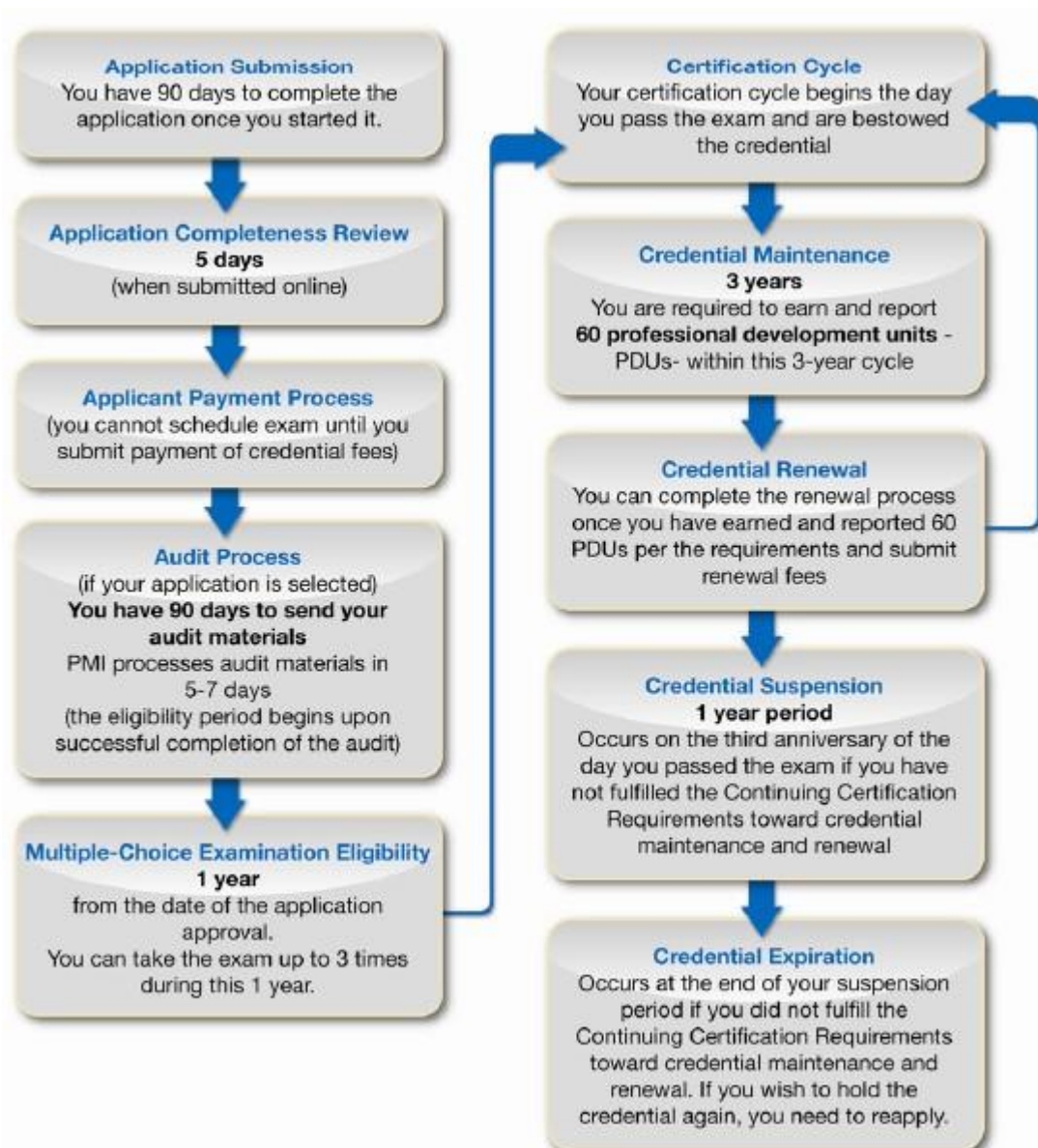


TARGET PMP® CERTIFICATION



**SIXTH EDITION
2020**

Trainer: NARCISS POPESCU, PMP



Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

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1

DEVELOP PROJECT CHARTER



INPUTS

- » Business documents
 - Business case
 - Benefits management plan
- » Agreements
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Brainstorming
 - Focus groups
 - Interviews
- ✓ Interpersonal and team skills
 - Conflict management
 - Facilitation
 - Meeting management
- ✓ Meetings

OUTPUTS

- Project charter »
- Assumption log »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 4-2, Page 75.

2

DEVELOP PROJECT MANAGEMENT PLAN



INPUTS

- » Project charter
- » Outputs from other processes
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgement
- ✓ Data gathering
 - Brainstorming
 - Checklists
 - Focus groups
 - Interviews
- ✓ Interpersonal and team skills
 - Conflict management
 - Facilitation
 - Meeting management
- ✓ Meetings

OUTPUTS

- Project Management Plan »

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3

DIRECT AND MANAGE PROJECT WORK



INPUTS

- » Project management plan
 - Any component
- » Project documents
 - Change log
 - Lessons learned register
 - Milestone list
 - Project communications
 - Project schedule
 - Requirements traceability matrix
 - Risk register
 - Risk report
- » Approved change requests
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgement
- ✓ Project management information system
- ✓ Meetings

OUTPUTS

- Deliverables »
- Work performance data »
- Issue log »
- Change requests »
- Project management plan updates »
 - Any component
- Project documents updates »
 - Activity list
 - Assumption log
 - Lessons learned register
 - Requirements documentation
 - Risk register
 - Stakeholder register
- Organizational Process Assets updates »

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4

MANAGE PROJECT KNOWLEDGE



INPUTS

- » Project management plan
 - All components
- » Project documents
 - Lessons learned register
 - Project team assignments
 - Resource breakdown structure
 - Source selection criteria
 - Stakeholder register
- » Deliverables
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgement
- ✓ Knowledge management
- ✓ Information management
- ✓ Interpersonal and team skills
 - Active listening
 - Facilitation
 - Leadership
 - Networking
 - Political awareness

OUTPUTS

- Lesson learned register »
- Project management plan updates »
 - Any component
- Organizational Process Assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 4-8, Page 98

5

MONITOR AND CONTROL PROJECT WORK



INPUTS

- » Project management plan
 - Any component
- » Project documents
 - Assumption log
 - Basis of estimates
 - Cost forecasts
 - Issue log
 - Lessons learned register
 - Milestone list
 - Quality reports
 - Risk register
 - Risk report
 - Schedule forecasts
- » Agreements
- » Work performance information
- » Enterprise Environmental Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
 - Earned value analysis
 - Root cause analysis
 - Trend analysis
 - Variance analysis
- ✓ Decision making
- ✓ Meetings

OUTPUTS

- Work performance reports »
- Change requests »
- Project management plan updates »
 - Any component
- Project documents updates »
 - Cost forecasts
 - Issue log
 - Lessons learned register
 - Risk register
 - Schedule forecasts

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6

PERFORM INTEGRATED CHANGE CONTROL



INPUTS

- » Project management plan
 - Change management plan
 - Configuration management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- » Project documents
 - Basis of estimates
 - Requirements traceability matrix
 - Risk report
- » Work performance Reports
- » Change requests
- » Enterprise Environmental Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Change control tools
- ✓ Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
- ✓ Decision making
 - Voting
 - Autocratic decision making
 - Multicriteria decision analysis
- ✓ Meetings

OUTPUTS

- Approved change requests »
- Project management plan updates »
- Project documents updates »
 - Any component
 - Change log

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7

CLOSE PROJECT OR PHASE



INPUTS

- » Project charter
- » Project management plan
 - All components
- » Project documents
 - Assumption log
 - Basis of estimates
 - Change log
 - Issue log
 - Lessons learned register
 - Milestone list
 - Project communications
 - Quality control measurements
 - Quality reports
 - Requirements documentation
 - Risk register
 - Risk report
- » Accepted deliverables
- » Business documents
 - Business case
 - Benefits management plan
- » Agreements
- » Procurement documentation
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Document analysis
 - Regression analysis
 - Trend analysis
 - Variance analysis
- ✓ Meetings

OUTPUTS

- Project documents updates »
 - Lessons learned register
- Final product, service, or result transition »
- Final report »
- Organizational Process Assets updates »

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I Project Integration Management



- Project Statement of Work (SOW)
- Business Case
- Business Need vs Customer Business Need
- Agreements
- EEF
- OPA
- Facilitation techniques
- Delphi technique
- Expert Judgment
- Project Charter content
- Project Charter goals
- Project Management Plan content
- Project management plan vs Project Documents
- Baseline
- Project Management Plan Map
- PMIS
- Work Authorization System
- Deliverables
- Work Performance Data
- Work Performance Information
- Work Performance Reports
- Forecast
- Analytical Techniques
- FMEA
- FTA
- Change Control Board (CCB)
- Change Control vs Configuration Control
- Change Control System vs Configuration Management System
- Final product, service, or result transition
- Deliverables Workflow
- Change Requests Workflow

8

PLAN SCOPE MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Quality management plan
 - Project life cycle description
 - Development approach
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Alternatives analysis
- ✓ Meetings

OUTPUTS

- Scope management plan »
- Requirements management plan »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 5-2, Page 134.

