



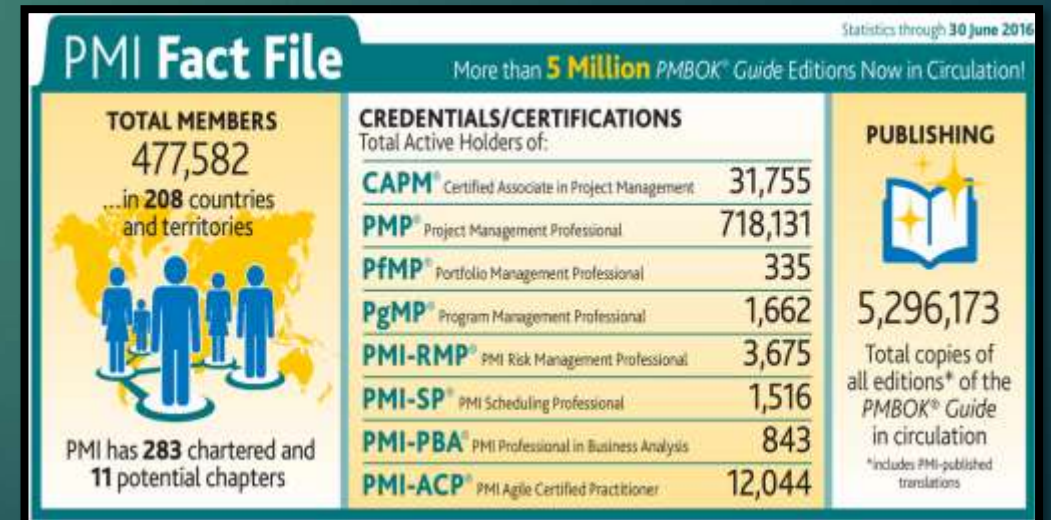
PMP Training Course

PRESENTED BY ENG. HAITHAM WAHID ,PMP

Why PMP



- ▶ Researches Show:
 1. Average project cost overrun (over budget) is 43%
 2. 15% of projects will be canceled before they ever get completed
 3. ONLY 34% of software projects are completed on-time and on-budget



Qualifying for the PMP® Exam



- ▶ To qualify to take the PMP® Exam, at a minimum, you must have a secondary diploma (high school or the global equivalent), 35 hours of project management training/education and, in the last 8 years either:
 - ▶ Three (3) years of project management experience with a bachelor's degree
- or
- ▶ Five (5) years of project management experience without a bachelor's degree

PMBOK History



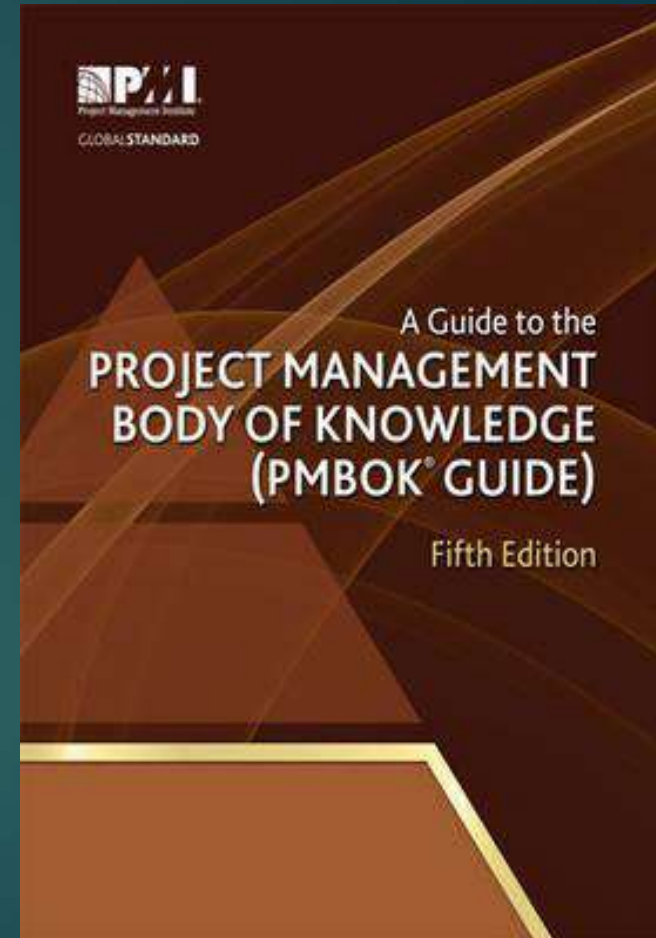
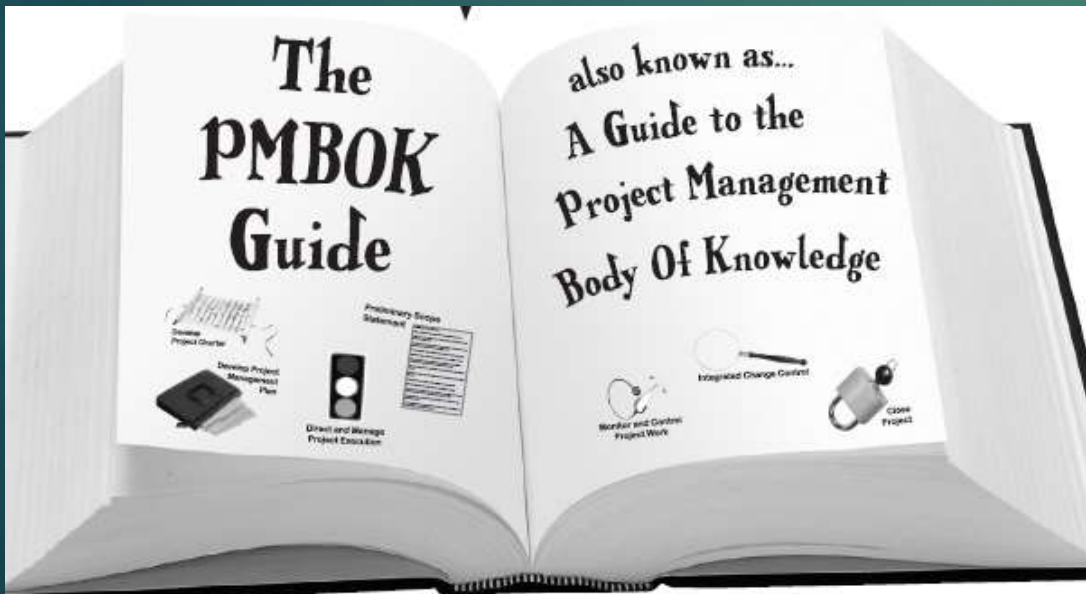
PMBOK® GUIDE FILMSTRIP

Timeline of "A Guide to Project Management Body of Knowledge" by PMI

1996	2000	2004	2009	2013	2017
1 st Edition	2 nd Edition	3 rd Edition	4 th Edition	5 th Edition	6 th Edition (2 Volumes)
176 Pages	211 Pages	390 Pages	467 Pages	589 Pages	976 Pages
9 Knowledge Areas	9 Knowledge Areas	9 Knowledge Areas	9 Knowledge Areas	10 Knowledge Areas	10 Knowledge Areas
37 Processes	39 Processes	44 Processes	42 Processes	47 Processes	49 Processes

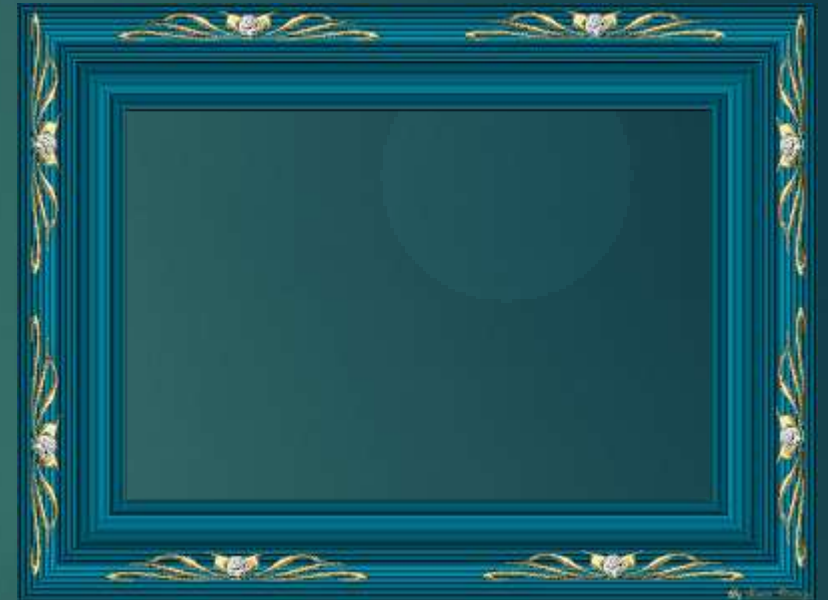
Reference

- ▶ **Listen** - **Read** - **Record** and **Practice**.
- ▶ PMBOK (Project Management Body Of Knowledge)
- ▶ Reference manual for PM professionals
- ▶ Basis for certification examination



2- Framework

- ▶ 1. What is a Project & Project Management
- ▶ 2. Difference between Project & Operation
- ▶ 3. Relation between Project ,Program, Portfolio
- ▶ 4. What is PMO
- ▶ 5. Types of Organizational Structure
- ▶ 6. OPA & EEF
- ▶ 7. Project Life Cycle
- ▶ 8. Project Stakeholders
- ▶ 9. The project constraints
- ▶ 10. PMBOK 5th Edition Structure
- ▶ 11. Project Selection Methods



1. What is a Project



- ▶ A Project is a **temporary** endeavor undertaken to create a **unique** product or service or result.

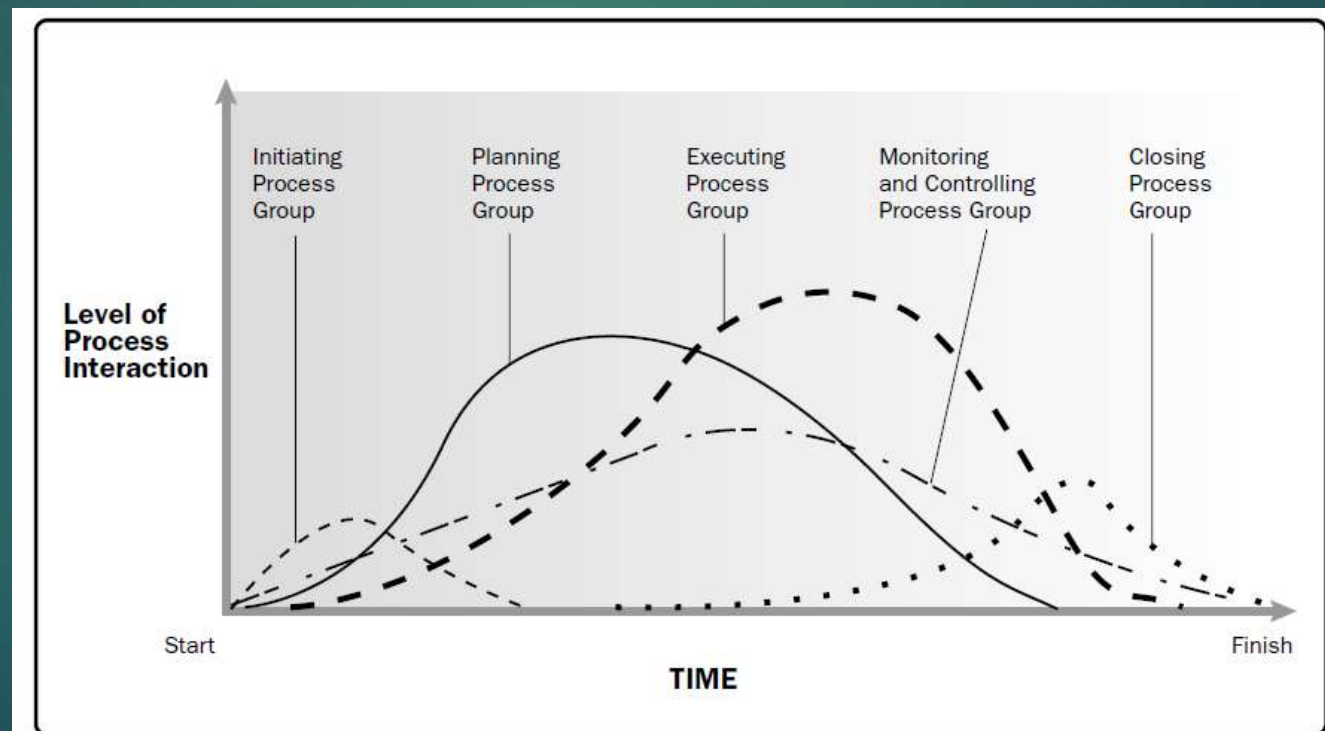


Figure 3-2. Process Groups Interact in a Phase or Project

LIFE IS A PROJECT



Project Management (life skills)

- ▶ **Project Management** is an iterative approach and is progressively elaborated (detailed) through the project life cycle as more information become available.
- ❑ It is the application of **Knowledge+Skills+T&T** to meet project requirements (**Objective**).
- ❑ PM skills along with business analysis & leadership are most wanted (Top three).
- ❑ About 15 M Jobs are required by the end of 2020.
- ❑ Eliminate “reinventing the Wheel” & “Duplication of efforts”





2. Difference between Project & Operation

PROJECTS	OPERATIONS
Temporary- Has a beginning and an end	On-going
Produces unique product(s), capabilities or results	Produces standard products or repetitive service
Ends when its objectives have been met or when the project is terminated	Does not end but is generally a repetitive process - following organization's existing procedures
Purpose is to meet objectives and then complete	Purpose is to sustain the business

► Similarities:

- 1) Both performed by people
- 2) Both constrained by limited resources
- 3) Both planned, executed, and controlled



Making a birdhouse

☐

Operation

☐

Project

Changing your air filters every six months

☐

Operation

☐

Project

Running an assembly line in a toy factory

☐

Operation

☐

Project

Organizing a large conference

☐

Operation

☐

Project

Going to the gym three times a week

☐

Operation

☐

Project

3. Relation between Project ,Program, Portfolio



Portfolio	Group of programs, projects, sub-portfolios, and operations (not necessarily interdependent). Focus is <u>on achieving strategic objectives of the organization</u> . Selects the right projects and programs, prioritizes the work, and provides the needed resources.
Program	Group of related projects and additional work. Goal is <u>to obtain benefits and control not available if projects are managed separately</u> . Manages the interdependencies between projects.
Project	Deliverable management.

Business value is the sum of all of the things your company is made of, from desks and chairs to people and the intellectual property they produce.

4. What is PMO

- **Project Management office (PMO)** is a structure within the organization that can provide governance of the project and aids in the sharing of resources (people, knowledge, etc.) across projects.

PMO type	Role	Level of control
Supportive	Consulting: Templates Project repository	Low
Controlling	Compliance: Project management framework Conformance to methodologies	Moderate
Directive	Controlling: PMO manages projects	High

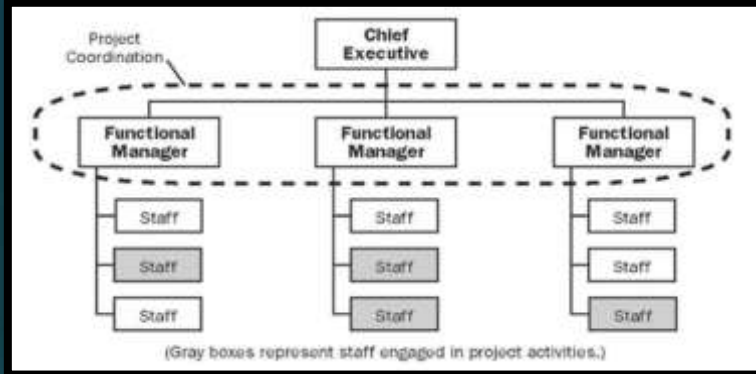


5. Types of Organizational Structure

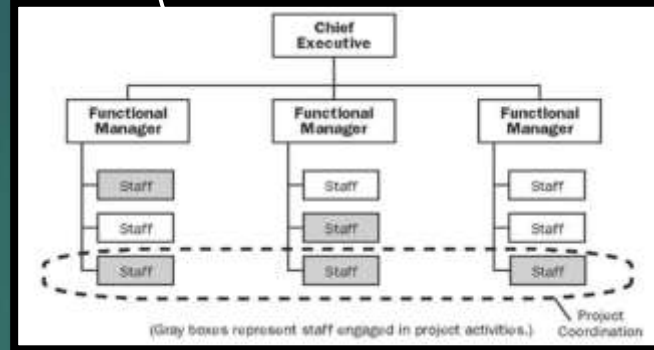
- ▶ The culture of your organization influences your project and the likelihood of success of your project. The organizational structure influences the culture and the culture influences the structure. (EEF)



▶ Functional



Matrix (Weak-Balanced-Strong)



Projectized

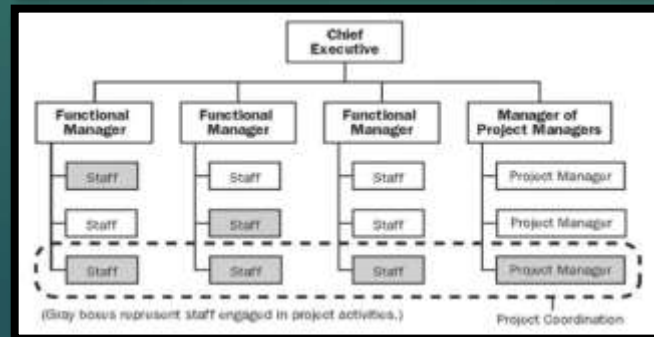
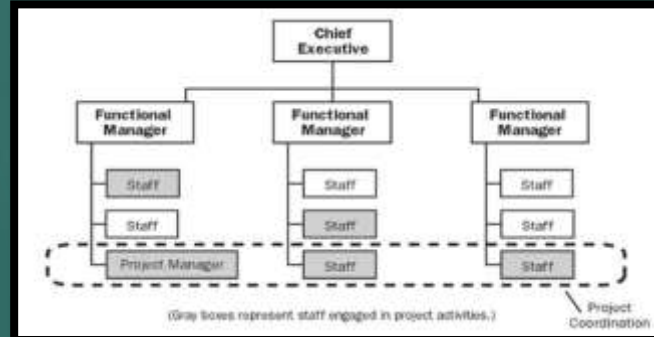
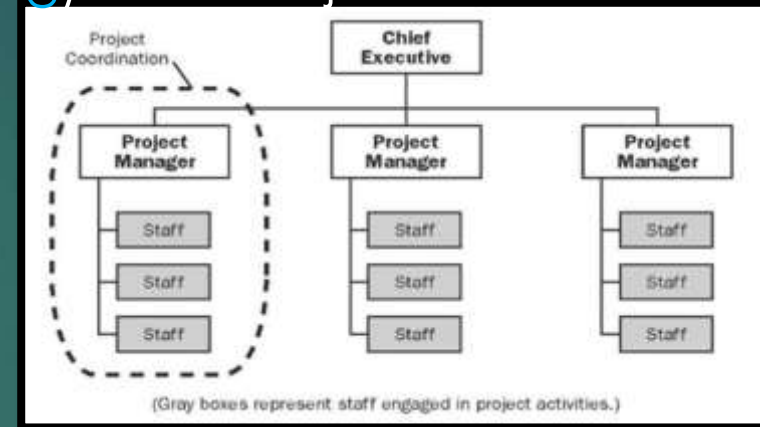




Table 2-1. Influence of Organizational Structures on Projects

<div> <div>Organization Structure</div> <div>Project Characteristics</div> </div>	Functional	Matrix			Projectized
		Weak Matrix	Balanced Matrix	Strong Matrix	
Project Manager's Authority	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Resource Availability	Little or None	Low	Low to Moderate	Moderate to High	High to Almost Total
Who manages the project budget	Functional Manager	Functional Manager	Mixed	Project Manager	Project Manager
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

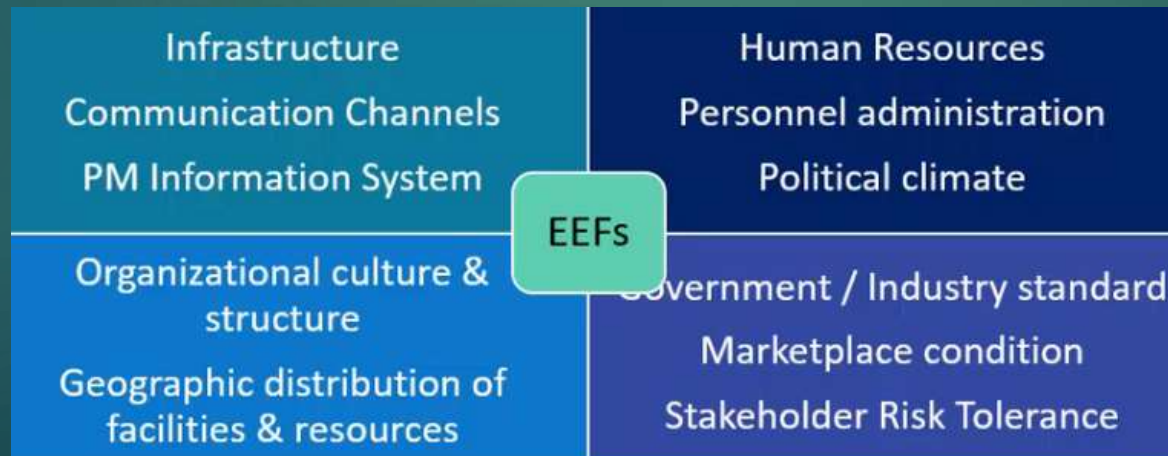


You're the project manager for an industrial design project. Your team members report to you, and you're responsible for creating the budget, building the schedule, and assigning the tasks. When the project is complete, you release the team so they can work on other projects for the company. What kind of organization do you work in?

- A. Functional
- B. Weak matrix
- C. Strong matrix
- D. Projectized

6. EEF & OPA

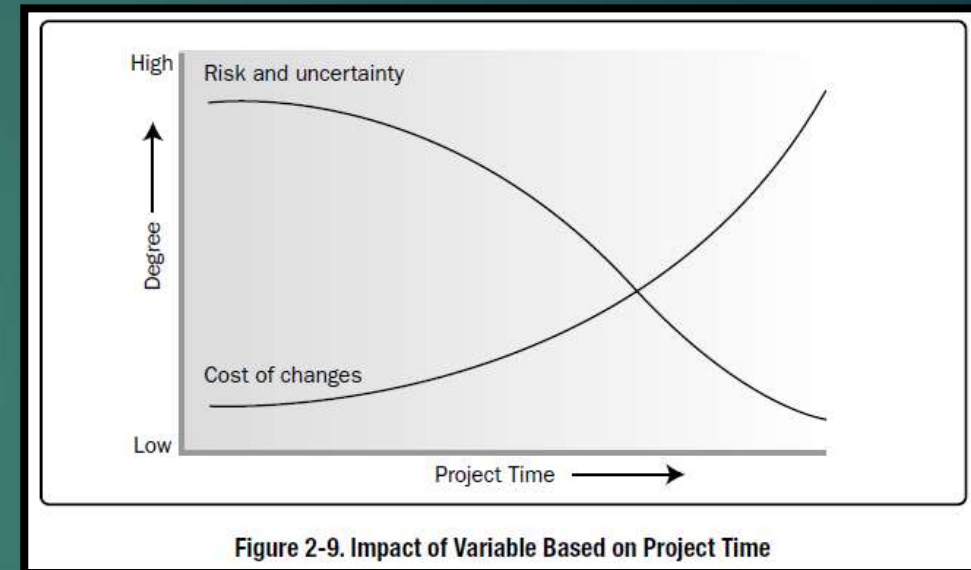
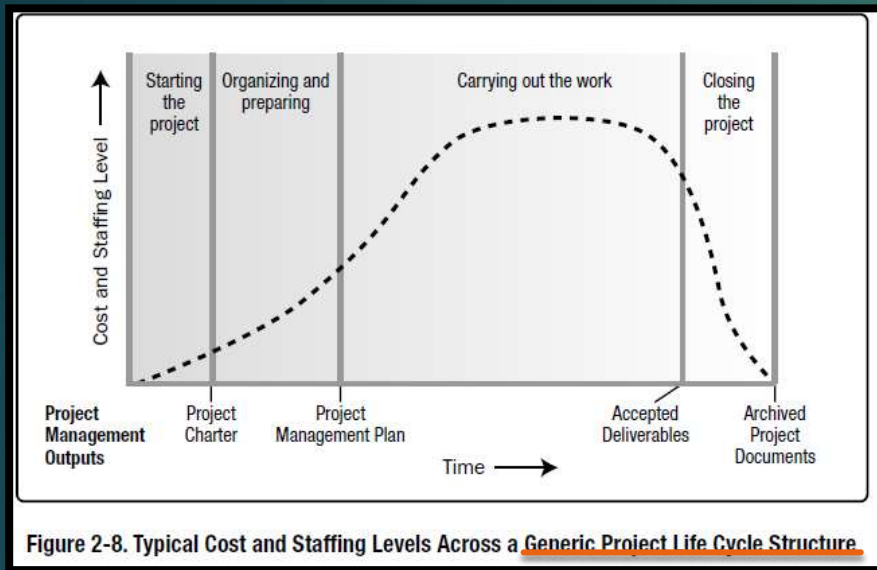
Enterprise Environmental Factors	Organizational Process Assets
May be Internal or external, conditions not under the control of the project team that influence, constrain, or direct the project	Plans, processes, policies, procedures, organizational knowledge bases
Examples include: organizational culture, marketplace conditions, stakeholder risk tolerances, project management information system (<u>PMIS</u>), systems	Examples include: processes, templates, guidelines, project files, <u>historical information and lessons learned</u> .



7. Project Life Cycle



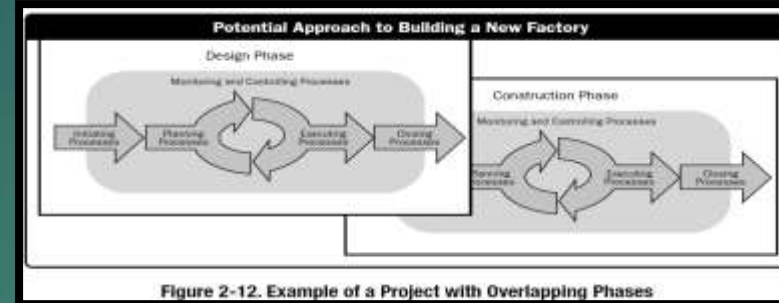
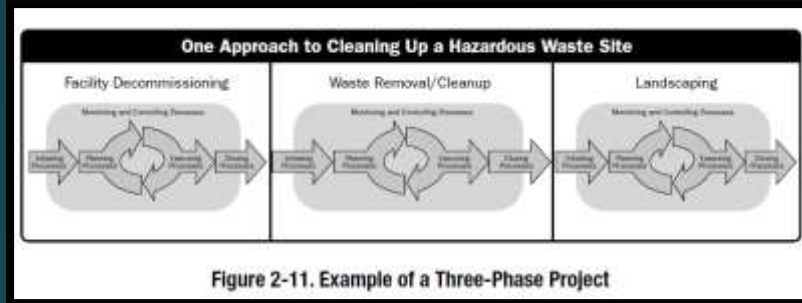
- It is the series of **phases** that a project passes through from its **initiation** to its **closure**.



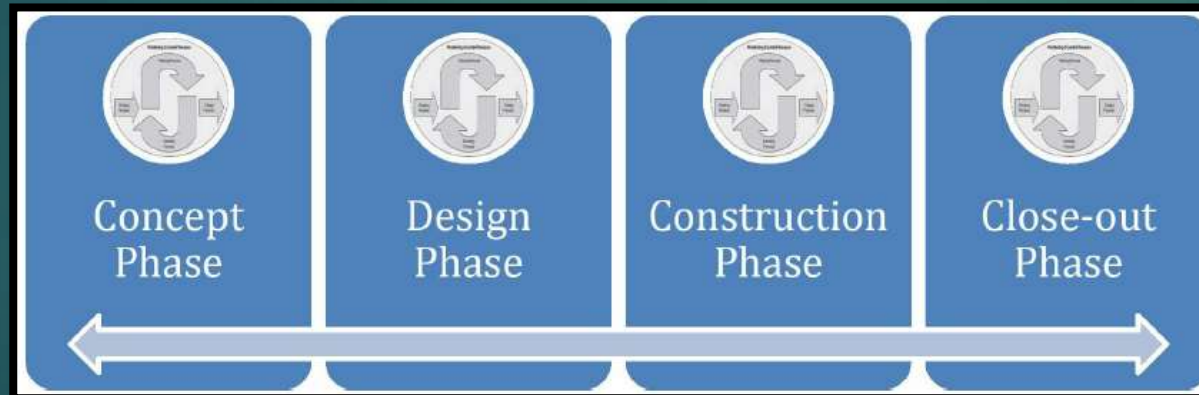
Cost of changes	Low at the start and gets progressively higher
Cost and Staffing Levels	Low at the start, peak during intermediate phases, drops off quickly
Stakeholder influence, risk and uncertainty	High at the start and gets progressively lower

► Project Phases (Sequential & overlapping)

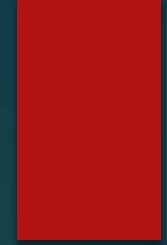
- Team works in parallel: The more Rework, the more risk.



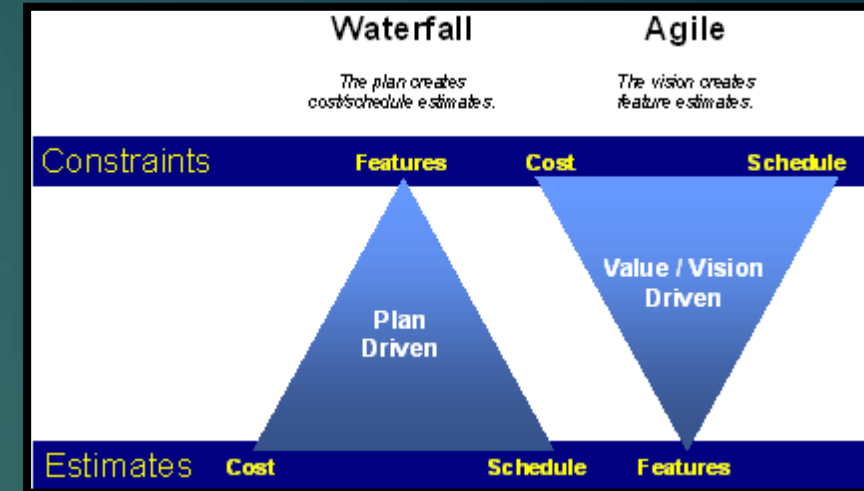
- Project Phases and Project Process Groups are **not** the same thing.
- The five (5) process groups are repeated in each of the phases.



➤ Predictive, Iterative Incremental and Adaptive Life Cycle (agile/scrum)



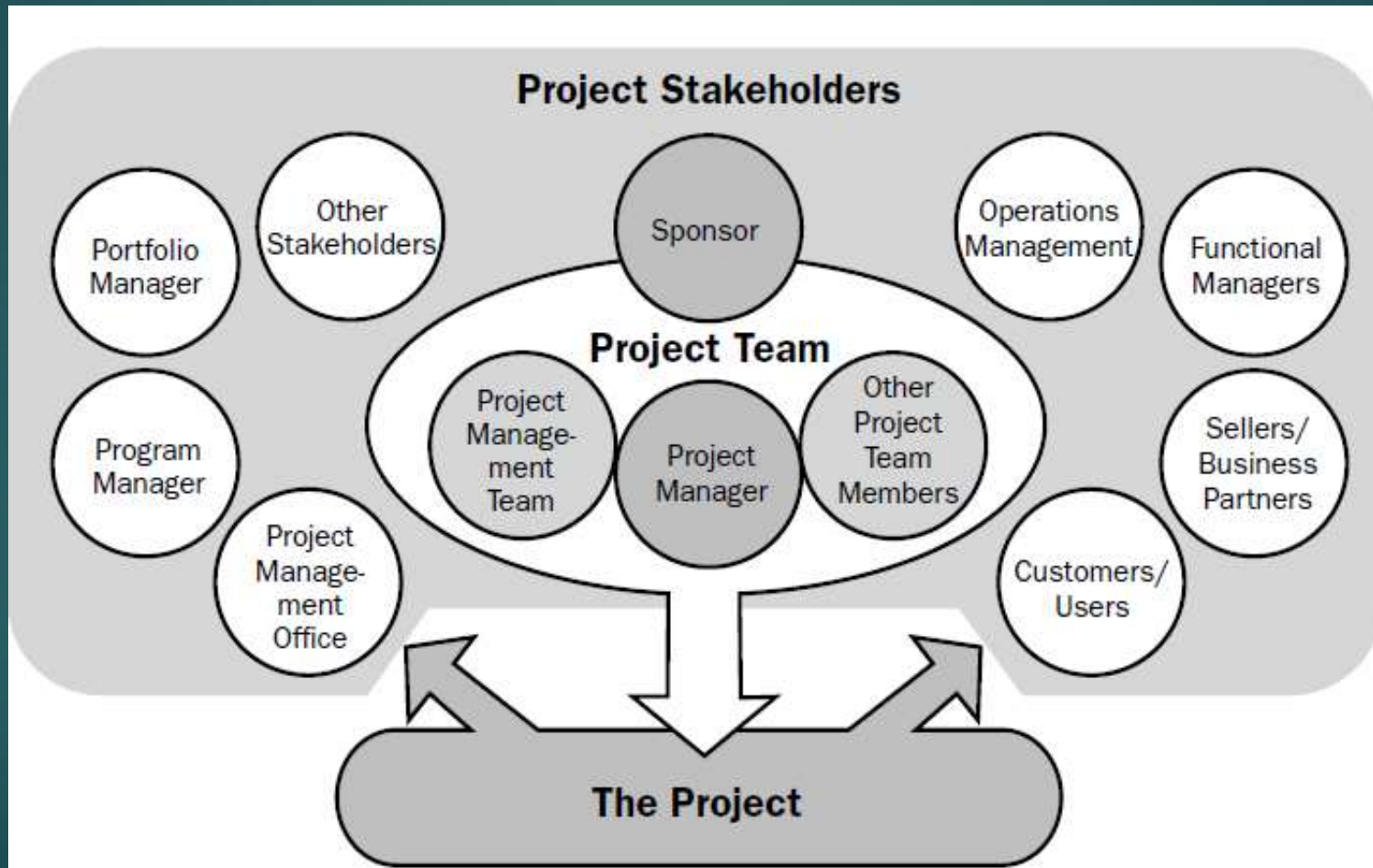
	Predictive	Iterative and Incremental	Adaptive
Other names	Fully plan-driven		Change driven or agile
Project scope	Defined as early as possible	Defined one iteration at a time	Will be decomposed into a list of requirements
Phases and iterations	Phases are sequential or over lapping	Iterations performed in a sequential or overlapping fashion	Each iteration is rapid and fixed in time and cost
Project Management Processes	Subset of activities and processes for each phase	During each iteration activities from all process groups performed	-Several processes are performed in each iteration -early iterations focus more on planning
When used	-the product to be delivered is well understood -there is a substantial base of industry practice -the product must be delivered in full to have value	-need to manage changing objectives and scope -reduce the complexity of a project -partial delivery of a product is beneficial and provides value	- in response to high level of change and stakeholder involvement



8. Project Stakeholders



- ▶ any person, group or organization who may **affect**, be **affected by**, or perceive itself to be affected by a decision, action or outcome of a project. (**internal/external**)



STAKEHOLDER	KEY WORDS
Customer/users	Will use the project's product, result, or service
Sponsor	Provides money, champions the project, navigates the political environment
Portfolio Managers/Review Board	High level governance, organizations executives, project selection committee
Program Manager	Manage group of interrelated projects- provide benefits not achievable if projects are managed separately
Project Management Office	Support and/or manage projects under the PMO's domain
Project Manager	Responsible for achieving project objectives
Functional Managers	Provides management oversight to an administrative area
Operational Management	Responsible for an area of the core business. Deals directly with the organization's salable products or services
Sellers	External companies providing components or services
Business partners	External companies that fill a specified role such as installation, customization, training, or support

9. The project constraints

- ▶ Projects are affected by constraints:

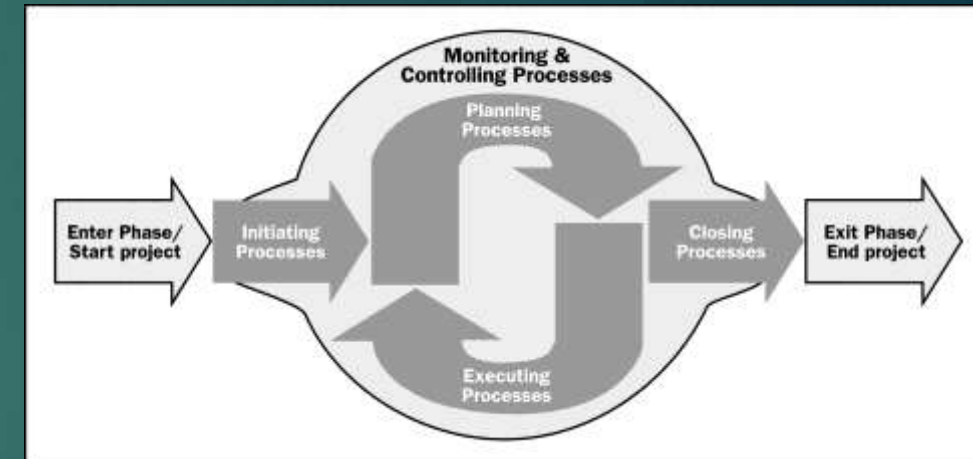
Scope – Time – Cost – Quality – Resources – Risk – Customer Satisfaction

- ▶ What would happen if a stakeholder wanted to add more scope?
- ▶ Would you need to increase the budget, extend the schedule, etc.? A big part of project management is managing **change requests** as they occur.



10. PMBOK 5th Edition Structure

		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
	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	
	Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
	Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
	Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
	Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
	Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
	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 Control Risks	
	Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	



Five Process Groups



► **Initiating process group**

These processes help us to begin a project or a phase of a project. There are two initiating processes. The first initiating process, develop project charter, and Identify Stakeholders.

► **Planning process group** - These processes are used in developing a plan for the project, including developing the project baselines (i.e. scope, time, and cost).

► **Executing process group** - These processes create the project's deliverables through the acquisition, development and management of human resources. A majority of the project budget is spent during executing.

► **Monitoring and controlling process group** – These processes track the project's progress as well as initiate and manage changes to the project. These processes are occurring continuously throughout the life of the project, even while the processes belonging to the other groups are occurring.

► **Closing process group** - These processes are used to close out a project or a phase of a project or a procurement.

11. Project Selection Methods

Activities before Project Initiation:

- 1) Project Selection.
- 2) Feasibility study.
- 3) Cost-Benefit Analysis.

1. Benefit measurement models (Comparative approach):

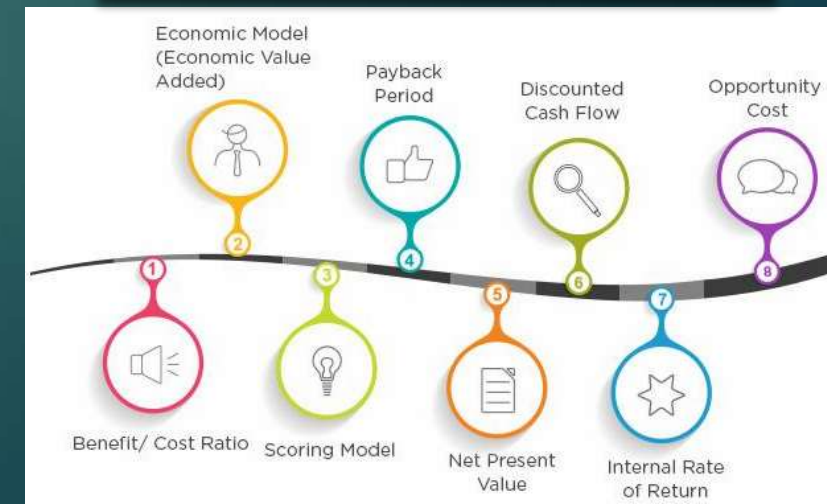
- ▶ Murder Board.
 - ▶ Peer review.
 - ▶ Scoring Model.
 - ▶ Economic Models:
 - PV.
 - NPV.
 - IRR.
 - **Payback Period.**
 - BCR.
 - EVA.
- ROI

2. Constrained Optimization Methods (Mathematical Approach):

- ▶ Linear Programming.
- ▶ Integer Programming.
- ▶ Dynamic Programming.
- ▶ Multi-Objective Programming.



Year	Project A	Project B
0	-1000	-1000
1	500	100
2	400	300
3	300	400
4	100	600



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
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5. Project Scope Management



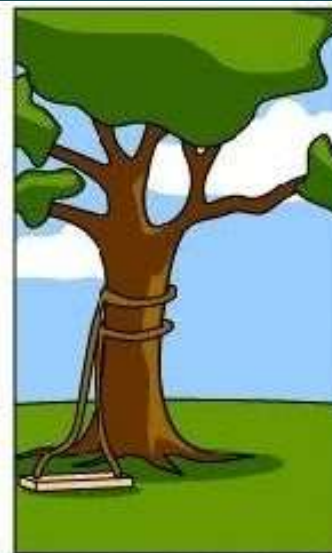
How the customer explained it



How the Project Leader understood it



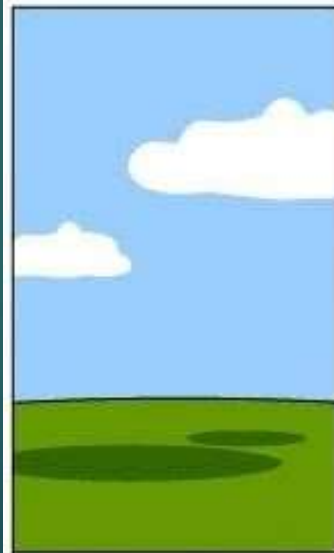
How the Analyst designed it



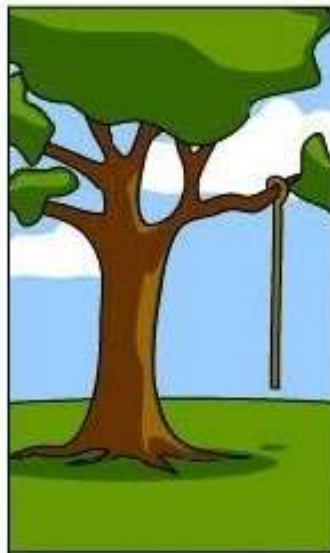
How the Programme wrote it



How the Business Consultant described it



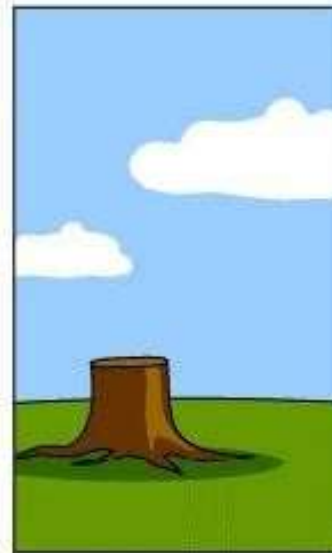
How the project was documented



What operations installed



How the customer was billed



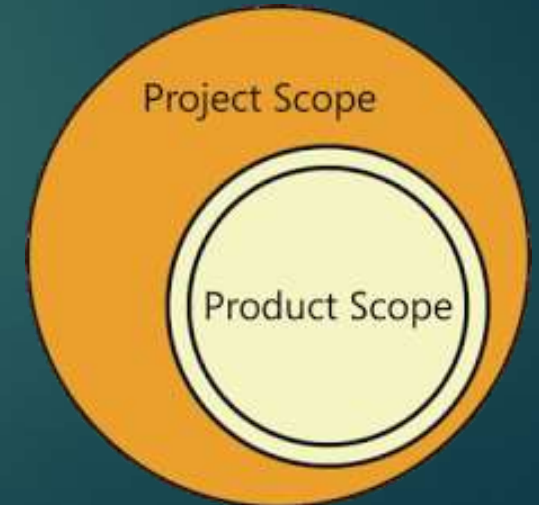
How it was supported



What the customer really needed

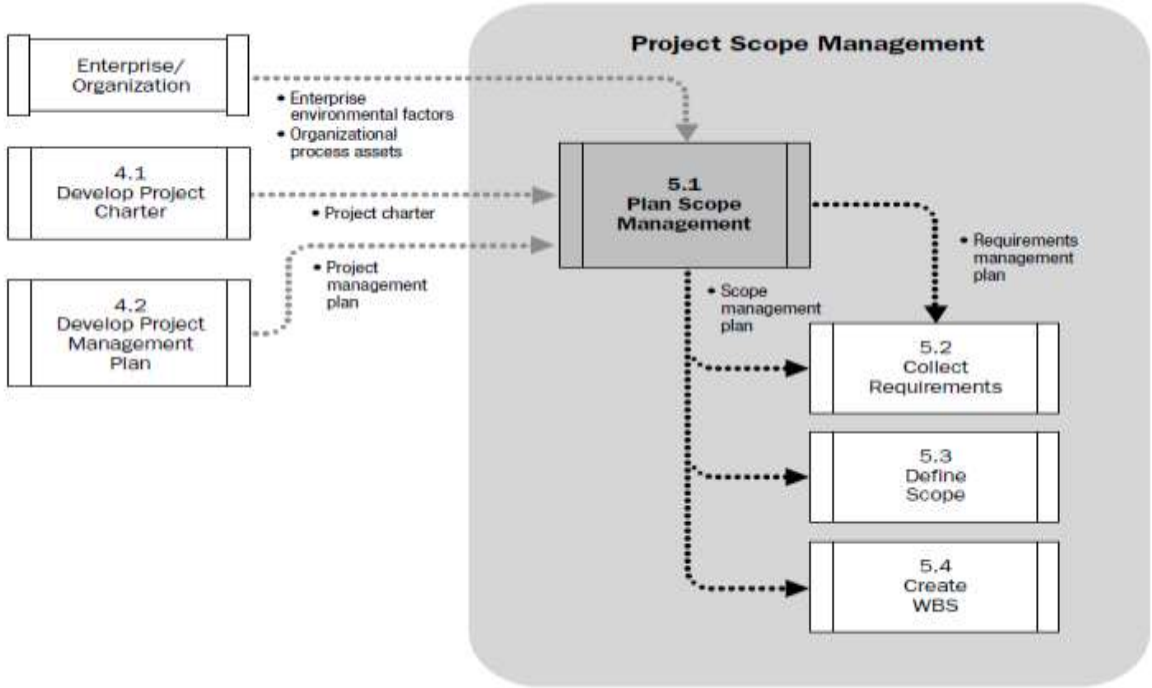
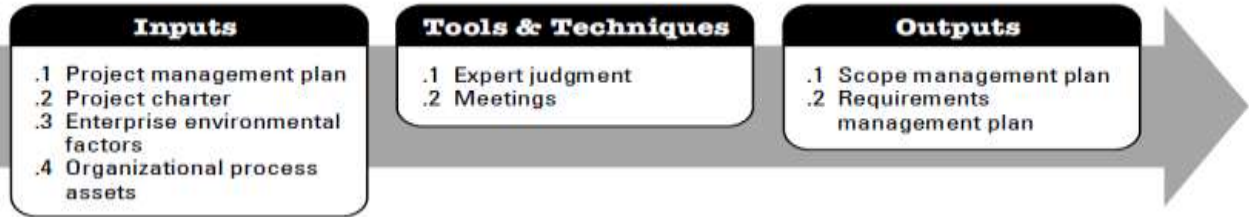
What is a scope?

- ▶ **1) Product scope:** The features and functions that characterize a product, service, or result.
- ▶ **2) Project scope:** The work performed to deliver a product, service, or result with the specified features and functions.



5.1 Plan Scope Management

- ▶ The process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled.
- ▶ **The key benefit** of this process is that it provides guidance and direction on how scope will be managed throughout the project.



Output



1- 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.
- ❑ It helps to reduce **Scope Creep**.

Output

2- Requirements Management Plan:

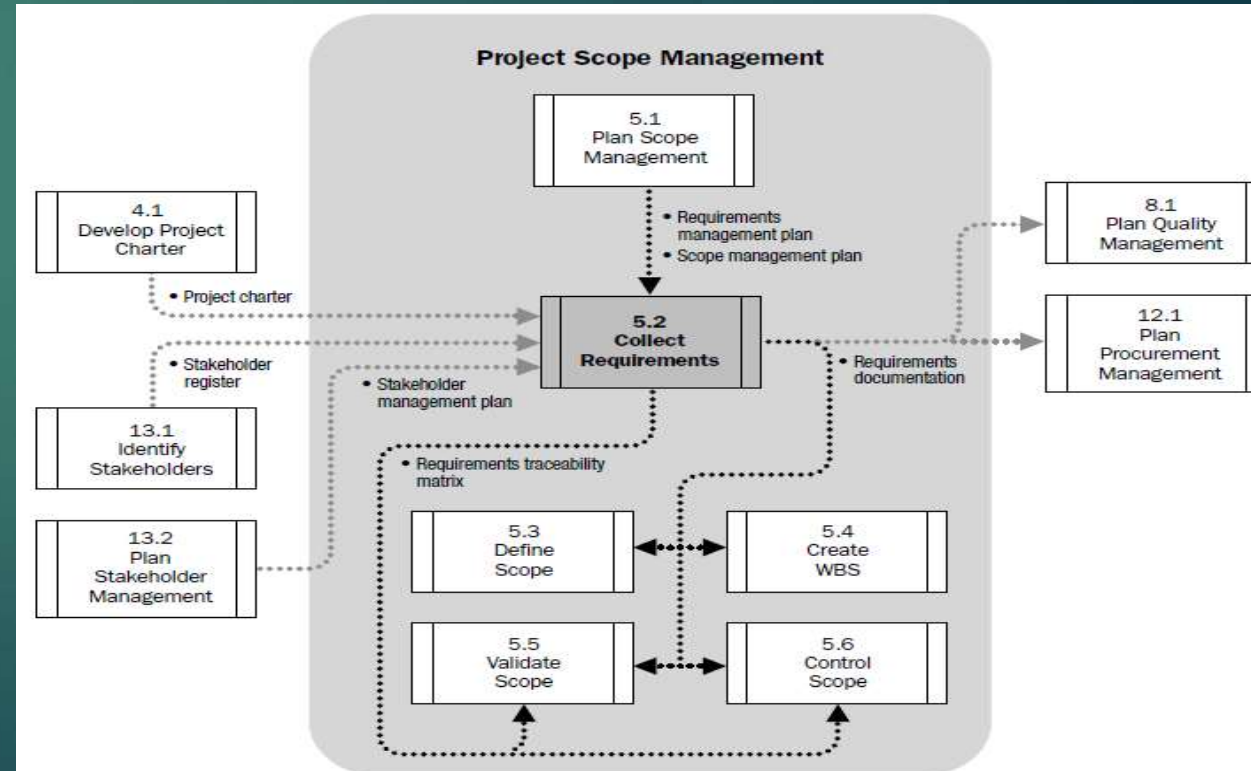
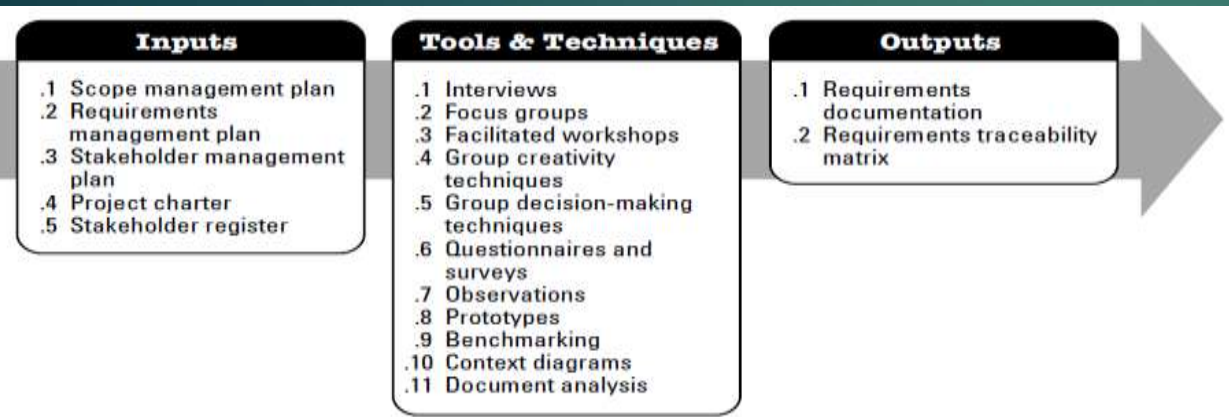
- ❑ How requirements activities will be planned, tracked, and reported.
- ❑ Configuration management activities such as: how changes to the product will be initiated, how impacts will be analyzed, how they will be traced, tracked, and reported, as well as the authorization levels required to approve 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.



