Project Quality Management

Project Quality Management

- Includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements in order to meet stakeholders' objectives.

Process Name	Process Group	Key Outputs
Plan Quality Management	Planning	Quality Management Plan, Quality Metrics
Manage Quality	Executing	Quality Reports, Test and Evaluation Documents
Control Quality	Monitoring and Controlling	Quality Control Measurements, Verified Deliverables,

Quality Vs. Grade

- **Quality**
  - The degree to which a set of inherent characteristics fulfill requirements
- **Grade**
  - Category assigned to deliverables having the same functional use but different technical characteristics.

Quality Methodologies

- Total Quality Management(TQM)
  - Everyone in the company is responsible for quality, looks at the underlying process of how a product is made.
- Continuous Improvement - Kaizen
  - Japanese Management term, a philosophy of continuous improvement by all parties, no matter how small the change
- ISO 9000
  - Organizational for International standards to ensure the companies document what they do and execute what they document
- Just in Time Inventory
  - Inventories levels as near zero as possible

Quality Methodologies

- The Deming Cycle (Plan, Do, Check, Act)
  - (W. Edwards Deming), advocated plan-do-check-act as the basis for quality mgmt.
- Six Sigma
  - Focus on achieving very high levels of quality by controlling the process and reducing defects.

Value	Percent Correct
1 sigma	68.26 percent
2 sigma	95.46 percent
3 sigma	99.73 percent
6 sigma	99.99 percent

Quality Terms

- Attribute and Variable Sampling
  - Measuring some characteristics of the sample. Attribute is about if it conforms or not. Variable is about how well it conforms base on a scale
- Mutual Exclusivity
  - Two events can not occur at the same time
- Tolerances
  - The limits in which the product will meet product acceptance
- Prevention vs. Inspection
  - Prevention is about keeping the errors out of the process and inspection is about keeping the errors out of the customers hands.

How To Ensure Effective Quality Management

- Always cost more if the customers find the defects. Prevent defects from going to the customers
- Build quality into the planning and design of a project
- Build a culture in the organization that wants to produce quality work.

Plan Quality Management

- Identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with quality requirements and/or standards.
- Guidance and direction on how quality will be managed and verified throughout the project.
- Identifies what the quality specifications are for this project and how these specifications will be met

Plan Quality Management

INPUTS

1.Project Charter
Project Management Plan
  a.Requirements Management Plan
  b.Risk Management Plan
  c.Stakeholder Engagement Plan
  d.Scope Baseline
Project Documents
  a.Assumption Log
  b.Requirements Documentation
  c.Requirements Traceability Matrix
  d.Risk Register
  e.Stakeholder Register
Enterprise Environmental Factors
Organizational Process Assets

TOOLS & TECHNIQUES

1.Expert Judgment
Data Gathering
  a.Benchmarking
  b.Brainstorming
  c.Interviews
Data Analysis
  a.Cost-Benefit Analysis
  b.Cost of Quality
Decision Making
  a.Multicriteria Decision Analysis
Data Representation
  a.Flowcharts
  b.Logical Data Model
  c.Matrix Diagrams
  d.Mind Mapping
Test and Inspection Planning
Meetings

OUTPUTS

1.Quality Management Plan
Quality Metrics
Project Management Plan Updates
  a.Risk Management Plan
  b.Scope Baseline
Project Documents Updates
  a.Lessons Learned Register
  b.Requirements Traceability Matrix
  c.Risk Register
  d.Stakeholder Register

Plan Quality Management - Inputs

- Project Charter
- Project Management Plan
- Project Documents
  - Stakeholder Register
  - Risk Register
  - Requirements Documentation
  - Requirements Traceability Matrix
- Enterprise Environmental factors
- Organizational Process Assets

Plan Quality Management - Tools

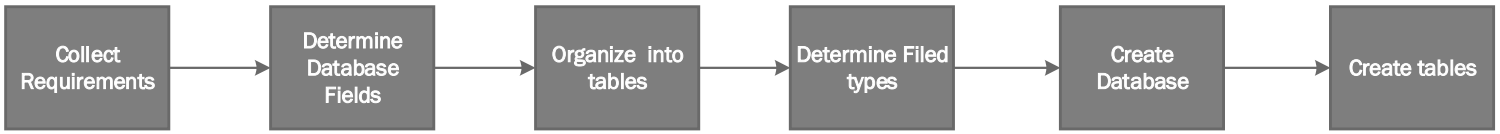
- Expert Judgment
- Data Gathering
  - Brainstorming
  - Benchmarking
  - Interviews
- Data Analysis
  - Cost Benefit Analysis
    - Does the activities, work packages performed cost more then the expected results. The benefits must out weigh their costs.
  - Cost of Quality, (COQ)
    - All costs incurred over the life of the product ensuring it meets quality of the product
    - Conformance, Prevention costs, Appraisal costs
    - Non-Conformance, Internal and external failure costs