9

COLLECT REQUIREMENTS



INPUTS

- » Project charter
- » Project management plan
 - Scope management plan
 - Requirements management plan
 - Stakeholder engagement plan
- » Project documents
 - Assumption log
 - Lessons learned register
 - Stakeholder register
- » Business documents
 - Business case
- » Agreements
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Brainstorming
 - Interviews
 - Focus groups
 - Questionnaires and surveys
 - Benchmarking
- ✓ Data analysis
 - Document analysis
- ✓ Decision making
 - Voting
 - Multicriteria decision analysis
- ✓ Data representation
 - Affinity diagrams
 - Mind mapping
- ✓ Interpersonal and team skills
 - Nominal group technique
 - Observation/conversation
 - Facilitation
- ✓ Context diagrams
- ✓ Prototypes

OUTPUTS

- Requirements documentation »
- Requirements traceability matrix »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 5-4, Page 138.

10

DEFINE SCOPE



INPUTS

- » Project charter
- » Project management plan
 - Scope management plan
- » Project documents
 - Assumption log
 - Requirements documentation
 - Risk register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Alternatives analysis
- ✓ Decision making
 - Multicriteria decision analysis
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Product analysis

OUTPUTS

- Project scope statement »
- Project documents updates »
 - Assumption log
 - Requirements documentation
 - Requirements traceability matrix
 - Stakeholder register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 5-8, Page 150.

11

CREATE WBS



INPUTS

- » Project management plan
 - Scope management plan
- » Project documents
 - Project scope statement
 - Requirements documentation
- » Enterprise Environmental Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Decomposition

OUTPUTS

- Scope baseline »
- Project documents updates »
 - Assumption log
 - Requirements documentation

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 5-10, Page 156.

12

VALIDATE SCOPE



INPUTS

- » Project management plan
 - Scope management plan
 - Requirements management plan
 - Scope baseline
- » Project documents
 - Lessons learned register
 - Quality reports
 - Requirements documentation
 - Requirements traceability matrix
- » Verified deliverables
- » Work performance data

TOOLS & TECHNIQUES

- ✓ Inspection
- ✓ Decision making
 - Voting

OUTPUTS

- Accepted deliverables »
- Work performance information »
- Change requests »
- Project documents updates »
 - Lessons learned register
 - Requirements documentation
 - Requirements traceability matrix

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13

CONTROL SCOPE



INPUTS

- » Project management plan
 - Scope management plan
 - Requirements management plan
 - Change management plan
 - Configuration management plan
 - Scope baseline
 - Performance measurement baseline
- » Project documents
 - Lessons learned register
 - Requirements documentation
 - Requirements traceability matrix
- » Work performance data
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Variance analysis
 - Trend analysis

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan Updates »
 - Scope management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
 - Performance measurement baseline
- Project documents updates »
 - Lessons learned register
 - Requirements documentation
 - Requirements traceability matrix

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S Project Scope Management



- Project Scope vs Product Scope
- Gold Plating
- Scope Management Plan content
- Scope Creep
- Requirements Management Plan content
- Requirements classification
- Requirements Documentation
- Requirements Traceability Matrix
- facilitated Workshops
- JAD
- QFD
- VOC
- User Stories
- Decision-Making Techniques
- Prototypes
- Benchmarking
- Context Diagrams
- Product Analysis
- Alternatives generation
- Project Scope Statement content
- WBS
- WBS dictionary content
- Control account
- Planning Component
- Work Package
- Decomposition approaches
- Scope baseline
- 100% rule
- Rolling wave planning
- Validate Scope vs Control Scope
- Deliverables workflow

14

PLAN SCHEDULE MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Scope management plan
 - Development approach
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
- ✓ Meetings

OUTPUTS

- Schedule management plan»

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15

DEFINE ACTIVITIES



INPUTS

- » Project management plan
 - Schedule management plan
 - Scope baseline
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Decomposition
- ✓ Rolling wave planning
- ✓ Meetings

OUTPUTS

- Activity list »
- Activity attributes »
- Milestone list »
- Change requests »
- Project management plan updates »
 - Schedule baseline
 - Cost baseline

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 6-5, Page 183.

16

SEQUENCE ACTIVITIES



INPUTS

- » Project management plan
 - Schedule management plan
 - Scope baseline
- » Project documents
 - Activity attributes
 - Activity list
 - Assumption log
 - Milestone list
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Precedence diagramming method
- ✓ Dependency determination and integration
- ✓ Leads and lags
- ✓ Project management information system

OUTPUTS

- Project schedule network diagrams »
- Project documents updates »
 - Activity attributes
 - Activity list
 - Assumption log
 - Milestone list

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17

ESTIMATE ACTIVITY DURATIONS



INPUTS

- » Project management plan
 - Schedule management plan
 - Scope baseline
- » Project documents
 - Activity attributes
 - Activity list
 - Assumption log
 - Lessons learned register
 - Milestone list
 - Project team assignments
 - Resource breakdown structure
 - Resource calendars
 - Resource requirements
 - Risk register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Analogous estimating
- ✓ Parametric estimating
- ✓ Three-point estimating
- ✓ Bottom-up estimating
- ✓ Data analysis
 - Alternatives analysis
 - Reserve analysis
- ✓ Decision making

OUTPUTS

- Duration estimates »
- Basis of estimates »
- Project documents updates »
 - Activity attributes
 - Assumption log
 - Lessons learned register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 6-12, Page 195.

18

DEVELOP SCHEDULE



INPUTS

- » Project management plan
 - Schedule management plan
 - Scope baseline
- » Project documents
 - Activity attributes
 - Activity list
 - Assumption log
 - Basis of estimates
 - Duration estimates
 - Lessons learned register
 - Milestone list
 - Project schedule network diagrams
 - Project team assignments
 - Resource calendars
 - Resource requirements
 - Risk register
- » Agreements
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Schedule network analysis
- ✓ Critical path method
- ✓ Resource optimization
- ✓ Data analysis
 - What-if scenario analysis
 - Simulation
- ✓ Leads and lags
- ✓ Schedule compression
- ✓ Project management information system
- ✓ Agile release planning

OUTPUTS

- Schedule baseline »
- Project schedule »
- Schedule data »
- Project calendars »
- Change requests »
- Project management plan updates »
 - Schedule management plan
 - Cost baseline
- Project documents updates »
 - Activity attributes
 - Assumption log
 - Duration estimates
 - Lessons learned register
 - Resource requirements
 - Risk register

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19

CONTROL SCHEDULE



INPUTS

- » Project management plan
 - Schedule management plan
 - Schedule baseline
 - Scope baseline
 - Performance measurement baseline
- » Project documents
 - Lessons learned register
 - Project calendars
 - Project schedule
 - Resource calendars
 - Schedule data
- » Work performance data
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Earned value analysis
 - Iteration burndown chart
 - Performance reviews
 - Trend analysis
 - Variance analysis
 - What-if scenario analysis
- ✓ Critical path method
- ✓ Project management information system
- ✓ Resource optimization
- ✓ Leads and lags
- ✓ Schedule compression

OUTPUTS

- Work performance information »
- Schedule forecast »
- Change requests »
- Project management plan Updates »
 - Schedule management plan
 - Schedule baseline
 - Cost baseline
 - Performance measurement baseline
- Project documents updates »
 - Assumption log
 - Basis of estimates
 - Lessons learned register
 - Project schedule
 - Resource calendars
 - Risk register
 - Schedule data

