Input, Output and Tools of all Processes

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Integration
Scope
Time
Cost
Quality
Human Resources
Communications
Risk
Procurement
Integration Mgmt / Initiating Process Group
Develop Project Charter

**Input:**
- Contract
- Project statement of work
- Environmental and organizational factors
- Organizational process assets

**Output:**
- Project charter

**Tools & Techniques**
- Project selection methods
- Project management methodology
- Project management information system
- Expert judgement
Integration Mgmt / Initiating Process Group
Develop Project Scope Statement (preliminary)

- **Input:**
  - Project charter
  - Project statement of work
  - Environmental and organizational factors
  - Organizational process assets

- **Output:**
  - Project scope statement (preliminary)

- **Tools & Techniques**
  - Project management methodology
  - Project management information system
  - Expert judgement
Input:
- Project Charter
- Project scope statement (preliminary)
- Project management processes
- Forecasts
- Environmental and organizational factors
- Organizational process assets
- Work performance information

Output:
- Project management plan

Tools & Techniques
- Project management methodology
- Project management information system
- Expert judgement
Integration Mgmt / Executing Process Group
Direct and Manage Project Execution

**Input:**
- Project management plan
- Approved corrective actions
- Approved preventive actions
- Approved change requests
- Approved defect repair
- Validated defect repair

**Output:**
- Deliverables
- Requested changes
- Implemented change requests
- Implemented corrective actions
- Implemented preventive actions
- Implemented defect repair
- Work performance information

**Tools & Techniques**
- Project management methodology
- Project management information system
Input:
- Project management plan
- Work performance information
- Performance reports
- Rejected change requests

Output:
- Recommended corrective actions
- Recommended preventive actions
- Performance reports
- Forecasts
- Recommended defect repair
- Requested changes

Tools & Techniques
- Project management methodology
- Project management information system
- Earned value management
- Expert judgement
Integration Mgmt / Monitoring & Controlling
Integrated Change Control

**Input:**
- Project management plan
- Requested changes
- Work performance information
- Recommended preventive actions
- Recommended corrective actions
- Recommended defect repair
- Deliverables (approved)

**Output:**
- Approved change requests
- Rejected change requests
- Project management plan (approved update)
- Project scope statement (approved update)
- Approved corrective actions
- Approved preventive actions
- Approved defect repair
- Deliverables (approved)

**Tools & Techniques**
- Project management methodology
- Project management information system
- Expert judgement
Integration Mgmt / Closing Process Group

Close Project

**Input:**
- Project charter
- Project scope statement
- Project management plan
- Contract documentation
- Organizational process assets
- Environmental and organizational factors
- Work performance information
- Deliverables (approved)

**Output:**
- Administrative closure procedure
- Contract closure procedure
- Final product, service or result
- Organizational process assets (updates)

**Tools & Techniques**
- Project management methodology
- Project management information system
- Expert judgement
Input:
- Project charter
- Project scope management (preliminary)
- Organizational process assets
- Environmental and organizational assets
- Project management plan

Output:
- Scope management plan

Tools & Techniques
- Expert judgement
- Templates, forms, standards
Scope Mgmt / Planning Process Group

Scope Definition

- **Input:**
  - Project charter
  - Scope management plan
  - Organizational assets
  - Approved change requests

- **Output:**
  - Project scope statement (detailed)
  - Project management plan (updates)

- **Tools & Techniques**
  - Product analysis
  - Alternative identification
  - Expert judgement
Input:
- Project scope statement (detailed)
- Project management plan

Output:
- Work breakdown structure (WBS) and dictionary

Tools & Techniques
- Work breakdown structure templates
- Decomposition
Scope Mgmt / Monitoring and Controlling
Scope Verification

**Input:**
- Scope management plan
- Deliverables
- Project scope statement
- Work breakdown structure and dictionary

**Output:**
- Verified scope
- Work breakdown structure and dictionary (updates)

**Tools & Techniques**
- Inspection
Scope Mgmt / Monitoring and Controlling Scope Control

- **Input:**
  - Scope management plan
  - Work breakdown structure and dictionary
  - Performance reports
  - Work performance information
  - Approved change requests

- **Output:**
  - Requested changes
  - Recommended corrective action
  - Organizational process assets (updates)
  - Project management plan (updates)
  - Work breakdown structure and dictionary (updates)

