Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Total quality management (TQM) APICS CPIM Learning System © 2023	**Term** Quality APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Internal customer APICS CPIM Learning System © 2023	**Term** Quality trilogy APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Intangible costs APICS CPIM Learning System © 2023	**Term** Hoshin planning APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Robust design APICS CPIM Learning System © 2023	**Term** Fitness for use APICS CPIM Learning System © 2023

Conformance to requirements or fitness for use. [It] can be defined through five principal approaches: (1) [The transcendent type] is an ideal; a condition of excellence. (2) [The product-based type] is based on a product attribute. (3) [The user-based type] is fitness for use. (4) [The manufacturing-based type] is conformance to requirements. (5) [The value-based type] is the degree of excellence at an acceptable price. Also, [it] has two major components: (1) [conformance—it] is defined by the absence of defects, and (2) [design—it] is measured by the degree of customer satisfaction with a product's characteristics and features.	A term coined to describe Japanese-style management approaches to quality improvement. Since then, [it] has taken on many meanings. Simply put, [it] is a management approach to long-term success through customer satisfaction. [It] is based on the participation of all members of an organization in improving processes, goods, services, and the culture in which they work. The methods for implementing this approach are found in teachings of such quality leaders as Philip B. Crosby, W. Edwards Deming, Armand V. Feigenbaum, Kaoru Ishikawa, J.M. Juran, and Genichi Taguchi.
A three-pronged approach to managing quality proposed by Joseph Juran. The three legs are quality planning (developing the products and processes required to meet customer needs), quality control (meeting product and process goals), and quality improvement (achieving unprecedented levels of performance). Syn: Juran Trilogy.	The recipient (person or department) of another person's or department's output (good, service, or information) within an organization. See: customer, external customer.
Breakthrough planning. A Japanese strategic planning process in which a company develops up to four vision statements that indicate where the company should be in the next five years. Company goals and work plans are developed based on the vision statements. Periodic audits are then conducted to monitor progress.	Those costs that are difficult to quantify, such as the cost of poor quality or of high employee turnover.
A term used to indicate that a good or service fits the customer's defined purpose for that good or service.	Type of design for a product or service that plans for intended performance even in the face of a harsh environment.

Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Quality assurance/control APICS CPIM Learning System © 2023	**Term** Total quality control (TQC) APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Management by walking around (MBWA) APICS CPIM Learning System © 2023	**Term** Cost of poor quality APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Quality costs APICS CPIM Learning System © 2023	**Term** External failure costs APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Internal failure costs APICS CPIM Learning System © 2023	**Term** Field service APICS CPIM Learning System © 2023

The process of creating and producing the total composite good and service characteristics (by marketing, engineering, manufacturing, purchasing, etc.) through which the good and service will meet the expectations of customers.	Two terms that have many interpretations because of the multiple definitions for the words “assurance” and “control.” For example, “assurance” can mean the act of giving confidence, the state of being certain, or the act of making certain; “control” can mean an evaluation to indicate needed corrective responses, the act of guiding, or the state of a process in which the variability is attributable to a constant system of chance causes. One definition of quality assurance is all the planned and systematic activities implemented within the quality system that can be demonstrated to provide confidence that a good or service will fulfill requirements for quality. One definition for quality control is the operational techniques and activities used to fulfill requirements for quality. Often, however, quality assurance and quality control are used interchangeably, referring to the actions performed to ensure the quality of a good, service, or process. See: quality control.
The costs associated with performing a task incorrectly and/or generating unacceptable output. These costs would include the costs of nonconformities, inefficient processes, and lost opportunities. See: quality costs.	The management technique of managers touring a facility on a regular basis to talk with workers and staff about problems, trends, and potential solutions.
The costs related to problems found after the product reaches the customer. This usually includes such costs as warranty and returns.	The overall costs associated with prevention activities and the improvement of quality throughout the firm before, during, and after production of a product. These costs fall into four recognized categories: internal failure costs, external failure costs, appraisal costs, and prevention costs. Internal failure costs relate to problems before the product reaches the customer. These usually include rework, scrap, downgrades, reinspection, retest, and process losses. External failure costs relate to problems found after the product reaches the customer. These usually include such costs as warranty and returns. Appraisal costs are associated with the formal evaluation and audit of quality in the firm. Typical costs include inspection, quality audits, testing, calibration, and checking time. Prevention costs are those caused by improvement activities that focus on reducing failure and appraisal costs. Typical costs include education, quality training, and supplier certification. See: cost of poor quality.
The functions of installing and maintaining a product for a customer after the sale or during the lease. [It] may also include training and implementation assistance. Syn: after-sale service.	The cost of things that go wrong before the product reaches the customer. [These] usually include rework, scrap, downgrades, reinspection, retesting, and process losses.

Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Nonevident failure	**Term** Prevention costs
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Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Preventive maintenance	**Term** Basic seven tools of quality (B7)
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Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Check sheet	**Term** Pareto chart
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Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Pareto’s law	**Term** Cause-and-effect diagram
APICS CPIM Learning System © 2023	APICS CPIM Learning System © 2023

The costs caused by improvement activities that focus on the reduction of failure and appraisal costs. Typical costs include education, quality training, and supplier certification. [This is one of the] four categories of quality costs.	Failure occurring in either a product or a production process that is not immediately evident. This may be indicative of a faulty design.
Tools that help organizations understand their processes in order to improve them. The tools are the cause-and-effect diagram (also known as the fishbone diagram or the Ishikawa diagram), check sheet, flowchart, histogram, Pareto chart, control chart, and scatter diagram. Syn: seven tools of quality. See: seven newer tools of quality.	The activities, including adjustments, replacements, and basic cleanliness, that forestall machine breakdowns. The purpose is to ensure that production quality is maintained and that delivery schedules are met. In addition, a machine that is well cared for will last longer and cause fewer problems. Syn: periodic maintenance.
A bar graph that displays the results of a Pareto analysis. It may or may not display the 80-20 variation, but it does show a distinct variation from the few compared to the many.	A simple data-recording device. [It] is designed by the user to facilitate the user's interpretation of the results [and] is one of the seven tools of quality. [It is] often confused with data sheets and checklists.
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). [This] is one of the seven tools of quality. Syn: fishbone chart, Ishikawa diagram.	A concept developed by Vilfredo Pareto, an Italian economist, that states that a small percentage of a group accounts for the largest fraction of its impact or value. In an ABC classification, for example, 20 percent of the inventory items may constitute 80 percent of the inventory value. See: ABC classification, 80-20.

Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Fishbone analysis APICS CPIM Learning System © 2023	**Term** Five whys APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Flowchart APICS CPIM Learning System © 2023	**Term** Process flow APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Process flow diagram APICS CPIM Learning System © 2023	**Term** Histogram APICS CPIM Learning System © 2023
Module 8 *Section A: Quality*	**Module 8** *Section A: Quality*
Term Frequency distribution APICS CPIM Learning System © 2023	**Term** Scatter chart APICS CPIM Learning System © 2023

The common practice in total quality management is to ask “why” five times when confronted with a problem. By the time the answer to the fifth “why” is found, the ultimate cause of the problem is identified. Syn: five Ws. See: root cause analysis.	A technique to organize the elements of a problem or situation to aid in the determination of the causes of the problem or situation. The analysis relates the effect of the environment to the several possible sources of the problem.
The sequence of activities that, when followed, results in a product or service deliverable. See: flow process chart, process chart.	[A] chart that shows the operations, transportation, storages, delays, inspections, and so on related to a process. [This is] drawn to better understand processes [and is] one of the seven tools of quality. Syn: flow diagram. See: block diagram, flow process chart.
A graph of contiguous vertical bars representing a frequency distribution in which the groups or classes of items are marked on the x axis and the number of items in each class is indicated on the y axis. The pictorial nature of [this] lets people see patterns that are difficult to see in a simple table of numbers. [It] is one of the seven tools of quality.	A graphical and progressive representation of the various steps, events, and tasks that make up an operations process. Provides the viewer with a picture of what actually occurs when a product is manufactured or a service is performed.
A graphical technique to analyze the relationship between two variables. Two sets of data are plotted on a graph, with the y axis used for the variable to be predicted and the x axis used for the variable to make the prediction. The graph will show possible relationships (although two variables might appear to be related, they might not be—those who know most about the variables must make that evaluation). [This] is one of the seven tools of quality. Syn: cross plot, scatter diagram, scatterplot.	A table that indicates the frequency with which data falls into each of any number of subdivisions of the variable. The subdivisions are usually called classes.