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Project Schedule Management



- Schedule Management Plan content
- Apportioned Effort (AE)
- Discrete Effort (DE)
- Level of Effort (LOE)
- Precedence Diagramming Method (PDM)
- Arrow diagramming method (ADM)
- Graphical Evaluation and Review Technique (GERT)
- Dependencies
- Lead and Lag
- Project Schedule Network Diagram
- Project calendar vs Resource calendars
- Resource calendars map
- Analogous estimating vs Parametric estimating
- Regression analysis
- Learning curve
- Triangular Distribution vs Beta Distribution
- Pert formula = $(P+4M+O)/6$
- Standard Deviation (SD) = $(P-O)/6$
- Task Variance = SD^2
- Schedule Network Analysis
- Critical Path Method (CPM)
- Total Float (Total Slack)
- Free Float (Free Slack)
- Total Float = $LS - ES$ or $LF - EF$
- Critical Chain Method (CCM)
- Feeding buffer vs Project buffer
- Parkinson's Law
- Resource Leveling vs Resource Smoothing
- What-If Scenario Analysis vs Simulation
- Monte Carlo Simulation
- Crashing vs Fast Tracking
- Schedule Baseline vs Project Schedule
- Hammock Activity

20

PLAN COST MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Schedule management plan
 - Risk management plan
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
- ✓ Meetings

OUTPUTS

- Cost management plan»

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21

ESTIMATE COSTS



INPUTS

- » Project management plan
 - Cost management plan
 - Quality management plan
 - Scope baseline
- » Project documents
 - Lessons learned register
 - Project schedule
 - Resources requirements
 - Risk register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Analogous estimating
- ✓ Parametric estimating
- ✓ Bottom-up estimating
- ✓ Three-point estimating
- ✓ Data analysis
 - Alternatives analysis
 - Reserve analysis
 - Cost of quality
- ✓ Project management information system
- ✓ Decision making
 - Voting

OUTPUTS

- Cost estimates »
- Basis of estimates »
- Project documents updates »
 - Assumption log
 - Lessons learned register
 - Risk register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 7-4, Page 240.

22

DETERMINE BUDGET



INPUTS

- » Project management plan
 - Cost management plan
 - Resource management plan
 - Scope baseline
- » Project documents
 - Basis of estimates
 - Cost estimates
 - Project schedule
 - Risk register
- » Business documents
 - Business case
 - Benefits management plan
- » Agreements
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Cost aggregation
- ✓ Data analysis
 - Reserve analysis
- ✓ Historical information review
- ✓ Funding limit reconciliation
- ✓ Financing

OUTPUTS

- Cost baseline »
- Project funding requirements »
- Project documents updates »
 - Cost estimates
 - Project schedule
 - Risk register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 7-6, Page 248.

23

CONTROL COSTS



INPUTS

- » Project management plan
 - Cost management plan
 - Cost baseline
 - Performance measurement baseline
- » Project documents
 - Lessons learned register
- » Project funding requirements
- » Work performance data
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Earned value analysis
 - Variance analysis
 - Trend analysis
 - Reserve analysis
- ✓ To-complete performance index (TCPI)
- ✓ Project management information system

OUTPUTS

- Work performance information »
- Cost forecasts »
- Change requests »
- Project management plan updates »
 - Cost management plan
 - Cost baseline
 - Performance measurement baseline
- Project documents updates »
 - Assumption log
 - Basis of estimates
 - Cost estimates
 - Lessons learned register
 - Risk register

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c Project Cost Management



- Rough Order of Magnitude
- Budget estimate
- Definitive estimate
- Type of Cost
- Sunk Costs
- Depreciation
- Present Value
- NPV
- IRR
- Discounted Cashflow
- Payback Period
- BCR
- Opportunity Cost
- ROI
- Life Cycle Costing
- Cost Management Plan Content
- Analogous vs parametric estimating
- Three point estimating
- Triangular distribution vs Beta distribution
- Contingency reserve vs Management reserve
- Cost of Quality
- Vendor Bid Analysis
- Cost aggregation
- Historical relationships
- Funding limit reconciliation
- Project funding requirements
- EVM formulas
- TCPI

24

PLAN QUALITY MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Requirements management plan
 - Risk management plan
 - Stakeholder engagement plan
 - Scope baseline
- » Project documents
 - Assumption log
 - Requirements documentation
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register
- » Enterprise Environmental Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Benchmarking
 - Brainstorming
 - Interviews
- ✓ Data analysis
 - Cost-benefit analysis
 - Cost of quality
- ✓ Decision making
 - Multicriteria decision analysis
- ✓ Data representation
 - Flowcharts
 - Logical data model
 - Matrix diagrams
 - Mind mapping
- ✓ Test and inspection planning
- ✓ Meetings

OUTPUTS

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

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25

MANAGE QUALITY



INPUTS

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

TOOLS & TECHNIQUES

- ✓ Data gathering
 - Checklists
- ✓ Data analysis
 - Alternatives analysis
 - Document analysis
 - Process analysis
 - Root cause analysis
- ✓ Decision making
 - Multicriteria decision analysis
- ✓ Data representation
 - Affinity diagrams
 - Cause-and-effect diagrams
 - Flowcharts
 - Histograms
 - Matrix diagrams
 - Scatter diagrams
- ✓ Audits
- ✓ Design for X
- ✓ Problem solving
- ✓ Quality improvements methods

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

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 8-8, Page 288.

26

CONTROL QUALITY



INPUTS

- » 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
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Data gathering
 - Checklists
 - Check sheets
 - Statistical sampling
 - Questionnaires and surveys
- ✓ Data analysis
 - Performance reviews
 - Root cause analysis
- ✓ Inspection
- ✓ Testing/product evaluations
- ✓ Data representation
 - Cause-and-effect diagrams
 - Control charts
 - Histogram
 - Scatter diagrams
- ✓ Meetings

OUTPUTS

- 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

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 8-10, Page 298.

Project Quality Management



- Quality vs Grade
- Precision vs Accuracy
- Kaizen
- JIT
- PDCA
- Juran
- Crosby
- Deming
- TQM
- Six Sigma
- Lean Six Sigma
- Kanban
- Malcolm Baldrige
- OPM3®
- CMMI®
- ISO 9000 series

- Cost of Quality
- Marginal Analysis
- Gold plating
- Benchmarking
- Design of Experiments
- Control Chart
- Statistical sampling
- Quality management plan content
- Scatter diagram
- Quality audit
- Attribute sampling vs Variable sampling
- Change requests workflow
- Deliverable workflow

27

PLAN RESOURCE MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Quality management plan
 - Scope baseline
- » Project documents
 - Project schedule
 - Requirements documentation
 - Risk register
 - Stakeholder register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data representation
 - Hierarchical charts
 - Responsibility assignment matrix
 - Text-oriented formats
- ✓ Organizational theory
- ✓ Meetings

OUTPUTS

- Resource management plan »
- Team charter »
- Project documents »
 - Assumption log
 - Risk register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-2, Page 312.

28

ESTIMATE ACTIVITY RESOURCES



INPUTS

- » Project management plan
 - Resource management plan
 - Scope baseline
- » Project documents
 - Activity attributes
 - Activity list
 - Assumption log
 - Cost estimates
 - Resource calendars
 - Risk register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Bottom-up estimating
- ✓ Analogous estimating
- ✓ Parametric estimating
- ✓ Data analysis
 - Alternatives analysis
- ✓ Project management information system
- ✓ Meetings

OUTPUTS

- Resource requirements »
- Basis of estimates »
- Resource breakdown structure »
- Project documents updates »
 - Activity attributes
 - Assumption log
 - Lessons learned register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-5, Page 321.

29

ACQUIRE RESOURCES



INPUTS

- » Project management plan
 - Resource management plan
 - Procurement management plan
 - Cost baseline
- » Project documents
 - Project schedule
 - Resource calendars
 - Resource requirements
 - Stakeholder register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Decision making
 - Multicriteria decision analysis
- ✓ Interpersonal and team skills
 - Negotiation
- ✓ Pre-assignment
- ✓ Virtual teams

OUTPUTS

- Physical resource assignments »
- Project team assignments »
- Resource calendars »
- Change requests
- Project management plan updates »
 - Resource management plan
 - Cost baseline
- Project documents updates »
 - Lessons learned register
 - Project schedule
 - Resource breakdown structure
 - Resource requirements
 - Risk register
 - Stakeholder register
- Enterprise environmental factors updates »
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-8, Page 328.

