Summary of the PMI-PMBOK Sixth Edition

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Project Management Trainer & Consultant
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PMBOK 6\textsuperscript{th} Edition
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6. Closing

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4. Summary of key concepts*
5. Summary of tailoring considerations*
6. Tools & Techniques
Glossary

* Per knowledge area
Process Matrix

Knowledge Area vs. Process Groups
## Project Management Process Matrix

<table>
<thead>
<tr>
<th>Knowledge Area</th>
<th>Initiation</th>
<th>Planning</th>
<th>Executing</th>
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<td>• Develop Project Charter</td>
<td>• Develop Project Management Plan</td>
<td>• Direct and Manage Project Work</td>
<td>• Monitor and Control Project Work</td>
<td>• Close Project or Phase</td>
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<td>Scope</td>
<td>• Plan Scope Management</td>
<td>• Collect Requirements</td>
<td>• Manage Project Knowledge</td>
<td>• Perform Integrated Change Control</td>
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<td>• Control Costs</td>
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<td>• Plan Stakeholder Engagement</td>
<td>• Manage Stakeholder Engagement</td>
<td>• Monitor Stakeholder Engagement</td>
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*Source: Table 1-1, PMBOK 6th Edition, Page 556*
List of Key Terms
About the key terms

- The following key terms represent most of the key terms you need to know for the PMP exam. Assess your knowledge for each of the mentioned terms.

- Mark (✓) if you believe that you are familiar with the term and how to use it

- Mark (✗) if the term if you are not familiar with the term

- Read about the terms you marked with (X)

- PMP exam may refer to other key terms not mentioned in the list.
Project vs. non-project work

- Project
- Operation
- Program
- Portfolio
- Project constraints
Project Life Cycle

- Project vs. product life cycle
- Project phasing
- Predictive/waterfall
- Iterative
- Incremental
- Adaptive/agile
- Hybrid
- 5 process groups
- 10 knowledge areas
Project Management

- Project management
- Enterprise environmental factors
- Organizational process assets
- System
- Governance
- Management element
- Talent triangle
- Process/context/cognitive integration
- Project complexity

- Organizational structure
  - Functional
  - Project-based
  - Matrix
  - Virtual
  - Hybrid

- Leadership styles
- PMO types
- Forms of power
Project Evaluation & Selection

- Project reasons
- Business case
- Benefits management plan
- Scoring
- BCR
- PBP
- PV
- NPV
- ROI
- IRR
Project Initiation

- Project charter
  - Objectives
  - Who signs the charter?
  - Main contents

- Stakeholders
  - Key stakeholder
  - Project sponsor
  - Project manager
  - Project team

- Stakeholder register

- Assumptions log

- Stakeholder mapping
  - Power/interest grid
  - Power/influence grid
  - Impact/influence grid
  - Stakeholder cube
  - Salience model
  - Directions of influence
  - Prioritization
Project Planning Overview

- Project plan
- Subsidiary plans
- Project baselines
- Project documents
- Project plan iteration
Plan Project Scope

- Requirements Management Plan
- Requirements Documentation
- Requirements Traceability Matrix
- Scope Statement
- Decomposition
- WBS
- WBS dictionary
- Work package
- Work package owner
- Control account
- Planning package

- Focus group
- Affinity diagram
- Mind mapping
- Scope baseline
### Plan Project Schedule

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Plan Project Costs

- Fixed cost
- Variable cost
- Direct cost
- Indirect cost
- Sunk cost
- ROM estimate
- Definitive estimate
- Contingency reserve
- Management reserve
- Cost S-curve
- Cost baseline
Plan Project Quality

- Quality vs. grade
- Prevention vs. inspection
- Attribute vs. variable sampling
- Tolerance vs. control limits
- Standards vs. regulations
- Precession vs. accuracy
- COQ [prevention, appraisal, failure]
- Deming PDCA cycle
- Levels of quality effectiveness
- TQM
- Six sigma
- Lean six sigma

- Data gathering techniques
  - Benchmarking
  - Brainstorming
- Data analysis techniques
  - Cost-benefit analysis
  - Cost of quality
- Data representation techniques
  - Flowchart/ process maps
  - SIPOC model7logical data model
  - Matrix diagrams
  - Mind mapping

- Test & inspection planning
- Quality plan contents
Plan Project Resources

- Project Organization Chart
- Resource breakdown structure
- Organizational theory
- RACI / RAM
- Role
- Responsibility
- Authority
- Competency
- Resource management plan
- Team charter
- Resource Calendar
- Reward/ recognition
Plan Project Communications

- Elements of personal communication
- 5Cs of good written communication
- Communication channels
- Communication technology
- Communication methods
- Interactive communication model
- Communication plan
- Communication matrix
- Escalation
- Glossary
Plan Project Risks

- Risk
- Issue
- Trigger
- Primary risk
- Secondary risk
- Risk appetite
- Risk tolerance
- Risk threshold
- Risk exposure
- Project resilience

- Risk Breakdown Structure (RBS)
- Probability
- Impact
- P x I matrix
- Root-cause analysis
- Assumption & constraint analysis
- SWOT analysis
- PESTEL
- TECOP
- VUCA
Plan Project Risks

- Detectability
- Proximity

- Simulation/Monte Carlo
- Sensitivity/ Tornado
- Decision tree
- Influence diagram

- Escalate
- Avoid
- Transfer
- Mitigate

- Exploit
- Share

- Passive acceptance
- Active acceptance
Plan Project Procurements

- FFP
- FPIF
- FPEPA
- CPFF
- CPIF
- CPAF
- T&M
- IFB
- RFI
- RFQ
- RFP
- Seller / buyer
- Make or buy
- Independent estimate
- SOW
Plan Stakeholder Engagement

- Stakeholder engagement assessment matrix
  - Unaware
  - Resistant
  - Neutral
  - Supportive
  - Leading

- Current engagement
- Desired engagement
Project Execution

- Deliverable
- Work order
- Change request
- Issue log
- Knowledge vs. information
- Quality audit
- Design for X
- Virtual team
- Motivation theories
- PMIS
- Emotional intelligence

- Bidder conference
- 5 stages for team development
- 5 ways to resolve conflict
- 5 staged to negotiate procurements
Project Monitoring & Controlling

- CCB
- CMS

- Scope creep
- Gold plating

- Status reporting
- Contract changes
- Tally sheet
- Control chart
- Pareto chart
- Risk audit

- PV
- AC
- EV
- SV / SPI
- CV / CPI
- TCPI
- ETC
- EAC
- BAC
- Typical
- Atypical
Project Closing

- Addition
- Integration
- Starvation
- Extinction

- Close project
- Close phase

- Final report

- Lessons learned
List of Tools & Techniques
Tools & Techniques

- Data gathering (9)
- Data analysis (27)
- Data representation (15)
- Decision making (2)
- Communication skill (2)
- Interpersonal & team skills (17)
- Ungrouped (59)

- Total (132)

The next slides shows detailed list of those tools & techniques and how frequent they are used in the PMBOK (i.e.: number of sections referring to the tool & technique)
## Data Gathering

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## Interpersonal and Team Skills

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<td>Quality improvement methods</td>
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<td>Strategies for overall project risks</td>
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<td>Recognition &amp; rewards</td>
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<td>Strategies for threats</td>
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<td>Source selection criteria</td>
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</tbody>
</table>
Inputs, T&T, Outputs of the Project Management Processes
# Develop Project Charter

## Objectives

Developing a document that formally authorizes a project or a phase and documenting initial requirements that satisfy the stakeholder’s needs and expectations.

