FOCUS PDCA

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F = FIND A PROCESS
- Process prioritization
- Customer research
- Review strategic/operational plans
- Identify the important quality characteristics

O = ORGANIZE TO IMPROVE THE PROCESS
- Select a team/individual who has process knowledge
- Create a plan

C = CLARIFY CURRENT KNOWLEDGE OF THE PROCESS
- Look at current process
- Identify quick and easy improvements
- Standardize best current method

U = UNDERSTAND THE SOURCES OF PROCESS VARIATION
- Measure the important quality characteristics
- Stabilize the process
- Identify process variables
- Measure key process variables
- Test to see if there is a relationship between key process variables and the important quality characteristics

S = SELECT THE PROCESS IMPROVEMENT
- Evaluate improvement alternatives for their potential effectiveness and feasibility
- Select the improvement

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P = PLAN THE IMPROVEMENT
- Plan the implementation of the improvement
- Plan continued data collection

D = DO THE IMPROVEMENT TO THE PROCESS
- Make the change
- Measure the impact of the change

C = CHECK THE RESULTS
- Examine data to determine whether change led to the expected improvement

QUALITY TOOLS

TOOL	DESCRIPTION	COMMENT(S)
Brainstorming	❖ Way to elicit a large number of ideas from a group of people in a short period of time to help identify issues/problems that may need to be improved.	❖ Usually the first tool used when a group is formed to analyze a problem or issue.
Flow Charts	❖ Tool that graphically shows the inputs and outputs of a given system.	❖ Helps identify any redundancies or problems within a given process and/or system.
Cause and Effect Diagram (Fishbone or Ishikawa)	❖ Used to organize data derived from a brainstorming session ❖ Graphic tool used to explore and display sources of variation in a process	❖ The areas usually identified for the "scales" of the fishbone are: manpower, methods, environment, materials, equipment and others as appropriate.
Affinity Diagram	❖ The means of organizing data into meaningful categories by recognizing their underlying similarities. ❖ Organizes a large number of qualitative inputs into a smaller category, constructs or major dimensions.	❖ Useful for analyzing quality problems, defects data, customer complaints, survey results, etc. ❖ Can be used in conjunction with other techniques, such as cause and effect diagrams or interrelationship digraphs.
Control Charts	❖ Used to help identify the central tendency of a process over time. ❖ Analyzes processes	❖ X,mr charts: used to track individual values or measures taken on a process or its output. ❖ X,R chart (average and range chart): used to track measurement data that is gathered in subgroups between 2 and 9 and averaged out. ❖ X,s chart (average and standard deviation): applied to measurement data. ❖ np charts: used to track the number of defects in a process ❖ p charts: used to track the fraction of items that are defective in a given subgroup ❖ c chart: used to track the number of defects produced by a process when the area of opportunity is constant from subgroup to subgroup.
Run Charts	❖ Graph of data collected over time. ❖ Used to display variation and to detect the presence and/or absence of special causes	❖ Should be used for preliminary analysis of any data measured on a continuous scale that can be organized in time sequence. ❖ They answer the question: "was this process in statistical control for the time period observed?"
Pareto Charts	❖ Indicates which problems should be solved first per the 80/20 rule.	❖ Remember the pareto principle: "the vital few are the few factors accounting for the largest percentage of problems that occur within an organization."