30

DEVELOP TEAM



INPUTS

- » Project management plan
 - Resource management plan
- » Project documents
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Resource calendars
 - Team charter
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Colocation
- ✓ Virtual teams
- ✓ Communication technology
- ✓ Interpersonal and team skills
 - Conflict management
 - Influencing
 - Motivation
 - Negotiation
 - Team building
- ✓ Recognition and rewards
- ✓ Training
- ✓ Individual and team assessment
- ✓ Meetings

OUTPUTS

- Team performance assessments »
- Change requests »
- Project management plan updates »
 - Resource management plan
- Project documents updates »
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Resource calendars
 - Team charter
- Enterprise environmental factors updates »
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-10, Page 336.

31

MANAGE TEAM



INPUTS

- » Project management plan
 - Resource management plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Project team assignments
 - Team charter
- » Work performance reports
- » Team performance assessments
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Interpersonal and team skills
 - Conflict management
 - Decision making
 - Emotional intelligence
 - Influencing
 - Leadership
- ✓ Project management information system

OUTPUTS

- Change requests »
- Project management plan updates »
 - Resource management plan
 - Schedule baseline
 - Cost baseline
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Project team assignments
- Enterprise environmental factors updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-12, Page 345.

32

CONTROL RESOURCES



INPUTS

- » Project management plan
 - Resource management plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Physical resource assignments
 - Project schedule
 - Resource breakdown structure
 - Resource requirements
 - Risk register
- » Work performance data
- » Agreements
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
 - Performance reviews
 - Trend analysis
- ✓ Problem solving
- ✓ Interpersonal and team skills
 - Negotiation
 - Influencing
- ✓ Project management information system

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan updates »
 - Resource management plan
 - Schedule baseline
 - Cost baseline
- Project documents updates »
 - Assumption log
 - Issue log
 - Lessons learned register
 - Physical resource assignments
 - Resource breakdown structure
 - Risk register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 9-14, Page 352.



Project Resource Management



- Bureaucracy theory - Max Weber
- Scientific management – Frederick W. Taylor
- Hawthorne Effect – Elton Mayo
- Situational leadership - Paul Hersey and Ken Blanchard
- McGregor's theory of X and Y
- Maslow hierarchy of needs
- Herzberg
- Ouchi's theory of Z
- Vroom's expectancy theory
- David McClelland's achievement theory
- Contingency theory
- Chris Argyris's adult personality theory
- Team performance assessment
- Project performance appraisals
- Perks
- Fringe benefits
- Tuckman ladder
- Tight matrix
- War room
- Hofstede's cultural dimensions theory
- Source of conflicts
- Conflict resolution methods
- Power Sources for project managers
- EEF updates
- Interpersonal skills
- Halo effect

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PLAN COMMUNICATIONS MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Resource management plan
 - Stakeholder engagement plan
- » Project documents
 - Requirements documentation
 - Stakeholder register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Communication requirements analysis
- ✓ Communication technology
- ✓ Communication models
- ✓ Communication methods
- ✓ Interpersonal and team skills
 - Communication styles assessment
 - Political awareness
 - Cultural awareness
- ✓ Data representation
 - Stakeholder engagement assessment matrix
- ✓ Meetings

OUTPUTS

- Communications management plan »
- Project management plan updates »
 - Stakeholder engagement plan
- Project documents updates »
 - Project schedule
 - Stakeholder register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 10-2, Page 366.

34

MANAGE COMMUNICATIONS



INPUTS

- » Project management plan
 - Resource management plan
 - Communications management plan
 - Stakeholder engagement plan
- » Project documents
 - Change log
 - Issue log
 - Lessons learned register
 - Quality report
 - Risk report
 - Stakeholder register
- » Work performance reports
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Communication technology
- ✓ Communication methods
- ✓ Communication skills
 - Communication competence
 - Feedback
 - Nonverbal
 - Presentations
- ✓ Project management information system
- ✓ Project reporting
- ✓ Interpersonal and team skills
 - Active listening
 - Conflict management
 - Cultural awareness
 - Meeting management
 - Networking
 - Political awareness
- ✓ Meetings

OUTPUTS

- Project communications »
- Project management plan updates »
 - Communications management plan
 - Stakeholder engagement plan
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Project schedule
 - Risk register
 - Stakeholder register
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 10-5, Page 379.

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MONITOR COMMUNICATIONS



INPUTS

- » Project management plan
 - Resource management plan
 - Communications management plan
 - Stakeholder engagement plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Project communications
- » Work performance data
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Project management information system
- ✓ Data analysis
 - Stakeholder engagement assessment matrix
- ✓ Interpersonal and team skills
 - Observation/conversation
- ✓ Meetings

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan updates »
 - Communications management plan
 - Stakeholder engagement plan
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Stakeholder register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 10-7, Page 388.

Project Communications Management



- Communication skills
- Problems that may be generated by inadequate communications planning
- Effective communication and Efficient Communication
- $N(N-1)/2$ possible communication channels
- Factors that can affect the choice of communication technology
- Communication Management Plan content
- Communication models and Communication methods
- Sender-receiver model
- Push, pull and interactive communications
- Techniques and considerations for effective communications
- Manage communications vs Monitor communications
- Issue log

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PLAN RISK MANAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - All components
- » Project documents
 - Stakeholder register
- » Enterprise Environment Factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data analysis
 - Stakeholder analysis
- ✓ Meetings

OUTPUTS

- Risk management plan »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-2, Page 401.

37

IDENTIFY RISKS



INPUTS

- » Project management plan
 - Requirements management plan
 - Schedule management plan
 - Cost management plan
 - Quality management plan
 - Resource management plan
 - Risk management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- » Project documents
 - Cost estimates
 - Duration estimates
 - Issue log
 - Lessons learned register
 - Requirements documentation
 - Resource requirements
 - Stakeholder register
- » Agreements
- » Procurement documentation
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Brainstorming
 - Checklists
 - Interviews
- ✓ Data analysis
 - Root cause analysis
 - Assumption and constraint analysis
 - SWOT analysis
 - Document analysis
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Prompt lists
- ✓ Meetings

OUTPUTS

- Risk register »
- Risk report »
- Project document updates »
 - Assumption log
 - Issue log
 - Lessons learned register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-6, Page 409.

38

PERFORM QUALITATIVE RISK ANALYSIS



INPUTS

- » Project management plan
 - Risk management plan
- » Project documents
 - Assumption log
 - Risk register
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Data analysis
 - Risk data quality assessment
 - Risk probability and impact assessment
 - Assessment of other risk parameters
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Risk categorization
- ✓ Data representation
 - Probability and impact matrix
 - Hierarchical charts
- ✓ Meetings

OUTPUTS

- Project documents updates »
 - Assumption log
 - Issue log
 - Risk register
 - Risk report

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-8, Page 419.

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PERFORM QUANTITATIVE RISK ANALYSIS



INPUTS

- » Project management plan
 - Risk management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- » Project documents
 - Assumption log
 - Basis of estimates
 - Cost estimates
 - Cost forecasts
 - Duration estimates
 - Milestone list
 - Resource requirements
 - Risk register
 - Risk report
 - Schedule forecasts
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Representation of uncertainty
- ✓ Data analysis
 - Simulations
 - Sensitivity analysis
 - Decision tree analysis
 - Influence diagrams

OUTPUTS

- Project documents updates »
 - Risk report

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-11, Page 428.

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PLAN RISK RESPONSES



INPUTS

- » Project management plan
 - Resource management plan
 - Risk management plan
 - Cost baseline
- » Project documents
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Resource calendars
 - Risk register
 - Risk report
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational Process Assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Interviews
- ✓ Interpersonal and team skills
 - Facilitation
- ✓ Strategies for threats
- ✓ Strategies for opportunities
- ✓ Contingent response strategies
- ✓ Strategies for overall project risk
- ✓ Data analysis
 - Alternatives analysis
 - Cost-benefit analysis
- ✓ Decision making
 - Multicriteria decision analysis

OUTPUTS

- Change requests »
- 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
- Project documents updates »
 - Assumption log
 - Cost forecasts
 - Lessons learned register
 - Project schedule
 - Project team assignments
 - Risk register
 - Risk report

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-16, Page 437.