Plan Quality Management - Tools

- Decision Making
  - Multicriteria Decision Analysis
- Test and Inspection Planning
  - PM and team determine how to test or inspect the project output to ensure it meets the stakeholders needs and expectations.
- Meetings

Plan Quality Management - Tools

- Data Representation
  - Logical Data Model
    - A visual representation of the data and you can then use it to identify the best methods to sort and organize it
  - Matrix Diagram
    - The relationship between two or more groups within the project
  - Mind Mapping
    - Visually organize data
  - Flowcharts
    - A graphical representation of the process and any room for improvements



Plan Quality Management - Output

- Quality Management Plan
  - Quality standards that will be used by the project
  - Quality control and management activities for the project
  - Quality tools that will be used
  - How to continually improve our processes
- Quality Metrics
  - Specifications on how quality will be measure during the control quality process. Such as, error per line of code
- Project Management Plan Updates
- Project Document Updates

Manage Quality

- Translating the quality management plan into executable quality activities
- It increases the probability of meeting the quality objectives as well as identifying ineffective processes and causes of poor quality.
- Implementations of the plans the project manager, the project team, and management does to ensure the deliverables meets the quality specifications in the project management plan.
- Maybe called Quality Assurance.
- Confirm the quality processes used are meeting the quality objectives.

Manage Quality

INPUTS

1.Project Management Plan
  a.Quality Management Plan
2.Project Documents
  a.Lessons Learned Register
  b.Quality Control Measurements
  c.Quality Metrics
  d.Risk Report
3.Organizational Process Assets

TOOLS & TECHNIQUES

Data Gathering
Data Analysis
  Alternatives Analysis
  Document Analysis
  Process Analysis
  Root Cause Analysis
Decision Making
  Multicriteria Decision Analysis
Data Representation
  Affinity Diagrams
  Cause-and-Effect Diagrams
  Flowcharts
  Histograms
  Matrix Diagrams
  Scatter Diagrams
Audits
Design for X
Problem Solving
Quality Improvement Methods

OUTPUTS

1.Quality Reports
Test and Evaluation Documents
Change Requests
Project Management Plan Updates
  Quality Management Plan
  Scope Baseline
  Schedule Baseline
  Cost Baseline
Project Documents Updates
  Issue Log
  Lessons Learned Register
  Risk Register

Manage Quality - Inputs

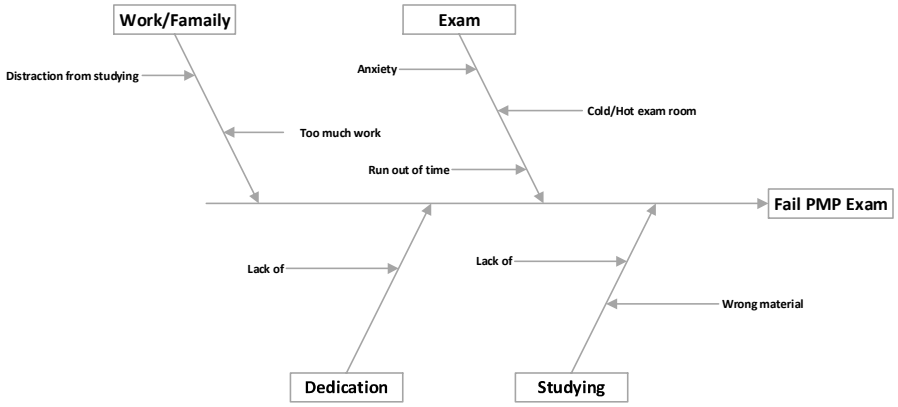
- Project Management Plan
  - Quality Management plan
- Project Documents
  - Quality Control Measurements
  - Risk Report
  - Lesson Learned Register
- Organizational Process Assets

Manage Quality - Tools

- Data Gathering
  - Checklist
- Data Analysis
  - Alternatives Analysis
  - Document analysis
  - Process Analysis
  - Root Case Analysis
- Decision Making
  - Multicriteria Decision Analysis

