

Action Plan – A series of planned activities with established accountabilities and delivery dates which, when complete, will result in the accomplishment of an objective.

Activity – A series of tasks within a process or sub-process.

Activity-based Costing – A cost allocation method based on the cost driver.

Adding value – Making the output of a process worth more for its customers.

Adoption Rate – The percentage of total projects completed which have been implemented.

Affinity diagram – One of the seven new management-planning tools. It is used to organize ideas into natural groupings in a way that stimulates creativity. Categories and new ideas are obtained by team members working silently so as not to inhibit thoughts.

Arrow diagram – One of the seven new management-planning tools. It is used to develop the best schedule and appropriate controls to accomplish the schedule. An arrow diagram is similar to the critical path method (CPM) and program evaluation review technique (PERT).

Assets – Items of value owned by or owed to the company, generally considered convertible in to cash.

Attribute – A measurable characteristic of a product, process, or outcome.

Bar Chart – A chart that uses a set of bars to compare the sizes of related items.

Barriers & Aids – A technique for pinpointing and analyzing elements, which resist change (barriers) or push for change (aids).

Black Belt – A full time person intensively trained in the quality management systems and advanced statistical tools and methods. A person assigned to work on critical business problems/opportunities alone or with teams.

Brainstorming – A way of using a group of people to quickly *generate*, *clarify* and *evaluate* a sizable list of ideas, problems, issues, etc.

Benchmarking – Also called competitive benchmarking. Involves (1) comparing products and/or services against direct competitors; and (2) comparing critical business processes (such as new product design-to-market process) against the best in the world, regardless of whether or not they are direct competitors.

Bill of Material – A listing of material required to perform a specific job.

Boundaries – A statement of where a process or sub-process begins and ends and what it includes.

Breakthrough – A significant increase in performance.

Budget – A time-oriented statement of the financial resources allocated to carry out an organization's activities and achieve the targeted objectives.

Carrying Costs – The annual costs of holding inventory.

Catch ball – An iterative process of developing objectives and plans to obtain the objectives; sharing them with persons who much execute the plans; requesting and considering their input; and finalizing the objectives and plans after sufficient involvement and commitment from all affected parties.

Cause – An established reason for the existence of a defect.

Cause & Effect Analysis – An analysis that identifies the factors (causes) that lead to an outcome (effect).

Cause-and-effect diagram – One of the basic seven process improvement tools. It is used to identify root causes are identified, "Why?" is asked five times to ensure that root causes, not symptoms, are being addressed.

Cellular manufacturing – See just in time.

Checkpoint – An upstream process standard. Statistically, it means to eliminate special causes of variation. Also called maintenance. In Japan, control is equivalent to management.

Check sheet – A simple but powerful data gathering tool.

Common Cause – A frequent source of variation in the output of a process.

Compounding – Adding compound interest to a present value to produce a future value.

Continuous Data – Data that can be measured. For example, the **time** required to perform a process activity (also called “variables” data).

Continuous Improvement (PDCA) – A cycle of continuous improvement that has four phases:

- **Plan** what to do
- **Do** what has been planned
- **Check** what has been done
- **Act** to prevent error or improve

Control – The existence of a desired state in the output of a process (also see Quality Control).

Control Chart – Used to determine whether or not variation is due to common or special causes. It is one of the seven basic process improvement tools.

Control point – A process output, such as defects or yield.

Control System – A tool for providing process stability that defines the process activities, key indicators, targets, and related management criteria, so that variation can be detected and reduced.

Corporate Vision – The long-range objective of the corporation.

Cost Driver – An activity that results in costs being incurred.

Cost Estimation – A technique for determining the dollar impact of problems and improvements.

Cost of Quality – Really the cost of bad quality or of not doing things right the first time. It consists of four major categories.

- *External failures.* This is the cost associated with correcting a bad product or service when it is with an external customer, for example, warranty expenses or product liability.
- *Internal failures.* This is the cost of failures or problems that are discovered before products or services leave the company; for example, scrap and rework.
- *Appraisal.* This is the cost to determine whether or not the products or services are faulty; for example, testing and inspection.
- *Prevention.* This is the cost associated with any activity whose purpose is to prevent bad quality; for example, training or process improvement teams.

