of Quality at the General Electric Company, where he had extensive contacts with such companies as Hitachi and Toshiba. Secondly, it was associated with the translation of his 1951 book: Quality Control: Principles, Practices and Administration and his articles on Total Quality Control. Feigenbaum argued for a systematic or total approach to quality, requiring the involvement of all functions in the quality process, not just manufacturing. The idea was to build in quality at an early stage, rather than inspecting and controlling quality after the fact.
Fishbone Chart	See "Cause and Effect Chart"
Fixed Effects Model	Experimental treatments are specifically selected by the researcher. Conclusions only apply to the factor levels considered in the analysis. Inferences are restricted to the experimental levels.
Flowchart	A graphical representation of the flow of a process. A useful way to examine how various steps in a process relate to each other, to define the boundaries of the process, to identify customer/supplier relationships in a process, to verify or form the appropriate

	team, to create common understanding of the process flow, to determine the current "best method" of performing the process, and to identify redundancy, unnecessary complexity and inefficiency in a process.
Fluctuations	Variances in data, which are caused by a large number of, minute variations or differences
FMEA	Failure Mode and Effects Analysis A systematized technique which identifies and ranks the potential failure modes of a design or manufacturing process in order to prioritize improvement actions.
FMECA	Failure Mode and Effect Criticality Analysis A powerful method of risk assessment and failure analysis for use in risk management and product liability control.
Force Field Analysis	A systematic method of understanding competing forces that increase or decrease the likelihood of successfully implementing change. A tool, developed by social psychologist Kurt Lewin, which is used to analyze the opposing forces involved in causing/resisting any change. It is shown in balance sheet format with forces that will help (driving forces) listed on the left and forces that hinder (restraining forces) listed on the right.
Formal qualification review	The test, inspection, or analytical process by which a group of configuration items comprising a system is verified to have met specific contractual performance requirements. Contrast with code review, design review, requirements review, test readiness review.
Frequency Distribution	A statistical table that presents a large volume of data in such a way that the central tendency (average/mean/median) and distribution are clearly displayed. An organization of data, usually in a chart, which depicts how often an different events occur. A histogram is one common type of frequency distribution, and a frequency polygon is another.
FTA	See "Fault Tree Analysis"
FTC	First Time Capability
Functional Configuration Audit	An audit conducted to verify that the development of a configuration item has been completed satisfactorily, that the item has achieved the performance and functional characteristics specified in the functional or allocated configuration identification, and that

	its operational and support documents are complete and satisfactory.
Functional Economic Analysis	A technique for analyzing and evaluating alternative information system investments and management practices.
Functional Process Improvement	A structured approach by all or part of an enterprise to improve the value of its products and services while reducing resource requirements.
Functional Verification	Testing to ensure the part conforms to all customer and supplier engineering performance and material requirements.
Future State	In an organizational transformation, the vision of where the organization will be after it is transformed. For the transformation to CQI, the future state includes constancy of purpose, leaders who model the new way, collaboration, customer mindedness, and a process focus.

G

Gauge R&R	Gauge Repeatability & Reproducibility A statistical tool which measures the amount of variations or errors in the measurement system arising from the measurement device and the people taking the measurement.
Gantt Chart	A bar chart that shows planned work and finished work in relation to time. Each task in a list has a bar corresponding to it. The length of the bar is used to indicate the expected or actual duration of the task.
Generally Implied	Custom or common practice for the organization, its customers and other interested parties, that the need or expectation under consideration is implied.
GD&T	Geometric Dimensioning and Tolerancing
GMP	Good Manufacturing Practice
GR&R	Gauge Repeatability and Reproducibility
Grade	An indicator of category or rank related to features or characteristics that cover different sets of needs for products or services intended for the same functional use. Category or rank given to different quality requirements for products, processes or systems having the same functional use.

H

Hardware	Tangible, discrete product with distinctive form.
Hazard	A condition that is prerequisite to a mishap.
Hazard Analysis	A technique used to identify conceivable failures affecting system performance, human safety or other required characteristics.
Hazard Probability	The aggregate probability of occurrence of the individual events that create a specific hazard.
Hazard Severity	An assessment of the consequence of the worst credible mishap that could be caused by a specific hazard.
Histogram	A bar chart showing a distribution of variables. An example would be to line up by height a group of people in a course. Normally one would be the tallest and one would be the shortest and there would be a cluster of people around an average height. This tool helps identify the cause of problems in a process by the shape of the distribution as well as the width of the distribution. See also "Frequency Distribution"
Hoshin kanri	Japanese term for hoshin planning, a form of interactive strategic planning which aids the flow of information up and down the organizational layers in a systematic, productive way.
Hoshin Planning	A method of strategic planning for quality. It helps executives integrate quality improvement into the organizations long-range plan. A method used to ensure that the mission, vision, goals, and annual objectives of an organization are communicated to and implemented by everyone, from the executive level to the front line level.
Hypothesis Testing	The process of using a variety of statistical tools to analyze data and, ultimately, to accept or reject the null hypothesis. A null hypothesis (H0) is a stated assumption that there is no difference in parameters (mean, variance, defects per million defect opportunities) for two or more populations. The alternate hypothesis (Ha) is a statement that the observed difference or relationship between two populations is real and not the result of chance or an error in sampling.