Scatter Diagrams	❖ Plot of one variable versus another. ❖ Used to demonstrate cause and effect relationships.	❖ Scatter plots are used to answer such questions as: "does vender A's material machine perform better than vendor B's?" "Does the length of training have anything to do with the volume of errors that the employee makes?"
Interrelationship Diagraphs (ID)	❖ Graphically displays interrelated factors and show the relationship between factors.	❖ Used when dealing with complex cause and effect issues and/or problems.
Histograms (bar graph)	❖ Used to measure how frequently something occurs within a process. ❖ Pictorial representation of a set of data used to compare processes	❖ Valuable trouble shooting aid. ❖ This tool should not be used alone as a data collection methodology. Always use a run chart or control chart before constructing a histogram. These are needed because histograms will conceal out of control conditions due to the fact that they don't show the time sequence of data.
Arrow Diagrams	❖ Scheduling tool used to manage a project, which shows the preceding and succeeding activities.	❖ This diagram allows managers to plan for an entire project and prioritize critical activities.
Matrix Charts	❖ Used to analyze the correlation between two or more relate groups of ideas.	❖ Decision matrices can be used to help display the timing and responsibilities in a given process.
Check Sheets	❖ Forms designed to collect data in a systematic and consistent manner.	❖ Well-designed check sheets will answer questions such as: "how often does a particular problem occur?" "Has everything been done?" "Have all inspections been performed?"
Tree Diagram	❖ Logic diagram that visually displays the relationship of component parts to a whole.	❖ Often used to demonstrate how various projects interrelate at any one given time.
Force Field Analysis	❖ Planning tool used to understand and/or strategize a process or system.	❖ Helps identify any constraining forces and/or barriers blocking improvement initiatives.
Storyboard	❖ A display of data, analysis and decisions made during the phases of an improvement process.	❖ Can be displayed on a poster board or in a manual. ❖ Utilizes graphs, charts, diagrams, matrices and other display methods to tell the story of a project with minimal use of text.
MANAGEMENT TECHNIQUES		
Statistical Process Control (SPC)	❖ An application of statistical techniques/methods used to measure and/or analyze variation within a process.	❖ Important to have an in-depth understanding of the difference between common and special cause variation when using this technique. ❖ Common cause: variation in a process that is due to the process itself and is produced by interactions of the variables of that process. ❖ Special cause: variation in a process that is assignable to a specific cause(es). They arise because of some particular or special circumstance, which is not inherent in the process.

PDCA Cycle (Deming-Shewhart Cycle)	❖ Model used to assess and evaluate performance improvement initiatives within an organization. ❖ Helps to promote and maintain continuous quality improvement within an organization.	❖ P- plan the process for improvement ❖ D- implement the plan ❖ C- check for how the process has improved the overall functioning of the organization (i.e., lessons learned) ❖ A- act to hold the gains of what has been learned ❖ Otherwise known as Kaizen (cycle of continuous process improvement)
Quality Function Deployment (QFD)	❖ Rigorous system designed to obtain customer input and convey the voice of the customer to all individuals and organizational units. Sometimes called policy deployment.	❖ Often displayed by using the diagram: "house of quality." ❖ Clearly defines the long-range direction of company development in regards to customer satisfaction. ❖ A customer driven process for planning products and/or services.
Control of Quality Costs Analysis	❖ Accounting method used to analyze the total cost of quality.	❖ Prevention Costs- costs identified to prevent poor quality (i.e., training ❖ Appraisal Costs-costs associated with measuring, evaluating or auditing products and/or services (i.e., equipment maintenance) ❖ Failure Costs- costs resulting from products or services not conforming to requirements (i.e., cost of re-work, re-inspections, etc.) ❖ Internal Failure Costs- costs incurred for re-work prior to being delivered to the customer ❖ External Failure Costs- costs incurred after the product has been delivered to the customer (i.e., customer re-calls, processing customer complaints, etc.)
Hoshin Planning Technique	❖ Process-focused system of long term planning designed to convey the voice of the customer to everyone within the organization through the development and deployment of appropriate management policies.	❖ Also called management by policy. ❖ Frequently used to deploy strategic plans.

OPERATIONAL DEFINITIONS:

TOPIC	DEFINITION	COMMENT(S)
Quality Management	• According to Juran (1993), quality management is the process of identifying and administering the activities needed to achieve the quality objectives of an organization. • The system of activities directed at achieving delighted customers, empowered employees, higher revenues, and lower costs.	• Quality objectives should be tied into financial planning. • Attainment of quality requires activities in all functions of an organization.
Quality Assessment	• Organization-wide review of the status of quality.	• Comprised of four elements: a. cost of poor quality b. quality culture in the organization c. operation of the company quality system d. how the organization is compared to others
Internal Failure Costs	• Costs associated with failures and/or nonconformance within the organization.	• Examples: equipment failures due to lack of preventive maintenance; high staff turnover rates; hiring staff that are not qualified and/or competent for the position, etc.

External Failure Costs	• Costs associated with failures and/or nonconformance found in services after they have been delivered to the customer.	• Examples: potential compensable events; negligence, malpractice; etc.
Appraisal Costs	• Costs incurred in determining the conformance to quality requirements.	• Examples: quality control checks; maintenance and testing of equipment; safety checks; IG inspections; JCAHO surveys; etc.
Prevention Costs	• Costs in keeping failure and appraisal costs to a minimum.	• Examples: quality planning; quality audits; education and/or training of staff; performance appraisals; etc.