

Module 8

Project Quality Management

Module Overview

- Lesson 1: Key Concepts & Terms
- Lesson 2: Plan Quality Management
- Lesson 3: Manage Quality
- Lesson 4: Control Quality



Lesson 1: Key Concepts & Terms

- Definition of Quality
- Project Quality Management
- Quality, Grade, & Gold Plating
- Prevention & Inspection
- Attribute Sampling & Variable Sampling
- Tolerances & Control Limits
- Trend Analysis
- Trends & Emerging Practices
- Tailoring Considerations
- Considerations for Adaptive Environment
- Project Quality Management Processes Interrelations



Definition of Quality

- **Quality** is
 - the totality of characteristics of an entity that bears on its ability to satisfy stated or implied needs. [ISO8402]
 - the degree to which the project fulfills requirements. [PMBOK6 / ISO9000]

Project Quality Management

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.

Quality, Grade, & Gold Plating

- Quality \neq Grade
- **Grade** is a category assigned to deliverables having the same functional use but different technical characteristics.
- Low-grade product of high quality is OK.
- High-grade product of low quality is NOT OK.
- **Gold plating** is giving the customer extras.

Prevention & Inspection

- **Prevention** means keeping errors out of the process.
- **Inspection** means keeping errors out of the customers' hands.

Attribute Sampling & Variable Sampling

- **Attribute sampling** means the result either conform or does not conform.
- **Variable sampling** means the result is rated on a continuous scale that measures the degree of conformity.

Tolerances & Control Limits

- **Tolerances** means specified range of acceptable results.
- **Control limits** means identify the boundaries of common variation in a statistically stable process or process performance.

Trend Analysis

- **Trend analysis** is the science of analyzing past results to predict future performance.

Trends & Emerging Practices

- Customer satisfaction
- Continual improvement
 - Plan-do-check-act (PDCA) by Shewhart / Deming
 - Total Quality Management (TQM)
 - Six Sigma
 - Lean Six Sigma
- Management responsibility
- Mutually beneficial partnership with suppliers