I

IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IDEAL	Initiating, Diagnosing, Establishing, Acting, Learning
IDOV	Identify, Design, Optimize, Validate A methodology used in DFSS for design and product optimization.
Immediate Customer	The person or unit that directly receives the output of the process.
IMR	Individual Mean Range
Information	Meaningful data
Infrastructure	System of facilities, equipment and services needed for the operation of an organization.
Input	The service or product a supplier provides to a process. Inputs to one process are the outputs from preceding processes.
Inspection	Activities, such as measuring, examining, testing, gaging one or more characteristics of a product or service, and comparing these with specified requirements to determine conformity. Conformity evaluation by observation and judgment accompanied as appropriate by measurement, testing or gauging.
Interrelationship Digraph	A way to display cause-and-effect relationships among all the elements in a system. The relationship arrows indicate the issues/causes that are the most fundamental among all the related items.
Interested Party	Person or group having an interest in the performance or success of an organization.
IPPD	Integrated Product and Process Development
Ishikawa, Kaoru	One of Japan's quality control pioneers. He developed the cause & effect diagram (Ishikawa diagram) in 1943 and published many books addressing quality control. In addition to his work at Kawasaki, Ishikawa was a long-standing member of the Union of Japanese Scientists and Engineers and an assistant professor at the University of Tokyo.
Ishikawa Diagram	A graphic tool used to explore and display all the factors that may influence or cause a given outcome. (Also known as Cause and Effect or Fishbone Diagram.)
ISIR	Initial Sample Inspection Report
ISO	International Organization for Standardization
ISO/IEC	International Organization for Standardization and International Electrotechnical Commission

ISO/TS 16949	international automotive quality management system standard administered by ISO; a recently mandated requirement for suppliers of the Big Three and other automakers
ISO 14000	International environmental management system standard administered by ISO
ISO 9000	International Standard for Quality Systems Family of quality management and quality assurance standards adopted by ISO, an international consensus of over 110 countries. ISO 9000, first published in 1987, has been adopted as national standards in more than 80 countries.

J

JIS	Japan Industrial Standards
JIT	Just-in-time inventory system An inventory control system where components/products and services are delivered to the customer only when needed.
JTC1	Joint Technical Committee 1 JTC1 is a joint committee of ISO and IEC. The scope of JTC1 is information technology standardization.
Juran Dr., Joseph	He was instrumental in adding the human dimension to quality, merging quality and management. His work resulted in what we call Total Quality Management. One of the great quality gurus, and, like Deming, an early student of the work of Walter Shewhart at Western Electric. His work has specialized in linking management to quality engineering. Dr. Juran is the founder of the Juran Institute which has long been the vehicle of his work in quality management and is well-known for espousing "the quality trilogy" of quality planning, quality control, and quality improvement. Juran has authored many books and other works in an effort to spread awareness of quality management ideas and applications.
JUSE	Japanese Union of Scientists and Engineers

K

Kaizen	Taken from the Japanese words kai and zen, where kai means change and zen means good. The popular meaning is continual improvement of all areas of a company not just quality. It is a Japanese term which in Western quality management has come to signify a commitment to small scale, gradual and continuous improvements to quality which are easy to implement and maintain. Japanese writers suggest that Kaizen is the single biggest difference between their successful quality culture and Western guilty culture.
Key Performance Indicators	Refers to the short list of measurable parameters that will indicate how well the business is doing at attaining its goals. In a manufacturing quality scenario, this may be the amount of scrap or rework that gets metered. In a service quality scenario, such as an insurance company, this may be the open inventory of unprocessed claims. In brand management, market share in itself and in comparison with competing brands is sure to be relevant. In logistics, on time deliveries, empty return loads, or missing items are candidate indicators.
Key Principles of Quality	The three guiding concepts for managing quality improvement are: Principle 1, Quality is defined as any product or service that satisfies customer specifications. Principle 2, the work standard is defect free. Principle 3, Quality is measured by the price of non quality.
KJ Method	The grouping method that creates the affinity diagram, which was developed by the Japanese cultural anthropologist Jiro Kawakita.
KMS	Knowledge Management System
Knowledge Acquisition	The procedure in artificial intelligence of interacting with an external source, usually a domain expert, to find and organize knowledge for the purpose of transferring the knowledge to an expert system to solve problems.
Knowledge Base	A logical collection of information in a particular domain that has been formalized in the appropriate representation with which to perform reasoning. A dynamic knowledge base is used to store information relevant to

	solving a particular problem and varies from one problem solving session to the next.
KPA	Key Process Area
KPI	See also "Key Performance Indicator"
KPIV	Key Process Input Variables
KPOV	Key Process Output Variables

L

LAB	Laboratory Accreditation Bureau
LCL	Lower Control Limit
Line Charts	Charts used to track the performance without relationship to process capability or control limits.
Linear Accuracy	Accuracy of the instrument when measuring along a single axis. This data is often integrated with the volumetric accuracy.
Lot or Batch	One or more components or finished devices that consist of a single type, model, class, size, composition, or software version that are manufactured under essentially the same conditions and that are intended to have uniform characteristics and quality within specified limits.
Lower Control Limit	A horizontal dotted line plotted on a control chart which represents the lower process limit capabilities of a process.
LSL	Lower Specification Limit
LTPD	Lot Tolerance Percent Defective The value of incoming quality where it is desirable to reject most lots.

M

M&TE	Measuring & Test Equipment
Maintainability	The probability that a failed system can be made operable in a specified interval or downtime. Ability of an item under stated conditions of use to be retained in, or restored to, within a given period of time, a specified state in which it can perform its required functions when maintenance is performed under stated conditions and while using prescribed procedures and resources.
Maintenance	Activities such as adjusting, cleaning, modifying, overhauling equipment to assure performance in accordance with requirements. Maintenance to a software system includes correcting software errors, adapting software to a new environment, or making enhancements to software.
Management	Coordinated activities to direct and control an organization.
Management System	System to establish policy and objectives and to achieve those objectives.
Matrix Analysis	This method quantifies and arranges matrix diagram data so that the information is easy to visualize and comprehend. The relationships between the elements shown in a matrix diagram are quantified by obtaining numerical data for intersection cells. The results of this technique are presented in diagram form.
Matrix Diagram	This method identifies corresponding elements involved in a problem situation or event. These elements are arranged in rows and columns on a chart that shows the presence or absence of relationships among collected pairs of elements.
MBNQA	Malcolm Baldrige National Quality Award An annual award given to a United States company that excels in quality management and quality achievement.
MBO	Management By Objectives
MBTI	Myers Briggs Type Indicator
Measurement Control System	Set of interrelated or interacting elements necessary to achieve metrological confirmation and continual control of measurement processes.
Measurement Process	Set of operations to determine the value of a quantity.

