



CDC UNIFIED PROCESS PRACTICES GUIDE



PROJECT QUALITY MANAGEMENT

Document Purpose

The purpose of this document is to provide guidance on the practice of **Quality Management** and to describe the practice overview, requirements, best practices, activities, and key terms related to these requirements. In addition, templates relevant to this practice are provided at the end of this guide.

Practice Overview

The Project Management Institute (PMI) Project Management Body of Knowledge (PMBOK) and American Society for Quality (ASQ) define quality as the degree to which a set of inherent characteristics fulfill **requirements**. The discipline of quality management complements project management with a focus on customer satisfaction, prevention of defects over inspection, management responsibility, and continuous improvement.

At the highest of levels, as a concept of continuous improvement, quality management as a function of project management involves planning, doing, checking, and acting to improve quality standards.

- **Planning** – Assesses the project’s current level of quality, where that level needs to be, and then develops an effective and workable plan with specific targets for improving quality.
- **Doing** – Implements the planned solution or change.
- **Checking** – Reviews and evaluates the results of the implemented change and its affect on project quality and ensures that there are no negative consequences.
- **Acting** – Takes action based on what was learned from implementing and evaluating the planned change. Continue repeating the cycle until the project quality objectives have been achieved.



Project Managers assume responsibility for the development of quality policies for the project and the coordination of related activities, in compliance with any organizational and/or regulatory standards. A Quality Management Plan documents this information and describes the authorities, policies, tools and techniques that are specific to ensuring project excellence, reducing cost and eliminating unnecessary corrections and/or changes.

It is important to note that the concept of quality does not necessarily require perfection. Quality is more about doing what was agreed to be done rather than being perfect or even exceeding expectations.

PMI PMBOK breaks the practice of quality management into three processes: Quality Planning (QP), Quality Assurance (QA) and Quality Control (QC). Overarching these three processes is the concept of continuous improvement by planning, doing, checking, and acting to improvements project quality.

QUALITY PLANNING

QP involves identifying which organizational and/or regulatory quality standards are relevant to the project and how to satisfy them. The process outlines the rules that define the quality needs of the project, the required standards for the project’s product or service and how it will be confirmed that the planned requirements are provided in the project’s final product. Some examples of a QP technique are:

- **Cost-Benefit Analysis** – Cost-Benefit Analysis is the process of comparing the various costs associated with an investment with the benefits that it proposes to return in order to choose the best or most appropriate option. While the idea is simple, the analysis can be quite complex often involving the use of mathematical calculations such as *time value of money* formulas. Monetary values may also be assigned to less tangible effects such as risk, agency goals, prospects of regulatory changes, etc.



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- **Benchmarking** – A benchmark is a point of reference for a measurement which is usually recognized as an industry best practice. Benchmarking is the process of evaluating and comparing project performance against an identified benchmark with the purpose of continuously measuring and improving project efficiency with the goal of improving project performance.

QP is one of the key processes when planning the project and is also important during development of the Project Management Plan. QP should be performed in parallel with other project planning processes and involves:

- The creation of a Quality Management Plan
- The identification and the definition of Quality Metrics & Measures
- The identification of acceptance criteria for the product's performance requirements and essential conditions that must be achieved before project deliverables are accepted.

QUALITY MANAGEMENT PLAN

The Quality Management Plan (QMP) is a formal document that encompasses both QA and QC procedures that address key aspects of assessing project quality standards. It is developed in the planning phase of a project and focuses on the processes used to plan, implement, document, and assess the project's level of quality. The plan defines the project's policies, objectives, principles, responsibilities, and accountability as it relates to project quality and outlines how the project team will implement, perform, and measure those policies. The detail of the QMP will vary depending on the needs of the individual project.

QUALITY METRICS & MEASURES

Quality metrics are parameters or ways of quantitatively assessing a project's level of quality, along with the processes to carry out such measurement. Metrics outline the standard that work will be measured against and are often unique to each project and/or product. Quality metrics are defined in the planning phase of the project and then measured throughout the project's life to track and assess the project's level of conformity to its established quality baseline.

When identifying metrics by which to measure project quality against, an established standard is identified and then used to establish a quality baseline for each defined quality metric. This baseline is then used as a barometer to measure overall project quality throughout the project's life. Sources of quality baseline information include:

- The organization's quality plan
- Similar projects completed within the last six months
- Industry standards

ACCEPTANCE CRITERIA

Acceptance criteria are pre-established minimum standards or requirements that a project or product must meet before deliverables are accepted. Acceptance criteria are defined in the planning phase of the project and then tracked throughout the project's life to ensure the project's conformity to established quality standards. Acceptance criteria can include functionality requirements, performance measures, essential conditions, regulatory compliance, etc.

QUALITY ASSURANCE

PMI PMBOK defines QA as the application of planned, systematic activities to ensure that the project will employ all processes needed to meet requirements. QA provides the confidence that project quality is in fact being met and has been achieved. These actions and the metrics used to measure them, are defined in the project's QMP. It is the responsibility of the project manager and the project team to ensure the diligent execution of the QMP and to assure the project is performing according to the standards defined within that plan. An example of a QA technique is:



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- **Quality Audits** – Quality Audits are used as an approach to determine whether project activities comply with the project's quality policies, processes, and/or procedure and whether the appropriate controls are being applied. Quality audits are typically performed at defined project intervals (at the end of a project phase, iteration, month, etc.) and are geared toward determining if project quality complies with the quality metrics and measures defined in the Quality Management Plan.