- **Tools & Techniques**
  - Change control system
  - Variance analysis
  - Re-planning
  - Configuration management system
Time Mgmt / Planning Process Group
Activity Definition

- **Input:**
  - Work breakdown structure and dictionary
  - Project scope statement
  - Organized process assets
  - Project management plan

- **Output:**
  - Activity list
  - Activity list attributes
  - Work breakdown structure and dictionary (updates)
  - Milestone list

- **Tools & Techniques**
  - Decomposition
  - Templates
  - Level of detail
  - Expert judgement
Input:
- Activity list
- Activity list attributes
- Project scope statement
- Milestone list

Output:
- Project schedule network diagrams
- Activity list (updates)
- Project management plan and scope statement (updates)

Tools & Techniques
- Precedence Diagramming Method (PDM)
- Arrow Diagramming Method (ADM)
- Schedule network templates
- Dependency determination.
Time Mgmt / Planning Process Group
Activity Resource Estimating

- **Input:**
  - Activity list
  - Activity list attributes
  - Organizational policies
  - Resource availability

- **Output:**
  - Activity resource requirements
  - Resource requirements supporting detail
  - Activity list (updates)

- **Tools & Techniques**
  - Expert judgement
  - Alternative identification
  - Published estimating data
  - Estimating software programs
  - Bottom-up estimates by activity
Time Mgmt / Planning Process Group
Activity Duration Estimating

- **Input:**
  - Activity list
  - Activity list attributes
  - Project scope statement
  - Project cost estimates
  - Activity resource requirements
  - Resource availability
  - Organizational process assets
  - Risk register

- **Output:**
  - Activity duration estimates
  - Activity list (updates)
  - Activity list attributes (updates)

**Tools & Techniques**
- Expert judgements
- analogous duration estimating
- quantitatively based durations
- three-point-estimates of duration
- reserve time
- maximum activity duration
Time Mgmt / Planning Process Group

Schedule Development

**Input:**
- Project scope statement
- Project schedule network diagrams
- Activity duration estimates
- Activity resource requirements
- Resource availability
- Risk register
- Activity list attributes
- Resources calendars

**Output:**
- Project schedule
- Project schedule supporting detail
- Schedule management plan (updates)
- Resource requirements (update)

**Tools & Techniques**
- Critical path method
- Schedule compression
- What if analysis
- Resource leveling
- Critical chain
Time Mgmt / Monitoring and Controlling
Schedule Control

- **Input:**
  - Project schedule
  - Performance reports
  - Approved change requests
  - Schedule management plan

- **Output:**
  - Project schedule (updates)
  - Requested changes
  - Recommended corrective action
  - Organizational process assets

- **Tools & Techniques**
  - Progress reporting
  - Schedule charge control system
  - Performance measurement
  - Project management software
  - Variance analysis
  - Schedule comparison bar charts
Cost Mgmt / Planning Process Group
Cost Estimating

**Input:**
- Project charter
- Project scope statement
- Project management plan
- Work breakdown structure and dictionary
- Time management plan
- Staffing management plan
- Risk register
- Environmental and organizational factors
- Organizational process assets

**Output:**
- Activity cost estimates
- Activity cost supporting detail

**Tools & Techniques**
- Analogous cost estimating
- Resource cost rates
- Bottom-up cost estimating
- Computerized tools
- Other cost estimating methods
- Contingency activities
- Cost of quality
Cost Mgmt / Planning Process Group
Cost Budgeting

**Input:**
- Activity cost estimates
- Work breakdown structure and dictionary
- Project schedule
- Project charter
- Project management plan

**Output:**
- Cost baseline
- Project funding requirements
- Project management plan (update)

**Tools & Techniques**
- Cost aggregation
- Management reserves
- Parametric modeling
- Expenditure rationalization
Cost Mgmt / Monitoring and Controlling
Cost Control

**Input:**
- Performance reports
- Approved change requests
- Cost baseline
- Project funding requirements

**Output:**
- Project management plan (update)
- Required corrective action
- Estimate at completion
- Request changes
- Organizational process assets (update)

**Tools & Techniques**
- Cost change control system
- Performance measurement
- Project performance reviews
- Computerized tools
- Variance management
Quality Mgmt / Planning Process Group

Quality Planning

Input:
- Project charter
- Project management plan
- Project scope statement
- Organizational process assets
- Environmental and organizational factors

