PMP® V5 RDS

Project Quality Management

V1.1

Overview

- Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.
- Project Quality Management uses policies and procedures to implement, within the project's context, the organization's quality management system and, as appropriate, it supports continuous process improvement activities as undertaken on behalf of the performing organization.
- Project Quality Management works to ensure that the project requirements, including product requirements, are met and validated.

Quality Management Processes

- **8.1 Plan Quality Management —** The process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements.
- **8.2 Perform Quality Assurance —** The process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used.
- **8.3 Control Quality —** The process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.

Concepts

- Meeting customer requirements by overworking the project team may result in decreased profits and increased project risks, employee attrition, errors, or rework.
- Meeting project schedule objectives by rushing planned quality inspections may result in undetected errors, decreased profits, and increased post-implementation risks.

Concepts

- Quality is perceived differently in daily life and management.
  - Quality is defined as the degree to which the project fulfills requirements.
- Quality and grade
  - Quality: the degree to which a set of characteristics fulfill requirements
  - Grade: category assigned to products have the same functional use but different technical characteristics
    - It may not be a problem if a suitable low-grade software product (one with a limited number of features) is of high quality (no obvious defects, readable manual).
    - It may be a problem if a high-grade software product (one with numerous features) is of low quality (many defects, poorly organized user documentation).

Concepts

- **Customer satisfaction:** Understanding, evaluating, defining, and managing requirements to met customer expectations.
- **Prevention over inspection:** Quality should be planned, designed, and built into not inspected into the project's management or the project's deliverables.
- **Continuous improvement:**
  - The PDCA (plan-do-check-act, Deming lifecycle) cycle is the basis for quality improvement
  - Other methodologies
    - Total Quality Management (TQM), Six Sigma, Lean, Six Sigma
- **Management Responsibility:**
  - Success requires the participation of all members of the project team
  - Management retains responsibility to provide suitable resources at adequate capacities

Some Quality Theorists

- Joseph Juran
  - He developed the 80/20 principle, advocated top management involvement and defined quality as "fitness for use".
- W. Edwards Deming
  - He developed 14 Steps to Total Quality Management and advocated the Plan-Do-Check-Act cycle as the basis for quality improvement.
- Philip Crosby
  - He popularized the concept of the cost of poor quality, advocated prevention over inspection, and "zero defects" (do their job right the first time). He believed that quality is "conformance to requirement".

80/20 Principle

- Also known as Pareto principle
- E.g. 80% of problems is caused by 20% of causes
  - Implication: fixing 20% of causes will resolve 80% of problems
- Concept of focusing

PMI's View

- The project manager should recommend improvements to the performing organization's standards, policies, and processes.
- Quality should be considered whenever there is a change to the project constraints
- Quality should be checked before an activity or work package is completed
- The project manager must determine metrics (product and quality metrics) to be used to measure quality before the work begins
- The project manager must make sure authorized approaches and processes are followed

Actions

- Review project charter and project scope statement
- Understand the customer's definition of quality
- Identify the desired performance in the product and components of the product
- Determine the quality standards, processes, and metrics

Actions

- Test the validity of assumptions before they result in problems
- Collect problems, errors and complaints, and review what can be done to prevent them from recurring
- Inspect work as it is being done
- Measure performance against standards
- Hold meetings, issue reports, take measurements and perform calculations

Actions

- Reassess the quality standards
- Evaluate the effectiveness of the quality control system
- Request changes
- Include quality issues in lessons learned

Concepts

- Gold Plating (over processing):
  - Giving customer extras
  - Often just the team's impression of what is valued by the customer, but the customer may not agree
  - Kind of waste as resources are used but values may not added to customers
  - Unprofessional
- Prevention over Inspection
  - Quality must be planned in, NOT inspected in

Concepts

- Marginal Analysis
  - Looking for the point where the benefits or revenue to be received from improving quality equals the incremental cost to achieve the quality
  - Never target on 100% customer satisfaction – cost is too high
- Continuous Improvement (Kaizen)
  - Continuously looking for small improvements in quality
- Total Quality Management (TQM)
  - A management approach of an organisation centred on quality, introduced by Deming

For Reference Only

Concepts: Lean

- Origin from the Toyota Production System
- Preserving value with less work
- Eliminate waste
  - Transport
  - Inventory
  - Motion
  - Waiting
  - Overproduction
  - Over Processing
  - Defects

For Reference Only

Concepts: Just in Time (JIT)

- Have suppliers deliver raw materials just when or before they are needed, decreasing inventory to close to zero
- Must have high quality practices to make sure there is enough materials to meet production requirements because of waste and rework
- A pull system
- Forces attention on quality

Concepts

- Impact of Poor Quality
  - Increases costs
  - Low morale
  - Low customer satisfaction
  - Increases risk
  - Rework
  - Schedule delays
- Increase in quality can lead to increased productivity, cost effectiveness and decreased cost risk

Key Points about 3 Processes

- Plan Quality Management
  - Determine quality standards, requirements, metrics, process, procedures
  - Create quality management plan
- Perform Quality Assurance
  - Perform continuous improvement
  - Perform quality audit: compliance and substantive tests
  - Process analysis
- Control Quality
  - Inspect; validate deliverables
  - Take measurements
  - Solve problems

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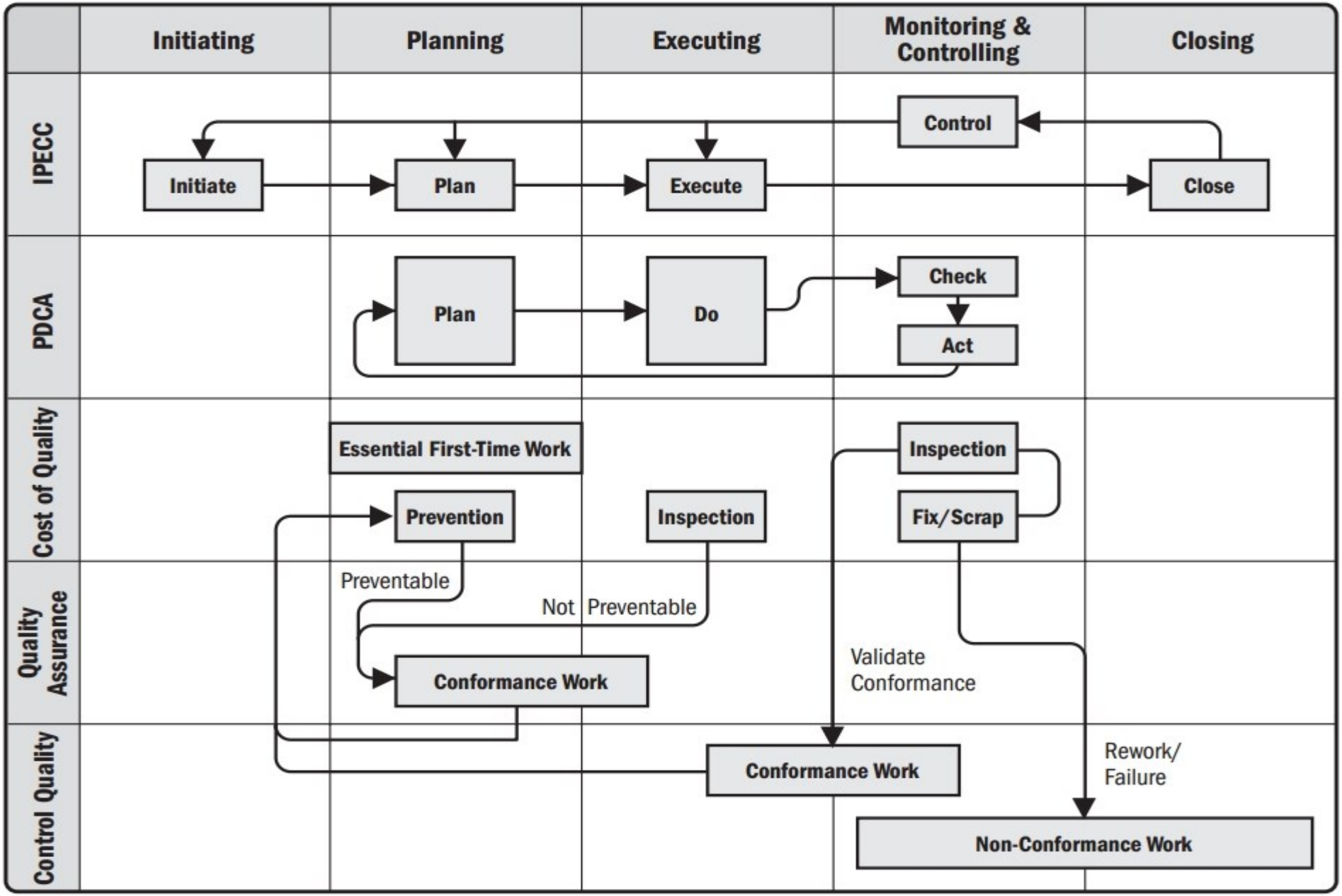


Plan Quality Management

(planning)

Plan Quality Management

- The process of identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with relevant quality requirements
- The key benefit of this process is that it provides guidance and direction on how quality will be managed and validated throughout the project

Plan Quality Management

- Requires:
  - Stakeholder register, project scope baseline (scope statement, WBS, WBS dictionary), schedule baseline, cost baseline, risk register, requirements documentation

For Reference Only

Related Concepts

- Good practice: a generally accepted way
- Best practice: a method or technique that has widely adopted shown results superior to those achieved with other means
- Standards: a best practice that consistently deliver results
  - From the organization / government / professional associations
    - e.g. PMBOK and PRINCE2 can be considered as PM standards
  - PM looks for standards that might help the project to achieve higher quality

For Reference Only

Related Concepts

- International Organization for Standardization
  - ISO 9001: Quality Management System (QMS)
  - ISO/IEC 20000: IT Service Management (ITSM)
  - ISO/IEC 27001: Information Security Management System (ISMS)
  - Occupational Safety and Health Administration (OSHA)
- Certificates are granted to organizations that passed the external audit and fulfil the requirements stated in the mentioned ISO standard
- Personnel certifications (PECB)
  - Foundation
  - Lead Auditor

Related Concepts

- PM must plan the project to meet customer's quality standards
  - Helps the PM know when the project goes out of track (variance) and request changes for corrective / preventive actions (prevent defeat)
  - PM need to create additional standards not covered by existing standards