## Inputs

1. Business documents
   - Business case
   - Benefits management plan
2. Agreements
3. Enterprise environmental factors
4. Organizational process assets

## Tools & Techniques

1. Expert judgment
2. Data gathering
   - Brainstorming
   - Focus groups
   - Interviews
3. Interpersonal & team skills
   - Conflict management
   - Facilitation
   - Meeting management
4. Meetings

## Outputs

1. Project charter
2. Assumption Log
## Identify Stakeholders

### Objectives
Identifying all people or organizations impacted by the project, and documenting relevant information regarding their interest, involvement, and impact on the project success.

### Inputs
1. Project charter
2. Business documents
   - Business case
   - Benefits management plan
3. Project management plan
   - Communications management plan
   - Stakeholder engagement plan
4. Project documents
   - Change log
   - Issue log
   - Requirements documentation
5. Agreements
6. Enterprise environmental factors
7. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Data gathering
   - Questionnaires & surveys
   - Brainstorming
3. Data analysis
   - Stakeholder analysis
   - Document analysis
4. Data representation
   - Stakeholder mapping/representation
5. Meetings

### Outputs
1. Stakeholder register
2. Change requests
3. Project management plan updates
   - Requirements management plan
   - Communications management plan
   - Risk management plan
   - Stakeholder engagement plan
4. Project documents updates
   - Assumption log
   - Issue log
   - Risk register
# Develop Project Management Plan

## Objectives
Documenting the actions necessary to define, prepare, integrate, and coordinate all subsidiary plans.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project charter</td>
<td>1. Expert judgment</td>
<td>1. Project management plan</td>
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<tr>
<td>2. Outputs from other processes</td>
<td>2. Data gathering</td>
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</tr>
<tr>
<td>3. Enterprise environmental factors</td>
<td>3. Interpersonal &amp; team skills</td>
<td></td>
</tr>
<tr>
<td>4. Organizational process assets</td>
<td>4. Meetings</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Brainstorming</td>
<td></td>
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<tr>
<td></td>
<td>2. Checklists</td>
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<tr>
<td></td>
<td>3. Focus groups</td>
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<tr>
<td></td>
<td>4. Interviews</td>
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</tr>
<tr>
<td></td>
<td>1. Conflict management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Facilitation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Meeting management</td>
<td></td>
</tr>
</tbody>
</table>

**Tools & Techniques**
- Expert judgment
- Data gathering
  - Brainstorming
  - Checklists
  - Focus groups
  - Interviews
- Interpersonal & team skills
  - Conflict management
  - Facilitation
  - Meeting management
- Meetings
Plan Scope Management

**Objectives**

Creating a scope management plan that documents how the project scope will be defined, validated, and controlled.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Project management plan</td>
<td>2. Data analysis</td>
<td>2. Requirements management plan</td>
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<tr>
<td>• Quality management plan</td>
<td>• Alternative analysis</td>
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<tr>
<td>• Project life cycle description</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>• Development approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Enterprise environmental factors</td>
<td>3. Meetings</td>
<td></td>
</tr>
<tr>
<td>4. Organizational process assets</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Objectives
Defining & documenting stakeholder needs to meet the project objectives.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project charter  
2. Project management plan  
   - Scope management plan  
   - Requirements management plan  
   - Stakeholder engagement plan  
3. Project documents  
   - Assumption log  
   - Lessons learned register  
   - Stakeholder register  
4. Business documents  
   - Business case  
5. Agreements  
6. Enterprise environmental factors  
7. Organizational process assets | 1. Expert judgment  
2. Data gathering  
   - Brainstorming  
   - Interviews  
   - Focus groups  
   - Questionnaires & surveys  
   - Benchmarking  
3. Data analysis  
   - Document analysis  
4. Decision making  
   - Voting  
   - Autocratic  
   - Multicriteria decision analysis  
5. Data representation  
   - Affinity diagrams  
   - Mind mapping  
6. Interpersonal & team skills  
   - Nominal group technique  
   - Observation/conversation  
   - Facilitation  
7. Context diagrams  
8. Prototypes | 1. Requirements documentation  
2. Requirements traceability matrix |
# Define Scope

## Objectives

Developing detailed description of the project and product.

## Inputs

1. Project charter
2. Project management plan
   - Scope management plan
3. Project documents
   - Assumption log
   - Requirements documentation
   - Risk register
4. Enterprise environmental factors
5. Organizational process assets

## Tools & Techniques

1. Expert judgment
2. Data analysis
   - Alternative analysis
3. Decision making
   - Multicriteria decision making
4. Interpersonal & team skills
   - Facilitation
5. Product analysis

## Outputs

1. Project scope statement
2. Project documents updates
   - Assumption log
   - Requirements documentation
   - Requirements traceability matrix
   - Stakeholder register
## Create WBS

### Objectives
Subdividing project deliverables and project work into smaller, more manageable components.

<table>
<thead>
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<th>Tools &amp; Techniques</th>
<th>Outputs</th>
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<td>1. Expert judgment</td>
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<td>2. Project documents</td>
<td>2. Decomposition</td>
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<tr>
<td>• Requirements documentation</td>
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<td>3. Enterprise environmental factors</td>
<td></td>
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<tr>
<td>4. Organizational process assets</td>
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</tr>
</tbody>
</table>

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# Plan Schedule Management

## Objectives

Establishing the policies, procedures, and documentation for planning, developing, managing, executing and controlling the project schedule.

## Inputs

1. Project charter
2. Project management plan
   - Scope management plan
   - Development approach
3. Enterprise environmental factors
4. Organizational process assets

## Tools & Techniques

1. Expert judgment
2. Data analysis
3. Meetings

## Outputs

1. Schedule management plan
## Define Activities

### Objectives
Identifying the specific actions to be performed to produce the project deliverables

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
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</thead>
</table>
| 1. Project management plan  
  • Schedule management plan  
  • Scope baseline  
  2. Enterprise environmental factors  
  3. Organizational process assets | 1. Expert judgment  
  2. Decomposition  
  3. Rolling wave planning  
  4. Meetings | 1. Activity list  
  2. Activity attributes  
  3. Milestone list  
  4. Change requests  
  5. Project management plan updates  
  • Schedule baseline  
  • Cost baseline |
### Sequence Activities

#### Objectives
Identifying and documenting relationships among the project activities.

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<td>1. Project schedule network diagrams</td>
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<td>2. Dependency determination &amp; integration</td>
<td>2. Project documents updates</td>
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<tr>
<td>• Scope baseline</td>
<td>3. Leads and lags</td>
<td>• Activity attributes</td>
</tr>
<tr>
<td>2. Project documents</td>
<td>4. Project management information system</td>
<td>• Activity list</td>
</tr>
<tr>
<td>• Activity attributes</td>
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<td>• Assumption log</td>
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<td>• Activity list</td>
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<td>• Milestone list</td>
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<tr>
<td>• Assumption log</td>
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<td>• Milestone list</td>
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<tr>
<td>3. Enterprise environmental factors</td>
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<td></td>
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<tr>
<td>4. Organizational process assets</td>
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</tbody>
</table>

- Precedence diagramming method (PDM)
- Dependency determination & integration
- Leads and lags
- Project management information system
## Estimate Activity Durations

### Objectives
Approximating the number of work periods needed to complete individual activities with estimated resources.