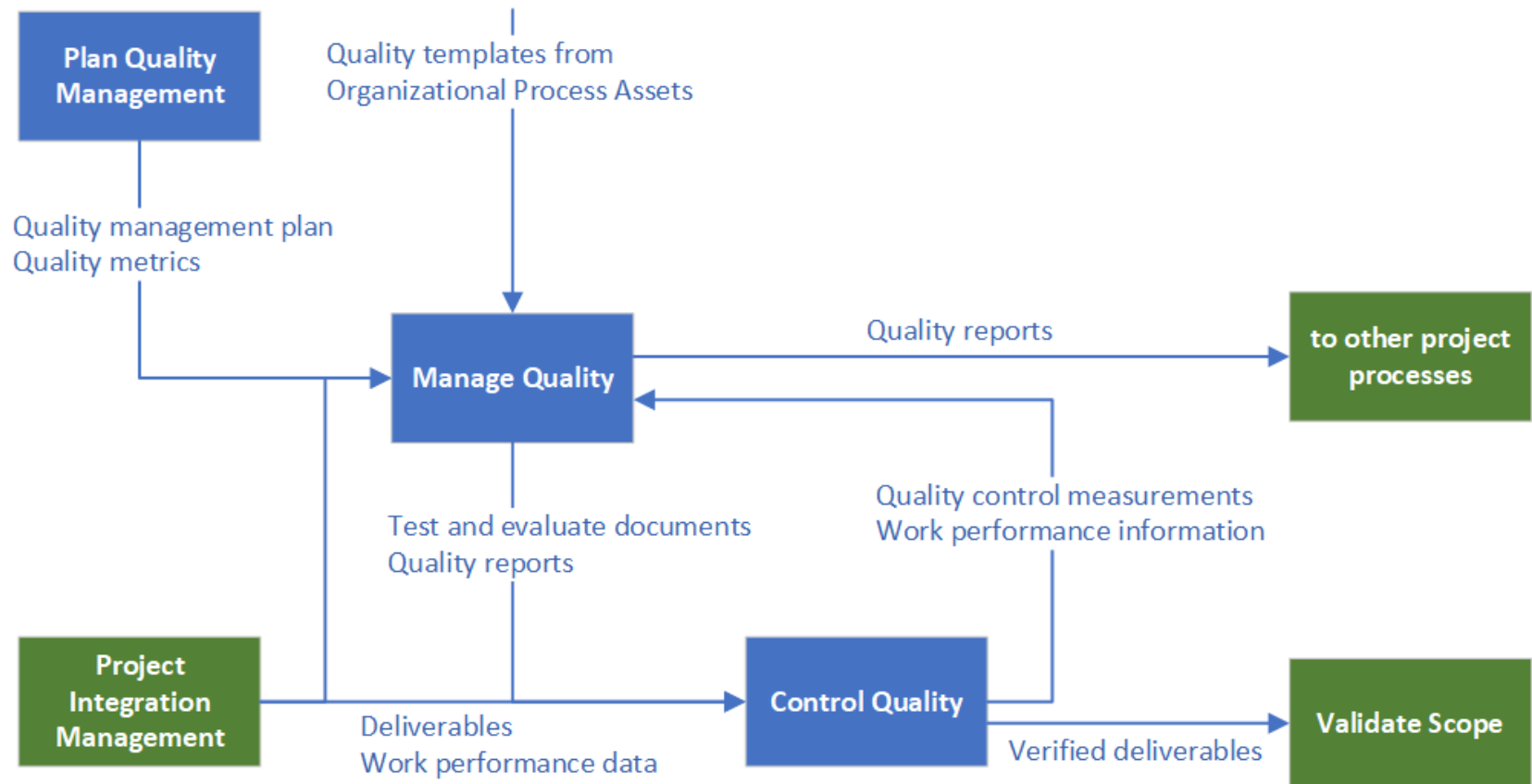
Tailoring Considerations

- Policy compliance & auditing
- Standards & regulatory compliance
- Continuous improvements
- Stakeholder engagement

Considerations for Adaptive Environment

- Quality & review steps are built-in throughout the project.
- Checking the effectiveness of quality processes is done in recurring **retrospectives**.