Module 8 *Section A: Quality*	**Module 8** *Section B: Technology*
Term Seven new tools (N7) APICS CPIM Learning System © 2023	**Term** Information system architecture APICS CPIM Learning System © 2023
Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Gap analysis APICS CPIM Learning System © 2023	**Term** Learning curve APICS CPIM Learning System © 2023
Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Data governance APICS CPIM Learning System © 2023	**Term** Enterprise resources planning (ERP) APICS CPIM Learning System © 2023
Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Closed-loop MRP APICS CPIM Learning System © 2023	**Term** Manufacturing resource planning (MRP II) APICS CPIM Learning System © 2023

A model of how the organization operates regarding information. The model considers four factors: (1) organizational functions; (2) communication of coordination requirements; (3) data modeling needs; and (4) management and control structures. [This] should be aligned with and match the architecture of the organization.	A set of quality improvement tools developed by the Union of Japanese Scientists and Engineers (JUSE). The N7 are affinity diagram, interrelationship digraph, matrix diagram, tree diagram, prioritization matrix, process decision program chart, and activity network diagram. See: basic seven tools of quality.
A curve reflecting the rate of improvement in time per piece as more units of an item are made. A planning technique, [this] is particularly useful in project-oriented industries in which new products are frequently phased in. The basis for the [this] calculation is that workers will be able to produce the product more quickly after they get used to making it. Syn: experience curve, manufacturing progress curve.	A tool designed to assess the difference that exists between a service that is offered and customer expectations.
Framework for organizing, defining, and standardizing the business processes necessary to effectively plan and control an organization so the organization can use its internal knowledge to seek external advantage. [This type of] system provides extensive databanks of information including master file records, repositories of cost and sales, financial detail, analysis of product and customer hierarchies, and historic and current transactional data.	The overall management of data's accessibility, usability, reliability, and security. Used to ensure data record accuracy.
A method for the effective planning of all resources of a manufacturing company. Ideally, it addresses operational planning in units and financial planning in dollars, and has a simulation capability to answer what-if questions. It is made up of a variety of processes, each linked together: business planning, production planning (sales and operations planning), master production scheduling, material requirements planning, capacity requirements planning, and the execution support systems for capacity and material. Output from these systems is integrated with financial reports such as the business plan, purchase commitment report, shipping budget, and inventory projections in dollars. [It] is a direct outgrowth and extension of closed-loop MRP.	A system built around material requirements planning that includes the additional planning processes of production planning (sales and operations planning), master production scheduling, and capacity requirements planning. Once this planning phase is complete and the plans have been accepted as realistic and attainable, the execution processes come into play. These processes include the manufacturing control processes of input-output (capacity) measurement and detailed scheduling and dispatching, as well as anticipated delay reports from both the plant and suppliers, supplier scheduling, and so on. [This term] implies not only that each of these processes is included in the overall system, but also that feedback is provided by the execution processes so the planning can be kept valid at all times.

Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Advanced planning and scheduling (APS)	**Term** Electronic data interchange (EDI)
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Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Decision support system (DSS)	**Term** Cloud computing
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Module 8 *Section B: Technology*	**Module 8** *Section B: Technology*
Term Internet of Things (IOT)	**Term** Automated guided vehicle system (AGVS)
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Continuous improvement	**Term** Continuous process improvement (CPI)
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The paperless (electronic) exchange of trading documents, such as purchase orders, shipment authorizations, advanced shipment notices, and invoices, using standardized document formats.	Techniques that deal with analysis and planning of logistics and manufacturing during short, intermediate, and long-term time periods. [This] describes any computer program that uses advanced mathematical algorithms or logic to perform optimization or simulation on finite capacity scheduling, sourcing, capital planning, resource planning, forecasting, demand management, and others. These techniques simultaneously consider a range of constraints and business rules to provide real-time planning and scheduling, decision support, available-to-promise, and capable-to-promise capabilities. [This] often generates and evaluates multiple scenarios. Management then selects one scenario to use as the “official plan.” The five main components of [these] systems are (1) demand planning, (2) production planning, (3) production scheduling, (4) distribution planning, and (5) transportation planning.
An emerging way of computing where data is stored in massive data centers that can be accessed from any connected computers over the internet.	A computer system designed to assist managers in selecting and evaluating courses of action by providing a logical (usually quantitative) analysis of the relevant factors.
A transportation network that automatically routes one or more material handling devices, such as carts or pallet trucks, and positions them at predetermined destinations without operator intervention.	An environment in which objects, animals or people are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. This allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer-based systems.
A never-ending effort to expose and eliminate root causes of problems; small-step improvement as opposed to big-step improvement. Syn: continuous improvement. See: kaizen.	The act of making incremental, regular improvements and upgrades to a process or product in the search for excellence.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Baseline measures APICS CPIM Learning System © 2023	**Term** Value stream APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Learning organization APICS CPIM Learning System © 2023	**Term** Knowledge management APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Gemba APICS CPIM Learning System © 2023	**Term** Genchi genbutsu APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Five Ss APICS CPIM Learning System © 2023	**Term** Just-in-Time (JIT) APICS CPIM Learning System © 2023