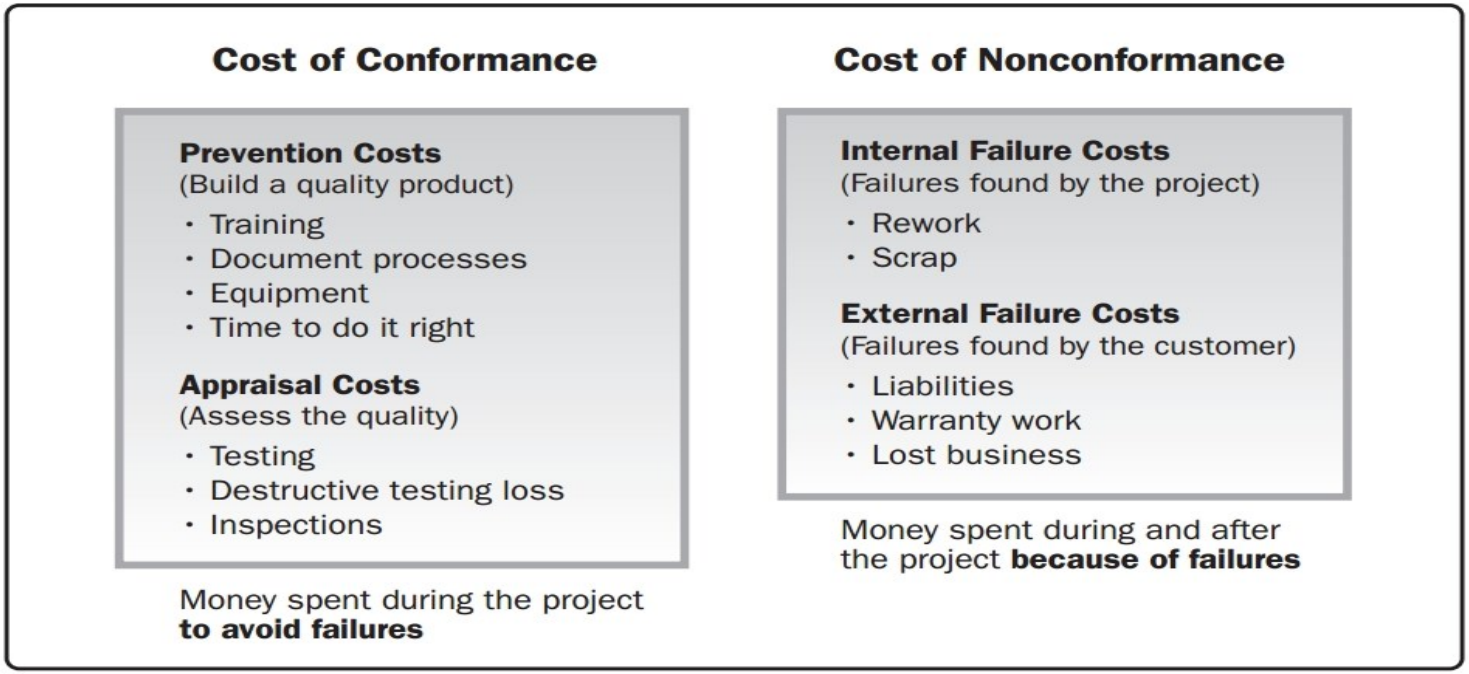
Related Concepts

- After identifying standards, the process need to determine what work to be done to meet the standards
- Quality must be balanced with other project constraints
  - Do not negatively impact the scope , time, cost if higher quality is not required
- Most tools and techniques are used in 3 quality management processes e.g. flowchart.

Plan Quality Management

Tools and Techniques

- Cost-Benefit Analysis: the PM weights the benefits vs. the costs of meeting quality requirements
- Cost of Quality (COQ):
  - Make sure the project is not spending too much to assure quality

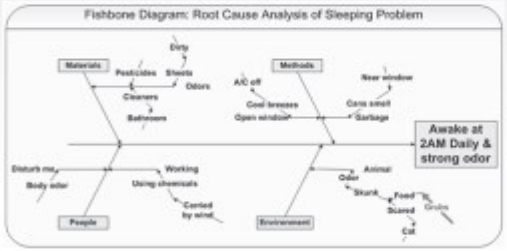


Seven Basic Quality Tools

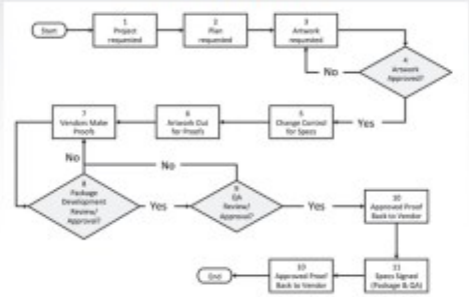
Plan Quality Management: Tools and Techniques

- Cause and Effect Diagram
- Flowcharts
- Checksheets
- Histograms
- Pareto Diagrams
- Scatter Diagrams
- Control Charts

Cause & Effect Diagram



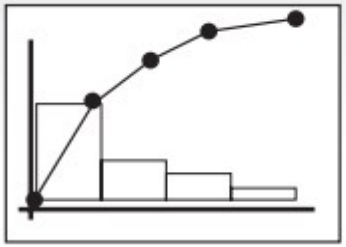
Flowcharts



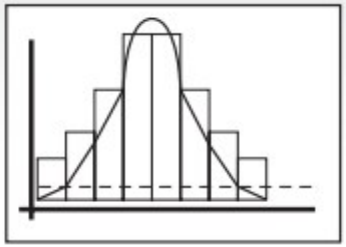
Checksheets

Category	*Strokes*	*Frequency*
Attribute 1		
Attribute 2		
Attribute ...		
Attribute n		

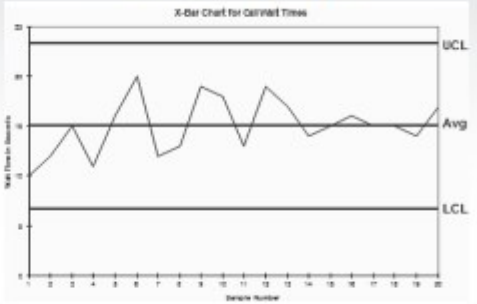
Pareto Diagrams



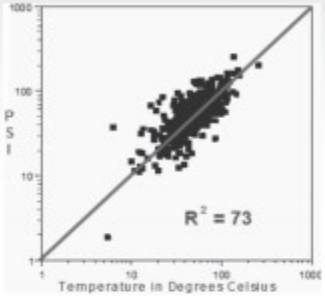
Histograms



Control Charts



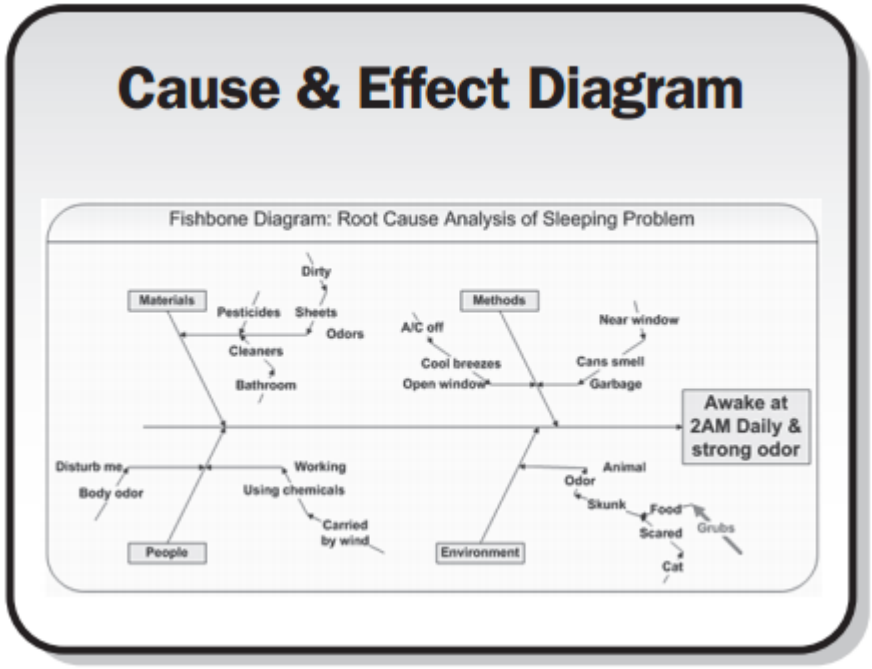
Scatter Diagrams



Cause and Effect Diagram

Plan Quality Management: Tools and Techniques

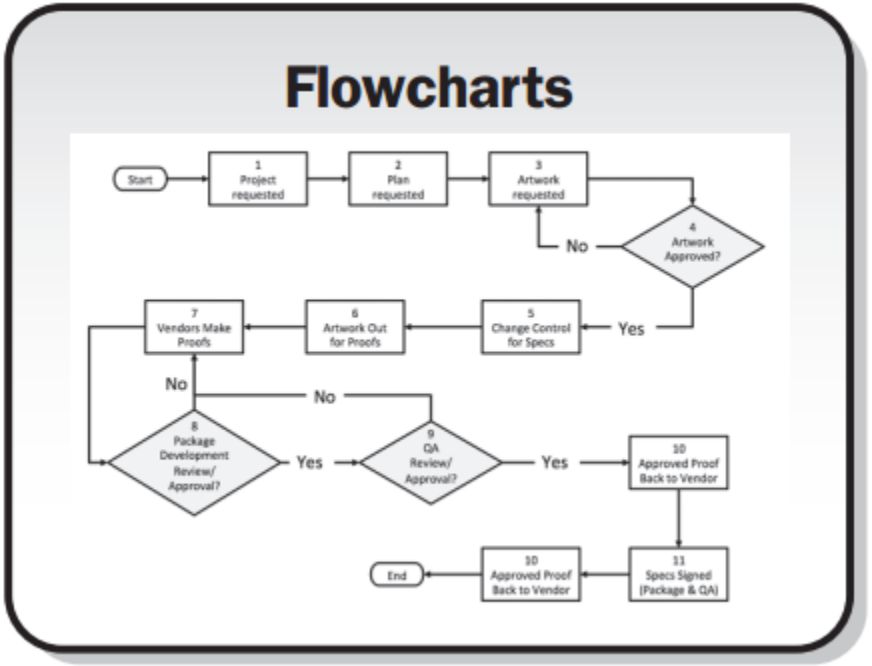
- Also known as Fishbone diagram, Ishikawa diagram
  - Illustrate how various factors might be linked to potential problems or effects.
  - Used in quality control to help the project manager look backwards at what has contributed to quality problems (finding root cause)
  - A creative way to look at the causes of a problem
  - Helps stimulate thinking, organizes thoughts, and generates discussion
  - Use with the “5 whys” techniques