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IMPLEMENT RISK RESPONSES



INPUTS

- » Project management plan
 - Risk management plan
- » Project documents
 - Lessons learned register
 - Risk register
 - Risk report
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Interpersonal and team skills
 - Influencing
- ✓ Project management information system

OUTPUTS

- Change requests »
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Project team assignments
 - Risk register
 - Risk report

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-18, Page 449.

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MONITOR RISKS



INPUTS

- » Project management plan
 - Risk management plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Risk register
 - Risk report
- » Work performance data
- » Work performance reports

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Technical performance analysis
 - Reserve analysis
- ✓ Audits
- ✓ Meetings

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan updates »
 - Any component
- Project documents updates »
 - Assumption log
 - Issue log
 - Lessons learned register
 - Risk register
 - Risk report
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 11-20, Page 453.

R Project Risk Management



- Management reserve vs Contingency reserve
- Individual Risks vs Overall Project Risk
- Risk Attitude: Risk Appetite, Risk Tolerance, Risk Threshold
- Cause, Risk, Effect
- Risk Management plan content
- Risk register content
- Risk register map
- Influence diagrams
- Risk Data Quality Assessment
- Risk urgency assessment
- Probability distribution
- Sensitivity Analysis, Tornado diagram
- Expected Monetary Value, Decision Trees
- Monte Carlo simulation
- Avoid, Transfer, Mitigate, Accept
- Exploit, Share, Enhance, Accept
- Fallback plan
- Residual Risks
- Secondary Risks
- Workarounds
- Risk reassessment
- Risk audit

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PLAN PROCUREMENT MANAGEMENT



INPUTS

- » Project charter
- » Business documents
 - Business case
 - Benefits management plan
- » Project management plan
 - Scope management plan
 - Quality management plan
 - Resource management plan
 - Scope baseline
- » Project documents
 - Milestone list
 - Project team assignments
 - Requirements documentation
 - Requirements traceability matrix
 - Resource requirements
 - Risk register
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Market research
- ✓ Data analysis
 - Make-or-buy analysis
- ✓ Source selection analysis
- ✓ Meetings

OUTPUTS

- Procurement management plan »
- Procurement strategy »
- Bid documents »
- Procurement statement of work »
- Source selection criteria »
- Make-or-buy decisions »
- Independent cost estimates »
- Change requests »
- Project documents updates »
 - Lessons learned register
 - Milestone list
 - Requirements documentation
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 12-2, Page 466.

44

CONDUCT PROCUREMENTS



INPUTS

- » Project management Plan
 - Scope management plan
 - Requirements management plan
 - Communications management plan
 - Risk management plan
 - Procurement management plan
 - Configuration management plan
 - Cost baseline
- » Project documents
 - Lessons learned register
 - Project schedule
 - Requirements documentation
 - Risk register
 - Stakeholder register
- » Procurement documentation
- » Seller proposals
- » Procurement statement of work
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Advertising
- ✓ Bidder conference
- ✓ Data analysis
 - Proposal evaluation
- ✓ Interpersonal and team skills
 - Negotiation

OUTPUTS

- Selected sellers »
- Agreements »
- Change requests »
- Project management plan updates »
 - Requirements management plan
 - Quality management plan
 - Communications management plan
 - Risk management plan
 - Procurement management plan
 - Scope baseline
 - Schedule baseline
 - Cost baseline
- Project documents updates »
 - Lessons learned register
 - Requirements documentation
 - Requirements traceability matrix
 - Resource calendars
 - Risk register
 - Stakeholder register
- Organizational process assets updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 12-4, Page 482.

45

CONTROL PROCUREMENTS



INPUTS

- » Project management plan
 - Requirements management plan
 - Risk management plan
 - Procurement management plan
 - Change management plan
 - Schedule baseline
- » Project documents
 - Assumption log
 - Lessons learned register
 - Milestone list
 - Quality reports
 - Requirements documentation
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register
- » Agreements
- » Procurement documentation
- » Approved change requests
- » Work performance data
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Claims administration
- ✓ Data analysis
 - Performance reviews
 - Earned value analysis
 - Trend analysis
- ✓ Inspection
- ✓ Audits

OUTPUTS

- Closed procurements »
- Work performance information »
- Procurement documentation updates »
- Change requests »
- Project management plan updates »
 - Risk management plan
 - Procurement management plan
 - Schedule baseline
 - Cost baseline
- Project documents updates »
 - Lessons learned register
 - Resource requirements
 - Requirements traceability matrix
 - Risk register
 - Stakeholder register
- Organizational process assets Updates »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 12-6, Page 492.

P Project Procurement Management



- CPFF
- CPIF vs CPAF
- T&M
- FFP, FPIF, FPEPA
- $PTA = ((\text{Ceiling Price} - \text{Target Price}) / \text{buyer's Share Ratio}) + \text{Target Cost}$
- Types of procurement documents
- Source selection criteria
- Bidder Conference definition
- Agreement content
- Claims Administration
- ADR
- Conduct Procurement vs Control Procurement
- Procurements audits
- Closed procurements

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IDENTIFY STAKEHOLDERS



INPUTS

- » Project charter
- » Business documents
 - Business case
 - Benefits management plan
- » Project management plan
 - Communications management plan
 - Stakeholder engagement plan
- » Project documents
 - Change log
 - Issue log
 - Requirements documentation
- » Agreements
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Questionnaires and surveys
 - Brainstorming
- ✓ Data analysis
 - Stakeholder analysis
 - Document analysis
- ✓ Data representation
 - Stakeholder mapping/representation
- ✓ Meetings

OUTPUTS

- Stakeholder register »
- Change requests »
- Project management plan updates »
 - Requirements management plan
 - Communications management plan
 - Risk management plan
 - Stakeholder engagement plan
- Project document updates »
 - Assumption log
 - Issue log
 - Risk register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 13-2, Page 507.

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PLAN STAKEHOLDER ENGAGEMENT



INPUTS

- » Project charter
- » Project management plan
 - Resource management plan
 - Communications management plan
 - Risk management plan
- » Project documents
 - Assumption log
 - Change log
 - Issue log
 - Project schedule
 - Risk register
 - Stakeholder register
- » Agreements
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Data gathering
 - Benchmarking
- ✓ Data analysis
 - Assumption and constraint analysis
 - Root cause analysis
- ✓ Decision making
 - Prioritization/ranking
- ✓ Data representation
 - Mind mapping
 - Stakeholder engagement assessment matrix
- ✓ Meetings

OUTPUTS

- Stakeholder engagement plan »

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 13-4, Page 516.

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MANAGE STAKEHOLDER ENGAGEMENT



INPUTS

- » Project management plan
 - Communications management plan
 - Risk management plan
 - Stakeholder engagement plan
 - Change management plan
- » Project documents
 - Change log
 - Issue log
 - Lessons learned register
 - Stakeholder register
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Expert judgment
- ✓ Communication skills
 - Feedback
- ✓ Interpersonal and team skills
 - Conflict management
 - Cultural awareness
 - Negotiation
 - Observation/conversation
 - Political awareness
- ✓ Ground rules
- ✓ Meetings

OUTPUTS

- Change requests »
- Project management plan updates »
 - Communications management plan
 - Stakeholder engagement plan
- Project documents updates »
 - Change log
 - Issue log
 - Lessons learned register
 - Stakeholder register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 13-7, Page 523.

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MONITOR STAKEHOLDER ENGAGEMENT



INPUTS

- » Project management plan
 - Resource management plan
 - Communications management plan
 - Stakeholder engagement plan
- » Project documents
 - Issue log
 - Lessons learned register
 - Project communications
 - Risk register
 - Stakeholder register
- » Work performance data
- » Enterprise environmental factors
- » Organizational process assets

TOOLS & TECHNIQUES

- ✓ Data analysis
 - Alternatives analysis
 - Root cause analysis
 - Stakeholder analysis
- ✓ Decision making
 - Multicriteria decision analysis
 - Voting
- ✓ Data representation
 - Stakeholder engagement assessment matrix
- ✓ Communication skills
 - Feedback
 - Presentations
- ✓ Interpersonal and team skills
 - Active listening
 - Cultural awareness
 - Leadership
 - Networking
 - Political awareness
- ✓ Meetings

OUTPUTS

- Work performance information »
- Change requests »
- Project management plan updates »
 - Resource management plan
 - Communications management plan
 - Stakeholder engagement plan
- Project documents updates »
 - Issue log
 - Lessons learned register
 - Risk register
 - Stakeholder register

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 13-9, Page 530.