The processes of creating, producing, and delivering a good or service to the market. For a good, [this] encompasses the raw material supplier, the manufacture and assembly of the good, and the distribution network. For a service, [this] consists of suppliers, support personnel and technology, the service “producer,” and the distribution channel. May be controlled by a single business or a network of several businesses.	A set of measurements (or metrics) that seeks to establish the current or starting level of performance of a process, function, product, firm, or other entity. [These] are usually established before implementing improvement activities and programs.
An integrated approach used by organizations to capture, share, develop, and use organizational knowledge. This information is used to more effectively produce product, interface with customers, and navigate through competitive markets.	1) A group of people who have woven a continuous, enhanced capacity to learn into the corporate culture. 2) An organization in which learning processes are analyzed, monitored, developed, and aligned with competitive goals.
A Japanese phrase meaning to visit the shop floor to observe what is occurring	The place where humans create value; the real workplace. Also a philosophy: “Go to the actual place, see the actual work.”
A philosophy of manufacturing based on planned elimination of all waste and on continuous improvement of productivity. It encompasses the successful execution of all manufacturing activities required to produce a final product, from design engineering to delivery, and includes all stages of conversion from raw material onward. The primary elements of [this] are to have only the required inventory when needed; to improve quality to zero defects; to reduce lead times by reducing setup times, queue lengths, and lot sizes; to incrementally revise the operations themselves; and to accomplish these activities at minimum cost. In the broad sense, it applies to all forms of manufacturing—job shop, process, and repetitive—and to many service industries as well. Syn: short-cycle manufacturing, stockless production, zero inventories.	Five terms beginning with “S” used to create a workplace suitable for lean production: sort, simplify, scrub, standardize, and sustain. Sort means to separate needed items from unneeded ones and remove the latter. Simplify means to neatly arrange items for use. Scrub means to clean up the work area. Standardize means to sort, simplify, and scrub daily. Sustain means to always follow the first four Ss. Sometimes referred to by the Japanese equivalents: seiri, seiton, seiso, seiketsu, and shitsuke.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Quick changeover	**Term** Operator flexibility
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Jidoka	**Term** Poka-yoke (mistake-proof)
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term QS 9000	**Term** Process control
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Flexible automation	**Term** Kaizen
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Training machine workers to perform tasks outside their immediate jobs and in problem-solving techniques to improve process flexibility. This is a necessary process in developing a fully cross-trained workforce.	The ability to shorten machine setups between different machine operation requirements to increase process flexibility. Highest concentration is on first reducing external setup time, then on internal setup issues. This reduces economic order quantity, queue and manufacturing lead times, and work-in-process inventory; it improves quality, process, and material flows.
[Japanese term for mistake-proofing] techniques, such as manufacturing or setup activity, designed in a way to prevent an error from resulting in a product defect. For example, in an assembly operation, if each correct part is not used, a sensing device detects that a part was unused and shuts down the operation, thereby preventing the assembler from moving the incomplete part to the next station or beginning another [operation...]. Syn: failsafe techniques, failsafe work methods, mistake-proofing.	The Japanese term for the practice of stopping the production line when a defect occurs.
1) The function of maintaining a process within a given range of capability by feedback, correction, and so forth. 2) The monitoring of instrumentation attached to equipment (valves, meters, mixers, liquid, temperature, time, etc.) from a control room to ensure that a high-quality product is being produced to specification.	A variation of ISO 9000 certification with additional requirements tailored for the automobile industry, including suppliers. [It] is being superseded by ISO/TS 16949, which incorporates many European standards. See: ISO 9000, ISO/TS 16949.
The Japanese term for improvement; refers to continuing improvement involving everyone —managers and workers. In manufacturing, [this] relates to finding and eliminating waste in machinery, labor, or production methods. See: continuous process improvement.	Automation that provides short setup times and the ability to switch quickly from one product to another.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Kaizen event APICS CPIM Learning System © 2023	**Term** Kaizen blitz APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Value stream mapping APICS CPIM Learning System © 2023	**Term** Supermarket approach APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Overall equipment effectiveness (OEE) APICS CPIM Learning System © 2023	**Term** Rework order APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Employee involvement (EI) APICS CPIM Learning System © 2023	**Term** Employee empowerment APICS CPIM Learning System © 2023