QUALITY CONTROL

QC is an iterative process that should be performed throughout the project's life and involves monitoring and controlling project results to determine whether they comply with defined quality standards outlined in the QMP and then identifying ways to eliminate causes of unsatisfactory results. To more easily manage quality within a project, especially large complex projects, it is a common practice to define quality measurement thresholds that identify when and what corrective action may be needed to eliminate causes of unsatisfactory project performance.

Quality standards for the project are defined in the QMP and should include standards for project processes, product functionality, regulatory compliance requirements, project deliverables or project management performance. The practice of QC focuses on areas such as:

- **Prevention** – Keeping errors out of the process
- **Inspection** – Keeping errors out of the hands of the customer
- **Tolerances** – The degree to which results are within an acceptable range

The main outcomes of quality control activities include:

- **Acceptance decisions** – Decisions as to whether the products or services are accepted or rejected
- **Rework** – Actions taken to correct rejected products or services
- **Process adjustments** – Action taken to correct or prevent future quality problems

Requirements

All projects regardless of the type or size should plan and implement Quality Management as a critical function of project success.

Best Practices

The following are recommended best practices for Quality Management.

- **Document** – Quality measures and metrics should be centrally documented.
- **Involve Stakeholders** – Involve project participants and stakeholders in the identification and definition of project quality standards.
- **Solicit Feedback** – Solicit feedback from the project team, customers, and stakeholders regarding quality metrics, proposed measures, and quality baselines.
- **Be Proactive** – Focus on detecting and addressing quality early in the project life, before it becomes an issue.
- **Iterative** - Project Quality Management is an ongoing, iterative process that is conducted throughout the project lifecycle.
- **Track Trends** – Trend quality metrics and measures over time to provide a graphical representation of the trend of the project's conformity to defined quality standards.
- **Review** - A regular review of quality standards, metrics, and measures is good project management practice. Depending on the complexity of the project the review process may happen daily but should happen at least weekly for even the simplest projects.
- **Thresholds** - Establish agreed upon thresholds that define when certain corrective action needs to be taken to bring project performance back within acceptable boundaries of performance which are outline within the QMP.



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- **Analysis** - Analyze the impact of quality on the product, project, and program.
- **Act Quickly** - Obtain quality feedback as quickly as possible to avoid escalation of potential quality issues.
- **Archive Quality** – Quality measures and metrics should be archived as historical project data and incorporated into the organization’s lessons learned.
- **Disseminate Quality** - Disseminate appropriate quality measures and metrics data to the project team and appropriate stakeholder.
- **Continuous Improvement** – Constantly look for ways to increase project quality.
- **Triple Constraints** - Analyze quality based on scope, time, and cost impact to the project. When managing competing requirements, evaluate how a change in one constraint affects one or both of the remaining two constraints. This evaluation will help the project team understand the costs and benefits of applying a level of quality.

Practice Activities

To implement the practice of Quality Management specific activities are required. These five activities are outlined below along with how they align with quality planning, assurance and control.

PMI PMBOK	Six Sigma – Total Quality Management Activities
Quality Planning	Define Project Quality <ul style="list-style-type: none"> • Identify customer quality standards and expectations • Identify internal project quality standards and expectations • Identify organizational quality standards and expectations • Identify regulatory quality standards and expectations • Determine business processes involved by your quality plan • Define customer and project goals, quality standards, critical success factors, and metrics for which to measure success • Identify acceptance criteria for project deliverables and product performance
Quality Planning	Measure Project Quality <ul style="list-style-type: none"> • Identify desired metrics and related monitoring processes for which to measure quality standards • Develop a plan for measuring quality • Agree upon methods for data collection and archiving • Determine timeframe for measurement and metrics reporting
Quality Assurance and Quality Control	Analyze Project Quality <ul style="list-style-type: none"> • Analyze quality data • Identify opportunities for improvement • Eliminate gaps between current and desired levels of performance
Quality Assurance and Quality Control	Improve Project Quality <ul style="list-style-type: none"> • Do things better, cheaper, and/or faster • For projects, eliminate unsatisfactory performance
Quality Control	Control Project Quality <ul style="list-style-type: none"> • Control improvements by identifying owners of ongoing monitoring and improvement of project processes

Practice Attributes

This section provides a list of practice attributes to help project teams determine when and how **Quality Management** impacts their project.

Practice Owner	CDC UP Project Office – NCPHI
Criteria	All projects regardless of the type or size should address the practice of Quality Management during the application of project management practices to the project.



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Estimated Level of Effort	Significant
Prerequisites	Requirements Management
Practice Dependencies	All
Practice Timing in Project Life Cycle	The quality management approach for the project is outlined in the planning phase. However, project quality management is an ongoing activity that is conducted throughout the entire project life cycle.
Templates/Tools	Quality Management Plan, Quality Management Checklist
Additional Information	N/A

Key Terms

Follow the link below to for definitions of project management terms and acronyms used in this document.
<http://www2.cdc.gov/cdcup/library/other/help.htm>

Related Templates/Tools

Below is a list of template(s) related to this practice. Follow the link below to download the document(s).
<http://www2.cdc.gov/cdcup/library/matrix/default.htm>

- Quality Management Plan Template
- Quality Management Checklist