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Basic Concepts

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Overview

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

C

C chart: See "count chart."

Calibration: The comparison of a measurement instrument or system of unverified accuracy to a measurement instrument or system of known accuracy to detect any variation from the required performance specification.

Capability: The total range of inherent variation in a stable process determined by using data from control charts.

Capability maturity model (CMM): A framework that describes the key elements of an effective software process. It's an evolutionary improvement path from an immature process to a mature, disciplined process. The CMM covers practices for planning, engineering and managing software development and maintenance to improve the ability of organizations to meet goals for cost, schedule, functionality and product quality.

Capacity constraint resources: A series of nonbottlenecks (based on the sequence in which jobs are performed) that can act as a constraint.

Cascading: The continuing flow of the quality message down to, not through, the next level of supervision until it reaches all workers. Also see "deployment."

CASCO: An International Organization for Standardization policy development committee for conformity assessment. **Cause:** An identified reason for the presence of a defect or problem.

Cause and effect diagram: A tool for analyzing process dispersion. It is also referred to as the "Ishikawa diagram," because Kaoru Ishikawa developed it, and the "fishbone diagram," because the complete diagram resembles a fish skeleton. The diagram illustrates the main causes and subcauses leading to an effect (symptom). The cause and effect diagram is one of the "seven tools of quality" (see listing).

Cell: An arrangement of people, machines, materials and equipment in which the processing steps are placed next to each other in sequential order and through which parts are processed in a continuous flow. The most common cell layout is a U shape.

Cellular manufacturing: Arranging machines in the correct process sequence, with operators remaining within the cell and materials presented to them from outside.

Centerline: A line on a graph that represents the overall average (mean) operating level of the process.

Central tendency: The tendency of data gathered from a process to cluster toward a middle value somewhere between the high and low values of measurement.

Certification: The result of a person meeting the established criteria set by a certificate granting organization.

Certified biomedical auditor (CBA): An ASQ certification.

Certified calibration technician (CCT): An ASQ certification.

Certified HACCP auditor (CHA): An ASQ certification.

Certified manager of quality/organizational excellence (CMQ/OE): An ASQ certification; formerly certified quality manager (CQM).

Certified quality auditor (CQA): An ASQ certification.

Certified quality engineer (CQE): An ASQ certification.

Certified quality improvement associate (CQIA): An ASQ certification.

Certified quality inspector (CQI): An ASQ certification; formerly certified mechanical inspector (CMI).

Certified quality process analyst (CQPA): An ASQ certification.

Certified quality technician (CQT): An ASQ certification.

Certified reliability engineer (CRE): An ASQ certification.

Certified Six Sigma Black Belt (CSSBB): An ASQ certification.

Certified Six Sigma Green Belt (CSSGB): An ASQ certification.

Certified software quality engineer (CSQE): An ASQ certification.

Chain reaction: A chain of events described by W. Edwards Deming: improve quality, decrease costs, improve productivity, increase market with better quality and lower price, stay in business, provide jobs and provide more jobs.

Chain sampling plan: In acceptance sampling, a plan in which the criteria for acceptance and rejection apply to the cumulative sampling results for the current lot and one or more immediately preceding lots.

Champion: A business leader or senior manager who ensures resources are available for training and projects, and who is involved in periodic project reviews; also an executive who supports and addresses Six Sigma organizational issues.

Change agent: An individual from within or outside an organization who facilitates change in the organization; might be the initiator of the change effort, but not necessarily.

Changeover: A process in which a production device is assigned to perform a different operation or a machine is set up to make a different part—for example, a new plastic resin and new mold in an injection molding machine.

Changeover time: The time required to modify a system or workstation, usually including both teardown time for the existing condition and setup time for the new condition.

Characteristic: The factors, elements or measures that define and differentiate a process, function, product, service or other entity.

Chart: A tool for organizing, summarizing and depicting data in graphic form.

Charter: A written commitment approved by management stating the scope of authority for an improvement project or team.

Checklist: A tool for ensuring all important steps or actions in an operation have been taken. Checklists contain items important or relevant to an issue or situation. Checklists are often confused with check sheets (see listing).

Check sheet: A simple data recording device. The check sheet is custom designed by the user, which allows him or her to readily interpret the results. The check sheet is one of the "seven tools of quality" (see listing). Check sheets are often confused with checklists (see listing).

