

## Inputs, Tools & Techniques, Outputs (ITTOs)

- Every process has inputs, tools & techniques, and outputs
  - Several ITTOs are associated with multiple processes
- Inputs
  - Knowledge and artifacts that are used for, or influence, the performance of a process
- Tools and Techniques
  - Specific tangible resources or defined procedures that are used in the performance of a process
- Outputs
  - Knowledge and artifacts that are created by the performance of a process

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## Tools and Techniques

- The *PMBOK® Guide* defines 131 tools and techniques, many of which are used for multiple processes
  - 6 groups categorize tools and techniques by their use/intent
  - 59 tools and techniques are ungrouped
- Tool and Technique Groups
  - Data Gathering (9)
  - Data Analysis (27)
  - Data Representation (15)
  - Decision-Making (2)
  - Communication Skills (2)
  - Interpersonal and Team Skills (17)

## Data Gathering Techniques

- Benchmarking
- Brainstorming
- Check Sheets
- Checklists
- Focus Groups
- Interviews
- Market Research
- Questionnaires and Surveys
- Statistical Sampling

## Data Analysis Techniques

- Alternatives Analysis
- Assessment of Other Risk Parameters
- Assumption and Constraint Analysis
- Cost of Quality
- Cost-Benefit Analysis
- Decision Tree Analysis
- Document Analysis
- Earned Value Analysis
- Influence Diagrams
- Iteration Burndown Chart
- Make or Buy Analysis
- Performance Reviews
- Process Analysis
- Proposal Evaluation
- Regression Analysis
- Reserve Analysis
- Risk Data Quality Assessment
- Risk Probability and Impact Assessment
- Root Cause Analysis
- Sensitivity Analysis
- Simulation
- Stakeholder Analysis
- SWOT Analysis
- Technical Performance Analysis
- Trend Analysis
- Variance Analysis
- What-if Scenario Assessment

## Data Representation Techniques

- Affinity Diagrams
- Cause-and-Effect Diagrams
- Control Charts
- Flow Charts
- Hierarchical Charts
- Logical Data Model
- Matrix Diagrams
- Matrix-Based Charts
- Mind Mapping
- Probability and Impact Matrix
- Scatter Diagrams
- Stakeholder Engagement and Assessment Matrix
- Stakeholder Mapping/Representation
- Text-Oriented Formats

## Decision-Making and Communication

- Decision Making Techniques
  - Multi-Criteria Decision Analysis
  - Voting
- Communication Skills
  - Feedback
  - Presentations

## Interpersonal and Team Skills

- Active Listening
- Communication Styles Assessment
- Conflict Management
- Cultural Awareness
- Decision Making
- Emotional Intelligence
- Facilitation
- Influencing
- Leadership
- Meeting Management
- Motivation
- Negotiation
- Networking
- Nominal Group Technique
- Observation/Conversation
- Political Awareness
- Team Building

## Ungrouped Tools and Techniques – Most Common

- **Expert Judgment**
- **Meetings**
- Decomposition
- Estimating Techniques
  - Analogous
  - Parametric
  - Bottom-Up
  - Three-Point
- Problem Solving
- Audits
- Inspections
- Project Management Information Systems
- Communication Technologies

## Ungrouped Tools and Techniques

- Integration Management
  - Change Control Tools
  - Information Management
  - Knowledge Management
- Schedule Management
  - Agile Release Planning
  - Critical Path Method
  - Dependency Determination and Integration
  - Leads and Lags
  - Precedence Diagramming Method
  - Resource Optimization
  - Rolling Wave Planning
  - Schedule Compression
  - Schedule Network analysis
- Scope Management
  - Context Diagram
  - Product Analysis
  - Prototypes
- Cost Management
  - Cost Aggregation
  - Financing
  - Funding Limit Reconciliation
  - Historical Information Review
  - To-Complete Performance Index
- Communications Management
  - Communication Methods
  - Communication Models
  - Communication Requirements Analysis

## Ungrouped Tools and Techniques (cont.)

- Quality Management
  - Design for X
  - Project Reporting
  - Quality Improvement Methods
  - Test and Inspection Planning
  - Testing/Product Evaluations
- Resources Management
  - Colocation
  - Individual and Team Assessments
  - Organizational Theory
  - Pre-assignment
  - Recognition and Rewards
  - Virtual Teams
  - Training
- Risk Management
  - Contingent Response Strategies
  - Prompt Lists
  - Representations of Uncertainty
  - Risk Categorization
  - Strategies for Threats
  - Strategies for Opportunities
  - Strategies for Overall Project Risk
- Procurement Management
  - Advertising
  - Bidder Conferences
  - Claims Administration
  - Source Selection Analysis
- Stakeholder Management
  - Ground Rules