Project Stakeholder Management

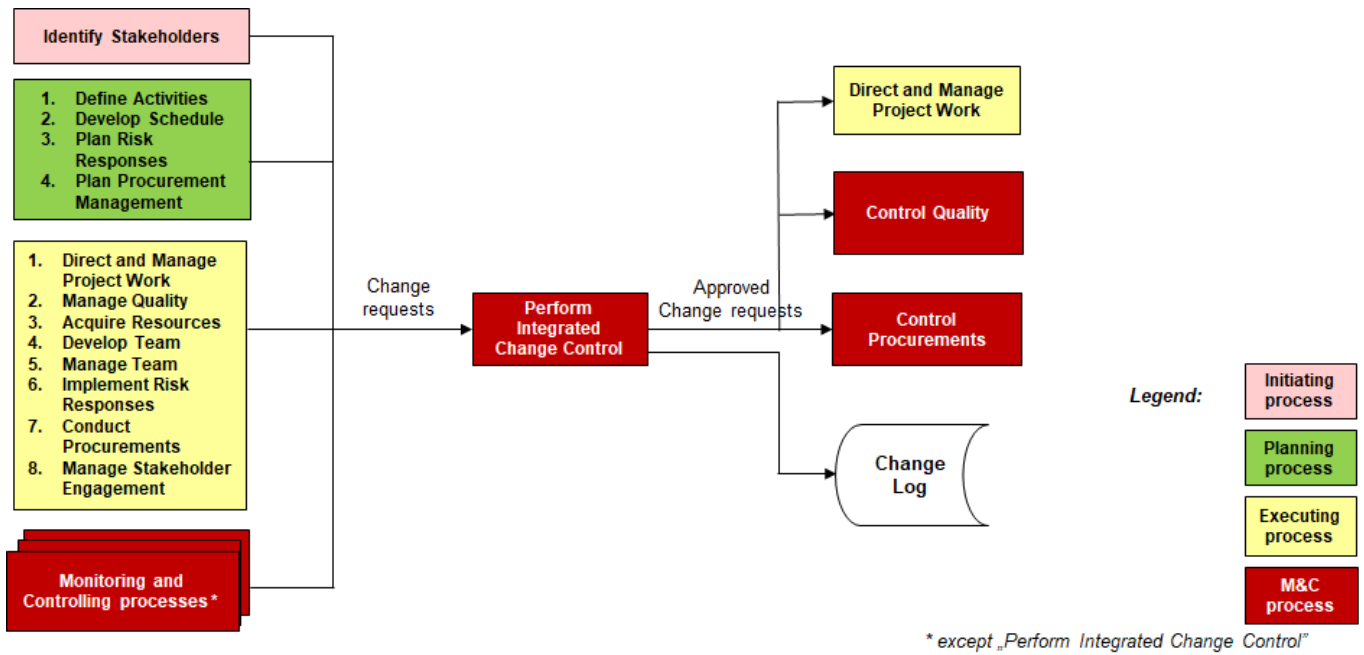


- Stakeholder register content
- Classification models used for stakeholders analysis
- Salience Model
- Stakeholders Engagement Assessment Matrix
- Stakeholder Engagement Plan sensitivity
- Stakeholder Engagement Plan vs Communication Mgmt. Plan
- Interpersonal skills vs Management skills
- Issue log
- Issue log map
- Manage stakeholder engagement vs Monitor stakeholder engagement

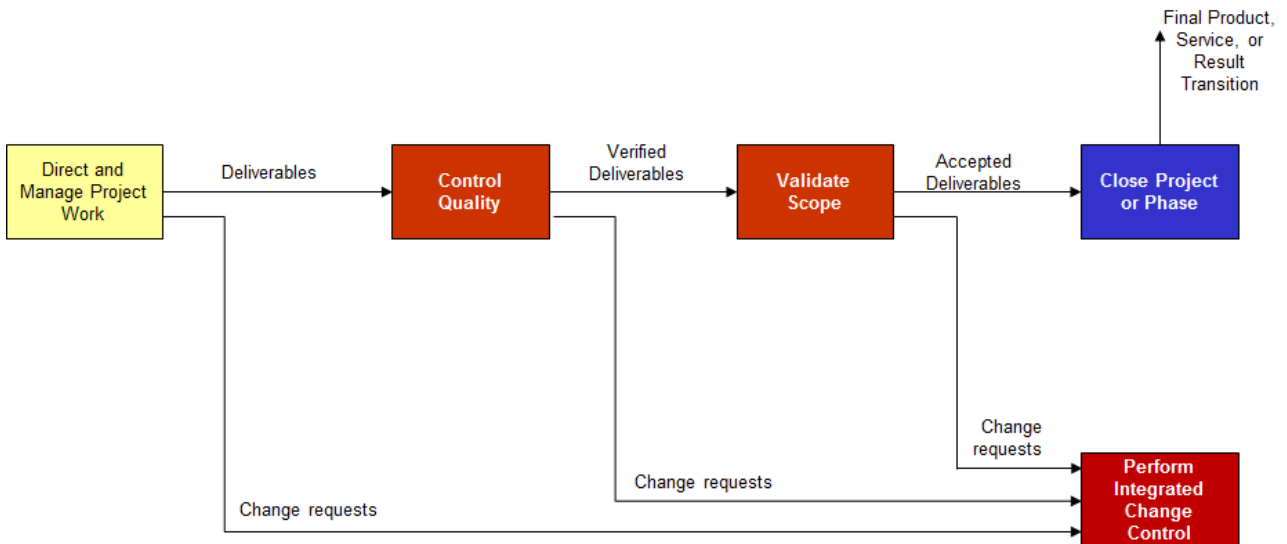
Keywords	Formulas
Schedule Performance Index (SPI)	<p>A) $SPI = EV/PV$ EV = Earned Value PV = Planned Value</p> <p>B) < 1 Project is behind schedule $= 1$ Project is on schedule > 1 Project is ahead of schedule</p>
Cost Performance Index (CPI)	<p>A) $CPI = EV/AC$ EV = Earned Value AC = Actual Cost</p> <p>B) < 1 Over budget $= 1$ On budget > 1 Under budget</p>
Schedule Variance (SV)	<p>A) $SV = EV - PV$ EV = Earned Value PV = Planned Value</p> <p>B) Negative - Behind schedule Zero - On schedule Positive - Ahead of schedule</p>
Cost Variance (CV)	<p>A) $CV = EV - AC$ EV = Earned Value AC = Actual Cost</p> <p>B) Negative - Over budget Zero - On budget Positive - Under budget</p>
Estimate at Completion (EAC) future performance = past performance	$EAC = (BAC/CPI)$ BAC = Budget at completion CPI = Cost performance index
Estimate at Completion (EAC) when original estimates are flawed	$EAC = AC + \text{bottom-up ETC}$ ETC = reestimate
Estimate at Completion (EAC) when variances are typical	$EAC = AC + (BAC - EV)/(CPI * SPI)$ or $EAC = AC + (BAC - EV)/CPI$ where CPI is future CPI and SPI is future SPI
Estimate at Completion (EAC) when variances are atypical	$EAC = AC + (BAC - EV)$ or $EAC = BAC - CV$
Estimate to Complete (ETC)	$ETC = EAC - AC$
Percent Complete	$EV / BAC * 100$
VAC (Variance at Completion)	$BAC - EAC$
Number of Communication Channels	$N(N-1)/2$ Where N = Number of project team members
Expected Value (EV) or PERT Estimation	$(O+4M+P)/6$ O= Optimistic estimate M= Most Likely estimate P= Pessimistic estimate