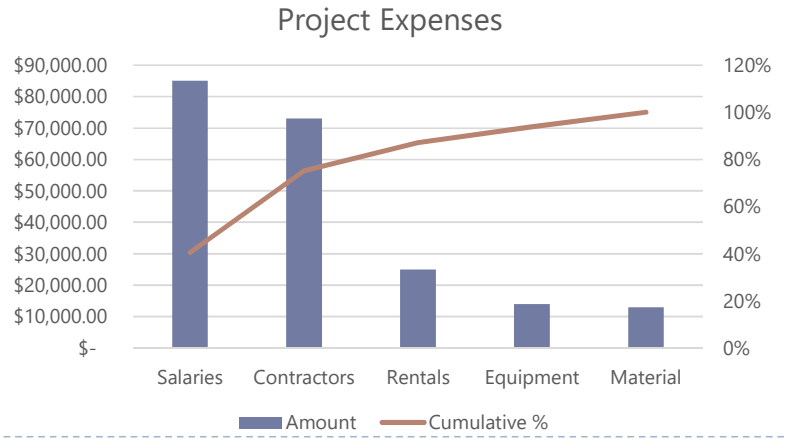
Manage Quality - Tools

- Data Representation
  - Affinity Diagrams
    - Used to group ideas together
  - Matrix Diagrams
    - Shows the relationship among processes
  - Cause and Effect Diagrams
    - Also known as Ishikawa or Fishbone diagram, it will tell you the causes of defects



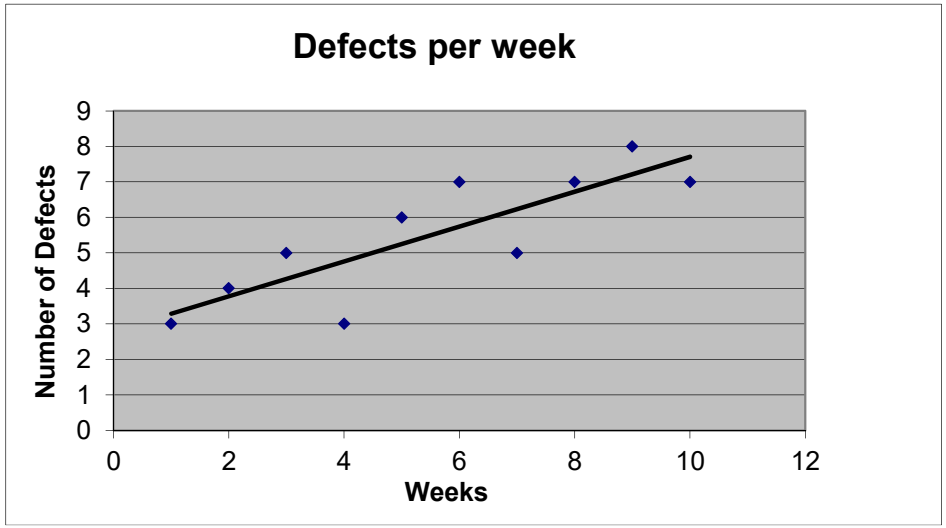
Manage Quality - Tools

- **Data Representation**
  - Flowcharts
    - Flowcharts show you a graphical representation of the process and any room for improvements.
  - Histograms
    - Histograms are bar charts that show the distribution of numerical data. One example of a histogram is a Pareto diagram. Pareto diagrams use the Pareto principle of 80/20.



Manage Quality - Tools

- Data Representation
  - Scatter Diagram
    - Scatter diagrams show trends in relation to different variables



Manage Quality - Tools

- Audits
  - Id all best practices are being executed
  - Id all short comings and gaps in the process
  - Share all findings with all parties/stakeholders/PMO
  - Proactively offer assistance in a positive manner to improved process execution
- Design for X
  - Used by engineers in order to design a particular aspect of a product
- Problem Solving
  - Finding solutions to problems. identifying the problem, determining what's causing it, looking at possible solutions, selecting a solution, implementing a solution, and verifying that it solves the problem.
- Quality Improvement Methods
  - Find ways to improve the quality processes

Manage Quality - Output

- Quality Reports
  - Report generally includes information about quality issues on the project and recommendations on how to improve the processes being used.
- Test and Evaluation Documents
  - Documents generally take the form of a checklist that can be used when checking the quality of the deliverables
- Change Requests
- Project Management Plan updates
  - Scope/Schedule/Cost Baseline
  - Quality Management Plan
- Project Document updates
  - Issue Log
  - Lessons Learned Register
  - Risk Register

Control Quality

- Assess performance and ensure the project outputs are complete, correct, and meet customer expectations.
- Verifying that project deliverables and work meet the requirements specified by key stakeholders for final acceptance.
- Each deliverable is inspected, measured, and tested

