Planning Process Group

- "Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve"
- The progressive elaboration of the project management plan
- Planning and documentation are iterative and on-going "rolling wave"

Planning Process Group
Develop Project Management Plan

“the process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The project’s integrated baselines and subsidiary plans may be included within the project management plan”

Planning Process Group
Develop Project Management Plan

Inputs:

- Project Charter
- Outputs from planning processes
- Enterprise Environmental Factors
  - Governmental or industry standards
  - PMIS
  - Organizational culture or structure
  - Infrastructure
  - Personnel administration (hiring and firing guidelines, performance reviews and training records)
- Organizational process assets:
  - Standardized guidelines, work instructions, proposals evaluation criteria, performance measurement criteria
  - Project management plan template
  - Change control procedures
  - Project files from previous projects
  - Historical information and lessons learned knowledge base
  - Configuration management knowledge base

Planning Process Group
Develop Project Management Plan

Tools and Techniques:

- Expert judgment to:
  - Tailor the process to meet the project need
  - Develop technical and management details to be included in the plan
  - Determine resources and skills needed to perform project work
  - Define the level of configuration management to apply on the project
  - Determine which project documents will be subject to the formal change control process
- Facilitation Techniques

Planning Process Group
Develop Project Management Plan

Outputs:

- Project management plan:
  - The life cycle selected for the project in the processes in each phase
  - Results of the tailoring by the project team as follows:
    - PM processes selected by the project team
    - Level of administration for each process
    - Description of the tools and techniques used for accomplishing each process
    - How the processes will be used to manage the specific project including dependencies and interactions
  - How work will be executed to accomplish the project objectives
  - A change management plan that will document how changes will be monitored and controlled
  - A configuration management plan
  - How integrity of the performance measurement baselines will be maintained
  - Needs and techniques for communicating among the stakeholders
  - Key management reviews for content, extent and timing

Project Management Plan	Project Documents	
Change management plan	Activity attributes	Project staff assignments
Communications management plan	Activity cost estimates	Project statement of work
Configuration management plan	Activity duration estimates	Quality checklists
Cost baseline	Activity list	Quality control measurements
Cost management plan	Activity resource requirements	Quality metrics
Human resource management plan	Agreements	Requirements documentation
Process improvement plan	Basis of estimates	Requirements traceability matrix
Procurement management plan	Change log	Resource breakdown structure
Scope baseline • Project scope statement • WBS • WBS dictionary	Change requests	Resource calendars
Quality management plan	Forecasts • Cost forecast • Schedule forecast	Risk register
Requirements management plan	Issue log	Schedule data
Risk management plan	Milestone list	Seller proposals
Schedule baseline	Procurement documents	Source selection criteria
Schedule management plan	Procurement statement of work	Stakeholder register
Scope management plan	Project calendars	Team performance assessments
Stakeholder management plan	Project charter Project funding requirements Project schedule Project schedule network diagrams	Work performance data Work performance information Work performance reports

Planning Process Group
Develop Project Management Plan

Then the project management plan is base-lined and may only be changed if a change request is generated and approved through the Perform Integrated Change Control process:

Project baselines include but not limited to:

- Schedule baseline
- Cost performance baseline
- Scope baseline

Subsidiary plans include but not limited to:

- Scope management plan
- Cost management plan
- Quality management plan
- Communications management plan

Planning Process Group
Plan Stakeholder Management

"the process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success."

Planning Process Group
Plan Stakeholder Management

Inputs:

- Project management plan
- Stakeholder register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Stakeholder Management

Tools & Techniques:

- Expert judgment
- Meetings
- Analytical techniques

Planning Process Group
Plan Stakeholder Management

The engagement level of the stakeholders can be classified as follows:

- Unaware. Unaware of project and potential impacts.
- Resistant. Aware of project and potential impacts and resistant to change.
- Neutral. Aware of project yet neither supportive nor resistant.
- Supportive. Aware of project and potential impacts and supportive to change.
- Leading. Aware of project and potential impacts and actively engaged in ensuring the project is a success

Planning Process Group
Plan Stakeholder Management

Outputs:

- Stakeholder management plan
  - Desired and current engagement levels of key stakeholders;
  - Scope and impact of change to stakeholders;
  - Identified interrelationships and potential overlap between stakeholders;
  - Stakeholder communication requirements for the current project phase;
  - Information to be distributed to stakeholders, including language, format, content, and level of detail;
  - Reason for the distribution of that information and the expected impact to stakeholder engagement;
  - Time frame and frequency for the distribution of required information to stakeholders
- Project documents updates

Name	Unaware	Neutral	Resistant	Supportive	Leading
Brian	C			D	
Omar		C		D	
Jacques			C	D	
Tina				C	D

Planning Process Group
Plan Scope Management

"the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled."

What is a scope?

- **Product scope:** The features and functions that characterize a product, service, or result.
- **Project scope:** The work performed to deliver a product, service, or result with the specified features and functions. The term project scope is sometimes viewed as including product scope.

Planning Process Group
Plan Scope Management

Inputs:

- Project management plan
- Project charter
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Scope Management

Tools & Techniques:

- Expert Judgment
- Meetings

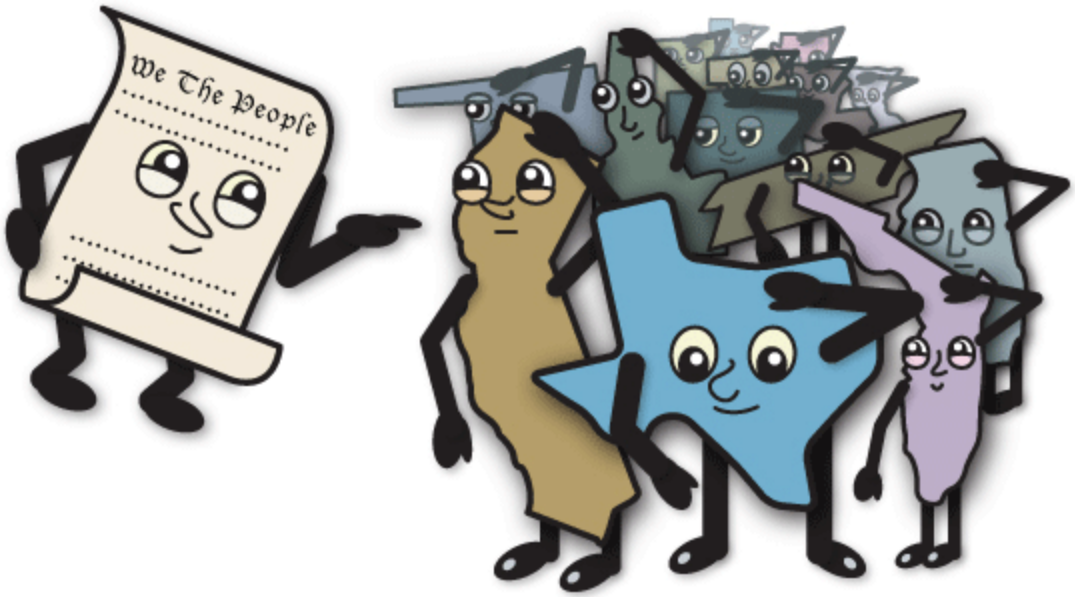
Planning Process Group
Plan Scope Management

Outputs:

- Scope management plan
  - Process for preparing a detailed project scope statement;
  - Process that enables the creation of the WBS from the detailed project scope statement;
  - Process that establishes how the WBS will be maintained and approved;
  - Process that specifies how formal acceptance of the completed project deliverables will be obtained; and
  - Process to control how requests for changes to the detailed project scope statement will be processed.
- Requirements management plan
  - How requirements activities will be planned, tracked, and reported;
  - Configuration management activities such as: how changes to the product will be initiated, how impacts will be analyzed, how they will be traced, tracked, and reported, as well as the authorization levels required to approve these changes;
  - Requirements prioritization process;
  - Product metrics that will be used and the rationale for using them; and
  - Traceability structure to reflect which requirement attributes will be captured on the traceability matrix.