Classification of defects: The listing of possible defects of a unit, classified according to their seriousness. Note: Commonly used classifications: class A, class B, class C, class D; or critical, major, minor and incidental; or critical, major and minor. Definitions of these classifications require careful preparation and tailoring to the product(s) being sampled to ensure accurate assignment of a defect to the proper classification. A separate acceptance sampling plan is generally applied to each class of defects.

Closed-loop corrective action (CLCA): A sophisticated engineering system to document, verify and diagnose failures, recommend and initiate corrective action, provide follow-up and maintain comprehensive statistical records. Code of conduct: Expectations of behavior mutually agreed on by a team.

Common causes: Causes of variation that are inherent in a process over time. They affect every outcome of the process and everyone working in the process. Also see "special causes."

Company culture: A system of values, beliefs and behaviors inherent in a company. To optimize business performance, top management must define and create the necessary culture.

Complaint tracking: Collecting data, disseminating them to appropriate persons for resolution, monitoring complaint resolution progress and communicating results.

Compliance: The state of an organization that meets prescribed specifications, contract terms, regulations or standards.

Computer aided design (CAD): A type of software used by architects, engineers, drafters and artists to create precision drawings or technical illustrations. CAD software can be used to create 2-D drawings or 3-D models.

Computer aided engineering (CAE): A broad term used by the electronic design automation industry for the use of computers to design, analyze and manufacture products and processes. CAE includes CAD (see listing) and computer aided manufacturing (CAM), which is the use of computers for managing manufacturing processes.

Concurrent engineering (CE): A way to reduce cost, improve quality and shrink cycle time by simplifying a product's system of life cycle tasks during the early concept stages.

Conflict resolution: The management of a conflict situation to arrive at a resolution satisfactory to all parties.

Conformance: An affirmative indication or judgment that a product or service has met the requirements of a relevant specification, contract or regulation.

Conformitè Europëenne Mark (CE Mark): European Union (EU) conformity mark for regulating the goods sold within its borders. The mark represents a manufacturer's declaration that products comply with EU New Approach Directives. These directives apply to any country that sells products within the EU.

Conformity assessment: All activities concerned with determining that relevant requirements in standards or regulations are fulfilled, including sampling, testing, inspection, certification, management system assessment and registration, accreditation of the competence of those activities and recognition of an accreditation program's capability.

Consensus: A state in which all the members of a group support an action or decision, even if some of them don't fully agree with it.

Constraint: Anything that limits a system from achieving higher performance or throughput; also, the bottleneck that most severely limits the organization's ability to achieve higher performance relative to its purpose or goal.

Constraints management: See "theory of constraints."

Consultant: An individual who has experience and expertise in applying tools and techniques to resolve process problems and who can advise and facilitate an organization's improvement efforts.

Consumer: The external customer to whom a product or service is ultimately delivered; also called end user.

Consumer's risk: Pertains to sampling and the potential risk that bad products will be accepted and shipped to the consumer.

Continuous flow production: A method in which items are produced and moved from one processing step to the next, one piece at a time. Each process makes only the one piece that the next process needs, and the transfer batch size is one. Also referred to as one-piece flow and single-piece flow.

Continuous improvement (CI): Sometimes called continual improvement. The ongoing improvement of products, services or processes through incremental and breakthrough improvements.

Continuous quality improvement (CQI): A philosophy and attitude for analyzing capabilities and processes and improving them repeatedly to achieve customer satisfaction.

Continuous sampling plan: In acceptance sampling, a plan, intended for application to a continuous flow of individual units of product, that involves acceptance and rejection on a unit-byunit basis and employs alternate periods of 100% inspection and sampling. The relative amount of 100% inspection depends on the quality of submitted product. Continuous sampling plans usually require that each t period of 100% inspection be continued until a specified number, i, of consecutively inspected units are found clear of defects. Note: For single level continuous sampling plans, a single d sampling rate (for example, inspect one unit in five or one unit in 10) is used during sampling. For multilevel continuous sampling plans, two or more sampling rates can be used. The rate at any time depends on the quality of submitted product.