The first three have been termed the *price of nonconformance*.

Countermeasure – The means or method to solve a problem or close the gap between the desired and current states.

Critical of Quality (CTQ) – What you manage and measure in the process that has a direct effect on the performance (or perceived performance) of the product or service in the hands of the customer.

Cross-functional management – One of the three major components of the management system of Japanese companies with mature TQ (Total Quality) capability. Cross-functional management consists of permanent committees for major processes (such as new product development) and outcomes (such as cost reduction). These committees are comprised of managers representing all major functions. The role of the committees is to plan and ensure the attainment of major cross-functional endeavors to which they are assigned.

Culture – An organization’s culture reflects commonly shared language, beliefs, values, relationships, and behaviors. Whether a culture is customer-focused or inside-focused depends on whose needs primarily direct the development, creation, and modification of products. The measures used to manage the organization reveal the culture’s real priorities.

Customer – Any individual or function that receives a product or desired outcome (end-user).

Customer Information system – The system which is used to access customer data to respond to customer inquiries and arrange customer service orders.

Customer-processor-supplier – The three simultaneous roles played by everyone involved in a process.

Customer-supplier alignment – A close working relationship between two parties, one of whom supplies the other, to ensure that the needs of each are being met.

Countermeasure – An action taken to reduce or remove the cause of process variation(s).

Customer Satisfaction – Satisfying the needs and reasonable expectations of customers with an attitude that puts the needs of the customer first.

Cycle Time – The time from the beginning to the end of any process or process step.

Daily management (DM) – One of the three major subsystems used by Japanese companies with mature TQ capability. Daily management relates to continuous/incremental process improvement and standardization activities. It involves all persons and includes group process improvement activities as well as individual suggestion systems.

Data – Information or a set of facts presented in descriptive form.

Debt Capital – Funds obtained for business use by borrowing money.

Debt Ratio – The percentage of debt that a company has in its capital structure. The capital structure has three components: debt, preferred stock, and common equity. The debt ratio is the amount of debt compared to the total of these three components. The higher the debt ratio, the larger the risk associated with a company's securities, and the lower its credit rating.

Defect – Non-conformance to a standard requirement.

Deming cycle – The same as the plan-do-check-act cycle; also called the Shewhart cycle.

Design of experiments (DOE) – A statistical method of designing experiments used in the development and optimization of products and processes. These methods enable product and process designers to find the optimal or nearly optimal design parameters to obtain a robust design without having to test thousands or millions of potential parameter combinations. There are two approaches to DOE: the classical school and the Taguchi methods.

Detection – An outcome-oriented approach to quality management based on after-the-fact identification of a problem.

DFSS (*Design for Six Sigma/DMADV: Define, Measure, Analyze, Design, Validate*) – A standard method for designing a new product or process capable of delivering Six Sigma level quality.

Direct Cost – A cost directly traceable to the production of a product or delivery of a service.

Discrete Data – Data that can be counted. For example, the **number** of defects (also called “attribute data”).

Dispersion – The extent to which data is scattered around its median (also called “variation”).

DMAIC – (*Define, Measure, Analyze, Improve, Control*) – The standard steps for improving an existing process to a Six Sigma level.

DPMO (*Defects Per Million Opportunities*) – Every product or service has “x” number of CTQ’s or “Opportunities for Defects.” DPMO is the measure of the AVERAGE number of defects across ALL CTQ’s that the current process will produce if not improved. Therefore, an automotive supplier with a 6 sigma process will NOT produce 3.4 defective transmissions per million. Rather, each transmission would have an average defects per million opportunities.

Economic Order Quantity – A calculation used to determine the cost-effective quantity to order based on the time demand for material, the cost of material and the cost to order material.

Efficient Allocation of Resources – Directing the resources (money, labor, time, machinery, land, etc.) to those activities where they can produce goods and services of the greatest value.

Empowerment – Giving employees the tools (such as knowledge) to eliminate process variation as well as the responsibility, control, and authority for doing so. Further, it means that employees can use their own discretion to exceed the existing job standard if they feel it is required to ensure customer satisfaction.

End-User – The customer for whom the product is primarily intended. This customer will personally use the product to achieve a desired outcome.

Executive committee – The top management committee.