5.2 Collect Requirements

- ▶ The process of **determining, documenting, and managing stakeholder needs and requirements** to meet **project objectives**.
- ▶ The **key benefit** of this process is that it provides the basis for defining and managing the **project scope** including product scope.



REQUIREMENTS :



- ▶ Conditions or capabilities to be met by the project to satisfy an agreement or other formally imposed specification.
- ▶ Quantified and documented needs and expectations of the sponsor, customer, and other stakeholders.
- ▶ **Business requirements**, which describe the higher-level needs of the organization.
- ▶ **Stakeholder requirements**, which describe needs of a stakeholder.
- ▶ **Solution requirements**, which describe features or functions, (functional & non functional)
- ▶ **Transition requirements** (describe temporary capabilities, such as training requirements, needed to transition from the current “as-is” state to the future “to-be” state).
- ▶ **Project requirements** (processes – project conditions).
- ▶ **Quality requirements** (criteria for project success).



Tools & Techniques

► Interviews

- ❑ Formal or informal approach to discover information from stakeholders **by talking to them directly.**

► Focus Groups

- ❑ bring together **prequalified stakeholders** and **subject matter experts** to learn about their expectations and attitudes about a proposed product.
- ❑ A moderator asks a group of people questions to understand their expectations of a product.

► Facilitated Workshops

- ❑ focused sessions that bring **key stakeholders** together to define product requirements. (JAD & QFD)





► Group Creativity Techniques

- **Brainstorming** (generate and collect multiple ideas).
- **Nominal Group Technique** (rank useful ideas with priority).
- **Idea/mind mapping** (ideas from brainstorming are represented in a single map to show commonalities and differences to get new ideas).
- **Affinity Diagram** (classifying ideas in groups for further analysis).
- **Multi-criteria Decision Analysis** (evaluating ideas using predefined criteria).

► Group Decision-Making Techniques

- Unanimity (everyone agrees , consensus of experts , **Delphi Technique**).
- Majority (**50%+** agrees).
- Plurality (**largest block** agrees).
- Dictatorship (one individual makes decision).



► Questionnaires and Surveys

- ❑ Designed to **quickly** accumulate information **from a large number** of respondents (useful for statistical analysis).



► Observations

- ❑ A direct way of viewing individuals in their environment and how they perform their jobs or tasks and carry out processes (**Job shadowing – uncover hidden requirements**).



► Prototypes (**Mockup**)

- ❑ obtaining **early feedback** on requirements by providing a working model of the expected product before actually building it.



► Benchmarking

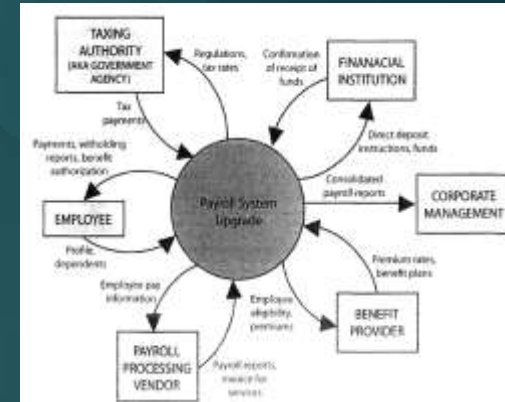
- ❑ **comparing** actual or planned practices to those of comparable organizations (internal or external) to identify **best practices**.

► Context Diagrams

- ❑ **visually depict** the product scope by showing the relationship between the business system, and the relationship of everything and everyone who interacts with the system. (scope model)

► Document Analysis

- ❑ Document analysis is used to elicit requirements by **analyzing existing documentation** and identifying information relevant to the requirements.



Output



► Requirements Documentation

- ❑ These documents contain the requirements and supporting detail for the requirements that meet business need.

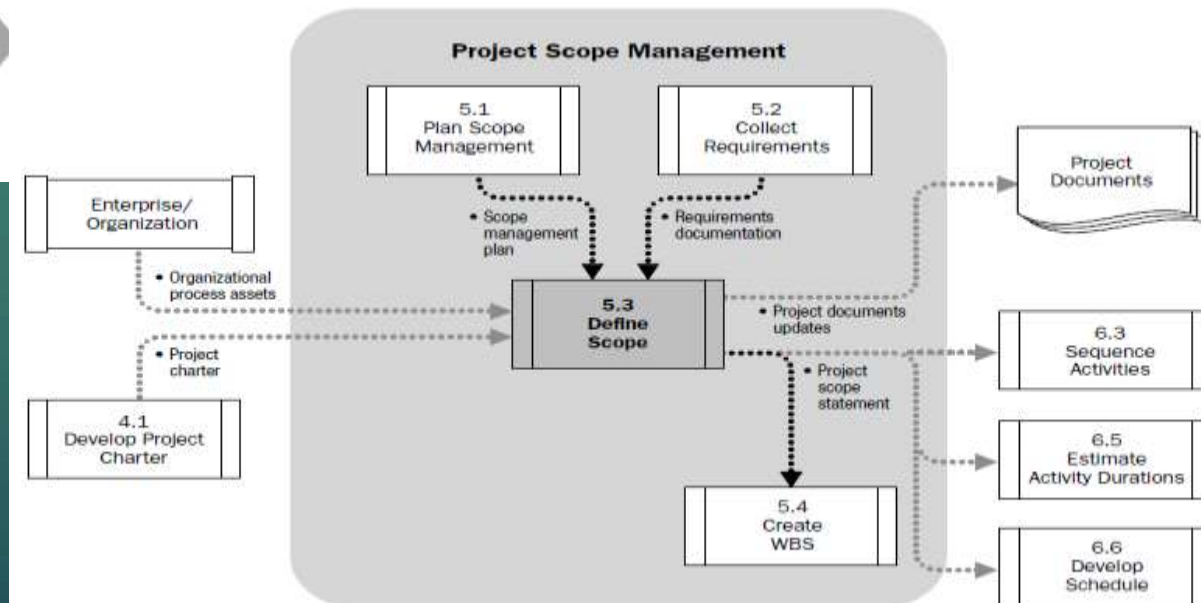
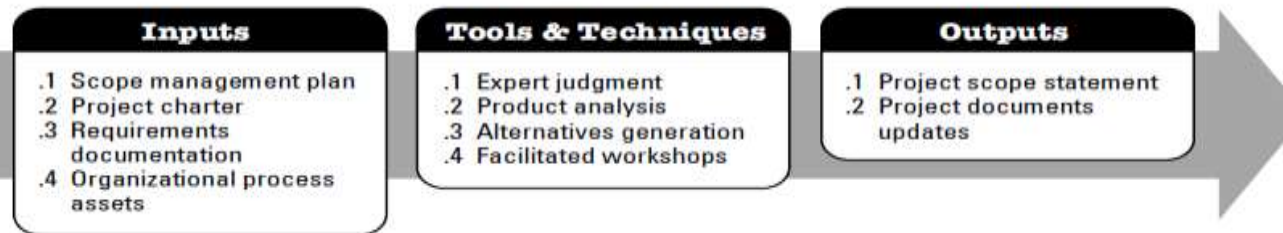
► Requirements Traceability Matrix

- ❑ The requirements traceability matrix is a grid that links product requirements from their origin to the deliverables that satisfy them.
- ❑ It helps ensure that each requirement adds business value by linking it to the business and project objectives.

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							

5.3 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 deliverable boundaries by defining which of the requirements collected will be included in and excluded from the project scope.
- ▶ It is an iterative process (**progressively elaborated**)



Tools and Techniques:

- ▶ **Expert Judgment**

- ▶ **Product Analysis**

translating high-level product descriptions into tangible deliverables.
(Product breakdown – system analysis – value engineeringetc.)

- ▶ **Alternatives Generation**

a technique used to develop as many **potential options** as possible in order to identify different approaches to execute and perform the work of the project.

- ▶ **Facilitated Workshops**



Outputs:

- ▶ **Project Scope Statement**
- ▶ **Project Documents updates**
- Stakeholder register.
- Requirements documentation.
- Requirements traceability matrix.

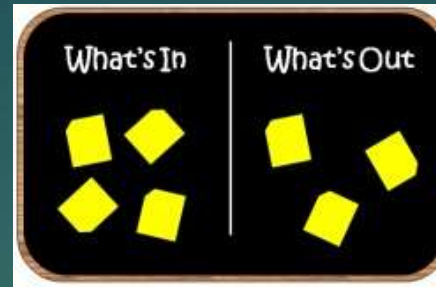
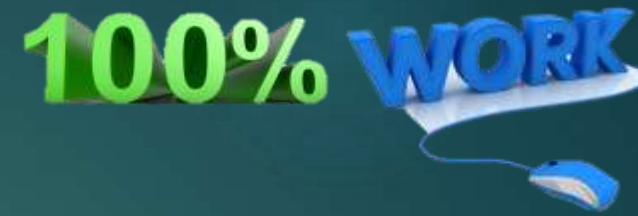


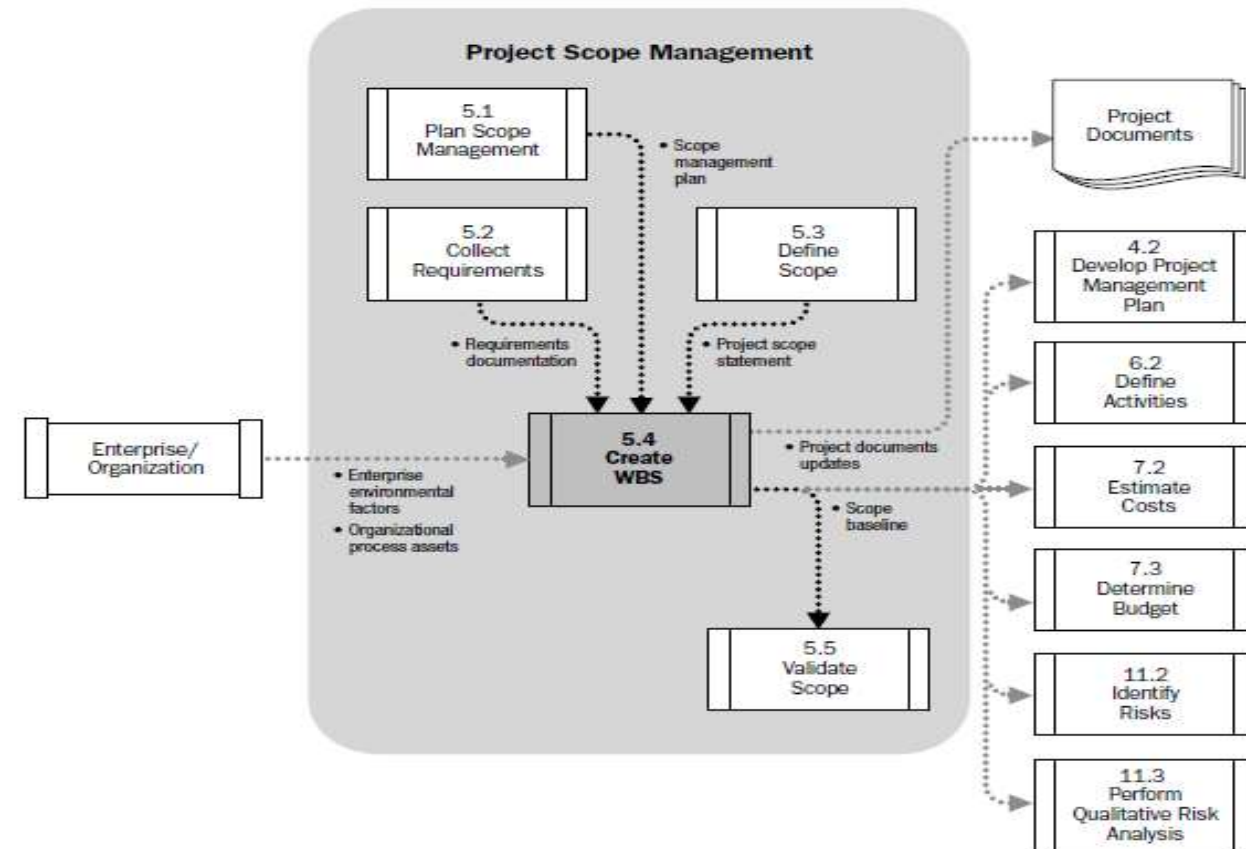
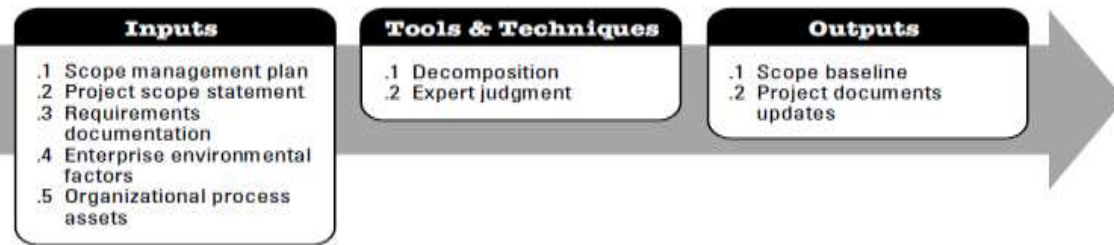
Table 5-1. Elements of the Project Charter and Project Scope Statement

Project Charter	Project Scope Statement
Project purpose or justification	Project scope description (progressively elaborated)
Measurable project objectives and related success criteria	Acceptance criteria
High-level requirements	Project deliverables
High-level project description	Project exclusions
High-level risks	Project constraints
Summary milestone schedule	Project assumptions
Summary budget	
Stakeholder list	
Project approval requirements (what constitutes success, who decides it, who signs off)	
Assigned project manager, responsibility, and authority level	
Name and authority of the sponsor or other person(s) authorizing the project charter	

5.4 Create WBS



- ▶ Large project has large probability to fail...solution?
- ▶ Create WBS is the process of subdividing project deliverables and project work into smaller, more manageable components.
- ▶ The key benefit of this process is that it provides a structured vision of what has to be delivered.

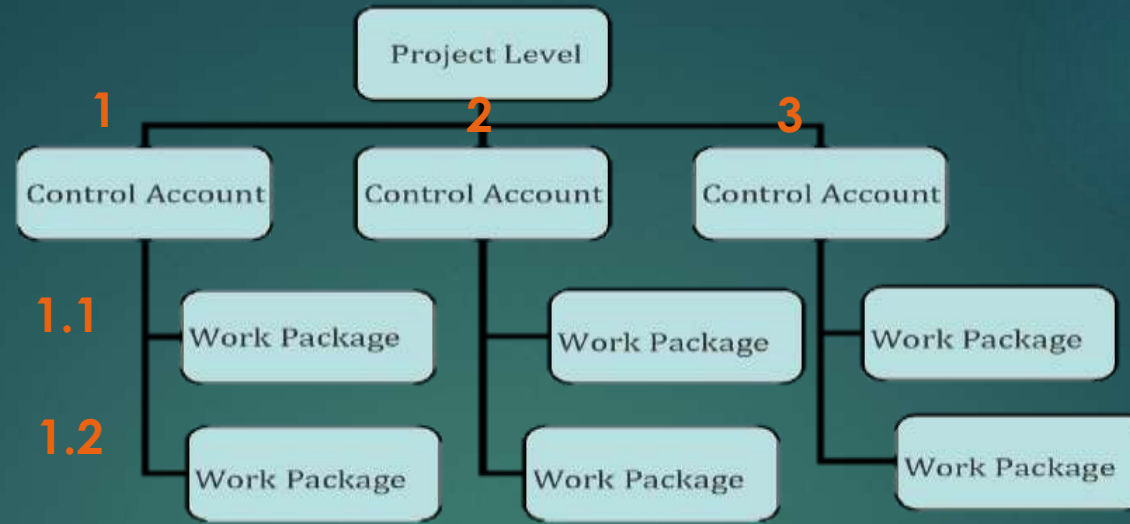


Tools & Techniques

- ▶ **Decomposition** – a technique used for dividing and subdividing the project scope and project deliverables into smaller, more manageable parts.
- ❑ Excessive decomposition of the WBS is bad. It may lead to:
 - wasted management effort- inefficient use of resources- decreased efficiency in performing the work
- ❑ **Work package** is the work defined at the lowest level of the WBS for which cost and duration can be estimated and managed.
- ❑ WBS can be divided by: phases/deliverables/sub-projects.
- ▶ **Expert judgment**



Outputs:



► Scope Baseline

is the approved version of [scope statement](#), [WBS](#), and its associated [WBS dictionary](#), that can be changed only through [formal change control procedures](#). It consists of:

1.Scope Statement

2.WBS (is a deliverable-oriented hierarchical decomposition of the work to be performed by the project team)

3.WBS Dictionary:

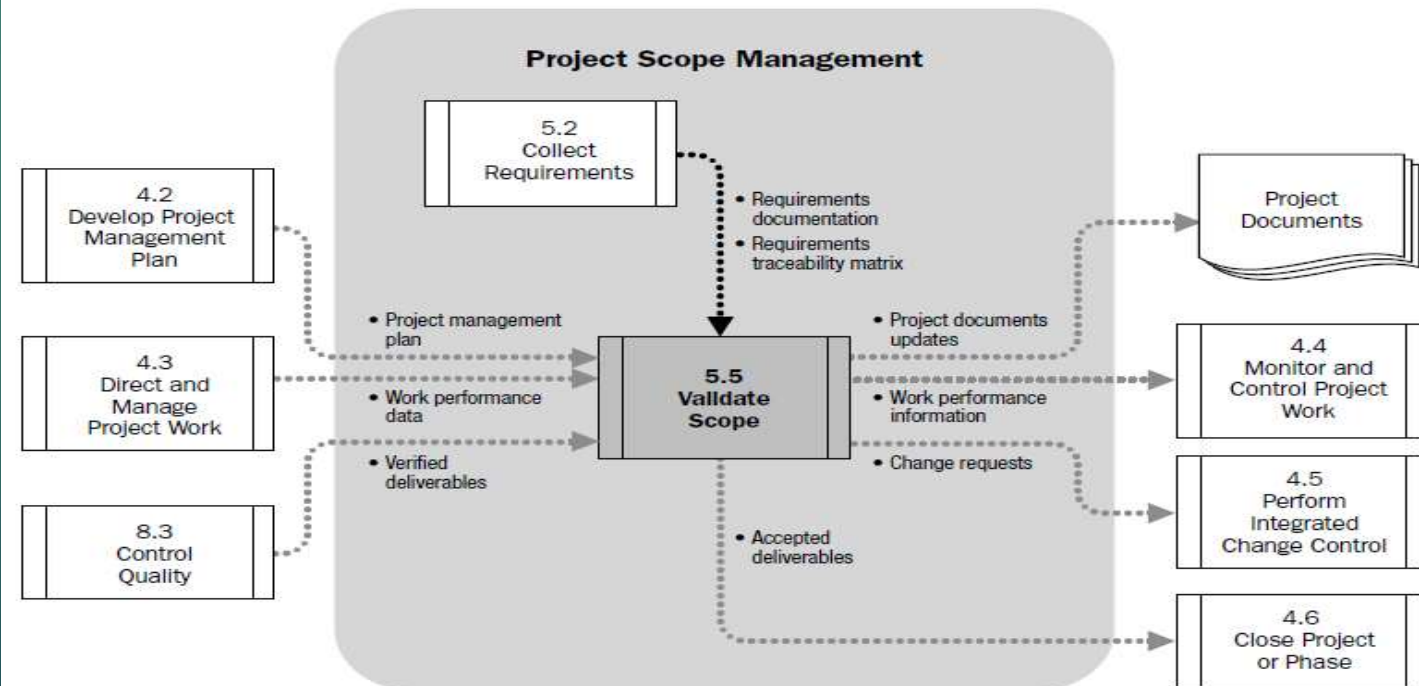
WBS Dictionary

WBS#	WBS Task	Deliverable	Owner	Duration	Budget	Risk Factor	Status
2	Phase 2	Phase 2 Report	Chandler	5 months	\$900,000	See Risk Plan	On Schedule
2.1	Design Development	Design Release	Monica	5 months	\$685,000	Resources	On Schedule
2.1.1	Build Prototypes	Prototypes	Ross	3 months	\$81,000	Design Change	Ahead
2.1.1.1	Build Prototype #1	Prototype #1	Joey	8 days	\$12,500		Complete

► Project Document Updates

5.5 Validate Scope

- ▶ The process of **formalizing acceptance** of the completed project deliverables.
- ▶ **The key benefit** of this process is that it brings objectivity to **the acceptance process** and increases the chance of final product acceptance by **validating each deliverable**.



Tools & Techniques

- ▶ **Inspection** – (Reviews /walkthroughs)
 - ❑ **Measuring, examining, and validating** to determine whether work and deliverables meet requirements and product **acceptance criteria**.
- ▶ **Group Decision-Making Techniques**



Output

► Accepted Deliverables

- Deliverables that meet the acceptance criteria are formally signed off and approved by the customer or sponsor.

► Change Requests

► Work Performance Information

► Project Documents Updates



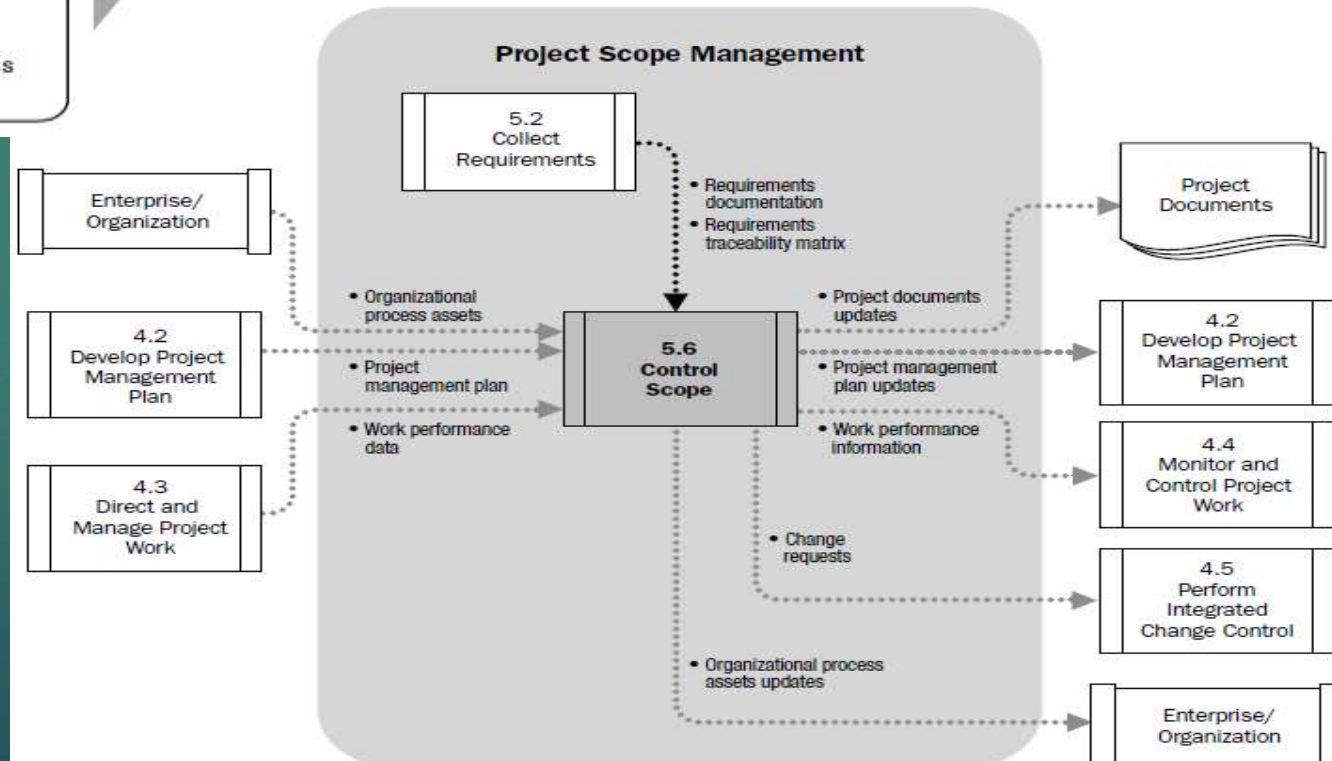
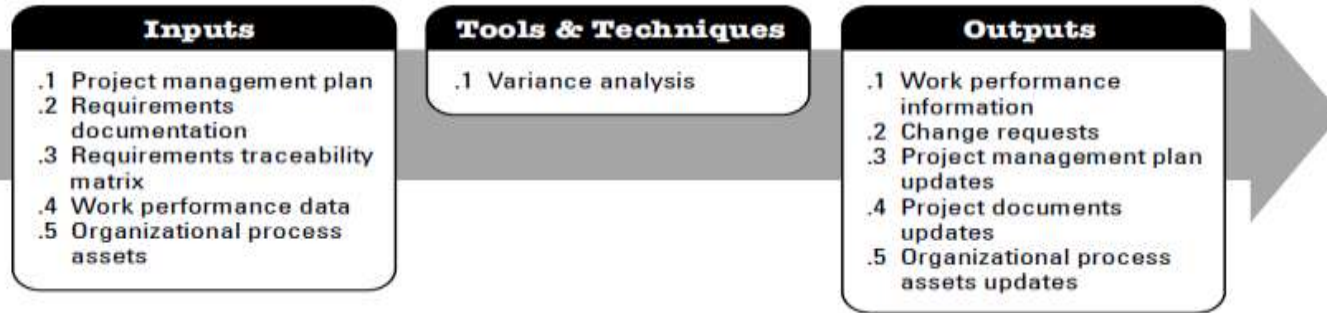
Conclusion



CONTROL QUALITY	VALIDATE SCOPE
Measures deliverables (products)	Measures deliverables (products)
Performed internally	Performed by the customer
About building deliverables correctly	About acceptance
Usually performed before validate scope	Usually performed after control quality
Product may fail control quality and the customer may accept the product anyway as part of validate scope	Product may pass control quality and the customer may not accept the product as part of validate scope
Input of control quality is: deliverables (from direct and manage project work)	Input of validate scope is verified deliverables (from control quality)
Output of control quality is: verified (meaning correct) deliverables	Output of validate scope is: accepted deliverables

5.6 Control Scope

- ▶ It is the process of monitoring the status of the **project and product scope** and managing **changes** to the **scope baseline**.
- ▶ **The key benefit** of this process is that it allows the **scope baseline** to be **maintained** throughout the project.



Tools & Techniques

► Variance Analysis

- It is used to determine the cause and degree of difference between the baseline and actual performance.



Output

- ▶ **Work Performance Information**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**
 - ❑ Causes of Variance – reasons for corrective actions – lessons learned.



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
	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	
	Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
	Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
	Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
	Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
	Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
	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 Control Risks	
	Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

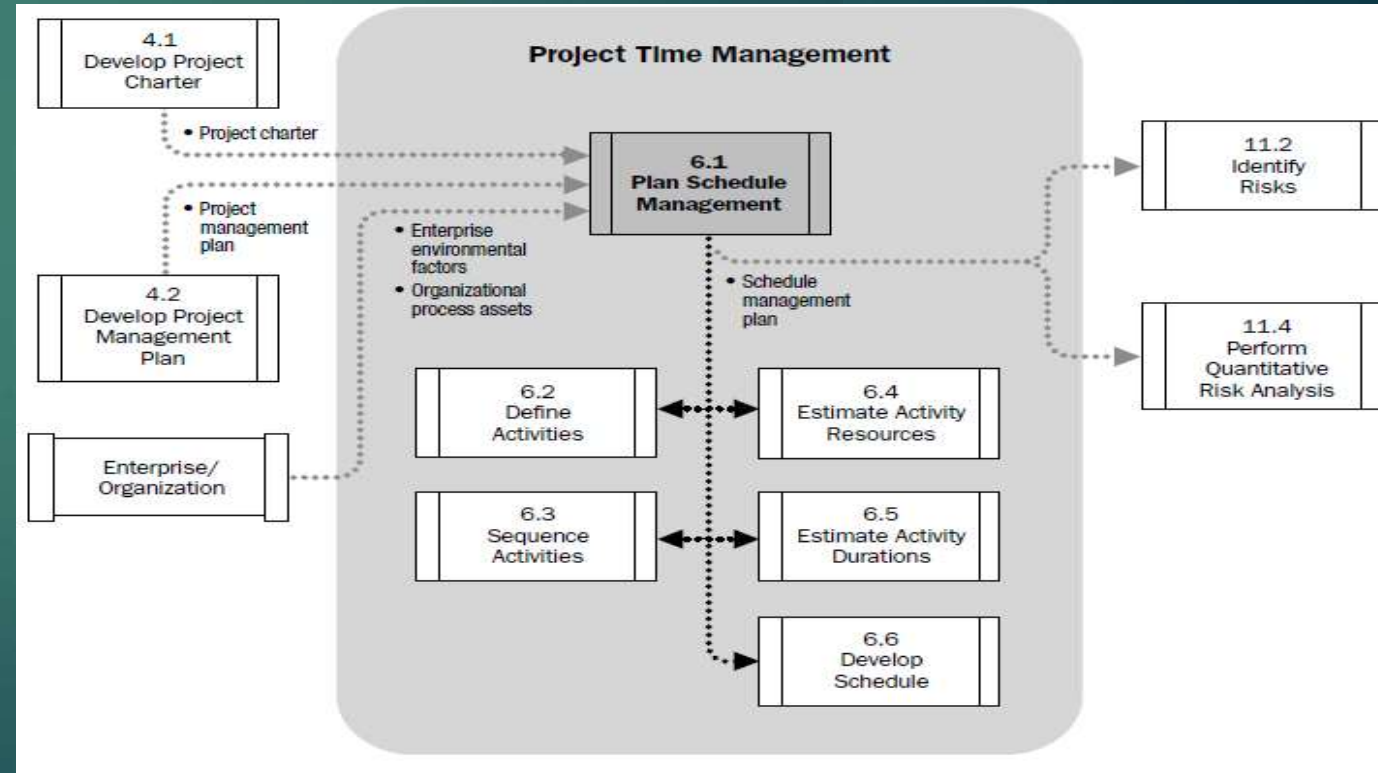


6. Project Time Management



6.1 Plan Schedule Management

- ▶ It is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.
- ▶ The **key benefit** of this process is that it provides **guidance and direction** on **how** the **project schedule** will be managed throughout the project.



Tools & Techniques



- ▶ Analytical Techniques (**What are the options to create the schedule?**)
 - ❑ Scheduling **methods** (CPM, CCM, PDM).
 - ❑ Scheduling **Tools** (Primavera , MS Project).
 - ❑ Scheduling **Techniques** (Rolling Wave Planning, Lead, Lag).
 - ❑ Schedule **Compression** Techniques (Fast track, Crashing).
 - ❑ **estimating approaches** (Analogous, Parametric, PERT).

Output:



Schedule Management Plan

- ▶ It establishes the criteria and the activities for developing, monitoring, and controlling the schedule, and **It is a component of Project Management Plan.**

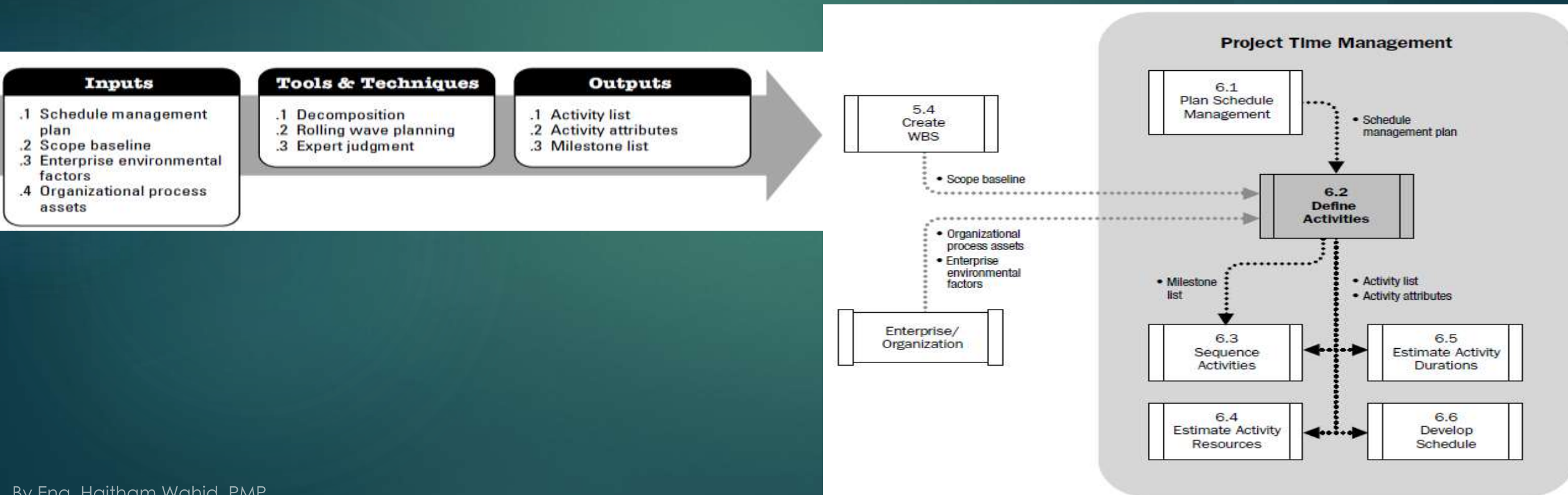
It can establish:

- ▶ Project schedule model development (Tool – methodology)
- ▶ **Level of accuracy** (acceptable range for estimates)
- ▶ **Units of measure** (staff hours/days – meter – km – ton)
- ▶ OPA links (consistency with the estimates and resulting schedules)
- ▶ **Project schedule maintenance** (updates – progress records)
- ▶ **Control thresholds** – Performance measurements (**EVM**) - reporting formats

6.2 Define Activities



- ▶ The process of **identifying and documenting** the specific **actions** to be performed to produce the project deliverables.
- ▶ **The key benefit** of this process is to **break down work packages into activities** that provide a basis for estimating, scheduling, executing, monitoring, and controlling the project work.



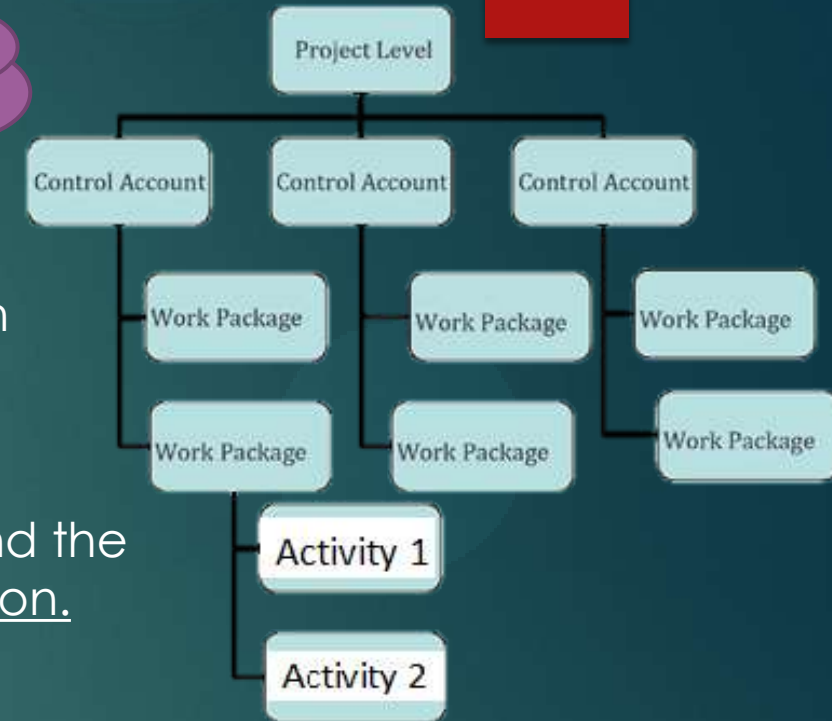
Tools & Techniques

Activity

Actions / Tasks

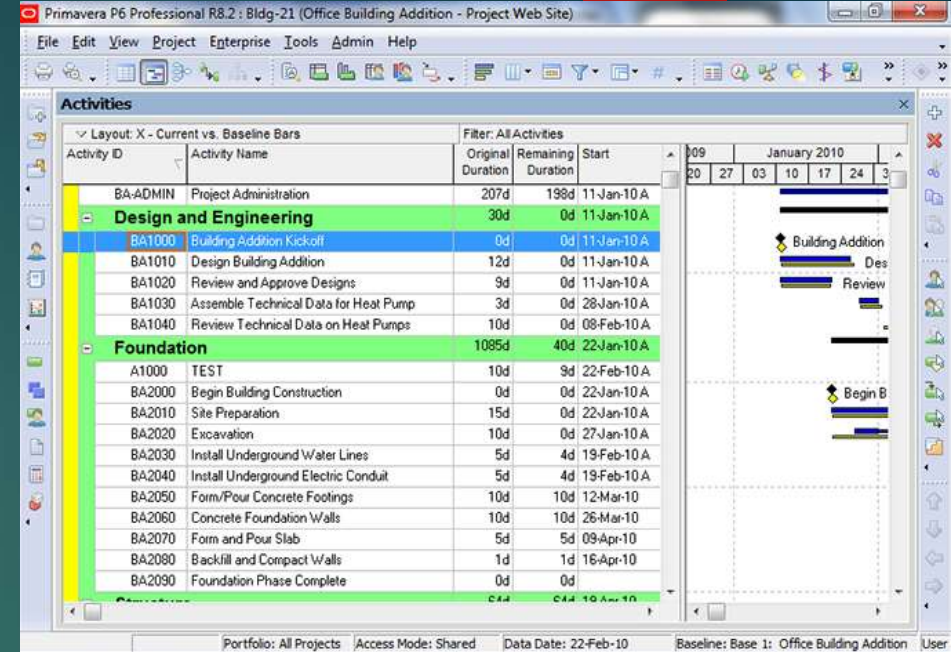
8/80 Rule

- **Decomposition** – we use this tool to break the work packages (in deliverable format) into smaller more manageable items (activities –in action format).
- **Rolling wave planning** – we plan the near term work in great detail and the far term work in much less detail. This is a type of progressive elaboration.



Output

- **Activity list** – this is a list of all the activities we need for the project. Of course, if we are doing rolling wave planning, we will only have the activities for the near term work.
- **Activity attributes** – this is a complete description of the activity including activity ID and WBS ID, etc.
- **Milestone list** – Helps prioritize activities during scheduling . It may be:
 - ❑ **Mandatory**- required by physical nature of work or by a contract (hard logic)
 - ❑ **Discretionary**- based on best practices but not mandatory (soft logic)



Milestone List August 1, 2007

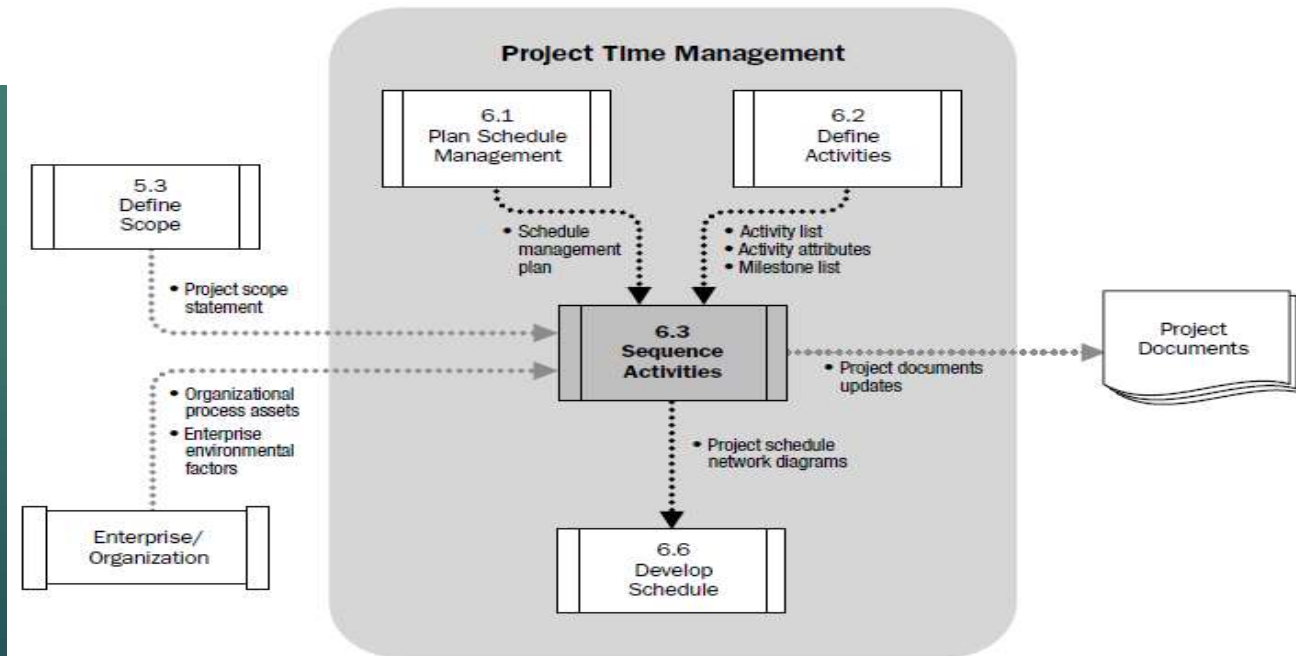
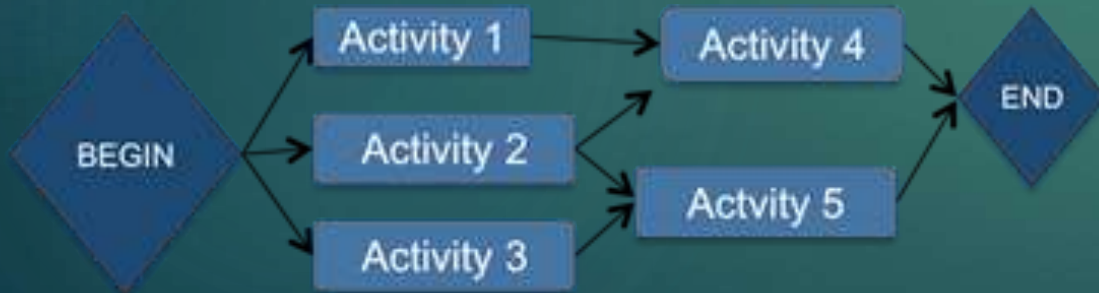
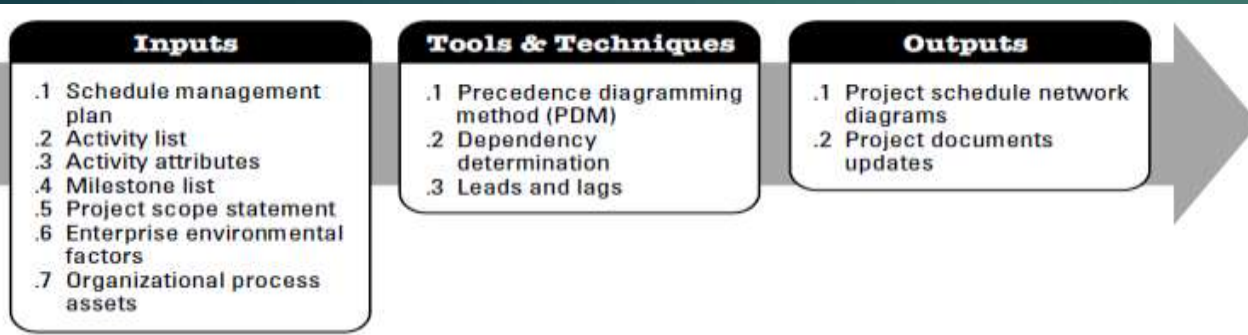
Project Name: Just-In-Time Training Project

Milestone	Estimated Completion Date*
Draft survey completed	8/3/07
Survey comments submitted	8/8/07
Survey sent out by IT	8/10/07
Percentage of survey respondents reviewed	8/17/07
Survey report completed	8/22/07
Survey results reported to steering committee	8/24/07

*Note: Dates are in U.S. format. 8/3/07 means August 3, 2007.

6.3 Sequence Activities

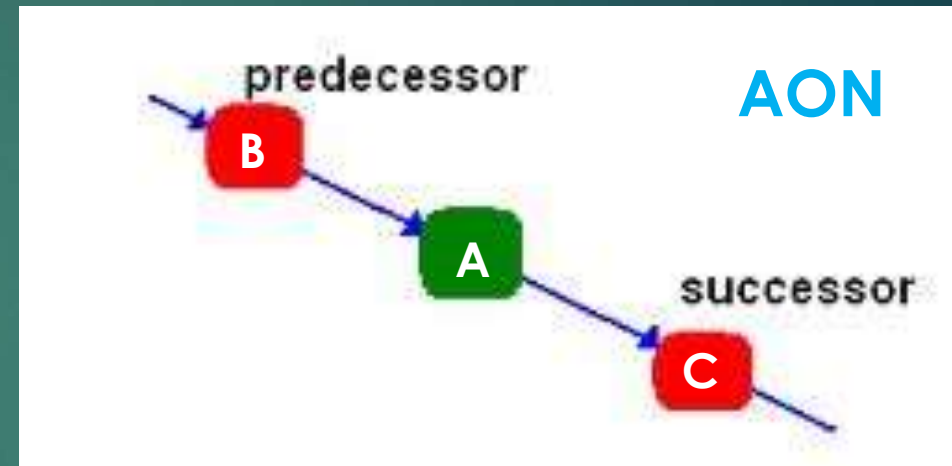
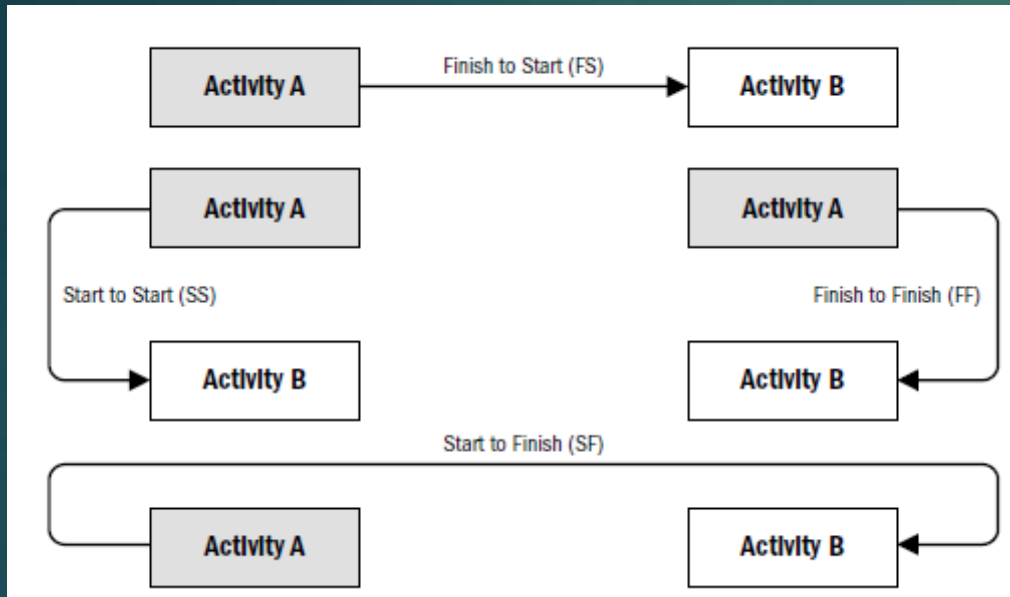
- ▶ the process of identifying and documenting **relationships** among the project activities.
- ▶ **The key benefit** of this process is that it defines **the logical sequence** of work to obtain the greatest efficiency given all project constraints.



Tools and Techniques:

► Precedence Diagramming Method (PDM)

It is a technique used for constructing a schedule model in which **activities** are represented by **nodes (AON)** and are **graphically linked by one or more logical relationships** to show the sequence in which the activities are to be performed.



- ❑ Development can not be **started** until the design is **finished**. (FS)
- ❑ One team will **start** cleaning the wall and the second team will **start** painting it. / Building design, Electrical layout (SS)
- ❑ The broadcast of a football match cannot **finish** until the match is **finished**. / Construction, inspection (FF)
- ❑ The first security guard shift (successor) cannot **finish** until the second security guard shift (predecessor) **starts**. (SF)

Tools and Techniques:

► Dependency Determination

1. **Mandatory** dependencies

Contractually required or inherent in the nature of the work (hard logic).

- + A – Requirements Documentation; B – Client Approval
- + A – Lay Building Foundation; B – Construct Floor

2. **Discretionary** dependencies

Preferred logic, Knowledge of best practices, soft logic.

- + A – Develop System Module X; B – Develop System Module Y
- + A – Furnish Room R; B – Furnish Room S

3. **External** dependencies (Outside the project team's control)

involve a relationship between project activities and non-project activities.

- + A – Client Go-Ahead; B – Initiate Project
- + A – Delivery of Equipment; B – Start Development
- + A – Approval of Building Plans; B – Start Construction

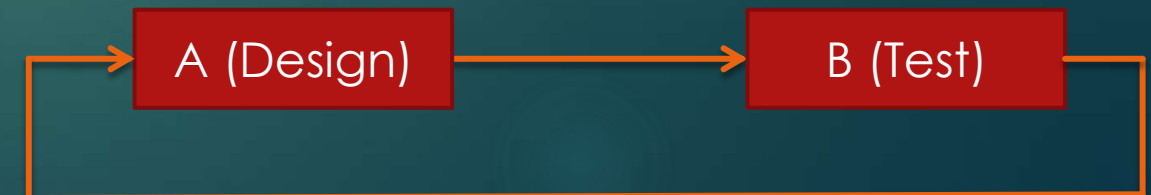
4. **Internal** dependencies (inside the project team's control).

involve a precedence relationship between project activities.