Flowchart

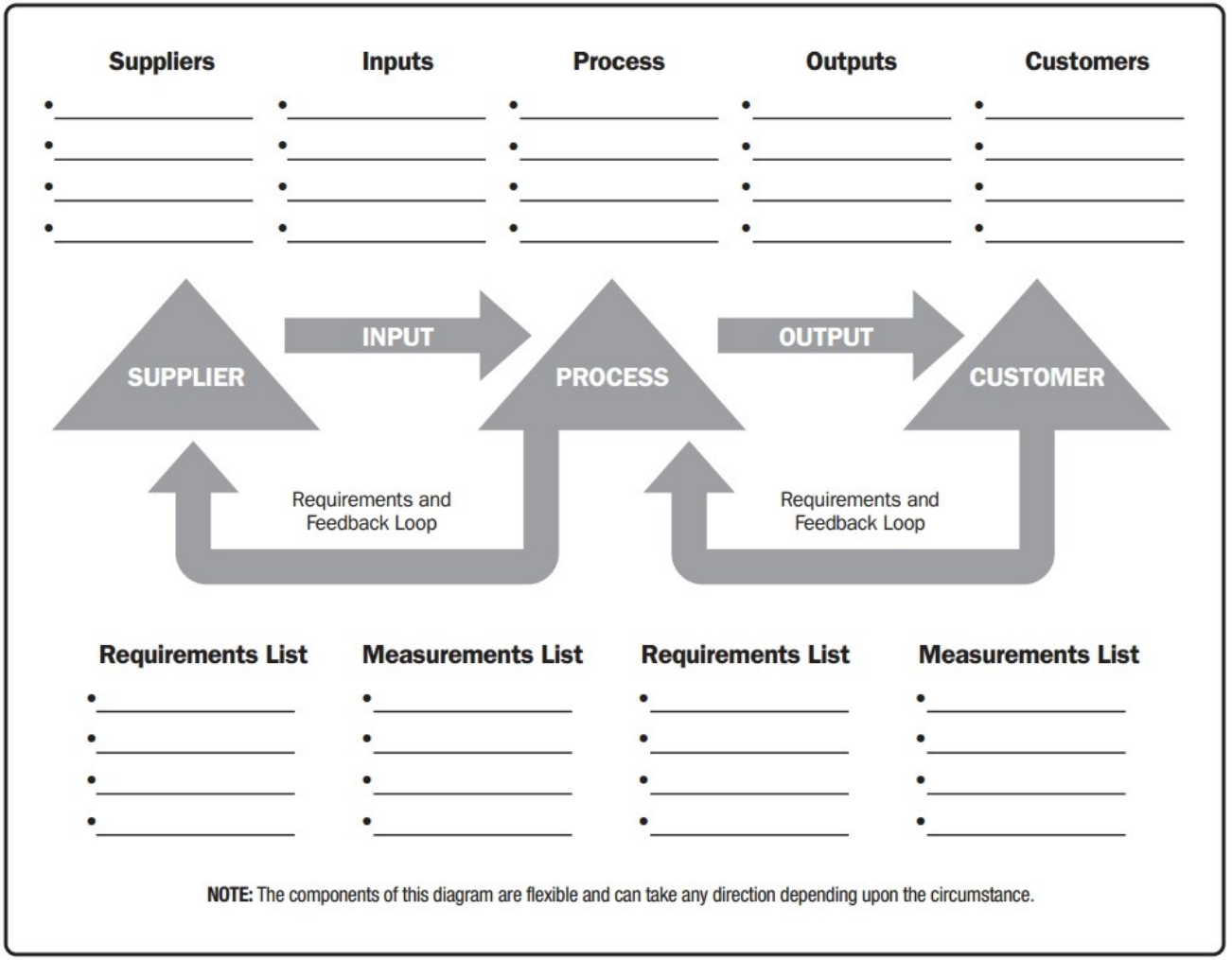
Plan Quality Management: Tools and Techniques

- A kind of process maps
  - Sequence of steps
  - Branching possibilities



SIPOC – Process Map

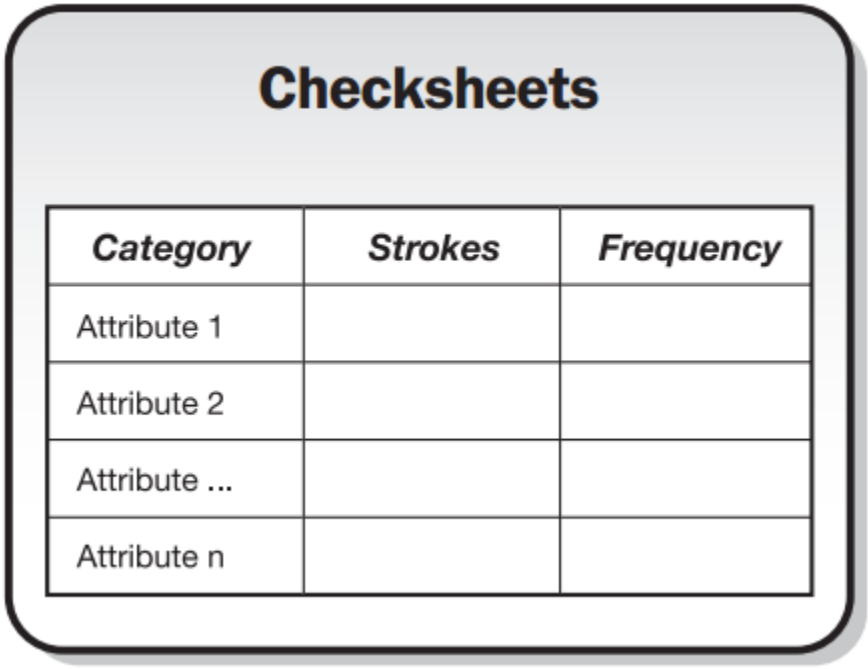
Plan Quality Management: Tools and Techniques



Checksheets

Plan Quality Management: Tools and Techniques

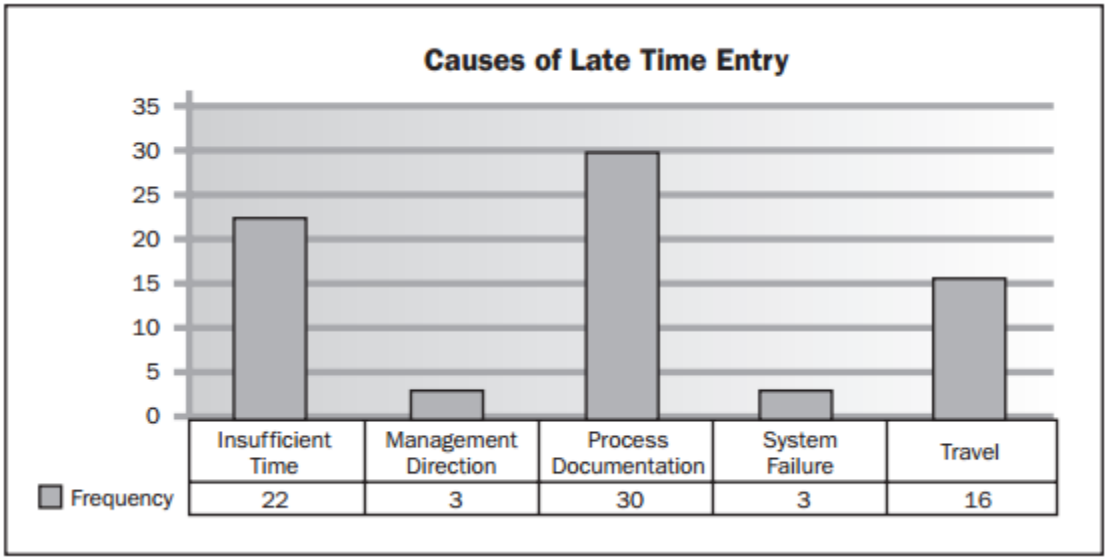
- Tally sheets
- As checklist when gathering data



Histograms

Plan Quality Management: Tools and Techniques

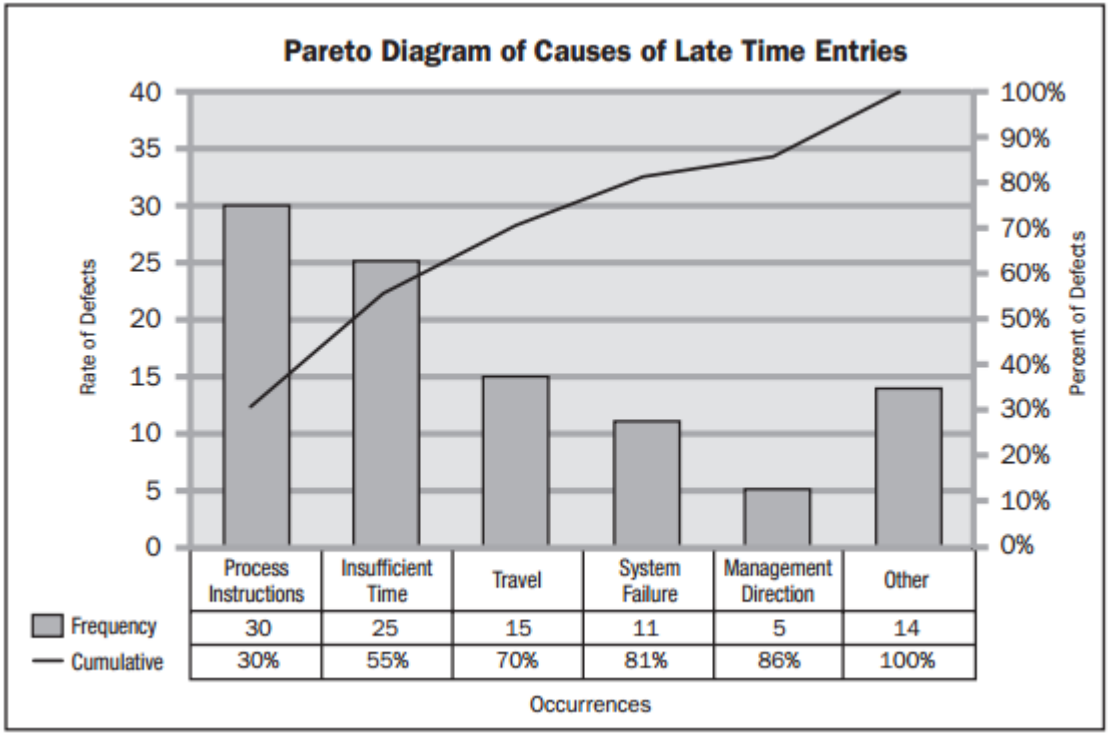
- Displays data in the form of bars or columns
- Show what problems are worth dealing with



Pareto Diagrams

Plan Quality Management: Tools and Techniques

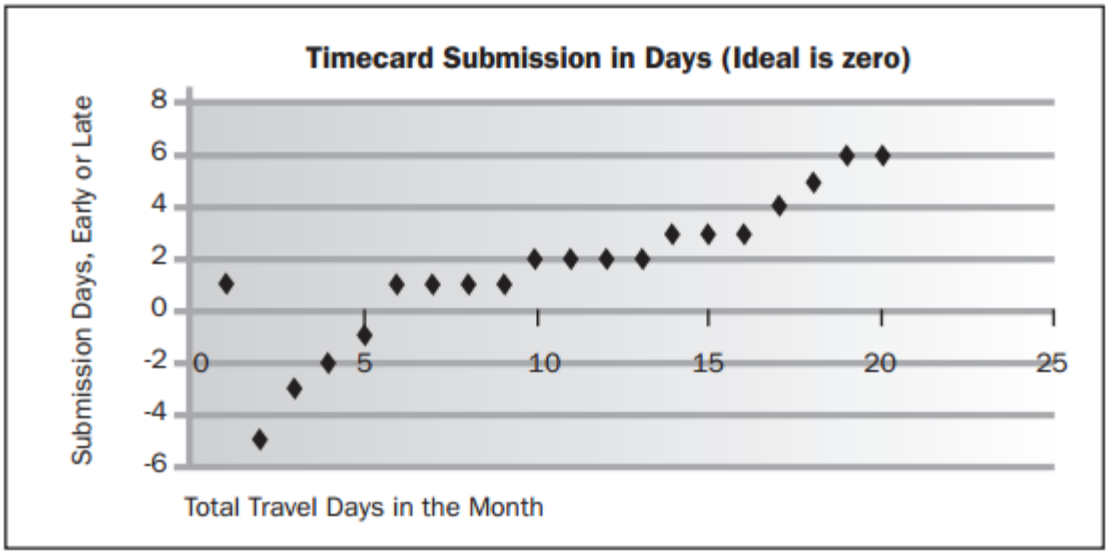
- A histogram ordered by frequency of occurrence.
- Rank ordering is used to focus corrective action.
- Conceptually related to Pareto's Law (80/20 rule): where 80% of the problems are due to 20% of the causes.
- Helps focus on the most critical issues
- Prioritize potential causes of the problems
- Separate the critical few from the uncritical many



