

Project Quality Management (PMI Framework)

1. PMI Project Quality Management: In-Depth Overview of QA and QC

Project Quality Management is one of the ten knowledge areas in PMI's PMBOK Guide. It ensures the project will satisfy the quality standards and requirements. It comprises three main processes:

1. Plan Quality Management

- Planning how to meet quality standards and metrics.
- Output includes the Quality Management Plan, quality checklists, and metrics.

2. Manage Quality (Quality Assurance - QA)

- Focuses on process quality.
- Involves quality audits, process analysis, and continuous improvement.
- QA is proactive, aimed at preventing defects through process adherence and improvement.

3. Control Quality (Quality Control - QC)

- Focuses on deliverable quality.
- Involves inspecting, testing, and measuring deliverables to ensure they meet requirements.
- QC is reactive, identifying and correcting defects.

QA ensures that the right process is being followed; QC ensures the results of that process are up to standards.

2. Costs of Compliance in Project Quality Management

Cost of Quality (CoQ) includes the cost of conformance (compliance) and non-conformance.

Costs of Compliance (Cost of Conformance) includes:

- Prevention Costs: Training, quality planning, process documentation, preventive maintenance.
- Appraisal Costs: Inspections, testing, quality audits, and performance reviews.

These costs are investments to avoid defects. They reduce the risk of internal failures (e.g., rework) and external failures (e.g., recalls, liability).

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Cost of Non-Conformance:

→ do not obey laws, rules, (cor) industry standards

- Internal Failures: Costs due to defects found before delivery.
- External Failures: Costs due to defects found after delivery, such as customer complaints, legal issues, or brand damage.

Investing in compliance saves costs long-term by avoiding expensive corrections later.

3. Quality Management Tools and Techniques

Quality management tools are essential for both understanding and improving quality in projects. These tools help teams identify, measure, analyze, and control processes and product quality.

Basic (Seven Quality Tools):

1. Cause-and-Effect Diagram (Fishbone/Ishikawa):

- Helps identify multiple potential causes of a problem.
- Useful in root cause analysis.
- Commonly used with brainstorming sessions.

2. Flowcharts:

- Visual representation of the sequence of steps in a process.
- Helps identify redundant steps, inefficiencies, and potential quality failures.

3. Check Sheets:

- Structured forms for collecting data in real time.
- Help track the frequency of issues and are easy to use and interpret.

4. Pareto Chart:

- Bar chart that shows which factors are most significant.

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- Based on the 80/20 principle - 80% of problems are often caused by 20% of issues.
- Prioritizes issues to focus on what's most impactful.

5. Control Charts:

- Used to monitor process stability over time.
- Displays upper and lower control limits.
- Helps detect trends or variations indicating a process going out of control.

6. Histogram:

- Graph showing frequency distribution of data.
- Highlights patterns like skewness, normal distribution, or outliers.

7. Scatter Diagram:

- Graph showing correlation between two variables.
- Helps determine if changes in one factor may be related to changes in another.

Advanced Tools:

8. Statistical Sampling:

- Selecting a subset of data for inspection or testing.
- Reduces time and cost while still providing insight into quality levels.

9. Design of Experiments (DoE):

- Systematic approach to determine relationships between factors affecting a process.
- Helps optimize process parameters for desired quality output.

10. Root Cause Analysis (RCA):

- A structured approach for identifying the true root cause of problems.
- Often uses 5 Whys, Fishbone diagrams, or Fault Tree Analysis.

11. Benchmarking:

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- Comparing your processes or performance against best practices.
- Helps identify gaps and opportunities for improvement.

12. Affinity Diagrams:

- Organize a large number of ideas into related groups.
- Used after brainstorming sessions to categorize and find patterns.

13. SIPOC Diagrams (Suppliers, Inputs, Process, Outputs, Customers):

- High-level process map useful for defining scope and understanding stakeholder expectations.

These tools are adaptable across industries, including manufacturing, IT, healthcare, and construction, and support both Quality Assurance and Quality Control efforts.

4. The 8D Problem Solving Approach in Quality Management

The 8D (Eight Disciplines) method is a structured problem-solving process used to address and eliminate recurring issues.

Steps:

- D1 - Establish the Team: Cross-functional team with relevant expertise.
- D2 - Describe the Problem: Use the 5W2H (What, Where, When, Why, Who, How, How much).
- D3 - Interim Containment Action: Prevent problem impact from spreading.
- D4 - Root Cause Analysis: Use tools like Fishbone Diagram or 5 Whys to identify true cause.
- D5 - Develop Permanent Corrective Actions (PCA): Ensure root cause is addressed.
- D6 - Implement PCAs: Put long-term fixes into practice.
- D7 - Prevent Recurrence: Update documentation, training, processes.
- D8 - Recognize Team Efforts: Celebrate successful resolution.

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It supports both QA (process improvement) and QC (error elimination) and is commonly used in manufacturing, automotive, and increasingly in services.

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5. In-Depth Project Quality Management Concepts

Core concepts include:

- Quality vs Grade:

Quality is about meeting requirements. Grade refers to category or feature set.

High quality can exist in both high and low-grade products.

- Precision vs Accuracy:

Precision is consistency. Accuracy is correctness. In quality management, both are important.

- Continuous Improvement:

Inspired by Kaizen, Lean, and Six Sigma. It involves small, regular improvements to eliminate waste and improve process efficiency.

- Integration with Other Areas:

- Risk: Poor quality increases project risk.
- Procurement: Contracts may include quality clauses.
- Cost/Schedule: Rework or failure increases budget and time overruns.

- Quality Roles:

- Project Manager ensures quality processes are planned and followed.
- QA Team focuses on process quality.
- QC Team handles inspection and verification.
- Stakeholders ensure deliverables meet expectations.

Project Quality Management is essential not only for compliance but for customer satisfaction, organizational reputation, and project success.