- + A – Develop System; B – Test System
- + A – Construct Wall; B – Paint Wall

❑ **GERT- graphical evaluation and review technique**

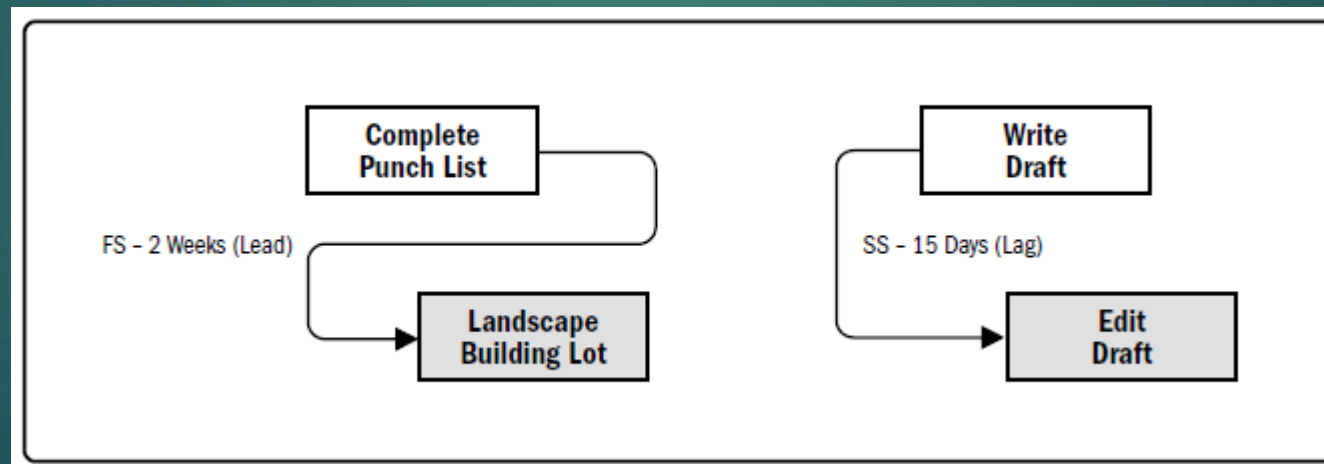
- Allows loops between activities



Tools and Techniques:

► Leads and Lags

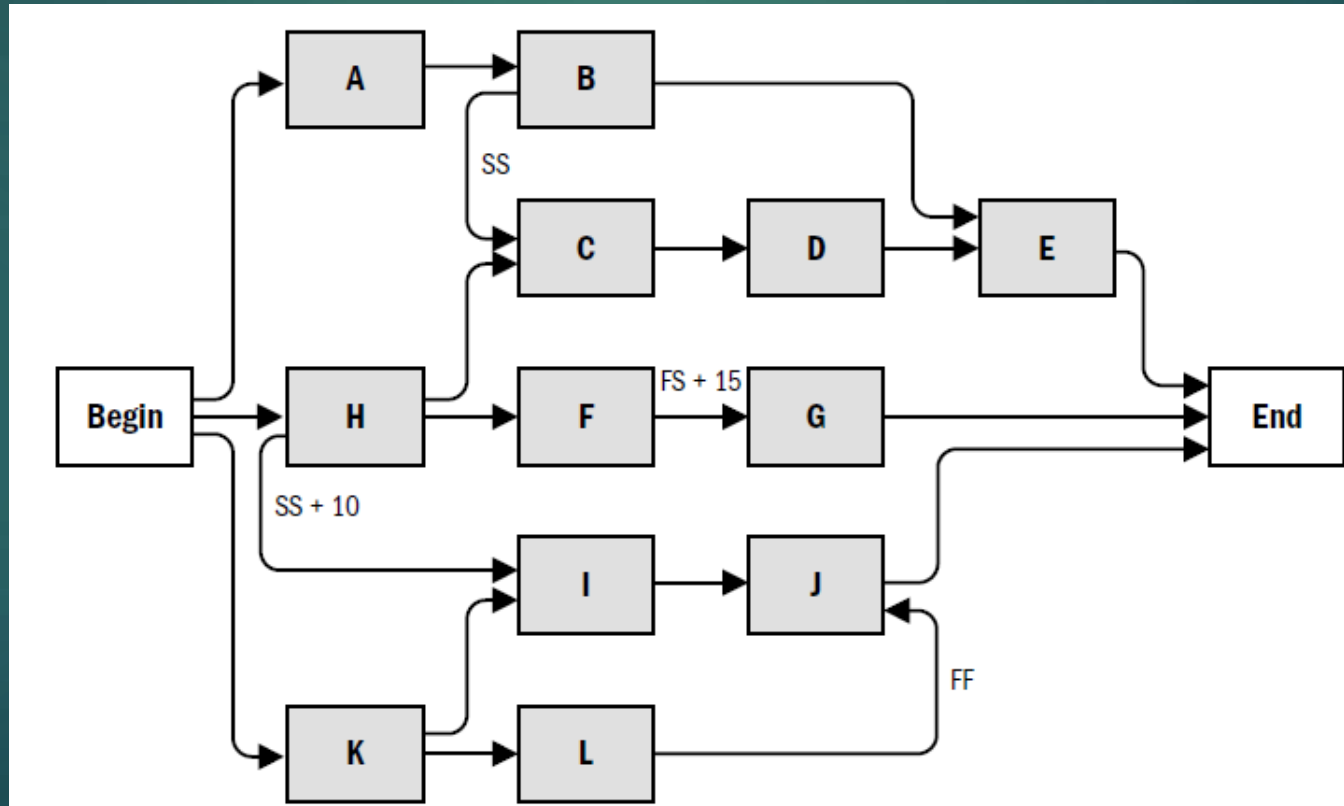
- ❑ A **lead (-)** is the amount of time whereby a successor activity can be advanced with respect to a predecessor activity.
- ❑ A **lag (+)** is the amount of time whereby a successor activity will be delayed with respect to a predecessor activity. (**Waiting Time**)



Output

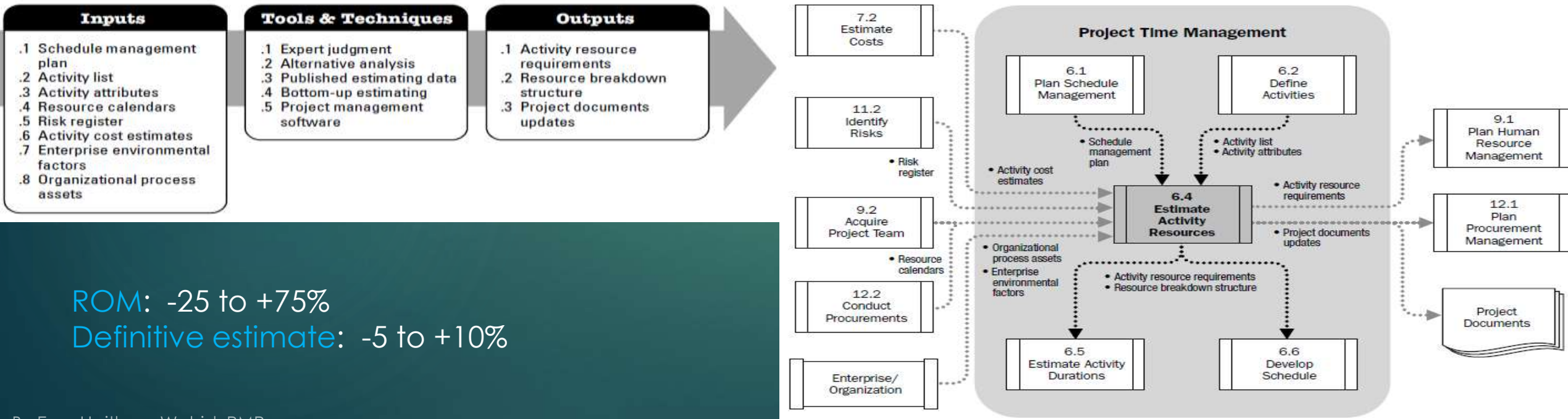
► Project Schedule Network Diagram:

It is a physical representation of the logical relationships of the project activities. Notice at this point there are no dates, no durations on the diagram



6.4 Estimate Activity Resources

- ▶ The process of estimating the **type** and **quantities** of material, human resources, equipment, or supplies required to perform each activity.
- ▶ **The key benefit** of this process is that it identifies characteristics of **resources** required to complete the activity which allows more accurate cost and duration estimates.



Tools and Techniques:

► Alternative Analysis

- ❑ Many schedule activities have alternative methods of accomplishment.

► Published Estimating Data

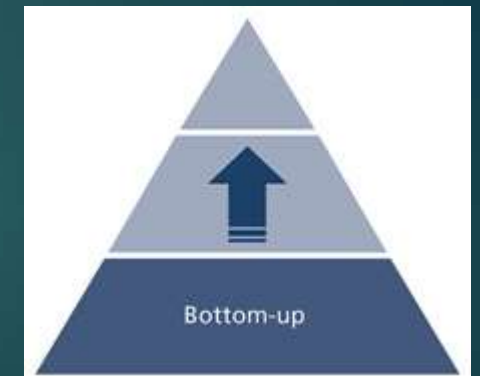
- ❑ Several organizations routinely publish updated production rates and unit costs of resources

► Bottom-up Estimating

- ❑ a method of estimating project **duration** or **cost** by aggregating the estimates of the lower-level components of the WBS.

► Project Management Software

- ❑ Primavera – MS project.



Output

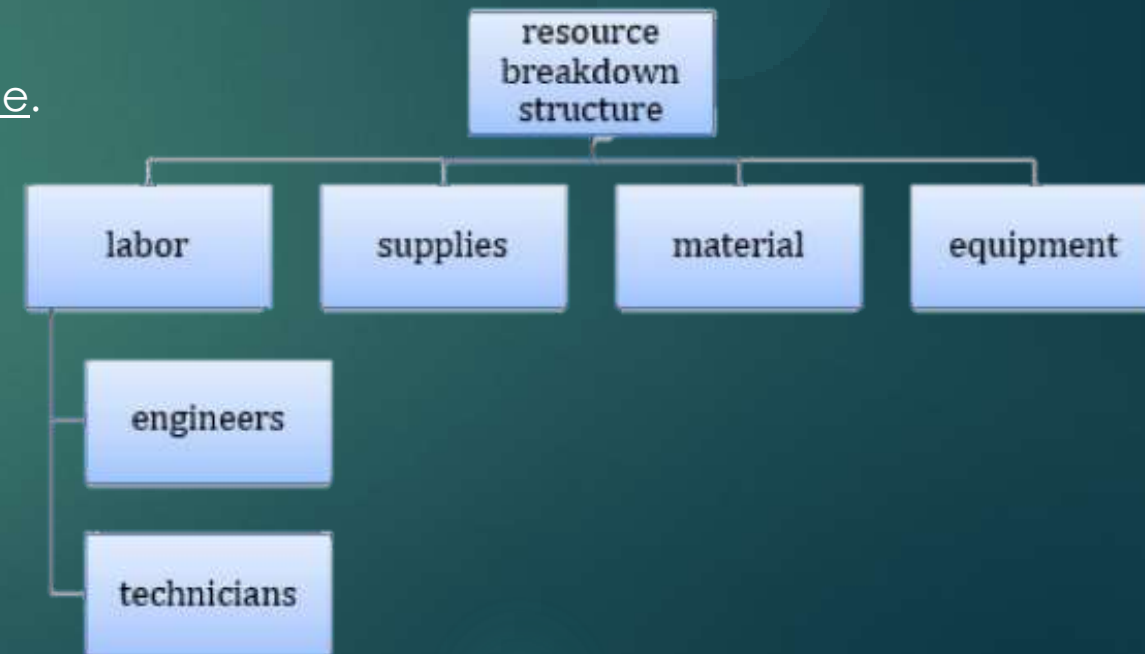


► Activity resource requirements

- ❑ It is Type and quantity of resources needed for each activity.
- ❑ It should also include how you came up with those requirements (basis of estimate and assumptions).

► Resource Breakdown Structure

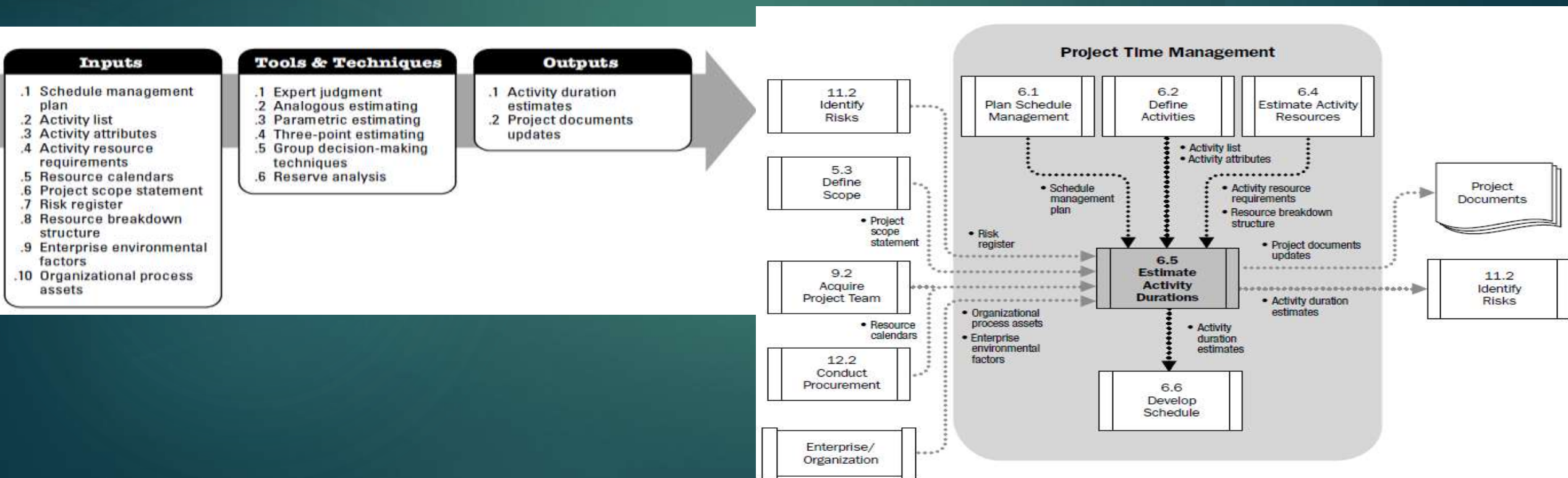
- ❑ A hierarchical representation of resources by category and type.
- ❑ Resource types may include the skill level, grade level, or other information as appropriate to the project.



► Project Document updates.

6.5 Estimate Activity Durations

- ▶ The process of estimating the number of work periods needed to complete individual activities with estimated resources.
- ▶ **The key benefit** of this process is that it provides the amount of time each activity will take to complete, which is a major input into the Develop Schedule process.
- ▶ **Padding.** (PM should avoid it).



Tools and Techniques:

ANALOGOUS ESTIMATING	PARAMETRIC ESTIMATING
Based on one past project	Based on statistics
Limited amount of data available	Enough data to create statistics
Less costly	More costly
Quicker	Slower- because we need to develop the statistics
Less accurate	More accurate

► Three- Points Estimating

1. Triangle (less accurate)
2. PERT (more accurate, consider uncertainty)
(Beta Distribution)

• **Triangular Distribution.** $tE = (tO + tM + tP) / 3$

$$\text{PERT Estimate or Expected Activity Duration} = \frac{O + 4M + P}{6}$$

$$\text{Standard Deviation of an Activity, } \sigma = \frac{P - O}{6}$$

$$\text{Variance of an Activity, } \sigma^2 = \left(\frac{P - O}{6} \right)^2$$

Tools and Techniques:

▶ Group Decision-Making Techniques

▶ Reserve Analysis : (time reserves)

CONTINGENCY RESERVE	MANAGEMENT RESERVE
For known unknowns	For unknown unknowns – unforeseen work that is within the scope of the project
Part of the project baseline and therefore under the control of the project manager.	Outside of the project baseline
<p>The reserve may be:</p> <ul style="list-style-type: none">• a percentage of the estimated duration• a fixed time• developed using other methods <p>As we move through the project, we should have a better estimate of what contingency is required</p>	Often developed based on historical information.

Output

► Activity Duration Estimates

- Quantitative assessments of the likely number of time periods that are required to complete an activity.



► Project Documents Updates



- Duration = Work Quantity / Production Rate

Not secure | www.planningplanet.com/wiki/422384/rates-norms-durations

Click to go back, hold to see history

planning planet

A new user every 192 minutes... Join us

HOME THE GUILD FIND A JOB USERS BLOG SELF ASSESSMENT FORUM E-MARKET WIKI **RATES** PARTNERS JOBS

Guild of Project Controls: Compendium | Role Descriptors | Self Assessment | Certifications | Membership

VIEW REVISIONS

Rates, Norms & Durations

Posted Thu, 2009-02-05 05:04 by Technical Develop...

What is needed to come up with a production rate?

A duration of time, the manhours involved, and an amount of work produced?

This section is here to document this. What information do you have that you can share?

- Automotive
- Bridges
- Building & Construction
- Building Services / E&M
- Defence Sector
- Fitout & Finishes
- Health & Healthcare
- IT Engineering Projects
- Petrochemical Oil & Gas
- Pharmaceutical
- Power Generation & Nuclear
- Roads & Infrastructure
- Rule of Thumb
- Shipbuilding
- Transportation
- Tunnelling & Mining
- Water Management

Activity Durations

Login or register to post comments

COMMENTS

USER LOGIN

Username or e-mail *

Password *

LOG IN

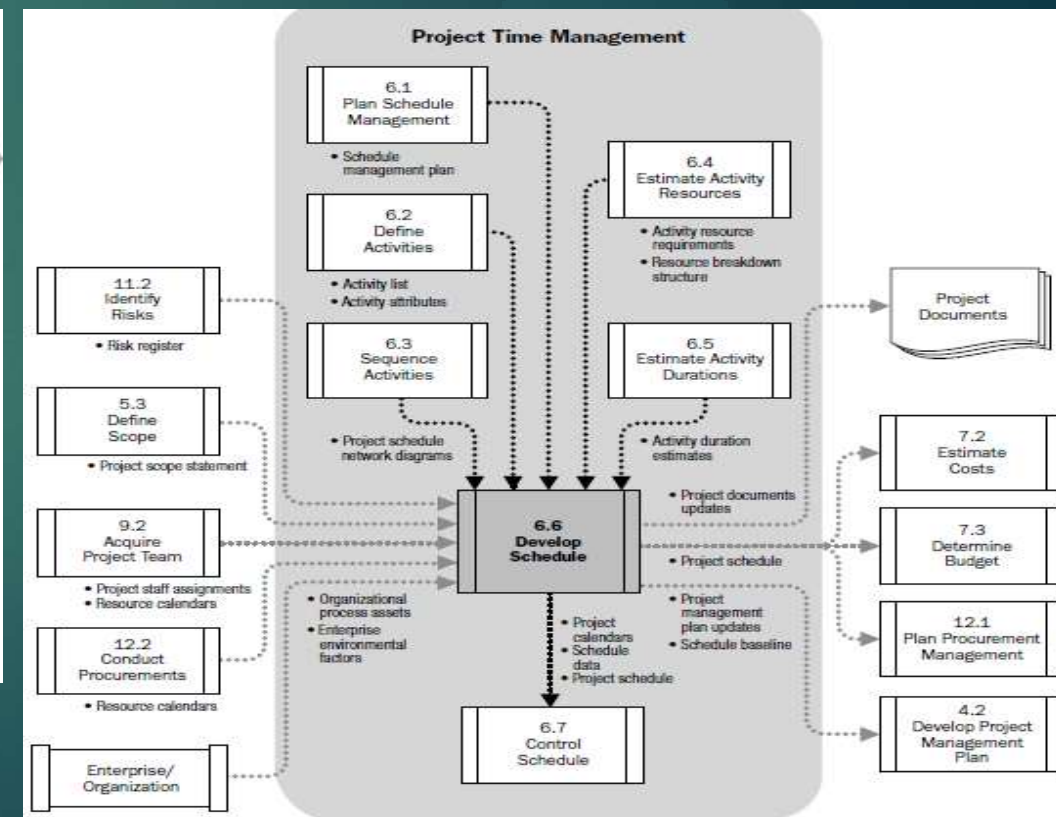
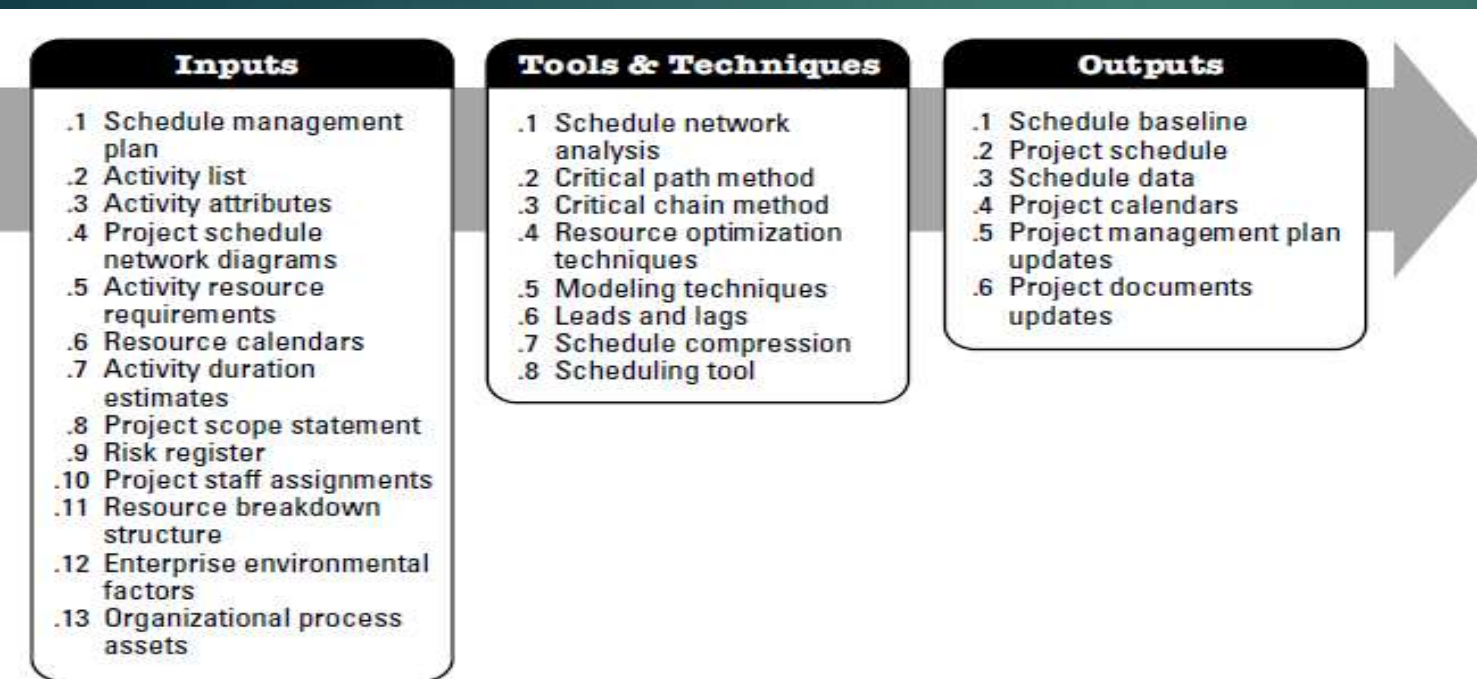
- Create new account
- Request new password

PP WIKI

- Building Information Modeling
- Planning Terms
- Professional Growth
- Schedule Construction
 - Activity Codes
 - Activity Durations
 - Rates, Norms & Durations**
 - Automotive
 - Bridges
 - Building & Construction
 - Building Services / E&M
 - Defence Sector
 - Fitout & Finishes
 - Health & Healthcare

6.6 Develop Schedule

- ▶ The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.
- ▶ **The key benefit** of this process is that by entering schedule activities, durations, resources, resource availabilities, and logical relationships into the scheduling tool, it generates a schedule model with planned dates for completing project activities.



Tools and Techniques:



Schedule Network Analysis

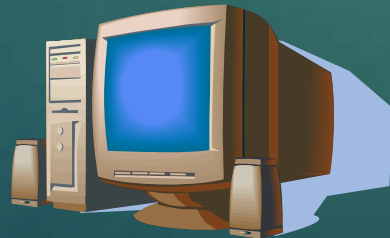
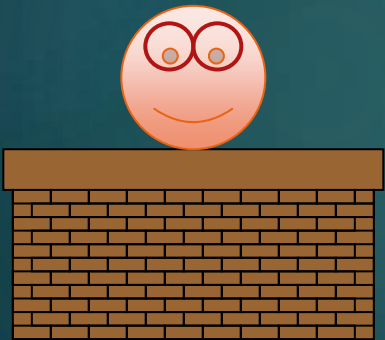
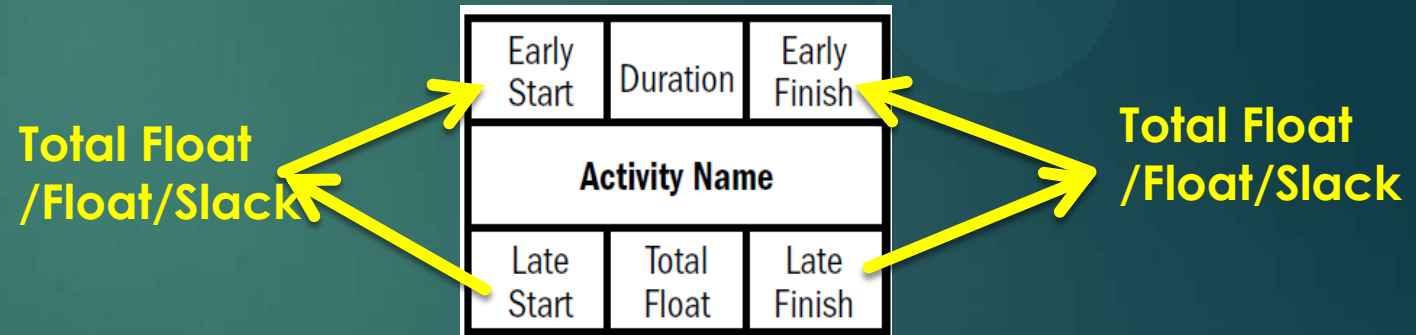
- ▶ a technique that generates the project schedule model.
- ▶ It employs various **analytical techniques**, such as critical path method, critical chain method, what-if analysis, and resource optimization.
- ▶ It calculates the **early and late start and finish dates** of activities.

Tools and Techniques:

► CPM:

The critical path method, which is a method used to **estimate the minimum project duration** and determine the amount of scheduling **flexibility (Float)** on the logical network paths within the schedule model.

- calculates **ES, EF, LS, LF** dates for all activities without regard for any resource limitations by performing a forward and backward pass analysis through the schedule network.
- The critical path is the sequence of activities that represents **the longest path through a project**, which determines **the shortest possible project duration**.
- Critical path activities have **ZERO** total float.
- There may be near-critical paths. (**more risk**)



Example



Activity	Predecessor	Duration
A	Start	2
B	A	5
C	B	6
D	B	3
E	C	8
F	C and D	7
G	E and F	4

- ▶ Duration of Critical Path?
- ▶ Total Float of Activity C?
- ▶ The critical path activities?
- ▶ If management imposes an end time of 22 days,
Calculate the project float?

Tools and Techniques:

Theory of Constraints

► CCM:

- ❑ A schedule method that allows the project team to place buffers (non-work schedule activities) on any project schedule path to account for limited resources and uncertainties.
- ❑ The resource-constrained critical path is known as the critical chain.

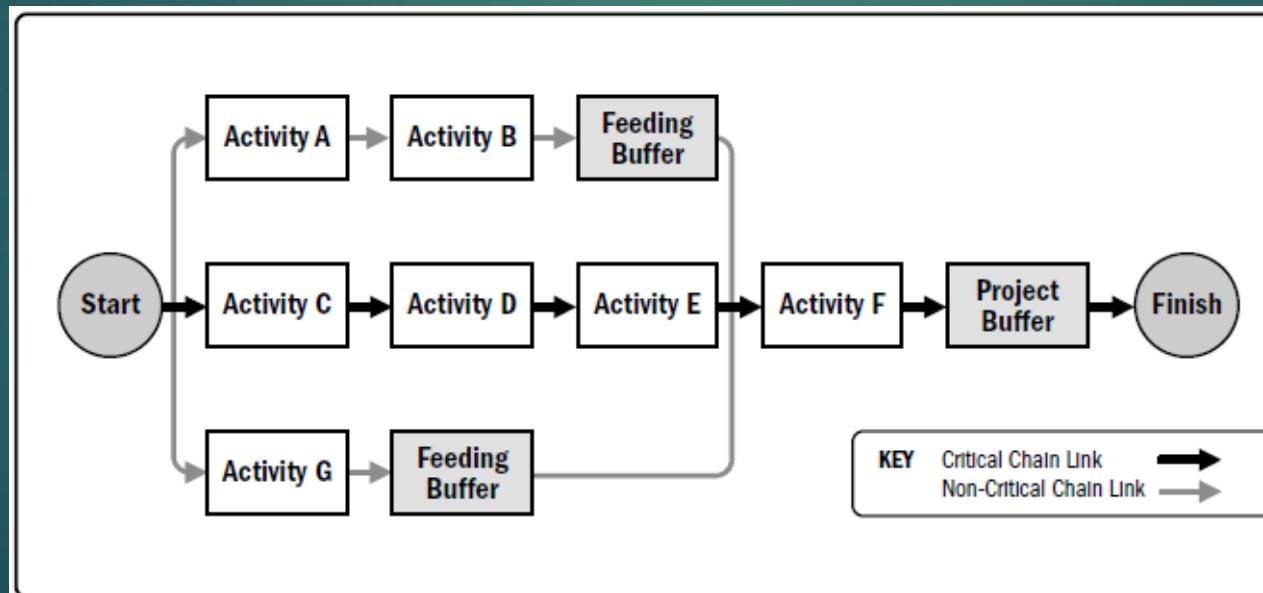


Figure 6-19. Example of Critical Chain Method

Tools and Techniques:

► Resource Optimization Techniques

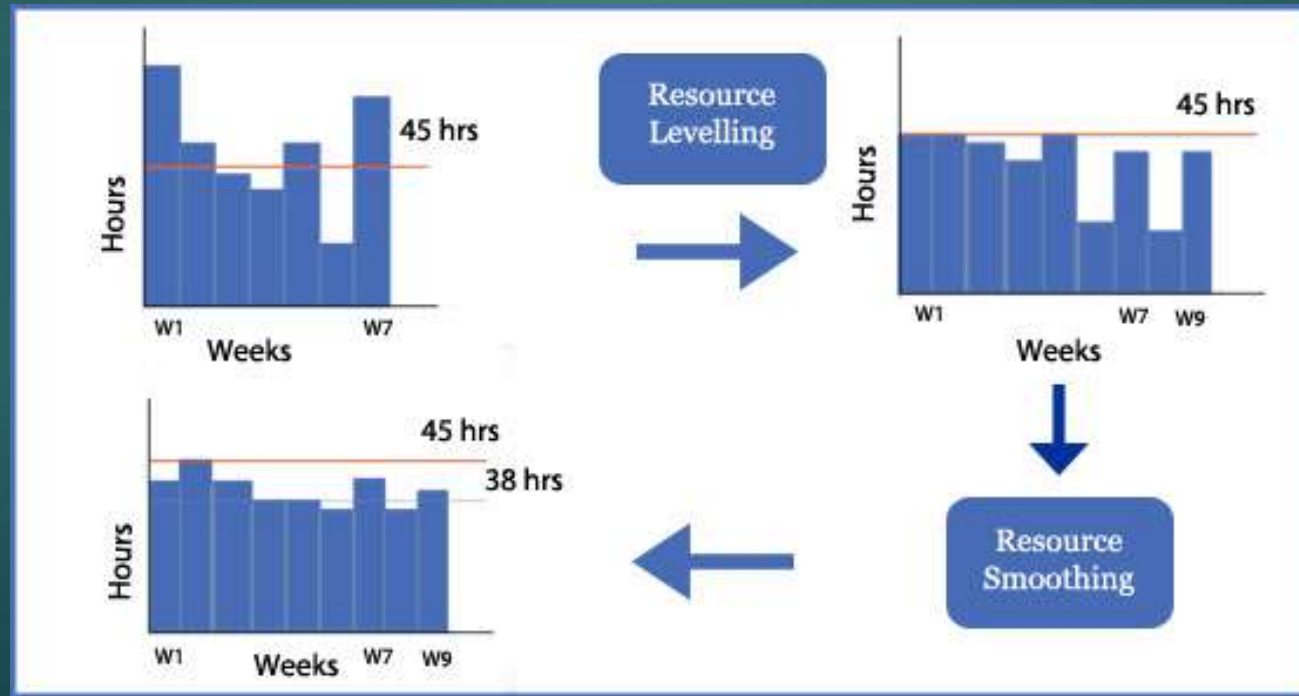
Resource Leveling

- A technique in which start and finish dates are adjusted based on **resource constraints** with the goal of balancing demand for resources with the available supply.
- **The Critical Path may change**- usually get longer.

&

Resource Smoothing

- A technique that adjusts the activities of a schedule model such that the requirements for resources on the project **do not exceed** certain predefined resource limits.
- **The Critical Path is not changed** and the completion date may **not** be delayed. (Smooth use of floats)



Tools and Techniques:

► Modeling Techniques

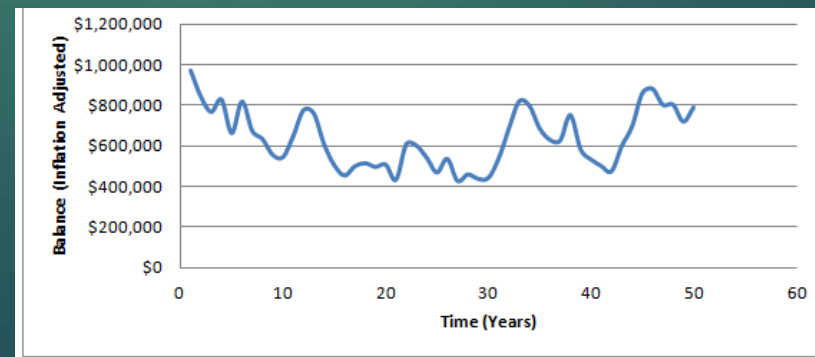
1. What-If Scenario Analysis

- ❑ evaluating scenarios in order to predict their effect, positively or negatively, on project objectives.
- ❑ It helps in preparing contingency and response plans to overcome or mitigate the impact of unexpected situations.



2. Simulation

- ❑ Simulation involves calculating multiple project durations with different sets of activity assumptions, usually using probability distributions constructed from the three-point estimates
- ❑ Monte Carlo Analysis technique.



Tools and Techniques:

► Schedule Compression:

1. Crashing

- ❑ used to shorten the schedule duration for the least incremental cost by adding resources (overtime – extra resources).
- ❑ It works only on critical path activities and may increase risk/cost.

2. Fast tracking

- ❑ activities or phases normally done in sequence are performed in parallel (experience preferred) . May result in increased risk, rework, and need more attention to communications.

► Scheduling Tool

- ❑ Automated tools (Primavera – MS Project).



Output






- ▶ **Schedule baseline** - It is the approved version of a schedule model
- ▶ **Project schedule:**
 - ❑ this is your working schedule. It is expected to change and to be updated with actual data.

Project Schedule	Schedule Baseline
Living document	Frozen document
Is a project document	Is a part of the project plan
Can be changed by the project manager (without formal change control)	Can only be changed through a formal change control process
	Schedule performance is always measured against the schedule baseline


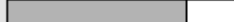


Output

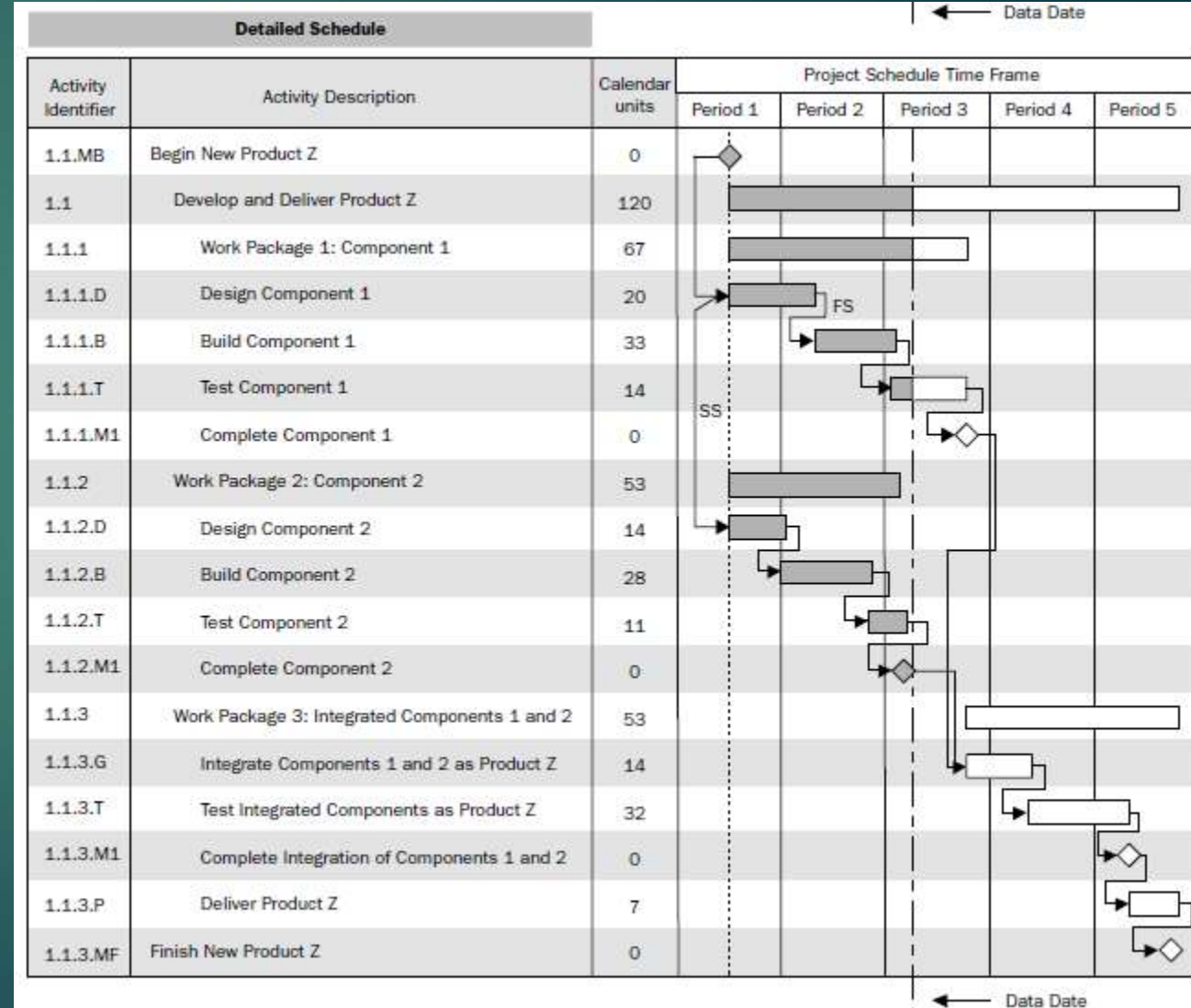
Project Schedule:

May be expressed in several forms:

Milestone Schedule							
Activity Identifier	Activity Description	Calendar units	Project Schedule Time Frame				
			Period 1	Period 2	Period 3	Period 4	Period 5
1.1.MB	Begin New Product Z	0					
1.1.1.M1	Complete Component 1	0					
1.1.2.M1	Complete Component 2	0					
1.1.3.M1	Complete Integration of Components 1 & 2	0					
1.1.3.MF	Finish New Product Z	0					

← Data Date

Summary Schedule							
Activity Identifier	Activity Description	Calendar units	Project Schedule Time Frame				
			Period 1	Period 2	Period 3	Period 4	Period 5
1.1	Develop and Deliver New Product Z	120					
1.1.1	Work Package 1: Component 1	67					
1.1.2	Work Package 2: Component 2	53					
1.1.3	Work Package 3: Integrated Components 1 and 2	53					



Output

► Schedule Data

- Includes schedule milestones, schedule activities, activity attributes, assumptions and constraints.
- Resource requirements by time period (Resource Histogram).
- Alternative schedules (best-case or worst-case).
- Contingency reserves and cash-flow projections.

► Project Calendars

- It identifies working days and shifts that are available for scheduled activities.

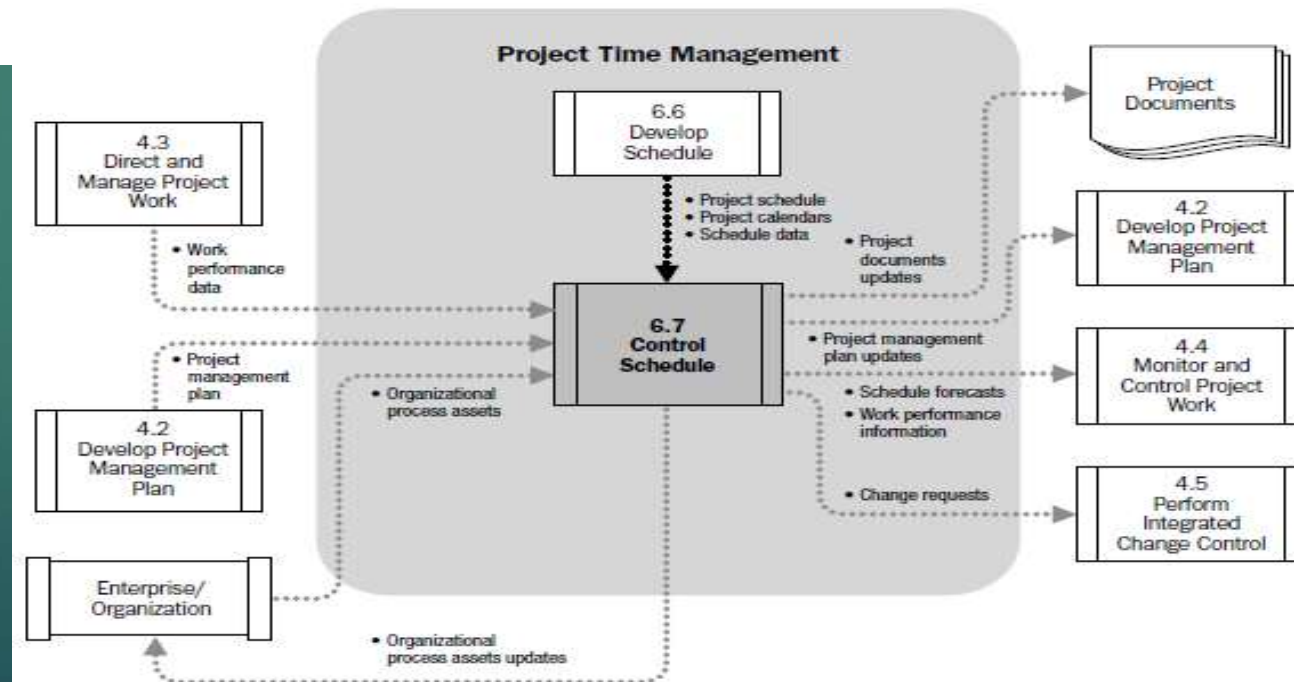
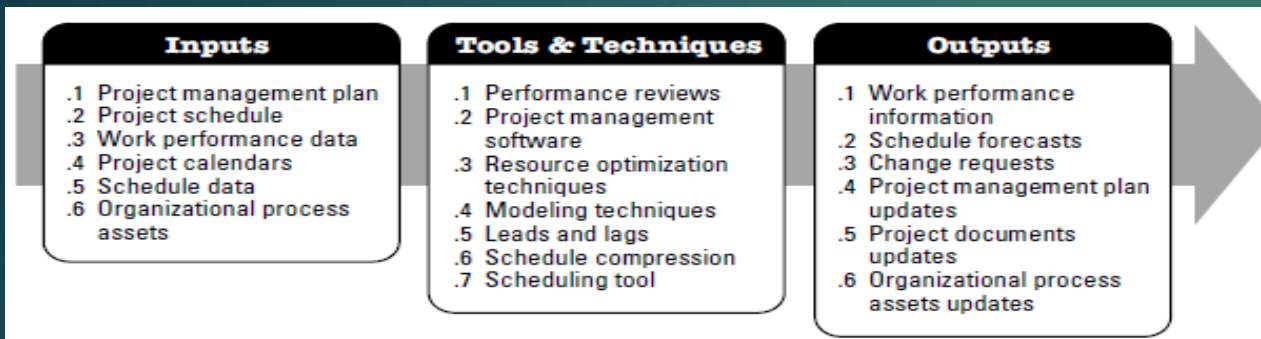
► Project Management Plan Updates

► Project Documents Updates



6.7 Control Schedule

- ▶ The process of **monitoring** the status of project **activities** to update project progress and **manage** changes to the **schedule baseline** to achieve the plan.
- ▶ **The key benefit** of this process is that it provides the means to recognize deviation from the plan and take corrective and preventive actions and thus **minimize risk**.



Tools & Techniques

► Performance Reviews

- ❑ **Trend Analysis** : examines project performance over **time** to determine whether performance is improving or deteriorating.
- ❑ **CPM**: Comparing the progress along the critical path.
- ❑ **CCM**: Comparing the amount of buffer remaining to the amount of buffer needed to protect the delivery date
- ❑ **Earned Value Management:**
 - i. Schedule Performance Index (SPI)
 - ii. Schedule Variance (SV)



Tools & Techniques

- ▶ Project Management Software
- ▶ Resource Optimization Techniques
- ▶ Modeling Techniques
- ▶ Leads and Lags
- ▶ Schedule Compression
- ▶ Scheduling Tools

- ❑ Schedule data is updated and compiled into the schedule model to reflect **actual progress** of the project and **remaining work** to be completed.



Output

- ▶ **Work Performance Information – SV & SPI**
- ▶ **Schedule Forecasts**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
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	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	



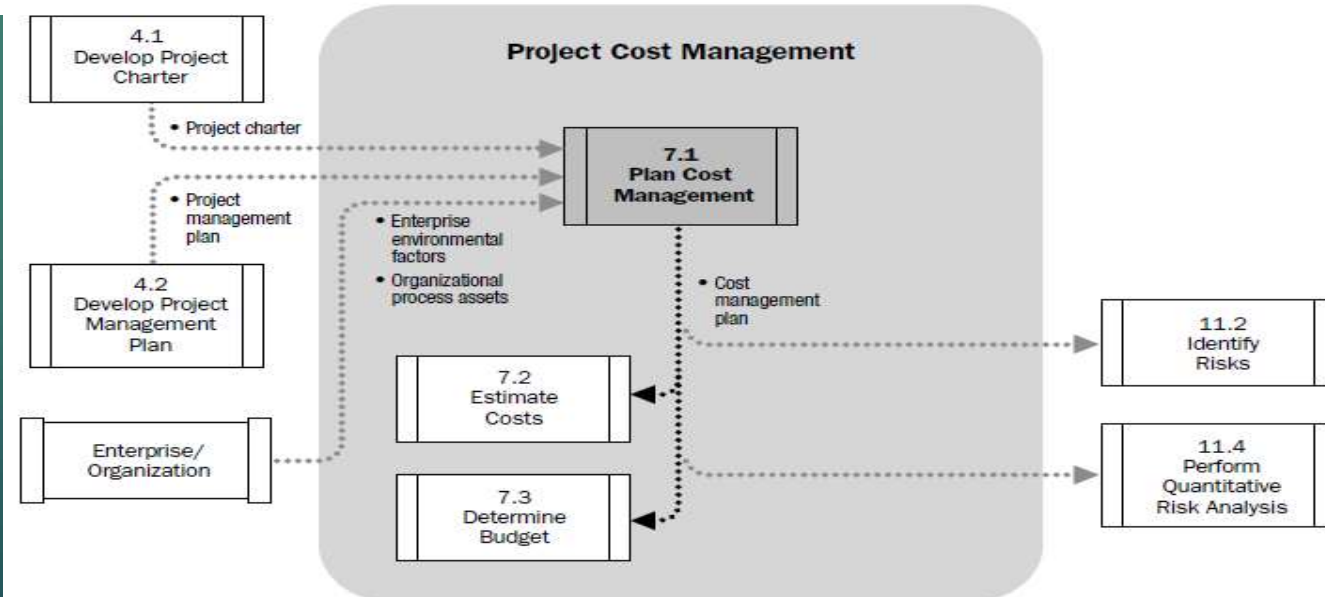
7. Project Cost Management



How To!

7.1 Plan Cost Management

- ▶ The process that establishes the **policies, procedures**, and documentation for planning, managing, expending, and controlling project costs.
- ▶ **The key benefit** of this process is that it provides **guidance** and **direction** on **how** the project costs will be managed throughout the project.



Types of Cost

- ▶ **Fixed Costs:** they stay the same and **do not change** throughout the project life cycle. Examples: setup costs, rental costs etc.
- ▶ **Variable Costs:** are costs that **change** with the amount of work. Examples: hourly labor, the cost of material, the cost of supply, fuel for bulldozer etc.
- ▶ **Direct Costs:** are expenses that are billed **directly** to the project. Examples: team travel expenses, team wages, the cost of material used in a project.
- ▶ **Indirect Costs:** are shared and allocated among **several or all projects**. Examples: fringe benefits and taxes ,the salary of an architect or a project manager who is partially allocated across many projects, Security, Office Boy.



- **Sunk Costs:** Sunk costs are costs that have been incurred on a project but have no value towards project objectives.

Tools & Techniques

► Analytical techniques

- ❑ It may relate to **project funding** such as self-funding/equity/debt.
- ❑ How **financial decisions** are made such as: ROI, cost-benefit analysis, NPV, opportunity cost .
- ❑ Project **Resources Finance** such as Make/buy , Rent /Lease.



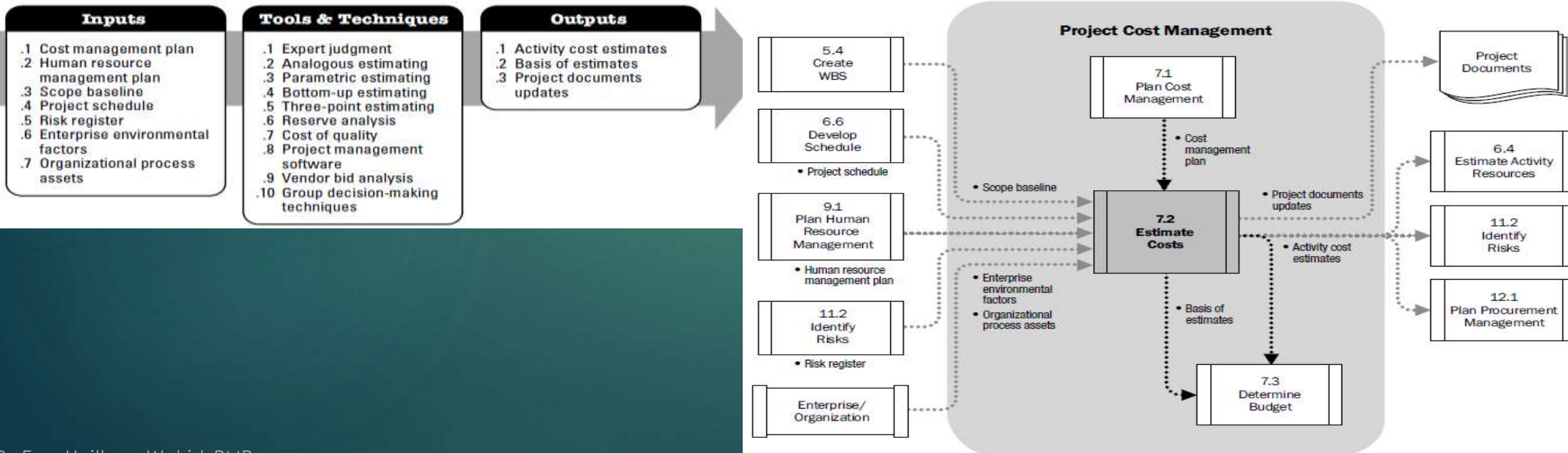
Output

Cost management plan	Defines- level of accuracy, units of measure, earned value rules, etc.
	It does not describe or list the planned costs for the project. (The cost estimate and cost baseline do this).
	It is not part of the cost baseline.
	It is contained in or a subsidiary plan of the project management plan.