Project Quality Management Processes Interrelations



Lesson 2: Plan Quality Management

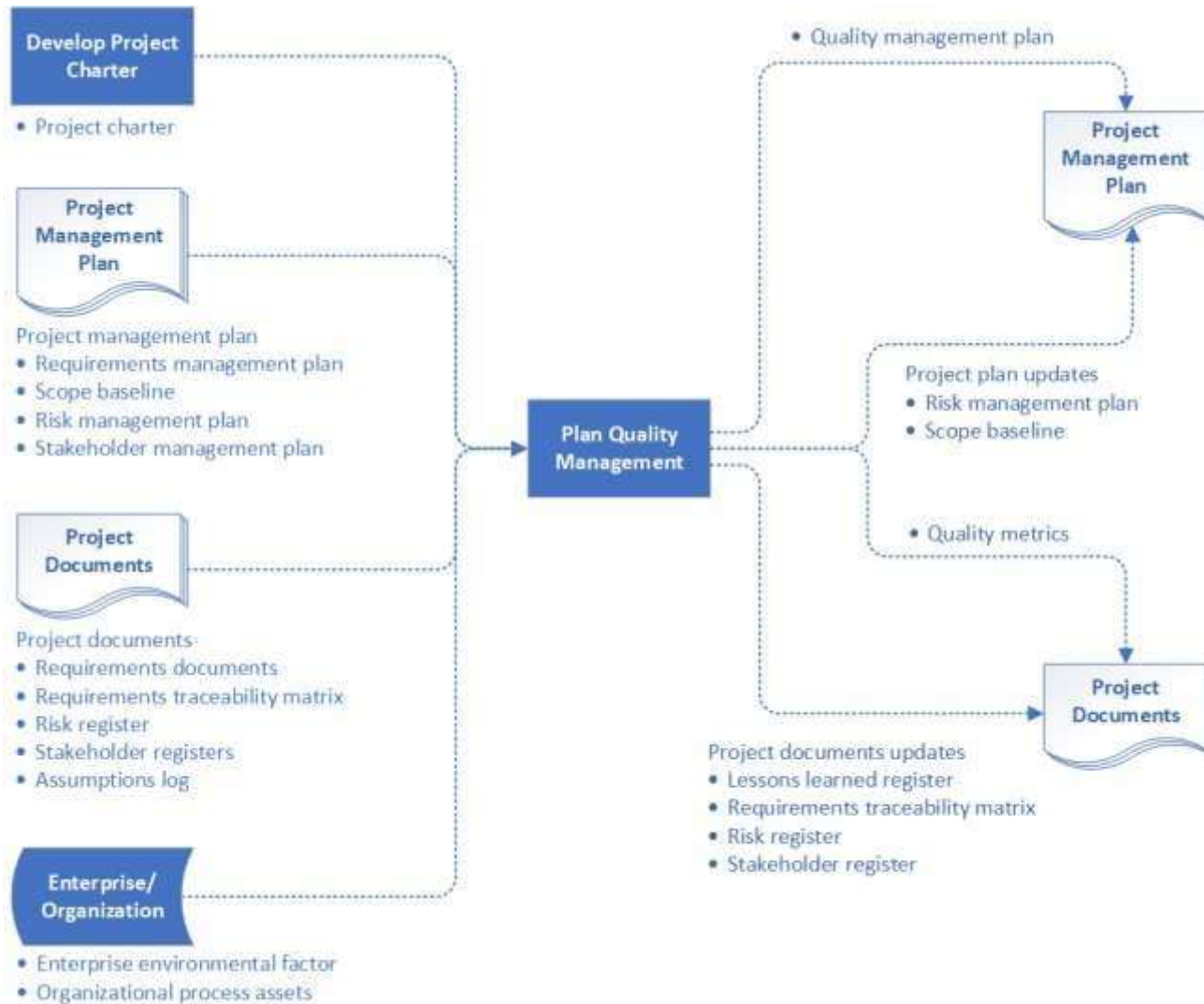
- Plan Quality Management Overview
- Plan Quality Management Data Flow
- Plan Quality Management Input
- Plan Quality Management Tools & Techniques
- Plan Quality Management Output



Plan Quality Management Overview

- 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 and/or standards. [PMBOK6]
- The process of identifying all relevant organizational or industry practices, standards, and requirements for the quality of the project, the product of the project, and the project management efforts, and then to plan how to meet those quality standards and requirements. [RITA9]

Plan Quality Management Data Flow



Plan Quality Management Input

- Project charter
- Project management plan
 - Requirements management plan
 - Scope baseline
 - Risk management plan
 - Stakeholder management plan
- Project documents
 - Requirements documentation
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register
 - Assumptions log
- Enterprise environmental factors
- Organizational process assets

Plan Quality Management Tools & Techniques

- Expert judgment
- Data gathering
 - Benchmarking
 - Brainstorming
 - Interviews
- Data analysis
 - Cost-benefit analysis
 - Cost of quality (COQ)
- Decision making
 - Multi-criteria decision analysis
 - Prioritization matrices
- Data representation
 - Flowcharts/process maps
→ SIPOC
 - Logical data model
 - Matrix diagrams
 - Mind mapping
- Test and inspection planning
- Meetings

Cost of Quality (Philip Crosby)

- Cost of conformance
 - Prevention cost: build a quality product
 - Training, document processes
 - Appraisal cost: asses the quality
 - Testing, inspection
- Cost of non-conformance
 - Internal failure cost: failures found by project
 - Rework, scrap
 - External failure cost: failures found by customers
 - Liabilities, warranty work

Marginal Analysis

Analysis focuses on finding the point at which the benefits or revenue to be received from improving quality equals the increment cost to achieve that quality.