A rapid improvement of a limited process area; for example, a production cell. Part of the improvement team consists of workers in that area. The objectives are to use innovative thinking to eliminate non-value-added work and to immediately implement the changes within a week or less. Ownership of the improvement by the area work team and the development of the team's problem-solving skills are additional benefits. See: kaizen event.	A time-boxed set of activities carried out by the cell team during the week of cell implementation. [It] is an implementation arm of a lean manufacturing program. See: kaizen blitz.
A way of managing inventory and improving picking by making all parts easy to take off of a shelf, much like the shelves of a supermarket. Inventory is then restocked in such a way that employees always have easy access.	A lean production tool to visually understand the flow of materials from supplier to customer that includes the current process and flow as well as the value-added and non-value-added time of all the process steps. Used to lead to reduction of waste, decrease flow time, and make the process flow more efficient and effective.
A manufacturing order to rework and salvage defective parts or products. Syn: repair order, spoiled work order.	Measuring the effectiveness of all of the equipment of a company based on usage, performance, and production quality.
The practice of giving non-managerial employees the responsibility and the power to make decisions regarding their jobs or tasks. It is associated with the practice of transfer of managerial responsibility to the employee. [This] allows the employee to take on responsibility for tasks normally associated with staff specialists. Examples include allowing the employee to make scheduling, quality, process design, or purchasing decisions.	The concept of using the experience, creative energy, and intelligence of all employees by treating them with respect, keeping them informed, and including them and their ideas in decision-making processes appropriate to their areas of expertise. [It] focuses on quality and productivity improvements. Syn: people involvement.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Job analysis	**Term** Performance appraisal
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Performance measure	**Term** Quality function deployment (QFD)
APICS CPIM Learning System © 2023	APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Voice of the customer (VOC)	**Term** Perceived quality
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term House of quality (HOQ)	**Term** Co-location
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Supervisory or peer analysis of work performance. May be made in connection with wage and salary review, promotion, transfer, or employee training.	A process of gathering (by observation, interview, or recording systems) significant task-oriented activities and requirements about work required of employees.
A methodology designed to ensure that all the major requirements of the customer are identified and subsequently met or exceeded through the resulting product design process and the design and operation of the supporting production management system. [It] can be viewed as a set of communication and translation tools. [It] tries to eliminate the gap between what the customer wants in a new product and what the product is capable of delivering. [This] often leads to a clear identification of the major requirements of the customers. These expectations are referred to as the voice of the customer (VOC). See: house of quality.	In a performance measurement system, the actual value measured for the criterion. Syn: performance measurement. See: performance criterion, performance measurement system, performance standard.
One of the eight dimensions of quality that refers to a subjective assessment of a product's quality based on criteria defined by the observer.	Actual customer descriptions in words for the functions and features customers desire for goods and services. In the strict definition, as related to quality function deployment (QFD), the term customer indicates the external customer of the supplying entity.
Placing project team members in physical proximity to facilitate communication and working relationships.	A structured process that relates customer-defined attributes to the product's technical features needed to support and generate these attributes. This technique achieves this mapping by means of a six-step process: (1) identification of customer attributes; (2) identification of supporting technical features; (3) correlation of the customer attributes with the supporting technical features; (4) assignment of priorities to the customer requirements and technical features; (5) evaluation of competitive stances and competitive products; and (6) identification of those technical features to be used (deployed) in the final design of the product. [This] is part of the quality function deployment (QFD) process and forces designers to consider customer needs and the degree to which the proposed designs satisfy these needs. See: customer-defined attributes, quality function deployment.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Supplier scheduling	**Term** Prototyping
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term SIPOC	**Term** Six sigma
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Lean six sigma	**Term** Six sigma quality
APICS CPIM Learning System © 2023	APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Define, measure, analyze, improve, control (DMAIC) process	**Term** Hypothesis testing
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1) A specialized product design and development process for developing a working model of a product. 2) A specialized system development process for performing a determination where user needs are extracted, presented, and developed by building a working model of the system. Generally, these tools make it possible to create all files and processing programs needed for the evaluation of a business application in a matter of days or hours.	A purchasing approach that provides suppliers with schedules rather than with individual hard-copy purchase orders. Normally, [this type of] system will include a business agreement (contract) for each supplier, a weekly (or more frequent) schedule for each supplier extending for some time into the future, and individuals called supplier schedulers. Also required is a formal priority planning system that works well, because it is essential in this arrangement to provide the supplier with valid due dates. Syn: vendor scheduling.
A methodology that furnishes tools for the improvement of business processes. The intent is to decrease process variation and improve product quality.	Acronym for “supplier, input, process, output, customer” (pronounced “sye-pahk”).
The six sigma approach is a set of concepts and practices that focus on reducing variability in processes and reducing deficiencies in the product. Important elements are (1) producing only 3.4 defects for every one million opportunities or operations, and (2) process improvement initiatives striving for six sigma-level performance. Six sigma is a business process that permits organizations to improve bottom-line performance, creating and monitoring business activities to reduce waste and resource requirements while increasing customer satisfaction.	A methodology that combines [two] improvement concepts [...]. It uses the seven wastes of lean and the DMAIC process from six sigma, and awards recognition of competence through judo-style belts.
Use of statistical models to test conclusions about a population or universe based on sample information.	A six sigma improvement process composed of five stages: (1) Determine the nature of the problem. (2) Measure existing performance and commence recording data and facts that offer information about the underlying causes of the problem. (3) Study the information to determine the root causes of the problem. (4) Improve the process by effecting solutions to the problem. (5) Monitor the process until the solutions become ingrained.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Problem-solving storyboard APICS CPIM Learning System © 2023	**Term** Brainstorming APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Nominal group technique APICS CPIM Learning System © 2023	**Term** Root cause analysis APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Fault tree analysis APICS CPIM Learning System © 2023	**Term** Design of experiments (DOE) APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Random sample APICS CPIM Learning System © 2023	**Term** Taguchi methodology APICS CPIM Learning System © 2023