- ❑ **Level of accuracy:** The acceptable range (e.g., $\pm 10\%$) used in determining realistic activity cost estimates.
- ❑ **Level of precision:** The degree of cost estimates to be rounded up/down (100.2\$ - 100\$).
- ❑ **Units of measure :** (staff hour- staff days – lump sum) for resources.
- ❑ **Organizational procedures links:** with Accounting system.
- ❑ **Control thresholds :** an agreed-upon amount of cost variation (%age deviation) from the base line before taking action.
- ❑ **Rules of performance measurement :** for Example - EVM
- ❑ **Reporting formats** (Templates – Frequency)

7.2 Estimate Costs

- ▶ The process of developing an **approximation of the monetary resources** needed to complete project activities.
- ▶ **The key benefit** of this process is that it **determines the amount of cost** required to complete project work.



Tools & Techniques

► **Cost of quality** – often an organization will estimate the cost of the project and then add on a factor to cover the cost of quality.

❑ cost of conformance/non conformance

► **Vendor bid analysis** – often we may ask our vendors to submit bids, that we may use in our cost estimating process.



Output

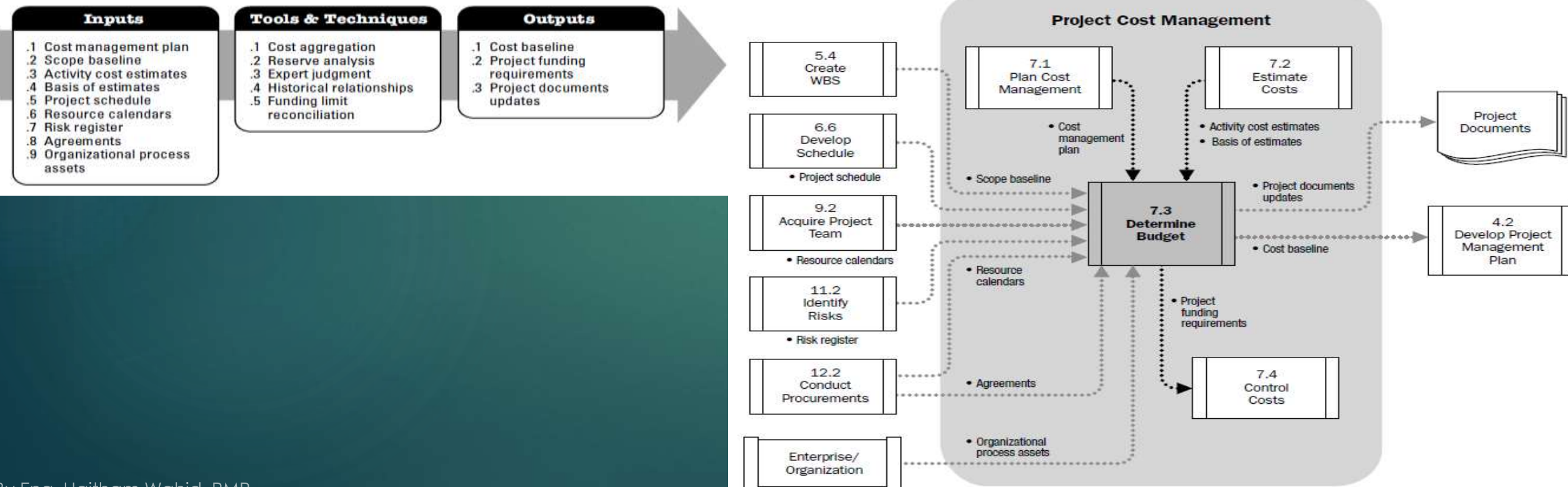
- ▶ **Activity cost estimates** – It is Quantitative assessments of the probable costs required to complete project work.
 - ❑ Labor, materials, equipment, services, facilities, IT, contingency reserves.

- ▶ **Basis of Estimates** – this is all of your backup information to support how you came to the cost estimate you did. It should include **constraints** and **assumptions**, etc.



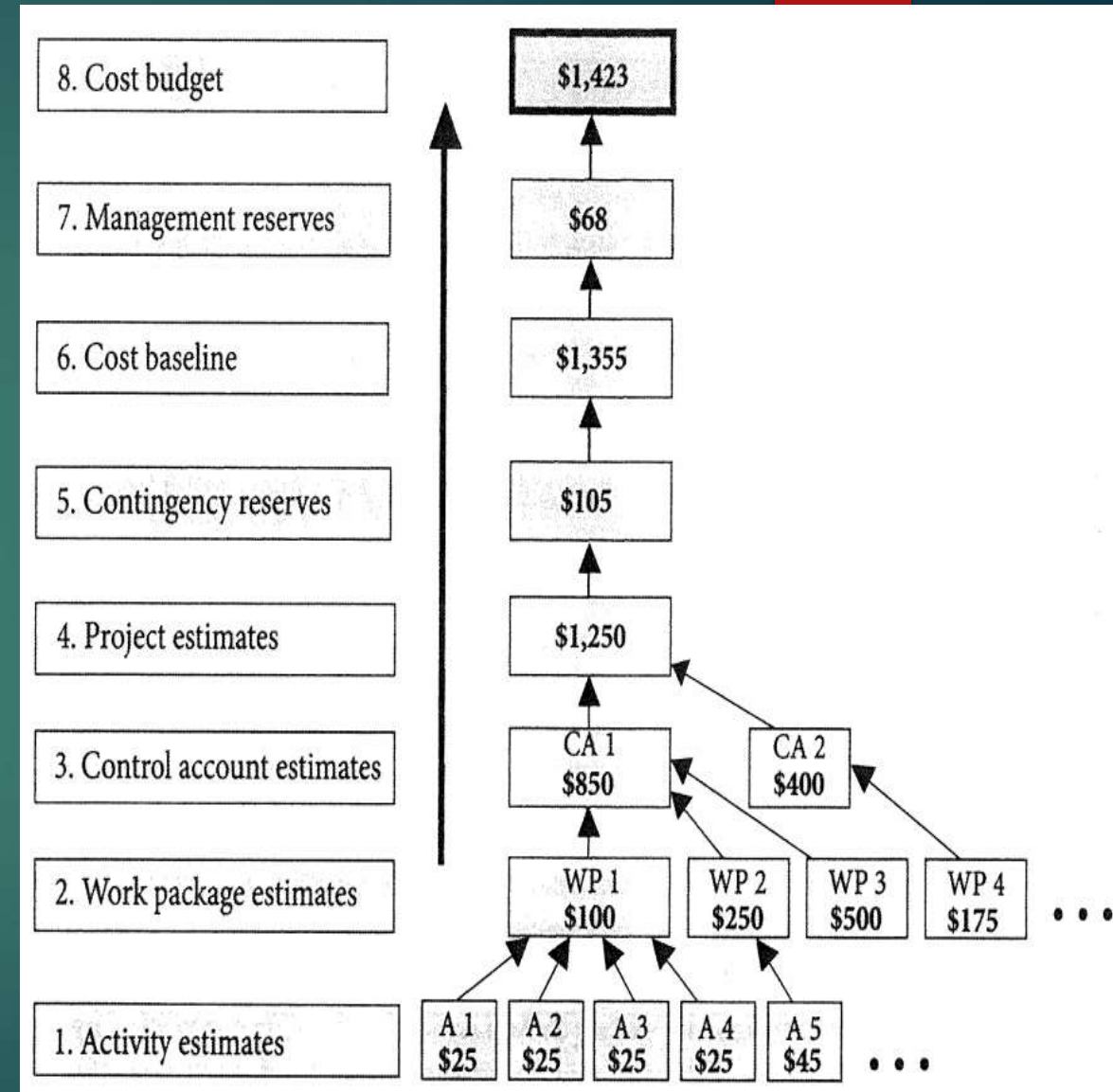
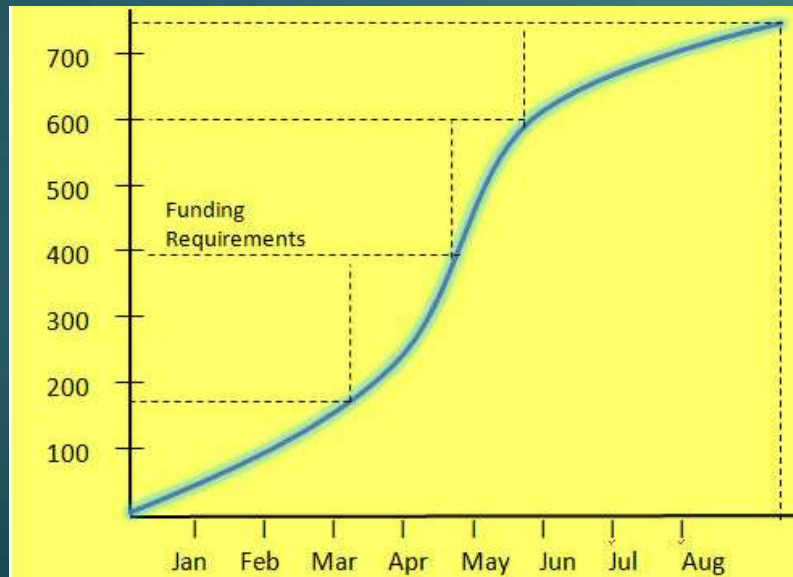
7.3 Determine Budget

- ▶ The process of **aggregating** the **estimated costs** of individual activities or work packages to establish an authorized **cost baseline**.
- ▶ **The key benefit** of this process is that it determines the **cost baseline** against which project performance can be **monitored** and **controlled**.



Tools & Techniques

- ▶ **Cost aggregation**- the cost of the individual activities (or work packages) are aggregated (added up) to create the cost baseline.
- ▶ **Historical Relationships**- Any historical relationships that result in parametric estimates or analogous estimates.
- ▶ **Funding limit reconciliation**- when we plan to spend money ,it should be in line with when money will be available. If this does not reconcile, the timing of activities may need to be adjusted.



Output

- ▶ **Cost baseline** – this is the approved time phased budget for the project. It should include contingency reserve but **not management reserve**.
- ▶ **Project funding requirements** – should match the cost baseline **plus management reserve**. For example: quarterly, annually.

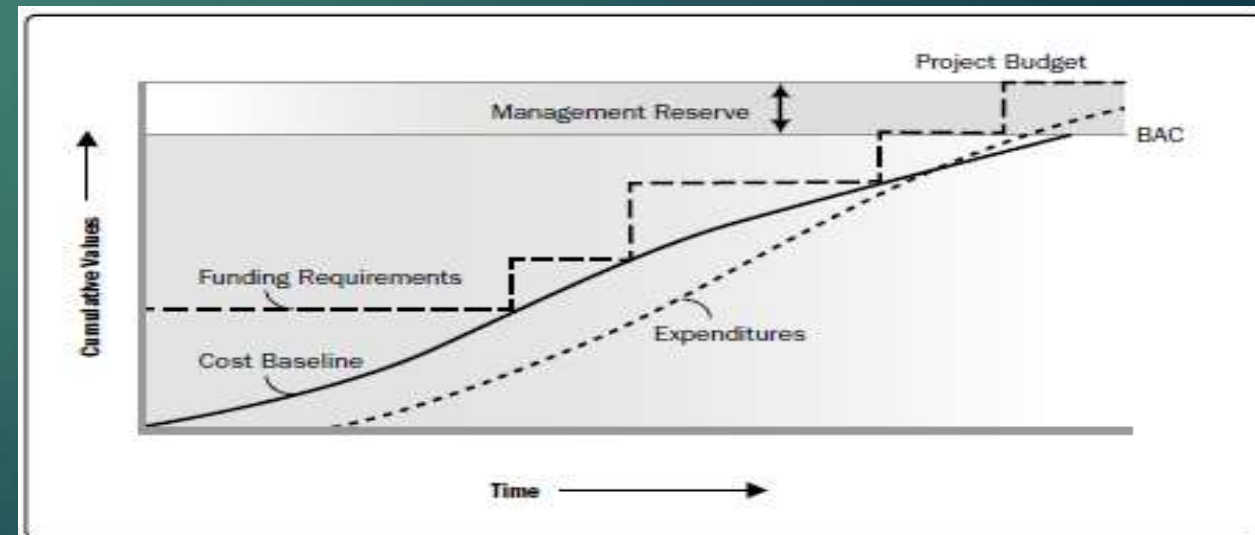
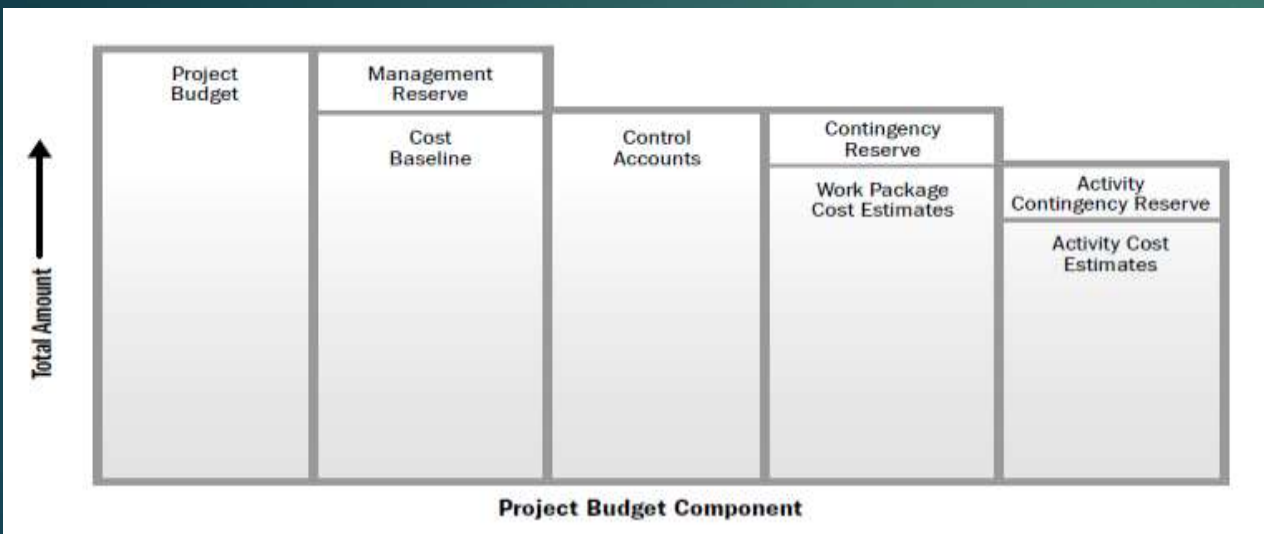
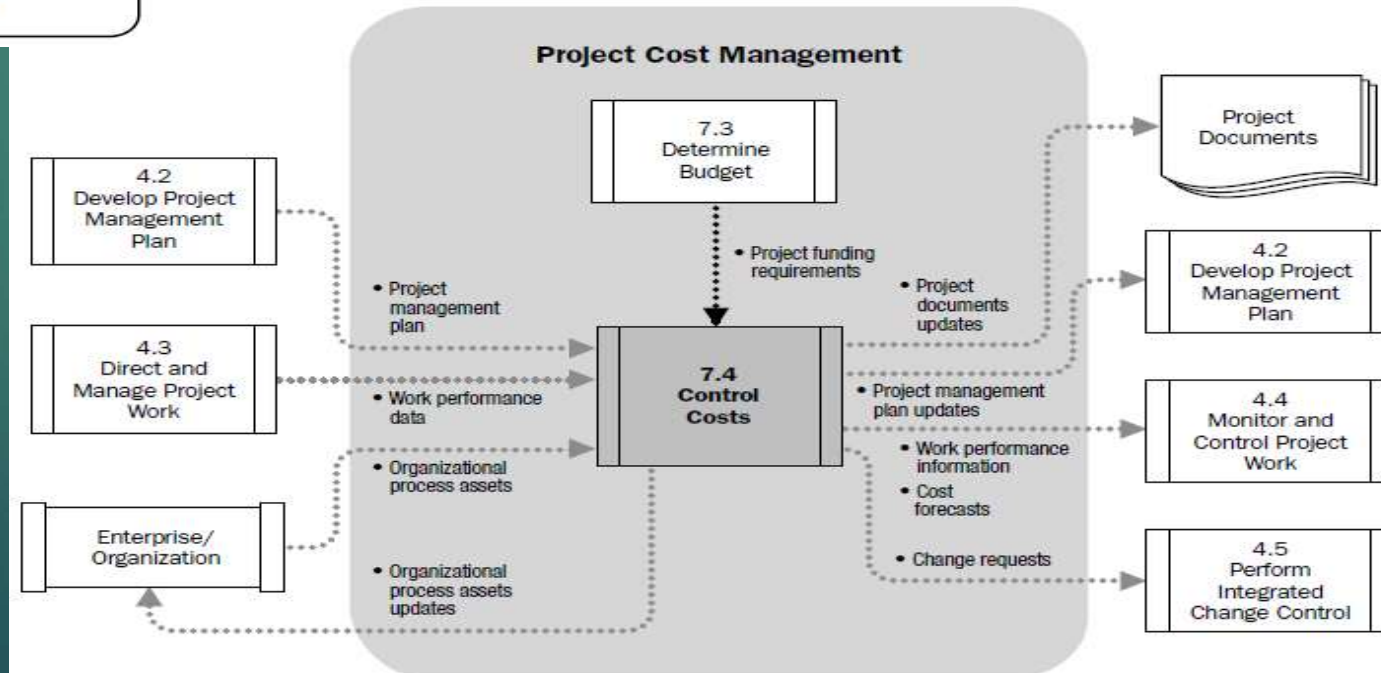
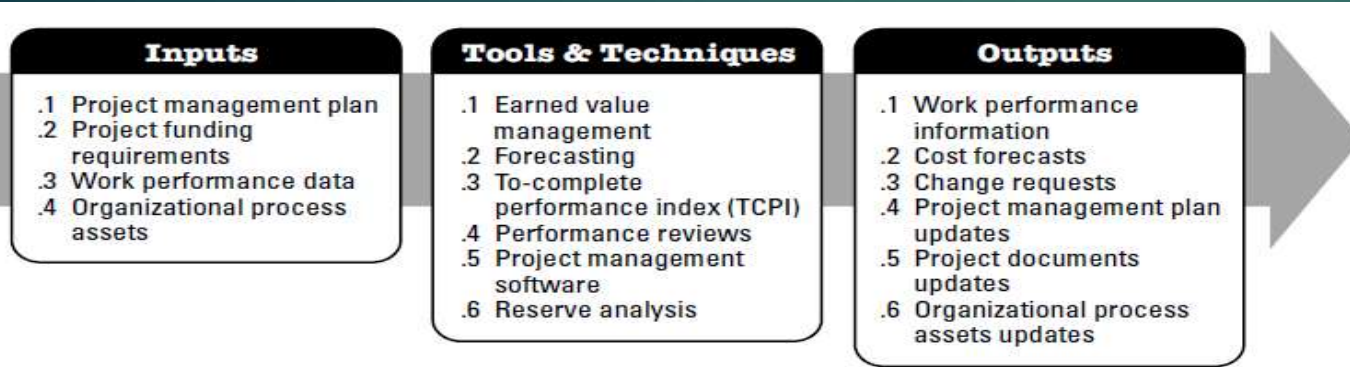


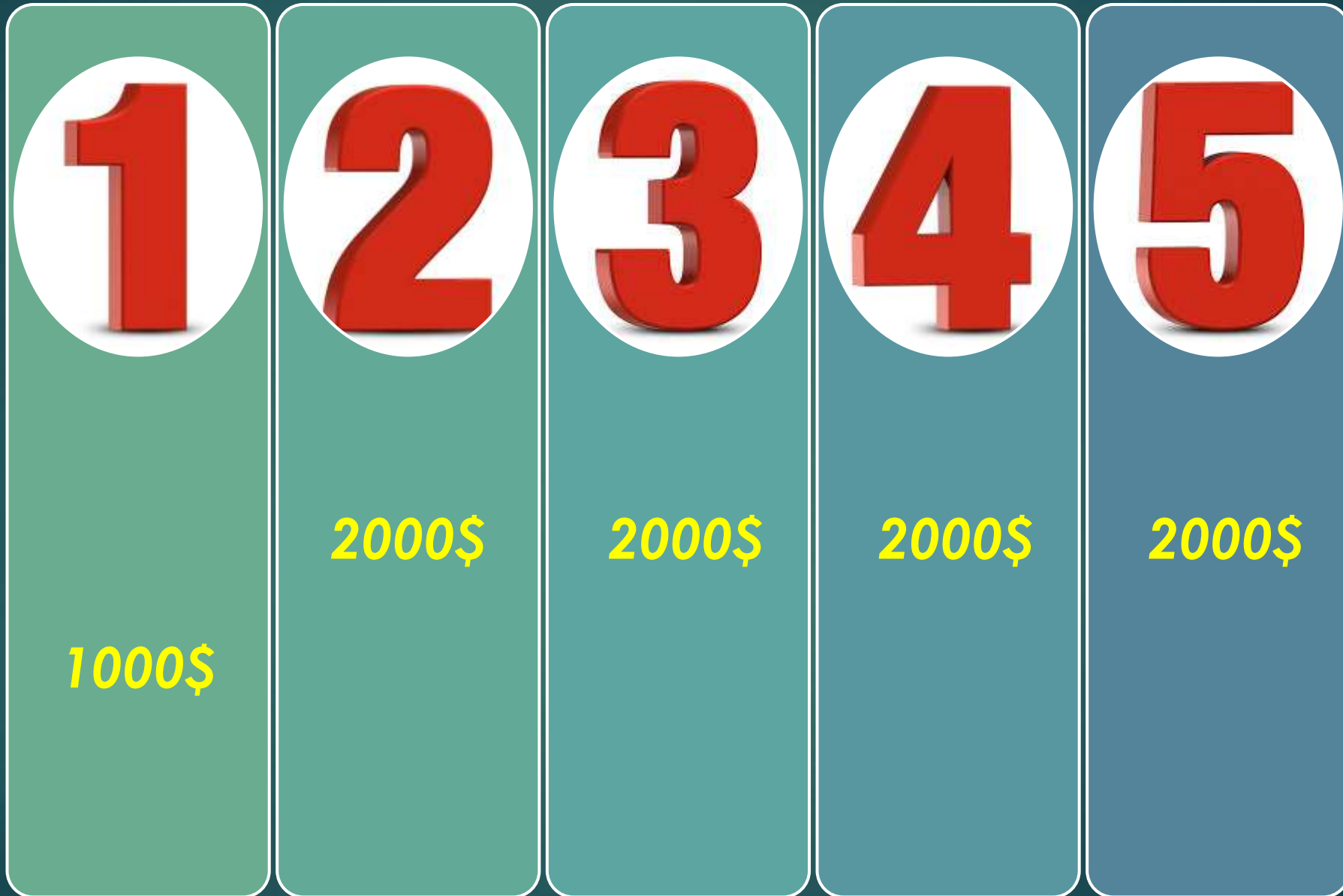
Figure 7-9. Cost Baseline, Expenditures, and Funding Requirements

7.4 Control Cost

- ▶ The process of monitoring the status of the project to update the project **costs** and **managing changes** to the **cost baseline**.
- ▶ **The key benefit** of this process is that it provides the means to recognize variance from the plan in order to take corrective action and minimize risk.



EXAMPLE



Tools & Techniques

► Earned Value Management

- ❑ EVM is a methodology that assess project performance and progress.
- ❑ It integrates the scope baseline with the cost baseline, along with the schedule baseline, to form the performance baseline.

Summarize performance against the plan.

- How much of what was planned to be done has actually been done?
- Has it been done on time?
- Has it been done within budget?
- When will the project be done?
- How much will the project cost at completion?

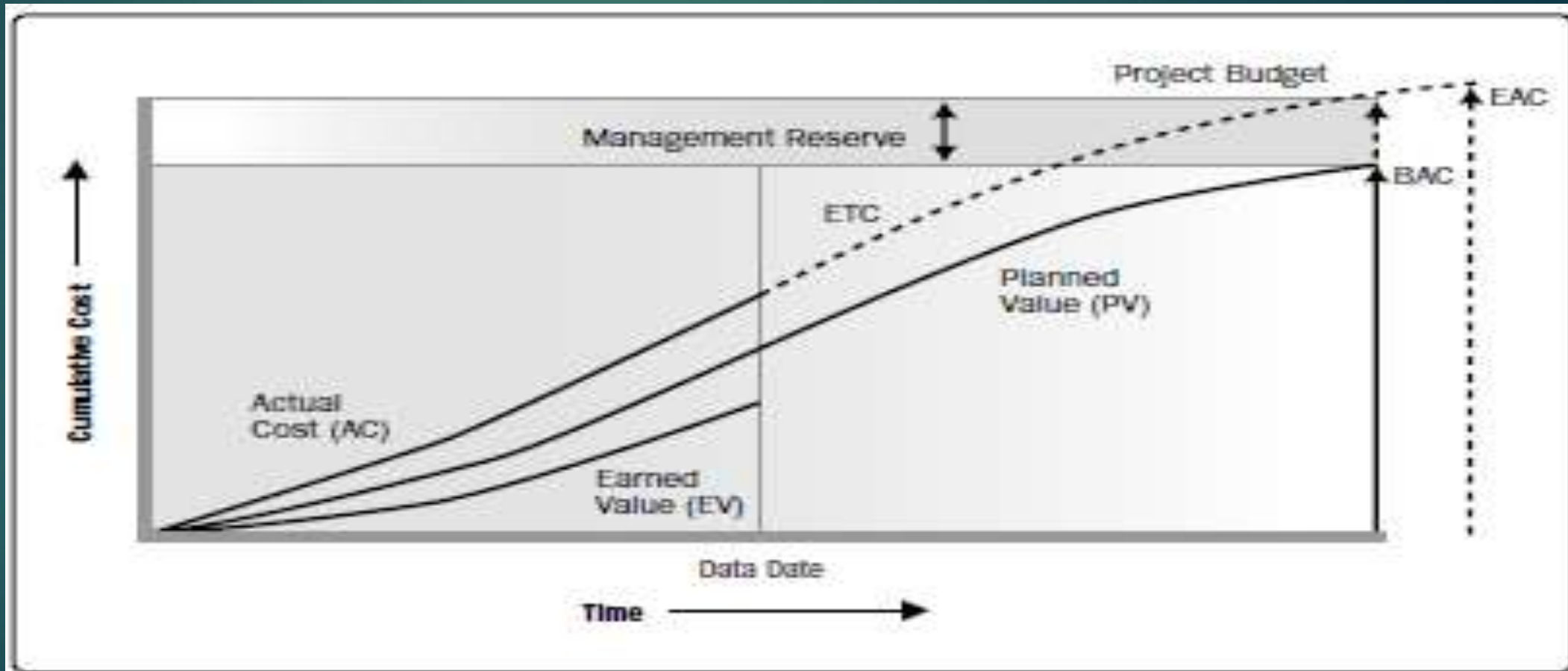


Figure 7-12. Earned Value, Planned Value, and Actual Costs



Name	Formula	What it says	Why you use it
BAC—Budget at Completion	No formula – it's the project budget	How much money you'll spend on the project	To tell the sponsor the total amount of value that he's getting for the project
PV—Planned Value	$PV = BAC \times \frac{\text{Planned \% Complete}}{100}$	What your schedule says you should have spent	To figure out what value your plan says you should have delivered so far
EV—Earned Value	$EV = BAC \times \frac{\text{Actual \% Complete}}{100}$	How much of the project's value you've really earned	EV lets you translate how much work the team's finished into a dollar value
AC—Actual Cost	What you've actually spent on the project	How much you've actually spent so far	The amount of money you spend doesn't always match the value you get!
SPI—Schedule Performance Index	$SPI = \frac{EV}{PV}$	Whether you're behind or ahead of schedule	To figure out whether you've delivered the value your schedule said you would
SV—Schedule Variance	$SV = EV - PV$	How much ahead or behind schedule you are	This puts a dollar value on exactly how far ahead or behind schedule you are
CPI—Cost Performance Index	$CPI = \frac{EV}{AC}$	Whether you're within your budget or not	Your sponsor is always most interested in the bottom line!
CV—Cost Variance	$CV = EV - AC$	How much above or below your budget you are	Your sponsor needs to know how much it costs to get him the value you deliver
TCPI—To-Complete Performance Index	$TCPI = \frac{BAC - EV}{BAC - AC}$	How well your project must perform to stay on budget.	This will let you forecast whether or not you can stick to your budget.

$$ETC = EAC - AC$$

$$VAC = BAC - EAC$$

Tools & Techniques

► **Forecasting** – 4 scenarios

1. Material cost increase.
2. Once.
3. Initial plan is no longer valid.
4. one/two machine is off.

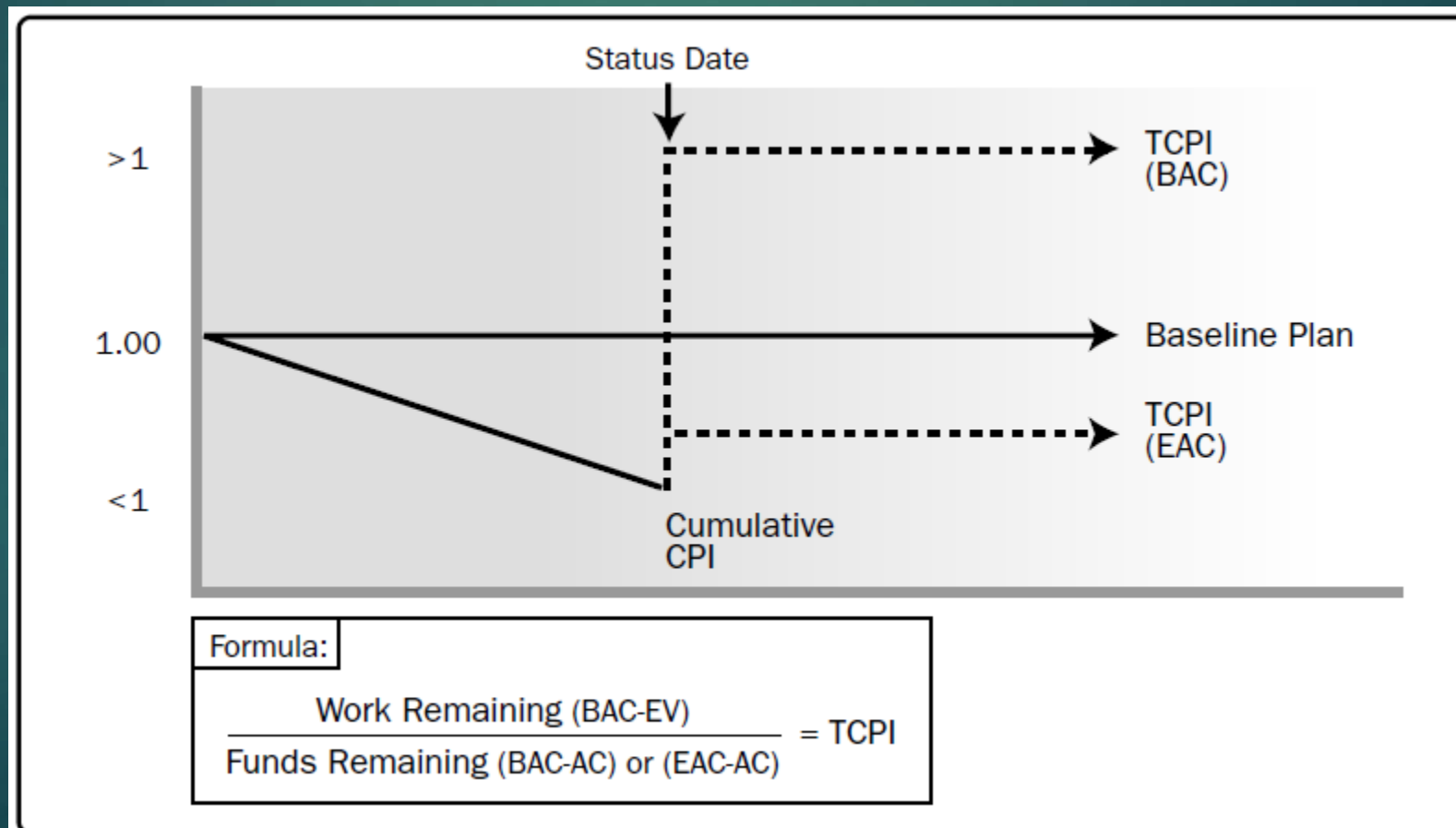


EAC	Estimate At Completion	The expected total cost of completing all work expressed as the sum of the actual cost to date and the estimate to complete.	<p>If the CPI is expected to be the same for the remainder of the project, EAC can be calculated using:</p> <p>If future work will be accomplished at the planned rate, use:</p> <p>If the initial plan is no longer valid, use:</p> <p>If both the CPI and SPI influence the remaining work, use:</p>	$EAC = BAC / CPI$ $EAC = AC + BAC - EV$ $EAC = AC + \text{Bottom-up ETC}$ $EAC = AC + [(BAC - EV) / (CPI \times SPI)]$
-----	------------------------	--	--	--

Tools & Techniques

► To-Complete Performance Index (TCPI)

- ❑ Calculated projection of cost performance that **must** be achieved on the **remaining work** to meet a specified management goal, such as BAC or EAC.
- ❑ “In order to stay within budget, What rate must we meet for the remaining work?”



Tools & Techniques

► Performance Reviews

- ❑ Variance Analysis – Trend Analysis – EVM performance

► Project Management Software

► Reserve Analysis



Output

- ▶ **Work Performance Information**
 - ❑ The calculated CV, SV, CPI, SPI, TCPI, and VAC.
- ▶ **Cost Forecasts**
 - ❑ The calculated EAC or ETC .
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



Definitions



WPD (AC, actual durations)

The **raw** observations and measurements identified during activities performed to carry out the project work. (from **Execution**)



WPI (status of deliverables, ETC)

The performance data collected from various **controlling** processes (from **M&C**)



WPR (status reports, memos)

The **physical** or **electronic** representation of work performance information compiled in project documents, intended to generate decisions or raise issues, actions, or awareness.

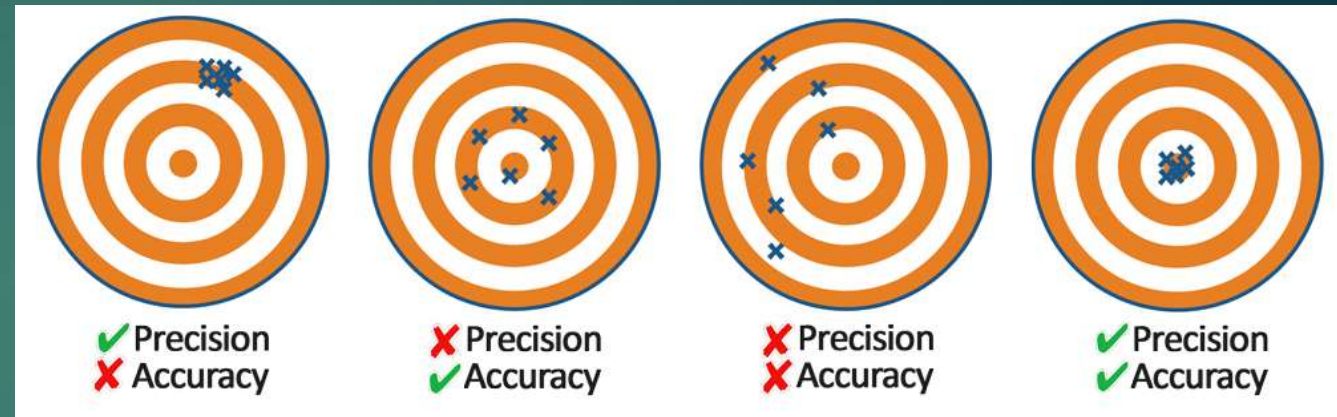
		Project Management Process Groups				
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Definitions:

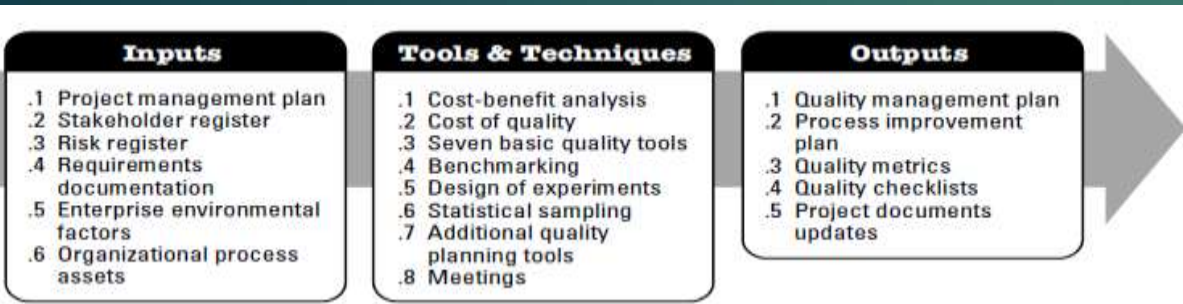
- ▶ Quality & Grade.
- ▶ Accuracy & Precision.
- ▶ Prevention over inspection.
- ▶ Customer Satisfaction.
- ❑ Conformance to Requirements.
- ❑ Fitness for use.
- ▶ Continuous Improvement (Kaizen).
- ▶ Management Responsibility.
- ▶ Marginal Analysis.
- ▶ Just in Time (JIT).



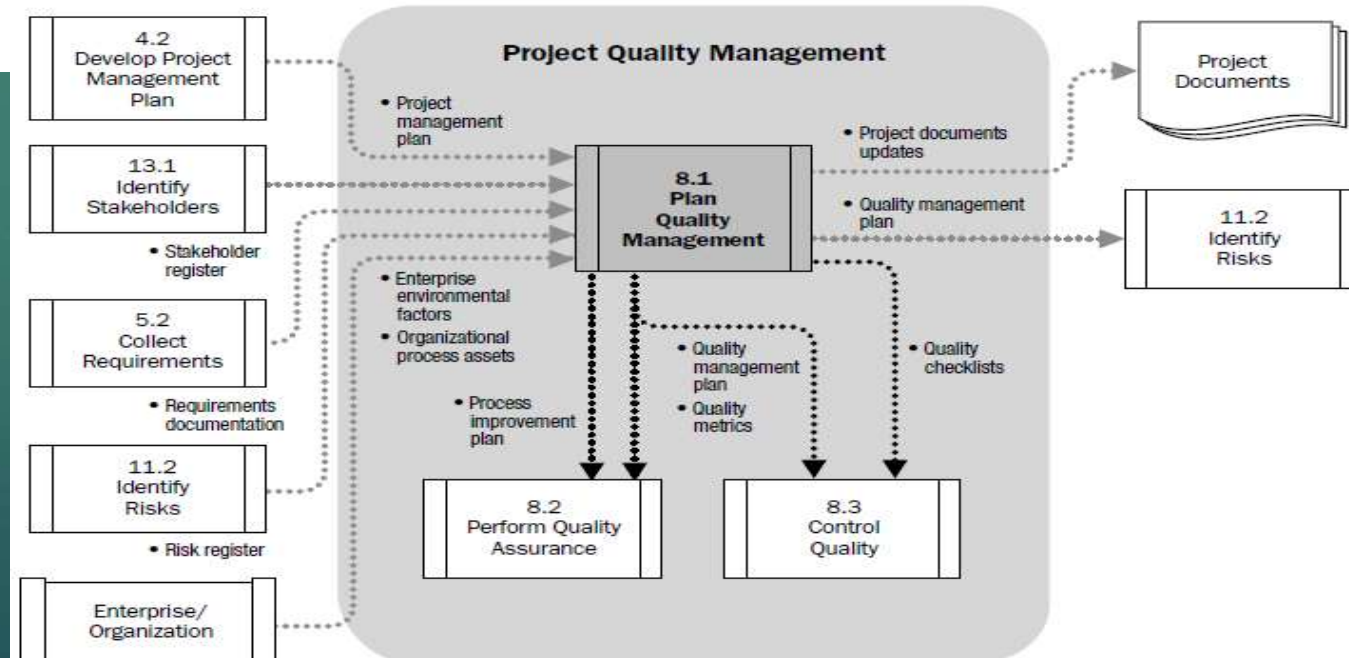
8.1 Plan Quality Management



- ▶ is 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**.
- ▶ **The key benefit** of this process is that it provides guidance and direction on **how** quality will be managed and validated throughout the project.



Standards Requirements



Tools & Techniques

► Cost-Benefit Analysis.

► Cost of Quality (COQ).

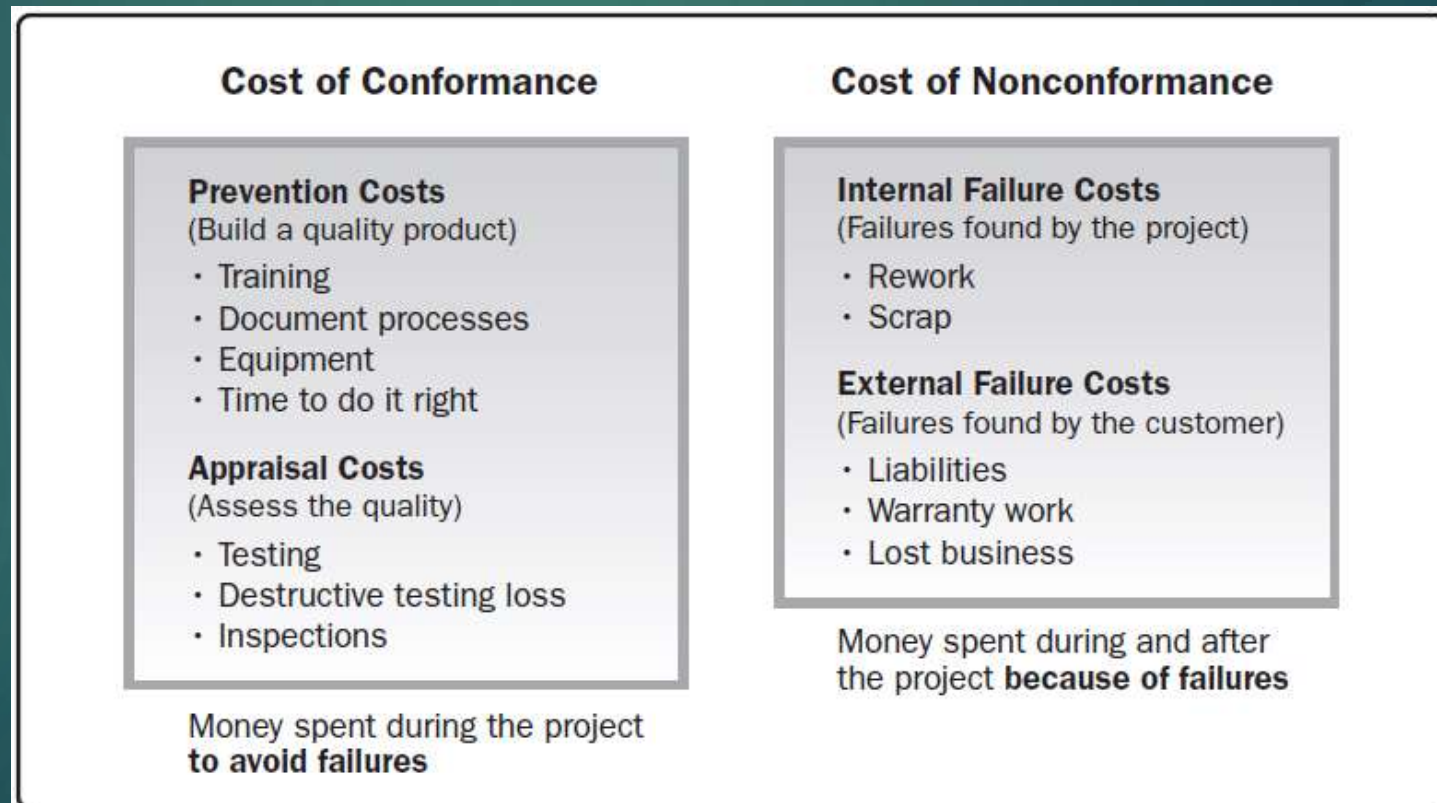
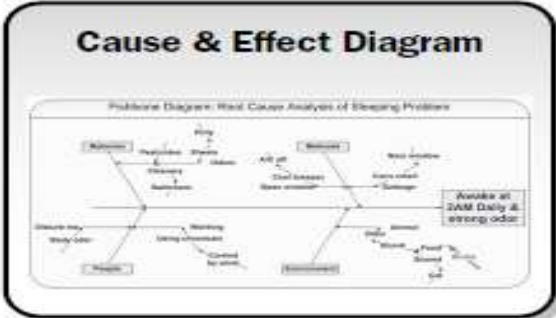


Figure 8-5. Cost of Quality

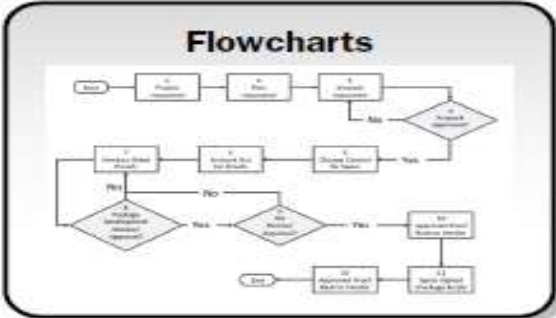
► Seven Basic Tools:

[illegible]

Flowcharts

```

graph TD
    Start([Start]) --> 1[1. Product Identification]
    1 --> 2[2. Basic Information]
    2 --> 3[3. Detailed Information]
    3 --> 4{4. Approved?}
    4 -- No --> 1
    4 -- Yes --> 5[5. Developed Product]
    5 --> 6[6. Internal Test for Feasibility]
    6 --> 7[7. External Test for Market]
    7 --> 8[8. Detailed Report for Review]
    8 --> 9{9. Approved?}
    9 -- No --> 6
    9 -- Yes --> 10[10. Developed Product]
    10 --> 11[11. New Product of the Market]
    11 --> End([End])
  
```



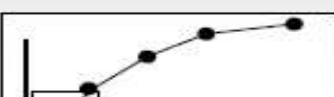
Checksheets

<i>Category</i>	<i>Strokes</i>	<i>Frequency</i>
Attribute 1		
Attribute 2		
Attribute ...		
Attribute n		

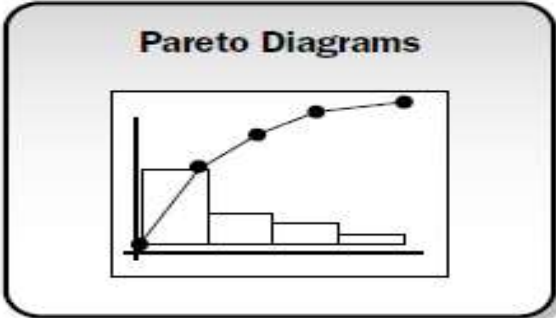
Checksheets

<i>Category</i>	<i>Strokes</i>	<i>Frequency</i>
Attribute 1		
Attribute 2		
Attribute ...		
Attribute n		

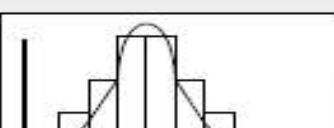
Pareto Diagrams



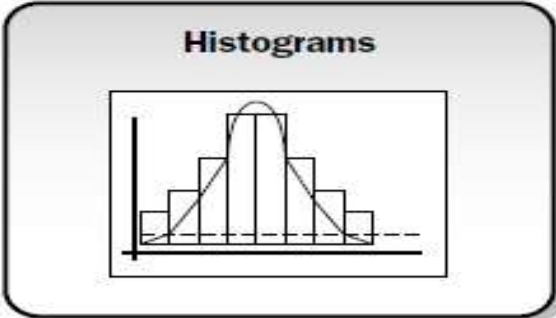
A Pareto Diagram is a bar chart with a cumulative curve. The horizontal axis represents categories, and the vertical axis represents frequency or value. The bars are arranged in descending order of height. A line connects the top-right corners of the bars, forming a curve that represents the cumulative total.



Histograms



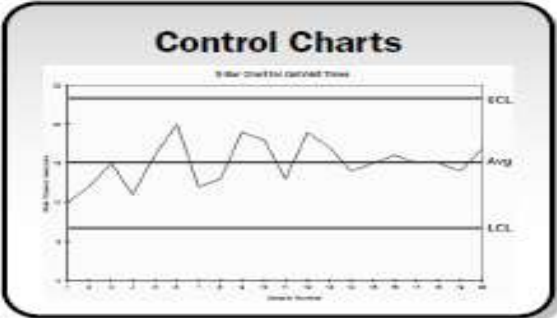
A histogram with a normal distribution curve overlaid. The histogram has 10 bars of equal width. The curve is centered over the histogram, illustrating the relationship between the two distributions.



Control Charts

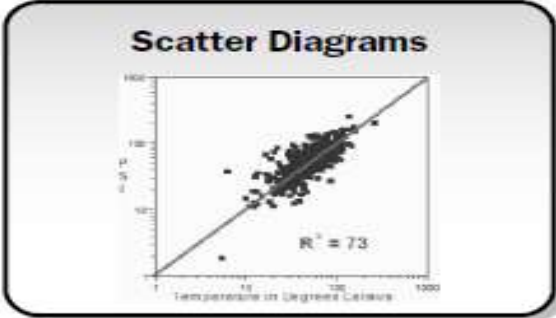
The graph displays the following data points (approximate values):

Sample No. (months)	Avg. Sales (millions)
1	3.5
2	4.5
3	3.5
4	5.5
5	7.5
6	4.5
7	3.5
8	4.5
9	7.5
10	6.5
11	4.5
12	7.5
13	5.5
14	4.5
15	5.5
16	5.5
17	5.5
18	4.5
19	5.5
20	6.5



Scatter Diagrams

A scatter diagram illustrating the relationship between Temperature in Degrees Celsius (X-axis) and pH (Y-axis). The X-axis is logarithmic, ranging from 1 to 1000. The Y-axis is linear, ranging from 0 to 150. A positive linear trend is evident, with a regression line drawn through the data points. The coefficient of determination is $R^2 = 73$.