Scatter Diagrams

Plan Quality Management: Tools and Techniques

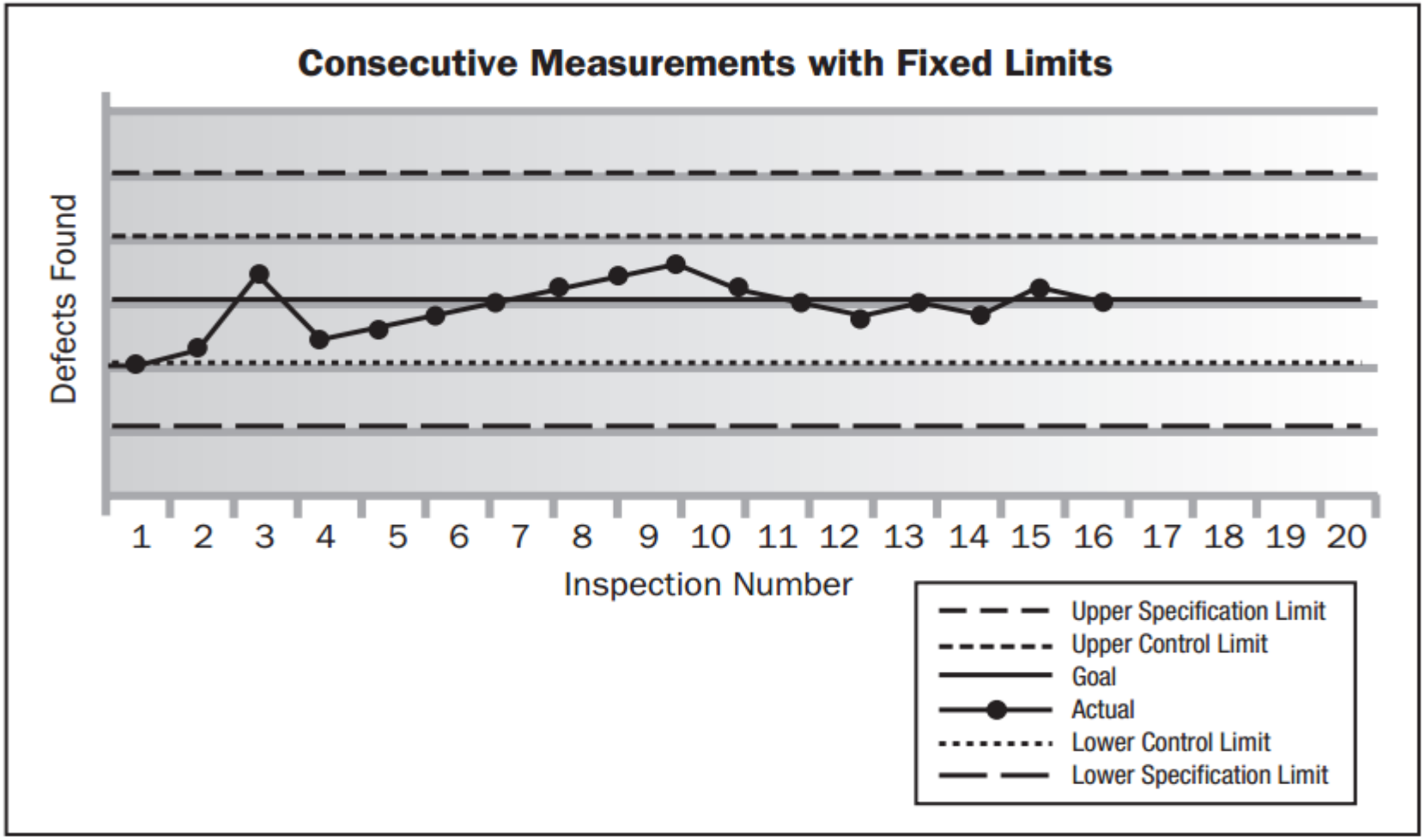
- Shows the relationship between two variables
- Allows the quality team to study and identify the possible relationship between changes observed in two variables



Control Charts

Plan Quality Management: Tools and Techniques

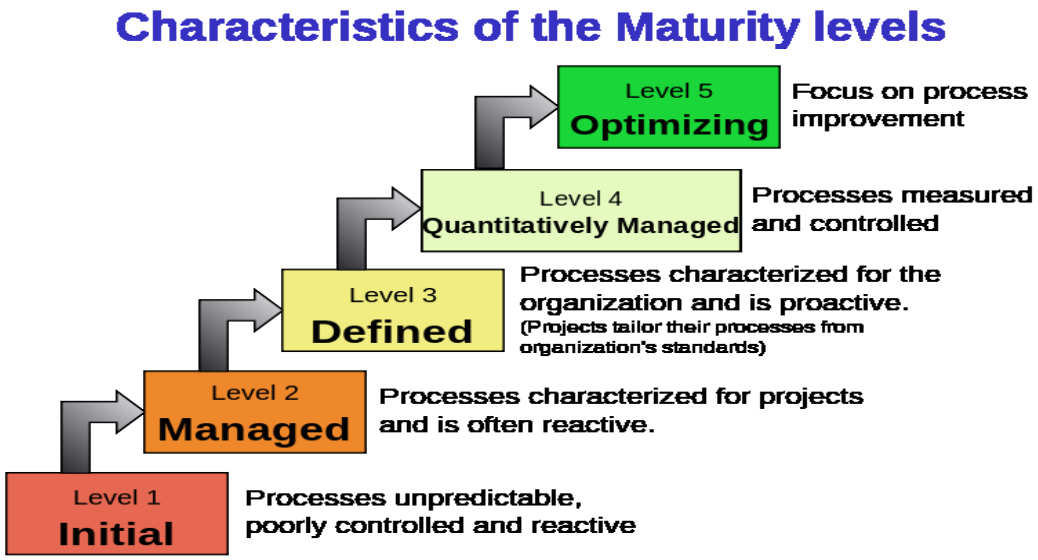
- Covered in details later



Benchmarking

Plan Quality Management: Tools and Techniques

- A kind of assessment method: comparing against a standard, peer, product, or competitor
- Capability Maturity Model Integration (CMMI)
  - Provide basis for measuring quality performance



- Look at past projects for improvement ideas
  - OPM3®, Organizational Project Management Maturity Model of PMI

Design of Experiments (DoE)

Plan Quality Management: Tools and Techniques

- Uses experiments to statistically determine what variables will improve quality
  - E.g. change the type of wood for a desk, and analyze the quality variance
- While all other factors have to remain the same

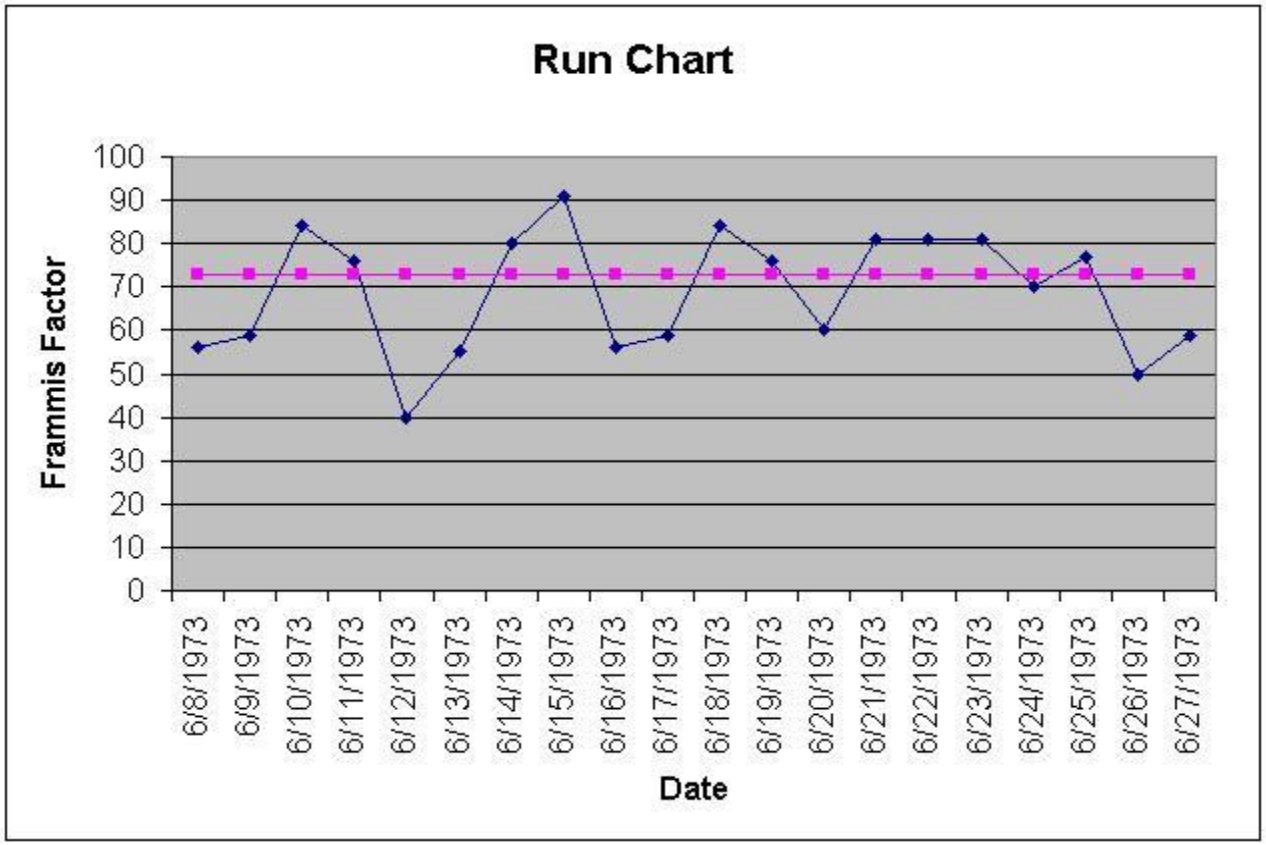
Statistical Sampling

Plan Quality Management: Tools and Techniques

- Take a statistically valid sample of the population for measurement
- When studying the entire population would take too long, cost too much or be too destructive
- Best to be used when it is believed that there are not too many defects

Other Tool: Run Chart

- Shows the history, pattern, peak and trough of the data
- Shows data points plotted in the order in which they occur
- Show trends in a process, variation, or declines or improvements over time



Quality Management Plan

Plan Quality Management: Outputs

- Determine what quality is and the plan to manage quality
- Include
  - The quality standards that apply to the project
  - Who will be involved in managing quality, when, and what are their duties
  - Meetings to be held for quality control
  - The reports to address quality
  - Metrics to be used to measure quality
  - When and what part of the project or deliverables will be measured

Process Improvement Plan

Plan Quality Management: Outputs

- It details the steps for analyzing project management and product development processes to identify activities that enhance their value.
- Areas to consider include:
  - **Process boundaries.** Describe the purpose of the process, the start and end of the process, its inputs and outputs, the process owner, and the stakeholders of the process.
  - **Process configuration.** Provides a graphic depiction of processes, with interfaces identified, used to facilitate analysis.
  - **Process metrics.** Along with control limits, allows analysis of process efficiency.
  - **Targets for improved performance.** Guide the process improvement activities.