Output:
- Quality management plan
- Quality metrics
- Quality checklists
- Process improvement plan
- Project management plan (updated)

Tools & Techniques
- Cost-benefit analysis
- Benchmarking
- Design of experiments
- Cost of quality
Quality Mgmt / Executing Process Group
Perform Quality Assurance

**Input:**
- Quality management plan
- Quality metrics
- Process improvement plan
- Work performance information
- Approved change requests
- Quality control measurements

**Output:**
- Requested changes
- Recommended corrective actions
- Organisational process assets (updates)
- Project management plan (updates)

**Tools & Techniques**
- Quality planning tools and techniques
- Quality audits
- Process analyses
- Quality control tools and techniques
- Benchmarking
Quality Mgmt / Monitoring & Controlling Perform Control Quality

- **Input:**
  - Quality management plan
  - Quality metrics
  - Quality checklists
  - Organizational process assets
  - Work performance information
  - Approved change requests
  - Product, service, or result

- **Output:**
  - Recommended corrective actions
  - Recommended preventive actions
  - Requested changes
  - Recommended defect repair
  - Validated defect repair
  - Project management plan (updates)
  - Quality control measurements
  - Organizational process assets (updates)

- **Tools & Techniques**
  - Inspection
  - Control charts
  - Pareto diagrams
  - Statistical sampling
  - Flowcharting
  - Trend analysis
  - Defect repair review
Input:
- Activity resource estimates
- Environmental and organizational factors
- Project management plan

Output:
- Roles and responsibilities
- Project organization charts
- Staffing management plan

Tools & Techniques
- Organisational charts and position descriptions
- Human resource templates
- Networking
- Organizational theory
Human Resources Mgmt / Planning
Acquire Project Team

- **Input:**
  - Roles and responsibilities
  - Project organization charts
  - Staffing management plan
  - Environmental and organizational factors
  - Organizational process assets

- **Output:**
  - Project staff assignments
  - Resource calendars
  - Staffing management plan (updates)
  - Resource availability

- **Tools & Techniques**
  - Pre-assignment
  - Negotiation
  - Procurement
  - Virtual Teams
**Input:**
- Project staff assignments
- Staffing management plan

**Output:**
- Team performance assessment

**Tools & Techniques**
- General management skills
- Training
- Team-building activities
- Ground rules
- Co-location
- Recognition and rewards
Human Resources Mgmt / Monitoring & Controlling
Manage Project Team

- **Input:**
  - Project staff assignments
  - Roles and responsibilities
  - Project organization charts
  - Staffing management plan
  - Performance reports
  - Team performance assessment
  - Organizational process assets

- **Output:**
  - Staffing management plan (updates)
  - Requested changes
  - Organizational process assets (updates)

- **Tools & Techniques**
  - Observation and conversation
  - Project performance appraisals
  - Conflict management
  - Issues log
Communication Mgmt / Planning Process Group

Communications Planning

- **Input:**
  - Organizational process assets
  - Project charter
  - Project management plan
  - Project scope statement

- **Output:**
  - Communications management plan

- **Tools & Techniques**
  - Stakeholder analysis
  - Communications requirement analysis
  - Communications technology
Communications Mgmt / Executing
Information Distribution

- **Input:**
  - Work performance information
  - Communications management plan

- **Output:**
  - Project management plan (updates)
  - Organizational process assets (updates)

- **Tools & Techniques**
  - Communication skills
  - Information gathering and retrieval systems
  - Information distribution methods
  - Lessons learned process
Communications Mgmt / Monitoring & Controlling
Performance Reporting

**Input:**
- Work performance information
- Project management plan
- Forecasts
- Approved change requests
- Deliverables

**Output:**
- Performance reports
- Forecasts
- Requested changes
- Project management plan (updates)
- Recommended corrective action
- Organizational process assets

**Tools & Techniques**
- Information presentation tools
- Performance information gathering and compilation
- Status review meeting
Communications Mgmt / Monitoring & Controlling

Manage Stakeholders

- **Input:**
  - Project management plan
  - Communication management plan
  - Organizational process assets

- **Output:**
  - Resolved issues
  - Communications management plan (updates)
  - Organizational process assets (updates)

- **Tools & Techniques**
  - Communication methods
  - Issue logs
Risk Mgmt / Planning Process Group
Risk Management Planning