Tools & Techniques

► Seven Basic Tools:



1. Fishbone/Ishikawa (Cause & Effect)

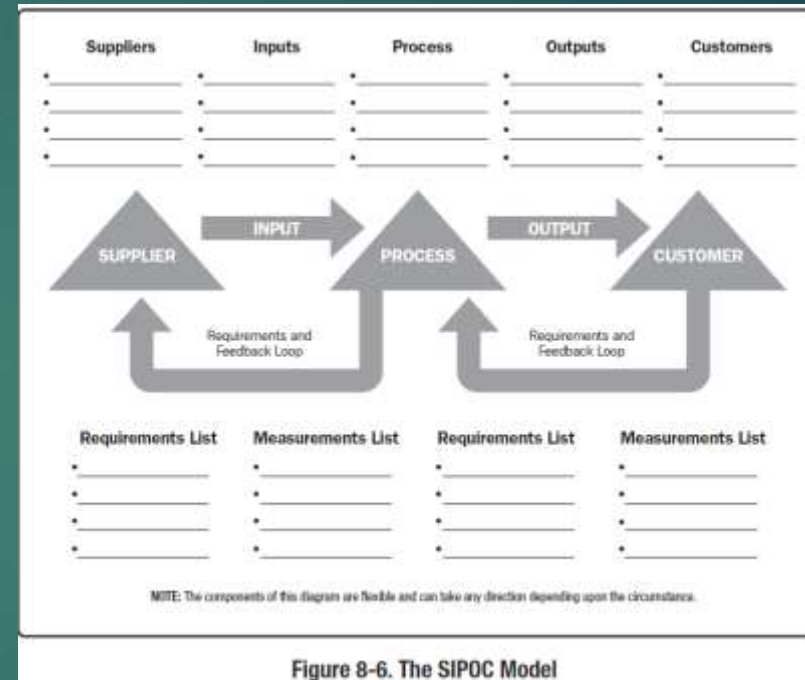


Figure 8-6. The SIPOC Model

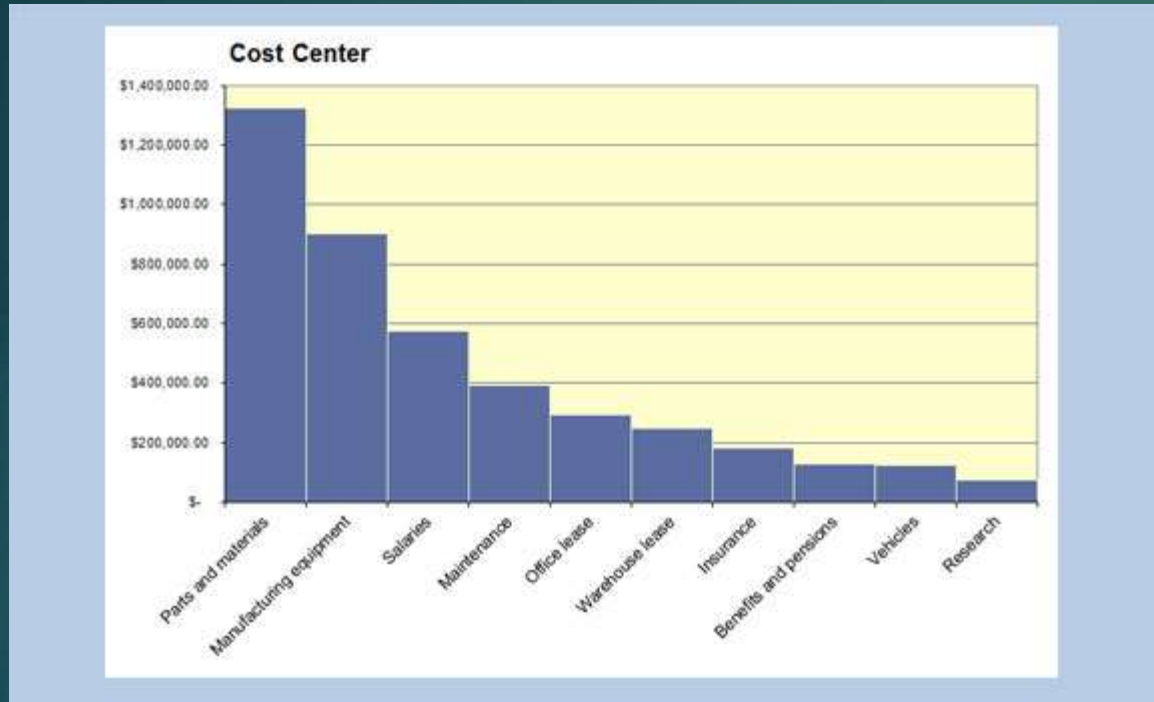
2. Flowchart



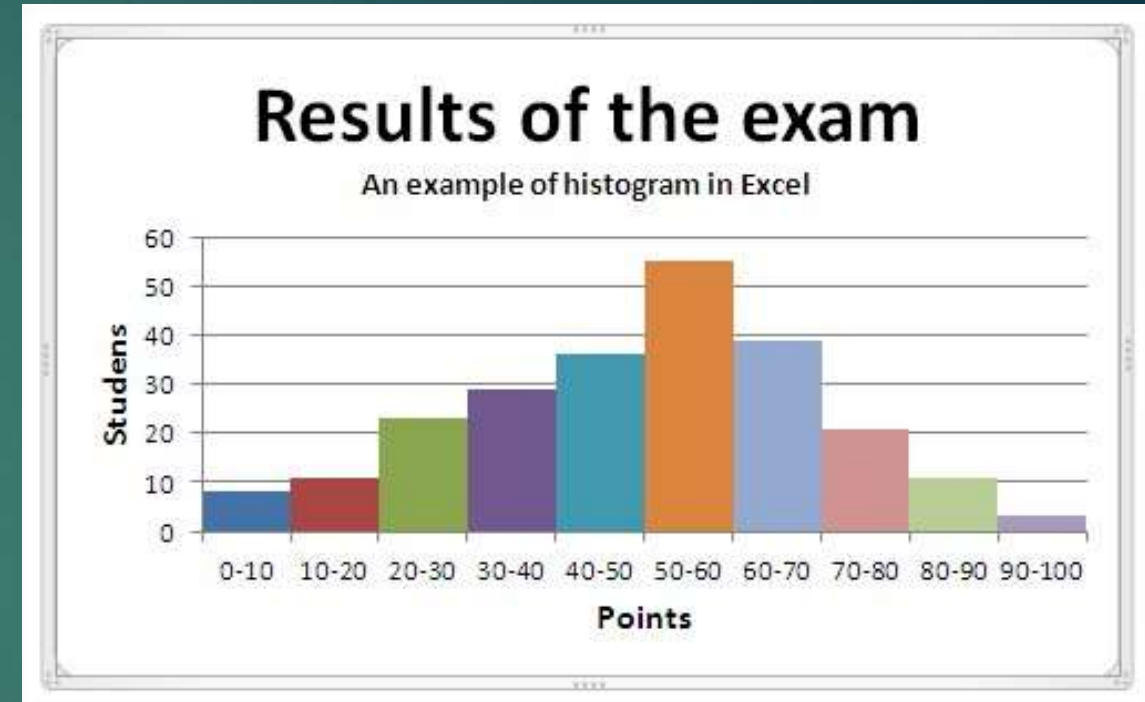
3. Checksheet

Tools & Techniques

► Seven Basic Tools:



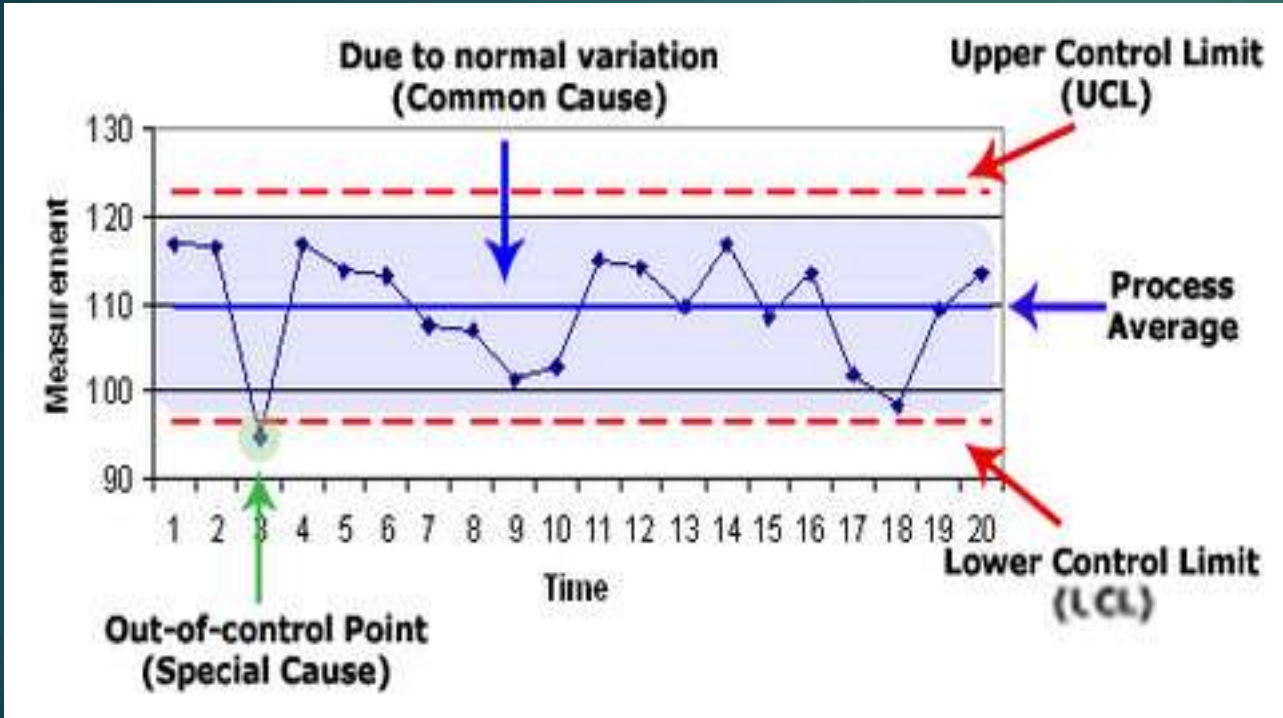
4. Pareto Diagram (80/20)



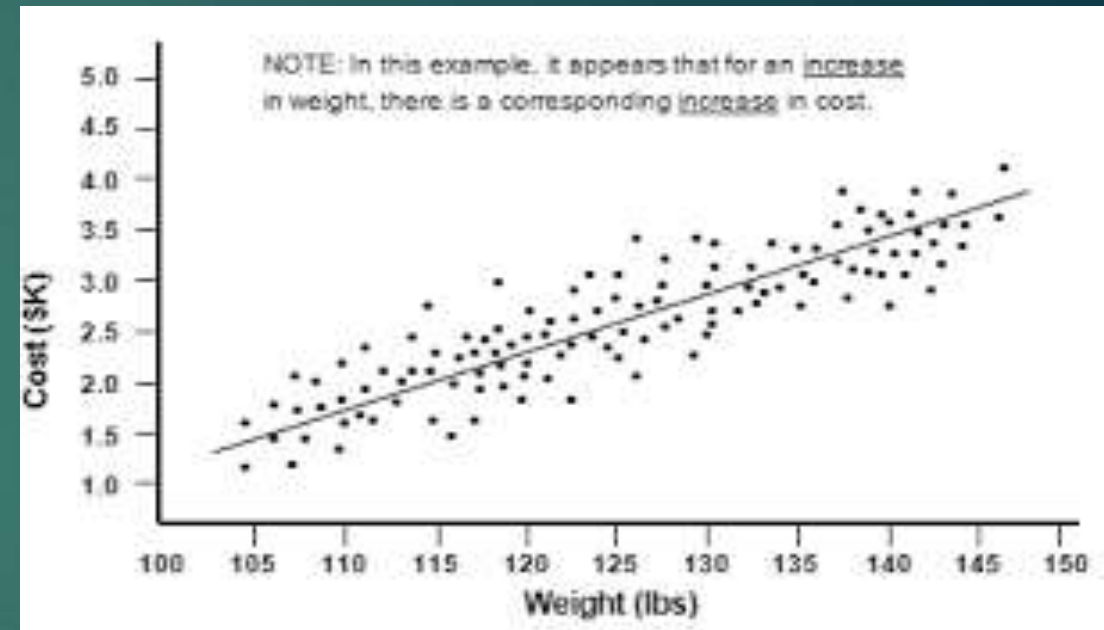
5. Histogram

Tools & Techniques

► Seven Basic Tools:



6. Control Chart
(Control Limit & Specification Limit)



7. Scatter Diagram

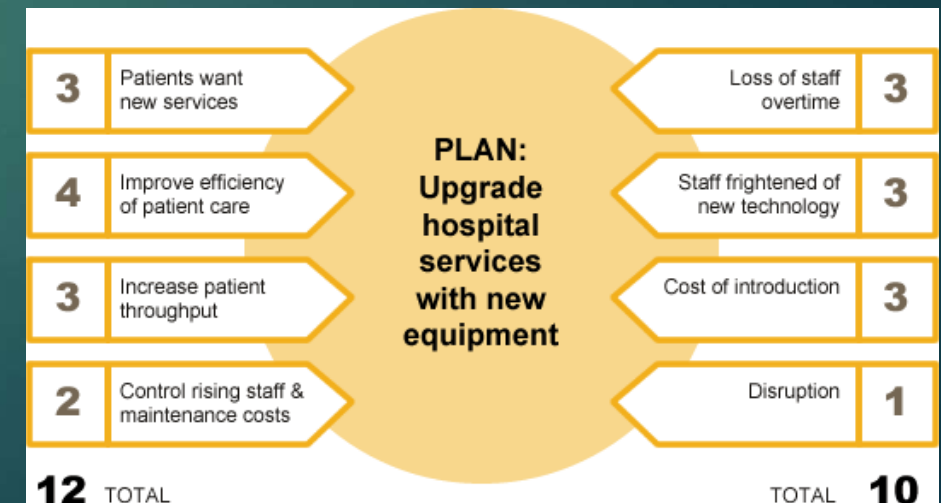
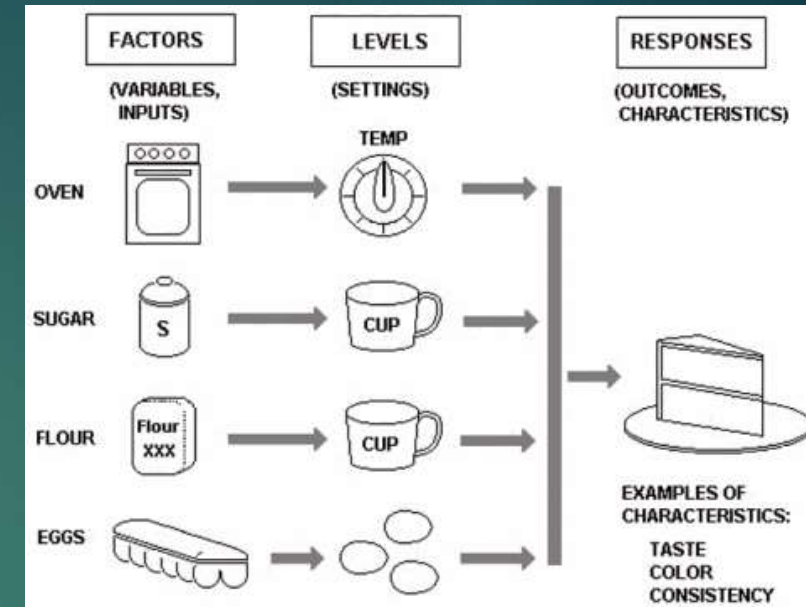
Tools & Techniques

► Design of Experiments

► Statistical Sampling

► Additional Quality Planning Tools

Brainstorming – **Force Field Analysis** (for & against changes) – Nominal Group



Output

Quality management plan	Describes how the quality requirements will be met.
	Does not contain the quality standards.
	It is a subset of the project management plan.

Process Improvement plan	Describes how project management and product development processes will be analyzed and enhanced.
	It is a subset of the project management plan.

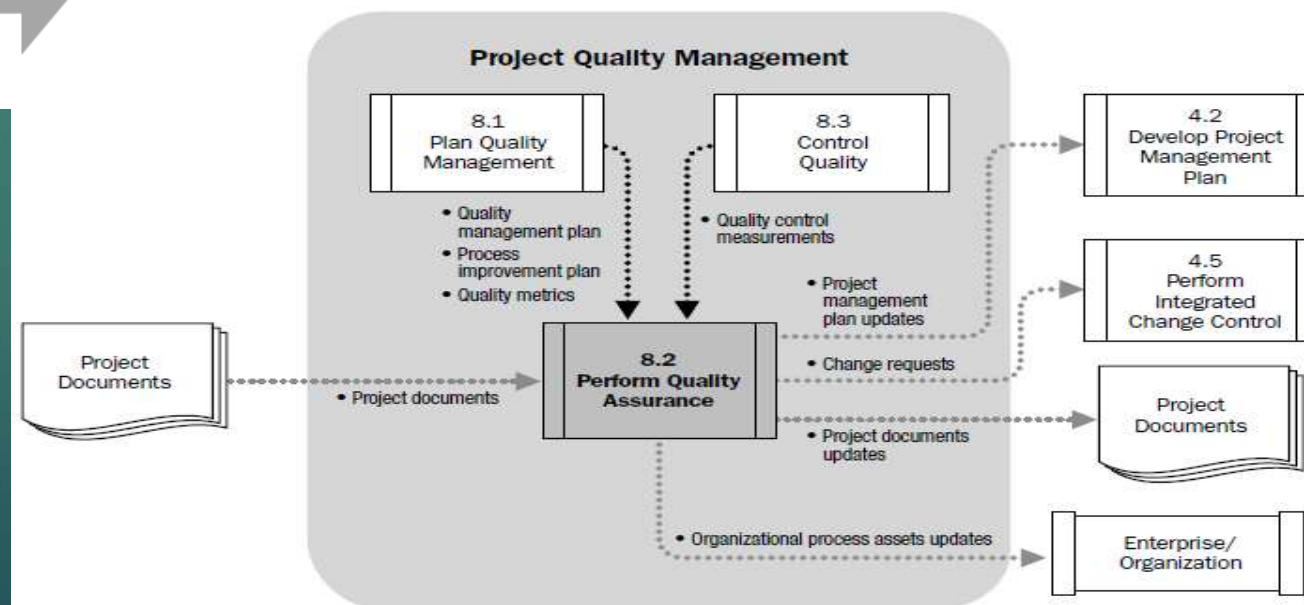
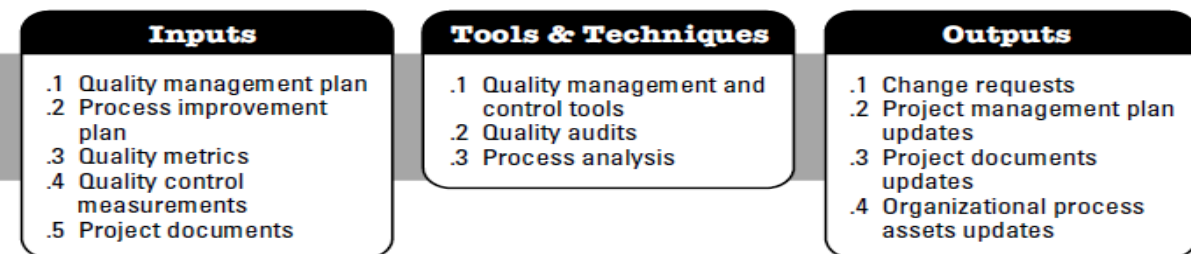
- ▶ **Quality metrics**-describes a project or product attribute and how the control quality process will measure it.
- ▶ **Quality Checklists**- A structured tool used to verify that a set of required steps has been performed.
- ▶ **Project Document Updates**



8.2 Perform Quality Assurance



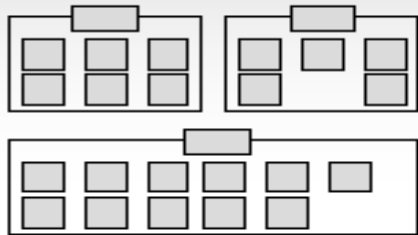
- ▶ is the process of **auditing** the quality requirements and the results from quality control measurements to ensure that appropriate **quality standards** and operational definitions are used.
- ▶ **The key benefit** of this process is that it facilitates **the improvement of quality processes**.
- ▶ QA seeks to build **confidence** that a future output or an unfinished output (work in progress) will be completed in a manner that **meets the specified requirements and expectations**.



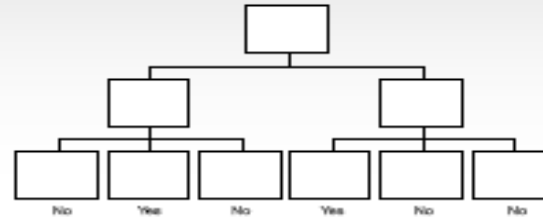
Tools & Techniques

► Quality Management & Control Tools

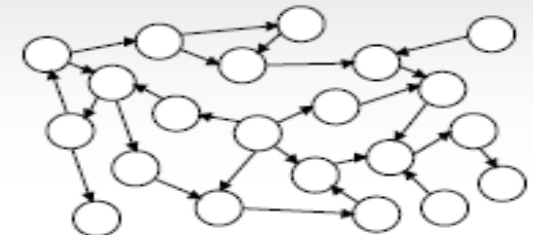
Affinity Diagram



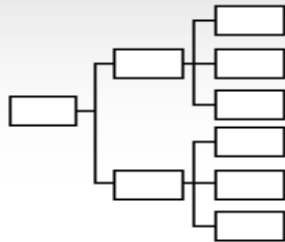
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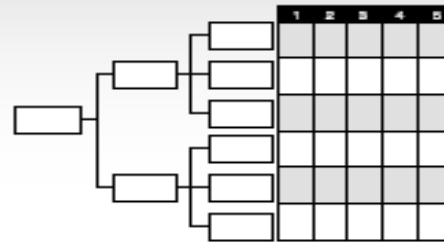
Interrelationship Digraph



Tree Diagrams



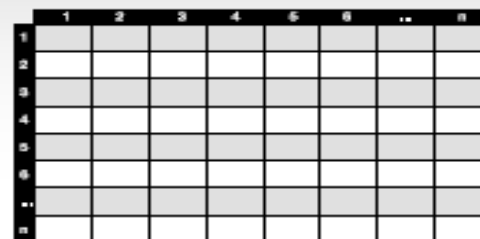
Prioritization Matrices



Network Diagrams



Matrix Diagrams



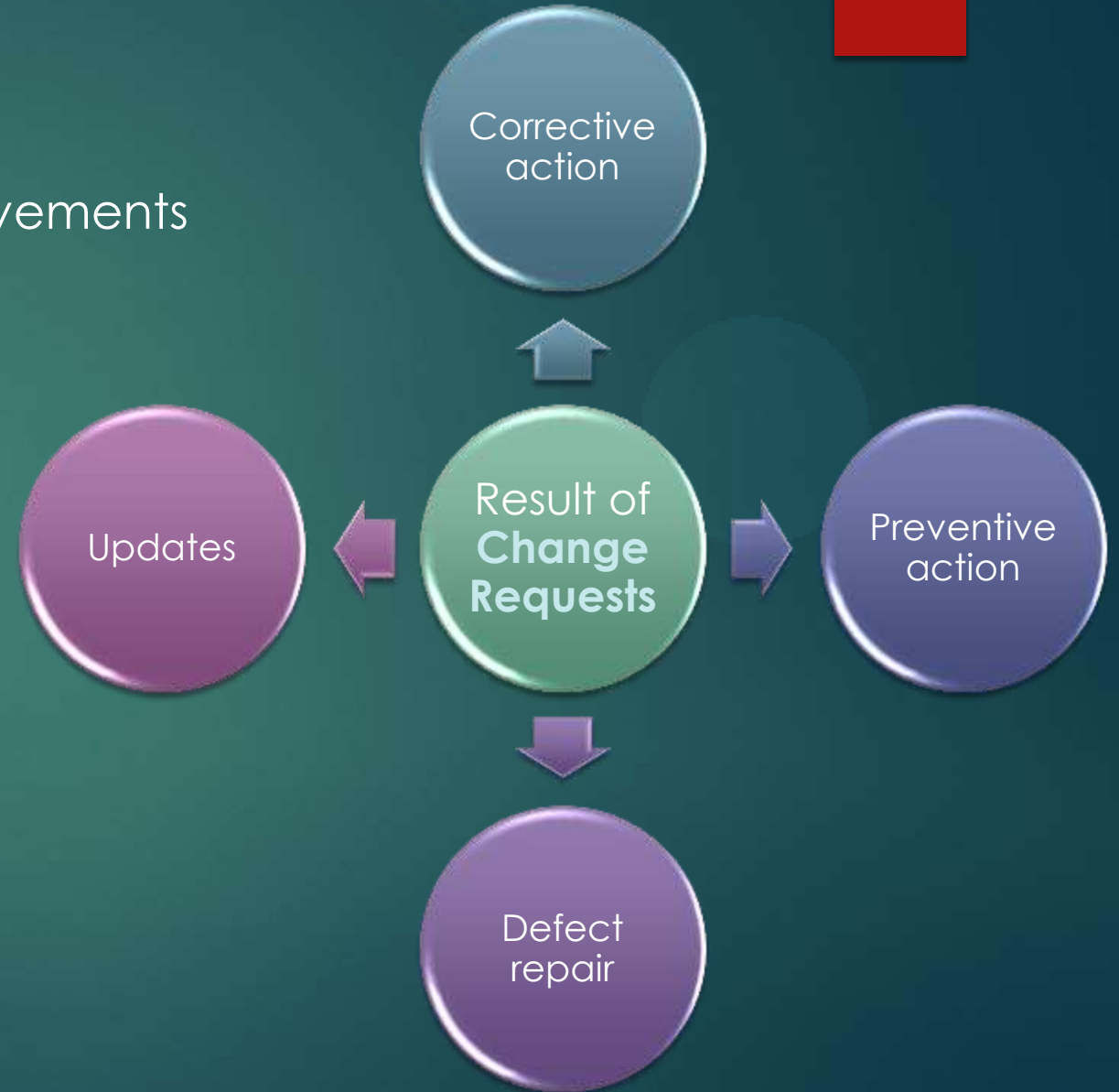
Tools & Techniques

- ▶ **Quality audits** – this is a review by someone outside the team to see how we are doing from a quality **standpoint** and to correct any negatives, according to organization and project **policies**, **processes**, and **procedures**.
- ▶ **Process analysis** – we use the **process improvement plan** to analyze our processes and discover the **root cause** of issues.



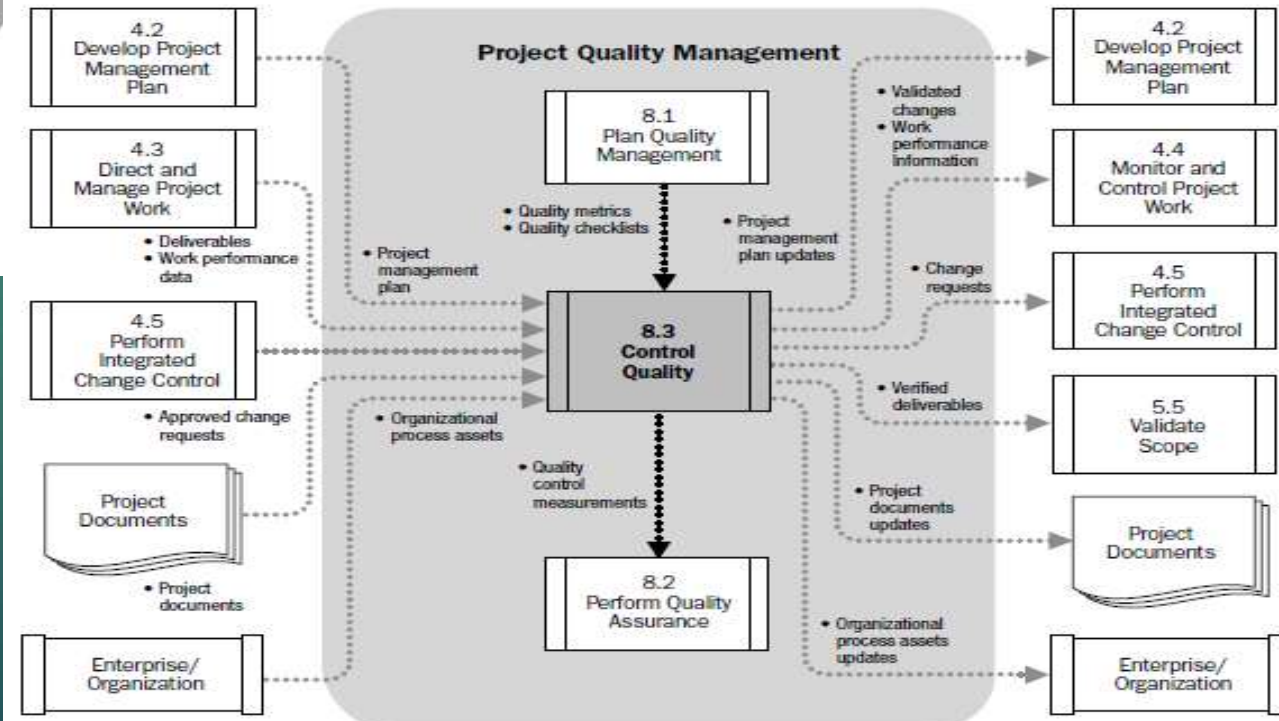
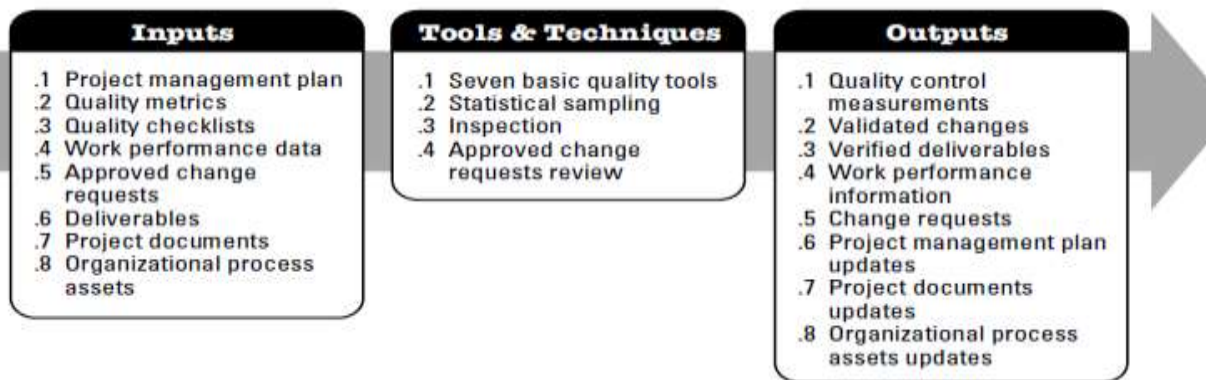
Output

- ▶ **Change Requests**
 - ❑ Consideration of the recommended improvements
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



8.3 Control Quality

- ▶ The process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.
- ▶ **The key benefits** of this process :
 - (1) Identifying the causes of poor process or product quality and actions to eliminate them.
 - (2) validating project deliverables for final acceptance.



Tools & Techniques

- ▶ **Seven Basic Quality Tools**

- ▶ **Statistical Sampling**

- ▶ **Inspection**

- ❑ The **examination** of a work **product** to determine if it conforms to documented standards.(measurements – testing – visual inspection)

- ▶ **Approved Change Requests Review**

- ❑ All approved change requests should be reviewed to **verify** that they were implemented **as approved**.



Output

► Quality Control Measurements

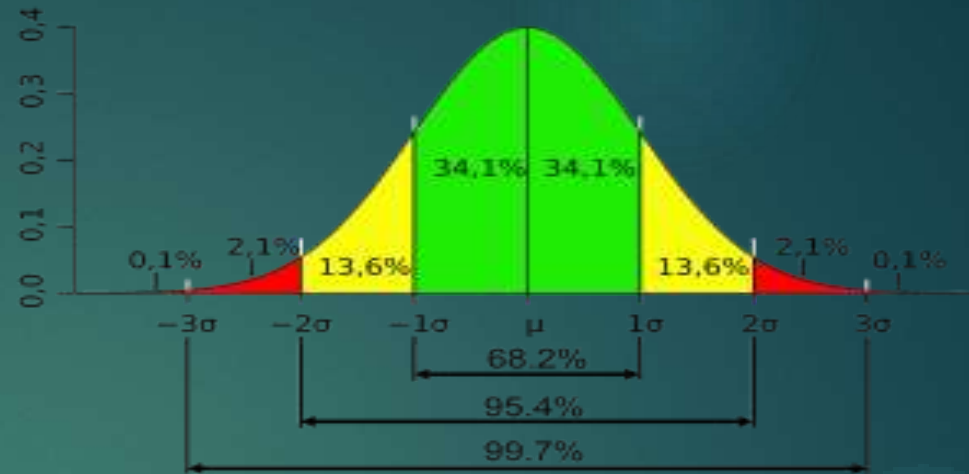
► Validated Changes

- ❑ Any changed or repaired items are **inspected** and will be accepted or rejected.

► Verified Deliverables

- ❑ Deliverables that are tested for **correctness**.

► Work Performance Information



Output

- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



Conclusion

Perform Quality Assurance	Control Quality
Improving our processes	Measuring our products
More managerial	More technical
More big picture	More detailed
Input-control quality measurements (provide input on what processes need improvement)	Output-control quality measurements



Quality Control Measurements





- Defects
- Over-Production
- Waiting
- Non-Utilized Talent
- Transportation
- Inventory
- Motion
- Extra-Processing

		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
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9. Project Human Resource Management

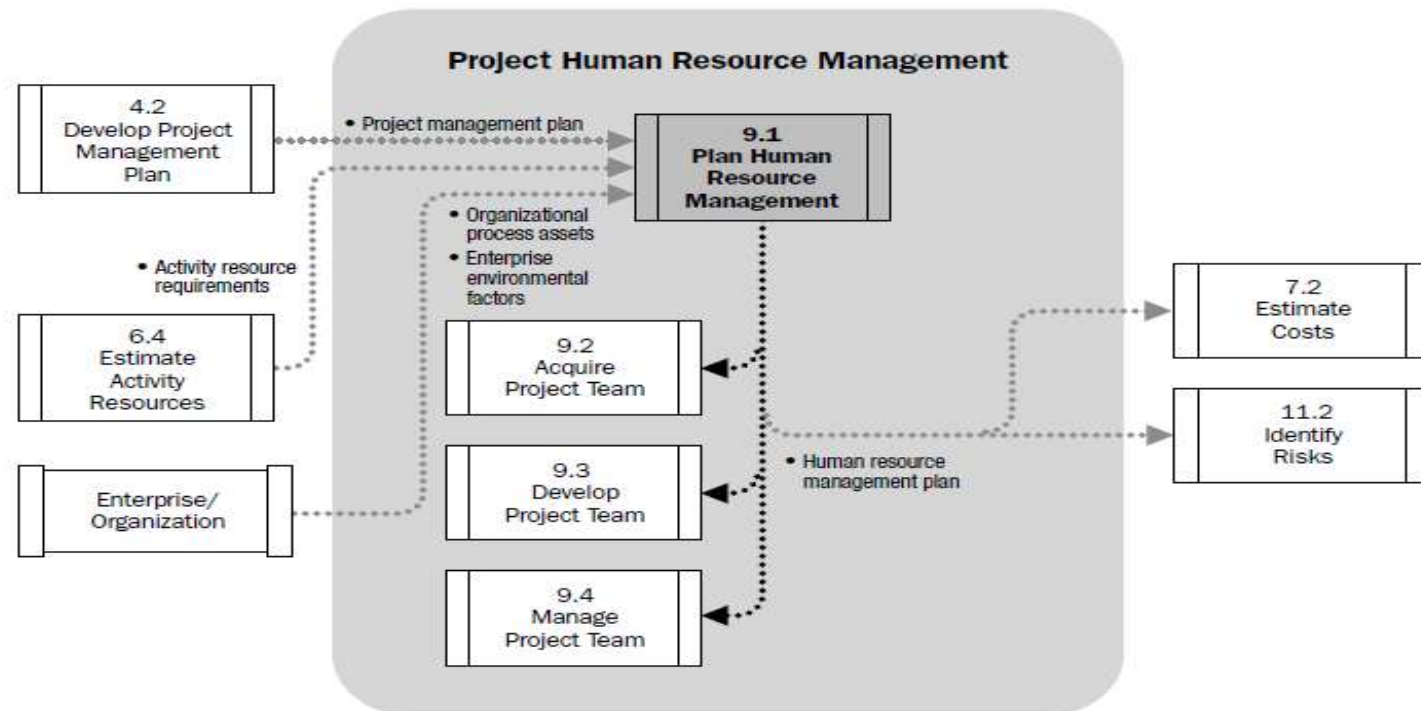


Who is doing what?

9.1 Plan Human Resource Management

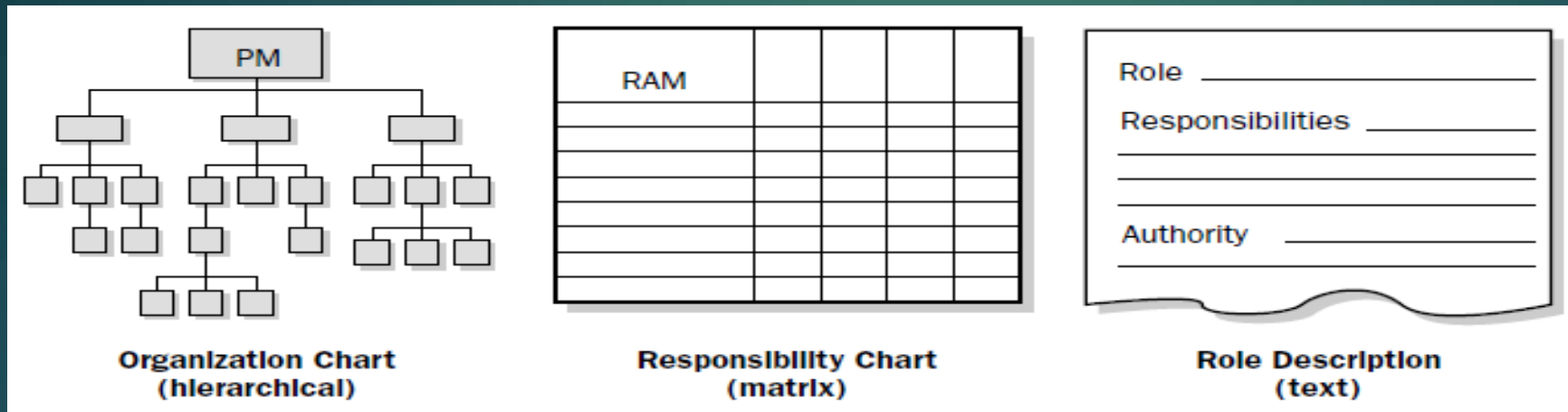


- ▶ The process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan.
- ▶ **The key benefit** of this process is that it establishes project roles and responsibilities, project organization charts, and the staffing management plan including the timetable for staff acquisition and release.



Tools & Techniques:

► Organization charts and positional descriptions



Org. Charts & OBS & RBS

RAM & RACI

RACI Chart	Person				
Activity	Ann	Ben	Carlos	Dina	Ed
Create charter	A	R	I	I	I
Collect requirements	I	A	R	C	C
Submit change request	I	A	R	R	C
Develop test plan	A	C	I	I	R

R = Responsible A = Accountable C = Consult I = Inform

Tools & Techniques:

► Networking

Formal and informal **interaction** with others in an organization, industry, or professional environment to improving knowledge.



► Organizational Theory

Provides information regarding the way in which people, teams, and organizational units **behave**.



Output

► HR Management Plan:

- It is part of the project management plan, provides guidance on **how** project human resources should be defined, staffed, managed, and released, It includes:

1- Roles and Responsibilities:

- **Role:** *The function assumed by or assigned to a person in the project.*
- **Authority:** *The right to apply project resources, make decisions, sign approvals, accept deliverables.*
- **Responsibility:** *The assigned duties and work.*
- **Competency:** *The skill and capacity.*



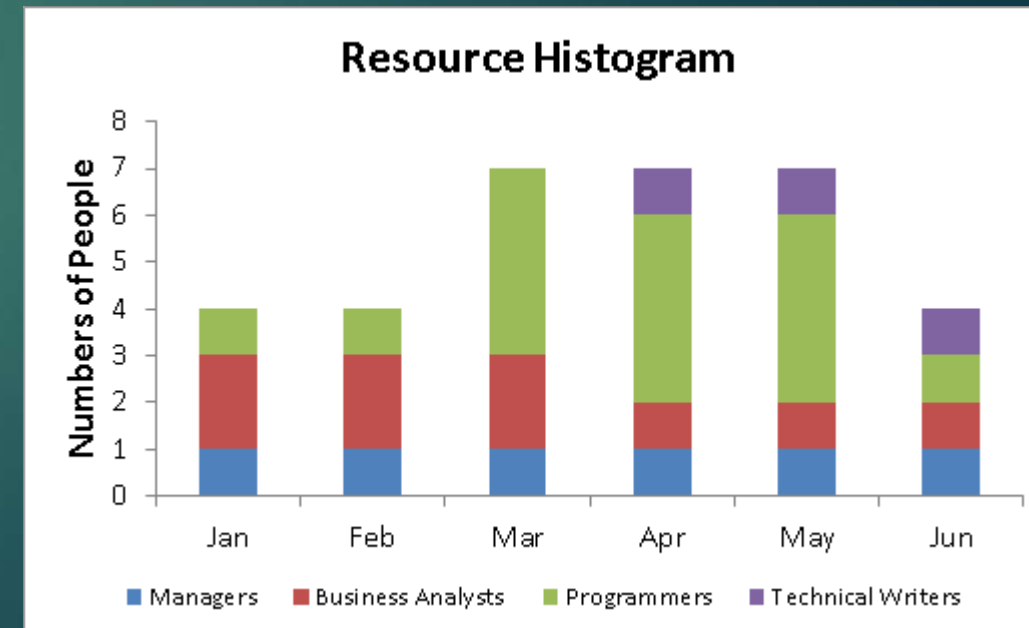
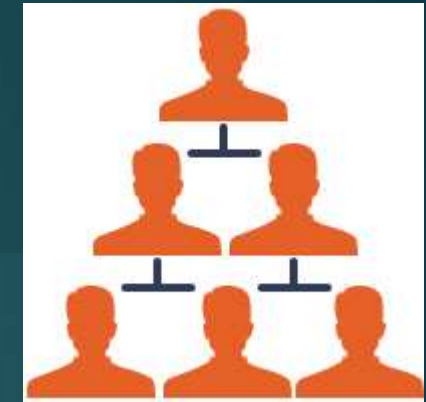
Output

2- Project Organization Charts

- ▶ a graphic display of project team members and their reporting relationships.

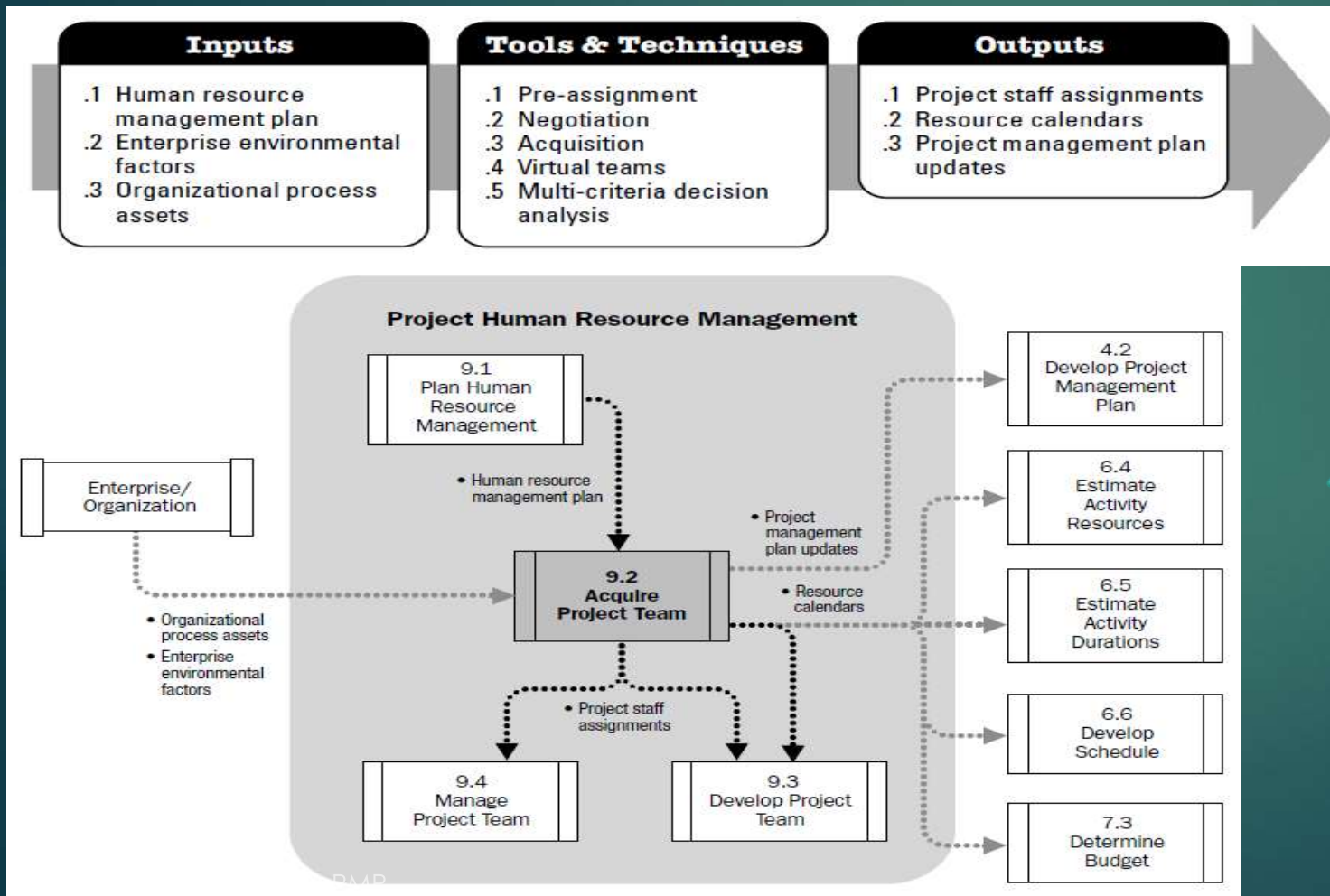
3- Staffing Management Plan

- ▶ a component of the [human resource management plan](#) that describes when and how project team members will be acquired and how long they will be needed. It includes:
 - ▶ [Staff acquisition](#) (sources – contracts – procedure).
 - ▶ [Staff release plan](#) (method – timing – mutual benefits).
 - ▶ Resource calendars (Availability of resources)- [Resource Histogram](#)
 - ▶ Training needs – Compliance- safety.
 - ▶ Recognition and rewards.



9.2 Acquire Project Team

- ▶ The process of confirming human resource **availability** and **obtaining** the team necessary to complete project activities.
- ▶ **The key benefit** of this process consists of outlining and guiding the team selection and **responsibility** assignment to obtain a successful team.



TOOLS and TECHNIQUES

- ▶ **Pre-assignment**

- ▶ **Negotiation**

- ❑ The ability to negotiate and influence will affect the success of the project.

- ▶ **Acquisition**

- ▶ **Multi-criteria decision analysis** – A decision-making tool may be used that will weigh the different criteria based on the needs of the team and the position.
(ex. availability, experience, Skills, cost, etc.)



TOOLS and TECHNIQUES

► **Virtual teams** - are individuals who do **not** normally meet face-to-face.

1. Some of the **negatives** that may need to be overcome when using a virtual team include:

- ❑ Issues with communications
- ❑ Members feeling alone or isolated

2. Some of the **positives** virtual teams may bring include:

- ❑ Considering projects not considered because of geography.
- ❑ skilled resources that are not available locally.
- ❑ Lower costs associated with office space, relocation of individuals.



Output

► Project Staff Assignments

- ❑ at this point we should know who will hold what positions on the team. (*dynamically*)
- ❑ Project team directory is developed.

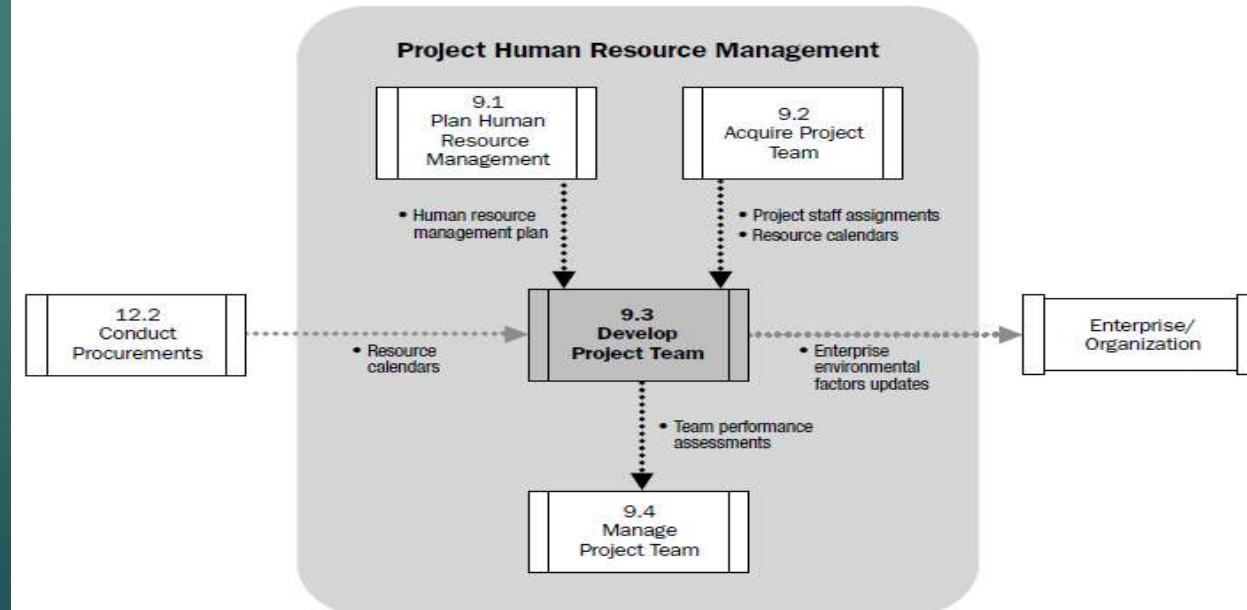
► Resource Calendars

► Project Management Plan Updates



9.3 Develop Project Team

- ▶ The process of **improving competencies**, team member **interaction**, and overall team environment to **enhance project performance**.
- ▶ **The key benefit** of this process is improved **teamwork**, **enhanced** people **skills and competencies**, motivated employees, **reduced** staff turnover rates, and improved overall project performance.



Tools & Techniques

► Interpersonal (soft) Skills

- ❑ Communication skills, emotional intelligence, conflict resolution, negotiation, influence, team building, and group facilitation.

► Training

- ❑ it is about improving the competency of an individual member.



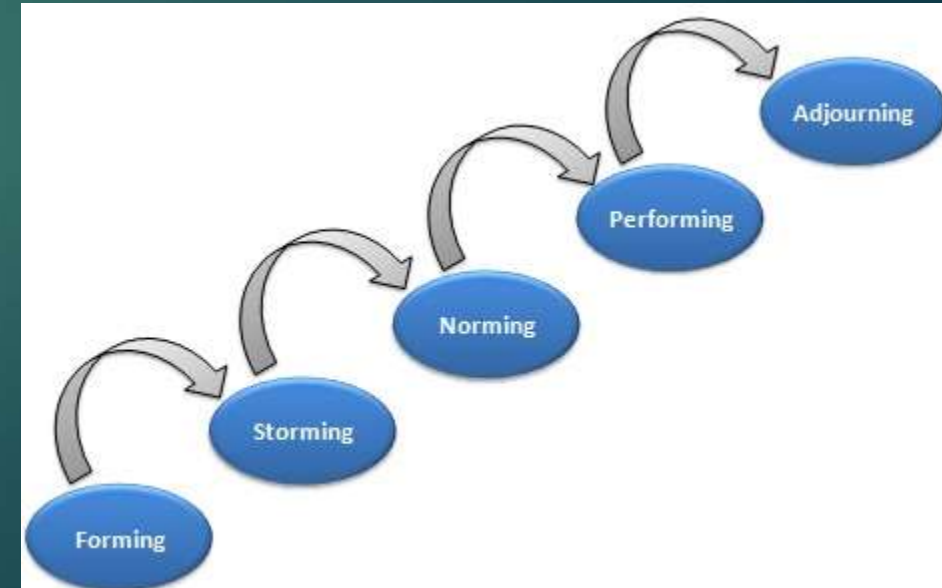
Tools & Techniques

- ▶ **Team Building Activities** – to help team members work together effectively.



❑ Tuckman ladder for team development:

1. **Forming:** Team learns about project and what roles and responsibilities are.
2. **Storming:** Team begin to address project work and management approach.
3. **Norming:** Team work together and trust each other.
4. **Performing:** Team work through issues smoothly and effectively.
5. **Adjourning:** Team completes work and moves on from the project.



الأربعاء، 15 نوفمبر 2017 05:31 م



شركة تستدعى "ولي أمر" أحد أعضائها لحضور حفل "Dish Party"



التاريخ : 13 نوفمبر 2017

استدعاء ولي أمر موظف

السيد المحترم ولي أمر الموظف: أبو بكر صبار

السلام عليكم ورحمة الله وبركاته،

تدعوكم إدارة شركة شارك اند شريمب و ترحبوا منكم سرعة الحضور للمكتب الموافق الثلاثاء 14 نوفمبر 2017 في تمام الساعة الرابعة عصراً. وذلك لحضور Dish Party وللتشاور معنا في أمور تخص الموظف المذكور أعلاه وذلك حرصاً منا على مصلحته و دلع نفسيته.