### Inputs
1. **Project management plan**
   - Schedule management plan
   - Scope baseline
2. **Project documents**
   - Activity attributes
   - Activity list
   - Assumption log
   - Lessons learned register
   - Milestone list
   - Resource breakdown structure
   - Resource calendars
   - Resource requirements
   - Risk register
3. **Enterprise environmental factors**
4. **Organizational process assets**

### Tools & Techniques
1. Expert judgment
2. Analogous estimating
3. Parametric estimating
4. Three-point estimates
5. Bottom-up estimating
6. Data analysis
   - Alternative analysis
   - Reserve analysis
7. Decision making
8. Meetings

### Outputs
1. Duration estimates
2. Basis of estimates
3. Project documents updates
   - Activity attributes
   - Assumption log
   - Lessons learned register
## Develop Schedule

### Objectives

Analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.

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<td>2. Critical path method</td>
<td>2. Project schedule</td>
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<td>• Assumption log</td>
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<td>6. Project management plan updates</td>
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<tr>
<td>• Basis of estimates</td>
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<td>• Schedule management plan</td>
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<tr>
<td>• Lessons learned register</td>
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<td>• Cost baseline</td>
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<td>• Milestone list</td>
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<tr>
<td>• Project schedule network diagrams</td>
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<td>• Project team assignments</td>
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<td>• Resource calendars</td>
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<tr>
<td>• Resource requirements</td>
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<td>• Risk register</td>
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<td>3. Agreements</td>
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<td>4. Enterprise environmental factors</td>
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<td>5. Organizational process assets</td>
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<td>6. Agreements</td>
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<tr>
<td>10. Organizational process assets</td>
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</tr>
</tbody>
</table>
# Plan Cost Management

## Objectives

Establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs.

## Inputs

1. Project charter
2. Project management plan  
   - Schedule management plan  
   - Risk management plan
3. Enterprise environmental factors
4. Organizational process assets

## Tools & Techniques

1. Expert judgment
2. Data analysis
3. Meetings

## Outputs

1. Cost management plan
## Estimate Costs

### Objectives
Developing an approximation of the monetary resources needed to complete project activities.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
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</thead>
</table>
| 1. Project management plan  
   - Cost management plan  
   - Quality management plan  
   - Scope baseline  
2. Project documents  
   - Lessons learned register  
   - Project schedule  
   - Resource requirements  
   - Risk register  
3. Enterprise environmental factors  
4. Organizational process assets | 1. Expert judgment  
2. Analogous estimating  
3. Parametric estimating  
4. Bottom-up estimating  
5. Three-point estimates  
6. Data analysis  
   - Alternatives analysis  
   - Reserve analysis  
   - Cost of quality  
7. Project management information system  
8. Decision making  
   - Voting | 1. Cost estimates  
2. Basis of estimates  
3. Project documents updates  
   - Assumption log  
   - Lessons learned register  
   - Risk register |
## Determine Budget

### Objectives
Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.

### Inputs
1. Project management plan
   - Cost management plan
   - Resource management plan
   - Scope baseline
2. Project documents
   - Basis of estimates
   - Cost of estimates
   - Project schedule
   - Risk register
3. Business documents
   - Business case
   - Benefits management plan
4. Agreements
5. Enterprise environmental factors
6. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Cost aggregation
3. Data analysis
   - Reserve analysis
4. Historical information review
5. Funding limit reconciliation
6. Financing

### Outputs
1. Cost baseline
2. Project funding requirements
3. Project documents updates
   - Cost estimates
   - Project schedule
   - Risk register
Plan Quality Management

**Objectives**
Identifying quality requirements and/or standards for the project and product, and documenting how the project will demonstrate compliance.

<table>
<thead>
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<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
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<td>• Benchmarking</td>
<td>3. Project management plan updates</td>
</tr>
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<td>• Risk management plan</td>
<td>• Brainstorming</td>
<td>• Risk management plan</td>
</tr>
<tr>
<td>• Stakeholder management plan</td>
<td>• Interviews</td>
<td>• Scope baseline</td>
</tr>
<tr>
<td>• Assumption log</td>
<td>• Cost-benefit analysis</td>
<td>• Lessons learned register</td>
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<tr>
<td>• Requirements documentation</td>
<td>• Cost of quality</td>
<td>• Requirements traceability matrix</td>
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<tr>
<td>• Requirements traceability matrix</td>
<td>4. Decision making</td>
<td>• Risk register</td>
</tr>
<tr>
<td>• Risk register</td>
<td>• Multicriteria decision analysis</td>
<td>• Stakeholder register</td>
</tr>
<tr>
<td>• Stakeholder register</td>
<td>5. Data representation</td>
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</tr>
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<td>• Flowcharts</td>
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<td>5. Organizational process assets</td>
<td>• Logical data model</td>
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<td></td>
<td>• Matrix diagrams</td>
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<td>• Mind mapping</td>
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<td></td>
<td>6. Test and inspection planning</td>
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<tr>
<td></td>
<td>7. Meetings</td>
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</tr>
</tbody>
</table>
## Plan Resource Management

### Objectives
Identifying and documenting project roles, responsibilities, and required skills, reporting relationships, and creating a staffing management plan.

### Inputs
1. Project charter
2. Project management plan
   - Quality management plan
   - Scope baseline
3. Project documents
   - Project schedule
   - Requirements documentation
   - Risk register
   - Stakeholder register
4. Enterprise environmental factors
5. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Data representation
   - Hierarchical charts
   - Responsibility assignment matrix
   - Text-oriented formats
3. Organizational theory
4. Meetings

### Outputs
1. Resource management plan
2. Team charter
3. Project documents updates
   - Assumption log
   - Risk register
### Objectives
Estimating the type and quantities of material, people, equipment, or supplies required to perform each activity.