Planning Process Group
Collect Requirements

"the process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives"



Planning Process Group
Collect Requirements

What do we mean by Requirements:

- Business requirements, which describe the higher-level needs of the organization as a whole, such as the business issues or opportunities, and reasons why a project has been undertaken.
- Stakeholder requirements, which describe needs of a stakeholder or stakeholder group.
- Solution requirements, which describe features, functions, and characteristics of the product, service, or result
- Transition requirements describe temporary capabilities.
- Project requirements, which describe the actions, processes, or other conditions the project needs to meet.
- Quality requirements,

Planning Process Group
Collect Requirements

Inputs:

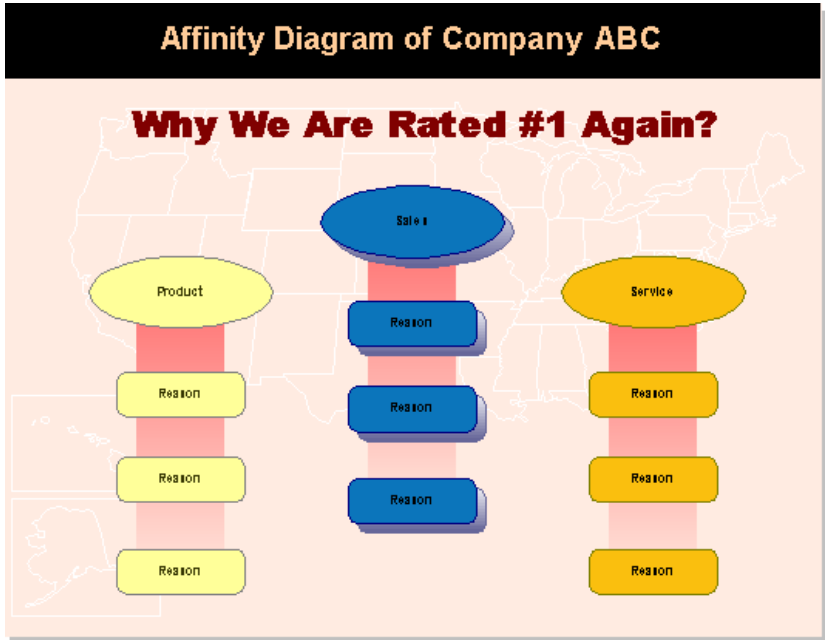
- Scope management plan
- Requirements management plan
- Stakeholder management plan
- Project charter
- Stakeholder register

Planning Process Group
Collect Requirements

Tools and Techniques:

- Interviews
- Focus groups
- Facilitated workshops
- Group creativity techniques
  - Brainstorming
  - Nominal group technique
  - Idea/ Mind-mapping
  - Affinity Diagram
  - Multicriteria decision analysis.
- Group decision-making techniques
- Questionnaires and surveys
- Observations
- Prototypes
- Benchmarking
- Context diagrams
- Document analysis

Unanimity
Majority
Plurality
Dictatorship



Planning Process Group
Collect Requirements

Tools and Techniques:

- ❖Interviews
- ❖Focus groups
- ❖Facilitated workshops
- ❖Group creativity techniques
  - ❖Brainstorming
  - ❖Nominal group technique
  - ❖Idea/ Mind-mapping
  - ❖Affinity Diagram
  - ❖Multicriteria decision analysis.
- ❖Group decision-making techniques
- ❖Questionnaires and surveys
- ❖Observations
- ❖Prototypes
- ❖Benchmarking
- ❖Context diagrams

Document analysis: business plans, marketing literature, agreements, requests for proposal, current process flows, logical data models

Planning Process Group
Collect Requirements

Outputs:

- Requirements documentations include but not limited to:
  - Functional requirements
  - Non-functional requirements
  - Quality requirements
  - Acceptance criteria
  - Business rules
  - Impact to other organizational areas
  - Support and training requirements
- Requirements traceability matrix: The requirements traceability matrix is a grid that links product requirements from their origin to the deliverables that satisfy them. They include but not limited to:
  - Requirements to project needs
  - To project objectives
  - To product design
  - To product development
  - To project scope/WBS deliverables

Planning Process Group
Collect Requirements

Requirements Traceability Matrix								
Project Name:								
Cost Center:								
Project Description:								
ID	**Associate ID**	**Requirements Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverables**	**Product Design**	**Product Development**	**Test Cases**
001	1.0							
	1.1							
	1.2							
	1.2.1							
002	2.0							
	2.1							
	2.1.1							
003	3.0							
	3.1							
	3.2							
004	4.0							
005	5.0							

Planning Process Group
Define Scope

“the process of developing a detailed description of the project and product. The key benefit of this process is that it describes the project, service, or result boundaries by defining which of the requirements collected will be included in and excluded from the project scope.”

Planning Process Group
Define Scope

Inputs:

- Scope management plan
- Project charter
- Requirements documentation
- Organizational process assets

Planning Process Group
Define Scope

Tools and Techniques:

- Expert judgment
- Product analysis:
  - Product breakdown
  - Systems analysis
  - Requirements analysis
  - Systems engineering
  - Value engineering
  - Value analysis
- Alternatives generation:
  - Brainstorming
  - Lateral thinking
  - Pairwise comparisons
- Facilitated workshops

Planning Process Group
Define Scope

Outputs:

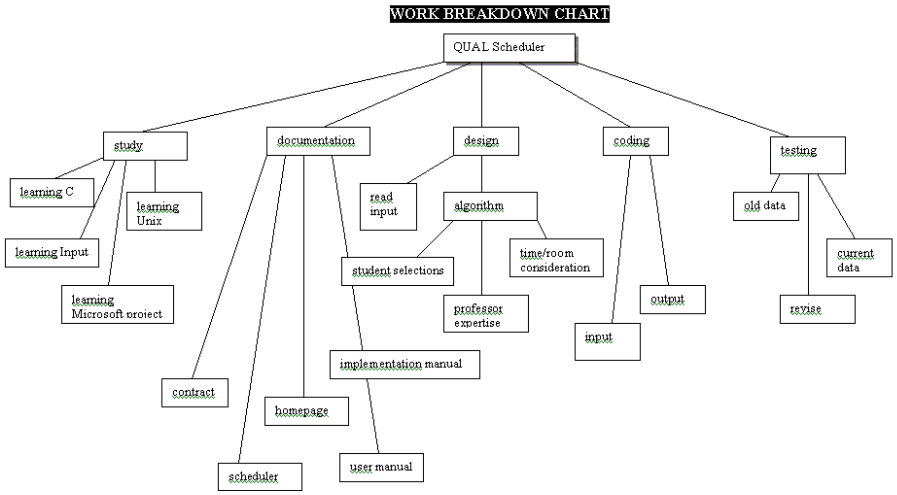
- Project scope statement
  - Product scope description
  - Product acceptance criteria
  - Project deliverables
  - Project exclusions
  - Project constraints
  - Project assumptions
- Project documents updates

Questions and Answers

- What is gold-plating?

Planning Process Group
Create WBS

"Subdividing the project deliverables and project work into more manageable smaller components"



Planning Process Group
Create WBS

Inputs:

- Scope management plan
- Project scope statement
- Requirements documentation
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Create WBS

Tools and Techniques:

- Decomposition
  - Identify and analyze the deliverables and related work
  - Structure and organize the WBS
  - Decompose the upper levels into lower levels components
  - Develop and assign identification codes to WBS components
  - Verify that the level of decomposition is appropriate
  - Can be created by:
    - Phases of the project life cycle
    - Using deliverables
    - Using subprojects
- Expert Judgment

Planning Process Group
Create WBS

Outputs:

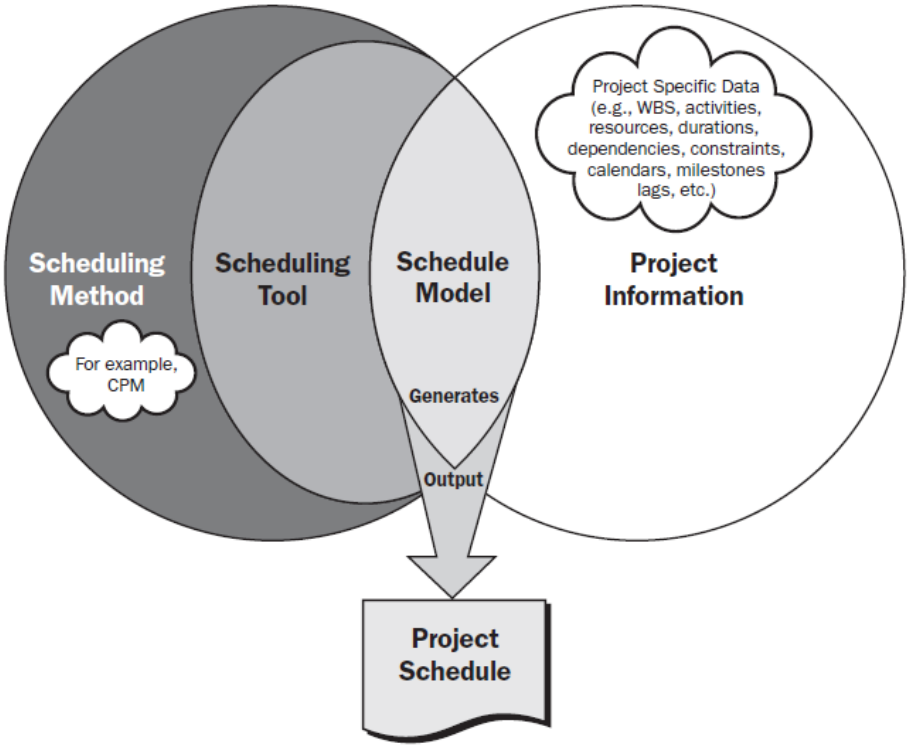
- Scope Baseline:
  - Scope Statement
  - WBS
  - WBS dictionary includes but not limited to:
    - Code of account identifier
    - Description of work
    - Responsible organization
    - List of schedule milestones
    - Acceptance criteria
    - Cost estimates,
    - Quality requirements
- Project documents updates

Planning Process Group
Plan Schedule Management

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule

Planning Process Group
Plan Schedule Management

Introduction



Planning Process Group
Plan Schedule Management

Inputs:

- Project management plan
- Project charter
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Schedule Management

Tools & Techniques :

- Expert judgment
- Analytical techniques
- Meetings

Planning Process Group
Plan Schedule Management

Outputs :

- Schedule management plan
  - Project schedule model development
  - Level of accuracy.
  - Units of measure.
  - Organizational procedures links
  - Project schedule model maintenance.
  - Control thresholds
  - Rules of performance measurement
  - Reporting formats
  - Process descriptions

Planning Process Group
Define Activities

“Identifying the specific actions to be performed to produce the project deliverables”

Planning Process Group
Define Activities

Inputs:

- Schedule management plan
- Scope baseline
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Define Activities

Tools and Techniques:

- ❖Decomposition
- ❖Rolling wave planning (progressive elaboration)
- ❖Expert judgment

Planning Process Group
Define Activities

Outputs:
- ❖Activity list
- ❖Activity attributes
- ❖Milestone list

Planning Process Group Sequence Activities

"Identifying and documenting relationships among the project activities"

Planning Process Group Sequence Activities

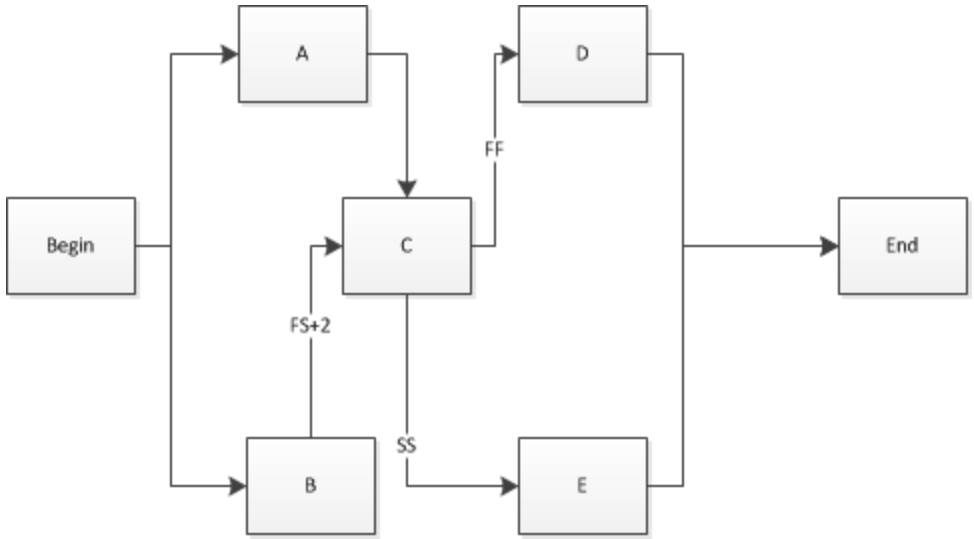
Inputs:

- Schedule management plan
- Activity list
- Activity attributes
- Milestone list
- Project scope statement
- Enterprise environmental factors
- Organizational process assets

Planning Process Group Sequence Activities

Tools and Techniques:

- Precedence diagramming method (PDM) also known as Activity On Node (AON) used in CPM (Critical Path Method)
  - Finish to start FS
  - Finish to finish FF
  - Start to finish SF
  - Start to start SS
- Dependency determination
  - Mandatory dependencies
  - External dependencies
  - Internal dependencies.
  - Discretionary dependencies (preferred logic)
- Leads and lags



Planning Process Group Sequence Activities

Outputs:

- Project schedule network diagrams
- Project document updates

Planning Process Group
Estimate Activity Resources

“the process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity”

Planning Process Group
Estimate Activity Resources

Inputs:

- Schedule management plan
- Activity list
- Activity attributes
- Resource calendars
- Risk register
- Activity cost estimates
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Estimate Activity Resources

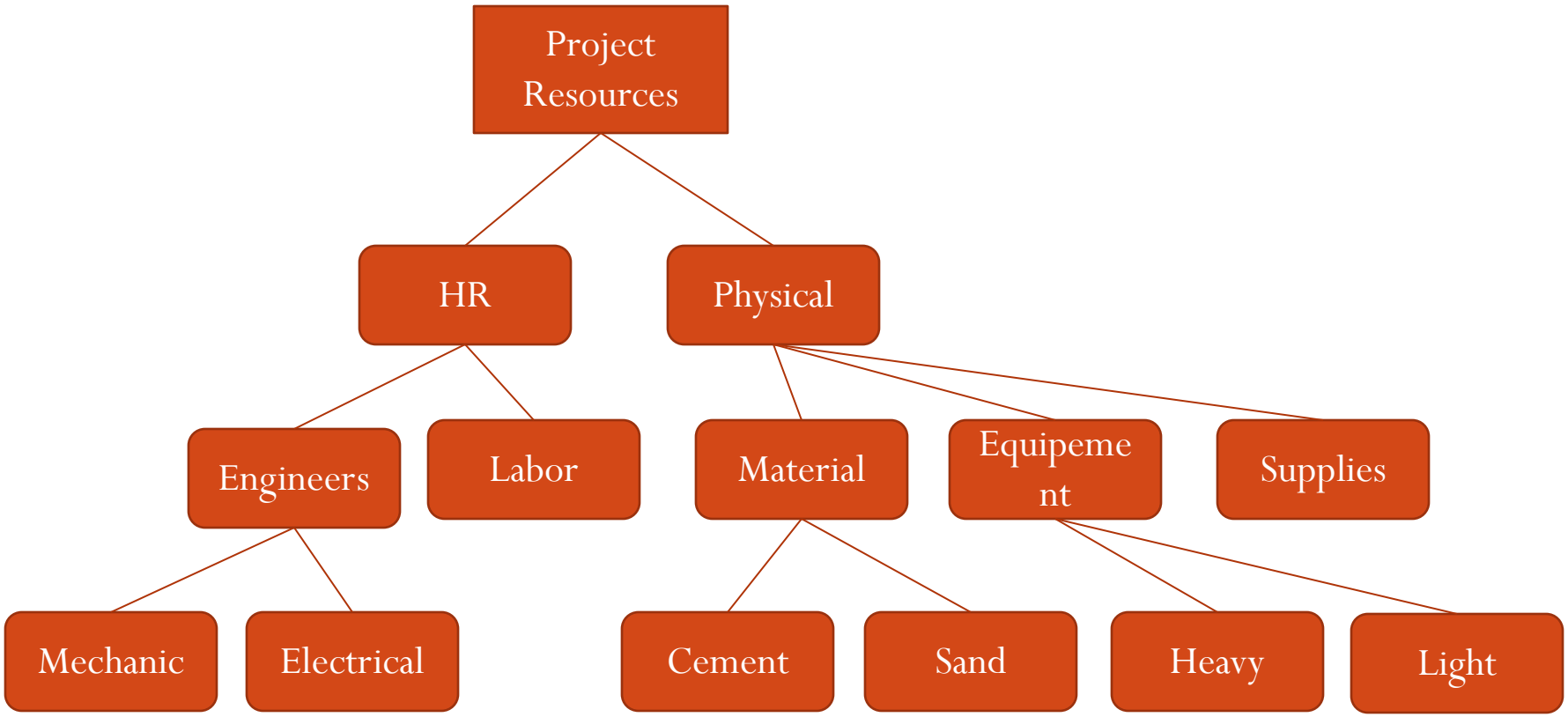
Tools and Techniques:

- Expert judgment
- Alternatives analysis
- Published estimating data
- Bottom-up estimating
- Project management software

Planning Process Group
Estimate Activity Resources

Outputs:

- Activity resource requirements
- Resource breakdown structure (RBS)
- Project documents update: includes but not limited to
  - Activity list
  - Activity attributes
  - Resource calendars


Project Resources
HR
Physical
Engineers
Labor
Material
Equipeme nt
Supplies
Mechanic
Electrical
Cement
Sand
Heavy
Light

Planning Process Group
Estimate Activity Durations

"the process of estimating the number of work periods needed to complete individual activities with estimated resources"

Planning Process Group
Estimate Activity Durations

Inputs:

- Schedule management plan
- Activity list
- Activity attributes
- Activity resource requirements
- Resource calendars
- Project scope statement
- Risk register
- Resource breakdown structure
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Estimate Activity Durations

Tools and techniques:

- Expert judgment
- Analogous estimating: uses parameters such as duration, budget and size from previous similar projects using historical information and expert judgment and is less accurate and less expensive
- Parametric estimating: uses a statistical relationship between historical data and other variables e.g. footage in construction
- Three point estimates to consider risk and uncertainty (PERT analysis):
  - Beta Distribution: time expected=(to+4tm+tp)/6
  - Standard deviation=(tp-to)/6
- Group decision-making techniques
- Reserve analysis: to include time reserves or buffers as a percentage to the whole project schedule or individual activities to account for uncertainty

Planning Process Group
Estimate Activity Durations

Outputs:

- Activity duration estimates: may include some indication of the range of possible results: 2w+/- 2d or as a percentage
- Project document updates: include and not limited to
  - Activity attributes
  - Assumptions

Planning Process Group
Estimate Activity Durations

Tips for the exam:

- One-time estimate (padding)
- Parametric analysis uses:
  - Regression analysis (scatter diagram)
  - Learning curve
- Heuristics (rule of thumb)

Planning Process Group
Develop Schedule

"the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model"

Planning Process Group
Develop Schedule

Inputs:

- Schedule management plan
- Activity list
- Activity attributes
- Project schedule network diagrams
- Activity resource requirements
- Resource calendars
- Activity duration estimates
- Project scope statement
- Risk register
- Project staff assignments
- Resource breakdown structure
- Enterprise environmental factors
- Organizational process assets

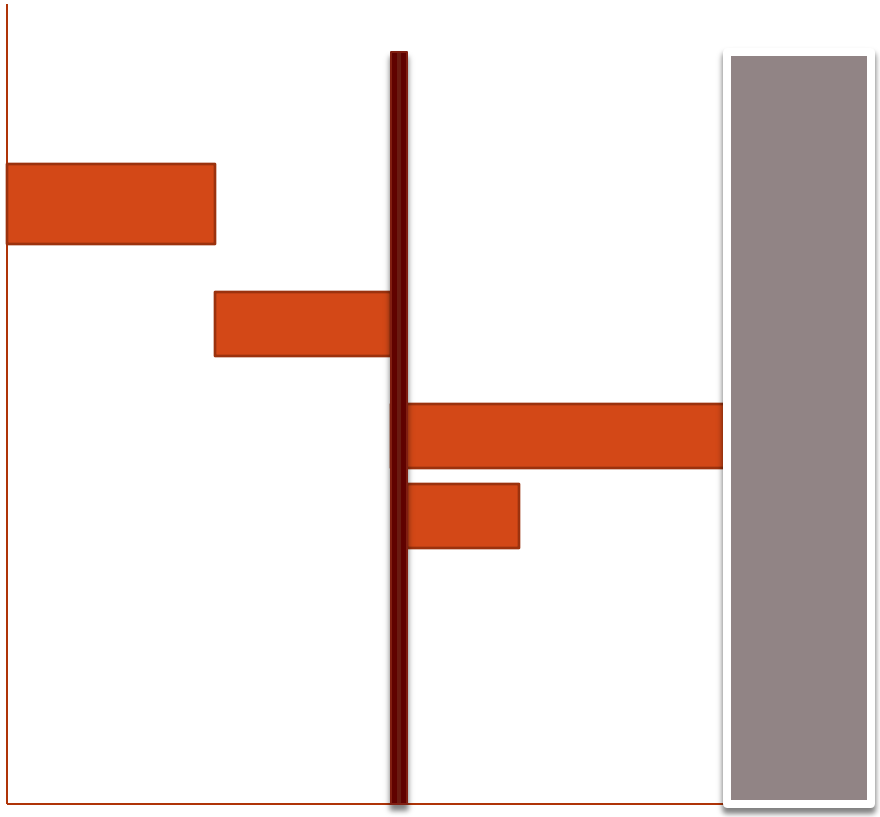
Planning Process Group
Develop Schedule

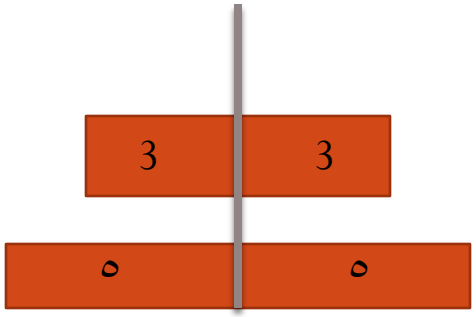
Tools and techniques:

- Schedule network analysis
- Critical path method
- Critical chain method
- Resource optimization techniques
  - Resource leveling.
  - Resource Smoothing.
- Modeling techniques
  - What-if scenario analysis
  - Simulation –Monte Carlo-
- Leads and lags
- Schedule compression
  - Crashing
  - Fast Tracking
- Scheduling tool

Murphy's Law
Student's Syndrome

Resource
Availability


Feeding
Buffer
Project
Buffer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5

Planning Process Group
Develop Schedule

Outputs:

- Schedule baseline
- Project schedule
  - Bar chart
  - Milestone chart
  - Project schedule network diagram
- Schedule data
  - Resource requirements by time period, often in the form of a resource histogram
  - Alternative schedules, such as best-case or worst-case, not resource-leveled, or resource-leveled, with or without imposed dates
  - Scheduling of contingency reserves.
- Project calendars
- Project management plan updates
- Project documents updates

Planning Process Group
Plan Cost Management

"the process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs"

Planning Process Group
Plan Cost Management

Inputs:

- Project management plan
- Project charter
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Cost Management

Tools & Techniques:

- Expert judgment
- Analytical techniques
- Meetings

Planning Process Group
Plan Cost Management

Outputs:

- Cost management plan
  - Level of accuracy
  - Units of measure
  - Organizational procedures links: a WBS CA is assigned a unique code or account number that links directly to the accounting system
  - Control thresholds
  - Rules of performance management:
    - Point of WBS at which measurements of CAs will be performed
    - Establish the EV measurements techniques
    - Specify the EVM equations to determine the EAC forecasts
  - Reporting formats and frequency
  - Other details

Planning Process Group
Estimate Costs

"The process of developing an approximation of monetary resources needed to complete project activities"

Planning Process Group
Estimate Costs

Inputs:

- Cost management plan
- Human resource management plan
- Scope baseline
- Project schedule
- Risk register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Estimate Costs

Tools and Techniques:

- Expert judgment
- Analogous estimating
- Parametric estimating
- Bottom-up estimating
- Three-point estimating
- Reserve analysis
- Cost of quality
- Project management software
- Vendor bid analysis
- Group decision-making techniques

Planning Process Group
Estimate Costs

Outputs:

- Activity cost estimates
- Basis of estimates
  - Documentation of the basis of the estimate (i.e., how it was developed),
  - Documentation of all assumptions made,
  - Documentation of any known constraints,
  - Indication of the range of possible estimates (e.g., €10,000 (±10%) to indicate that the item is expected to cost between a range of values), and
  - Indication of the confidence level of the final estimate.
- Project documents updates

Planning Process Group
Determine Budget

"The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline"

Planning Process Group
Determine Budget

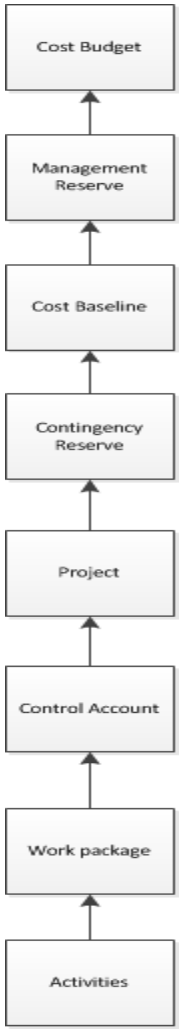
Inputs:

- Cost management plan
- Scope baseline
- Activity cost estimates
- Basis of estimates
- Project schedule
- Resource calendars
- Risk register
- Agreements
- Organizational process assets

Planning Process Group Determine Budget

Tools and techniques:

- ❖Cost aggregation
- ❖Reserve analysis
- ❖Expert judgment
- ❖Historical relationships that result in analogues or parametric estimates
- ❖Funding limit reconciliation

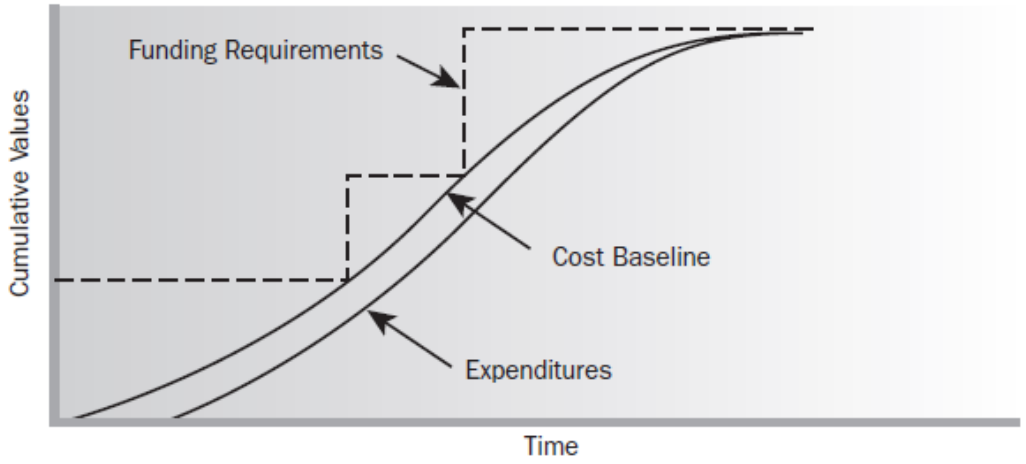


Project Budget=Project Estimated Cost+ Contingency Reserve+ Management Reserve

Planning Process Group
Determine Budget

Outputs:

- Cost performance baseline (performance measurement baseline PMB): an authorized time-phased budget at completion (BAC) used to measure, monitor, and control the overall cost performance on the project
- Project funding requirements
- Project documents update
  - Risk register
  - Cost estimates
  - Project schedule



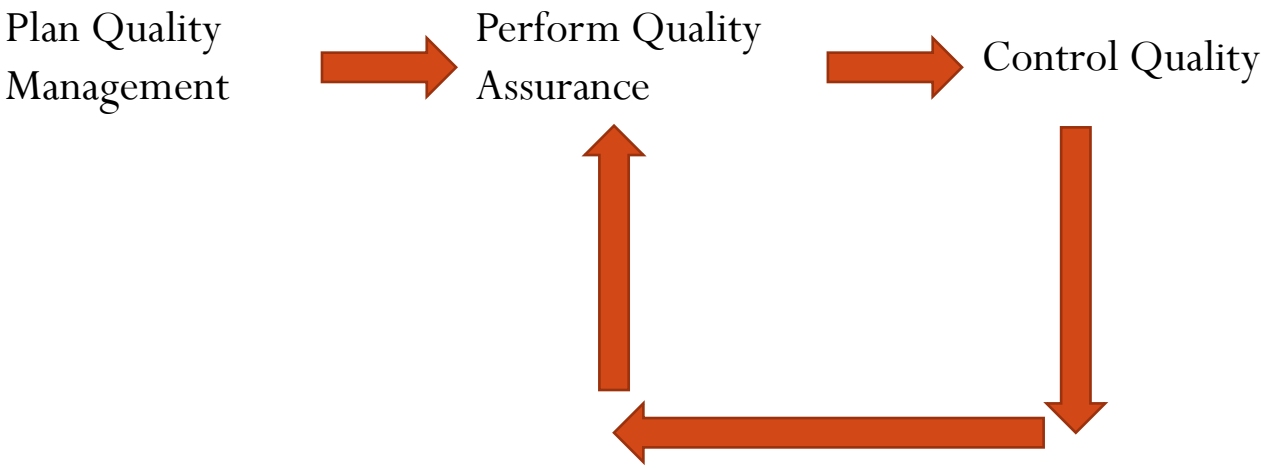
Planning Process Group
Determine Budget

Tips for the exam:

- Life cycle costing
- Value analysis (engineering)
- Cost risk
- Cost types: variable, fixed, direct and indirect
- Rough order of magnitude (ROM) -50% to 100% of the actual cost
- Definitive during the project -10% to +15% of actual cost

Planning Process Group
Introduction to Quality

- Quality and grade are not the same
- Precision and accuracy are not equivalent
- Quality standards:
  - Proprietary approaches; Deming, Juran, Crosby
  - Non-proprietary; TQM, Six Sigma, failure mode and effect analysis (FMEA), design reviews, VOC, COQ and continuous improvement
- It recognize the importance of:
  - Customer satisfaction
  - Prevention over inspection
  - Continuous improvement: plan-do-check-act cycle
  - Management responsibility
  - Cost of Quality (COQ)


Plan Quality Management
Perform Quality Assurance
Control Quality

Planning Process Group
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 relevant quality requirements"

Planning Process Group
Plan Quality Management

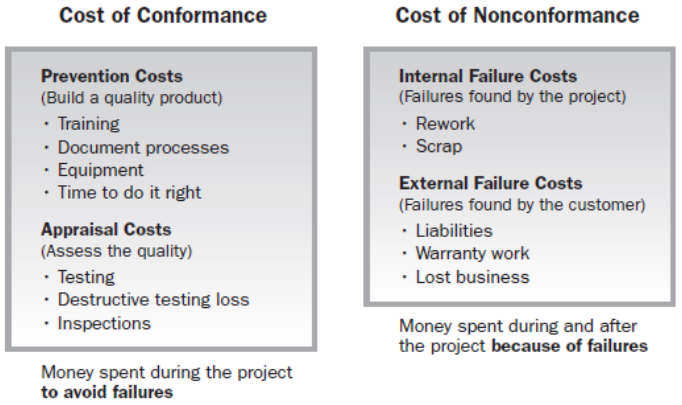
Inputs:

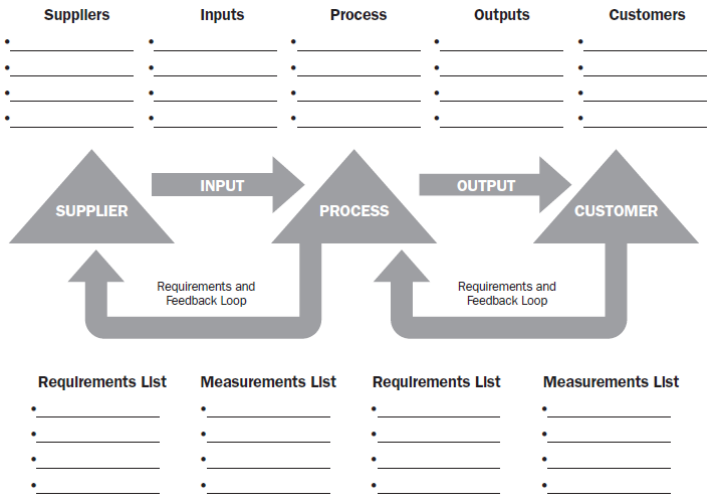
- Project management plan
- Stakeholder register
- Risk register
- Requirements documentation
- Enterprise environmental factors
- Organizational process assets

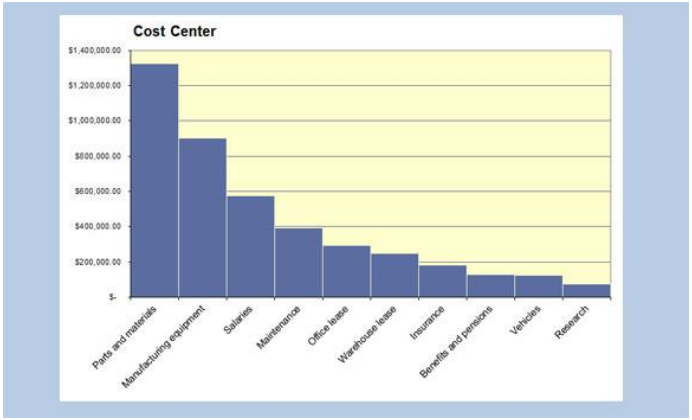
Planning Process Group
Plan Quality Management

Tools and techniques:

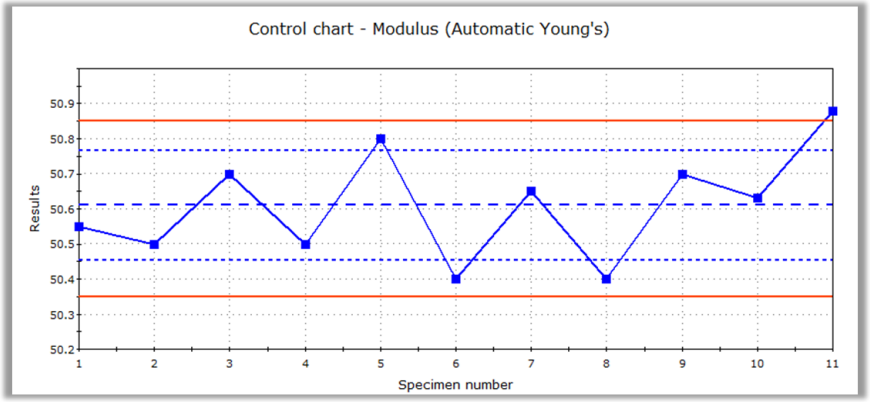
- Cost-benefit analysis: COQ compared to benefits
- Cost of quality COQ:
- Seven Basic Quality Tools:
  - Cause & Effect Diagrams
  - Flowcharts (The SIPOC Model)
  - Checksheets
  - Pareto Diagrams
  - Histograms
  - Control Charts
  - Scatter Diagrams
- Benchmarking
- Design of Experiments
- Statistical Sampling
- Additional Quality Planning Tools:
  - Brainstorming
  - Force Field Analysis
  - Nominal Group Technique
  - Meetings




Suppliers
Inputs
Process
Outputs
Customers
SUPPLIER
INPUT
PROCESS
OUTPUT
CUSTOMER
Requirements and Feedback Loop
Requirements and Feedback Loop
Requirements List
Measurements List
Requirements List
Measurements List


Cost Center
$1,400,000.00
$1,200,000.00
$1,000,000.00
$800,000.00
$600,000.00
$400,000.00
$200,000.00
$-
Parts and materials
Manufacturing equipment
Salaries
Maintenance
Office lease
Warehouse lease
Insurance
Benefits and pensions
Vehicles
Research


Ishikawa Diagram
book sales dropping
competition
tablets
e-book
social media
internet
television
games
overkill
books
bookstores
publishers
self-publishing
reading decline
abundance
quality
books
ability
campaign
price
crisis
politics
costs
"reform"
business model
lacking innovation
dilemma
customers
etc
technologies
"new"
economics
strategy


Control chart - Modulus (Automatic Young's)
Results
50.9
50.8
50.7
50.6
50.5
50.4
50.3
50.2
1
2
3
4
5
6
7
8
9
10
11
Specimen number

Planning Process Group
Plan Quality Management

Tools and techniques:

- Cost-benefit analysis: COQ compared to benefits
- Cost of quality COQ:
- Seven Basic Quality Tools:
  - Cause & Effect Diagrams
  - Flowcharts (The SIPOC Model)
  - Checksheets
  - Pareto Diagrams
  - Histograms
  - Control Charts
  - Scatter Diagrams
- Benchmarking
- Design of Experiments
- Statistical Sampling
- Additional Quality Planning Tools:
  - Brainstorming
  - Force Field Analysis
  - Nominal Group Technique
  - Meetings

Planning Process Group
Plan Quality Management

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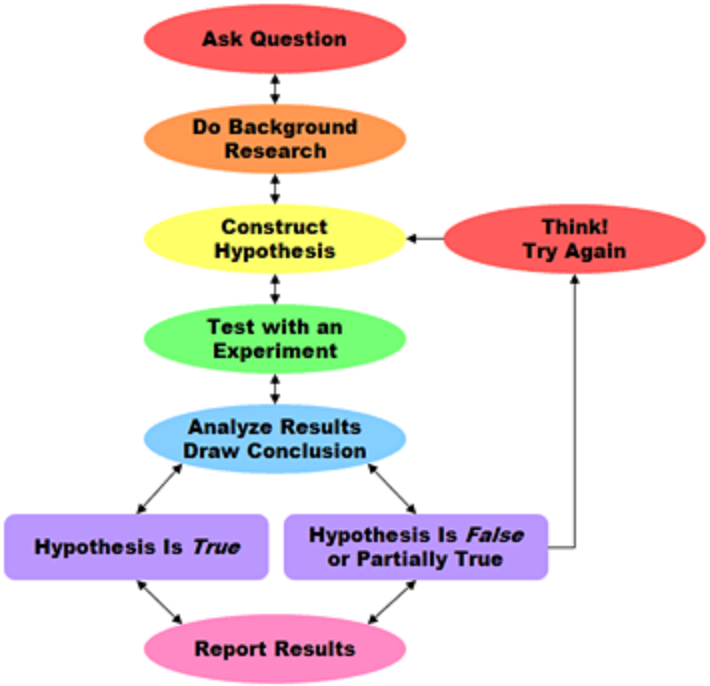

Planning Process Group
Plan Quality Management

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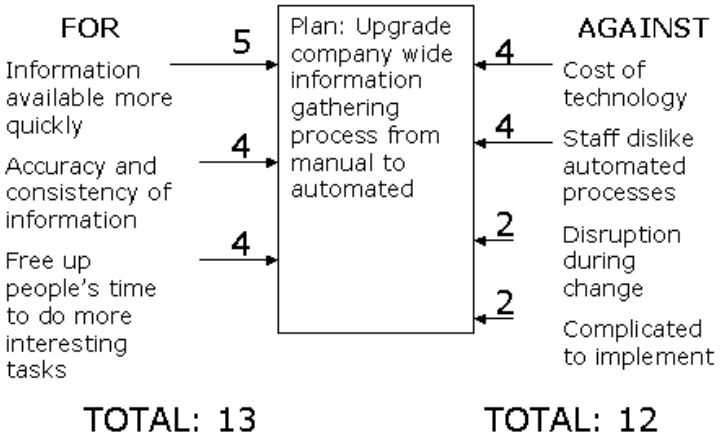


Planning Process Group
Plan Quality Management

Outputs:

- Quality management plan
- Quality metrics
- Quality checklists
- Process improvement plan
  - Process boundaries
  - Process configuration
  - Process metrics
  - Targets for improved performance
- Project documents updates:
  - Stakeholder register
  - Responsibility Assignment Matrix (RAM)

Planning Process Group
Plan HR Management

"the process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan"