شاكرين لكم حسن تعاونكم معنا،

المدير التنفيذي

محمد نعيم



Tools & Techniques

- ▶ **Ground rules** – helps to set expectations on acceptable behaviors. The team together should develop the rules and also enforce the rules.



- ▶ **Colocation (War Room/tight matrix)**

It involves placing many or all of the most active project team members in the same physical location to enhance their ability to perform as a team.



Tools & Techniques



► **Recognition and Rewards**

- ❑ Recognizing and rewarding desirable behavior. People are **motivated** if they feel they are valued and this value is demonstrated by rewards.

(taking cultures difference into consideration)



- ## ► **Personnel Assessment tools** – Give insight into areas of **strength** and **weakness**.



Output

- ▶ **Team Performance Assessments (as a team)**

- ❑ It is measured in terms of **technical success**, performance on project **schedule** and **budget**.
- ❑ Indicators (improved competencies and skills).
- ❑ Reduced turnoff rate – team cohesiveness.

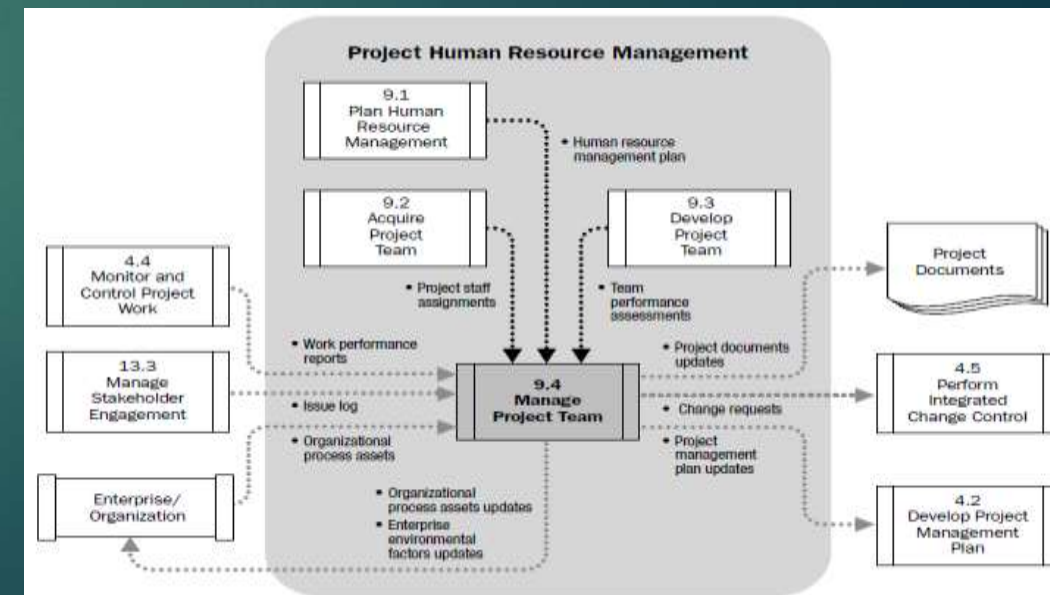
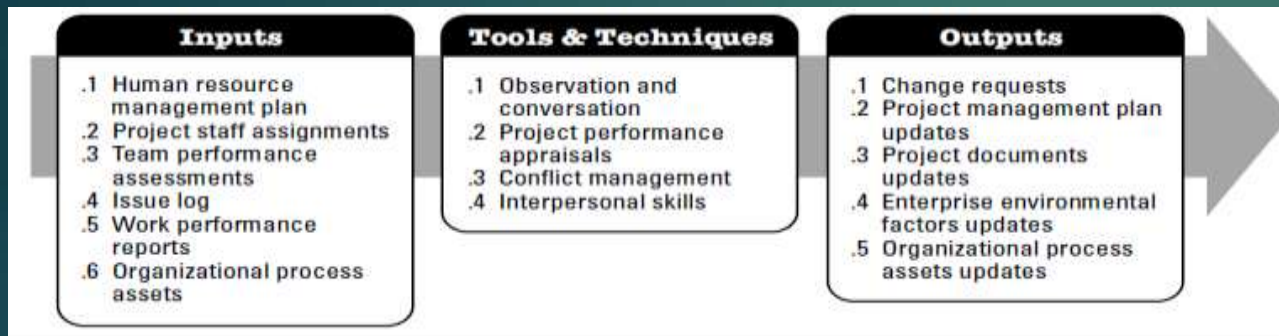
- ▶ **Enterprise Environmental Factors Updates**

- ❑ employee training records.
- ❑ skill assessments.



9.4 Manage Project Team

- ▶ The process of **tracking team member** performance, providing feedback, **resolving issues**, and managing team changes to optimize project performance.
- ▶ **The key benefit** of this process is that it influences team behavior, **manages conflict**, **resolves issues**, and appraises **team member** performance.



Tools & Techniques

► Observation and Conversation

- ❑ Used to stay in touch with the work and attitudes of project team members.



► Project Performance Appraisals (as individuals)

- ❑ Include clarification of roles and responsibilities, constructive feedback to team members, unresolved issues, development of individual training plans. (by a supervisor for example)

► Interpersonal Skills

- ❑ Leadership - Influence - Effective Decision Making – Power of PM.



Tools & Techniques



► Conflict Management

- ❑ Conflict is **inevitable** in a project management.
- ❑ Sources of conflict are : **S**chedules, project **p**riorities, **R**esources, **T**echnical opinions, **A**ministrative procedures, **C**ost and **P**ersonality.

- There are five general techniques for resolving conflict:

- ❑ **Withdraw/Avoid**: Postponing the issue to be better prepared.
- ❑ **Smooth/ Accommodate**: Emphasizing areas of agreement rather than areas of difference.
- ❑ **Compromise/ Reconcile**: lose-lose. bring some degree of satisfaction to all parties.
- ❑ **Force/ Direct**: win-lose . Pushing one's viewpoint at the expense of others.
- ❑ **Collaborate/ Problem Solve**: win-win . consensus and commitment.



Output

- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**

- ▶ **Enterprise Environmental Factors Updates**
 - ❑ Performance appraisals – Skills updates

- ▶ **Organizational Process Assets Updates**
 - ❑ Historical information and lessons learned.
 - ❑ Templates - Organizational standard processes.



HR Theories:



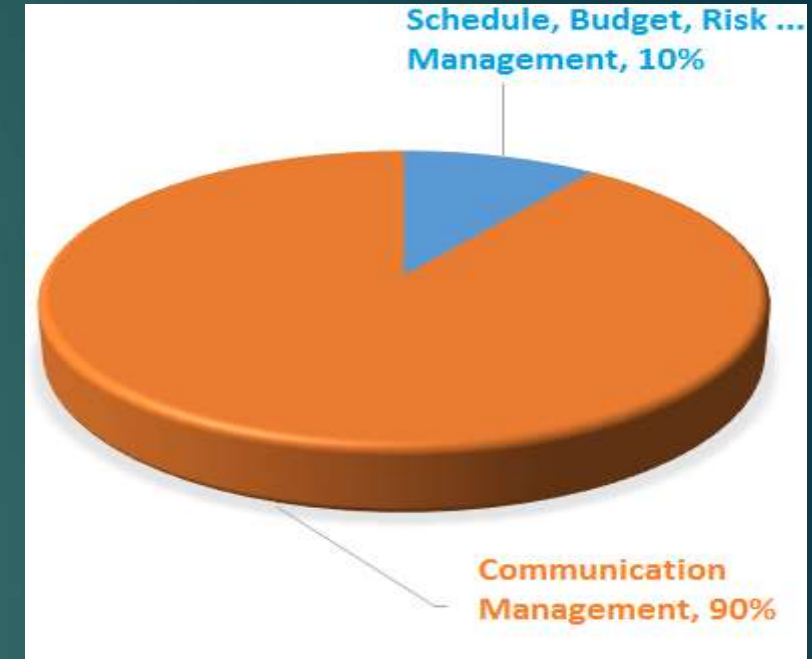
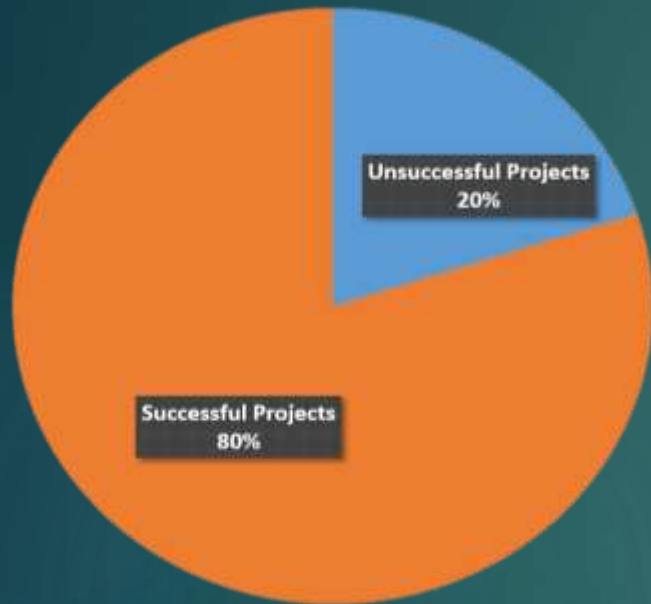
- ▶ Halo Effect.
- ▶ Expectancy Theory.
- ▶ Fringe benefits.
- ▶ Perks/perquisites.
- ▶ X & Y Theory of McGregor
- ▶ Theory Z (Job for life)
- ▶ Herzberg Theory
- ▶ Maslow's hierarchy of needs.



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10. Project Communication Management



Who needs to know what?

Communication can vary between:

- ▶ **Internal** (within the project) and **external** (customer, other projects, the media, the public).
- ▶ **Vertical** (up and down the organization) and **horizontal** (with peers).
- ▶ **Official** (news letters, annual report) and **unofficial** (off the record communications).
- ▶ **Formal** (reports, memos, briefings) and **informal** (emails, ad-hoc discussions).
- ▶ **Written** and **oral**.
- ▶ **Verbal** and **non-verbal** (voice inflections, body language).

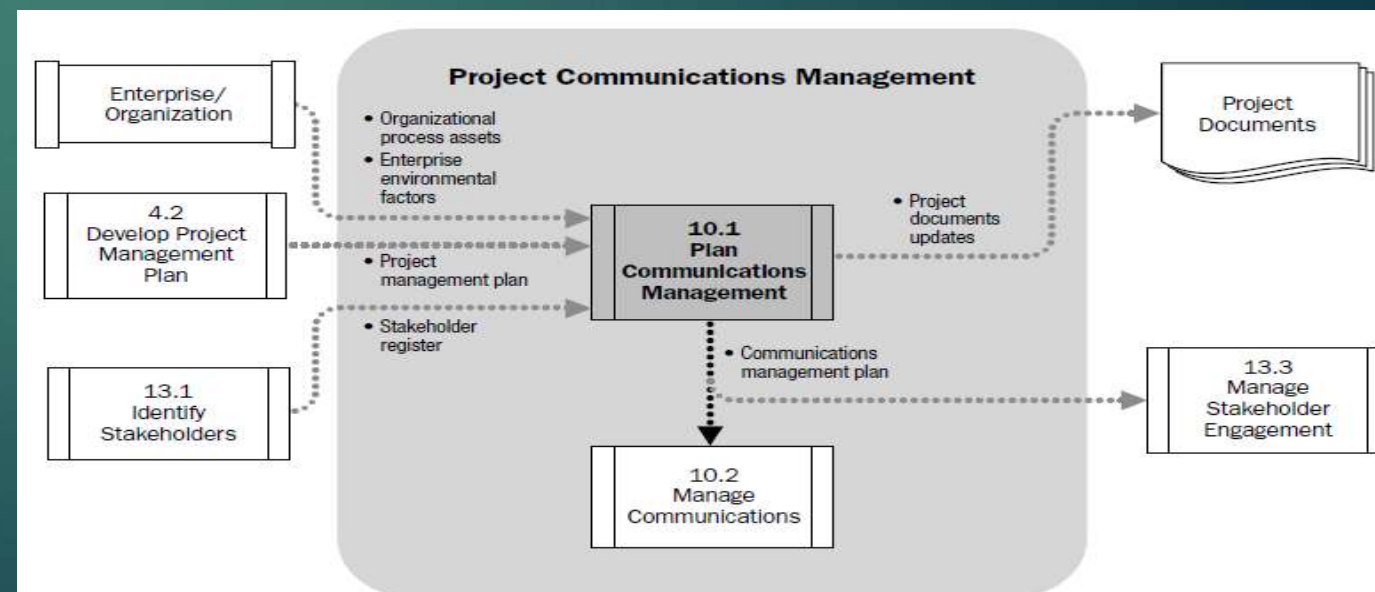
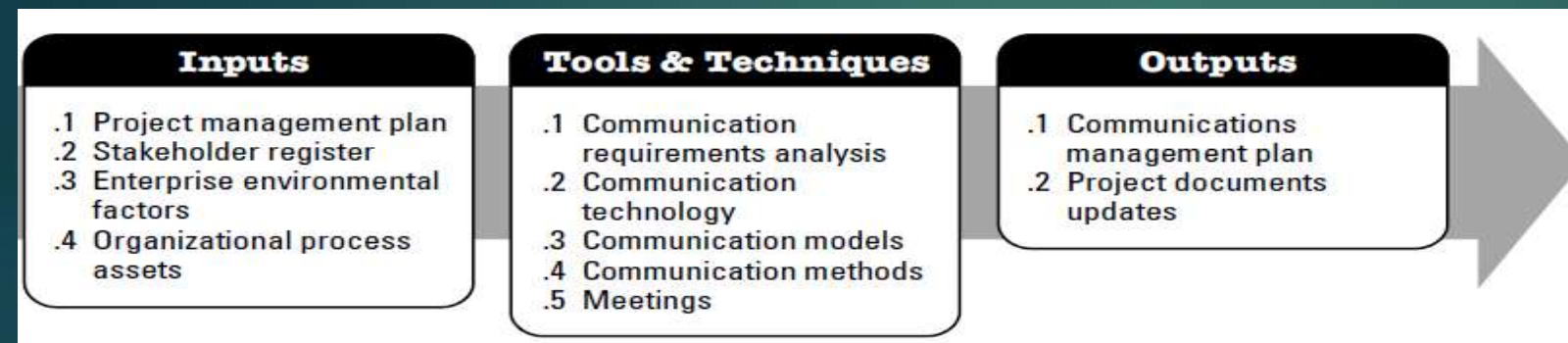
- ☐ Formal/informal Written.
- ☐ Formal/informal Verbal.

- ☐ Meetings



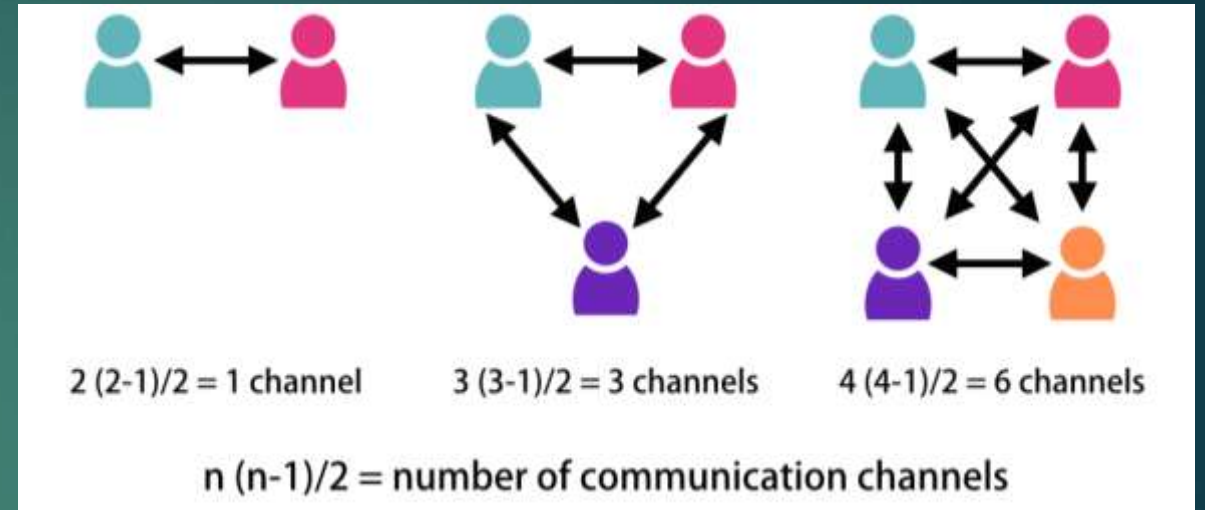
10.1 Plan Communications Management

- ▶ The process of developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements, and available organizational assets.
- ▶ **The key benefit** of this process is that it identifies and documents the approach to communicate most effectively and efficiently with stakeholders.



Tools & Techniques

► Communications requirements analysis



► Communication Technology

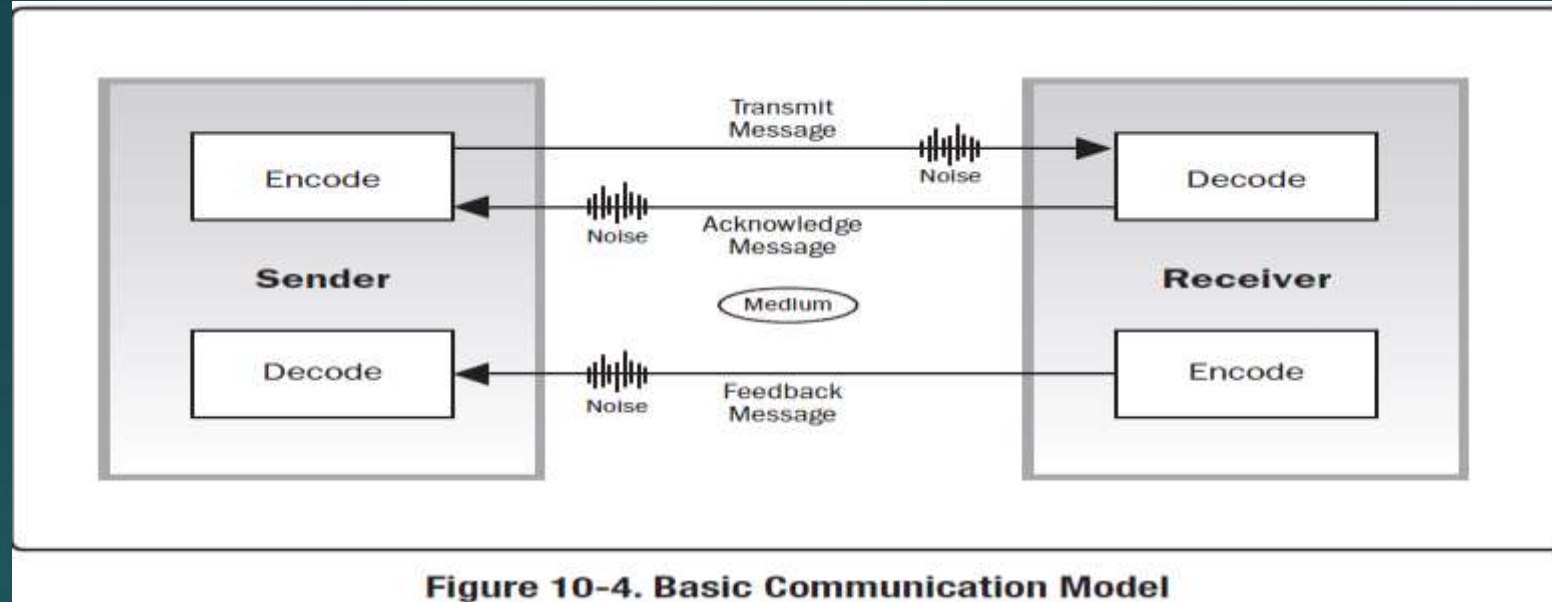
Factors that can affect the choice of communication technology include:

- ❑ Urgency of the need for information (timing – frequency).
- ❑ Availability of technology – Ease of use – Project environment.
- ❑ Sensitivity and confidentiality of the information.



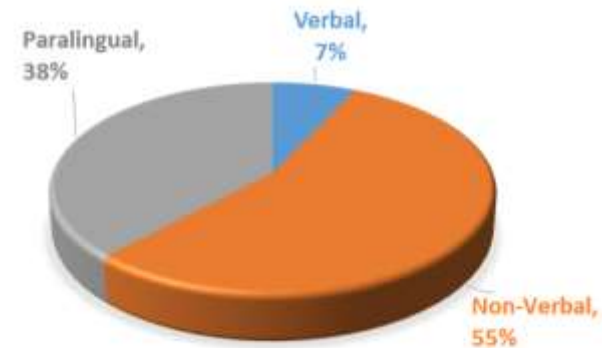
Tools & Techniques

► Communication Models



► Communication Methods

Interactive	<u>Most efficient way</u> to ensure a common understanding	Meetings, phone calls, video conferences, etc.
Push	Sent to specific recipients. <u>Does not ensure receipt or understanding</u>	Letters, memos, reports, <u>e-mails</u> , faxes, voice mails, press releases, etc.
Pull	Used for <u>large volumes</u> of info and/or large audiences. People may decide to access or not access information	Intranet sites, <u>e-learning</u> , knowledge repositories, etc.



Output

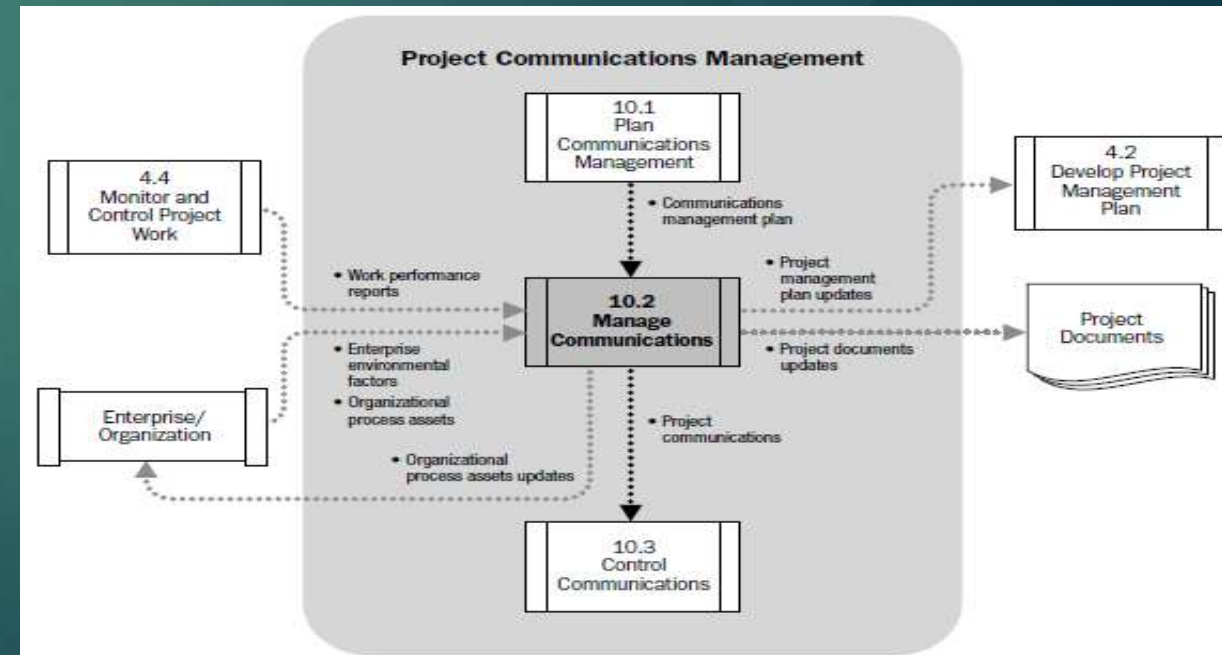
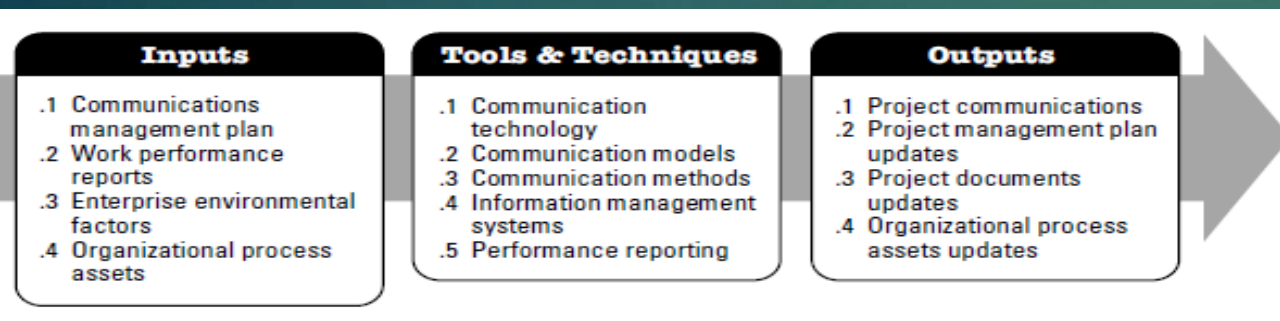


- ▶ **Communications Management Plan-** it contains:
 - ❑ Stakeholder communication requirements.
 - ❑ Information to be communicated, including language, format, content, and level of detail.
 - ❑ Reason, time frame and frequency for the distribution - Person responsible for communicating and who will receive the information.
 - ❑ Person responsible for authorizing release of confidential information.
 - ❑ Methods and technologies – Resources allocated – Escalation process.
 - ❑ Glossary of common terminology.
 - ❑ Communication constraints.
 - ❑ Meetings.

Who	What	When	Where	Why	How

10.2 Manage Communications

- ▶ The process of **creating, collecting, distributing, storing, retrieving**, and the ultimate disposition of project information in accordance to the **communications management plan**.
- ▶ **The key benefit** of this process is that it enables an efficient and effective communications flow between project stakeholders.



Tools & Techniques

► **Communication technology**

- to ensure that the choice is appropriate for the information that is being communicated.

► **Communication Models**

- To ensure that communication is appropriate for the project and any barriers are identified and managed.

► **Communication methods**

- to ensure that the information created and distributed has been received and understood.

► **Information Management Systems**

- Project information is managed and distributed using a variety of tools, including:

Hard copy documents – Electronic communications – Electronic Project Management tools.



Tools & Techniques

► Performance Reporting

- **Status report** describes where the project **currently stands** regarding the performance measurement baseline.
- **Progress report** describes what has been **accomplished**.
- **Trend report** examines project **results over time** to see if performance is improving or deteriorating.
- **Forecasting report** predicts **future** project status and **performance**.
- **Variance report** compares **actual** results to **baselines**.
- **Earned value report** **integrates scope, cost, and schedule** measures to assess project performance.
- **Lessons learned documentation Reports** on performance are used as **lessons learned** for future projects.



Output

► Project Communications

- ❑ It may include Performance reports, deliverables status, schedule progress, cost incurred.

► Project Management Plan Updates

- ❑ updates based upon the current performance of the project against the performance measurement baseline (PMB).

► Project Documents Updates

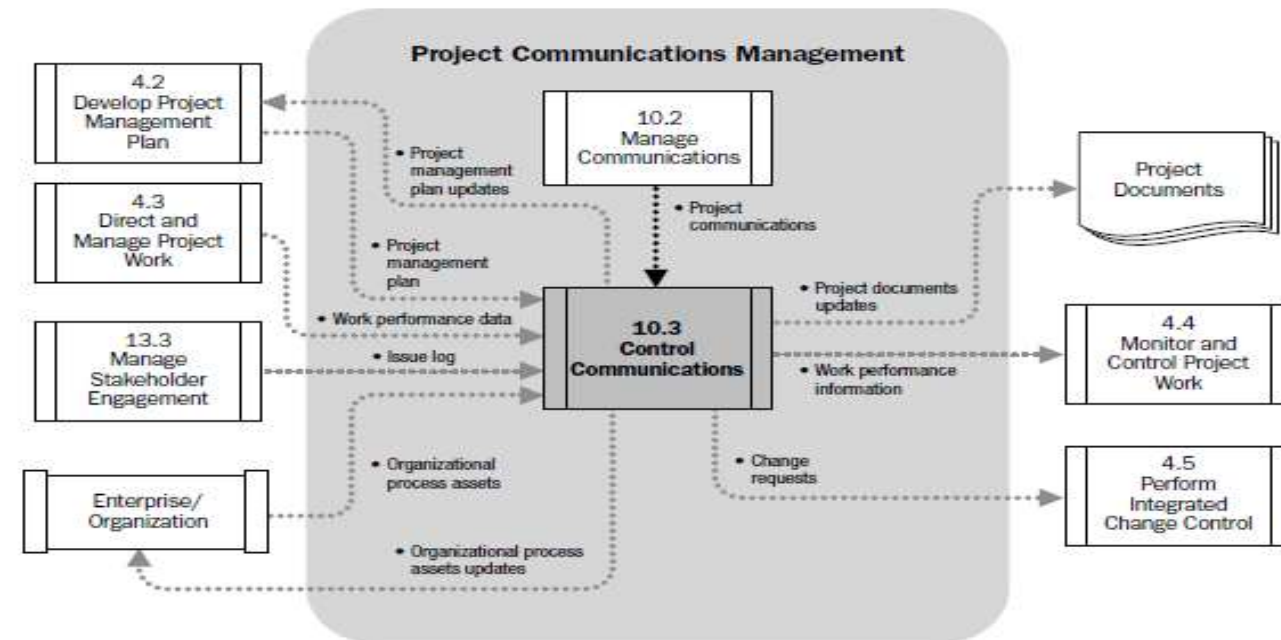
- ❑ The issue log – Project schedule – Funding requirements.

► Organizational Process Assets Updates



10.3 Control Communications

- ▶ The process of monitoring and controlling **communications** throughout the entire project life cycle to ensure **the information needs** of the project stakeholders are met.
- ▶ **The key benefit** of this process is that it ensures an optimal information flow among all communication participants.



Tools & Techniques

► Information Management Systems

- ❑ Provides a set of standard tools for the project manager to **capture**, **store**, and **distribute information** to stakeholders about the project performance.

► Expert Judgment

► Meetings



Output

- ▶ **Work Performance Information**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
	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	
	Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
	Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
	Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
	Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
	Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
	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 Control Risks	
	Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

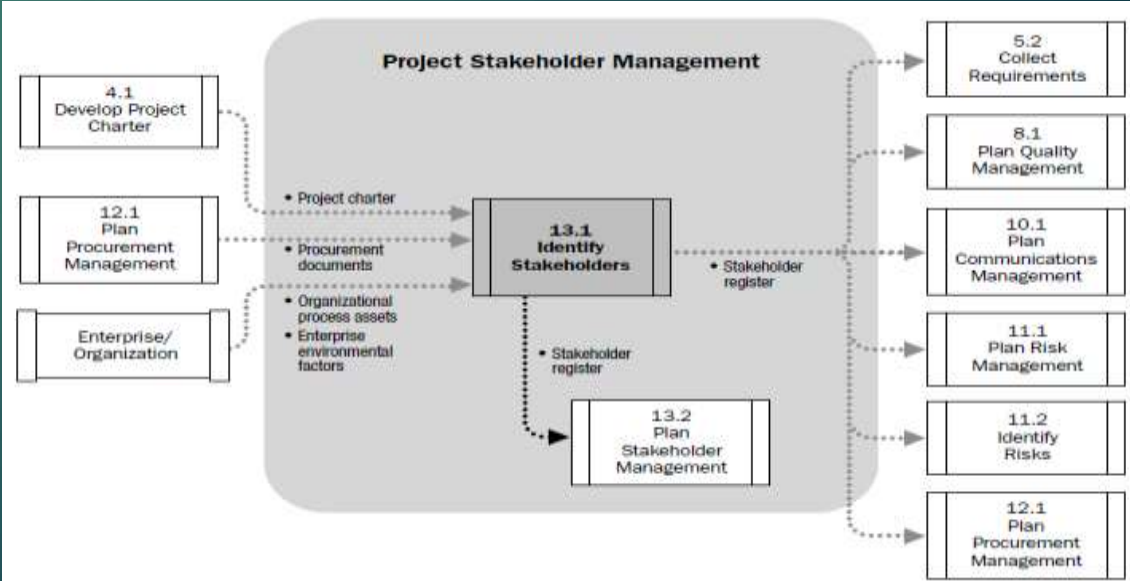
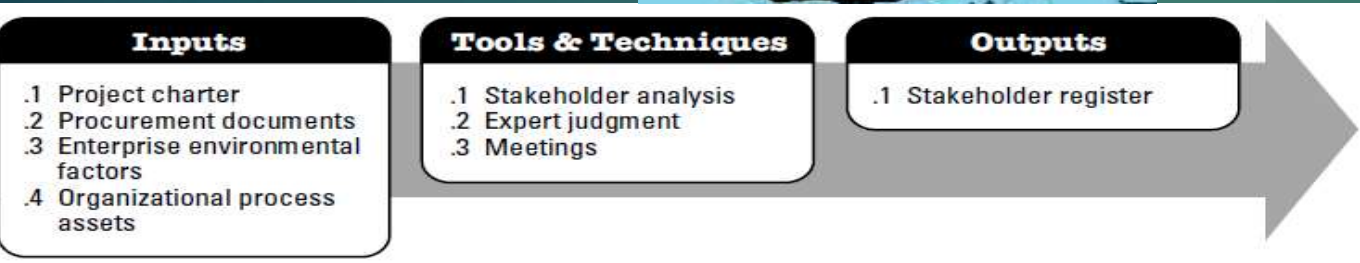
13. Project Stakeholder Management



Who is involved?

13.1 Identify Stakeholders

- ▶ The process of **identifying** the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project, analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
- ▶ **The key benefit** of this process is that it allows the project manager to identify the appropriate focus for each stakeholder.



Tools & Techniques

- Stakeholder analysis steps:

1. Identify all potential project stakeholders ,**role** ,and relevant information.
2. Analyze the potential impact or support each stakeholder could generate, and classify them so as to define an approach strategy.
3. Assess how key stakeholders are likely to react or respond in various situations.

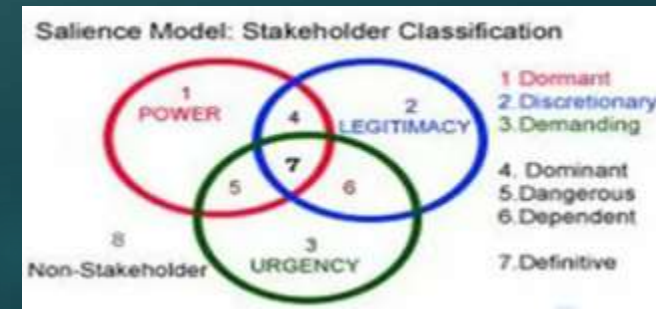
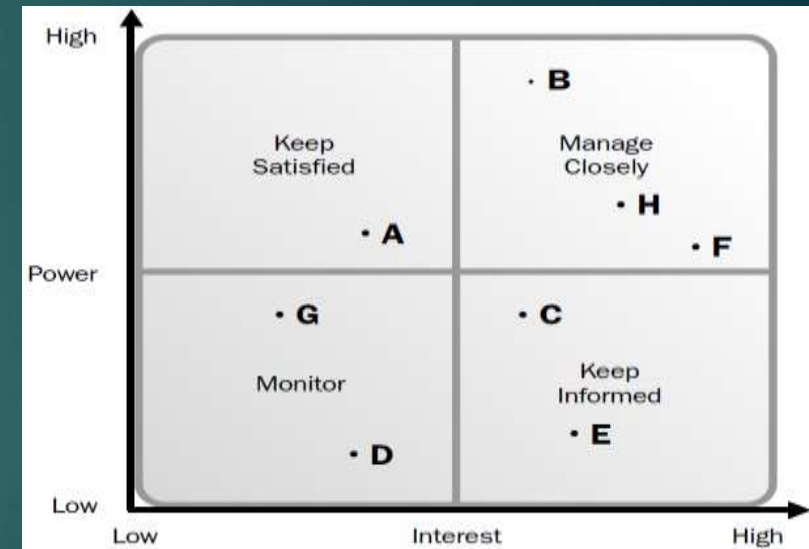
- There are multiple classification models used for stakeholders analysis, such as:

- Power/interest grid, grouping the stakeholders based on their level of authority (“power”) and their level or concern (“interest”) regarding the project outcomes.

- Power/influence grid, grouping the stakeholders based on their level of authority (“power”) and their active involvement (“influence”) in the project.

- Influence/impact grid, grouping the stakeholders based on their active involvement (“influence”) in the project and their ability to effect changes to the project’s planning or execution (“impact”).

- Salience model, describing classes of stakeholders based on their power (ability to impose their will),urgency (need for immediate attention), and legitimacy (their involvement is appropriate).



Output:

► Stakeholder Register

1- Identification information

Name, position, location, role in the project, contact information.

2- Assessment information

Major requirements, main expectations, potential influence in the project, phase in the life cycle with the most interest.

3- Stakeholder classification

- ☐ Internal/external.
- ☐ supporter/neutral/resistor.

WORKSHOP

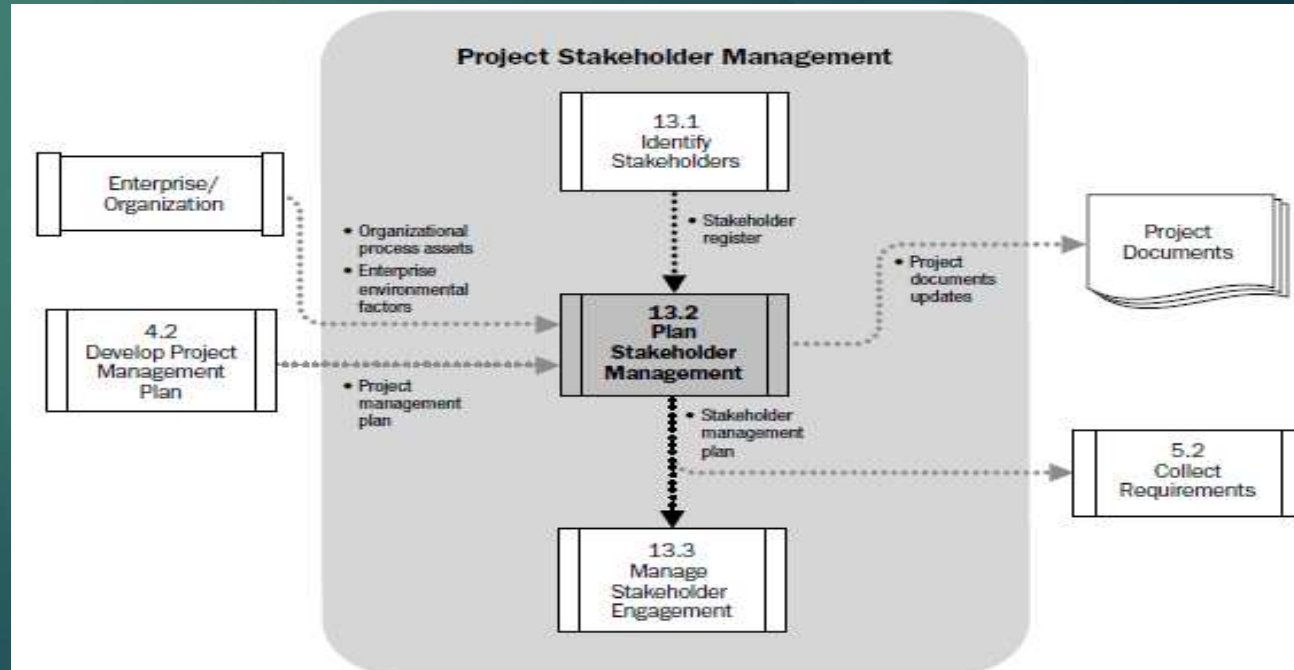


Stakeholder Register

Name	Position	Department/Role	Contact information	Power High/Low	Interest High/Low	Classification
Abdallah	Sponsor Rep.	Ministry of Works	44111111 Abdallah@gmail.com	High	Low	Internal
Ahmed	Owner Rep.	Ministry of planning	44222222 Ahmed@gmail.com	High	Low	Internal
Saad	Port Rep.	Ports Authority	44333332 Saad@gmail.com	High	High	External
Sameh	Petrol Rep.	Ministry of Petrol	44333322 Sameh@gmail.com	High	Low	External
Attia	Civil defense Rep.	Civil Defense	44666666 Attia@gmail.com	Low	Low	External
Faisal	Ashghal Rep.	Ashghal	44444441 Faisal@gmail.com	High	Low	External
Naser	Kahrmaa Rep.	Ministry of electricity	44555551 Naser@gmail.com	High	Low	External
Fadel	Oreedoo Rep.	Ministry of Telecommunication	44777771 Fadel@gmail.com	High	Low	External
Basel	Traffic Rep.	Traffic Authority	44888888 Basel@gmail.com	High	High	External
Haitham Wahid	Project Manager	Ministry of Works	44999990 Haitham @gmail.com	High	High	Internal
Zaid Al Nawayseh	Consultant	PMO	44999991 zaid@gmail.com	High	High	Internal
Ahmed Salah	Consultant	PMO	44999992 ahmed@gmail.com	High	High	Internal
Ahmed Kassem	Consultant	PMO	44999993 Ahmed_K@gmail.com	High	High	Internal
Mohamed Hesham	Consultant	PMO	44999994 M_hesham@gmail.com	High	High	Internal
Mahmoud Hassan	Site Engineer	Civil Work	44999995 Ma_hasan@gmail.com	Low	High	Internal
Mahmoud Agagy	Site Engineer	Civil Work	44999998 Ma_Agagy@gmail.com	Low	High	Internal
Mohamed Othman	Procurement Manager	Procurement Department	44999997 M_othman@gmail.com	Low	High	Internal
Mohamed Naem	Planning Engineer	Planning Department	44999996 M_naem@gmail.com	Low	High	Internal

13.2 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.
- ▶ **The key benefit** of this process is that it provides a clear, actionable plan to interact with project stakeholders to support the project's interests. (sensitive information)



Tools & Techniques



► Analytical Techniques

- ❑ The current engagement level of all stakeholders needs to be compared to the planned engagement levels required for successful project completion.

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Stakeholder 1	C			D	
Stakeholder 2			C	D	
Stakeholder 3				D C	

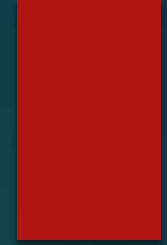
Figure 13-7. Stakeholders Engagement Assessment Matrix

Output

- ▶ **Stakeholder Management Plan-** it contains:
 - ❑ Desired and Current Engagement levels.
 - ❑ Scope and impact of change to stakeholders.
 - ❑ Identified interrelationships - communication requirements.
 - ❑ Information to be distributed to stakeholders (language, format, content).
 - ❑ Reason, time frame and frequency for information distribution.
 - ❑ Methods for updating stakeholder management plan.

- ❑ Not engaging the stakeholders early lead to more change requests.
- ❑ Ignoring negative stakeholders is a key reason of project failure.

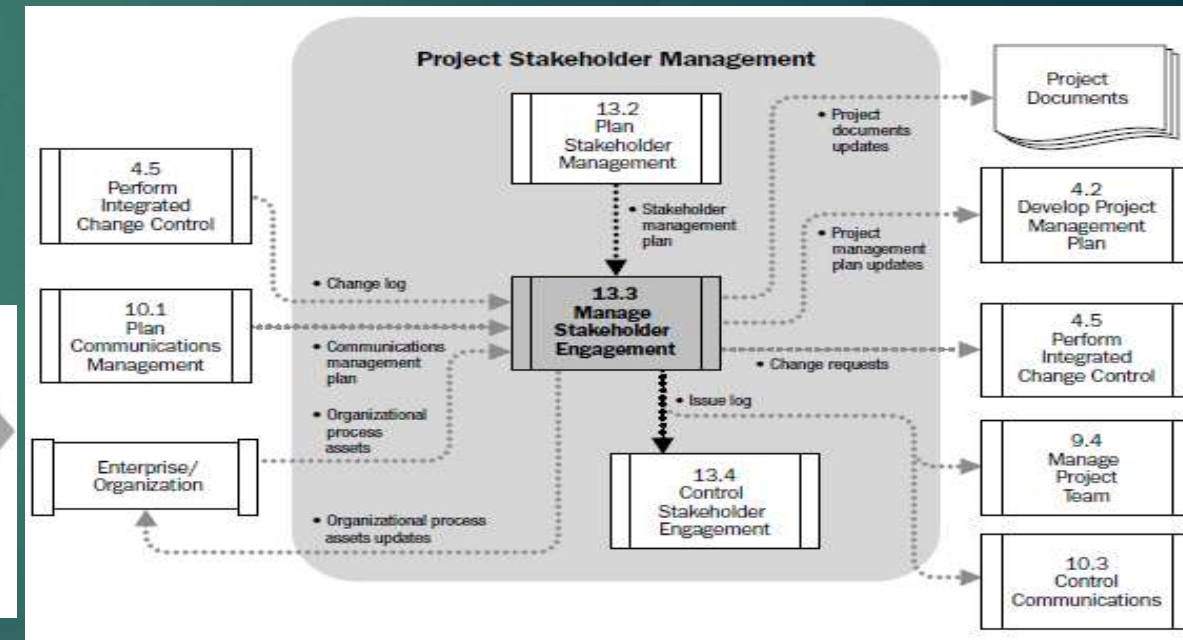




Communication Management Plan	Stakeholder Management Plan
Stakeholder communication requirements.	Stakeholder communication requirements.
Information to be distributed to stakeholders, including language, format, content.	Information to be distributed to stakeholders, including language, format, content.
Reason for the distribution of that information.	Reason for the distribution of that information.
Time frame and frequency for the distribution of required information	Time frame and frequency for the distribution of required information
<u>Person responsible for authorizing release of confidential information.</u>	<u>Identified interrelationships .</u>
<u>Escalation process</u>	<u>Desired and Current Engagement levels</u>
Method for updating and refining the <u>communications management plan</u> as the project progresses	Method for updating and refining the <u>stakeholder management plan</u> as the project progresses and develops.

13.3 Manage Stakeholder Engagement

- ▶ The process of **communicating** and **working with stakeholders** to meet their needs/expectations, **address issues** as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.
- ▶ **The key benefit** of this process is that it allows the project manager to increase support and minimize resistance from stakeholders, to achieve project success.



Tools & Techniques

► Communication Methods

- ❑ Based on communication requirements, the project manager decides how, when, and which of these communication methods are to be used in the project.

► Interpersonal Skills

- ❑ Building trust, resolving conflict, active listening, and overcoming resistance to change.

► Management Skills

- ❑ Facilitate consensus toward project objectives.
- ❑ Influence people to support the project.
- ❑ Negotiate agreements to satisfy project needs.
- ❑ Modify organizational behavior to accept the project outcomes.



Output

► Issue log

- ❑ This log is updated as new issues are identified and current issues are resolved as a result of interaction.

► Change requests

► Project Management Plan Updates

► Project Documents Updates

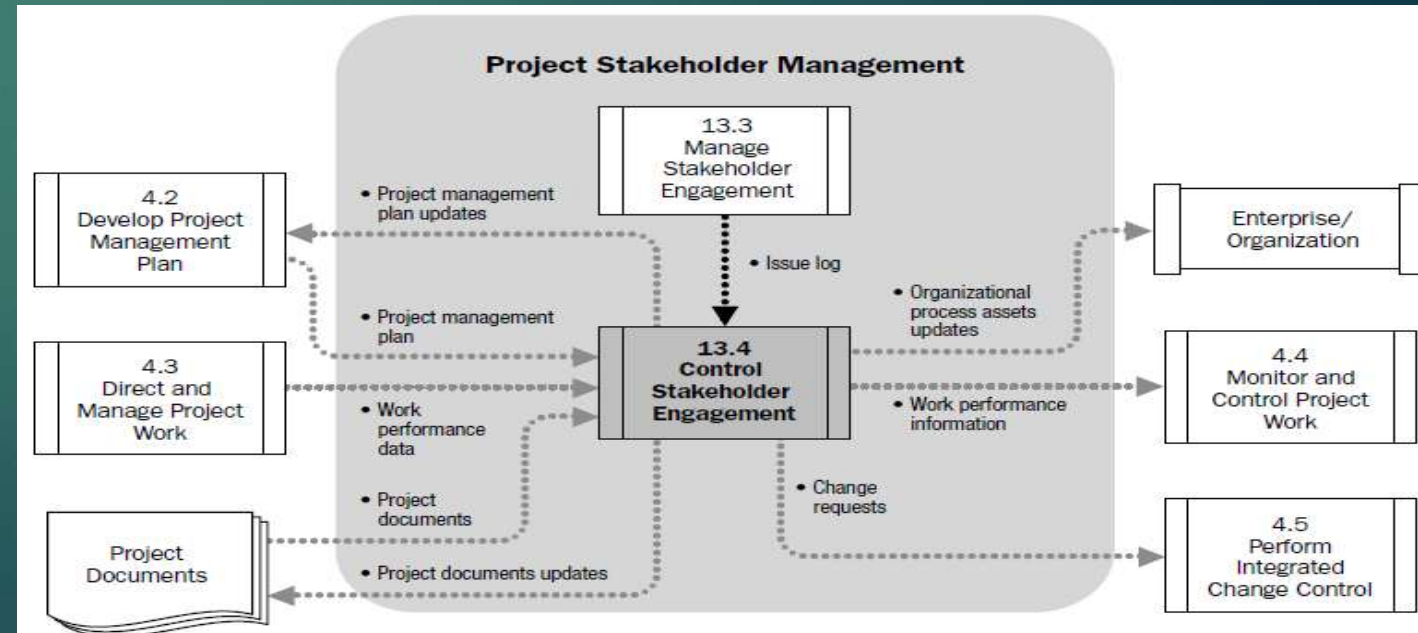
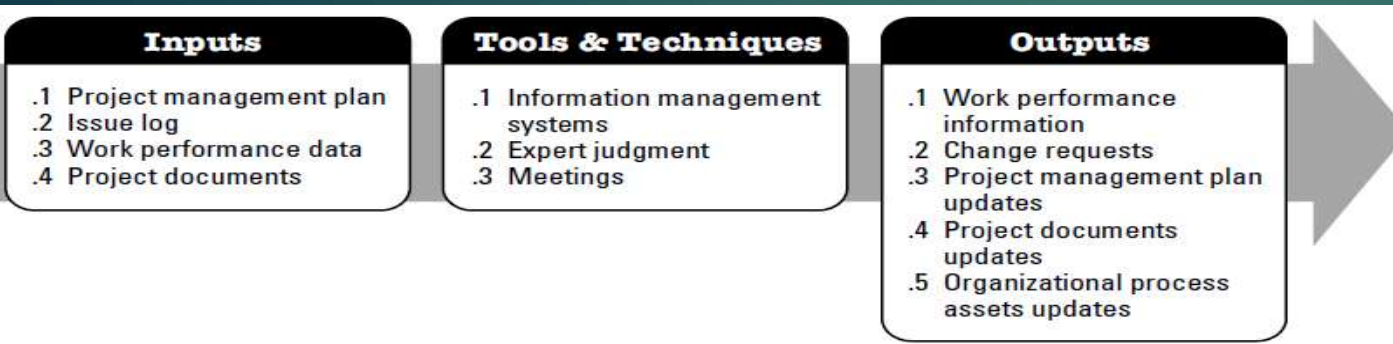
► Organizational Process Assets Updates

ISSUES LOG

#	Category	Issue Description	Impact	Originator	Owner	Action Taken	Status
	EXAMPLE:	Lost key resource on project team	High	Bob	Mary	Requested alternate subject matter expert	Closed
1	Time	Functional Manager George out most of March for vacation	Medium	Robert	George	Requested that George make his recommended book list prior to leaving for vacation. George's personal workspace will not be part of 5S.	Closed
2	Cost	Desired shelving costs more than original estimate	High	Tim	Nancy	Placed change request for project budget increase	Open
3	Work/Process Flow	Will interns have access to library?	Medium	Tim	Nancy	Forward issue to project sponsor	Open
4	Time	Book list review is taking too long	Medium	Robert			Waiting

13.4 Control Stakeholder Engagement

- ▶ The process of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.
- ▶ **The key benefit** of this process is that it will maintain or increase the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes.