Plan Quality Management Output

- Quality management plan
- Quality metrics
- Project management plan updates
 - Risk management plan
 - Stakeholder management plan
- Project documents updates
 - Lessons learned register
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register

Lesson 3: Manage Quality

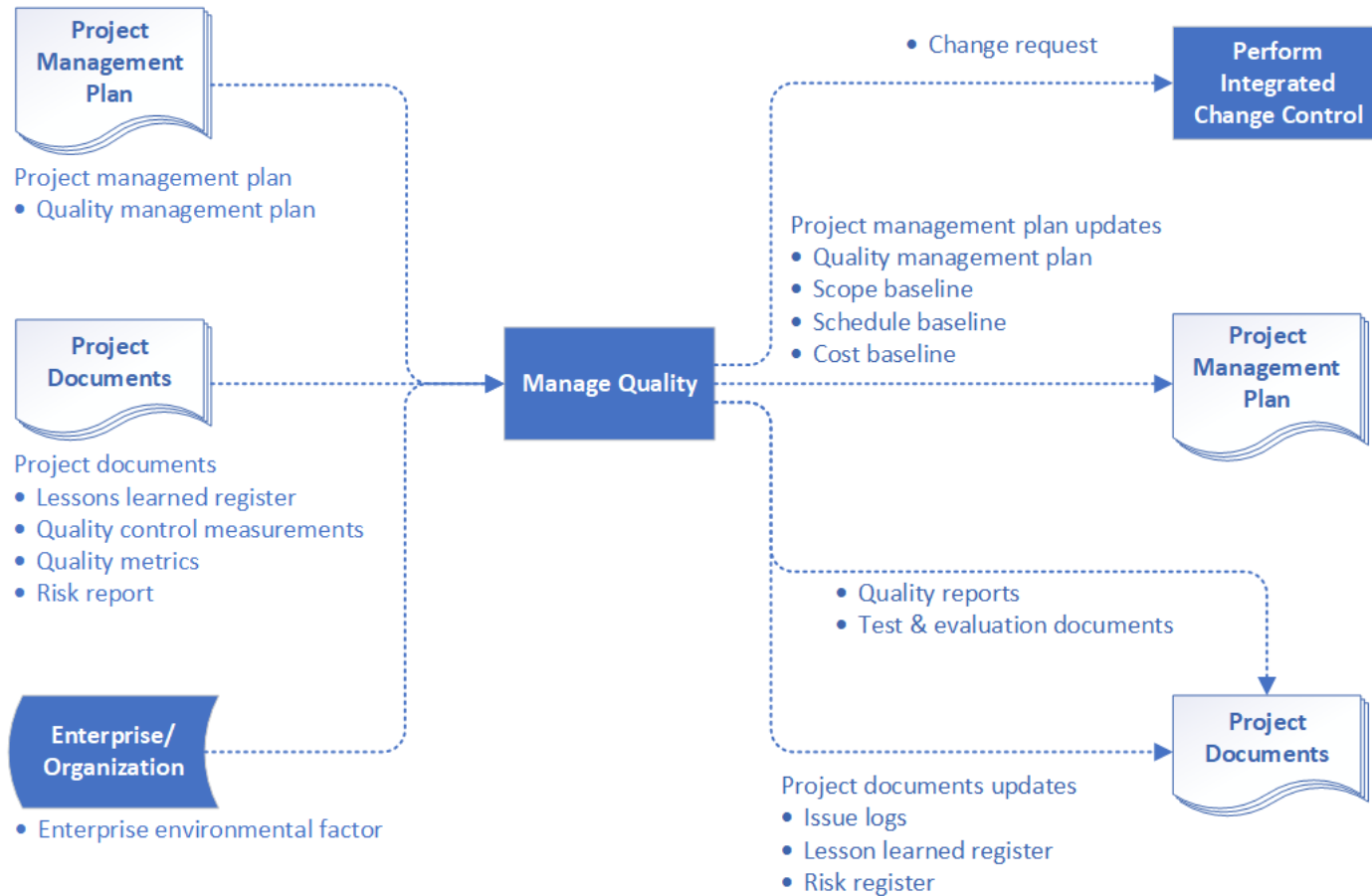
- Manage Quality Overview
- Manage Quality Data Flow
- Manage Quality Input
- Manage Quality Tools & Techniques
- Manage Quality Outputs