### Inputs
1. Project management plan
   - Resource management plan
   - Scope baseline
2. Project documents
   - Activity attributes
   - Activity list
   - Assumption log
   - Cost estimates
   - Resource calendars
   - Risk register
3. Enterprise environmental factors
4. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Bottom-up estimating
3. Analogous estimating
4. Parametric estimating
5. Data analysis
   - Alternative analysis
6. Project management information system
7. Meetings

### Outputs
1. Resource requirements
2. Basis of estimates
3. Resource breakdown structure (RBS)
4. Project documents updates
   - Activity attributes
   - Assumption log
   - Lessons learned register
Plan Communications Management

### Objectives
Determining the project stakeholder information needs and defining a communication approach.

<table>
<thead>
<tr>
<th><strong>Inputs</strong></th>
<th><strong>Tools &amp; Techniques</strong></th>
<th><strong>Outputs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project charter</td>
<td>1. Expert judgment</td>
<td>1. Communications management plan</td>
</tr>
<tr>
<td>2. Project management plan</td>
<td>2. Communication requirements analysis</td>
<td>2. Project management plan updates</td>
</tr>
<tr>
<td>• Resource management plan</td>
<td>3. Communication technology</td>
<td>• Stakeholder engagement plan</td>
</tr>
<tr>
<td>• Stakeholder engagement plan</td>
<td>4. Communication models</td>
<td>3. Project document updates updates</td>
</tr>
<tr>
<td>3. Project documents</td>
<td>5. Communication methods</td>
<td>• Project schedule</td>
</tr>
<tr>
<td>• Requirements documentation</td>
<td>6. Interpersonal and team skills</td>
<td>• Stakeholder register</td>
</tr>
<tr>
<td>• Stakeholder register</td>
<td>• Communication styles assessment</td>
<td></td>
</tr>
<tr>
<td>4. Enterprise environmental factors</td>
<td>• Political awareness</td>
<td></td>
</tr>
<tr>
<td>5. Organizational process assets</td>
<td>• Cultural awareness</td>
<td></td>
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<tr>
<td></td>
<td>7. Data representation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stakeholder engagement assessment matrix</td>
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<tr>
<td></td>
<td>8. Meetings</td>
<td></td>
</tr>
</tbody>
</table>
# Plan Risk Management

## Objectives
Defining how to conduct risk management activities for a project

## Inputs
1. Project charter
2. Project management plan
   - All components
3. Project documents
   - Stakeholder register
4. Enterprise environmental factors
5. Organizational process assets

## Tools & Techniques
1. Expert judgment
2. Data analysis
   - Stakeholder analysis
3. Meetings

## Outputs
1. Risk management plan
## Identify Risks

### Objectives
Determining which risks may affect the project and documenting their characteristics.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Expert judgment</td>
<td>1. Risk register</td>
</tr>
<tr>
<td>• Requirements management plan</td>
<td></td>
<td>2. Risk report</td>
</tr>
<tr>
<td>• Schedule management plan</td>
<td>2. Data gathering</td>
<td>3. Project documents updates</td>
</tr>
<tr>
<td>• Cost management plan</td>
<td>• Brainstorming</td>
<td>• Assumption log</td>
</tr>
<tr>
<td>• Quality management plan</td>
<td>• Checklists</td>
<td>• Issue log</td>
</tr>
<tr>
<td>• Resource management plan</td>
<td>• Interviews</td>
<td>• Lessons learned register</td>
</tr>
<tr>
<td>• Risk management plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Scope baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cost baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Project documents</td>
<td>3. Data analysis</td>
<td></td>
</tr>
<tr>
<td>• Assumption log</td>
<td>• Root cause analysis</td>
<td></td>
</tr>
<tr>
<td>• Cost estimates</td>
<td>• Assumption &amp; constraint analysis</td>
<td></td>
</tr>
<tr>
<td>• Duration estimates</td>
<td>• SWOT analysis</td>
<td></td>
</tr>
<tr>
<td>• Issue log</td>
<td>• Document analysis</td>
<td></td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Requirements documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Resource requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stakeholder register</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Agreements</td>
<td>4. Interpersonal and team skills</td>
<td></td>
</tr>
<tr>
<td>4. Procurement documents</td>
<td>• Facilitation</td>
<td></td>
</tr>
<tr>
<td>5. Enterprise environmental factors</td>
<td>5. Prompt lists</td>
<td></td>
</tr>
<tr>
<td>6. Organizational process assets</td>
<td>6. Meetings</td>
<td></td>
</tr>
</tbody>
</table>
# Perform Qualitative Risk Analysis

## Objectives

Prioritizing risks for future analysis or action by assessing and combining their probability of occurrence and impact.

## Inputs

1. Project management plan  
   - Risk management plan  
2. Project documents  
   - Assumption log  
   - Risk register  
   - Stakeholder register  
3. Enterprise environmental factors  
4. Organizational process assets

## Tools & Techniques

1. Expert judgment  
2. Data gathering  
   - Interviews  
3. Data analysis  
   - Risk data quality assessment  
   - Risk probability and impact assessment  
   - Assessment of other risk parameters  
4. Interpersonal and team skills  
   - Facilitation  
5. Risk categorization  
6. Data representation  
   - Probability and impact matrix  
   - Hierarchical charts  
7. Meetings

## Outputs

1. Project documents updates  
   - Assumption log  
   - Issue log  
   - Risk register  
   - Risk report
Perform Quantitative Risk Analysis

Objectives
Numerically analyzing the effect of identified risks on overall project objectives.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td></td>
<td>1. Project documents updates</td>
</tr>
<tr>
<td>• Risk management plan</td>
<td>1. Expert judgment</td>
<td>• Risk report</td>
</tr>
<tr>
<td>• Scope baseline</td>
<td>2. Data gathering</td>
<td></td>
</tr>
<tr>
<td>• Schedule baseline</td>
<td>• Interviews</td>
<td></td>
</tr>
<tr>
<td>2. Project documents</td>
<td>3. Interpersonal and team skills</td>
<td></td>
</tr>
<tr>
<td>• Assumption log</td>
<td>• Facilitation</td>
<td></td>
</tr>
<tr>
<td>• Basis of estimates</td>
<td>4. Representation of uncertainty</td>
<td></td>
</tr>
<tr>
<td>• Cost estimates</td>
<td>5. Data analysis</td>
<td></td>
</tr>
<tr>
<td>• Cost forecasts</td>
<td>• Simulation</td>
<td></td>
</tr>
<tr>
<td>• Duration estimates</td>
<td>• Sensitivity analysis</td>
<td></td>
</tr>
<tr>
<td>• Milestone list</td>
<td>• Decision tree analysis</td>
<td></td>
</tr>
<tr>
<td>• Resource requirements</td>
<td>• Influence diagrams</td>
<td></td>
</tr>
<tr>
<td>3. Enterprise environmental factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Organizational process assets</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Expert judgment
2. Data gathering
   • Interviews
3. Interpersonal and team skills
   • Facilitation
4. Representation of uncertainty
5. Data analysis
   • Simulation
   • Sensitivity analysis
   • Decision tree analysis
   • Influence diagrams
# Plan Risk Responses

## Objectives
Developing options and actions to enhance opportunities and reduce threats to project objectives.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project management plan  
  • Resource management plan  
  • Risk management plan  
  • Cost baseline  
  2. Project documents  
  • Lessons learned register  
  • Project schedule  
  • Project team assignments  
  • Resource calendars  
  • Risk register  
  • Risk report  
  • Stakeholder register  
  3. Enterprise environmental factors  
  4. Organizational process assets | 1. Expert judgment  
  2. Data gathering  
  • Interviews  
  3. Interpersonal and team skills  
  • Facilitation techniques  
  4. Strategies for threats  
  5. Strategies for opportunities  
  6. Contingent response strategies  
  7. Strategies for overall project risk  
  8. Data analysis  
  • Alternatives analysis  
  • Cost-benefit analysis  
  9. Decision making  
  • Multicriteria decision analysis | 1. Change requests  
  2. Project management plan updates  
  • Schedule management plan  
  • Cost management plan  
  • Quality management plan  
  • Resource management plan  
  • Procurement management plan  
  • Scope baseline  
  • Schedule baseline  
  • Cost baseline  
  3. Project documents updates  
  • Assumption log  
  • Cost forecasts  
  • Lessons learned register  
  • Project schedule  
  • Project team assignments  
  • Risk register  
  • Risk report |
Plan Procurement Management