Tools & Techniques

- ▶ **Information Management Systems**
- ▶ **Expert Judgment**
- ▶ **Meetings**



Output

- ▶ **Work Performance Information**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
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11. Project Risk Management



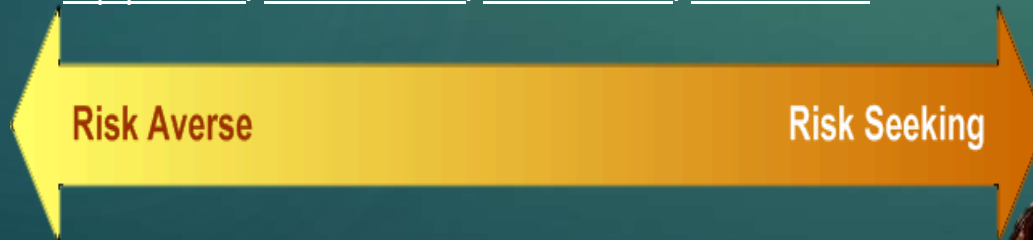
What if?



Definitions

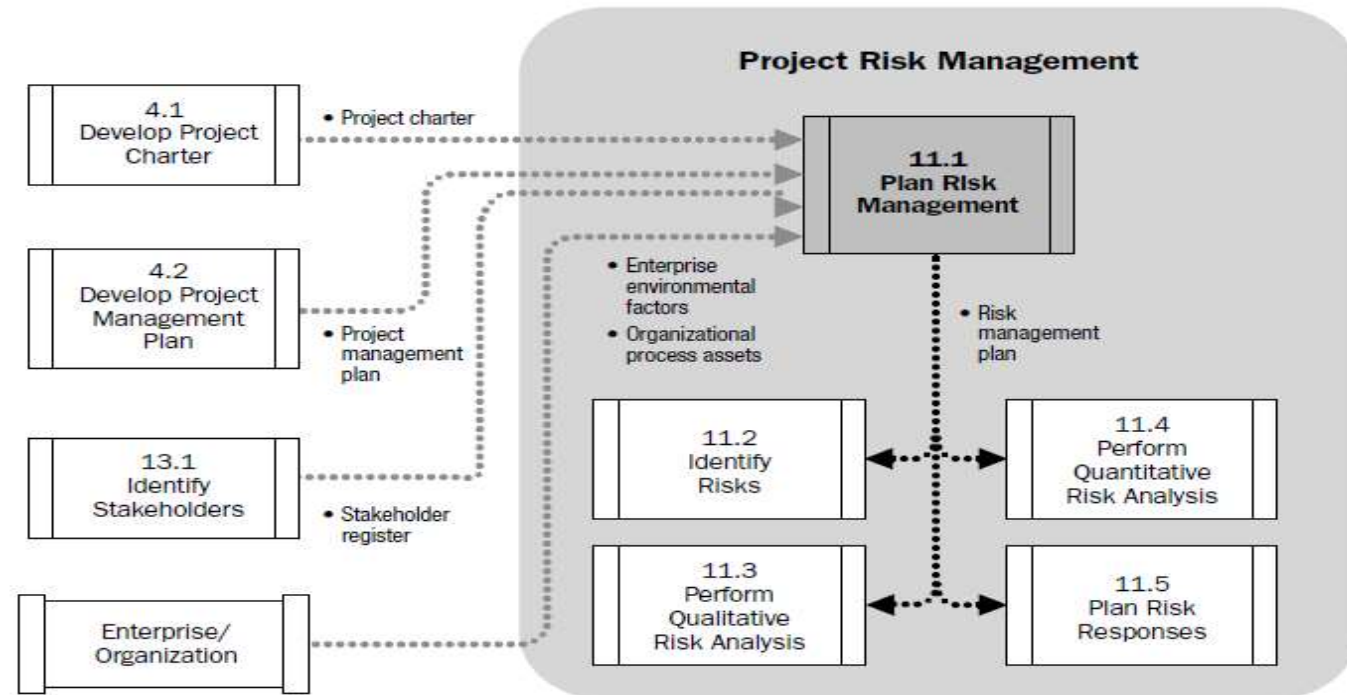


- ▶ Risk & Issue
- ▶ Risk may be Opportunity (+)/Threat (-) with Probability & Impact.
- ▶ Objective of Project Risk Management.
- ▶ 80 % of issues can be avoided by good Risk Management.
- ▶ Shooting messenger approach.
- ▶ Be Proactive - most meetings discuss Risks.
- ▶ Risks are high at project start and go lower through the project.
- ▶ Risks Make better plan.
- ▶ Risk Factors.
- ▶ Risk Appetite/tolerance/threshold/Attitude.



11.1 Plan Risk Management

- ▶ The process of defining **how** to conduct risk management activities for a project.
- ▶ **The key benefit** of this process is it ensures that the degree, type, and visibility of **risk management** are commensurate with both the risks and the importance of the project **to the organization**.



output

- Risk Management Plan : it includes:

Other processes	Respons.	Time	budget	Methodology
Identify Risks	Ahmed	2 W	500\$	Meetings
...
...
...
Control Risks	Mina	1 M	1000\$	Audit

- ❑ Methodology. (How)
- ❑ Roles and Responsibilities. (Who)
- ❑ Budgeting –Timing.
- ❑ Risk Categories (RBS).
- ❑ Definition of Risk Probability and Impact.
- ❑ Probability and Impact Matrix.
- ❑ Revised Stakeholders' Tolerances.
- ❑ Reporting Formats- Tracking.

Table 11-1. Definition of Impact Scales for Four Project Objectives

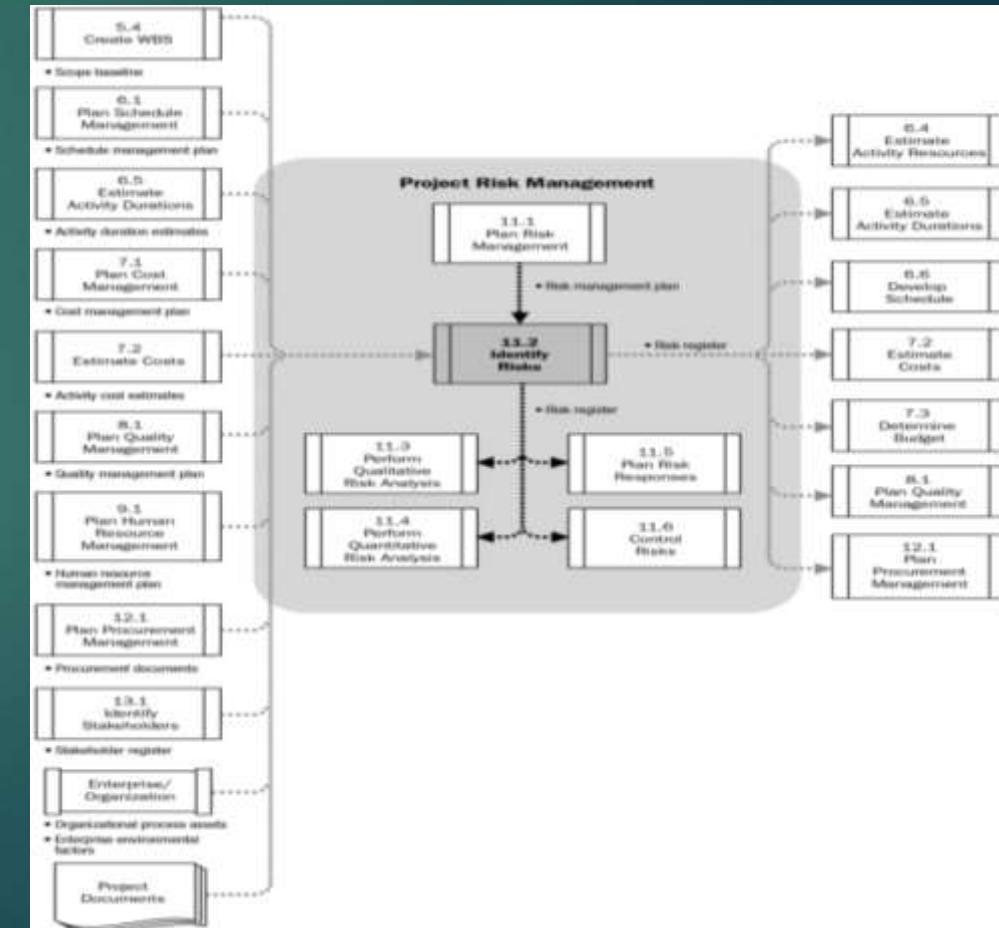
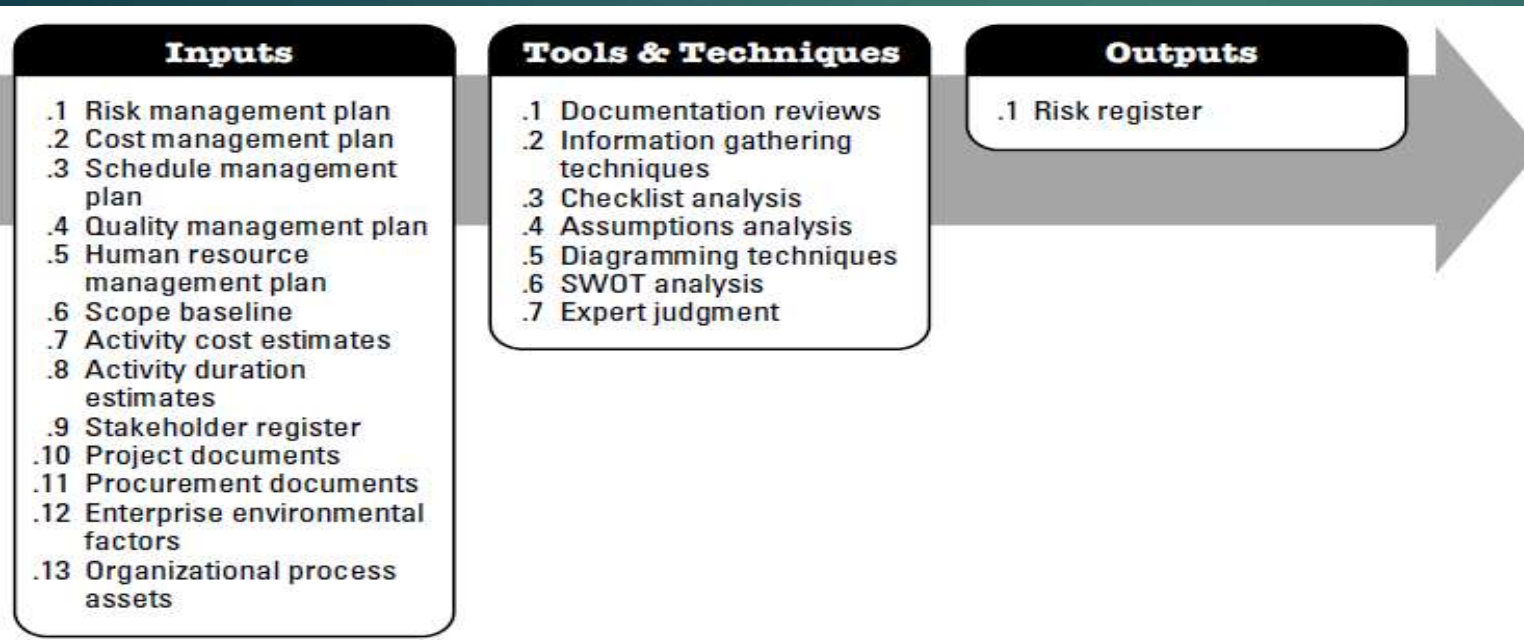
Defined Conditions for Impact Scales of a Risk on Major Project Objectives (Examples are shown for negative impacts only)					
Project Objective	Relative or numerical scales are shown				
	Very low /0.05	Low /0.10	Moderate /0.20	High /0.40	Very high /0.80
Cost	Insignificant cost increase	< 10% cost increase	10 – 20% cost increase	20 – 40% cost increase	> 40% cost increase
Time	Insignificant time increase	< 5% time increase	5 – 10% time increase	10 – 20% time increase	> 20% time increase
Scope	Scope decrease barely noticeable	Minor areas of scope affected	Major areas of scope affected	Scope reduction unacceptable to sponsor	Project end item is effectively useless
Quality	Quality degradation barely noticeable	Only very demanding applications are affected	Quality reduction requires sponsor approval	Quality reduction unacceptable to sponsor	Project end item is effectively useless

This table presents examples of risk impact definitions for four different project objectives. They should be tailored in the Risk Management Planning process to the individual project and to the organization's risk thresholds. Impact definitions can be developed for opportunities in a similar way.

Likelihood	Impact				
	Insignificant	Minor	Moderate	Major	Severe
Almost certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

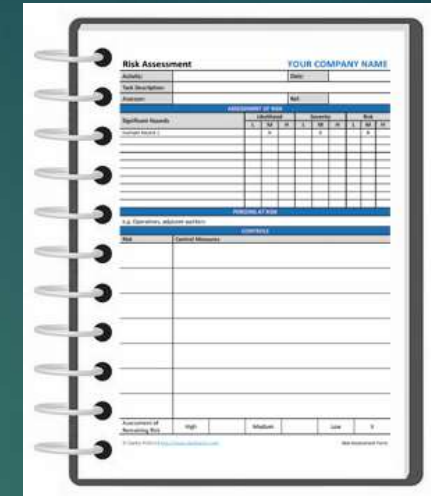
11.2 Identify Risks

- ▶ The process of determining which **risks** may **affect** the project and documenting their characteristics.
- ▶ **The key benefit** of this process is the documentation of **existing risks** and the knowledge and ability it provides to the project team to **anticipate events**.



Tools & Techniques:

- ▶ **Checklist analysis.**
- ▶ **Assumptions analysis.**
- ▶ **Information Gathering Techniques:**
 - ❑ Brainstorming – Delphi technique – Interviewing – Root cause Analysis.
- ▶ **Diagramming Techniques:**
 - ❑ **Cause and effect diagram** – What **causes** would lead certain risks to occur.
 - ❑ **System or process flow charts** – show how elements in a system **relate** to each other.
 - ❑ **Influence diagrams** – show How one event or activity may **influence** another.
- ▶ **SWOT Analysis:**



Internal

External



► Example for SWOT Analysis:



Output

► Risk Register

- ❑ This document contains the outcomes of the other risk management processes as they are conducted ([Progressively Elaborated](#)).

- ❑ It contains the following information:

1) [List of identified risks](#)

- The identified risks are described in as much detail as is reasonable.

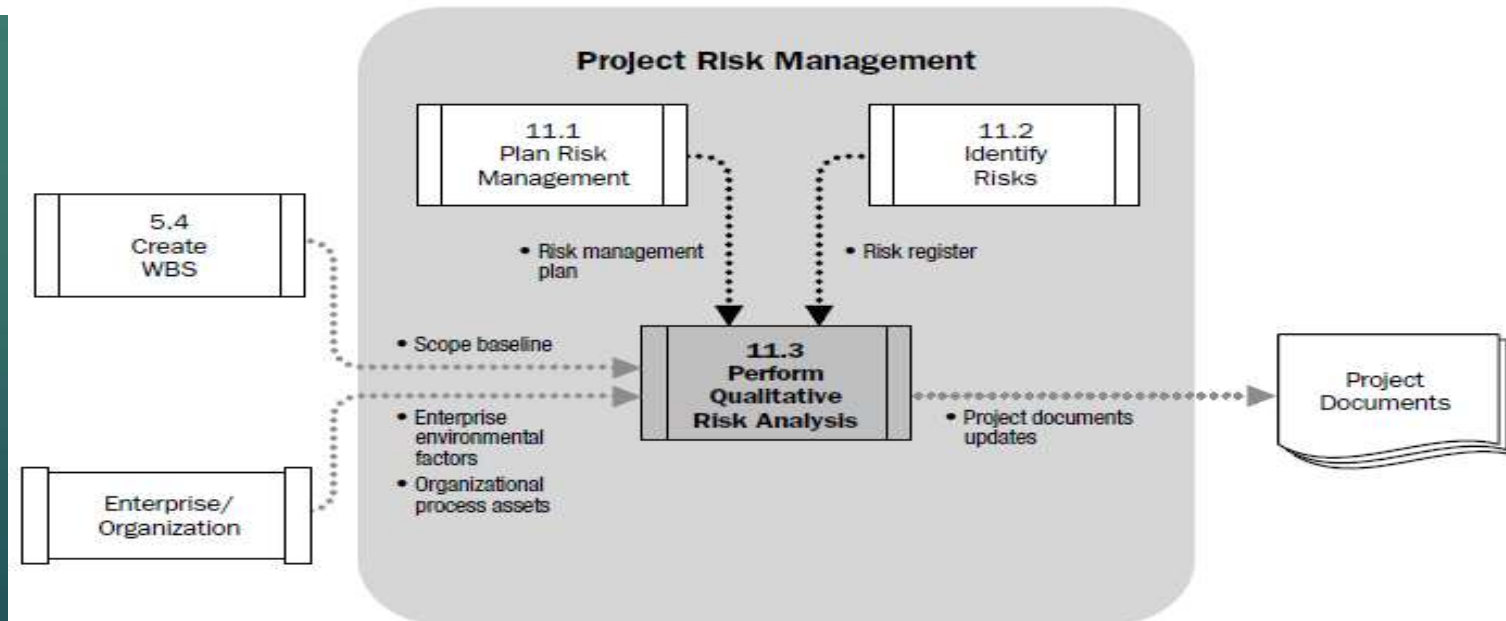
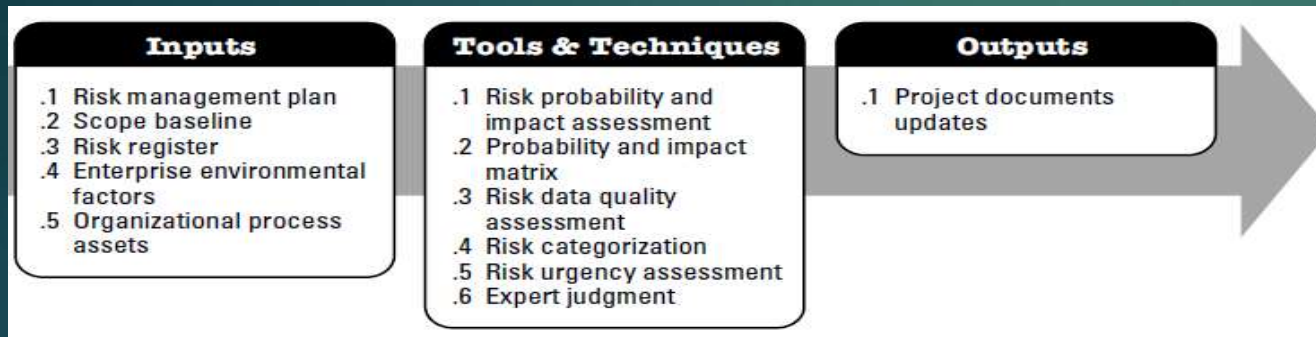
2) [List of potential responses](#)

- Potential responses to a risk.

Risk category	Risk Name	Priority	Probability	Impact	Potential responses	Owner	Comments
Technology	Late delivery of computer systems				last time we borrowed the systems we needed		
Resources	Terry moved off project-need replacement				Last time Terry was pulled off we got him 10% of the time to mentor his replacement		

11.3 Perform Qualitative Risk Analysis

- ▶ The process of **prioritizing** risks for further analysis or action by assessing and combining their **probability** of occurrence and **impact**.
- ▶ **The key benefit** of this process is that it enables project managers to reduce the level of uncertainty and to **focus** on high-priority risks.



Tools & Techniques

► Risk probability and impact assessment

ID	Risk	Probability	Impact
1	A	High	High
2	B	High	Moderate
3	C	Low	Low

► Probability and impact matrix

Risk ID	Prob. 1-10	Impact 1-10	Hazard Rating
A	5	4	20
B	2	5	10
C	1	3	3
D	3	5	15
E	5	1	5

Probability and Impact Matrix										
Probability	Threats					Opportunities				
0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
	0.05/ Very Low	0.10/ Low	0.20/ Moderate	0.40/ High	0.80/ Very High	0.80/ Very High	0.40/ High	0.20/ Moderate	0.10/ Low	0.05/ Very Low

Impact (numerical scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

$$\text{Risk Rating} = \text{Probability} * \text{Impact}$$

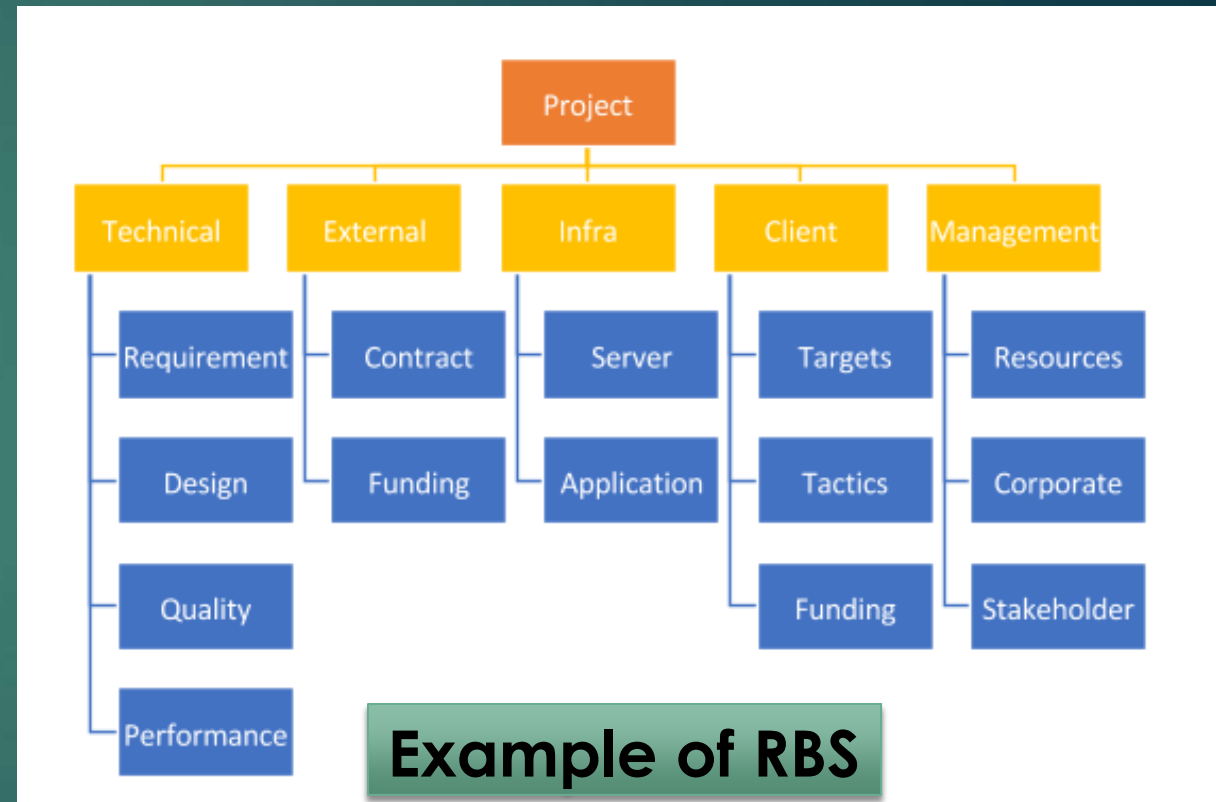
Tools & Techniques

► Risk Data Quality Assessment.

► Risk Categorization.

- ❑ By sources of risk (risk breakdown structure “RBS”), area affected (WBS), or other categories (project phase).
- ❑ Risk Checklist: is the lowest level of RBS.

► Risk Urgency Assessment.



Output

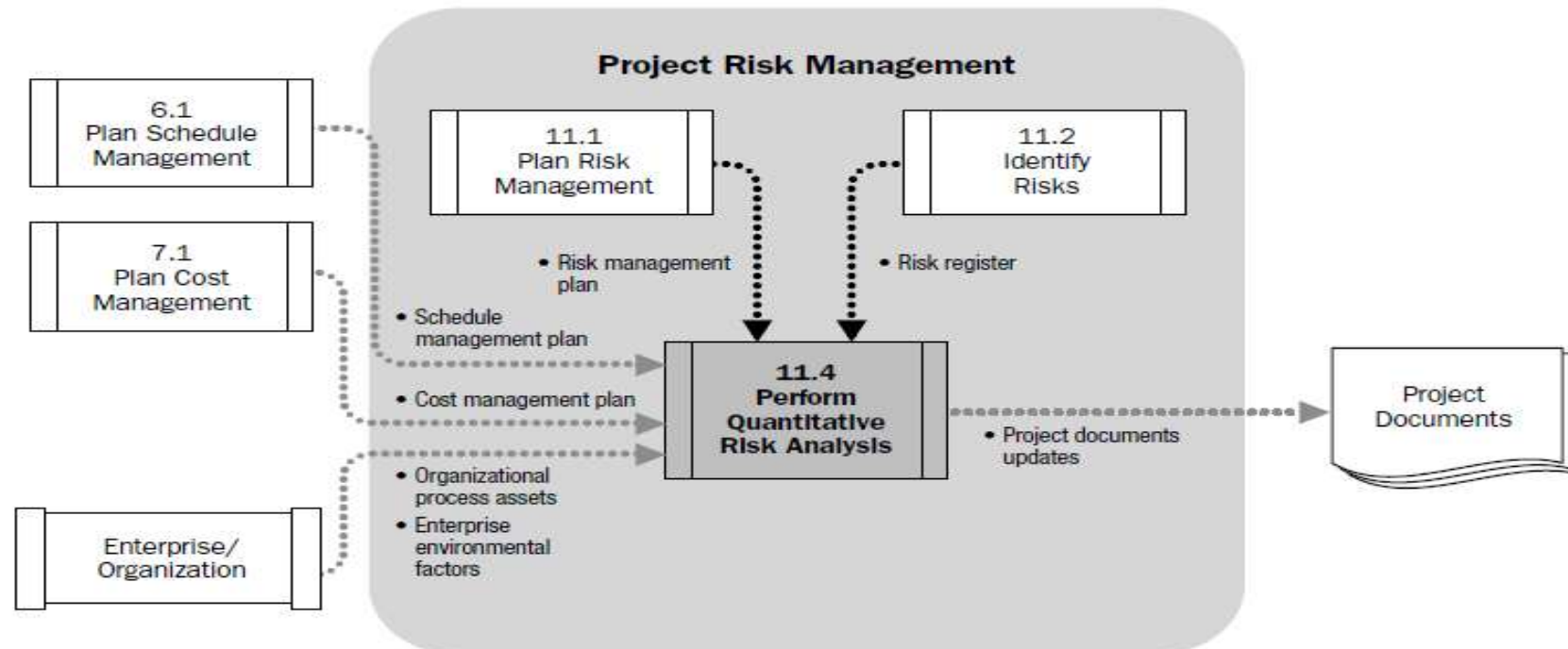
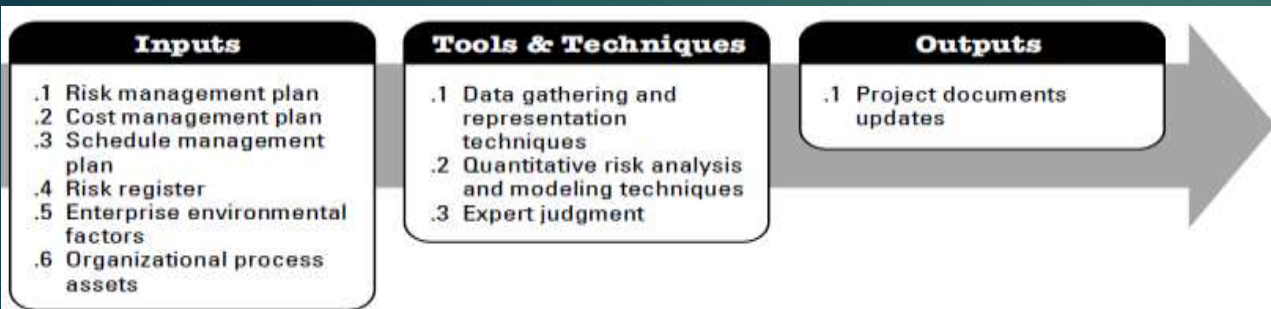
- ▶ Project Document Updates:
 - ❑ **Risk Register updates**
 - ▶ assessments of probability and impacts for each risk, risk **ranking** or scores, risk **urgency** or risk **categorization**.
 - ▶ Watch list: for low probability risks or risks requiring further analysis.

Risk category	Risk Name	Priority	Probability	Impact	Potential responses	Owner	Comments
Technology	Late delivery of computer systems	1	High	low		Nick	
Resources	Terry moved off project-need replacement	2	Moderate	low		Alex	

- ❑ **Assumptions log updates**

11.4 Perform Quantitative Risk Analysis

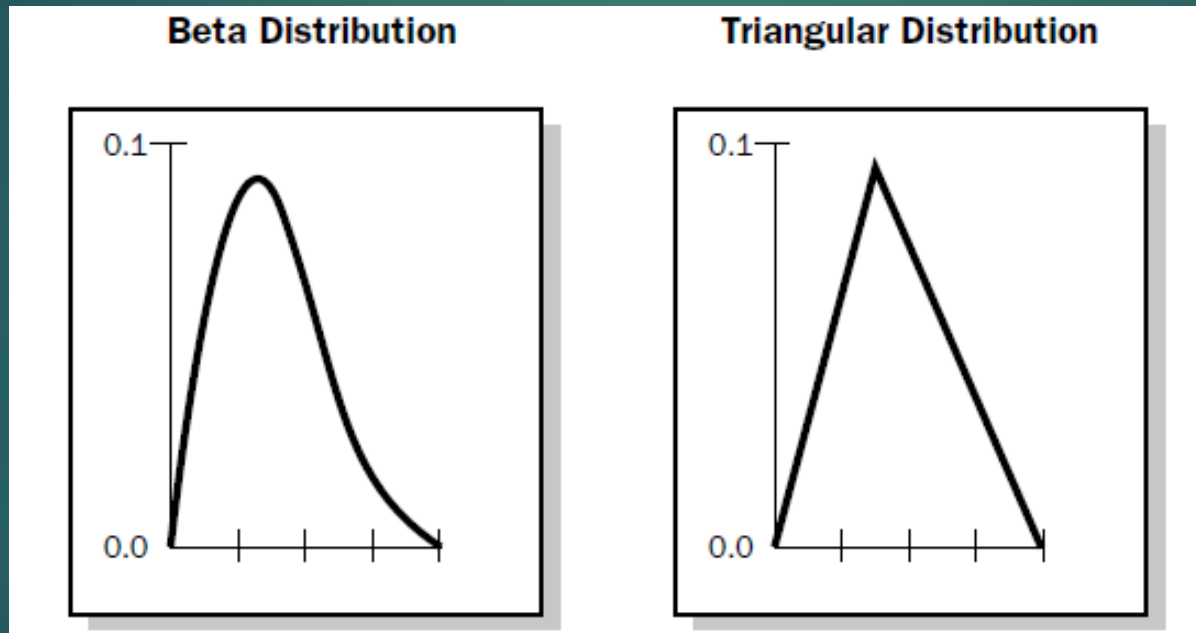
- ▶ The process of **numerically analyzing** the effect of identified risks on overall project objectives.
- ▶ **The key benefit** of this process is that it produces **quantitative risk information** to **support decision making** in order to **reduce** project uncertainty.



Tools & Techniques

► Data Gathering and Representation Techniques

1. Interviewing.
2. **Probability distributions** : Continuous probability distributions, using modeling and simulation, represent the uncertainty in values (durations and costs) of project components.



Tools & Techniques

► Quantitative Risk Analysis and Modeling Techniques

1. Sensitivity Analysis. (Tornado Diagram)
2. Expected Monetary Value Analysis. (EMV/Decision tree)
3. Modeling and Simulation. (Monte Carlo technique)

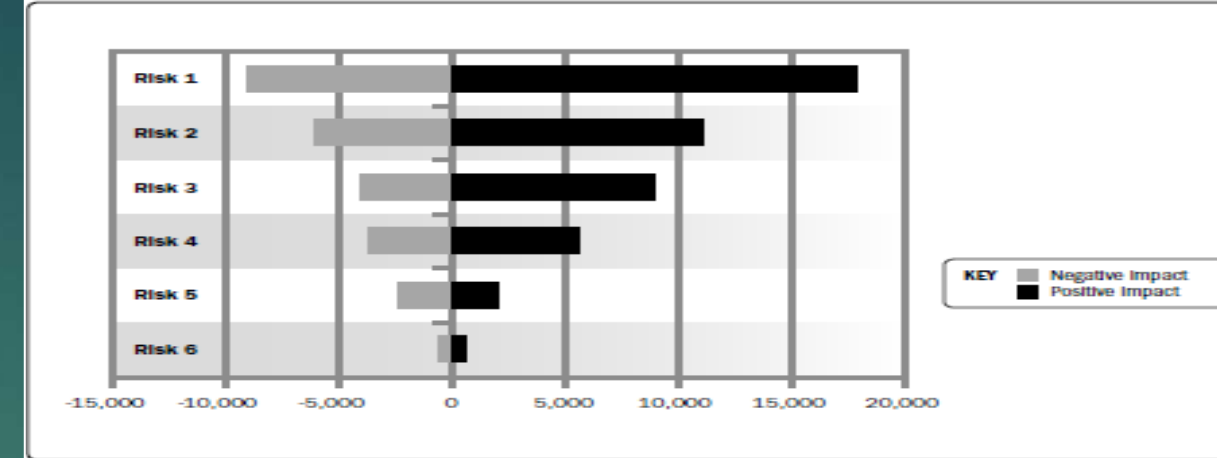
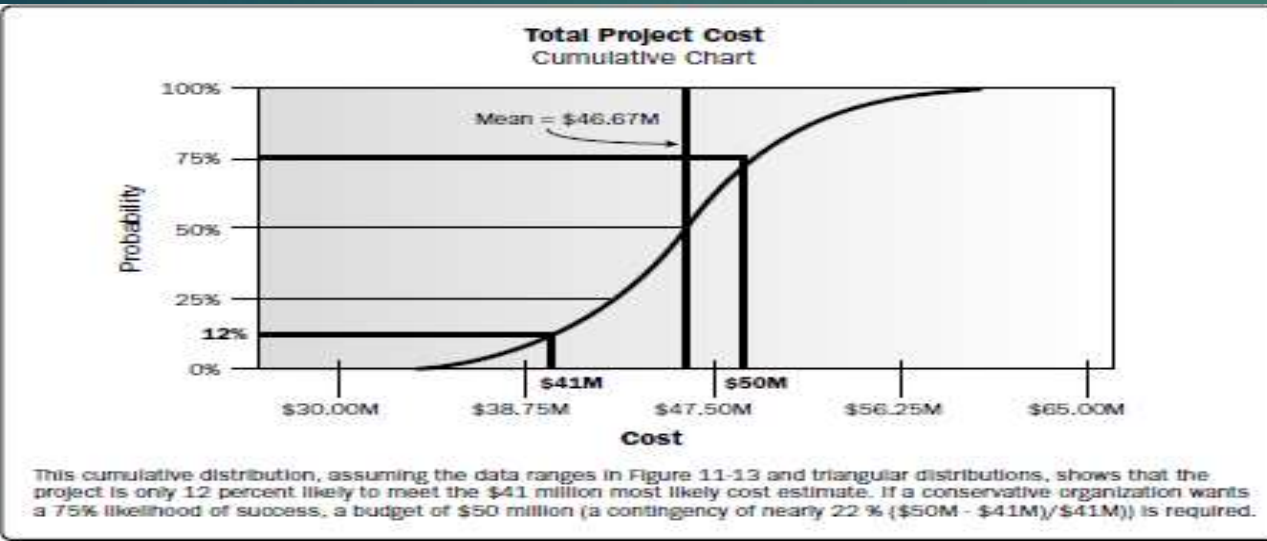
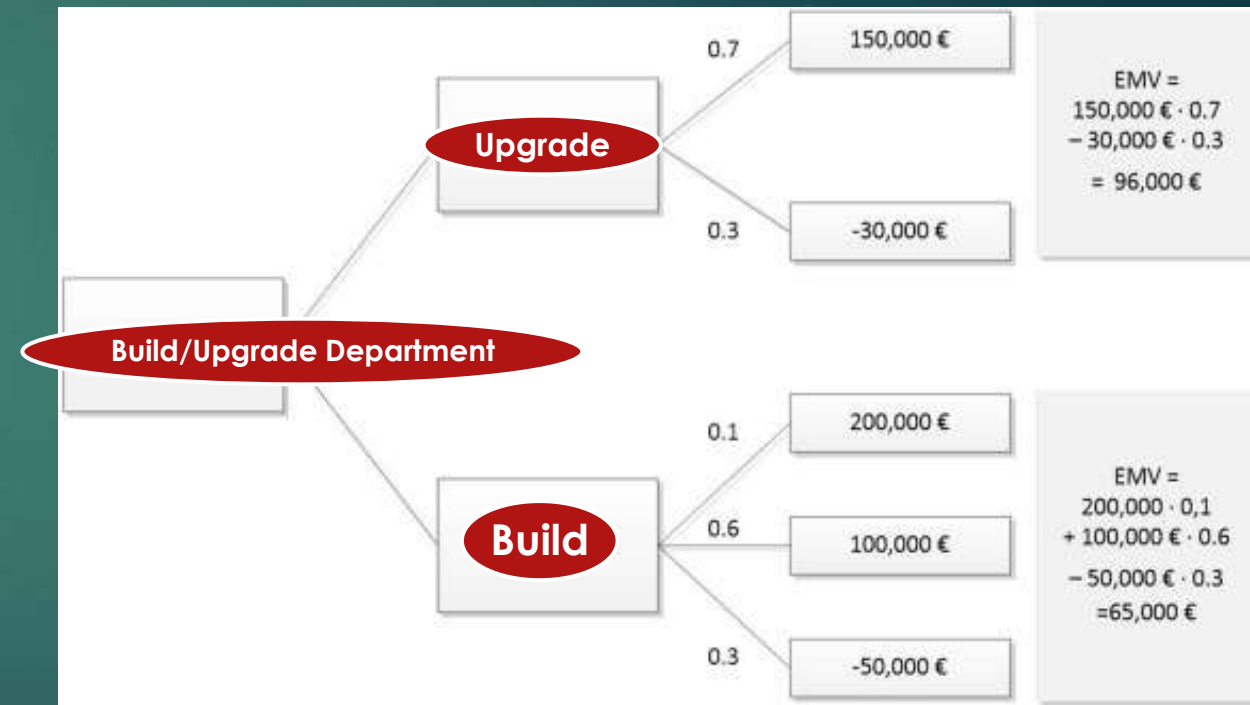


Figure 11-15. Example of Tornado Diagram



Output

► Project Document Updates:

□ Risk Register updates

- Probabilistic analysis of the project (distributions).
- Probability of achieving cost and time objectives.
- Prioritized list of quantified risks.

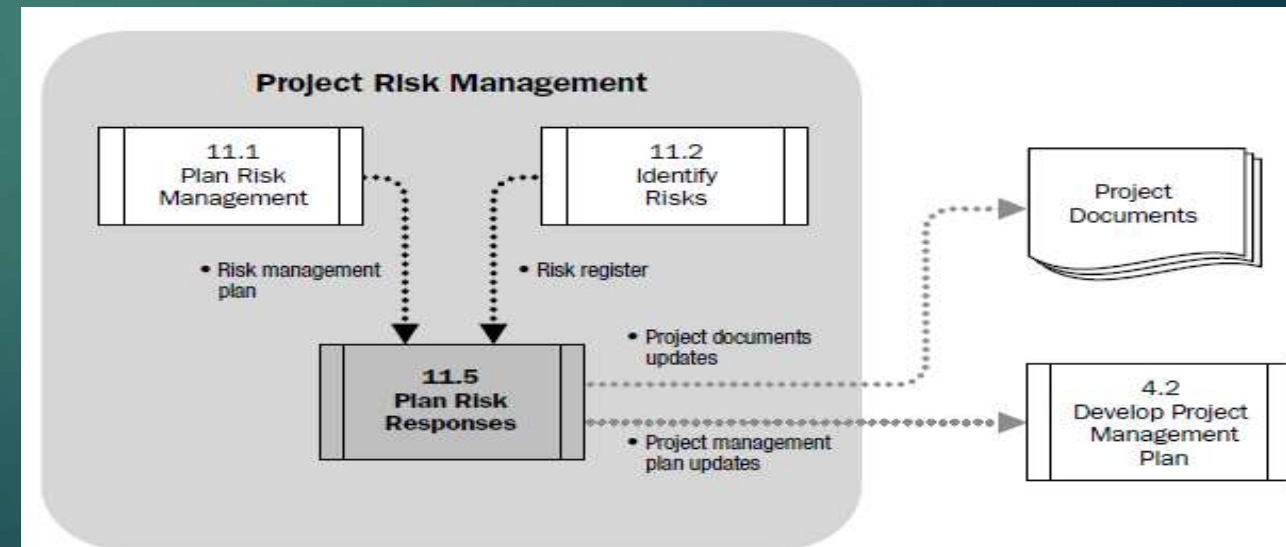
Risk category	Risk Name	Priority	Probability	Impact	Potential responses	Owner	Comments
Technology	Late delivery of computer systems	1	95%	1 week to schedule		Nick	
Resources	Terry moved off project-need replacement	2	45%	4 weeks to schedule		Alex	

CONCLUSION

Qualitative Risk Analysis	Quantitative Risk Analysis
Goal- prioritize risks for quantitative analysis or developing responses	Goal- understand overall risk for project
Quick Cost effective Uses terms like- low, moderate, high Can use numbers relative to each other	Slower More expensive Based on statistics Uses numbers

11.5 Plan Risk Responses

- ▶ The process of developing **options and actions** to **enhance opportunities and to reduce threats** to project objectives.
- ▶ **The key benefit** of this process is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed.

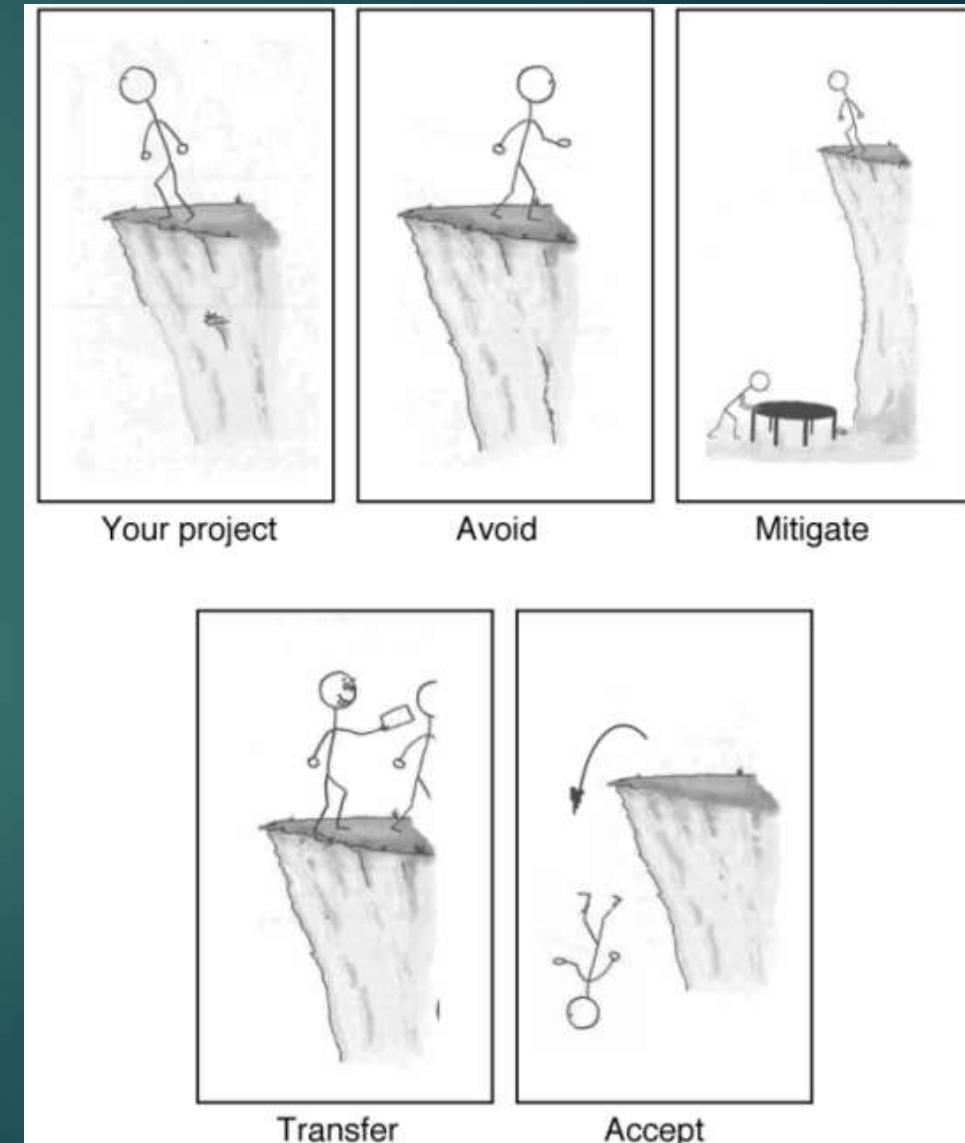


Tools & Techniques

► Strategies for Negative Risks (Threats)



- Active accept. (Contingency Plan)
- Passive accept. (No Plan- "workaround" during "Control Risk").



Tools & Techniques

► Strategies for Positive Risks (Opportunities)



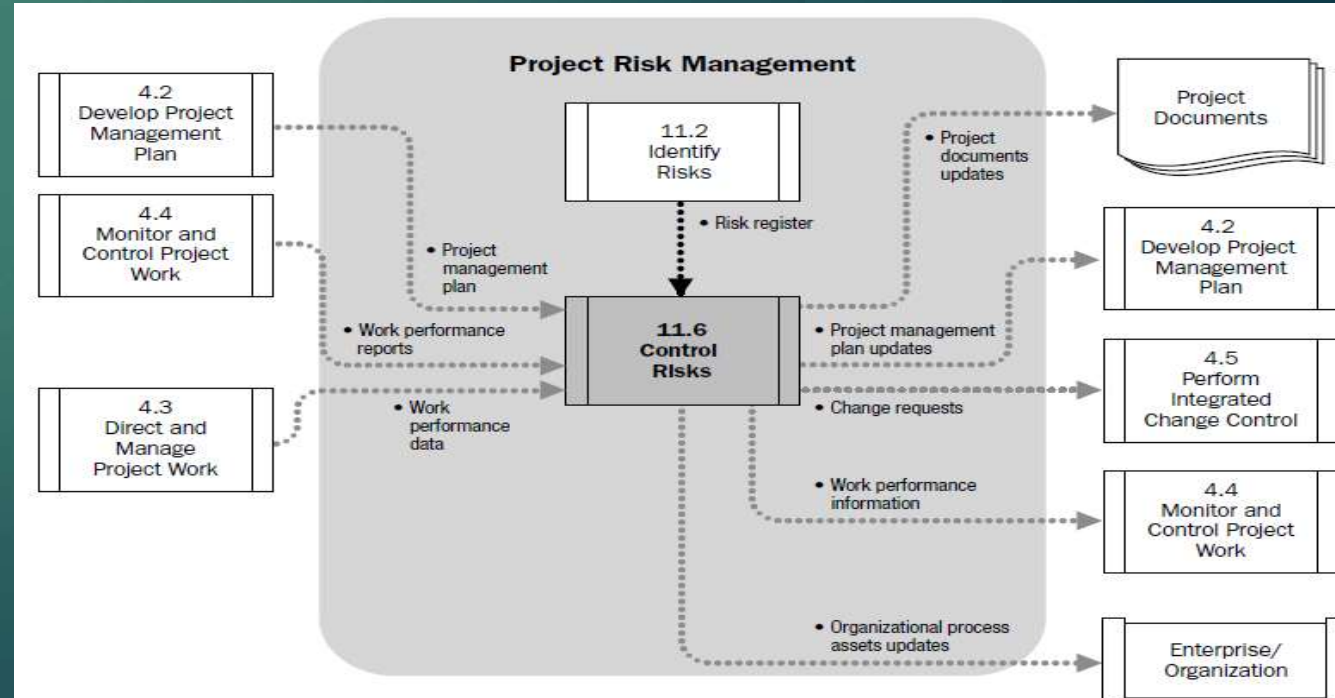
Outputs:



- ▶ Project Management Plan Updates
- ▶ Project Documents Updates:
 - ❑ Risk Register :
 - risk owners/responsibilities – approved response strategies – warning signs – budget and schedule activities – **Contingency plans/triggers**.
 - **Fallback plans** (after ineffective primary response).
 - **Residual risks** : **remaining** after responses.
 - **Secondary risks** : **arise** upon implementing a risk response.
- **Contingency reserve**
- ❑ Assumptions log
- ❑ Technical Documentations
- ❑ Change Requests

11.6 Control 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.
- ▶ **The key benefit** of this process is that it improves efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses.



Objectives



Tools & Techniques

► Risk Reassessment

- ❑ **Identification** of new risks, reassessment of current risks (on regular basis), and the **closing** of risks that are outdated.

► Risk Audits

- ❑ Examine and document the effectiveness of risk responses for identified risks , root causes, and the effectiveness of risk management process.



Tools & Techniques

- ▶ **Variance and Trend Analysis** – SV,CV,SPI,CPI
- ▶ **Technical Performance Measurement** - ex. product return
- ▶ **Reserve Analysis**
 - ❑ Compares the amount of the **contingency reserves** remaining to the amount of **risk** remaining at any time to determine if the remaining reserve is adequate.
- ▶ **Meetings**



Output

- ▶ **Work Performance Information**
 - ❑ to communicate and support project decision making.
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**





Risks

Activities Risks

Display: All Risks

Risk Name	Risk Category	Risk Type	Risk Status	Risk Owner	Identified By	Identified On	Exposure Start	Exposure Finish	Project	Description
Delay in conc. Delivery	Project Dependenc	Threat	Proposed	E-0012.Ahmed Ade		01-Oct-14	01-Aug-14		SF-V-4	

General Impact Activities Description Cause Effect Notes

ID	Name				
RISK1	Delay in conc. Delivery				
Category	Project Dependencies	Exposure Start	01-Aug-14	Identified On	01-Oct-14
Type	Threat	Exposure Finish		Identified By	
Owner	E-0012 Ahmed Adel	Pre-Response Exposure Cost	\$0.00		
Status	Proposed	Post-Response Exposure Cost	\$0.00		

		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
Knowledge Areas	Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
	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	
	Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
	Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
	Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
	Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
	Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
	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 Control Risks	
	Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
	Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	



12. Project Procurement Management



Definitions:

- ▶ Buyer – Seller.
- ▶ PM role.
- ▶ Centralized/Decentralized contracting.
- ▶ Procurement Management.
- ▶ Price
- ▶ Types of contracts: (OPA)
 1. FP.
 2. CR.
 3. T&M.



1- Fixed Price Contracts (Cost Risk on Seller)

► as in construction Projects.