Control Quality - ITTO

INPUTS

1.Project Management Plan
- Quality Management Plan

Project Documents
- Lessons Learned Register
- Quality Metrics
- a.Test and Evaluation Documents

Approved Change Requests

Deliverables

Work Performance Data

Enterprise Environmental Factors

Organizational Process Assets

TOOLS & TECHNIQUES

Data Gathering
- Checklists
- Check Sheets
- Statistical Sampling
- Questionnaires and Surveys

Data Analysis
- Performance Reviews
- Root Cause Analysis

Inspection

Testing/Product Evaluations

Data Representation
- Cause-and-Effect Diagrams
- Control Charts
- Scatter Diagrams

Meetings

OUTPUTS

1.Quality Control Measurements

2.Verified Deliverables

3.Work Performance Information

4.Change Requests

5.Project Management Plan Updates
- Quality Management Plan

Project Documents Updates
- Issue Log
- Lessons Learned Register
- Risk Register
- Test and Evaluation Documents

Control Quality - Input

- Project Management Plan
  - Quality Management Plan
- Project Documents
  - Quality Metrics
  - Test and evaluation Documents
  - Lesson Learned Register
- Work Performance Data
- Approved Change Requests
- Deliverables
  - Output from direct and manage project work
- Enterprise Environmental Factors
- Organizational Process Assets

Control Quality - Tools

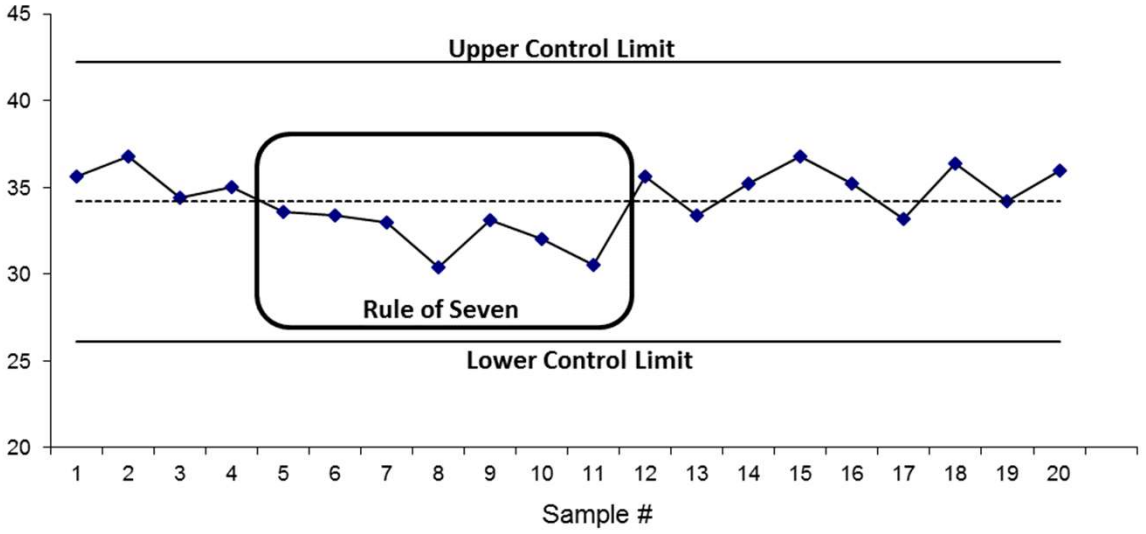
- Data Gathering
  - Checklists - ensures that all components of the deliverables are checked correctly
  - Check sheets - used to keep a running total or tally
  - Statistical Sampling
  - Questionnaires and Surveys
- Data Analysis
  - Performance reviews or root cause analysis
- Inspection
  - Inspections are often referred to as audits, walk-throughs or peer reviews. Used to validate defect repairs

Control Quality - Tools

- Testing/Product Evaluations
  - Before the project team or manager can verify that a deliverable has met all its quality requirements they would have to test these deliverables extensively. E.g. Unit testing, integration testing.
- Meeting
- Data Representation
  - Cause and Effect Diagrams
  - Scatter Diagrams
  - Histogram
    - Pareto Diagrams

Control Quality - Tools

- Data Representation
  - Control Chart
    - will tell if a process is in “control”
    - identify the rule of seven



Control Quality - Output

- Quality Control Measurements
  - The results of the activities done in the control quality processes to determine if the quality standards or policies were met
- Verified Deliverables
  - An input to Validate Scope
  - Needed for formal acceptance
- Work Performance Information
- Change Requests
- Project Management Plan updates
- Project Document updates