Measuring Equipment	Measuring instrument, software, measurement standard, reference material or auxiliary apparatus or combination thereof necessary to realize a measurement process.
Median	In a series of numbers, the median is a number which has at least half the values greater than or equal to it and at least half of them less than or equal to it.
Metacraftsmanship	It is a term used to tie together the many ideas shared by quality improvement, reengineering, management, leadership, and customer-driven production. Although these theories have much in common, they are often treated as separate and disparate approaches to improving a business. Metacraftsmanship focuses on overcoming the losses to society which are engendered by specialization, and suggests ways of getting complex organizations to work the way a single craftsman would.
Metrological Characteristic	Distinguishing feature which can influence the results of measurement.
Metrological Confirmation	Set of operations required to ensure that measuring equipment conforms to the requirements for its intended use.
MGPP	Multi Generational Product Planning MGPP is a tools used to define the scope of the current product or service to be designed as well as to plan the long-term direction of future product and service generations. It is used in the Define phase of DMADV.
Mishap	An unplanned event or series of events resulting in death. injury, occupational illness, or damage to or loss of data and equipment or property or damage to the environment.
MOA	Memorandum of Agreement
MRB	Material Review Board
MRP	Materials Requirements Planning A planning tool to increase manufacturing efficiency by managing the production schedule, reducing inventory, increasing cash flow and delivering products in a timely manner.
MSA	Measurement System Analysis
MSE	Measurement System Evaluation
MTBF	Mean Time Between Failures An average time between machinery breakdowns.
Mutation Analysis	A method to determine test set thoroughness by measuring the extent to which a test set can discriminate the program from slight variants of the program.

N

NACCB	National Accreditation Council for Certification Bodies in the United Kingdom
NDT	Nondestructive Testing
NIST	National Institute for Standards and Technology A federal agency under the Department of Commerce. Originally established by an act of congress on March 3, 1901 as the National Bureau of Standards. The institutes overall goal is to strengthen and advance the nations science and technology and facilitate their effective application for public benefit.
Noise	In the context of quality management, noise is essentially variability.
Nominal	The standard or desired dimension or size of a feature. The print values for the measurement as opposed to the measured values.
Nominal Group Technique	A structured brainstorming technique that allows a group or team to quickly come to consensus on the importance of issues, problems or solutions. Based on individual contributions, equal footing of team members and prioritization of issues. Technique used to encourage creative thinking and new ideas, but is more controlled than brainstorming. Each member of a group writes down his or her ideas and then contributes one to the group pool. All contributed ideas are then discussed and prioritized.
Nonconformance	Product or material which does not conform to the customer requirements or specifications.
Nonconformities	Specific occurrences of a condition that does not conform to specifications or other inspection standards; sometimes called discrepancies or defects
Nonconformity	The non-fulfillment of specified requirements. A process which does not conform to a quality system requirement. Non-fulfillment of a requirement.
Normal Distribution	See also “Distribution”
NSPI	National Society for Performance and Instruction
Null Hypothesis	A tentative explanation which indicates that a chance distribution is operating; a contrast to the alternate hypothesis. Typically a hypothesis of no difference. That is why the word "null" in "null hypothesis" is used -- it is the hypothesis of no difference.

	Despite the "null" in "null hypothesis," there are occasions when the parameter is not hypothesized to be 0. For example the null hypothesis may be that the parameter is equal to a specific value.
Numerical Reliability	The probability that an item will perform a required function under stated conditions for a stated period of time. See also “MTBF”

O

Object Modeling	The objective of object modeling is to understand and describe an environment in terms of its objects while embracing the concepts of abstraction, encapsulation, modularity, hierarchy, typing, concurrence and persistence.
Objective Evidence	Used in quality audits, objective evidence is information which can be proven true, based on facts obtained through observation, measurement, test or other means.
OCAP	Out of Control Action Plan
OEM	Original Equipment Manufacturer
OHSAS 18000	Occupational Health and Safety Standard
Ongoing Process Capability	Ongoing Process Capability is a long term measure of statistical process control or process performance. It differs from preliminary process capability by utilizing data from a longer time period so as to include all common causes of variation, in particular, those common causes that may result in process shifts affecting a number of sample intervals. Systematic or repetitive patterns of special cause may also be included if the underlying reasons for these special causes are understood. The time required for ongoing capability evaluation depends on the time required for the sources of variation to vary throughout their full ranges, but will typically be three to six months.
Organization	Group of people and facilities with an arrangement of responsibilities, authorities and relationships.
Organization Diagnostics	The process of identifying organization problems with individuals, processes, procedures, technology, culture, etc.
Organizational Structure	Arrangement of responsibilities, authorities and relationships between people.
OSHA	Occupational Safety and Health Administration
Outcome	The degree to which outputs meet the needs and expectations of the customer.
Output	The service or product that a customer receives from a process. The output of one process can be the input to a succeeding process.
Owner	The person who has or is given the responsibility and authority to lead the continuing improvement of a process. Process ownership is a designation made by leaders of

organizations and depends on the boundaries of the process.