Manage Quality Overview

- The process of transforming quality management plan into executable quality activities that incorporate organization's quality policies into the project.
- Sometimes is called **Quality Assurance** → using project processes effectively

Manage Quality Data Flow



Manage Quality Input

- Project management plan
 - Quality management plan
- Project documents
 - Lessons learned register
 - Quality metrics
 - Quality control measurements
 - Risk report
- Organizational process assets

Manage Quality Tools & Techniques

- Data gathering
 - Checklists
- Data analysis
 - Alternative analysis
 - Document analysis
 - Process analysis
 - Root cause analysis
- Decision making
 - Multicriteria decision analysis
 - Prioritization matrix
- Data representation
 - Affinity diagrams
 - Cause-end-effect diagrams (fishbone, Ishikawa, why-why)
 - Flowcharts
 - Histograms
 - Matrix diagrams
 - Scatter diagrams

Manage Quality Tools & Techniques (continued)

- Audits
- Design for X (DfX)
- Problem solving
- Quality improvement methods
 - Plan-do-check-act (PDCA)
 - Six sigma

Design of Experiments (DOE)

- A technique that can be used to analyze alternatives.
- Allows to systematically change important factors in a process to see which combinations have an optimal impact on the project deliverables.
- Example: determining combination of materials, structure, and construction to product the highest-quality product.