Keywords	Formulas
To-Complete Performance Index (TCPI) based on the BAC	$TCPI = (BAC - EV) / (BAC - AC)$ BAC = Budget at completion AC = Actual cost EV = Earned value
To-Complete Performance Index (TCPI) based on the EAC	$TCPI = (BAC - EV) / (EAC - AC)$ BAC = Budget at completion AC = Actual cost EV = Earned value EAC = Estimate at completion
Burn Rate	$1/CPI$
Total Float (or) Total Slack	LS-ES (or) LF-EF LS = Late start ES = Early start LF = Late finish EF = Early finish
Standard Deviation of a Task	$(P-O)/6$ P = Pessimistic estimate O = Optimistic estimate
Present Value (PV)	$PV = FV / (1 + r/100)^n$ N = Number of years r = Discount rate
Net Present Value (NPV)	The higher the better
Internal Rate of Return (IRR)	The higher the better
The Payback Period	The lower the better
The Life Cycle Cost	The lower the better
The Benefit to Cost Ratio (BCR)	The higher the better
Critical Path	Path with longest duration
Rough Order of Magnitude (ROM) Estimate	Estimated value + or - 50%
Task Variance	$(Standard\ Deviation) * (Standard\ Deviation)$
PTA (Point of Total Assumptions)	$((Ceiling\ Price - Target\ Price) / Buyer's\ Share\ Ratio) + Target\ Cost$
Mathematical Basics	Average (Mean) = Sum of all members divided by the number of items. Median = Arrange values from lowest value to highest. Pick the middle one. If there is an even number of values, calculate the mean of the two middle values. Mode = Find the value in a data set that occurs most often.
EMV (Expected Monetary Value)	Probability * Impact in currency

CHANGE REQUESTS FLOW



DELIVERABLES FLOW



WORK PERFORMANCE DATA, INFORMATION, REPORTS FLOW

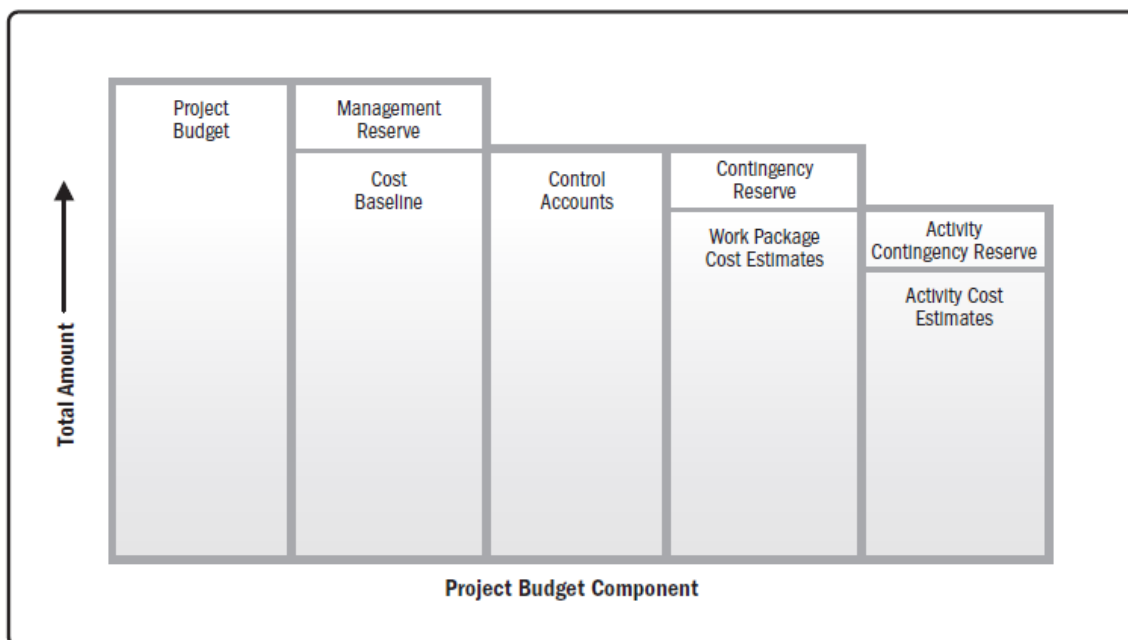
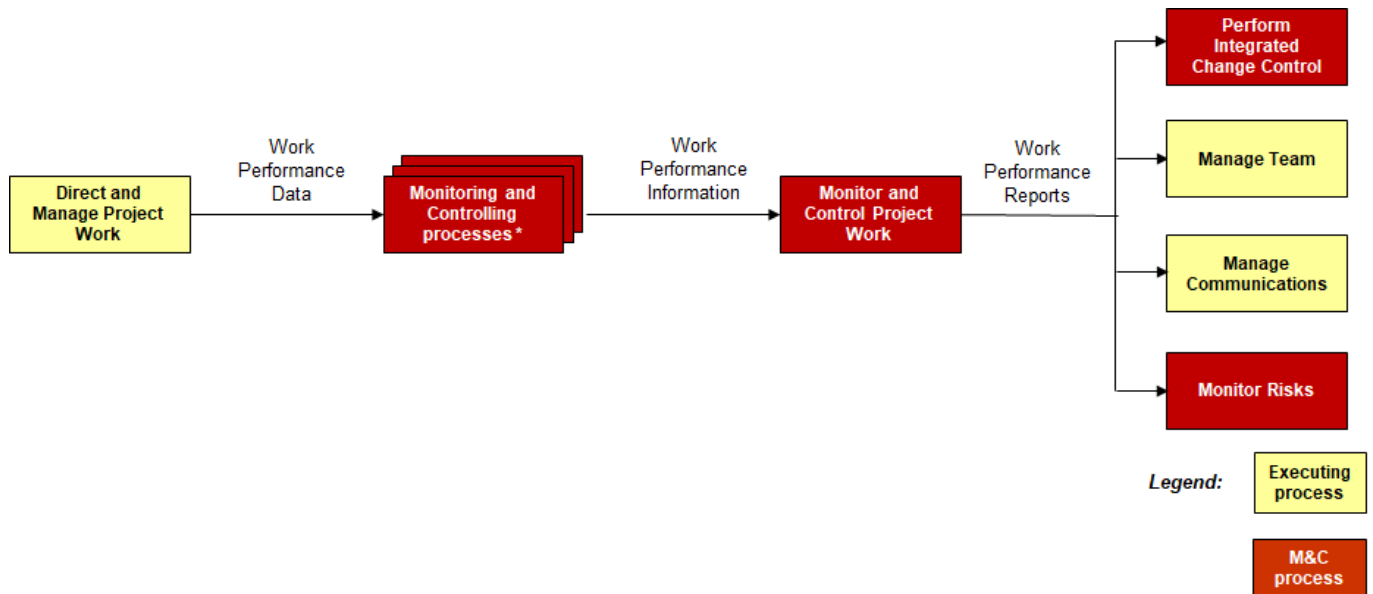


Figure 7-8. Project Budget Components

Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017, Figure 7-8, Page 255.

PROJECT MANAGEMENT PLAN VS PROJECT DOCUMENTS

Project Management Plan	Project Documents	
1. Scope management plan	1. Activity attributes	19. Quality control measurements
2. Requirements management plan	2. Activity list	20. Quality metrics
3. Schedule management plan	3. Assumption log	21. Quality report
4. Cost management plan	4. Basis of estimates	22. Requirements documentation
5. Quality management plan	5. Change log	23. Requirements traceability matrix
6. Resource management plan	6. Cost estimates	24. Resource breakdown structure
7. Communications management plan	7. Cost forecasts	25. Resource calendars
8. Risk management plan	8. Duration estimates	26. Resource requirements
9. Procurement management plan	9. Issue log	27. Risk register
10. Stakeholder engagement plan	10. Lessons learned register	28. Risk report
11. Change management plan	11. Milestone list	29. Schedule data
12. Configuration management plan	12. Physical resource assignments	30. Schedule forecasts
13. Scope baseline	13. Project calendars	31. Stakeholder register
14. Schedule baseline	14. Project communications	32. Team charter
15. Cost baseline	15. Project schedule	33. Test and evaluation documents
16. Performance measurement baseline	16. Project schedule network diagram	
17. Project life cycle description	17. Project scope statement	
18. Development approach	18. Project team assignments	

TOOLS AND TECHNIQUES GROUPS

There are **132 individual tools and techniques** in the PMBOK® Guide – Sixth Edition. These are not the only tools and techniques that can be used to manage a project. They represent those tools and techniques that are considered to be good practice on most projects most of the time. Some are mentioned once and some appear many times in the PMBOK® Guide.