P

P Chart	Charts used to plot percent defectives in a sample.
P3I	Pre Planned Product Improvement
PACF	Partial Autocorrelation Function
PAIS	Process Appraisal Information System
Paradigm	A way of thinking about a given subject that defines how one views events, relationships, ideas, etc. within the boundaries of that subject.
Paradigm Shift	A point in time when the knowledge or structure which underlies a science or discipline changes in such a fundamental way that the beliefs and behavior of the people involved in the science or discipline are changed.
Pareto Analysis	A bar chart in which the bars are displayed by frequency, in descending order, identifying the most important defects.
Pareto Chart	A bar graph used to arrange information in such a way that priorities for process improvement can be established. It displays the relative importance of data and is used to direct efforts to the biggest improvement opportunity by highlighting the vital few in contrast to the many others.
PCL	Process Center Line
PDCA	See "Plan Do Check Act"
PDPC	See also "Process Decision Program Chart"
Penny Matrix	A way to prioritize a list of options by pooling the opinions of raters. Raters "spend" their pennies across several options with the sums of "money spent" indicating a priority weighting and ranking to the options.
Perturbation	A non random disturbance.
PFMEA	Process Failure Mode and Effects Analysis An analytical technique used by a manufacturing responsible engineer/team as a means to assure that, to the extent possible, potential failure modes and their associated causes/mechanisms have been considered and addressed.
Plan-Do-Study-Act	Originally Shewhart's Plan Do Check Act or the application of the scientific method to engineering and management. Deming later changed Check to Study. A look before you leap approach to standardization or maintenance (Standardize Do Check Act), solving problems and improvement or reactive mode (Check Act Plan Do) and achieving

	opportunities and new developments or proactive mode (Plan Do Check Act).
Plan-Do-Check-Act	A four-step improvement process originally conceived of by Walter A. Shewhart. The first step involves planning for the necessary improvement; the second step is the implementation of the plan; the third step is to check the results of the plan; the last step is to act upon the results of the plan. It is also known as the Shewhart cycle, the Deming cycle and the PDCA cycle.
Pokayoke	Japanese approach to mistake proofing. Primarily activities for front line employees empowered to make changes to their work processes to enhance accuracy, safety and efficiency.
PONQ	See also "Price Of Non Quality"
Population	The universe of data under investigation from which a sample will be taken.
PPAP	Production Parts Approval Process The process outlines the methods used for approval of production and service commodities, including bulk materials, up to and including part submission warrant in the advanced quality planning process.
PPM	Parts Per Million It is a way of stating the performance of a process in terms of actual or projected defective material.
PPP	Proper Prior Planning
Preliminary Process Capability	Short term studies conducted to obtain early information on the performance of new or revised processes relative to internal or customer requirements. In many cases, preliminary studies should be conducted at several points in the evolution of new processes. These studies should be based on as many measurements as possible. When X bar and R charts, at least twenty subgroups (typically three to five pieces) are required to obtain sufficient data for decision making. When this amount of data is not available, control charts should be started with whatever data is available.
Present State	In a force field analysis, the description of an organization as it currently exists. It includes what happens in the organization, both formally and informally.
Prevention	A future-oriented strategy that improves quality by directing analysis and action toward correcting the production process. Prevention

	is consistent with a philosophy of never-ending improvement.
Preventive Action	Action to eliminate the cause of a potential nonconformity or other undesirable potential situation.
Price Of Non Quality	What it costs to do things wrong, resulting in losses such as time, money and opportunity. An equation for estimating PONQ is the amount of time required to fix a defect x the number of defects x the hourly wage rate (fully burdened with overhead, overtime, benefits, etc.).
Prioritization Matrix	A way to prioritize options by requiring the raters to work to consensus on priorities. Also known as a paired-comparison technique., the tool pairs each option with each other, with row totals indicating weighting and ranking.
Procedure	Specified way to carry out an activity or a process.
Process	The combination of people, machine and equipment, raw materials, methods and environment that produces a given product or service. Set of interrelated or interacting activities which transform inputs into outputs. A series of actions which repeatedly come together to transform inputs provided by a supplier into outputs received by a customer. A process can be used to develop products and services.
Process Capability	The measured, built-in reproducibility (consistency) of the product turned out by the process. Such a determination is made using statistical methods, not wishful thinking. The statistically determined pattern or distribution can only then be compared to specification limits to decide if a process can consistently deliver product within those parameters.
Process Capability Index	Measurement indicating the ability of a process to produce specified results. Cp and Cpk are two process capability indices.
Process Decision Program Chart	A method helps determine which processes to use to obtain desired results by evaluating the progress of events and the variety of conceivable outcomes. Implementation plans do not always progress as anticipated. When problems, technical or otherwise, arise, solutions are frequently not apparent. The PDPC method, in response to these kinds of problems, anticipates possible outcomes and prepares countermeasures that will lead to the best possible solutions.

Process Flow Diagram	Depicts the flow of material through the process, including any rework or repair operations.
Process Improvement	The continuous endeavor to learn about all aspects of a process and to use this knowledge to change the process to reduce variation and complexity and to improve customer judgments of quality.
Process Model	A graphic representation of a business process that exhibits the activities and their interdependencies that make up the business process to any desired level of detail. An activity model reveals the interactions between activities in terms of inputs and outputs while showing the controls placed on each activity and the types of resources assigned to each activity.
Process Quality Audit	An analysis of elements of a process and appraisal of completeness, correctness of conditions, and probable effectiveness.
Process Scope	The specific beginning and end points of any process for the purpose of analysis. The more specific the smallest element, the more meaningful the analysis of the input controls.
Process Spread	The range of values which a given process characteristic displays; this particular term most often applies to the range but may also encompass the variance. The spread may be based on a set of data collected at a specific point in time or may reflect the variability across a given amount of time.
Process Validation	Establishing by objective evidence that a process consistently produces a result or product meeting its predetermined specifications.
Process Variation	The spread of process output over time. There is variation in every process, and all variation is caused. The causes are of two types - special or common. A process can have both types of variation at the same time or only common cause variation. The management action necessary to improve the process is very different in each situation.
Product	Result of a process, e.g. services, software, hardware or processed materials, or a combination thereof.
Product Liability	A generic term used to describe the onus on a producer or others to make restitution for loss related to personal injury, property damage, or other harm caused by a product or service.
Product Quality Audit	A quantitative assessment of conformance to required product characteristics.