Executive Visit – Periodic on-site reviews by the officers of the corporation with the objective of demonstrating executive involvement concerning the progress of:

- Corporate short-term plans
- Counseling employees
- Assessing the status of 6 sigma implementations

Expectations – Customer expectations are their basis for determining what “quality” means. Customers have expectations about the performance and perception attributes of the product as well as the outcomes to be achieved by using the product.

Failure mode analysis (FMA): a procedure to determine which malfunction symptoms appear immediately before or after a failure of a critical parameter in a system. After all the possible causes are listed for each symptom, the product is designed to eliminate the problems.

Failure mode effects analysis (FMEA): a procedure in which each potential failure mode in every sub-item of an item is analyzed to determine its effect on other sub-items and on the required function of the item.

Failure mode effects and criticality analysis (FMECA): a procedure that is performed after a failure mode effects analysis to classify each potential failure effect according to its severity and probability of occurrence

Feigenbaum, Armand V.: the founder and president of General Systems Co., an international engineering company that designs and implements total quality systems. Feigenbaum originated the concept of total quality control in his book, Total Quality Control, which was published in 1951. The book has been translated into many languages, including Japanese, Chinese, French, and Spanish. Feigenbaum is an ASQ Honorary member and served as ASQ president for two consecutive terms.

Fishbone diagram: see “cause-and-effect diagram”

Fitness for use: a term used to indicate that a product or service fits the customer’s defined purpose for that product or service.

Flowchart: a graphical representation of the steps in a process. Flowcharts are drawn to better understand processes. The flowchart is one of the seven tools of quality.

FMA: failure mode analysis

FMEA: failure mode effects analysis

Funnel experiment: an experiment that demonstrates the effects of tampering. Marbles are dropped through a funnel in an attempt to hit a flat-surfaced target below. The experiment shows that adjusting a stable process to compensate for an undesirable result or an extraordinarily good result will produce output that is worse than if the process had been left alone.

Gap – The difference between customer expectations and supplier performance.

Green Belt – A person trained to work in support of Six Sigma initiatives on a part-time basis. They generally work part time as project team leaders on problems/opportunities that are small in scale than Black Belt projects.

Goal – Used synonymously with target. See target.

Hidden Factory – All of the process rework and/or repair activities created to turn defective product or services in to 1st quality outputs.

Histogram – A graphic device that depicts variation in an observed measurement. A histogram shows the frequency of occurrence of different measurements for a given quality attribute. It is one of the seven basic process improvement tools.

Hoshin kanri – The Japanese term for management by policy.

Hoshin planning – Another term for management by policy. It is not a good term because the process involves more than planning.

Improvement – Statistically, it means to reduce variation due to common causes (that is, inherent variation of the process). There are two categories: (1) *Kaizen* – incremental improvements (that is, many, small, frequent, and continuous); and (2) *Innovation* – infrequent, major, large, and quantum-level improvements.

Incremental Cost – The additional cost from taking a particular action.

Indicator – A measurement.

Innovation – A category of improvement. See improvement.

Input – Materials, energy, or information used to produce a specified output (work product or service.)

Inspection at the source – People performing an operation are accountable for the quality of their work and inspect their work. Contrasts with a traditional approach whereby another person inspects the work.

Integration – A frequently used term in the Malcolm Baldrige National Quality Award criteria. As such, it means compatible, complementary improvement efforts and cross-functional initiatives relative to a strategic quality plan. Integration is not a traditional financial plan with some quality-related objectives. It is a system for concurrent improvement and maintenance activities. It operates at a level where quality initiatives provide competitive advantage. Integration is consistent with a company's mission and vision. It is streamlined so that the necessary workforce and budget follow from the quality improvement initiatives.

Interrelationship diagram – Displays the relationships between factors in a complex situation. It is one of the new management planning tools.

Interview – An exchange of information utilizing face-to-face, or telephone communication.

Involve All Employees – Involve employees up and down the organization in order to make a significant impact on customer satisfaction.

Involvement – All employees are expected to have three jobs.

- a) Doing their job
- b) Improving the way their job is done
- c) Contributing to plans that they must execute

Jidoka – A Japanese term meaning a process designed to stop automatically when there is a problem.