Quality Metrics

Plan Quality Management: Outputs

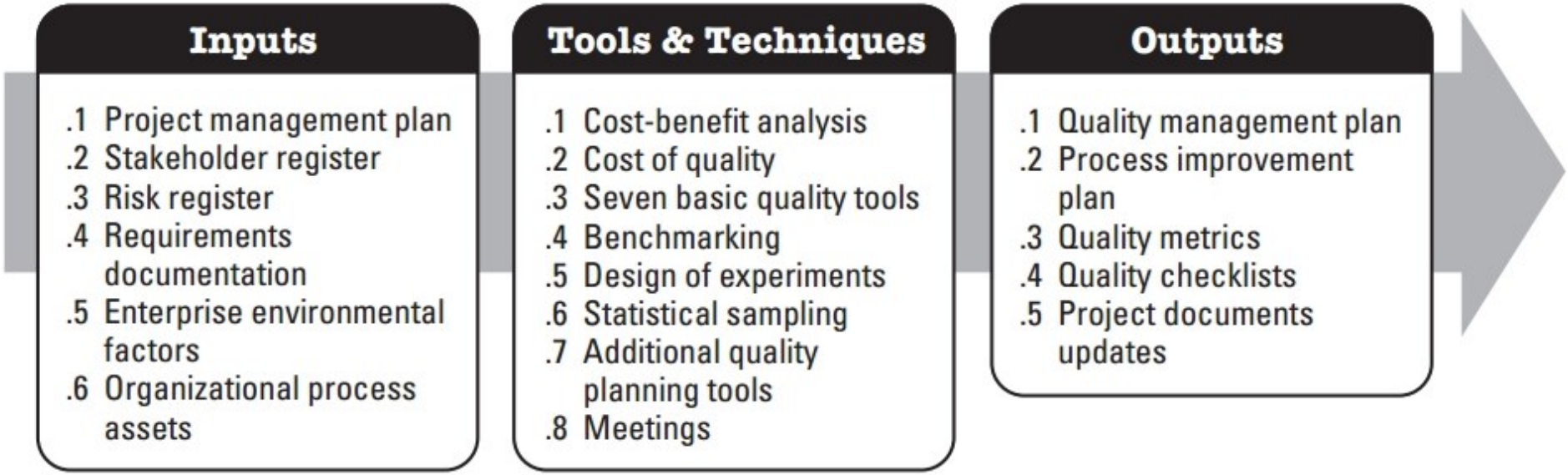
- What are to be measures?
- What measurement is acceptable?
- Examples:
  - The number of changes
  - Number of resources used
  - Number of items that fail inspection
- Design the metrics according to the project needs

Quality Checklists

Plan Quality Management: Outputs

- List of items to inspect
- List of steps to be performed
- Picture of the item to be inspected
- Created in Plan Quality process, used in Perform Quality Control process

Plan Quality Management
(planning)



Perform Quality Assurance

(executing)

Perform Quality Assurance

- The process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used
- The key benefit of this process is that it facilitates the improvement of quality processes

Perform Quality Assurance

- Provide an umbrella for continuous process improvement, which reduces waste and eliminates activities that do not add value.
- Use data from quality control measurements
- Usually performed by a group outside the project, e.g. quality assurance department

Perform Quality Assurance

Inputs

- Quality Management Plan
- Quality Metrics
- Process Improvement Plan
- Quality Control Measurements
  - The results of quality control activities
  - Used to analyse and evaluate the quality standards and processes of the performing organization

Quality Management and Control Tools

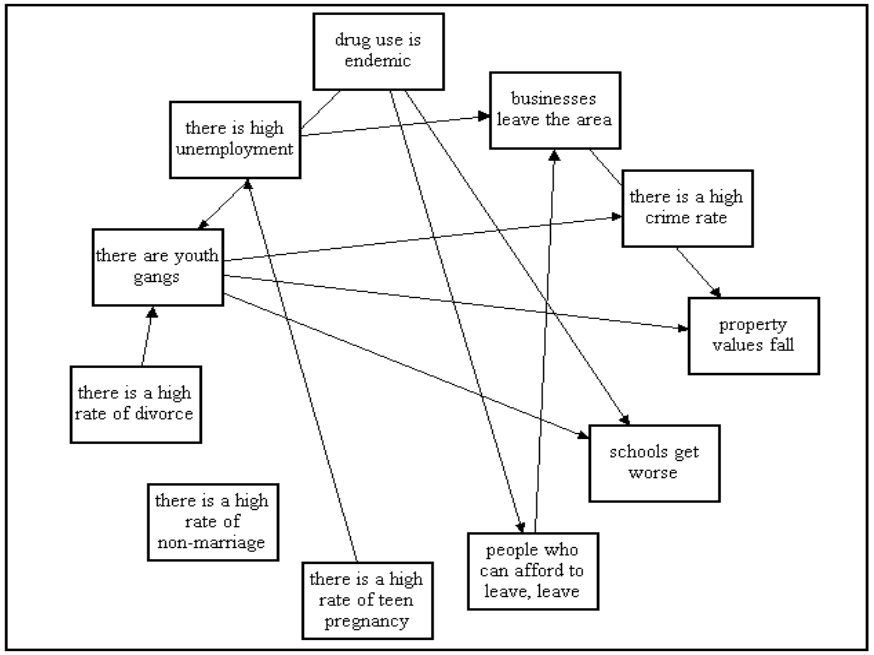
Perform Quality Assurance: Tools and Techniques

- Affinity diagrams
  - Covered in scope management
- Activity network diagram
  - Covered in time management
- Prioritization matrices
  - Identify the key issues and the suitable alternatives to be prioritized as a set of decisions for implementation.
- Matrix diagrams
  - To perform data analysis within the organizational structure created in the matrix; the diagram seeks to show the strength of relationships between factors, causes, and objectives that exist between the rows and columns that form the matrix

Quality Management and Control Tools

Perform Quality Assurance: Tools and Techniques

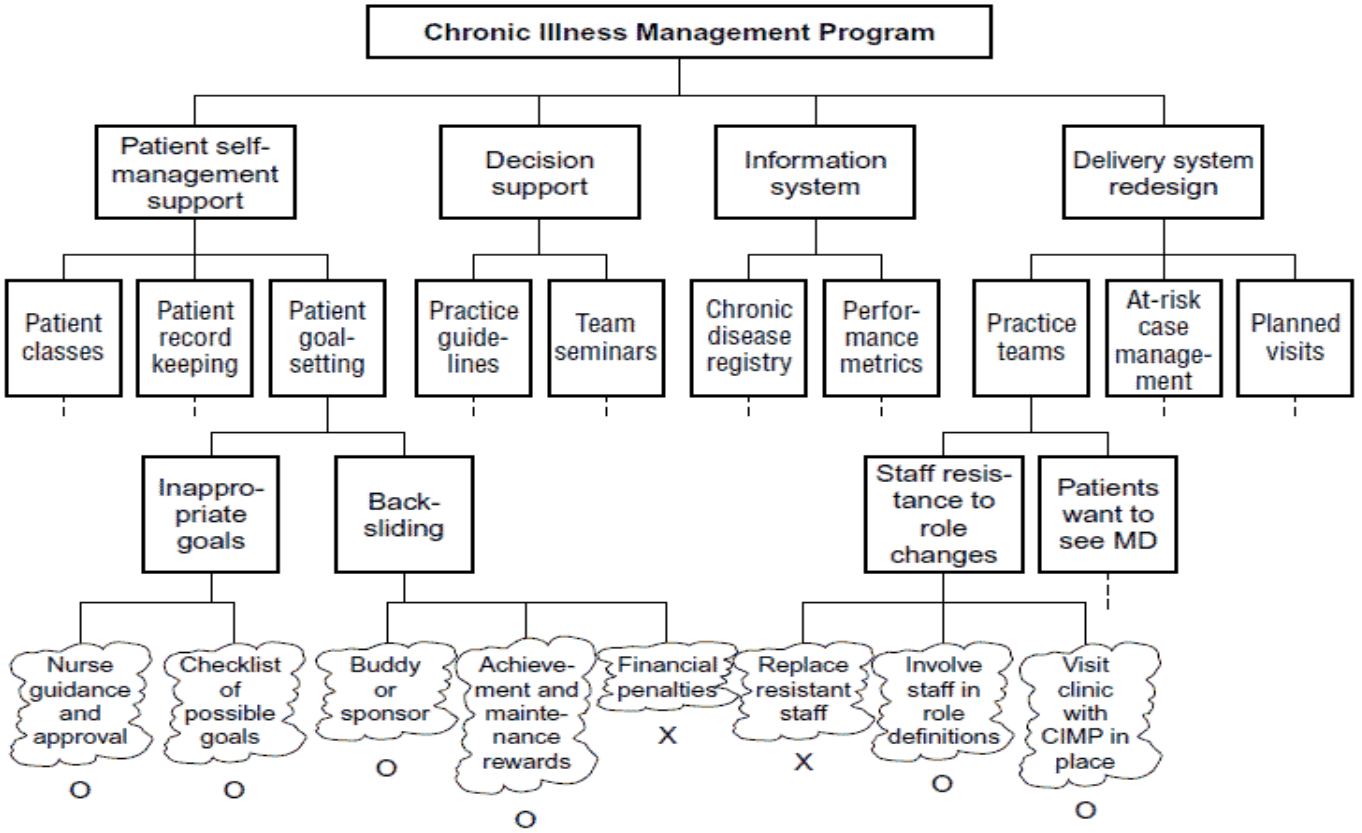
- Interrelationship digraphs
  - An adaptation of relationship diagrams. The interrelationship digraphs provide a process for creative problem solving in moderately complex scenarios that possess intertwined logical relationships for up to 50 relevant items.
- Tree diagrams
  - Also known as systematic diagrams and may be used to represent decomposition hierarchies
  - E.g. WBS, RBS, OBS



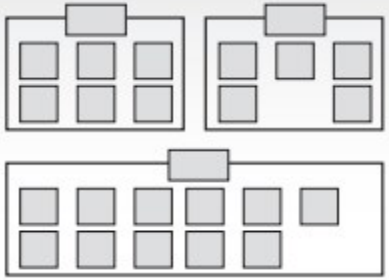
PDPC

Perform Quality Assurance: Tools and Techniques

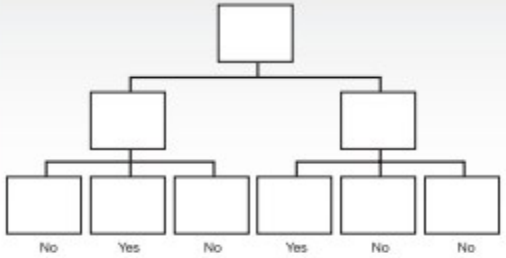
- Process decision program charts
  - Used to understand a goal in relation to the steps for getting to the goal. The PDPC is useful as a method for contingency planning.