Project	Unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources.
Project Plan	A management document describing the approach taken for a project. The plan typically describes work to be done, resources required, methods to be used, the configuration management and quality assurance procedures to be followed, the schedules to be met, the project organization, etc. Project in this context is a generic term. Some projects may also need integration plans, security plans, test plans, quality assurance plans, etc.
Proof Of Correctness	The use of techniques of mathematical logic to infer that a relation between program variables assumed true at program entry implies that another relation between program variables holds at program exit.

Q

QA	Quality Assurance Generally refers to the post-production checks, inspection, or reviews done to ensure quality of a product or service.
QC	Quality Control
QFD	Quality Function Deployment The process of translating customer expectations and requirements into product or service documentation to ensure expectations and requirements are being met.
QIC	Quality Improvement Council A group composed of the coach and the senior leadership of an organization which is primarily responsible for planning, strategy development, deployment, monitoring, educating, and promoting CQI.
QIS	Quality Information System
QL	Quality Leader
QMS	Quality Management System
QOO	Quality Of Operations
QOS	Quality Operating System A systematic, disciplined approach that uses standardized tools and practices to manage business and achieve ever increasing levels of customer satisfaction.
QPR	Quality Problem Report
QS	Quality System
QS-9000	Quality system requirements for suppliers to Daimler Chrysler, Ford and General Motors.
QSR	Quality System Requirements
Qualification Process	Process to demonstrate the ability to fulfill specified requirements.
Quality	The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. The totality of features and characteristics that bear on the ability of a device to satisfy fitness-for-use, including safety and performance. Degree to which a set of inherent (existing) characteristics fulfils requirements.
Quality Assurance	All those planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. Part of quality management focused on providing confidence that quality requirements will be fulfilled.

Quality Audit	A systematic and independent examination and evaluation to determine whether quality activities and results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.
Quality Characteristic	Inherent characteristic of a product, process or system related to a requirement. Characteristics of the output of a process that are important to the customer. The identification of quality characteristics requires knowledge of the customer needs and expectations.
Quality Control	The operational techniques and the activities used to fulfill requirements of quality. Part of quality management focused on fulfilling quality requirements.
Quality Engineering	That branch of engineering which deals with the principles and practice of product and service quality assurance and control.
Quality Function Deployment	A requirements identification analysis, flow down and tracking technique. It focuses on quality and communication to translate customer needs into product and process design specifics. Also known as the "house of quality. A technique used to translate customer requirements into appropriate goals for each stage of product or service development and output. The two approaches to quality function deployment are known as the House of Quality and the Matrix of Matrices.
Quality Improvement	Part of quality management focused on increasing the ability to fulfill quality requirements. A systematic approach to the processes of work that looks to remove waste, loss, rework, frustration, etc. in order to make the processes of work more effective, efficient and appropriate.
Quality Inspection	Usually consists of three stages: sampling, measuring, and sorting. While many organizations rely on inspection to improve quality, the better way is to design quality into the product or service to improve the process. This may include some inspection as a means of data gathering.
Quality Loop	Conceptual model of interacting activities that influence the quality of a product or service in the various stages ranging from the identification of needs to the assessment of whether these needs have been satisfied.

Quality Management	The aspect of the overall business management function that determines and implements the quality policy. Coordinated activities to direct and control an organization with regard to quality.
Quality Management System	Management system to direct and control an organization with regard to quality.
Quality Manual	Document specifying the quality management system of an organization.
Quality Planning/Redesign	Creating new or redesigned products/services/processes to meet customer requirements. The steps of this method are organize the project, identify key customers, determine requirements, establish quality indicators, design, strengthen the design, test the design, implement and improve.
QSR Quality Measure	A quantitative measure of the features and characteristics of a product or service.
Qualification Process	Process to demonstrate the ability to fulfill specified requirements.
Quality Objective	Something sought, or aimed for, related to quality.
Quality Plan	A document setting out the specific quality practices, resources, and activities relevant to a particular product, process, service, contract, or project. Document specifying which procedures and associated resources shall be applied by whom and when to a specific project, product, process or contract.
Quality Plan Audit	See also "Quality system audit"
Quality Planning	A structured process for defining the methods (i.e., measurements, tests) that will be used in the production of a specific product or family of products (i.e., parts, materials). Part of quality management focused on setting quality objectives and specifying necessary operational processes and related resources to fulfill the quality objectives.
Quality Policy	The overall intentions and direction of an organization as regards quality as formally expressed by top management. Overall intentions and direction of an organization related to quality as formally expressed by top management.
Quality Spiral	See also "Quality loop"
Quality Surveillance	The continuing monitoring and verification of the status of procedures, methods, conditions, products, processes, and services, and analysis of records in relation to stated references to ensure that requirements for quality are being met.

Quality System	The organizational structure, responsibilities, procedures, processes, and resources for implementing quality management.
Quality System Audit	A documented activity performed to verify, by examination and evaluation of objective evidence, that applicable elements of the quality system are suitable and have been developed, documented, and effectively implemented in accordance with specified requirements.
Quality System Review	A formal evaluation by management of the status and adequacy of the quality system in relation to quality policy and/or new objectives resulting from changing circumstances.