**Input:**
- Project charter
- Project scope statement
- Project management plan
- Organizational process assets
- Environmental and organizational factors

**Output:**
- Risk management plan

**Tools & Techniques**
- Planning meetings and analysis
**Risk Mgmt / Planning Process Group**

**Risk Identification**

- **Input:**
  - Project charter
  - Project scope statement
  - Project management plan
  - Organizational process assets
  - Environmental and organizational factors

- **Output:**
  - Risk register
  - Project management plan (updates)

- **Tools & Techniques**
  - Documentation reviews
  - Information gathering techniques
  - Checklists
  - Assumptions analysis
  - Diagramming techniques

Diagram showing integration of scope, time, cost, quality, human resources, communications, risk, and procurement.
Risk Mgmt / Planning Process Group
Qualitative Risk Analysis

- **Input:**
  - Project management plan
  - Organizational process assets
  - Work performance information
  - Project scope statement

- **Output:**
  - Risk register (updates)

- **Tools & Techniques**
  - Risk probability and impact assessment
  - Probability and impact matrix
  - Risk data quality assessment
  - Risk categorization
  - Risk urgency assessment
Input:
- Project management plan
- Organizational process assets
- Risk register

Output:
- Risk register (updates)

Tools & Techniques
- Data gathering and representation techniques
- Quantitative risk analysis and modelling techniques
**Risk Mgmt / Planning Process Group**

**Risk Response Planning**

- **Input:**
  - Project management plan
  - Risk management plan
  - Risk register

- **Output:**
  - Risk register (updated)
  - Risk-related contractual agreements

- **Tools & Techniques**
  - Strategies for negative risks or threats
  - Strategies for positive risks or opportunities
  - Strategy for both threats and opportunities
  - Contingent response strategy
Risk Mgmt / Monitoring and Controlling
Risk Monitoring & Control

**Input:**
- Project management plan
- Work performance information
- Approved change requests

**Output:**
- Recommended corrective action
- Requested changes
- Risk register (updates)
- Organizational process assets (updates)

**Tools & Techniques**
- Risk reassessment
- Risk audits and periodic risk reviews
- Variance and trend analysis
- Technical performance measurement
- Reserve management
**Procurement Mgmt / Planning Process Group**

**Plan Purchases and Acquisitions**

**Input:**
- Project charter
- Project scope statement
- Project management plan
- Work breakdown structure and dictionary
- Environmental and organizational factors
- Organizational process assets
- Risk register

**Output:**
- Procurement management plan
- Contract statement of work
- Make-or-buy decisions
- Project management plan (updates)

**Tools & Techniques**
- Make-or-buy analysis
- Expert judgement
- Contract types
Input:
- Procurement management plan
- Contract statements of work
- Project management plan
- Make or buy decisions

Output:
- Procurement documents
- Evaluation criteria
- Contract statement of work (updates)

Tools & Techniques
- Standard forms
- Expert judgement
Procurement Mgmt / Executing Process Group
Request Seller Responses

- **Input:**
  - Procurement documents
  - Organizational process assets

- **Output:**
  - Qualified sellers list
  - Procurement document package
  - Proposals

- **Tools & Techniques**
  - Bidder conferences
  - Advertising
Procurement Mgmt / Executing Process Group
Select Sellers

**Input:**
- Proposals
- Evaluation criteria
- Organizational process assets
- Risk register
- Risk related contractual agreements
- Qualified sellers list
- Procurement document package

**Output:**
- Selected sellers
- Contract
- Contract management plan
- Resource availability

**Tools & Techniques**
- Weighting system
- Independent estimates
- Screening system
- Contract negotiation
Procurement Mgmt / Monitoring & Controlling Contract Administration

**Input:**
- Contract
- Performance reports
- Approved change requests
- Work performance information
- Selected sellers

**Output:**
- Organizational process assets (updates)
- Requested changes
- Recommended corrective actions
- Contract documentation

**Tools & Techniques**
- Contract change control system
- Buyer conducted performance review
- Inspections and audits
- Performance reporting
- Payment system
- Claims administration
- Records management system
Procurement Mgmt / Closing Process Group

Contract Closure

**Input:**
- Contract documentation
- Contract closure procedure

**Output:**
- Organizational process assets (updates)

**Tools & Techniques**
- Procurement audits
- Records management system