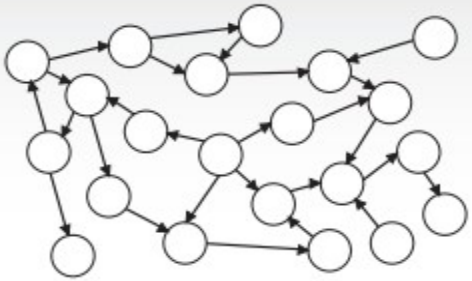
Affinity Diagram



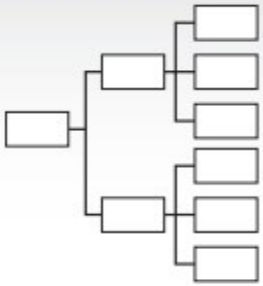
PDPC



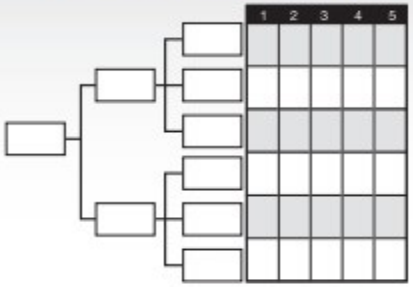
Interrelationship Digraph



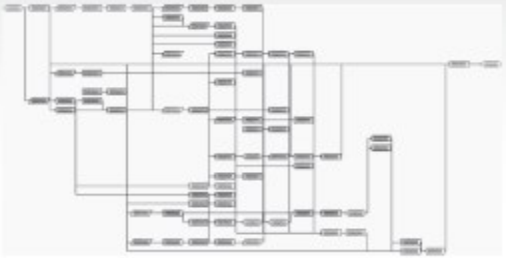
Tree Diagrams



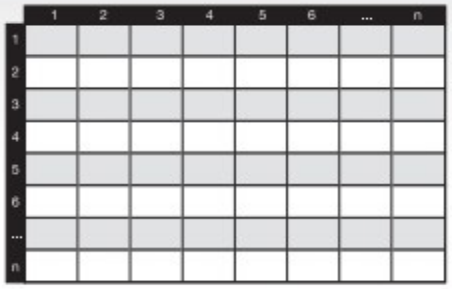
Prioritization Matrices



Network Diagrams



Matrix Diagrams



Quality Audits

Perform Quality Assurance: Tools and Techniques

- Structured, independent review to determine whether project activities comply with organizational and project policies, processes, and procedures
- Scheduled or random
- Conducted by internal or external auditors
- Confirm the implementation of approved change requests

Quality Audits

Perform Quality Assurance: Tools and Techniques

- The objectives are:
  - Identify all the good and best practices being implemented
  - Identify all nonconformity, gaps, and shortcomings
  - Share good practices introduced or implemented in similar projects
  - Proactively offer assistance to improve implementation of processes to help raise productivity
  - Highlight contributions of each audit in the lessons learned repository of the organization

Process Analysis

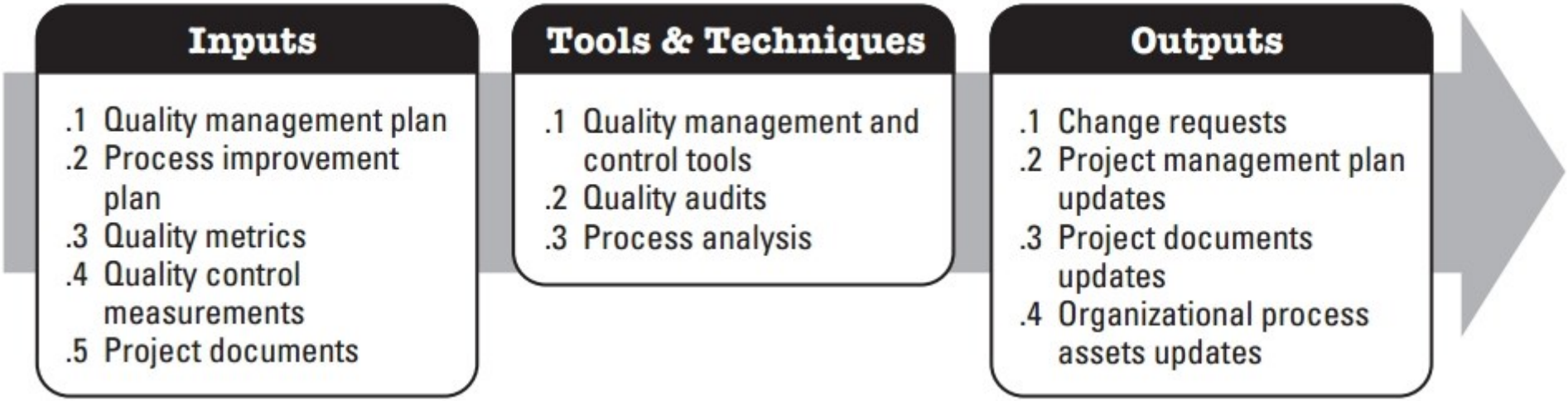
Perform Quality Assurance: Tools and Techniques

- Follows the steps outlined in the process improvement plan to identify needed improvements
- Also examines problems experienced, constraints experienced, and non-value-added activities identified during process operation
- Includes root cause analysis — a specific technique to identify a problem, discover the underlying causes that lead to it, and develop preventive actions
- Part of continuous improvement to identify improvements that might be needed in processes

Outputs

- Organizational Process Assets updates
  - E.g. the quality standards
- Change Requests
  - Quality improvement includes taking action to increase the effectiveness and/or efficiency
  - May be required to take corrective action or preventive action or to perform defect repair
- Project Management Plan updates
- Project Document updates
  - Quality audits reports
  - Training plans
  - Process documentation

Perform Quality Assurance
(executing)



Control Quality

(monitoring and controlling)

Control Quality

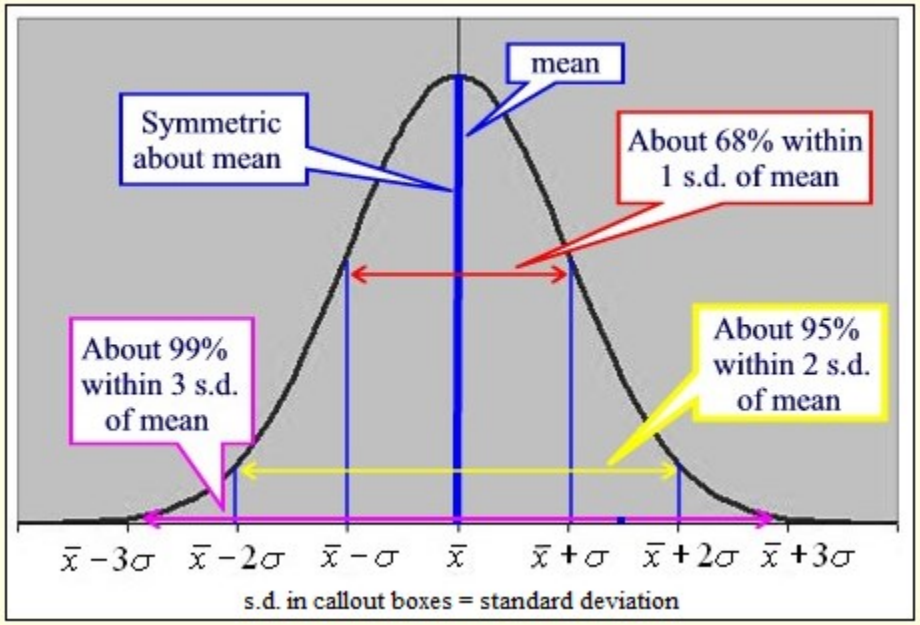
- The process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes
- The key benefits of this process include:
  - Identifying the causes of poor process or product quality and recommending and/or taking action to eliminate them
  - Validating that project deliverables and work meet the requirements specified by key stakeholders necessary for final acceptance

Actions

- Often performed by a quality control department, results sent to PM in the form of change requests
- PM then acts on these change request to help improve quality
- Quality control activities identify causes of poor process or product quality and recommend and/or take action to eliminate them.
- Important terms:
  - Prevention (keeping errors out of the process)
  - Inspection (keeping errors out of the hands of the customer)
  - Tolerances (specified range of acceptable results)
  - Control limits (thresholds, which can indicate whether the process is out of control)

Statistics Concepts

- Mutual Exclusivity
  - Two events are said to be mutually exclusive if they cannot both occur in a single trial
  - E.g. throwing a dice result in 1 to 3 or 4 to 6
- Probability
  - 0 to 1
- Normal Distribution
  - Most common probability density distribution chart
  - In the shape of bell curve and used to measure variations