### Objectives
Documenting project purchasing decisions, specifying the approach, and identifying potential sellers.

### Inputs
1. Project charter
2. Business documents
   - Business case
   - Benefits management plan
3. Project management plan
   - Scope management plan
   - Quality management plan
   - Resource management plan
   - Scope baseline
4. Project documents
   - Milestone list
   - Project team assignments
   - Requirements documentation
   - Requirements traceability matrix
   - Resource requirements
   - Risk register
   - Stakeholder register
5. Enterprise environmental factors
6. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Data gathering
   - Market research
3. Data analysis
   - Make-or-buy analysis
4. Source selection analysis
5. Meetings

### Outputs
1. Procurement management plan
2. Procurement strategy
3. Bid documents
4. Procurement statement of work
5. Source selection criteria
6. Make-or-buy decisions
7. Independent cost estimates
8. Change requests
9. Project documents updates
   - Lessons learned register
   - Milestone list
   - Requirements documentation
   - Requirements traceability matrix
   - Risk register
   - Stakeholder register
10. Organizational process updates

---

**Planning/procurement**

[Image source: Fayez Jolani]
Plan Stakeholder Engagement

### Objectives
Developing appropriate management strategies to effectively engage stakeholders throughout the project lifecycle, based on the analysis of their needs, interests, and potential impact on the project success.

### Inputs
1. Project charter
2. Project management plan
   - Resource management plan
   - Communications management plan
   - Risk management plan
3. Project documents
   - Assumption log
   - Change log
   - Issue log
   - Project schedule
   - Risk register
   - Stakeholder register
4. Agreements
5. Enterprise environmental factors
6. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Data gathering
   - Benchmarking
3. Data analysis
   - Assumption and constraint analysis
   - Root cause analysis
4. Decision making
   - Prioritization/ranking
5. Data representation
   - Mind mapping
   - Stakeholder engagement assessment matrix
6. Meetings

### Outputs
1. Stakeholder engagement plan
## Direct and Manage Project Work

### Objectives

Performing the work defined in the project management plan to achieve the project objectives

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project management plan  
   • Any component  
  2. Project documents  
   • Change log  
   • Lessons learned register  
   • Milestone list  
   • Project communications  
   • Project schedule  
   • Requirements traceability matrix  
   • Risk register  
   • Risk report  
  3. Approved change requests  
  4. Enterprise environmental factors  
  5. Organizational process assets | 1. Expert judgment  
  2. Project management information system  
  3. Meetings | 1. Deliverables  
  2. Work performance data  
  3. Issue log  
  4. Change requests  
  5. Project management plan updates  
   • Any component  
  6. Project documents updates  
   • Activity list  
   • Assumption log  
   • Lessons learned register  
   • Requirements documentation  
   • Risk register  
   • Stakeholder register  
  7. Organizational process assets updates |
# Manage Project Knowledge

## Objectives
Use existing knowledge and create new knowledge to achieve the project objectives and contribute to the organizational learning.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Expert judgment</td>
<td>1. Lessons learned register</td>
</tr>
<tr>
<td>• All components</td>
<td>2. Knowledge management</td>
<td>2. Project management plan updates</td>
</tr>
<tr>
<td>2. Project documents</td>
<td>3. Information management</td>
<td>• Any component</td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td>4. Interpersonal and team skills</td>
<td>3. Organizational process assets updates</td>
</tr>
<tr>
<td>• Project team assignments</td>
<td>• Active listening</td>
<td></td>
</tr>
<tr>
<td>• Resource breakdown structure</td>
<td>• Facilitation</td>
<td></td>
</tr>
<tr>
<td>• Source selection criteria</td>
<td>• Leadership</td>
<td></td>
</tr>
<tr>
<td>• Stakeholder register</td>
<td>• Networking</td>
<td></td>
</tr>
<tr>
<td>3. Deliverables</td>
<td>• Political awareness</td>
<td></td>
</tr>
<tr>
<td>4. Enterprise environmental factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Organizational process assets</td>
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</tr>
</tbody>
</table>
## Manage Quality (Quality Assurance)

### Objectives
Auditing the quality requirements and the results from quality control measurements to ensure appropriate quality standards and operations definitions are used

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Data gathering</td>
<td>1. Quality reports</td>
</tr>
<tr>
<td>• Quality management plan</td>
<td>• Checklists</td>
<td>2. Test and evaluation documents</td>
</tr>
<tr>
<td>2. Project documents</td>
<td>2. Data analysis</td>
<td>3. Change requests</td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td>• Alternatives analysis</td>
<td></td>
</tr>
<tr>
<td>• Quality control measurements</td>
<td>• Document analysis</td>
<td>4. Project management plan updates</td>
</tr>
<tr>
<td>• Quality metrics</td>
<td>• Process analysis</td>
<td>• Quality management plan</td>
</tr>
<tr>
<td>• Risk report</td>
<td>• Root cause analysis</td>
<td>• Scope baseline</td>
</tr>
<tr>
<td>3. Organizational process assets</td>
<td>3. Decision making</td>
<td>• Schedule baseline</td>
</tr>
<tr>
<td></td>
<td>• Multicriteria decision analysis</td>
<td>• Cost baseline</td>
</tr>
<tr>
<td></td>
<td>4. Data representation</td>
<td>5. Project documents updates</td>
</tr>
<tr>
<td></td>
<td>• Affinity diagrams</td>
<td>• Issue log</td>
</tr>
<tr>
<td></td>
<td>• Cause-and-effect diagrams</td>
<td>• Lessons learned register</td>
</tr>
<tr>
<td></td>
<td>• Flowcharts</td>
<td>• Risk register</td>
</tr>
<tr>
<td></td>
<td>• Histograms</td>
<td></td>
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<tr>
<td></td>
<td>• Matrix diagrams</td>
<td></td>
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<tr>
<td></td>
<td>• Scatter diagrams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Audits</td>
<td></td>
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<td></td>
<td>6. Design for X</td>
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<tr>
<td></td>
<td>7. Problem solving</td>
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<tr>
<td></td>
<td>8. Quality improvement methods</td>
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</tr>
</tbody>
</table>
## Acquire Resources

### Objectives
Confirming resource availability and getting-in the needed resources necessary to complete the project assignments.