The following tools and techniques groups are used throughout the PMBOK® Guide:

- Data gathering techniques.** Used to collect data and information from a variety of sources. There are **9 data gathering** tools and techniques.
- Data analysis techniques.** Used to organize, assess, and evaluate data and information. There are **27 data analysis** tools and techniques.
- Data representation techniques.** Used to show graphic representations or other methods used to convey data and information. There are **15 data representation** tools and techniques.
- Decision-making techniques.** Used to select a course of action from different alternatives. There are **2 decision-making** tools and techniques.
- Communication skills.** Used to transfer information between stakeholders. There are **2 communication skills** tools and techniques.
- Interpersonal and team skills.** Used to effectively lead and interact with team members and other stakeholders. There are **17 interpersonal and team skills** tools and techniques.
- There are **60 ungrouped** tools and techniques.

PMBOK® GUIDE ACRONYMS

1. Acronime care apar in PMBoK® Guide in diferite capitole, dar nu sunt mentionate in lista de acronime din Glosar:

1	ADR	Alternative Dispute Resolution
2	AE	Apportioned Effort
3	AOA	Activity on Arrow
4	AON	Activity-on-Node
5	CA	Control account
6	CCM	Critical Chain Method
7	CMMI	Capability Maturity Model Integration
8	DIKW	Data, Information, Knowledge, Widsom
9	DOE	Design of Experiments
10	DU (DUR)	Duration
11	EEF	Enterprise Environmental factors
12	FTA	Fault Tree Analysis
13	IPECC	Initiating, Planning, Executing, Controlling and Closing
14	JAD	Joint Application Design/Development session
15	KPI	Key Performance Indicator
16	MOU	Memorandum of Understanding
17	NGO	Nongovernmental Organization
18	OPA	Organizational Process Assets
19	OPM3	Organizational Project Management Maturity Model
20	PBO	Project-Based Organizations
21	PDCA	Plan-Do-Check-Act
22	PDPC	Process Decision Program Charts
23	PERT	Program Evaluation and Review Technique
24	PMB	Performance Measurement Baseline
25	PMIS	Project Management Information System
26	PMO	Project Management Office
27	ROM	Rough Order of Magnitude
28	SIPOC	Suppliers-Inputs-Process-Outputs-Customers
29	SLA	Service Level Agreement
30	SME	Subject Matter Expert
31	TCPI	To-Complete Performance Index
32	TQM	Total Quality Management
33	VOC	Voice of the Customer

2. Acronime care nu apar in PMBoK® Guide, dar ai caror termeni detaliati sunt mentionati in diferite capitole din standard:

34	CR	Cost Reimbursable
35	DD	Data Date
36	IRR	Internal Rate of Return
37	NPV	Net Present Value
38	ROI	Return on Investment
39	SD	Standard Deviation
40	WAS	Work Authorization System
41	WP	Work Package

3. Acronime care nu apar in nici un fel in PMBoK® Guide (nici ca acronime, nici termenii detaliati) dar pot aparea in examen:

42	ARMA	Autoregressive Moving Average
43	BCR	Benefits Cost Ratio
44	BOM	Bill of Materials
45	GERT	Graphical Evaluation and Review Technique
46	JIT	Just in Time
47	MBO	Management-by-objectives
48	P&L	Profit and loss
49	PFIS	Performance failure information systems
50	PTA	Pont of Total Assumptions
51	PV	Present Value (Apare in lista de acronime numai cu "Planned value")
52	TV	Task Variance

4. Acronimele care sunt mentionate in Glosarul din PMBOK® Guide:

AC	actual cost
BAC	budget at completion
CCB	change control board
COQ	cost of quality
CPAF	cost plus award fee
CPFF	cost plus fixed fee
CPI	cost performance index
CPIF	cost plus incentive fee
CPM	critical path method
CV	cost variance
EAC	estimate at completion
EF	early finish date
ES	early start date
ETC	estimate to complete
EV	earned value
EVM	earned value management
FF	finish-to-finish
FFP	firm fixed price
FPEPA	fixed price with economic price adjustment
FPIF	fixed price incentive fee
FS	finish to start
IFB	invitation for bid

PMBOK® GUIDE ACRONYMS

LF	late finish date
LOE	level of effort
LS	late start date
OBS	organizational breakdown structure
PDM	precedence diagramming method
PMBOK	Project Management Body of Knowledge
PV	planned value
QFD	quality function deployment
RACI	responsible, accountable, consult, and inform
RAM	responsibility assignment matrix
RBS	risk breakdown structure
RFI	request for information
RFP	request for proposal
RFQ	request for quotation
SF	start-to-finish
SOW	statement of work
SPI	schedule performance index
SS	start-to-start
SV	schedule variance
SWOT	strengths, weaknesses, opportunities, and threats
T&M	time and material contract
WBS	work breakdown structure
VAC	variance at completion

PMBOK® GUIDE PROCESSES

- * **Develop Project Charter.** The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.
- * **Develop Project Management Plan.** The process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan.
- * **Direct and Manage Project Work.** The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
- * **Manage Project Knowledge.** The process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning.
- * **Monitor and Control Project Work.** The process of tracking, reviewing, and reporting overall progress to meet the performance objectives defined in the project management plan.
- * **Perform Integrated Change Control.** The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating the decisions.
- * **Close Project or Phase.** The process of finalizing all activities for the project, phase, or contract.
- * **Plan Scope Management.** The process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled.
- * **Collect Requirements.** The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.
- * **Define Scope.** The process of developing a detailed description of the project and product.
- * **Create WBS.** The process of subdividing project deliverables and project work into smaller, more manageable components.
- * **Validate Scope.** The process of formalizing acceptance of the completed project deliverables.
- * **Control Scope.** The process of monitoring the status of the project and product scope and managing changes to the scope baseline.
- * **Plan Schedule Management.** The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.
- * **Define Activities.** The process of identifying and documenting the specific actions to be performed to produce the project deliverables.
- * **Sequence Activities.** The process of identifying and documenting relationships among the project activities.
- * **Estimate Activity Durations.** The process of estimating the number of work periods needed to complete individual activities with estimated resources.
- * **Develop Schedule.** The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling.
- * **Control Schedule.** The process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline.
- * **Plan Cost Management.** The process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled.
- * **Estimate Costs.** The process of developing an approximation of the monetary resources needed to complete project activities.
- * **Determine Budget.** The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.
- * **Control Costs.** The process of monitoring the status of the project to update the project costs and managing changes to the cost baseline.
- * **Plan Quality Management.** 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.
- * **Manage Quality.** The process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used.
- * **Control Quality.** The process of monitoring and recording results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations.
- * **Plan Resource Management.** The process of defining how to estimate, acquire, manage, and utilize physical and team resources.

- * **Estimate Activity Resources.** The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.
- * **Acquire Resources** The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.
- * **Develop Team** The process of improving competencies, team member interaction, and overall team environment to enhance project performance.
- * **Manage Team.** The process of tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance.
- * **Control Resources.** The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual use of resources, and performing corrective action as necessary.
- * **Plan Communications Management.** The process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project.
- * **Manage Communications.** Manage Communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information.
- * **Monitor Communications.** The process of ensuring that the information needs of the project and its stakeholders are met.
- * **Plan Risk Management.** The process of defining how to conduct risk management activities for a project.
- * **Identify Risks.** The process of identifying individual risks as well as sources of overall risk and documenting their characteristics.
- * **Perform Qualitative Risk Analysis.** The process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.
- * **Perform Quantitative Risk Analysis.** The process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives.
- * **Plan Risk Responses.** The process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks.
- * **Implement Risk Responses.** The process of implementing agreed-upon risk response plans
- * **Monitor Risks.** The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.
- * **Plan Procurement Management.** The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.
- * **Conduct Procurements.** The process of obtaining seller responses, selecting a seller, and awarding a contract.
- * **Control Procurements.** The process of managing procurement relationships, monitoring contract performance, making changes and corrections as appropriate, and closing out contracts.
- * **Identify Stakeholders.** The process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
- * **Plan Stakeholder Engagement.** The process of developing approaches to involve project stakeholders, based on their needs, expectations, interests, and potential impact on the project.
- * **Manage Stakeholder Engagement.** The process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement.
- * **Monitor Stakeholder Engagement** The process of monitoring project stakeholder relationships, and tailoring strategies for engaging stakeholders through the modification of engagement strategies and plans.

**These definitions are taken from the Glossary of the Project Management Institute, A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition, Project Management Institute, Inc., 2017.*



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