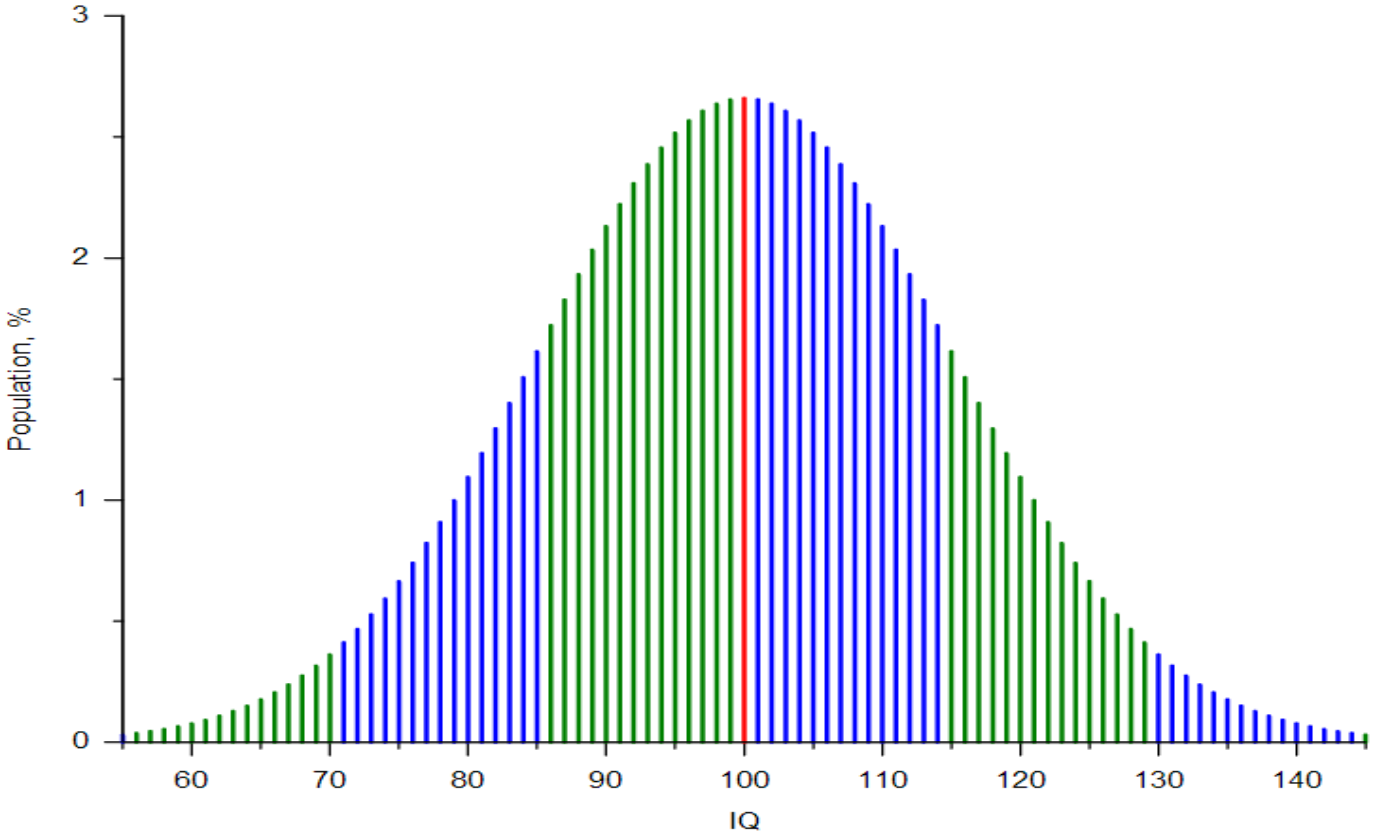


Statistics Concepts

- Statistical Independence
  - The probability of one event occurring does not affect the probability of another event occurring
  - E.g. the probability of rolling a 6 on a dice is statistically independent from the probability of getting a 5 on the next roll
- Standard Deviation (or Sigma, σ)
  - A measure of a range
  - A measure of how far you are from the mean
- 3 or 6 Sigma
  - 3 or 6 sigma represents the level of quality that a company has decided to try to achieve
  - $\pm 1\sigma$ is equal to 68.26%, which is the % of occurrences to fall between the two control limits
  - $\pm 2\sigma$ is equal to 95.46%
  - $\pm 3\sigma$ is equal to 99.73%
  - $\pm 6\sigma$ is equal to 99.99985%

About Normal Distribution

- Example: modern definition of IQ
  - Same age; mean = 100; SD = 15
  - Mensa: top 2 % of intelligent population (~140)



Control Chart

Control Quality: Tools and Techniques

- Set up in this process as part of the effort to determine what will be the quality on the project
- Helps the Control Quality process to determine if a process is performing within limits
- Shows whether the products characteristics/performance fall within certain agreed-upon limits

Control Chart

Control Quality: Tools and Techniques

- Upper and Lower Control Limits
  - Acceptable range of variation of a process
  - Set by the PM and stakeholders based on the organization's quality standard
  - Usually based on +/- 3 sigma (standard deviation)
  - Data points in range: in control
  - Data points outside the range: out of control
- Mean
  - Middle of the chart
  - Middle of the range of acceptable variation of the process

Control Chart

Control Quality: Tools and Techniques

- Specification Limits
  - Customer's expectations or contractual requirements for performance and quality
  - Inputs from customers, NOT calculated based on control chart, so can be anywhere on the chart
  - Thus the organization's quality standards must be stricter than the customer to ensure customer acceptance
- Out of control, when
  - A data point falls outside the upper or lower control limits, or
  - Non random points complying with the rule of seven
  - Indicates a lack of consistency and predictability in the process

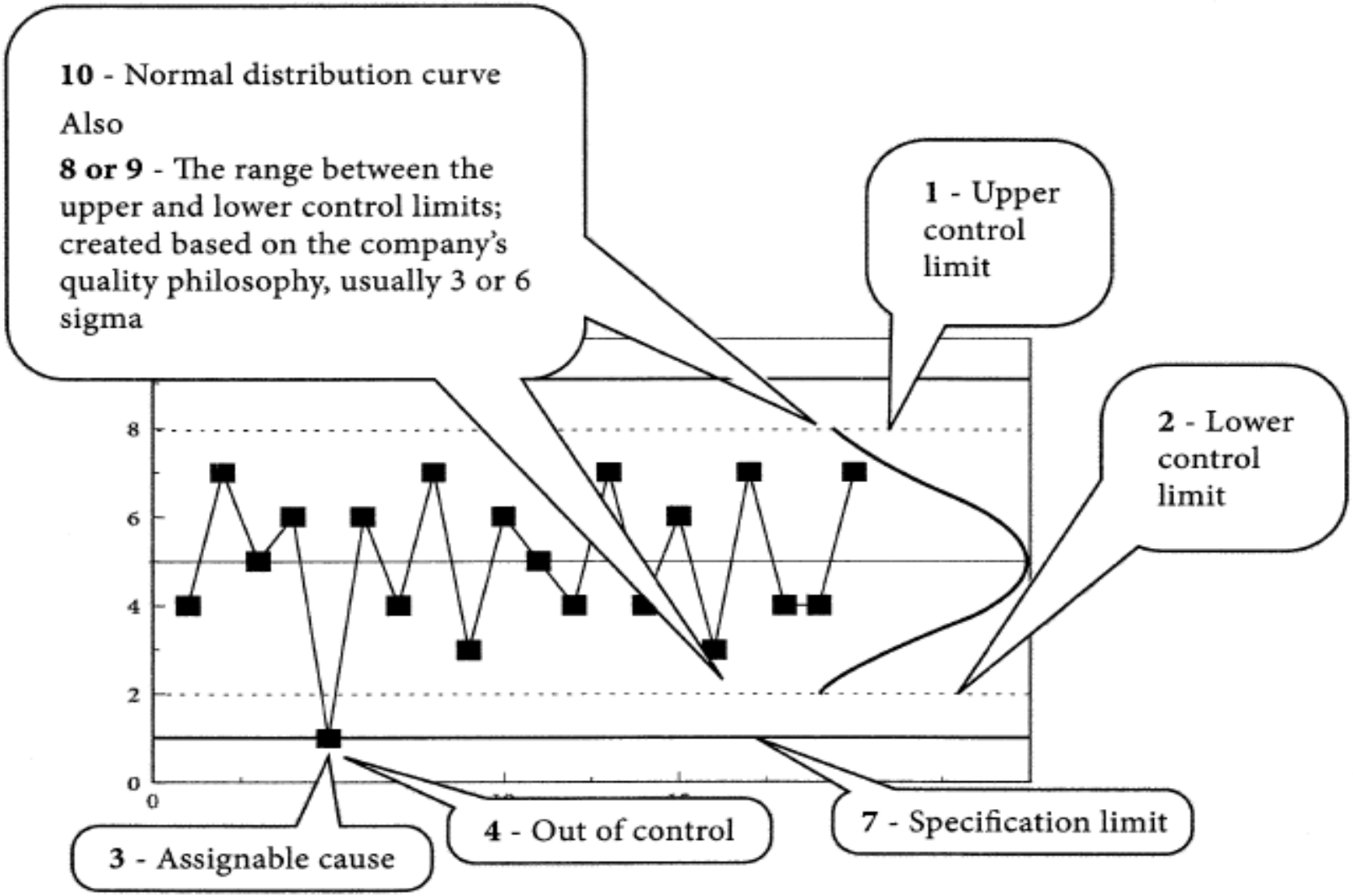
Control Chart

Control Quality: Tools and Techniques

- Rule of Seven:
  - Rule of thumb/heuristic
  - Nonrandom data points grouped together in a series making up 7 on one side of the mean
  - Indicates the process may be out of control
  - PM should investigate and find the cause
- Assignable Cause / Special Cause Variation
  - A data point or rule of seven that requires investigation to determine the cause of the variation