R

R Charts	Plot of the difference between the highest and lowest in a sample.
RAB	Registrar Accreditation Board (U.S.)
Range	A measure of the variation in a set of data. It is calculated by subtracting the lowest value in the data set from the highest value in that same set. The X, Y or Z distance the CMM can travel while measuring a part. For articulating arms, the laser trackers and other nontraditional CMMs, this dimension may be represented as a sphere.
Reaction Plan	The action specified by a Control Plan when nonconforming product or process instability is identified.
Realization	The carrying out of an action or process to completion as used in ISO 9000:2000.
Recognition	The formal and informal acknowledgement of an individual or group record of change. A record of change can be a written document or a database. Normally there are two associated with a computer system, hardware and software. Changes made to the data are recorded in an audit trail.
Record	Document stating results achieved or providing evidence of activities performed.
Red Bead Experiment	A simple exercise to demonstrate, among other things, that many managers hold workers to standards beyond their control, variation is part of any process, and workers work within a system beyond their control. The game also shows that some workers will always be above average, some average, and some below average, that the system, not the skills of individual workers, determines to a large extent how workers in repeating processes perform, and that only management can change the system or empower others to change it.
Refreezing	Recognizing, reinforcing, and rewarding new organizational attitudes and behaviors so they become the norm. Making processes, systems, and methods throughout the organization support CQI.
Registrar	A company that conducts quality system assessments to the Quality System Requirements.

Regrade	Alteration of the grade of a nonconforming product in order to make it conform to requirements differing from the original ones.
Regression Analysis	Models the relationship between one or more independent variables and a dependent variable.
Relations Diagram	This method is a technique developed to clarify intertwined causal relationships in a complex situation in order to find an appropriate solution. It is typically represented graphically as squared ellipses (concepts) and connected by directed lines (arrowheads show direction). The directed lines represent causal relations between the concepts.
Relative Quality	Degree of excellence of a product or service.
Release	Permission to proceed to the next stage of a process.
Reliability	The probability that an item will continue to function at customer expectation levels at a measurement point, under specified environmental and duty cycle conditions. The ability of an item to perform a required function under stated conditions.
Reliability Engineering	That engineering function dealing with the principles and practices related to the design, specification, assessment, and achievement of product or system reliability requirements and involving aspects of prediction, evaluation, production, and demonstration.
Repair	Action taken on nonconforming product so that the product will fulfill the intended usage although the product may not conform to the original requirements. Action on a nonconforming product to make it acceptable for the intended use.
Repeatability	A measure of the ability of an instrument to produce the same measured value when sequentially sensing the same quantity under similar measurement conditions.
Requirement	Need or expectation that is stated, generally implied or obligatory.
Requirement Indicator Matrix	A matrix that shows the presence of all possible relationships between customer requirements and quality indicators.
Requirements Analysis	The process of studying user needs to arrive at a definition of a system, hardware or software requirements. The process of studying and refining system, hardware or software requirements.
Requirements Phase	The period of time in the software life cycle during which the requirements, such as

	functional and performance capabilities for a software product, are defined and documented.
Resolution	The smallest distance that can be measured by the instrument.
Review	Activity undertaken to determine the suitability, adequacy and effectiveness of the subject matter to achieve established objectives.
Rework	Action taken on a nonconforming product so that it will fulfill the specified requirements before it is released for distribution. Action taken on nonconforming product so that it will meet the specified requirements. Action on a nonconforming product to make it conform to the requirements.
Risk	The possibility of loss, injury, disadvantage or destruction. Apply this definition to the issues of program management and you have the starting point for successful risk management.
Risk Assessment	A comprehensive evaluation of the risk and its associated impact.
Root Cause	The lowest level cause of a failure, or variation in a product, component or process.
Root Cause Analysis	Using one or more various tools to determine the root cause of a specific failure.
RQL	Rejectable Quality Level A generic term for the incoming quality level for which there is a low probability of accepting the lot.
RTY	Rolled Throughput Yield
Run Chart	A display of data in the order that they occur. Run charts display process variation and can be used to indicate special causes of process variation in the form of trends, shifts, or other non-random patterns.
Runs	The patterns in a Control Chart within which a number of points line up on only one side of the central line. Shows the history and pattern of variation. It is helpful to indicate on the chart whether up is good or down is good. This tool is used at the beginning of the change process to see what the problems are. It is used at the end (check) part of the change process to see whether the change has resulted in a permanent improvement.
RvC	Raad voor de Certificatie (Dutch Council for Certification)

S

S Chart	Control chart in which the standard deviation of the subgroup is tracked to determine the variation within a process over time. Sample standard deviation charts are usually paired with average charts for complete analysis.
SA8000	Social Accountability Standard
SAE	Society of Automotive Engineers
Sample	One or more individual events or measurements selected from the output of a process for purposes of identifying characteristics and performance of the whole.
SCAMPI^{SM}	Standard CMMI Appraisal Method for Process Improvement
Scatter diagram	An X-Y chart that measures the relationship between two sets of variables. If there is correlation between the variables, the points will be grouped around a line, otherwise, the points will be randomly distributed.
SCC	Standards Council of Canada
Scrap	Action on a nonconforming product to preclude its originally intended use.
SDCA	see also "Standardize-Do-Check-Act"
SEI	Software Engineering Institute
SFMEA	System Failure Mode and Effects Analysis
Shewhart Cycle	Another name for the Plan-Do-Check-Act cycle. It is also sometimes called the Deming cycle.
Shewhart, Walter A.	The father of statistical process control or statistical quality control. He pioneered statistical quality control and improvement methods when he worked for Western Electric and Bell Telephone in the early decades of the 20th century.
Sigma (σ)	The Greek letter used to designate the estimated standard deviation.
Simulation	The practice of mimicking some or all of the behavior of one system with a different, dissimilar system.
Simulation analysis	A software task to simulate critical tasks of the software or system environment to analyze logical or performance characteristics that would not be practical to analyze manually.
Simultaneous Engineering	A way of simultaneously designing products, and the processes for manufacturing those products, through the use of cross-functional teams to assure manufacturability and to reduce cycle time.
SIPOC	Supplier, Inputs, Process, Outputs, Customer