A technique that teams use to generate ideas on a particular subject. Each person on the team is asked to think creatively and write down as many ideas as possible. The ideas are not discussed or reviewed until after the brainstorming session.	A technique based on the plan/do/check/action problem-solving process. The steps being taken and the progress toward the resolution of a problem are continuously planned and updated.
Analytical methods to determine the core problem(s) of an organization, process, product, market, and so forth. See: current reality tree, five whys, stratification analysis.	A technique, similar to brainstorming, used by teams to generate ideas on a particular subject. Team members are asked to silently come up with as many ideas as possible, writing them down. Each member is then asked to share one idea, which is recorded. After all the ideas are recorded, they are discussed and prioritized by the group.
1) A process for structuring statistically valid studies in any science. 2) A quality management technique used to evaluate the effect of carefully planned and controlled changes to input process variables on the output variable. The objective is to improve production processes.	A logical approach to identify the probabilities and frequencies of events in a system that are most critical to uninterrupted and safe operation. This analysis may include failure mode effects analysis (determining the result of component failure interactions toward system safety) and techniques for human error prediction.
A concept of off-line quality control methods conducted at the product and process design stages in the product development cycle. This concept, expressed by Genichi Taguchi, encompasses three phases of product design: system design, parameter design, and tolerance design. The goal is to reduce quality loss by reducing the variability of the product's characteristics during the parameter phase of product development. Syn: Taguchi methods.	A selection of observations taken from all the observations of a phenomenon in such a way that each chosen observation has the same possibility of selection.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Benchmarking APICS CPIM Learning System © 2023	**Term** Benchmark measures APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Single-minute exchange of die (SMED) APICS CPIM Learning System © 2023	**Term** Workplace organization APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Virtual cell APICS CPIM Learning System © 2023	**Term** Kit APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Simulation APICS CPIM Learning System © 2023	**Term** Model APICS CPIM Learning System © 2023