Just-in-Time (JIT) – A production system and philosophy that was developed by Toyota over a 25-year period. JIT and total quality are like two sides of the same coin; world-class JIT requires world-class total quality. The following are attributes of a JIT production system that are required in addition to total quality principles.

Short set-up times (less than ten minutes), which allow small lot sizes and short lead times.

- a) *Cellular manufacturing*, which arranges production processes so that families of similar parts can be produced with minimal queues between operations.
- b) *Workplace organization*, which means having a place for everything and everything in its place, clean and ready for use.
- c) *Total productive maintenance*, which is an approach whose aim is zero machine breakdowns by improving the capability and reliability of equipment and involving equipment operators in improvement activities.
- d) *Balanced operations* – so that all operations take about the same time. A corollary to this principle is to go only as fast as the slowest operation in order not to build an inventory.
- e) *Doing a little of everything every day* instead of manufacturing in large lots infrequently.
- f) *Pull production system*, which essentially means to build to an order or to an authorization from the customer operation.
- g) *Shop floor control by sight* instead of complex computer systems. World-class JIT systems require from one-tenth to one-fiftieth of the inventory of traditional manufacturing systems and, therefore, don't need complex systems to keep track of inventory.

JUSE – Japanese Union of Scientists and Engineers.

Kaizen – A category of improvement. See improvement.

Kanban – In Japanese, it literally means *card*. Used in pull production systems to either authorize an operation to produce or move parts.

Leadership – Achieving breakthrough by focusing Company efforts and resources on priority issues in order to attain customer satisfaction.

Line Graph – Charts the variation in data over time.

Links – Processes external to the process or sub-process being studied that either influence or are influenced by the process.

Maintenance – Relative to process improvement and control, it is synonymous with process control, that is, maintaining a process at its current standard.

Manage By Fact – Managing work by collecting objective data and making decisions based on this information (sometimes referred to as “speaking with facts”).

Management by objectives (MBO) – Traditional Western management approach whereby management specifies organizational objectives (usually financial results) and holds individuals accountable for their attainment without analysis or an understanding of the processes that produce the results.

Management by policy (MBP) – One of three major components of the management system used by Japanese companies with mature TQ capability. Management by policy determines the key organizational objectives and means to obtain the objectives, deploys them throughout the entire organization, and makes regular reviews to ensure that the objectives are met and the means are followed. Also called policy management, policy deployment, *hoshin kanri*, and *hoshin* planning.

Management by process – New management approach in which the focus is on improving the process with an eye on results.

Marginal Cost – The cost of making one additional unit of production or service.

Master Black Belt – A full time person who's responsible for teaching, mentoring and reviewing Black Belts as well as for managing large-scale improvement projects.

Materials Management – A systematic approach to managing material. Includes such functions as establishing minimum and maximum stocking quantities, warehousing practices, stores counts and transportation of materials.

Matrix diagram– Shows the relationships among various data including the relative strength. IT is one of the seven new management tools.

MBO – See management by objectives.

MBP – See management by policy.

Measurement – The act of measuring in order to compare results to requirements.

Median – The middle value when figures are arranged according to size.

Mission – Why an enterprise exists; its *raison d'être* and the scope of the business it's in. For example, Exxon's mission could be oil energy or a financial conglomerate.

Natural Variation – The random variation inherent in any process.

Need – A condition expressed by customers that must be satisfied; an expression of something necessary, desired or useful.

No Cause Found (NCF) – The code used when analysis is unable to determine the true cause.

O & M – Abbreviation for Operating and Maintenance. Usually refers to a type of expenditure.

Objective – Specifically refers to a desired result. In the context of MBP, a policy is comprised of both an objective and the means to accomplish the objective.

Operating philosophy – A statement of fundamental values, beliefs, assumptions, credo, philosophy, and principles.

Outcome – The results achieved by using the product process or service.

Outgoing – The end result of a set of activities or work process.

Pareto Analysis – The study of related subjects to determine if one is more significant than the others.

Pareto chart – Organizes causes by frequency so that a significant few causes, which may account for most of the effect, can be identified. Also known as the 80/20 rule; that is, 80 percent of the effect is due to 20 percent of the causes. It is one of the seven basic process improvement tools.

Payback Period – The length of time until an investment has returned its initial investment.

PDCA – See plan-do-check-act.