Planning Process Group
Plan HR Management

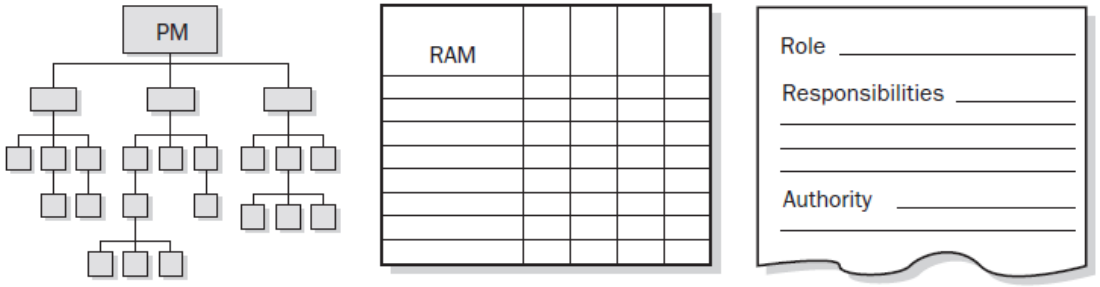
Inputs:

- Project Management Plan
- Activity resource requirements
- Enterprise environmental factors
  - Organization culture and structure
  - Existing human resources
  - Personnel administration policies
  - Market place conditions
- Organizational process assets:
  - Organizational standards policies & procedures
  - Templates for organizational charts and position descriptions
  - Historical information on organizational structure that have worked in previous projects

Planning Process Group
Plan HR Management

Tools and techniques:

- Organization charts and position descriptions
- Networking (Networking is the formal and informal interaction with others in an organization, industry, or professional environment)
- Organizational theory
- Expert judgment
- Meetings



Hierarchical-type Organization Chart | Matrix-based Responsibility Chart | Text-oriented Format

Planning Process Group
Plan HR Management

Outputs:

- Human resource Management plan:
  - Roles & responsibilities (roles, responsibilities, competencies, authority)
  - Project organizational charts
  - Staffing management plan
    - Staff acquisition
    - Resource calendars
    - Staff release plan
    - Training needs
    - Recognition and rewards
    - Compliance
    - Safety

Planning Process Group
Plan Communications Management

"The process of developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements, and available organizational assets"

Planning Process Group
Plan Communications Management

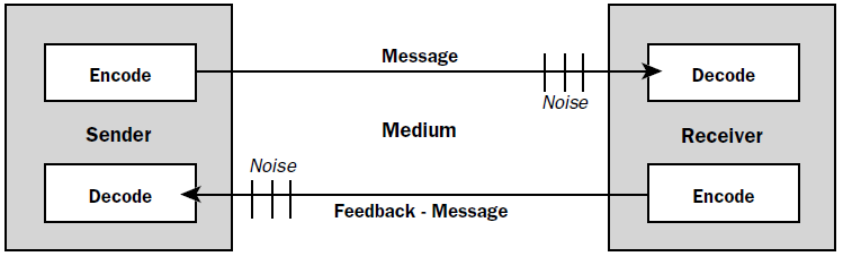
Inputs:

- Project management plan
- Stakeholder register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Communications Management

Tools and techniques:

- Communication requirements analysis: communication channels n(n-1)/2
- Communication technology:
  - Urgency of the need of information
  - Availability of technology
  - Ease of use
  - Sensitivity and confidentiality of the information.
  - Project environment : virtual environment
- Communication models
- Communication methods:
  - Interactive communication
  - Push communication
  - Pull communication
- Meetings



Planning Process Group
Plan Communications Management

Outputs:

- Communication management plan: such as
  - Information to be communicated including language, content, format and level of detail
  - Person responsible of release of confidential information
  - Resources allocated for communication activities including budget and time
  - Communication constraints
  - Glossary of common terminology
- Project documents update

Planning Process Group
Plan Risk Management

Introduction:

- Definition of Risk.
- Risk appetite.
- Risk tolerance
- Risk threshold

An organization's risk attitude may include its appetite for uncertainty, its threshold for risk levels that are unacceptable, or its risk tolerance at which point the organization may select a different risk response.

Planning Process Group
Plan Risk Management

"To define how to conduct risk management activities for a project"

Planning Process Group
Plan Risk Management

Inputs:

- Project management plan
- Project charter
- Stakeholder register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Risk Management

Tools and techniques:

- Analytical techniques
- Expert judgment
- Meetings

Planning Process Group
Plan Risk Management

Outputs:

- Risk management plan:
  - Methodology
  - Roles and responsibilities
  - Budgeting
  - Timing
  - Risk categories
  - Definition of risk probability and impact
  - Probability and impact matrix
  - Revised stakeholders' tolerance
  - Reporting formats
  - Tracks

Planning Process Group
Identify Risks

"To determine which risks may affect the project and documenting their characteristics"

Planning Process Group
Identify Risks

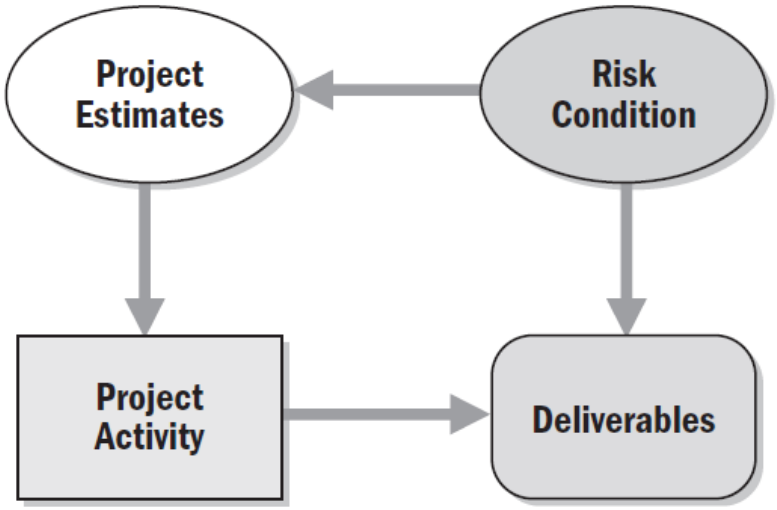
Inputs:

- Risk management plan
- Cost management plan
- Schedule management plan
- Quality management plan
- Human resource management plan
- Scope baseline
- Activity cost estimates
- Activity duration estimates
- Stakeholder register
- Project documents
- Procurement documents
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Identify Risks

Tools and techniques:

- Documentation reviews
- Information gathering techniques
  - Brainstorming
  - Delphi Techniques
  - Interviewing
  - Root Cause Analysis
- Checklist analysis
- Assumptions analysis
- Diagramming techniques
  - Cause and effect diagrams
  - System or process flow charts
  - Influence diagrams
- SWOT analysis
- Expert judgment



Planning Process Group
Identify Risks

Outputs:

- Risk register:
  - List of identified risks (if CAUSE an EVENT will take place with an EFFECT or IMPACT
  - List of potential responses

Planning Process Group
Perform Qualitative Risk Analysis

"To prioritize risks for further analysis or actions by assessing and combining their probability of occurrence and impact"

Planning Process Group
Perform Qualitative Risk Analysis

Inputs:

- Risk management plan
- Scope baseline
- Risk register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Perform Qualitative Risk Analysis

Tools and techniques:

- ❖Risk probability and impact assessment
- ❖Probability and impact matrix
- ❖Risk data quality assessment
- ❖Risk categorization
- ❖Risk urgency assessment
- ❖Expert judgment

Risk	Probability	Impact	Severity
R1	25%	4	1
R2	50%	3	1.5
R3	70%	2	1.4

Impact →	1	2	3	4	5
Probability ↓	Negligible	Minor	Moderate	Significant	Severe
(81-100)%	Low Risk	Moderate Risk	High Risk	Extreme Risk	Extreme Risk
(61-80)%	Minimum Risk	Low Risk	Moderate Risk	High Risk	Extreme Risk
(41-60)%	Minimum Risk	Low Risk	Moderate Risk	High Risk	High Risk
(21-40)%	Minimum Risk	Low Risk	Low Risk	Moderate Risk	High Risk
(1-20)%	Minimum Risk	Minimum Risk	Low Risk	Moderate Risk	High Risk