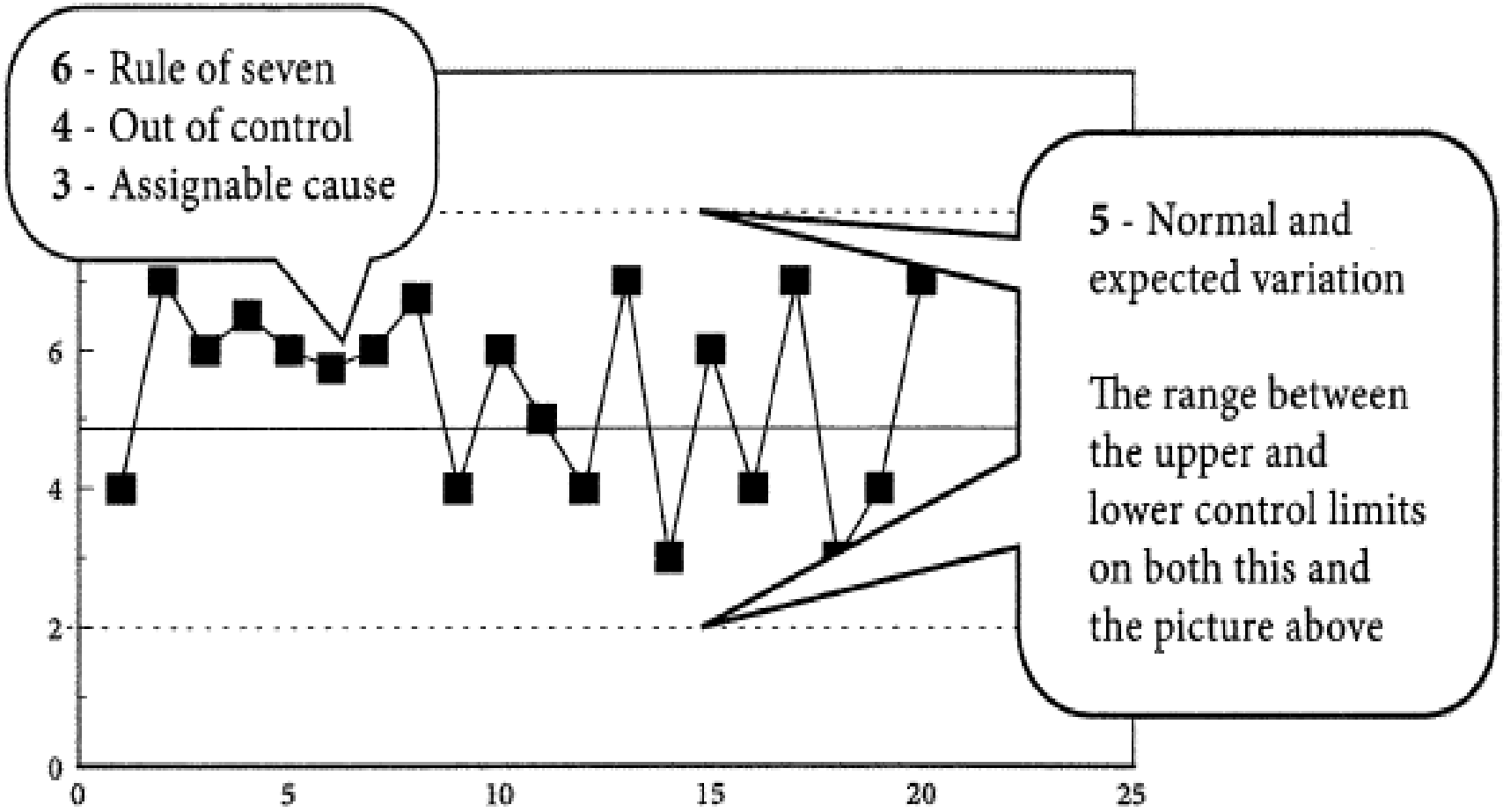
Control Chart

Control Quality: Tools and Techniques



Control Chart

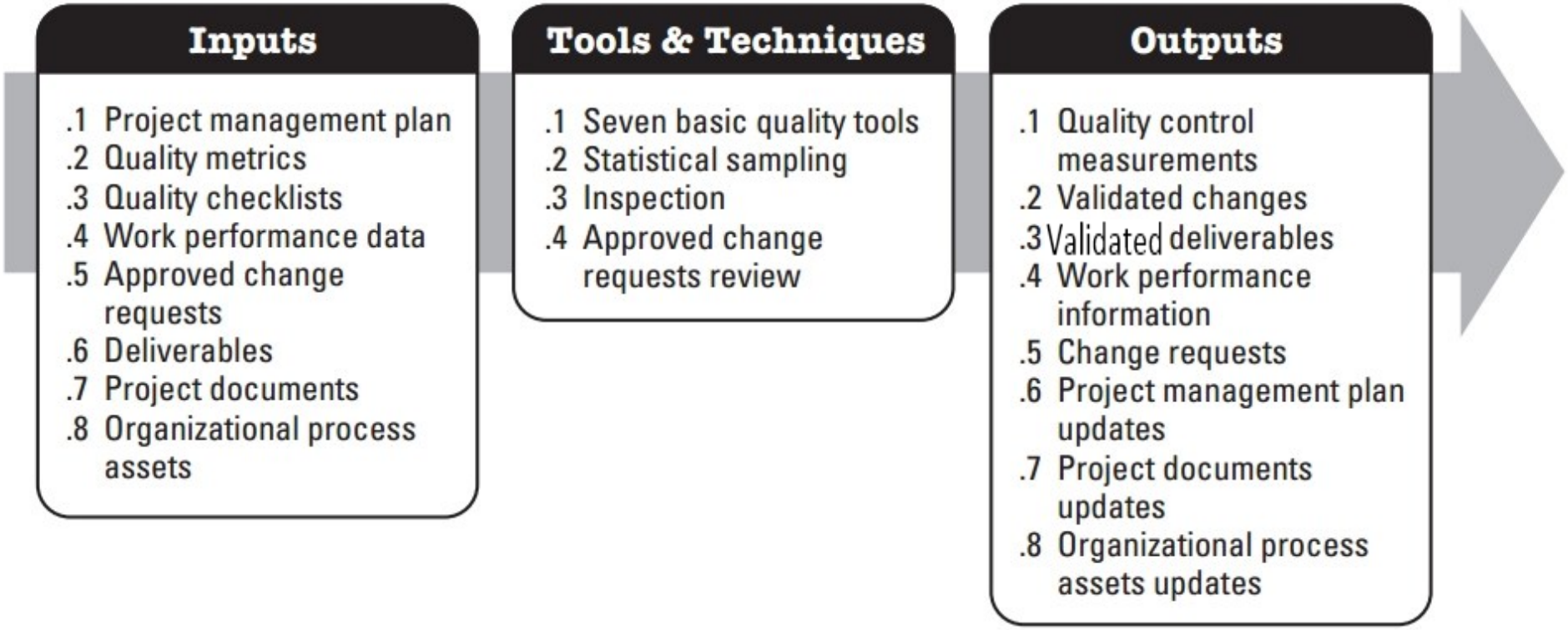
Control Quality: Tools and Techniques



Outputs

- Quality control Measurements
  - Documented results of control quality activities
- Validated changes
  - Any changed or repaired items are inspected and will be either accepted or rejected before notification of the decision is provided. Rejected items may require rework.
- Validated deliverables
  - A goal of the Control Quality process is to determine the correctness of deliverables
  - Input to Validate Scope for formalized acceptance

Control Quality
(monitoring and controlling)



Quality in the Real World

- To begin:
  1. The customer determines their requirements
  2. The project team clarifies those requirements
  3. The project team determines what work will be done to meet those requirements
- Quality starts:
  4. The project manager determines the existing standards, policies, plans, and procedures that might be available for their project.
  5. Project planning work and project execution
  6. The quality control department measures the performance of the project from the start of planning to the project's end against the standards, policies, plans, and procedures. As a result of these measurements, the department issues change requests.

Quality in the Real World

7. The quality assurance department performs audits periodically as part of the executing process, looking at the quality control measurements to see if there is any indication that the standards, policies, plans, and procedures are not being followed or the procedures are not producing the expected quality results.
8. The change control board evaluates these and any other change requests on the project as part of integrated change control
9. The project is completed, quality targets are reached, and the customer is happy
10. The organization has improved processes

Exercise

- Looking at the project practices of comparable projects
  - Benchmarking; Plan
- Measuring 4 doors produced, rather than all 400
  - Statistical sampling; QC
- Identifying the factors that influence particular variables of a product or process
  - Design of experiments; Plan
- Analyzing a chart of problems to find the most frequent one in order to determine if processes need to be improved
  - Pareto chart; QA
- Comparing the expense of quality efforts to the return on that investment
  - Cost benefit analysis; Plan

- Determining what will be acceptable upper and lower thresholds of variance
  - Control chart; Plan
- Comparing what was done to what was planned in writing to be done
  - Checklists; QC
- Graphically representing a process to determine where a process might be failing
  - Flowcharting; QC
- Taking measurements and comparing them to the upper and lower thresholds of variance
  - Control chart; QC

- Graphically representing a process to determine where quality problems might arise
  - Flowcharting; Plan
- Analyzing a graphic with an organized series of lines displaying issues that might have led to a defect to examine if the proper process was followed or if processes must be improved
  - Cause and effect diagram; QA
- Showing data in the form of bars to measure and plot how frequently some problem occurred
  - Histogram; QC
- Collecting many data points to look at the pattern of relationships or correlation between two variables
  - Scatter diagram; QC

- Using a bar chart to show how many problems occurred for each cause and arranging them according to the frequency that the problems occurred
  - Pareto chart; QC
- Creating a list of items to be checked during inspections
  - Checklists; Plan
- Reviewing a graphic with an organized series of lines displaying issues or potential issues that might have led to a defect or problem
  - Cause and effect diagram; QC

- When a product or service completely meets a customer's requirements:
  A. Quality is achieved.
  B. The cost of quality is high.
  C. The cost of quality is low.
  D. The customer pays the minimum price.

Answer: A

- To what does the following sentence refer? "The point where the benefits or revenue to be received from improving quality equals the incremental cost to achieve that quality."
  A. Quality control analysis
  B. Marginal analysis
  C. Standard quality analysis
  D. Conformance analysis

Answer: B

- Quality is:
  A. Meeting and exceeding the customer's expectations.
  B. Adding extras to make the customer happy.
  C. The degree to which the project meets requirements.
  D. Conformance to management's objectives.

Answer: C

- Which of the following is not example of Control Quality:
  A. Inspection.
  B. Cost of quality.
  C. Pareto chart.
  D. Fishbone diagram.

Answer: B

- Pareto charts help the project manager:
  A. Focus on the most critical issues to improve quality.
  B. Focus on stimulating thinking.
  C. Explore a desired future outcome.
  D. Determine if a process is out of control.

Answer: A

- A control chart helps the project manager:
  A. Focus on the most critical issues to improve quality.
  B. Focus on stimulating thinking.
  C. Explore a desired future outcome
  D. Determine if a process is functioning within set limits.

Answer: D

- Testing the entire population would be:
  A. Take too long.
  B. Provide more information than wanted.
  C. Be mutually exclusive.
  D. Show many defects.

Answer: A

- What percentage of the total distribution is 3 sigma from the mean equal to?
  A. 68.26%
  B. 99.99%
  C. 95.46%
  D. 99.73%

Answer: D

- Which of the following does not result from quality audits:
  A. Determination of whether project activities comply with organizational policies.
  B. Improved processes to increase productivity.
  C. Creation of quality metrics.
  D. Confirmation of the implementation of approved change requests.

Answer: C

- A control chart shows seven data points in a row on one side of the mean. What should be done?
  A. Perform a design of experiments.
  B. Adjust the chart to reflect the new mean.
  C. Find an assignable cause.
  D. Nothing. This is the rule of seven and can be ignored.

Answer: C

- In planning your project, which would generally have the highest priority: quality, cost, or schedule?
  A. Cost is most important, quality next, and then schedule.
  B. Quality is more important than cost or schedule.
  C. Schedule is most important, quality next, and then cost.
  D. It should be decided for each project.

Answer: D

- During a team meeting, the team adds a specific area of extra work to the project because they have determined it would benefit the customer. What is wrong in this situation?

A. The team is gold plating.
B. These efforts shouldn't be done in meetings.
C. Nothing. This is how to meet or exceed customer expectations.
D. Nothing. The project manager is in control of the situation.

Answer: A

- Who introduced the 80/20 principle?
  A. Pareto
  B. Juran
  C. Deming
  D. Crosby

Answer: B

- Which one is a process map?
  A. PDPC
  B. SIPOC
  C. Control Chart
  D. Cause and effect diagram

Answer: B

- Which of the following methods is used to provide a standard to measure performance?
  A. Benchmarking
  B. Sampling
  C. Estimating
  D. Leveling

Answer: A

- Design of experiments:
  A. Identifies which variables have the most influence on a quality outcome.
  B. Identifies which variables have the least influence on a quality outcome.
  C. Determines what a quality outcome is.
  D. Determines the methods to be used for research and development.

Answer: A

- Which statement is TRUE of quality planning?

A. Quality planning should be performed regularly throughout the project.

B. Quality planning is done to compile a risk response plan.

C. Quality planning is done only during development of the project management plan.

D. Quality planning is not considered during project executing.

Answer: A

- Which of the following is TRUE of inspections?
  A. They may not be conducted by the project team.
  B. They test future desires of prospective customers.
  C. They can only be conducted on the final product.
  D. They prevent defective deliverables from reaching the customer.

Answer: D

- Generally, where should control limits be located on a control chart?

A. Near the assignable cause
B. Above the statistical independence point
C. Within the specification limits
D. Above the normal curve

Answer: C

The End