PDPC – See process decision program chart.

Peak Load – The maximum amount of product or service required by consumers during a particular period.

Peak Period(s) – Those times, usually weekdays, when customer demand for electricity is greatest. FPL's daily peak periods during winter months occur between 6 a.m. – 11 a.m. and between 5 p.m. – 10 p.m. Daily peak in the summer is between 12 – 10 p.m. Peak periods are utility-specific since they vary from utility to utility.

Performance Measure – Measurement of actual accomplishment compared to what was planned.

Plan-do-check-act (PDCA) cycle – Also called the Deming cycle or Shewhart (original developer) cycle. It is the application of the scientific method to process control and improvement. Essentially, it means to analyze a situation or process; decide on an alternative and plan its implementation; implement the alternative; determine whether it worked; if so, institutionalize it, if not, discard it and try again. Recently, Dr. Deming refers to this cycle as the plan-do-study-act cycle.

Poka-yoke – The Japanese term for fail-safe or mistake proofing.

Policy – In management by policy and in the Deming Prize checklist, policy means the overarching or key objectives for the organization and the means by which the objectives are obtained.

Policy management – See management by policy.

PON – See price of nonconformance.

Population – A statistical term used to describe the whole range of possibilities from which a measurement could be taken.

Present Value – Value at the beginning of a time frame.

Preventable Occurrences – Full or partial failures that could have been prevented by better management action.

Prevention – A Quality Improvement method that uses analysis and process changes to reduce waste, delays and defects.

Prevention-based process/system to ensure quality – Can be contrasted to a system based upon inspection, which is reactive. A prevention-based system identifies those upstream activities that, if done, ensure that the results will be satisfactory. A prevention-based system is proactive.

Price of nonconformance (PON) – See cost of quality.

Prioritization matrices – Used to determine the highest-priority options or alternatives relative to accomplishing an objective. IT is one of the seven new planning tools.

Problem – A gap between what the customer desires and what currently exists.

Problem-solving tools – The seven basic process improvement tools.

- a) Flowchart
- b) Cause and effect diagram
- c) Pareto Chart
- d) Histogram
- e) Scatter diagram
- f) Run Chart
- g) Control Chart

Problem Statement – A brief description of a condition that needs to change.

Process – All of the activities, people, machines, information, material, measurements, and methods required to accomplish a task.

Process Boundary – The line separating a process from other business activities.

Process Capability – The inherent variation of a process relative to the variation that is acceptable to the customer. That is, if the inherent variation is very small relative to the customer needs and the process is centered at or near the target, then the process is said to be highly capable.

Process decision program chart (PDPC) – Identifies all events that can go wrong and the appropriate countermeasures for these events.

Process Improvement – Activities applied to detect and remove the causes of process variation.

Process Mapping – A tool that provides a graphic representation of the sequence of steps performed to produce an output (product or service).

Process Owner – The person or persons responsible for assuring that a process meets customer requirements.

Process Quality Indicator – Measures the degree and/or frequency of conformance to process valid requirements. They can provide early indication that the desired outcome will or will not be achieved.

Process Redesign – Actions taken to improve the efficiency or capability of a process to meet customer requirements.

Producer Price Index (PPI) – A U.S. Government Index that measures the change in wholesale prices by using a previous time period as a reference or index.

Pull production system – A production approach whereby material isn't moved or produced until a signal is received from the customer operation. It contrasts with a traditional push system whereby material is produced to a centrally

developed schedule (such as material requirements planning) and pushed to the next operation or the stockroom whether or not the customer operation needs it.

Purchase Order – Contractual document with a contractor or supplier of material and/or services.

Quality – Good quality results from the customer's perception that expectations have been met or exceeded. With respect to customer satisfaction, perception is reality. Customers are both internal and external to the business. External customers include the ultimate end users and hierarchy of companies between the company and end users.

Quality Circles – Natural work units that meet regularly to improve quality. Typically, quality circle members are volunteers. The circle usually determines what it is going to address. Quality circles contrast with process improvement teams, which are typically multifunctional and work on issues that are specified by management.

Quality Control – The ability to evaluate actual operating performance, compare actual performance to a target, and act on the difference.

Quality Elements – The translation of the customer's voice into variables the company can measure and control in order to meet customer needs and reasonable expectations.