Manage Quality Outputs

- 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

Lesson 4: Control Quality

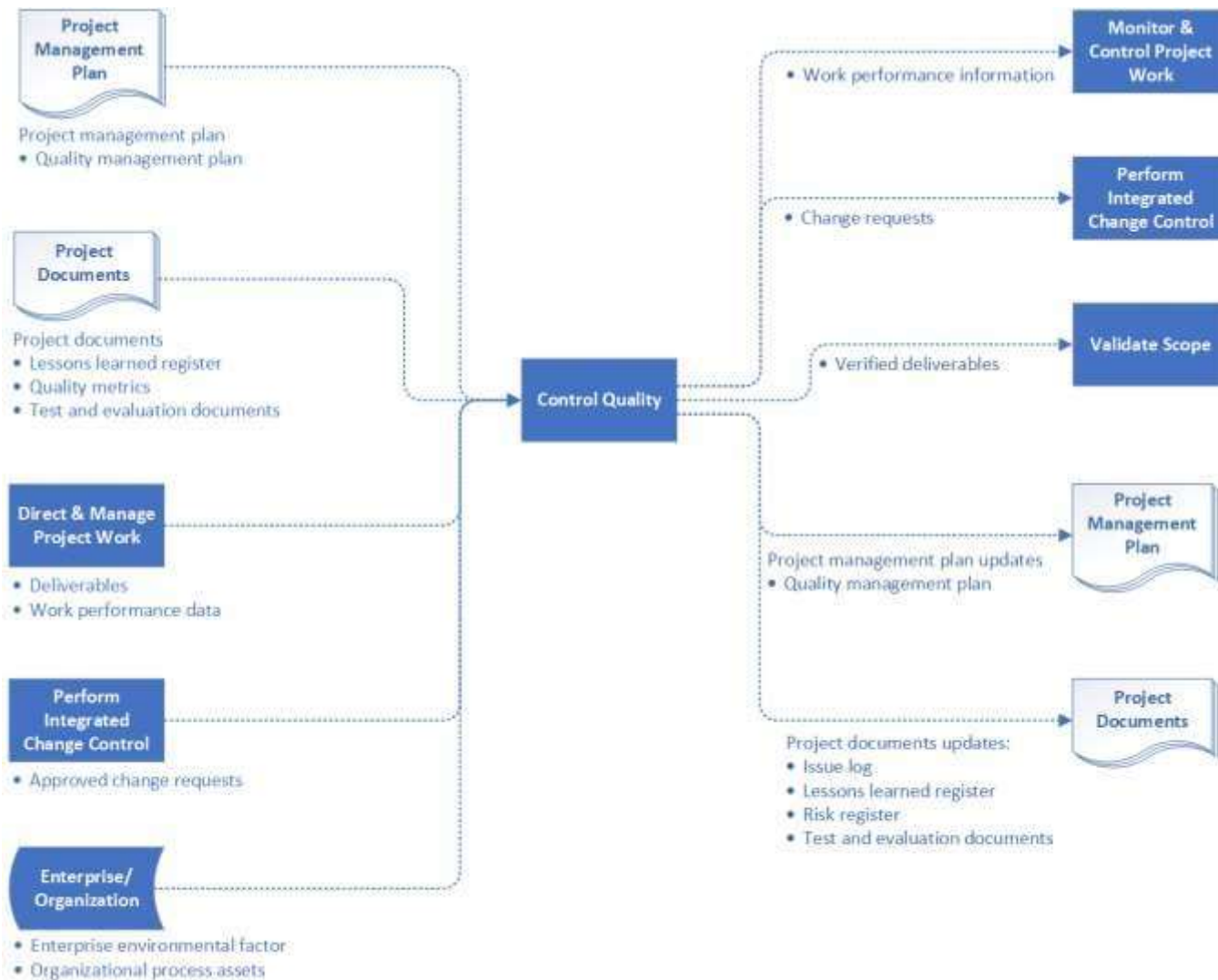
- Control Quality Overview
- Control Quality Data Flow
- Control Quality Input
- Control Quality Tools & Techniques
- Control Quality Output



Control Quality Overview

- The process of monitoring and recording results of executing the quality management activities in order to assess performance and ensure the project outputs are complete, correct, and meet customer expectations. [PMBOK6]
- The process of ensuring a certain level of quality in a deliverable, whether it be a product, service, or result. [RITA9]

Control Quality Data Flow



Control Quality Input

- Project management plan
 - Quality management plan
- Project documents
 - Lessons learned register
 - Quality metrics
 - Test and evaluation documents
- Approved change requests
- Deliverables
- Work performance data
- Enterprise environmental factors
- Organization process assets

Control Quality Tools & Techniques

- Data gathering
 - Checklists
 - Check sheets / tally sheets
 - Statistical sampling
 - Questionnaires and surveys
- Data analysis
 - Performance reviews
 - Root cause analysis (RCA)
- Inspection
 - Reviews, peer reviews, audits, walkthroughs
- Testing / product evaluations
- Data representation
 - Cause-and-effect diagrams (fishbone, Ishikawa, why-why)
 - Control charts
 - Histogram
 - Scatter diagrams
- Meetings
 - Approved change requests review
 - Retrospectives / lessons learned

Control Quality Output

- Quality control measurements
- Verified deliverables
- Work performance information
- Change requests
- Project management plan updates
 - Quality management plan
- Project documents updates
 - Issue log
 - Lessons learned register
 - Risk register
 - Test and evaluation documents

References

- [PMBOK6] – The PMBOK 6th edition from pmi.org
- [RITA9] – Rita Mulcahy's PMP Exam Prep 9th edition from RMC PublicationsTM
- [ISO8402] –
<https://www.iso.org/standard/20115.html>