### Inputs
1. Project management plan
   - Resource management plan
   - Procurement management plan
   - Cost baseline
2. Project documents
   - Project schedule
   - Resource calendars
   - Resource requirements
   - Stakeholder register
3. Enterprise environmental factors
4. Organizational process assets

### Tools & Techniques
1. Decision making
   - Multicriteria decision analysis
2. Interpersonal and team skills
   - Negotiation
3. Pre-assignments
4. Virtual teams

### Outputs
1. Physical resource assignments
2. Project team assignments
3. Resource calendars
4. Change requests
5. Project management plan updates
   - Resource management plan
   - Cost baseline
6. Project documents updates
   - Lessons learned register
   - Project schedule
   - Resource breakdown structure
   - Resource requirements
   - Risk register
   - Stakeholder register
7. Enterprise environmental factors updates
8. Organizational process assets updates
## Develop Team

### Objectives
Improving the competencies, team interaction, and the overall team environment to enhance project performance.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Colocation</td>
<td>1. Team performance assessments</td>
</tr>
<tr>
<td>• Resource management plan</td>
<td>2. Virtual teams</td>
<td>2. Change requests</td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td>4. Interpersonal and team skills</td>
<td>• Resource management plan</td>
</tr>
<tr>
<td>• Project schedule</td>
<td>• Cost management</td>
<td></td>
</tr>
<tr>
<td>• Project team assignments</td>
<td>• Influencing</td>
<td></td>
</tr>
<tr>
<td>• Resource calendars</td>
<td>• Motivation</td>
<td></td>
</tr>
<tr>
<td>• Team charter</td>
<td>• Negotiation</td>
<td></td>
</tr>
<tr>
<td>3. Enterprise environmental factors</td>
<td>• Team building</td>
<td></td>
</tr>
<tr>
<td>4. Organizational process assets</td>
<td>5. Recognition and rewards</td>
<td>5. Enterprise environmental factors updates</td>
</tr>
<tr>
<td></td>
<td>6. Training</td>
<td>6. Organizational process assets updates</td>
</tr>
<tr>
<td></td>
<td>7. Individual and team assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Meetings</td>
<td></td>
</tr>
</tbody>
</table>
## Manage Team

### Objectives
Tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance.

### Inputs
1. Project management plan  
   • Resource management plan  
2. Project documents  
   • Issue log  
   • Lessons learned register  
   • Project team assignments  
   • Team charter  
3. Work performance reports  
4. Team performance assessments  
5. Enterprise environmental factors  
6. Organizational process assets

### Tools & Techniques
1. Interpersonal and team skill  
   • Conflict management  
   • Decision making  
   • Emotional intelligence  
   • Influencing  
   • Leadership  
2. Project management information system

### Outputs
1. Change requests  
2. Project management plan updates  
   • Resource management plan  
   • Schedule baseline  
   • Cost baseline  
3. Project documents updates  
   • Issue log  
   • Lessons learned register  
   • Project team assignments  
4. Enterprise environmental factors updates
# Manage Communications

## Objectives
Making relevant information available to project stakeholders as planned.

## Inputs

1. Project management plan
   - Resource management plan
   - Communications management plan
   - Stakeholder engagement plan
2. Project documents
   - Change log
   - Issue log
   - Lessons learned register
   - Quality report
   - Stakeholder register
3. Work Performance reports
4. Enterprise environmental factors
5. Organizational process assets

## Tools & Techniques

1. Communication technology
2. Communication methods
3. Communication skills
   - Communication competence
   - Feedback
   - Nonverbal
   - Presentations
4. Project management information system
5. Project reporting
6. Interpersonal and team skills
   - Active listening
   - Conflict management
   - Cultural awareness
   - Meeting management
   - Networking
   - Political awareness
7. Meetings

## Outputs

1. Project communications
2. Project management plan updates
   - Communications management plan
   - Stakeholder engagement plan
3. Project documents updates
   - Issue log
   - Lessons learned register
   - Project schedule
   - Risk register
   - Stakeholder register
4. Organizational process assets updates
## Implement Risk Responses

### Objectives
Implement the agreed-upon risk response plans

### Inputs
1. Project management plan
   - Risk management plan
2. Project documents
   - Lessons learned register
   - Risk register
   - Risk report
3. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Interpersonal and team skills
   - Influencing
3. Project management information system

### Outputs
1. Change requests
2. Project documents updates
   - Issue log
   - Lessons learned register
   - Project team assignments
   - Risk register
   - Risk report
## Conduct Procurements

### Objectives

Obtaining seller responses, selecting a seller, and awarding a contract.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Expert judgment</td>
<td>1. Selected sellers</td>
</tr>
<tr>
<td>• Scope management plan</td>
<td>2. Advertising</td>
<td>2. Agreements</td>
</tr>
<tr>
<td>• Requirements management plan</td>
<td>3. Bidder conferences</td>
<td>3. Change requests</td>
</tr>
<tr>
<td>• Communications management plan</td>
<td>4. Data analysis</td>
<td>4. Project management plan updates</td>
</tr>
<tr>
<td>• Risk management plan</td>
<td>• Proposal evaluations</td>
<td>• Requirements management plan</td>
</tr>
<tr>
<td>• Procurement management plan</td>
<td>5. Interpersonal and team skills</td>
<td></td>
</tr>
<tr>
<td>• Configuration management plan</td>
<td>• Negotiation</td>
<td>• Quality management plan</td>
</tr>
<tr>
<td>• Cost baseline</td>
<td></td>
<td>• Communications management plan</td>
</tr>
<tr>
<td>2. Project documents</td>
<td></td>
<td>• Risk management plan</td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td></td>
<td>• Procurement management plan</td>
</tr>
<tr>
<td>• Project schedule</td>
<td></td>
<td>• Scope baseline</td>
</tr>
<tr>
<td>• Requirements documentation</td>
<td></td>
<td>• Schedule baseline</td>
</tr>
<tr>
<td>• Risk register</td>
<td></td>
<td>• Cost baseline</td>
</tr>
<tr>
<td>• Stakeholder register</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Procurement documents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Seller proposals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Enterprise environmental factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Organizational process assets</td>
<td></td>
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</tr>
</tbody>
</table>

### Tools & Techniques

1. Expert judgment
2. Advertising
3. Bidder conferences
4. Data analysis
   • Proposal evaluations
5. Interpersonal and team skills
   • Negotiation
# Manage Stakeholder Engagement

## Objectives
Communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project lifecycle.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project management plan  
   - Communications management plan  
   - Risk management plan  
   - Stakeholder engagement plan  
   - Change management plan  
2. Project documents  
   - Change log  
   - Issue log  
   - Lessons learned register  
   - Stakeholder register  
3. Enterprise environmental factors  
4. Organizational process assets | 1. Expert judgment  
2. Communication skills  
   - Feedback  
3. Interpersonal and team skills  
   - Conflict management  
   - Cultural awareness  
   - Negotiation  
   - Observation/conversation  
   - Political awareness  
4. Ground rules  
5. Meetings | 1. Change requests  
2. Project management plan updates  
   - Communications management plan  
   - Stakeholder engagement plan  
3. Project documents updates  
   - Change log  
   - Issue log  
   - Lessons learned register  
   - Stakeholder register |
Monitor and Control Project Work