Quality function deployment (QFD) – A process to understand the voice (expectations) of the customer and to translate the customer's voice into technical design parameters (substitute quality characteristics), subsystems, parts, components, processes, and process controls.

Quality Improvement Teams (QI Teams) – Employee teams formed to solve problems and to improve the quality of products and services. There are two types of teams: Functional and Task.

Quality in daily work – A process used to maintain and improve daily control of work activities.

Quality of conformance to design – The degree to which the delivered product or service quality reflects the intended quality of design.

Quality of design – The degree to which the intended product or service design satisfies the customer's needs for a designated market area.

Radar Chart – Graphically depicts the relative strengths or weaknesses of various attributes in an activity.

Range – The difference between the maximum and the minimum value of data in a sample.

Rate of Return – The net operating income earned by a utility company calculated as a percentage of its rate base.

Reliability – How well a product or process performs under specified conditions, without failure, for a given period of time.

Root Cause – A major reason for the occurrence of a problem.

Rework – A Quality Assurance method that focuses on improving rejects at the end of a process (inspection) with the goal of delivering only acceptable products and services to the customer.

Robust design – A design that is relatively insensitive to the variation in customer usage, production processes, material, and components.

Run Chart – Plots data over time (for example sales per month). It is one of the seven basic process improvement tools.

Sample – A measurable number of items taken from a population.

Scatter Diagram – Depicts the relationship between variables, thereby helping to substantiate whether or not a potential root cause is related to the effect. It is one of the seven basic process improvement tools.

SDCA – See standardize-do-check-act cycle.

Seven new planning tools for management – These are as follows:

- Affinity diagram (also called the KJ method)
- Interrelationship diagram
- Tree diagram
- Matrix diagram
- Prioritization matrices
- Process decision program chart (PDPC)
- Arrow diagram

Shareholder Value – The total value of the common stock of a company, measured by the price at which the stock could be sold.

Shewhart cycle – Also known as the Deming cycle or the plan-do-check-act cycle. See plan-do-check-act cycle.

Short-Term Plan (STP) – One-year plan developed to address a high priority corporate problem.

Sigma – a measure of the variation around the average of any process. Also known as 1 standard deviation, 1s represents 34.134% of your data points.

Six Sigma – A process quality measure indicating that there are 6 standard deviations between the process average and EACH (lower & upper) specification limit. Therefore, the greater the number of s's, smaller the variation (the tighter the distribution) around the average, it will produce approximately 3.4 Defects Per Million Opportunities.

Special Cause – A source of variation in the output of a process that is unpredictable, unstable, or does not occur very often (also called “assignable” cause).

Special Causes of variation – Specific factors that cause excessive variation and make a process unstable.

Specification – A description of the requirements to which a product or service must conform.

SQC – Abbreviation for Statistical Quality Control.

Stakeholders – Persons and organizations affected by the actions of a business.

Standard – The current best practice for an activity or process.

Standard Deviation – Calculated boundaries that describe how data is dispersed around its median.

Standardization – The process by which all persons follow the current standard. Management's job is to ensure standardization. When a process is improved, doing all of the things required to ensure that the improvement is institutionalized (that is, used pervasively in the company), and that the gains are sustained. Standardization means the same as *maintenance*.

Standardize – Assuring that a process will be performed in the same manner each time.

Standardize-do-check-act (SDCA) cycle – A variation of the PDCA cycle, whereby the P step entails planning to replicate a process standard throughout an organization.

Statistical process control – Using a statistical control chart to monitor a process to determine the nature of its variation. Based upon the nature of variation, a decision is made to leave the process alone or to take appropriate action. Any actions will utilize the quality improvement process.

Statistical thinking – This is the means to understand variation in all processes and the implications of the nature of variations. Dealing with special causes of variation requires one strategy, whereas common causes require another strategy.

Steps – The sequential order of activities performed.

Storyboarding – The process of documenting the application of the DMAIC to a specific area or process. Ideally, the DMAIC will be displayed prominently on a board or wall to make it as visible as possible. The term originated with Walt

Disney, who used to display ideas and issues prominently to enhance communication and to make it easy for people to contribute ideas.

STP – See Short-Term Plan.