	A tool used by a team to identify all relevant elements of a process improvement project before work begins. The name prompts the team to consider the suppliers of the process, the inputs to the process, the process the team is improving, the outputs of the process and the customers that receive the process outputs.
Six Sigma	Quality process, developed at Motorola, focused on reducing defects to a six sigma level, for all practical purposes zero defects.
Six Sigma Black Belt	Black Belts are project leader who receive four weeks of training focusing on the Six Sigma roadmap and extensive statistical methodologies. Successful Black Belts normally dedicate at least 75 percent of their time to a four to six month Six Sigma project.
Six Sigma Champion	Champions are trained in the essentials of the Six Sigma methodology focusing on selecting the projects that are aligned with business goals. Champions must select and mentor Six Sigma project leaders and must support, align and integrate the Six Sigma launch into their organization.
Six Sigma Green Belt	Green Belts are project leader who receive two weeks of training on the Six Sigma roadmap and essential elements of statistical methodologies supporting Six Sigma projects. Successful Green Belts are able to allocate 50 percent of their time to a four to six month Six Sigma project.
Six Sigma Master Black Belt	Master Black Belts are top full-time Six Sigma experts, who will help with project selection, mentor other belts and lead training.
Six Sigma Yellow Belt	Yellow Belts are project team members who assist and lead different aspects of Six Sigma projects. It is best for Yellow Belts to attend a two day project training and kick-off session lead by a Black Belt.
SLRP	Strategic Long Range Planning
SMART	A definition type for goals and problems in a Six Sigma quality initiative. It consists of type Specific, Measurable, Archievable, Realistic and Timebound.
SMWT	Self-Managed Work Teams
Software	An intellectual creation consisting of information expressed through supporting medium.
SPC	Statistical Process Control The application of statistical methods to analyze data, study and monitor process

	capability and performance. Use of control charts to monitor process performance.
Special Cause	A source of variation that is intermittent, unpredictable, unstable; sometimes called an assignable cause.
Special Cause Variation	Variation in the process that is assignable to a specific cause or causes. It arises because of special circumstances.
Specification	Document stating requirements The document that prescribes the requirements with which the product or service has to conform. The engineering requirement for judging acceptability of a particular characteristic. Chosen with respect to functional or customer requirements for the product, a specification may or may not be consistent with the demonstrated capability of the process (if it is not, out-of-specification parts are certain to be made). A specification should never be confused with a control limit.
Specification Analysis	Evaluation of each safety-critical software requirement with respect to a list of qualities such as completeness, correctness, consistency, testability. robustness, integrity, reliability, usability, flexibility, maintainability, portability, interoperability, accuracy, audibility, performance. internal instrumentation, security and training.
Spiral Model	A model of the software development process in which the constituent activities, typically requirements analysis, preliminary and detailed design. coding, integration, and testing are performed iteratively until the software is complete. Contrast with incremental development; rapid prototyping or waterfall model.
Spider Diagram	A visual report card for the performance of a number of indicators on a single chart. Also know as a "radar chart" and a "gap analysis" tool, this diagram makes visible the gaps between the current and desired performance.
SQA	Supplier Quality Assistance
SQC	Statistical Quality Control The application of statistical techniques to measure variation in materials, parts, components, and products. The process of maintaining acceptable levels of product quality by using statistical techniques.
SQE	Supplier Quality Engineering
SRM	Standard Reference Material
SS	Supplier Sourcing

Stakeholder	An individual or group of individuals with a common interest in the performance of the supplier organization and the environment in which it operates.
Standard Deviation	A measure of the spread of the process output or the spread of a sampling statistic from the process (e.g., of subgroup averages), denoted by the Greek letter σ(sigma) for the estimated standard deviation.
Standardize Do Check Act	An approach, similar to PDCA that establishes and maintains the current status of a process.
State Diagram	A diagram that depicts the states that a system or component can assume, and shows the events or circumstances that cause or result from a change from one state to another.
Static Analysis	Analysis of a program that is performed without executing the program. The process of evaluating a system or component based on its form, structure, content, documentation.
Statistical Control	The condition describing a process from which all special causes have been removed, evidenced on a control chart by the absence of points beyond the control limits and by the absence of non-random patterns or trends within the control limits.
Statistical Process Control	The application of statistical techniques to the control of processes. The use of statistical techniques such as Control Charts to analyze a process or its output to take appropriate actions to achieve and maintain a state of statistical control and to improve the capability of the process.
Statistical Quality Control	The application of statistical techniques to the control of quality.
Storytelling	A major accelerator of the process of organization wide CQI that uses storybooks to follow steps in the QI or QP strategy. Storybooks and storyboards help teams organize their work and their presentations so others can more readily learn from them. Use of storyboards and storybooks reduces variation in the process of storytelling so the focus of learning is on content, not the method of telling. Storybooks form a permanent record of a team's actions and achievements and all the data generated, and storyboards can function as the working minutes of a team.
Stratification	The process of classifying data into subgroups based on characteristics or categories.

Structural Variation	Variation caused by recurring system-wide changes such as seasonal changes or long-term trends.
Supplier	Organization or person that provides a product.
System	Set of interrelated or interacting elements.
Systematic Diagram	Is a hierarchical graphic representation of the prerequisite steps necessary to go accomplish a goal or task.
Systematic Diagram method	Searches for the most appropriate and effective means of accomplishing given objectives. This diagram can be divided into two types: The constituent component analysis diagram breaks down the main subject into its basic elements and depicts their relationships to the objectives and means of obtaining those objectives. The plan development diagram systematically shows the means and procedures necessary to successfully implement a given plan. It is typically represented graphically either a horizontal or vertical tree structure connecting the elements.