A set of measurements (or metrics) that is used to establish goals for improvements in processes, functions, products, and so on. [These] are often derived from other firms that display best-in-class achievement.	Comparing products, processes, and services to those of another organization thought to have superior performance. [This] target may or may not be a competitor or even in the same industry. There are seven common forms of [this]. See: competitive benchmarking, financial benchmarking, functional benchmarking, performance benchmarking, process benchmarking, product benchmarking, strategic benchmarking.
The arrangement of tools, equipment, materials, and supplies according to their frequency of use. Those items that are never used are removed from the workplace, and those items that are used frequently are located for fast, easy access and replacement. This concept extends the idea of “a place for everything and everything in its place.”	The concept of setup times of less than 10 minutes, developed by Shigeo Shingo in 1970 at Toyota. See: single-digit setup.
1) The components of a parent item that have been pulled from stock and readied for movement to a production area. 2) A group of repair parts to be shipped with an order. Syn: kitted material, staged material.	A logical rather than physical grouping of manufacturing resources. Resources [within this] can be dispersed throughout a facility. Product mix changes may change the layout of [this]. This technique is used when it is not practical to move the equipment.
A representation of a process or system that attempts to relate the most important variables in the system in such a way that analysis of the model leads to insights into the system. Frequently, the model is used to anticipate the result of a particular strategy in the real system.	1) The technique of using representative or artificial data to reproduce in a model various conditions that are likely to occur in the actual performance of a system. Frequently used to test the behavior of a system under different operating policies. 2) Within MRP II, using the operational data to perform what-if evaluations of alternative plans to answer the question, “Can we do it?” If yes, the simulation can then be run in the financial mode to help answer the question, “Do we really want to?” See: what-if analysis.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Computer-aided design (CAD)	**Term** Computer-aided manufacturing (CAM)
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Computer-integrated manufacturing (CIM)	**Term** Manufacturing execution systems (MES)
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Conformance	**Term** Variation
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Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Statistical process control (SPC)	**Term** Process capability
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The use of computers to program, direct, and control production equipment in the fabrication of manufactured items.	The use of computers in interactive engineering drawing and storage of designs. Programs complete the layout, geometric transformations, projections, rotations, magnifications, and interval (cross-section) views of a part and its relationship with other parts.
Programs and systems that participate in shop floor control, including programmed logic controllers and process control computers for direct and supervisory control of manufacturing equipment; process information systems that gather historical performance information, then generate reports; graphical displays; and alarms that inform operations personnel what is going on in the plant currently and what occurred during a very short history into the past. Quality control information is also gathered and a laboratory information management system may be part of this configuration to tie process conditions to the quality data that is generated. Cause-and-effect relationships can thereby be determined. The quality data at times affects the control parameters that are used to meet product specifications either dynamically or off line.	The integration of the total manufacturing organization through the use of computer systems and managerial philosophies that improve the organization's effectiveness; the application of a computer to bridge various computerized systems and connect them into a coherent, integrated whole. For example, budgets, CAD/CAM, process controls, group technology systems, MRP II, and financial reporting systems are linked and interfaced.
A change in data, a characteristic, or a function that is caused by one of four factors: special causes, common causes, tampering, or structural variation.	An affirmative indication or judgment that a product or service has met the requirements of a relevant specification, contract, or regulation.
The ability of the process to produce parts that conform to (engineering) specifications. [It] relates to the inherent variability of a process that is in a state of statistical control. See: Cp, Cpk, process capability analysis.	The application of statistical techniques to monitor and adjust an operation. Often used interchangeably with statistical quality control, although statistical quality control [also includes acceptance sampling.]

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Control limit APICS CPIM Learning System © 2023	**Term** Upper control limit (UCL) APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Lower control limit (LCL) APICS CPIM Learning System © 2023	**Term** Spread APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Control chart APICS CPIM Learning System © 2023	**Term** Statistical quality control (SQC) APICS CPIM Learning System © 2023
Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Acceptance sampling APICS CPIM Learning System © 2023	**Term** Go/no-go APICS CPIM Learning System © 2023

Control limit for points above the central line in a control chart.	A statistically determined line on a control chart [...]. If a value occurs outside this [upper or lower] limit, the process is deemed to be out of control.
Variability of an action. Often measured by the range or standard deviation of a particular dimension.	Control limit for points below the central line in a control chart.
The application of statistical techniques to control quality. Includes acceptance sampling as well as statistical process control, but is often used interchangeably with statistical process control.	A graphic comparison of process performance data with predetermined computed control limits. The process performance data usually consists of groups of measurements selected in the regular sequence of production that preserve the order. The primary use of [these] is to detect assignable causes of variation in the process as opposed to random variations. [This] is one of the seven tools of quality. Syn: process control chart.
The state of a unit or product. Two parameters are possible: [one conforms to specification and the other does not conform to specification].	1) The process of sampling a portion of goods for inspection rather than examining the entire lot. The entire lot may be accepted or rejected based on the sample even though the specific units in the lot are better or worse than the sample. There are two types: attributes sampling and variables sampling. In attributes sampling, the presence or absence of a characteristic is noted in each of the units inspected. In variables sampling, the numerical magnitude of a characteristic is measured and recorded for each inspected unit; this type of sampling involves reference to a continuous scale of some kind. 2) A method of measuring random samples of lots or batches of products against predetermined standards.

Module 8 *Section C: Continuous Improvement*	**Module 8** *Section C: Continuous Improvement*
Term Acceptable quality level (AQL)	**Term** Process capability index
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The value of the tolerance specified for the characteristic divided by the process capability. [Two types of this include] the widely used Cpk and Cp.	When a continuing series of lots is considered, a quality level that, for the purposes of sampling inspection, is the limit of a satisfactory process average.