Objectives
Tracking, reviewing, and reporting the overall progress to meet the performance objectives defined in the project management plan.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Any component</td>
<td>2. Data analysis</td>
<td>2. Change requests</td>
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<tr>
<td>2. Project documents</td>
<td></td>
<td>3. Project management plan updates</td>
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<tr>
<td>• Assumption log</td>
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<td>• Any component</td>
</tr>
<tr>
<td>• Basis of estimates</td>
<td></td>
<td>4. Project documents updates</td>
</tr>
<tr>
<td>• Cost forecasts</td>
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<td>• Cost forecasts</td>
</tr>
<tr>
<td>• Issue log</td>
<td></td>
<td>• Issue log</td>
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<tr>
<td>• Lessons learned register</td>
<td></td>
<td>• Lessons learned register</td>
</tr>
<tr>
<td>• Milestone list</td>
<td></td>
<td>• Risk register</td>
</tr>
<tr>
<td>• Quality reports</td>
<td></td>
<td>• Schedule forecast</td>
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<tr>
<td>• Risk register</td>
<td></td>
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<tr>
<td>• Schedule forecast</td>
<td></td>
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<tr>
<td>3. Work performance information</td>
<td></td>
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<tr>
<td>4. Agreements</td>
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<td>5. Enterprise environmental factors</td>
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<td>6. Organizational process assets</td>
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<tr>
<td>1. Expert judgment</td>
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<td>2. Data analysis</td>
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<tr>
<td>• Alternatives analysis</td>
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<tr>
<td>• Cost-benefit analysis</td>
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<tr>
<td>• Earned value analysis</td>
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<tr>
<td>• Root cause analysis</td>
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<td>• Trend analysis</td>
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<td>• Variance analysis</td>
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<td>3. Decision making</td>
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<tr>
<td>4. Meetings</td>
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</tbody>
</table>

Tracking, reviewing, and reporting the overall progress to meet the performance objectives defined in the project management plan.
## Perform Integrated Change Control

### Objectives
Reviewing all change requests, approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Expert judgment</td>
<td>1. Approved change requests</td>
</tr>
<tr>
<td>• Change management plan</td>
<td>2. Change control tools</td>
<td>2. Project management plan updates</td>
</tr>
<tr>
<td>• Configuration management plan</td>
<td>3. Data analysis</td>
<td>• Any component</td>
</tr>
<tr>
<td>• Scope baseline</td>
<td>• Alternatives analysis</td>
<td>3. Project documents updates</td>
</tr>
<tr>
<td>• Schedule baseline</td>
<td>• Cost-benefit analysis</td>
<td>• Change log</td>
</tr>
<tr>
<td>• Cost baseline</td>
<td>4. Decision making</td>
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<tr>
<td>2. Project documents</td>
<td>• Voting</td>
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</tr>
<tr>
<td>• Basis of estimates</td>
<td>• Autocratic decision making</td>
<td></td>
</tr>
<tr>
<td>• Requirements traceability matrix</td>
<td>5. Meetings</td>
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<tr>
<td>• Risk report</td>
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<tr>
<td>3. Work performance reports</td>
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<tr>
<td>4. Change requests</td>
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<tr>
<td>5. Enterprise environmental factors</td>
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<tr>
<td>6. Organizational process assets</td>
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</tbody>
</table>
## Validate Scope

### Objectives
Formalizing acceptance of the completed project deliverables.

### Inputs
1. Project management plan
   - Scope management plan
   - Requirements management plan
   - Scope baseline
2. Project documents
   - Lessons learned register
   - Quality reports
   - Requirements documentation
   - Requirements traceability matrix
3. Verified deliverables
4. Work performance data

### Tools & Techniques
1. Inspection
2. Decision making
   - Voting

### Outputs
1. Accepted deliverables
2. Work performance information
3. Change requests
4. Project documents updates
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
## Control Scope

### Objectives
Monitoring the status of the project and product scope and managing changes to the scope baseline.

### Inputs
1. Project management plan
   - Scope management plan
   - Requirements management plan
   - Change management plan
   - Configuration management plan
   - Scope baseline
   - Performance measurement baseline
2. Project documents
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
3. Work performance data
4. Organizational process assets

### Tools & Techniques
1. Data analysis
   - Variance analysis
   - Trend analysis

### Outputs
1. Work performance information
2. Change requests
3. Project management plan updates
   - Scope management plan
   - Scope baseline
   - Schedule baseline
   - Cost baseline
   - Performance measurement baseline
4. Project documents updates
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
# Control Schedule

## Objectives
Monitoring the status of the project to update project progress and managing changes to the schedule baseline.

## Inputs
1. Project management plan
   - Schedule management plan
   - Schedule baseline
   - Scope baseline
   - Performance measurement baseline
2. Project documents
   - Lessons learned register
   - Project calendars
   - Project schedule
   - Resource calendars
   - Schedule data
3. Work performance data
4. Organizational process assets

## Tools & Techniques
1. Data analysis
   - Earned value analysis
   - Iteration burndown chart
   - Performance reviews
   - Trend analysis
   - Variance analysis
   - What-if scenario analysis
2. Critical path method
3. Project management information system
4. Resource optimization
5. Leads and lags
6. Schedule compression

## Outputs
1. Work performance information
2. Schedule forecasts
3. Change requests
4. Project management plan updates
   - Schedule management plan
   - Schedule baseline
   - Cost baseline
   - Performance measurement baseline
5. Project documents updates
   - Assumption log
   - Basis of estimates
   - Lessons learned register
   - Project schedule
   - Resource calendars
   - Risk register
   - Schedule data
# Control Costs

## Objectives
Monitoring the status of the project to update the project budget and managing changes to the cost baseline.

## Inputs
1. Project management plan
   - Cost management plan
   - Cost baseline
   - Performance measurement baseline
2. Project documents
3. Project funding requirements
4. Work performance data
5. Organizational process assets

## Tools & Techniques
1. Expert judgment
2. Data analysis
   - Earned value analysis
   - Variance analysis
   - Trend analysis
   - Reserve analysis
3. To-complete performance index (TCPI)
4. Project management information system

## Outputs
1. Work performance information
2. Cost forecasts
3. Change requests
4. Project management plan updates
   - Cost management plan
   - Cost baseline
   - Performance measurement baseline
5. Project documents updates
   - Assumption log
   - Basis of estimates
   - Cost estimates
   - Lessons learned register
   - Risk register
## Control Quality

### Objectives
Monitoring and recording results of executing the quality activities to assess performance and recommended necessary changes.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project management plan  
   - Quality management plan  
 2. Project documents  
   - Lessons learned register  
   - Quality metrics  
   - Test and evaluation documents  
 3. Approved change requests  
 4. Deliverables  
 5. Work performance data  
 6. Enterprise environmental factors  
 7. Organizational process assets | 1. Data gathering  
   - Checklists  
   - Check sheets  
   - Statistical sampling  
   - Questionnaires and surveys  
 2. Data analysis  
   - Performance reviews  
   - Root cause analysis  
 3. Inspection  
 4. Testing/product evaluations  
 5. Data representation  
   - Cause-and-effect diagrams  
   - Control charts  
   - Histogram  
   - Scatter diagrams  
 6. Meetings | 1. Quality control measurements  
 2. Validated deliverables  
 3. Work performance information  
 4. Change requests  
 5. Project management plan updates  
   - Quality management plan  
 6. Project documents updates  
   - Issue log  
   - Lessons learned register  
   - Risk register  
   - Test and evaluation documents |
## Control Resources