T

Taguchi, Genichi	Developed a set of practices known as Taguchi Methods, as they are known in the U.S., for improving quality while reducing costs. Taguchi Methods focus on the design of efficient experiments, and the increasing of signal to noise ratios. Dr. Taguchi also articulated the developed the quality loss function. Currently, he is executive director of the American Supplier Institute and director of the Japan Industrial Technology Institute.
Tampering	Taking action without taking into account the difference between special and common cause variation.
Team	Cross-functional team: A group of usually five to eight people from two or more areas of the organization who are addressing an issue which impacts the operations of each area. For example, the processes of meeting information requests might be addressed by a team, managed care and marketing staff. Functional team: A group of five to eight people addressing an issue where any recommended changes would not be likely to affect people outside the specific area. For example, a functional team concerned with filing and retrieving data in the laboratory might consist just of people who work in the lab.
Test	Determination of one or more characteristics according to a procedure.
Testing	A means of determining the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating actions and conditions.
TGA	Germany Association for Accreditation
Throughput	Describes how many points per minute an instrument can measure.
Timing and Sizing Analysis	Analysis of the safety implications of safety-critical requirements that relate to execution time, clock time and memory allocation.
Timing Plan	A plan that lists tasks, assignments, events and timing required to provide a product that meets customer needs and expectations.
TL 9000	Quality system requirements for suppliers to the telecommunications industry
Top Management	Person or group of people who directs and controls an organization at the highest level.

Total Quality Management	Management and control activities based on the leadership of top management and based on the involvement of all employees and all departments from planning and development to sales and service. These management and control activities focus on quality assurance by which those qualities which satisfy the customer are built into products and services during the above processes and then offered to consumers.
TPI®	Test Process Improvement A model created by Sogeti Nederland B.V., which gives practical guidelines for assessing the maturity level of software testing.
TPM	Total Productive Maintenance
TQM	Total Quality Management
Traceability	The ability to trace the history, application, or location of an item or activity and like items or activities by means of recorded identification. Ability to trace the history, application or location of that which is under consideration.
Traceability Matrix	A matrix that records the relationship between two or more products and records the relationship between the requirements and the design of a given software component.
Transformation	A major organizational change from the present state to a new/preferred state in which CQI flourishes. The primary steps involved in moving an organization through a transformation are present state, unfreezing, transition period, refreezing, and new/preferred state.
Transition Period	A description of the time when an organization is visibly moving away from the old way toward the new way. During this time, employee attitudes and behaviors range from being excited and busy to being confused and resistant. The support for change is building. New leaders emerge, champions of the change come forward and confusion over roles begins to clear.
Tree Diagram	A tool to expand a proposed change from a general idea to a specific series of concepts or actions. Used to systematically map out in increasing detail the full range of paths and tasks that need to be accomplished to achieve a primary goal and related subgoals.
TRIZ	The Russian acronym for Theory of Inventive Problem Solving. TRIZ is an established science, methodology, tools and knowledge- and model-based

	technology for stimulating and generating innovative ideas and solutions for problem solving.
True Position	The exact location of a point, line or plane with respect to a datum or other feature.
TSP	Team Software Process
TVM	Total Value Management

U

U Chart	A control chart showing the count of defects per unit in a series of random samples.
UCL	Upper Control Limit
UKAS	United Kingdom Accreditation Scheme
Ultimate Customer	The person or unit who receives the output from a series of processes and for who these processes are designed. Without the ultimate customer, there would be no need for the intermediate processes to exist.
Unfreezing	Reassessing old values and behaviors and becoming open to the acceptance of a new culture.
USL	Upper Specification Limit

V

V&V	Verification and Validation
Validation	Confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use can be consistently fulfilled. Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.
Variables	Those characteristics of a part that can be measured. Examples are length in millimeters, resistance in ohms, closing effort of a door in kilograms, and the torque of a nut in foot pounds.
Variation	The inevitable difference among individual outputs of a process. The sources of variation can be grouped into two major classes: Common Causes and Special Causes.
VDA 6.1	Verband der Automobilindustrie, quality system requirements for suppliers to German car maker
Verification	The act of reviewing, inspecting, testing, checking, auditing, or otherwise establishing and documenting whether items, processes, services, or documents conform to specified requirements. Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled. Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.
VOC	Voice of the Customer Customer feedback both positive and negative; including likes, dislikes, problems and suggestions.
VOP	Voice of the Process Statistical data that is feedback to the people in the process to make decisions about the process stability and/or capability as a tool for continual improvement.
Volumetric Accuracy	Accuracy of the instrument when measuring along all axes simultaneously.
VV&A	Verification, Validation and Accreditation
VV&C	Verification, Validation and Certification
VV&T	Validation, Verification and Testing

W

Waiver	Written authorization to use or release a quantity of material, components, or stores already manufactured but not conforming to the specified requirements.
Work Environment	Set of conditions under which work is performed.
Workflow	A system whose elements are activities, related to one another by a trigger relation, and triggered by external events, which represent a business process starting with a commitment and ending with the termination of that commitment.

X

X&R Chart	A control chart which is a representation of process capability over time. It displays the variability in the process average and range across time.
XmR Chart	Control chart which uses a moving range. Typically two but can have a larger range.

Y

Yield	Yield is the percentage of a process that is free of defects.

Z

Zero Defects	The Six Sigma quality concept of zero tolerance for defects.

References

Articles: *Quality Encyclopedia*, Quality America Inc., Tucson

Extract from the web pages of *1stNclass.com, adams six sigma*