Stratification – Breaking down the whole into smaller related parts. For example, age, sex, occupation, race, ethnic group, and so on can stratify data about the U.S. population. Stratification is vital in analysis because significant differences can exist for various parts of the whole.

Stratify – Break down into component parts.

Steering Committees – Management Teams that provide direction, allocate resources, monitor progress, and support for the achievement of SP's goals objectives.

Sunk Cost – Money previously spent and beyond recovery.

Supplier – Contractor or vendor of material and/or services.

Surge – An abnormal rush of demand.

Survey – A means of gathering information with questionnaires.

System – A group of processes that together accomplish a specific purpose.

Table of Tables – A tool used to incorporate the customers' voice into the decision-making processes of the company. The Table helps to identify those items (functions) on which require focus in order to maximize and maintain customer satisfaction.

Target – A specific end result by a given time. Comparing target with objective: an objective is to improve billing accuracy, and a target is to reduce errors to .01% by December 1993.

Task Teams – QI Teams appointed to work on a specific process/problem.

TQM – See total quality.

Total Cost – The sum of the costs of making each unit of production or service.

Total productive maintenance – A continuous improvement approach that is focused on equipment. Its aim is zero breakdowns through improved process capability and reliability. Involving equipment operators in the maintenance process and continuously upgrading their capability to do more complex maintenance is a fundamental component of this improvement approach. Preventing breakdowns through robust processes is another key ingredient.

Total quality (TQ) – Sometimes referred to as total quality management (TQM). An organizational philosophy committed to meeting or exceeding customer's needs through continuous improvement of business processes resulting from the continuous development of people's capabilities.

Tree diagram – Shows the complete range of subtasks required to achieve an objective. It is one of the seven new management tools.

U chart: count per unit chart

Upper control limit (UCL) control limit for points above the central line in a control chart.

Value-Added Time (VAT) – Time consumed or expended in performing work, usually measured in minutes. For many business processes, VAT accounts for less than 10 % of the process cycle time.

Value engineering – Also called value analysis or VA/VE. Lawrence Miles of General Electric originated this improvement methodology in the 1940's. This approach focuses on the end uses or function of the product or service being studied rather than its component parts. The worth to the customer and the cost are determined for each function. Value is defined as the worth to the customer divided by cost. Where functions have an imbalance considered that can provide the same function at a lower cost. Although many U.S. businesses and the Department of Defense started value engineering equivalent programs, most have been abandoned. Those that still exist seem to

exist only in pockets within companies. Seldom are they company-wide standard operating procedures. By contrast, many Japanese companies use the procedure pervasively. These companies use value engineering to ensure customer satisfaction at the lowest cost.

Variable – A factor that when counted (discrete data), or measured (continuous data), can take on different numeric values.

Variable Cost – A cost that changes with changes in sales or production.

Variance – Any non-conformance to specifications.

Vision – A picture of the future state of the business in five, ten, or 20 years. Such a vision provides direction for strategic planning, the purpose of which is to attain the vision. An example of a vision statement is to be the recognized world leader in financial services. Visions can be more comprehensive and can define how things will work relative to different categories, such as the following:

- a) Customers
- b) Leadership
- c) Information and analysis
- d) Strategic quality planning
- e) Process and process assurance
- f) Human resource utilization

Voice of the Customer (VOC) – Expectations of the product, as stated by the customer. These expectations may be expressed in subjective terms that may not be directly measurable by objective criteria.

Work Order – The drawings and instructions issued to a construction or maintenance crew describing the work to be performed.

Work Process – A series of work activities intended to produce a specific output.

Yield – The basic metric of process quality that measures the proportion of 1st Quality product or service produced. There are four main types of yield measurements (you need to know AT LEAST the Final Yield and the Throughput Yield to even estimate the current 6 sigma level of a process):

- a) **FINAL YIELD** – The proportion of products or service outputs that pass final inspection. It ignores the “hidden factory.”
- b) **THROUGHPUT YIELD** – The probability of any product or service passing through ALL of the process steps without a defect or error.
- c) **NORMALIZED YIELD** – Based upon the ‘Rolled Throughput Yield’ and the number of process steps, Normalized Yield creates an average yield of each step. This allows you to compare the yields of both simple (a few steps) and complex processes (many steps).