Planning Process Group
Perform Qualitative Risk Analysis

Outputs:

- Project Documents Update
  - Risk register updates
  - Assumptions log updates

Planning Process Group
Perform Quantitative Risk Analysis

"the process of numerically analyzing the effect of the identified risks on the overall project objectives"

Planning Process Group
Perform Quantitative Risk Analysis

Inputs:

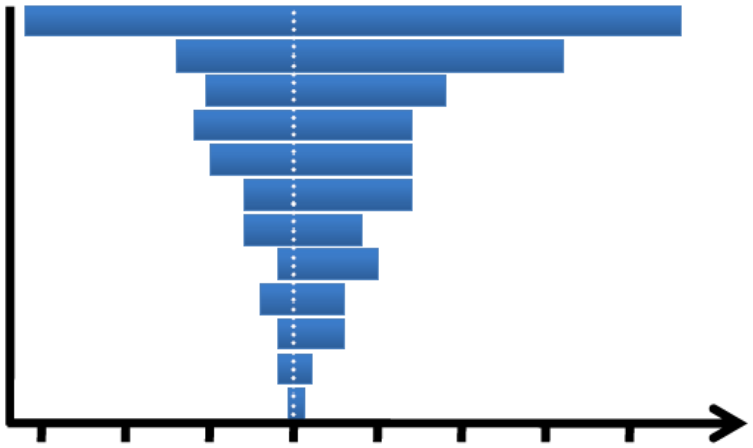
- Risk management plan
- Cost management plan
- Schedule management plan
- Risk register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Perform Quantitative Risk Analysis

Tools and techniques:

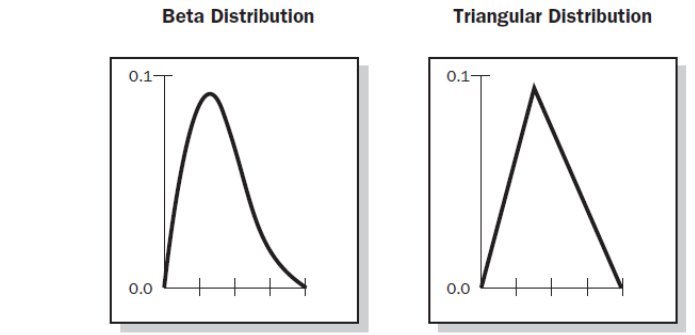
- Data gathering and representation techniques:
  - Interviewing
  - Probability distribution
- Quantitative risk analysis and modeling techniques
  - Sensitivity analysis (Tornado Diagram)
  - Expected monetary value (EMV)analysis
  - Modeling and simulation

  Monte Carlo Techniques
- Expert judgment

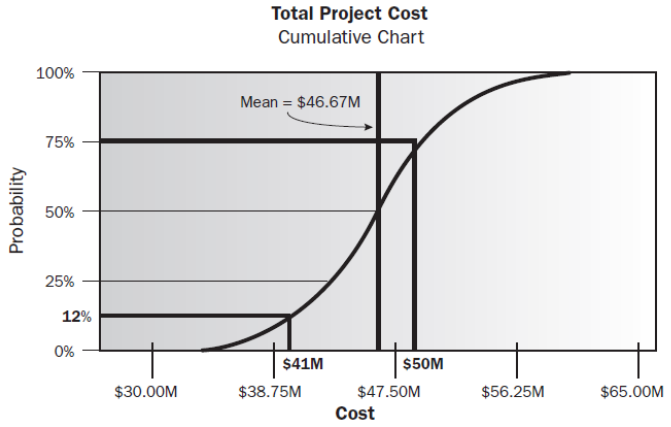


Planning Process Group
Perform Quantitative Risk Analysis

Risk	Probability	Impact on Cost	Impact on Time
Risk 1	20%	+10,000 usd	+2 weeks
Risk2	50%	+5000 usd	+1 week
Risk3	70%	+ 7000 usd	+ 3 weeks
Risk (1,2,3)	7%	+ 22,0000 usd	+ 6 weeks



Beta and triangular distributions are frequently used in quantitative risk analysis. The data shown in the figure on the left (Beta Distribution) is one example of a family of such distributions determined by two "shape parameters". Other commonly used distributions include the uniform, normal and lognormal. In these charts the horizontal (X) axes represent possible values of time or cost and the vertical (Y) axes represent relative likelihood.



Project A: 60% probability of success
40% probability of failure
If succeeded 100,000 USD profit is made
If failed 70,000 USD loss is incurred

Project B: 70% probability of success
30% probability of failure
If succeeded 80,0000 USD profit is made
If failed 50,000 USD of loss is incurred

EMV (A)= 60% X 100,000 – 40% X 7,0000 = 32,000 USD
EMV (B)= 70% X 80,000 – 30% X 50,000 = 41,000 USD

Planning Process Group
Perform Quantitative Risk Analysis

Outputs:

- Project Documents Update:
  - Probabilistic analysis of the project.
  - Probability of achieving cost and time objectives.
  - Prioritized list of quantified risks.
  - Trends in quantitative risk analysis results.

Planning Process Group
Plan Risk Responses

“the process of developing options to enhance opportunities and reduce threats to projects objectives”

Planning Process Group
Plan Risk Responses

Inputs:

- Risk register
- Risk management plan

Planning Process Group
Plan Risk Responses

Tools and techniques:

- Strategies for negative threats or risks
  - Avoidance
  - Transference
  - Mitigation
  - Acceptance: negative and positive
- Strategies for positive risks or opportunities
  - Exploit
  - Share
  - Enhance
  - Accept
- Contingent response strategy
- Expert judgment

Planning Process Group
Plan Risk Responses

Outputs:

- Project management plan updates
  - Schedule management plan.
  - Cost management plan.
  - Scope baseline
  - Schedule baseline
  - Cost baseline.
- Project documents updates:
  - Risk owners and assigned responsibilities;
  - Agreed-upon response strategies;
  - Specific actions to implement the chosen response strategy;
  - Trigger conditions, symptoms, and warning signs of a risk occurrence;
  - Budget and schedule activities required to implement the chosen responses;
  - Contingency plans and triggers that call for their execution;
  - Fallback plans for use as a reaction to a risk that has occurred and the primary response proves to be inadequate;
  - Residual risks that are expected to remain after planned responses have been taken, as well as those that have been deliberately accepted;
  - Secondary risks that arise as a direct outcome of implementing a risk response; and Contingency reserves that are calculated based on the quantitative risk analysis of the project and the organization's risk thresholds.

Planning Process Group
Plan Procurement Management

"the process of documenting project purchasing decisions, specifying the approach and identifying potential sellers"

Planning Process Group
Plan Procurement Management

Inputs:

- Project management plan
  - Scope Statement
  - WBS
  - WBS Dictionary
- Requirements documentation
- Risk register
- Activity resource requirements
- Project schedule
- Activity cost estimates
- Stakeholder register
- Enterprise environmental factors
- Organizational process assets

Planning Process Group
Plan Procurement Management

- Contract types:
  - Fixed price contracts:
    - Firm fixed price contracts (FFP)
    - Fixed price incentive fees contracts (FPIF)
    - Fixed price with economic price adjustment contracts (FP-EPA)
  - Cost reimbursable contracts:
    - Cost plus fixed fee (CPFF)
    - Cost plus incentive fee (CPIF)
    - Cost plus award fee (CPAF)
  - Time and material contracts (T & M)

Planning Process Group
Plan Procurement Management

Tools and techniques:

- Make-or-buy analysis
- Expert judgment
- Market research
- Meetings

Planning Process Group
Plan Procurement Management

Outputs:

- Procurement management plan
  - Types of contracts to be used
  - Risk management issues
  - Whether independent estimates will be used
  - The actions that the project team can take unilaterally
  - Standardized procurements documents
  - Managing multiple suppliers
  - Coordinating procurements with other project aspects
  - Procurement metrics
  - Identifying pre-qualified sellers
- Procurement statement of work
- Make-or-buy decisions
- Procurements documents
- Source selection criteria: such as
  - Understanding of need
  - Overall or life—cycle cost
  - Technical capability
  - Risk
  - Management approach
  - Technical approach
- Change requests
- Project Documents Update