### Objectives

Ensuring that the physical resources assigned and allocated to the project are available as planned, and take corrective actions as necessary.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project management plan</td>
<td>1. Data analysis</td>
<td>1. Work performance information</td>
</tr>
<tr>
<td>• Resource management plan</td>
<td>• Alternatives analysis</td>
<td>2. Change requests</td>
</tr>
<tr>
<td>2. Project documents</td>
<td>• Cost-benefit analysis</td>
<td>3. Project management plan updates</td>
</tr>
<tr>
<td>• Issue log</td>
<td>• Performance reviews</td>
<td>• Resource management plan</td>
</tr>
<tr>
<td>• Lessons learned register</td>
<td>• Trend analysis</td>
<td>• Schedule baseline</td>
</tr>
<tr>
<td>• Physical resource assignments</td>
<td></td>
<td>• Cost baseline</td>
</tr>
<tr>
<td>• Project schedule</td>
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<tr>
<td>• Resource breakdown structure</td>
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<tr>
<td>• Resource requirements</td>
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<tr>
<td>• Risk register</td>
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<tr>
<td>4. Agreements</td>
<td>3. Interpersonal and team skills</td>
<td>• Assumption log</td>
</tr>
<tr>
<td>5. Organizational process assets</td>
<td></td>
<td>• Issue log</td>
</tr>
<tr>
<td></td>
<td>• Negotiation</td>
<td>• Lessons learned register</td>
</tr>
<tr>
<td></td>
<td>• Influencing</td>
<td>• Physical resource assignments</td>
</tr>
<tr>
<td></td>
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<td>• Resource breakdown structure</td>
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<td></td>
<td></td>
<td>• Risk register</td>
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<tr>
<td></td>
<td>4. Project management information system</td>
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</tbody>
</table>
# Monitor Communications

## Objectives
Collecting and distributing performance information, including status reports, progress measurements, and forecasts.

## Inputs
1. Project management plan
   - Resource management plan
   - Communications management plan
   - Stakeholder engagement plan
2. Project documents
   - Issue log
   - Lessons learned register
   - Project communications
3. Work performance data
4. Enterprise environmental factors
5. Organizational process assets

## Tools & Techniques
1. Expert judgment
2. Project management information system
3. Data representation
   - Stakeholder engagement assessment matrix
4. Interpersonal and team skills
   - Observation/conversation
5. Meetings

## Outputs
1. Work performance information
2. Change requests
3. Project management plan updates
   - Communications management plan
   - Stakeholder engagement plan
4. Project documents updates
   - Issue log
   - Lessons learned register
   - Stakeholder register
Monitor Risks

**Objectives**

Implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| 1. Project management plan  
  • Risk management plan  
  2. Project documents  
  • Issue log  
  • Lessons learned register  
  • Risk register  
  • Risk report  
  3. Work performance data  
  4. Work Performance reports | 1. Data analysis  
  • Technical performance analysis  
  • Reserve analysis  
  2. Audits  
  3. Meetings | 1. Work performance information  
  2. Change requests  
  3. Project management plan updates  
  • Any component  
  4. Project documents updates  
  • Assumption log  
  • Issue log  
  • Lessons learned register  
  • Risk register  
  • Risk report  
  5. Organizational process assets updates |
# Control Procurements

## Objectives
Managing procurement relationships, monitoring contract performance, and making changes and corrections as needed.

## Inputs
1. Project management plan
   - Requirements management plan
   - Risk management plan
   - Procurement management plan
   - Schedule baseline
2. Procurement documents
   - Assumption log
   - Lessons learned register
   - Milestone list
   - Quality reports
   - Requirements documentation
   - Requirements traceability matrix
   - Risk register
   - Stakeholder register
3. Agreements
4. Procurement documentation
5. Approved change requests
6. Work performance data
7. Enterprise environmental factors
8. Organizational process assets

## Tools & Techniques
1. Expert judgment
2. Claims administration
3. Data analysis
   - Performance reviews
   - Earned value analysis
   - Trend analysis
4. Inspection
5. Audits

## Outputs
1. Closed procurements
2. Work performance information
3. Procurement documentation updates
4. Change requests
5. Project management plan updates
   - Risk management plan
   - Procurement management plan
   - Schedule baseline
   - Cost baseline
6. Project documents updates
   - Lessons learned register
   - Resource requirements
   - Requirements traceability matrix
   - Risk register
   - Stakeholder register
7. Organizational process assets updates
# Monitor Stakeholder Engagement

## Objectives

Monitoring overall project stakeholder relationships and adjusting and plans for engaging stakeholders.

## Inputs

1. Project management plan  
   - Resource management plan  
   - Communications management plan  
   - Stakeholder engagement plan
2. Project documents  
   - Issue log  
   - Lessons learned register  
   - Project communications  
   - Risk register  
   - Stakeholder register
3. Work performance data
4. Enterprise environmental factors
5. Organizational process assets

## Tools & Techniques

1. Data analysis  
   - Alternatives analysis  
   - Root cause analysis  
   - Stakeholder analysis
2. Decision making  
   - Multicriteria decision analysis  
   - Voting
3. Data representation  
   - Stakeholder engagement assessment matrix
4. Communication skills  
   - Feedback  
   - Presentations
5. Interpersonal and team skills  
   - Active listening  
   - Cultural awareness  
   - Leadership  
   - Networking  
   - Political awareness
6. Meetings

## Outputs

1. Work performance information
2. Change requests
3. Project management plan updates  
   - Resource management plan  
   - Communications management plan  
   - Stakeholder engagement plan
4. Project documents updates  
   - Issue log  
   - Lessons learned register  
   - Risk register  
   - Stakeholder register
## Close Project or Phase

### Objectives
Finalizing all activities across all of the project management process groups to formally complete the project or phase.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project charter</td>
<td>1. Expert judgment</td>
<td>1. Project documents updates</td>
</tr>
<tr>
<td>2. Project management plan</td>
<td>2. Data analysis</td>
<td>• Lessons learned register</td>
</tr>
<tr>
<td>• All components</td>
<td>• Document analysis</td>
<td>2. Final product, service, or result transition</td>
</tr>
<tr>
<td>3. Project documents</td>
<td>• Regression analysis</td>
<td>3. Final report</td>
</tr>
<tr>
<td>• Assumption log</td>
<td>• Trend analysis</td>
<td>4. Organizational process assets updates</td>
</tr>
<tr>
<td>• Basis of estimates</td>
<td>• Variance analysis</td>
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<tr>
<td>• Change log</td>
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<td>• Issue log</td>
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<tr>
<td>• Lessons learned register</td>
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<td>• Milestone list</td>
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<tr>
<td>• Project communications</td>
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<tr>
<td>• Quality control measurements</td>
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<tr>
<td>• Quality reports</td>
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<tr>
<td>• Requirements documentation</td>
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<tr>
<td>• Risk register</td>
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<td>• Risk report</td>
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<tr>
<td>4. Accepted deliverables</td>
<td>3. Meetings</td>
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<td>5. Business documents</td>
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<tr>
<td>• Business case</td>
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<td>• Benefits management plan</td>
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<td>6. Agreements</td>
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<td>7. Procurement documentation</td>
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<td>8. Organizational process assets</td>
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</tbody>
</table>
Please visit my website www.fayezjolani.com for more summary sheets and tools to help you pass your PMP exam from the fist round.

Good Luck.