Control chart: A chart with upper and lower control limits on which values of some statistical measure for a series of samples or subgroups are plotted. The chart frequently shows a central line to help detect a trend of plotted values toward either control limit.

Control limits: The natural boundaries of a process within specified confidence levels, expressed as the upper control limit (UCL) and the lower control limit (LCL).

Control plan (CP): Written descriptions of the systems for controlling part and process quality by addressing the key characteristics and engineering requirements.

Coordinate measuring machine (CMM): A device that dimensionally measures 3-D products, tools and components with an accuracy approaching 0.0001 inches.

Corrective action: A solution meant to reduce or eliminate an identified problem.

Corrective action recommendation (CAR): The full cycle corrective action tool that offers ease and simplicity for employee involvement in the corrective action/process improvement cycle.

Correlation (statistical): A measure of the relationship between two data sets of variables.

Cost of poor quality (COPQ): The costs associated with providing poor quality products or services. There are four categories: internal failure costs (costs associated with defects found before the customer receives the product or service), external failure costs (costs associated with defects found after the customer receives the product or service), appraisal costs (costs incurred to determine the degree of conformance to quality requirements) and prevention costs (costs incurred to keep failure and appraisal costs to a minimum).

Cost of quality (COQ): Another term for COPQ. It is considered by some to be synonymous with COPQ but is considered by others to be unique. While the two concepts emphasize the same ideas, some disagree as to which concept came first and which categories are included in each.

Count chart: A control chart for evaluating the stability of a process in terms of the count of events of a given classification occurring in a sample; known as a "c-chart."

Count per unit chart: A control chart for evaluating the stability of a process in terms of the average count of events of a given classification per unit occurring in a sample.

Cp: The ratio of tolerance to 6 sigma, or the upper specification limit (USL) minus the lower specification limit (LSL) divided by 6 sigma. It is sometimes referred to as the engineering tolerance divided by the natural tolerance and is only a measure of dispersion.

Cpk index: Equals the lesser of the USL minus the mean divided by 3 sigma (or the mean) minus the LSL divided by 3 sigma. The greater the Cpk value, the better.

Critical processes: Processes that present serious potential dangers to human life, health and the environment or that risk the loss of significant sums of money or customers.

Cross functional: A term used to describe a process or an activity that crosses the boundary between functions. A cross functional team consists of individuals from more than one organizational unit or function.

Cross pilot: See "scatter diagram."

Cultural resistance: A form of resistance based on opposition to the possible social and organizational consequences associated with change.

Culture change: A major shift in the attitudes, norms, sentiments, beliefs, values, operating principles and behavior of an organization.

Culture, organizational: A common set of values, beliefs, attitudes, perceptions and accepted behaviors shared by individuals within an organization.

Cumulative sum control chart (CUSUM): A control chart on which the plotted value is the cumulative sum of deviations of successive samples from a target value. The ordinate of each plotted point represents the algebraic sum of the previous ordinate and the most recent deviations from the target.

Current good manufacturing practices (CGMP): Regulations enforced by the U.S. Food and Drug Administration for food and chemical manufacturers and packagers.

Customer: See "external customer" and "internal customer."

Customer delight: The result of delivering a product or service that exceeds customer expectations.

Customer relationship management (CRM): A strategy for learning more about customers' needs and behaviors to develop stronger relationships with them. It brings together information about customers, sales, marketing effectiveness, responsiveness and market trends. It helps businesses use technology and human resources to gain insight into the behavior of customers and the value of those customers.

Customer satisfaction: The result of delivering a product or service that meets customer requirements.

Customer-supplier model (CSM): A model depicting inputs flowing into a work process that, in turn, add value and produce outputs delivered to a customer. Also called customer-supplier methodology.

Customer-supplier partnership: A long-term relationship between a buyer and supplier characterized by teamwork and mutual confidence. The supplier is considered an extension of the buyer's organization. The partnership is based on several commitments. The buyer provides long-term contracts and uses fewer suppliers. The supplier implements quality assurance processes so incoming inspection can be minimized. The supplier also helps the buyer reduce costs and improve product and process designs.

Cycle: A sequence of operations repeated regularly.

Cycle time: The time required to complete one cycle of an operation. If cycle time for every operation in a complete process can be reduced to equal takt time, products can be made in single-piece flow. Also see "takt time."