Firm Fixed Price (FFP)	Fixed Price –Incentive Fee (FPIF)	Fixed Price – Economic Price Adjustment (FP-EPA)
<ul style="list-style-type: none">- The most commonly used contract type is the FFP.- The price for goods is set and not subject to change unless the scope of work changes.- Any cost increase due to adverse performance is the responsibility of the seller.	<ul style="list-style-type: none">- It gives the buyer and seller some flexibility in that it allows for deviation from performance, with financial incentives.- Performance targets are established at outset and the final contract price is determined after completion of all work based on the seller's performance.- Definite Price ceiling.	<ul style="list-style-type: none">- Used when the seller's performance period spans a considerable period of years.- Allowing for pre defined final adjustments to the contract price due to changed conditions, such as inflation changes, or cost increases (or decreases).

2- Cost-reimbursable Contracts (Cost Risk on buyer)



Cost+ Fixed Fee (CPFF)

- The seller is reimbursed for all allowable **costs** for performing the contract work, and receives a **fixed-fee** payment calculated as a **percentage** of the initial estimated project costs.
- Fee amounts do **not** change unless the project scope changes.

Cost + Incentive fee (CPIF)

- The seller is reimbursed for all allowable **costs** for performing the contract work and receives a pre-determined **incentive fee** based upon achieving certain **performance objectives** as set forth in the contract.
- Both buyer and seller **share** cost targets.
- For example cost sharing **80/20** %.

Cost+ Award fee (CPAF)

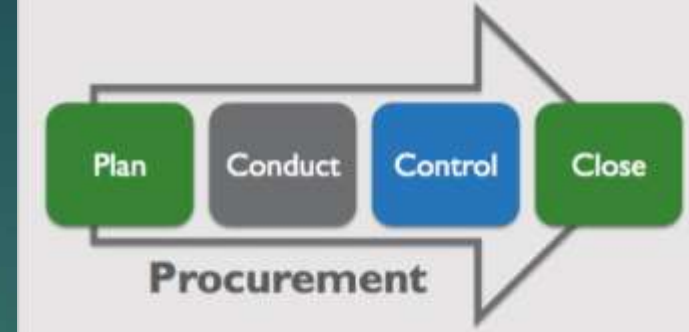
- The seller is reimbursed for all legitimate **costs**, but the majority of the fee is earned only based on the satisfaction of **certain broad subjective performance criteria** defined and incorporated into the contract.
- For example Max. award= 10,000\$

3- Time and Material Contracts (T&M)

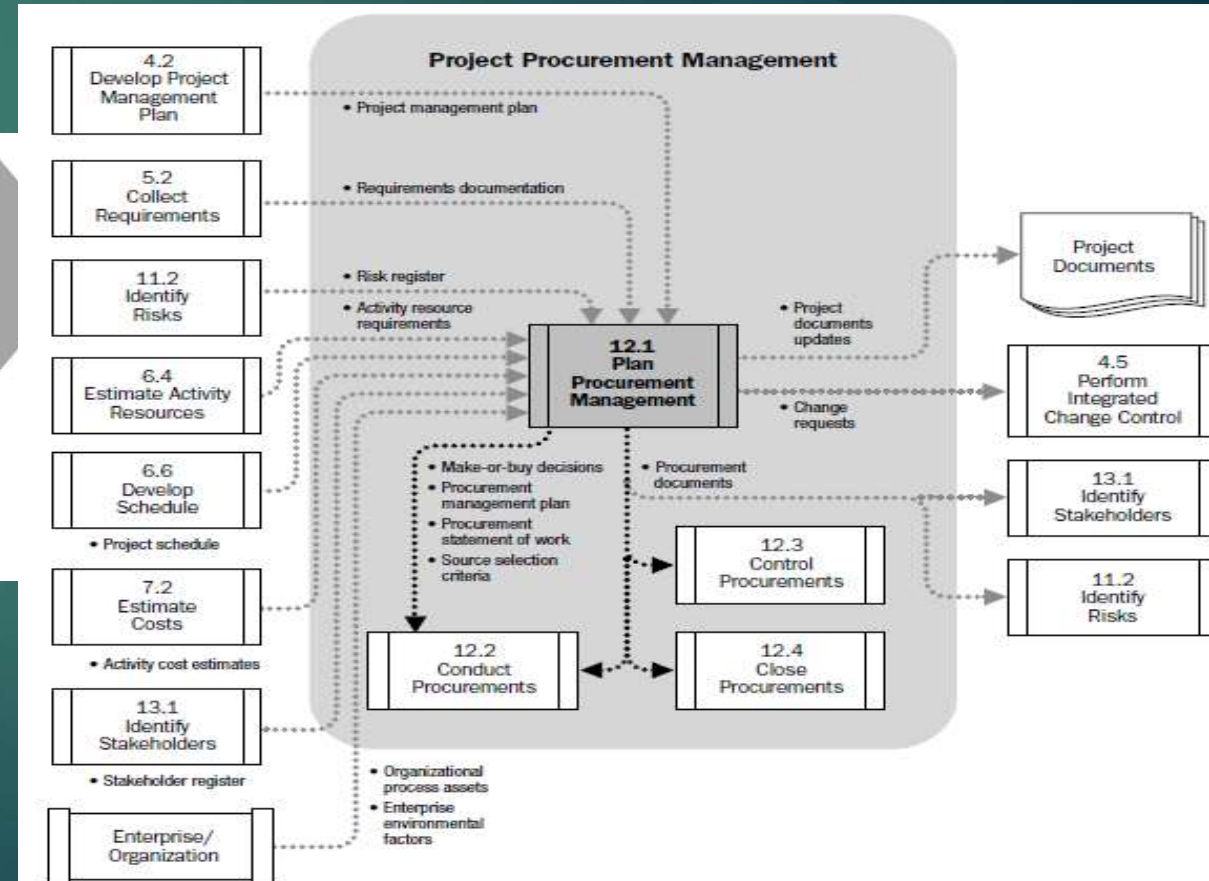
- ▶ It is a **hybrid** type of contractual arrangement that contain aspects of both **FP** & **CR** contracts
- ▶ Many organizations require “**not-to-exceed values and time limits**” placed in all T&M contracts to prevent **unlimited cost growth**.
- ▶ It is **quick** contract type.
- ▶ For example: **creating new website/ hire consultant**.



12.1 Plan Procurement Management



- ▶ The process of documenting project **procurement decisions**, specifying the **approach**, and **identifying potential sellers**.
- ▶ **The key benefit** of this process is that it determines whether to **acquire outside** support, and if so, **what** to acquire, **how** to acquire it, and **when** to acquire it.



Tools & Techniques

► Make or Buy Analysis

- A technique used to determine whether particular work can be accomplished by the project team(internal) or you should [purchase/lease](#) from outside sources (external).

► Expert Judgment

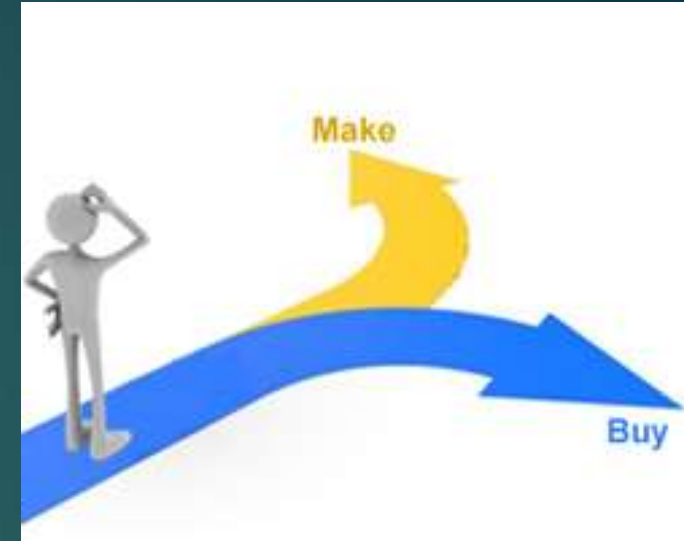
- to develop or modify the criteria that will be used to evaluate seller proposals.

► Meetings

- To obtain additional information by interchange meetings with potential bidders.

► Market Research

- Includes examination of industry and specific vendor capabilities.



Output

- **Procurement Management Plan**- it may include:
 - Types of contracts to be used.
 - Evaluation criteria - Standardized procurement documents.
 - Constraints – assumptions – log handling.
 - WBS management with sellers.
 - Identifying **prequalified sellers** and procurement **metrics**.
 - Contract lifecycle management.

VALUE GENERATIONPARTNERS					Procurement Management Plan	
Project Name:						
Project Manager:				Date:		
What		Why	When	Who	What	Other
Description	Type	Reason	Timing	Owner	Status	Comments

Output

► Procurement Statement of Work (PSOW)

- For each procurement, it is developed from the project scope baseline and defines **only** that portion of the project scope that is to be included within the related **contract**.
- It describes the procurement item in **sufficient detail** to allow prospective sellers to determine their capability to achieve its **objectives**.

► Procurement Documents

- They are used to solicit proposals from prospective sellers.
- RFI – IFB/RFQ/tender notice -RFP.



Output

► Source Selection Criteria

- Understanding of need – Overall cost – Risk – Technical capability – Management approach – Financial capacity – Business capacity – Interest - Business size and type – Past performance – References.

► Make -or – Buy Decisions

► Change Requests

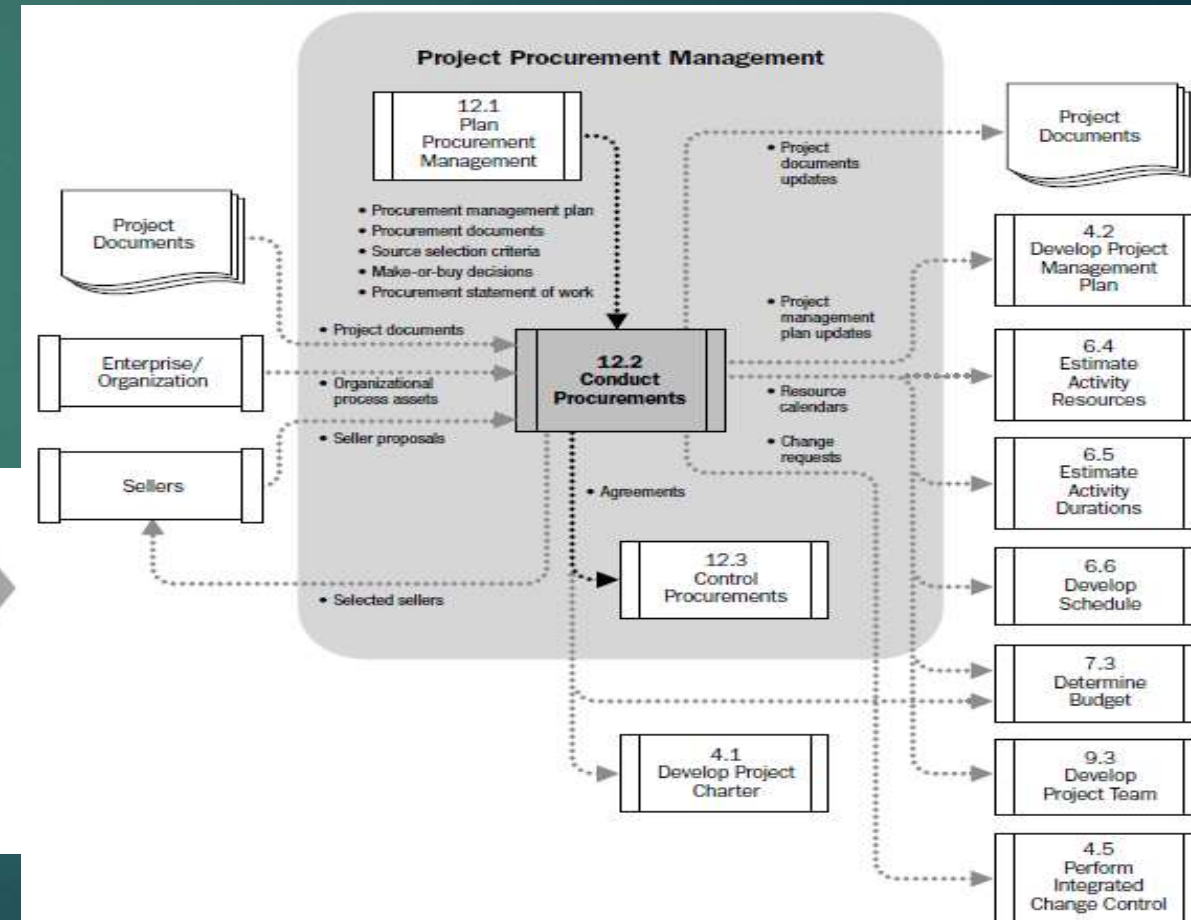
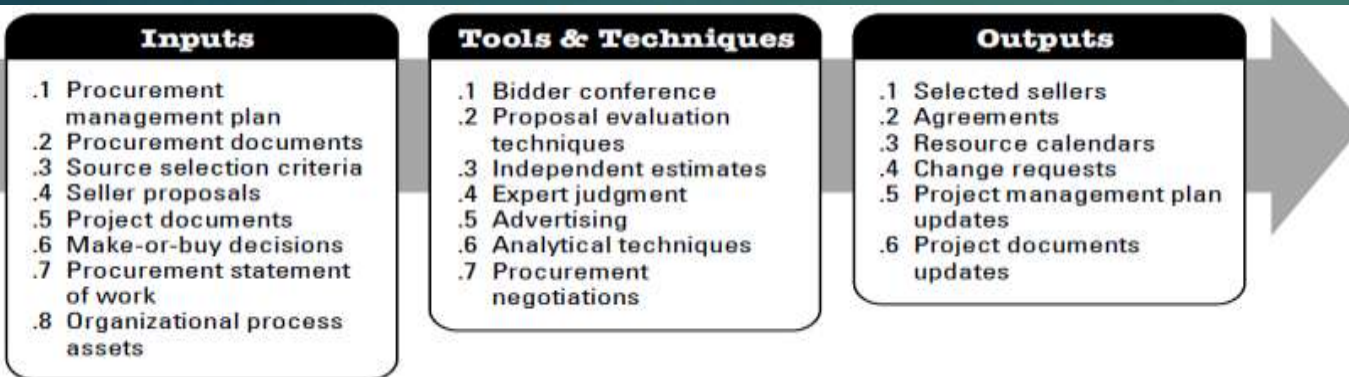
A decision that involves outsourcing typically requires a change request.

► Project Documents Updates



12.2 Conduct Procurements

- ▶ The process of obtaining seller responses, selecting a seller, and awarding a contract.
- ▶ **The key benefit** of this process is that it provides alignment of internal and external stakeholder expectations through established agreements.



Tools & Techniques

► Bidder Conferences

- ❑ Meetings between the buyer and all prospective sellers prior to submittal of a bid or proposal to ensure that all prospective sellers have a clear and common understanding of the procurement requirements.

► Advertising

- ❑ Existing lists of potential sellers often can be expanded by placing advertisements in general circulation publications (newspapers...etc).



► Proposal Evaluation Techniques

- ❑ Formal evaluation review based on buyer's predefined criteria.

► Independent Estimates

- ❑ Prepared to serve as a benchmark on proposed responses.



Tools & Techniques

► Expert Judgment

► Analytical Techniques

- It is used to identify the **readiness** of a vendor to provide the desired end state, determine the **cost expected** to support budgeting, and **avoid cost overruns** due to changes.

► Procurement Negotiations

- The project manager and other members of the project management team may be **present** during negotiations to provide **assistance**, and, if needed, to add **clarification** of the project's technical, quality, and management requirements.



Output

- ▶ **Selected Sellers**

- ❑ who is awarded the contract from a competitive range.



- ▶ **Agreements**

- ❑ Includes **terms and conditions**, and other items that the buyer specifies regarding what the seller is to perform or provide.

- ▶ **Resource Calendars**

- ▶ **Change Requests**

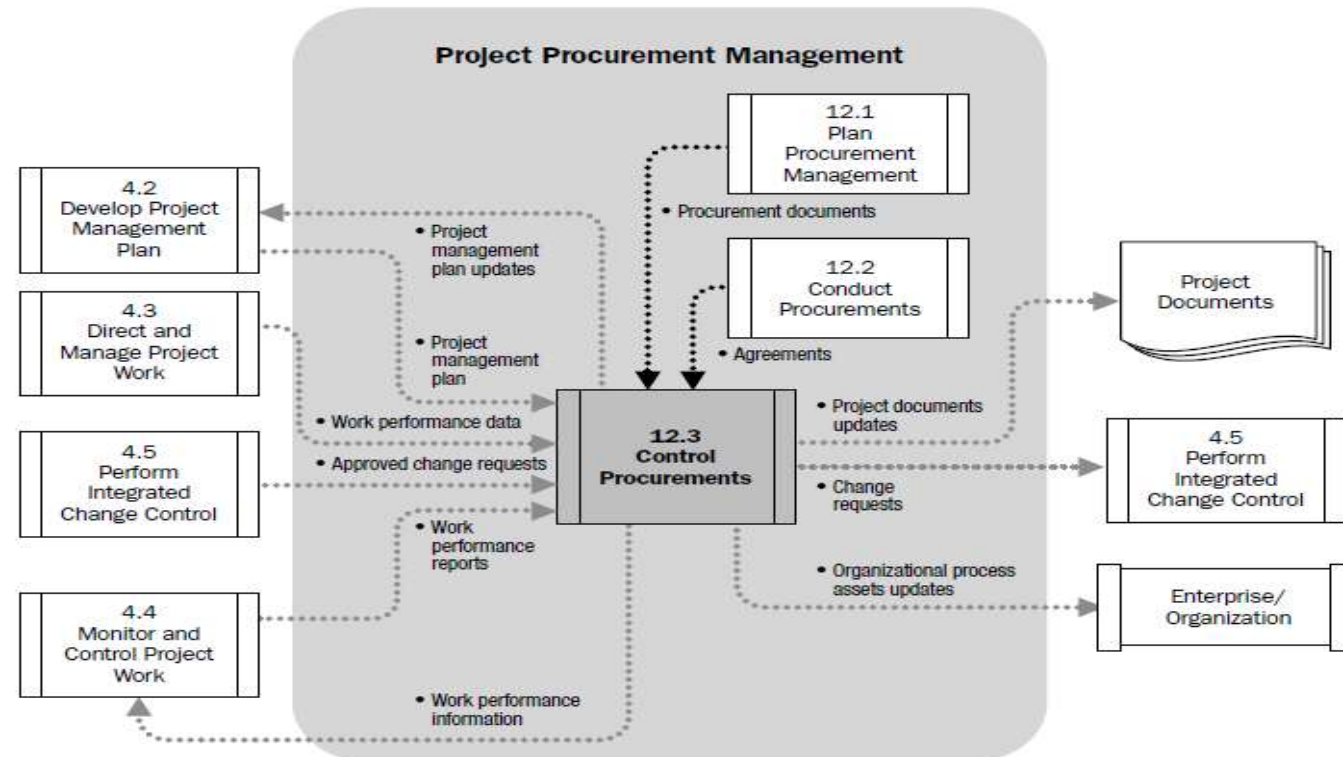
- ▶ **Project Management Plan Updates**

- ▶ **Project Documents Updates**

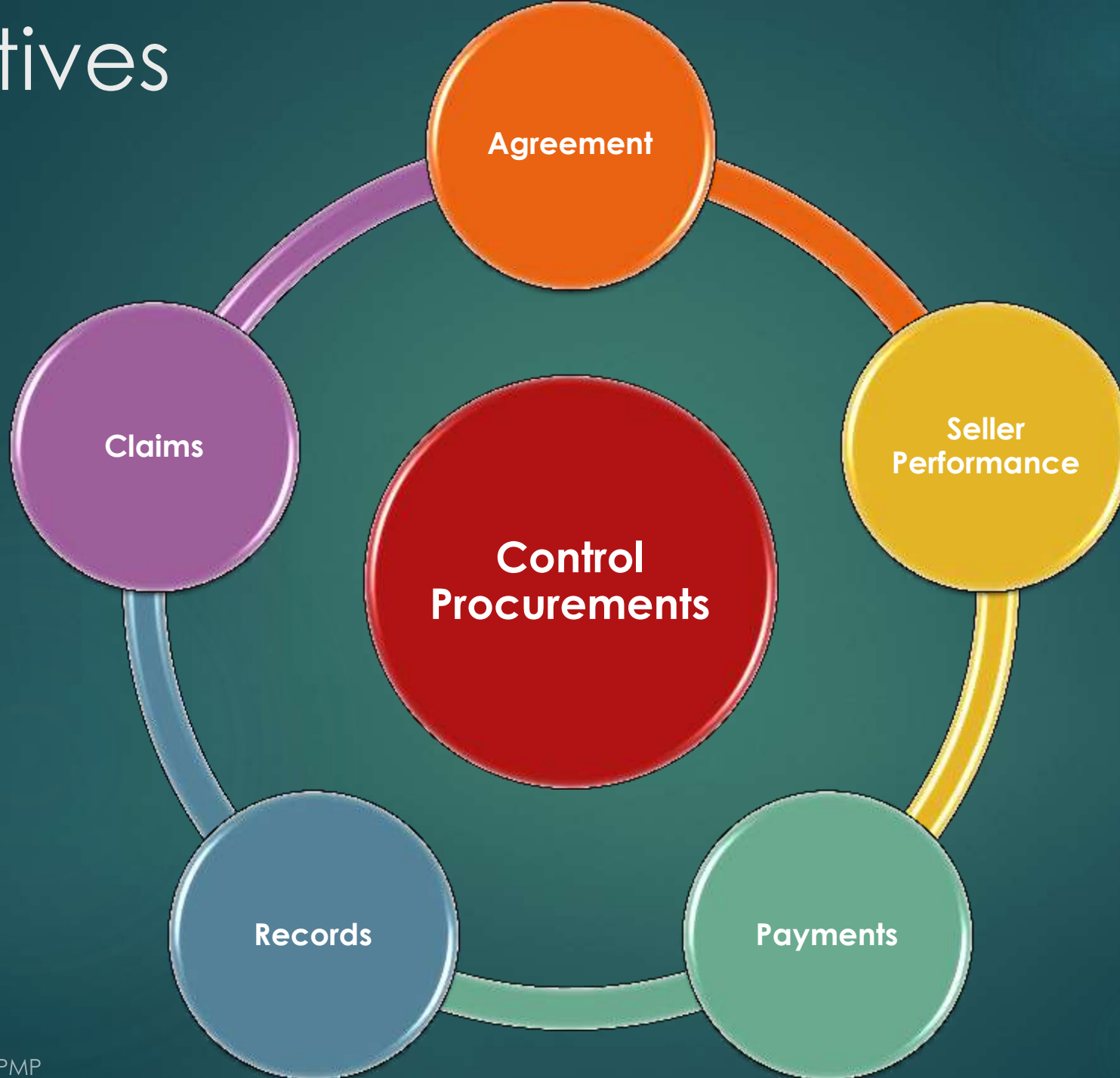


12.3 Control Procurements

- ▶ The process of **managing procurement relationships**, monitoring **contract performance**, and making **changes** and corrections to contracts as appropriate.
- ▶ **The key benefit** of this process is that it ensures that both the **seller's and buyer's performance** meets procurement requirements according to the terms of the legal agreement.



Objectives



Tools & Techniques



▶ Contract Change Control System

- ❑ Defines the process by which the **procurement** can be **modified** and is integrated with the integrated change control system.

▶ Procurement Performance Reviews

- ❑ A **structured review** of the seller's progress to **deliver** project **scope** and **quality**, within **cost** and on **schedule**, as compared to the **contract**.

▶ Inspections and Audits

- ❑ As specified in the contract, can be conducted during execution to **verify compliance** in the seller's work processes or deliverables.

▶ Performance Reporting

- ❑ Provides management with **information** about **how effectively** the seller is achieving the **contractual objectives**.

Tools & Techniques



► Payment Systems

- ❑ Payments to the **seller** are typically processed by **the accounts payable system of the buyer** after certification of **satisfactory work in contract**(not based on time or effort).

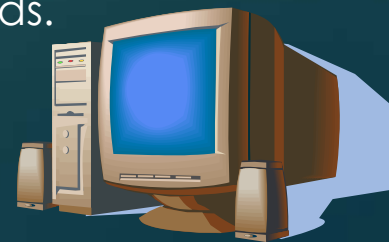


► Claims Administration

- ❑ Contested **changes requested** where the buyer and seller **cannot reach an agreement** on compensation for the change or **cannot agree** that a change has occurred.
- ❑ If the parties do not resolve **a claim**, it may be handled in accordance with **alternative dispute resolution(ADR)**.

► Records Management System

- ❑ Used by the **project manager** to manage contract and procurement documentation and records.



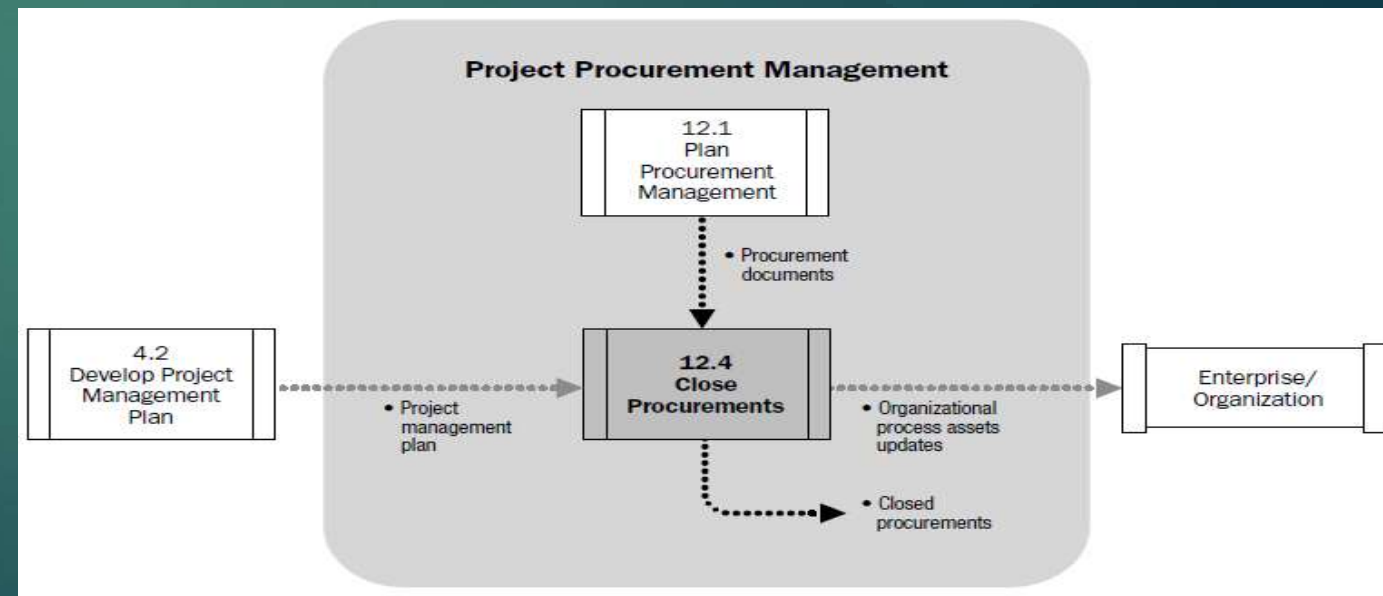
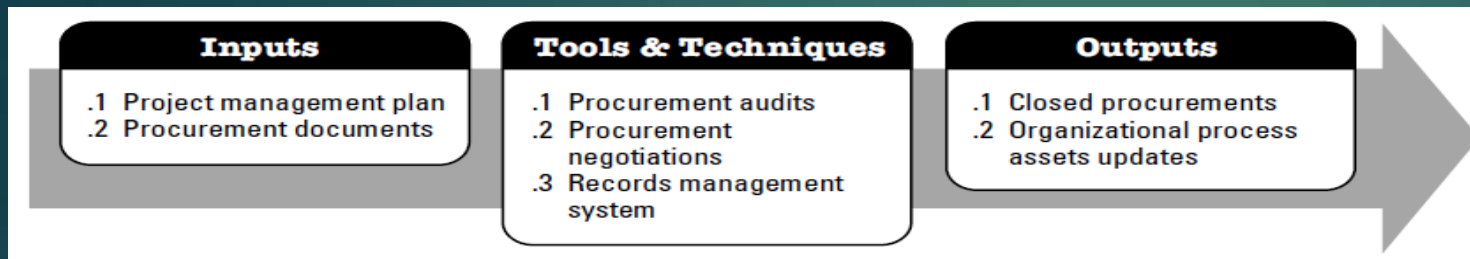
Output

- ▶ **Work Performance Information**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**
- ▶ **Organizational Process Assets Updates**
 - ❑ **Correspondence** : a complete and accurate written record of all written and oral contract communications, actions taken and decisions made ..etc.
 - ❑ **Payments schedule and requests** : all payment records.
 - ❑ **Seller performance evaluation documentation.**

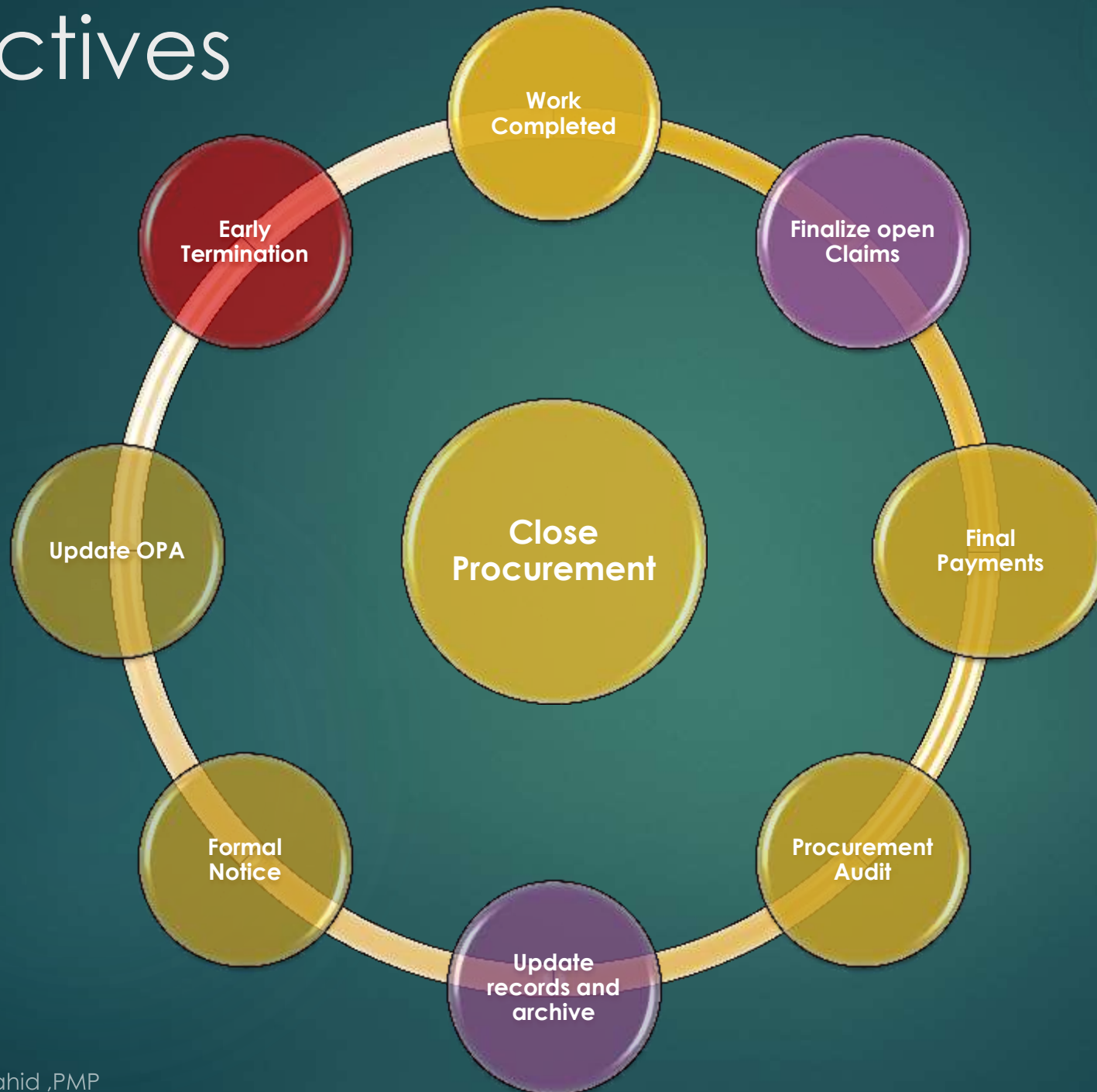


12.4 Close Procurements

- ▶ The process of completing **each** procurement.
- ▶ **The key benefit** of this process is that it documents agreements and related documentation for **future reference**.
- ▶ It involves **administrative activities** such as finalizing open claims, updating records to reflect final results, and archiving such information for future use.



Objectives



Administrative activities

Tools & Techniques

► Procurement Audits

- ❑ To identify success / failures from plan to control procurement process.

► Procurement Negotiations

- ❑ Final equitable settlement – ADR .

► Records Management System

- ❑ To update and archive the final documents.



Output

► Closed Procurements

- ❑ The buyer provides the seller with **formal written** notice that the contract has been completed in accordance with the **contract**.

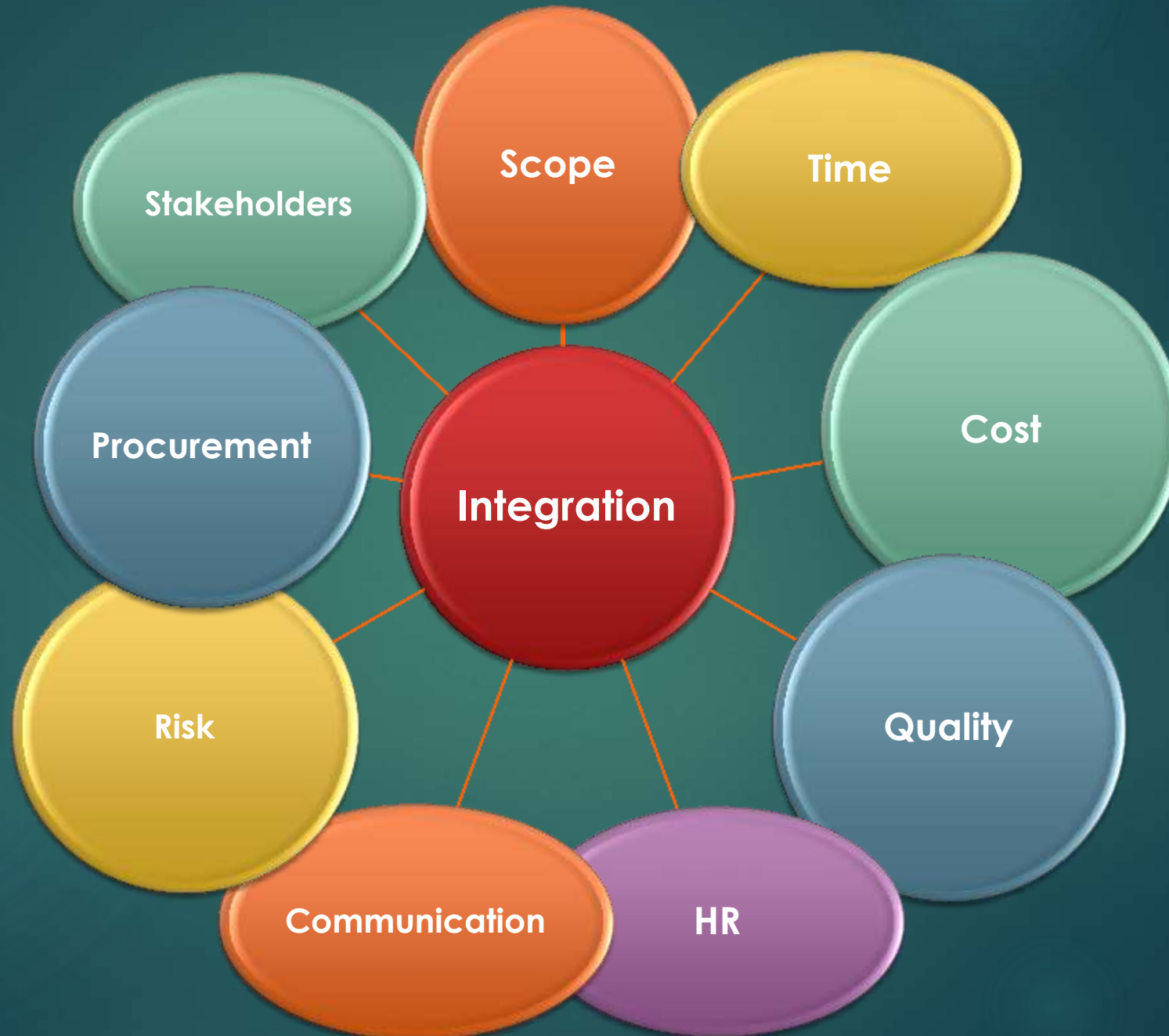
► Organizational Process Assets Updates

- ❑ Procurement files – Deliverable acceptance – Lessons learned documentation.



		Project Management Process Groups				
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
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4. PROJECT INTEGRATION MANAGEMENT



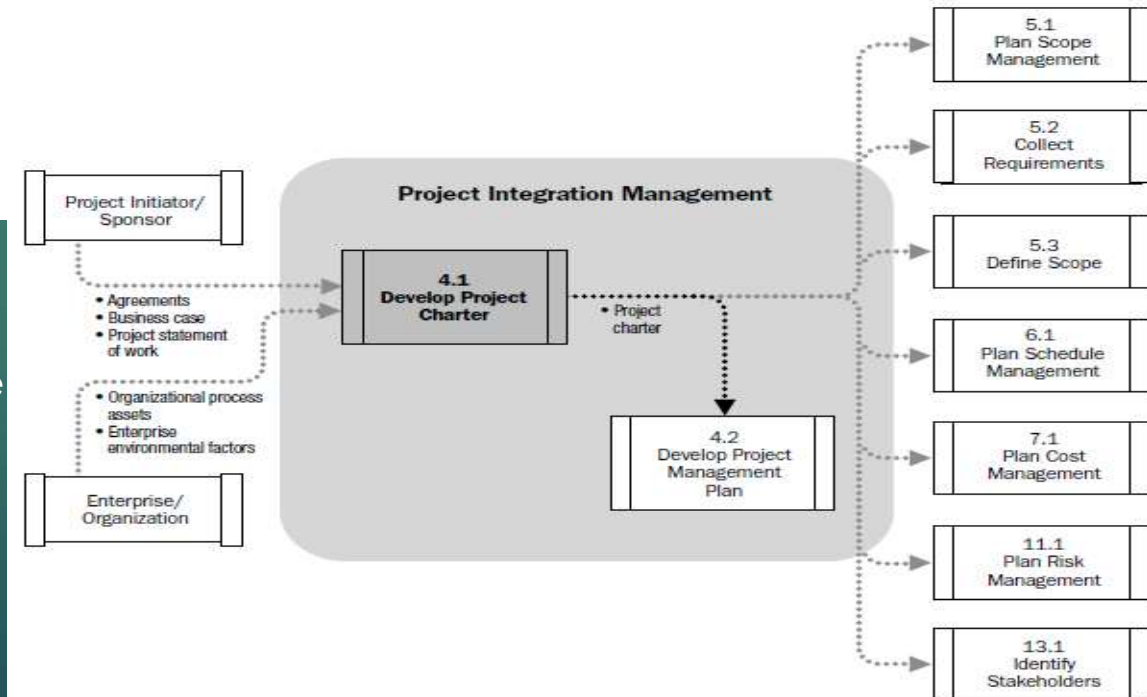
4.1 Develop Project Charter

- ▶ 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.
- ▶ The key benefit of this process is a well-defined project start and project boundaries, creation of a formal record of the project, and a direct way for senior management to formally accept and commit to the project.
- ▶ Projects are initiated by an entity external to the project such as a sponsor, program or project management office (PMO) staff person, or a portfolio governing body chairperson or authorized representative.



Figure 4-2. Develop Project Charter: Inputs, Tools and Techniques, and Outputs

- ▶ It is Sponsor responsibility to change or modify charter.
- ▶ Project Manager should be assigned during this process/before planning process group.



Inputs

► Project Statement of Work

- ❑ A narrative description of products, services, or results to be delivered by a project.
- ❑ $PSOW = \text{Business need} + \text{Product scope description} + \text{Strategic plan}.$

► Business Case

- ❑ Market demand – Organizational need – Customer request – Technological advance – Legal requirement – Ecological impact – Social need.
- ❑ $\text{Business Case} = \text{Business need} + \text{Cost benefit analysis}.$

► Agreements

- ❑ Between Requesting organization and Performing organization.

► EEF

► OPA

Tools & Techniques



- ▶ **Expert Judgment**

- ☐ where it is the **first** Stakeholders engagement.

- ▶ **Facilitation Techniques**



Output:



Project Charter

Project purpose or justification

Measurable project objectives and related success criteria

High-level requirements

High-level project description

High-level risks

Summary milestone schedule

Summary budget

Stakeholder list

Project approval requirements (what constitutes success, who decides it, who signs off)

Assigned project manager, responsibility, and authority level

Name and authority of the sponsor or other person(s) authorizing the project charter

WORKSHOP



PROJECT CHARTER

Project Title: create an expressway

Project Sponsor: Ministry of Works **Date Prepared:** 21/03/17

Project Manager: Haitham Wahid **Project Customer:** Ministry of planning

Project Purpose or Justification:

This proposed project will create an expressway with dedicated truck lanes to the west of city linking the industrial city to city port.

Project Description:

The project will be designed to manage up to 1500 heavy good vehicles per hour in each direction; it can cater for general traffic volumes at approximately 8000 V/h in each direction. A special characteristic of this proposed project is that HGVs will be segregated from general traffic, this is a unique feature that aims at improving safety by removing slower moving trucks from the flow of faster vehicles. Thus, allowing long distance haulage to progress uninterrupted.

Project and Product Requirements:

Reference to be provided following stakeholder requirements analysis.

Success Criteria:

Success criteria are measured against technical characteristics and stakeholder requirements/expectations within the allowed time and Budget, such as the expressway alignment with the main road (2 KM).

Initial Risks:

1. Because there may be changes due the Foundations, the project may require extra work due to unstable terrain.
2. Because this expressway path through Electric towers, we may need extra budget to circle around them with extra length(1KM).
3. Because this expressway path through petroleum pipe lines, we may need extra budget for protection.
4. Because the project is part of infrastructure improvements, it may need extra time for arrangements with other parties.

Stakeholders List

Name	Title
Ministry of Works	Project Sponsor
Ministry of planning	Owner

Assumptions

- Authorizations will not delay more than 7 days from request presentations.
- Payments will not be delayed.
- We may use FPIF, and T&M contracts.

Constraints

- Project has to terminate before 30th May 2017 date of Football World Cup 2017.
- Budget cannot exceed total contingencies.
- Formal written communication will be in Arab and English language.

Summary Milestones

Summary Milestones	Due Date
Project Kick Off	2nd April 2017
Seller selection	5 th April 2017
Foundation Completion	4 th May 2017
Expressway H.O	18 th May 2017

Summary Budget:

not exceed 100 million \$

Project Manager Authority Level

Staffing Decisions:

Full Authority

Budget Management and Variance:

may refer to sponsor approval

Technical Decisions:

Full Authority

Conflict Resolution:

Full Authority, whenever conflict affects any activity in the project, and within the project team.

Escalation Path for Authority Limitations:

Senior Management then Sponsor.

Approvals:

Haitham

Project Manager Signature
Haitham Wahid

Project Manager Name
21/03/17

Date

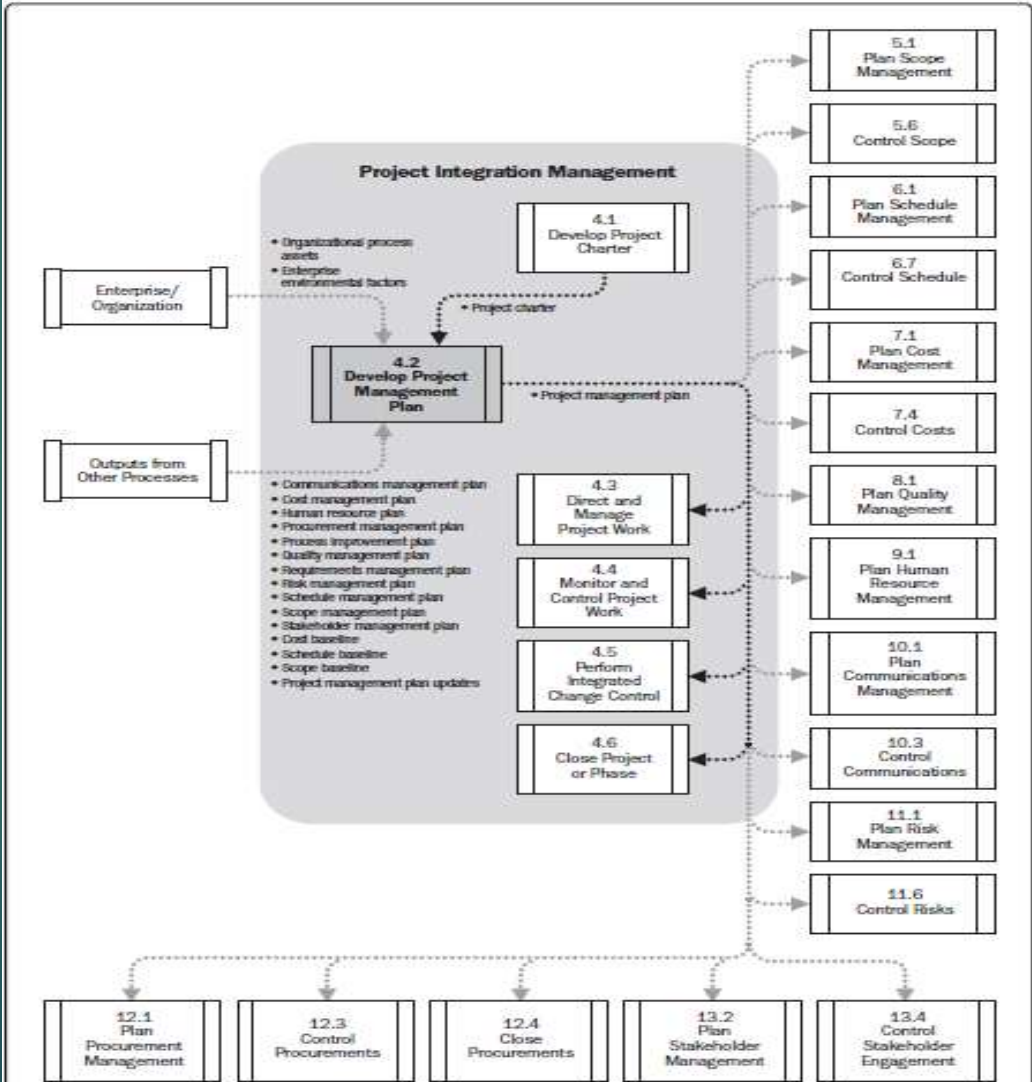
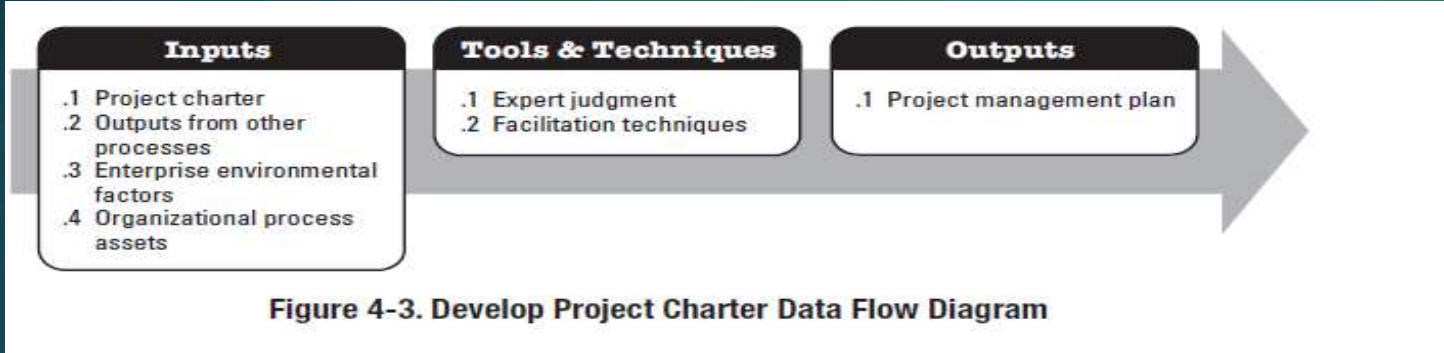
Sponsor or Originator Signature

Sponsor or Originator Name

Date

4.2 Develop Project Management Plan

- ▶ The process of defining, preparing, and coordinating all subsidiary plans and integrating them into a **comprehensive** project management plan.
- ▶ **The key benefit** of this process is a **central document** that defines the **basis** of all project work.
- ▶ This process results in a **project management plan** that is **progressively elaborated** by updates and controlled and approved through the **Perform Integrated Change Control**.

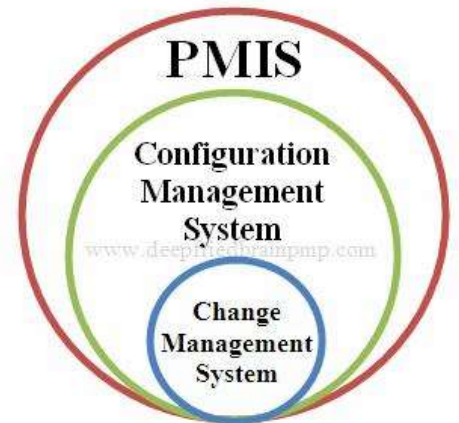


Output



► Project Management Plan

- The document that describes **how** the project will be executed, monitored, and controlled. It integrates and **consolidates** all of the subsidiary plans and baselines from the planning processes:
- **Baselines:** Scope, Cost and Schedule. **(3)**
- **Subsidiary Plans:** Scope, Requirements, Schedule, Cost, Quality, Process improvement, Human Resource, Communications, Risk, Procurement and Stakeholder Management Plan. **(11)**
- Lifecycle – PM approach – Work methodology
- **Change Management Plan:** how changes could be monitored and controlled, related to **baselines**. **(1)**
- **Configuration Management Plan:** how to make changes related to **Product** Configuration. **(1)**



Project Management Plan & Project Documents

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 <ul style="list-style-type: none"> • Project scope statement • WBS • WBS dictionary 	Change requests	Resource calendars
Quality management plan	Forecasts <ul style="list-style-type: none"> • 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

4.3 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.
- ▶ **The key benefit** of this process is that it provides **overall management** of the **project work**.

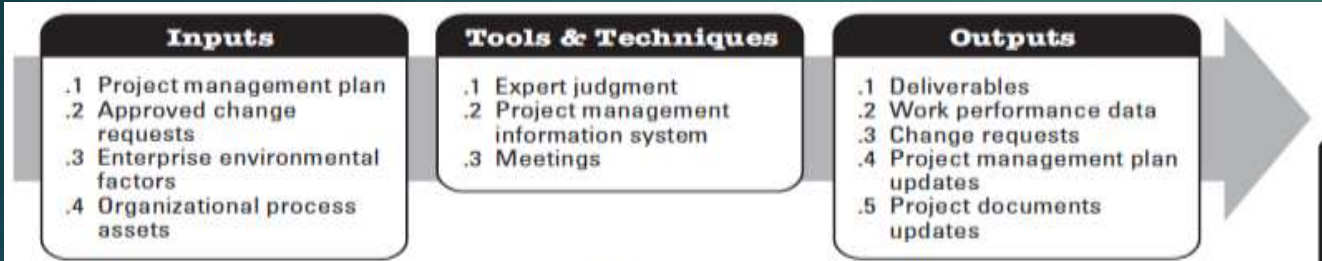
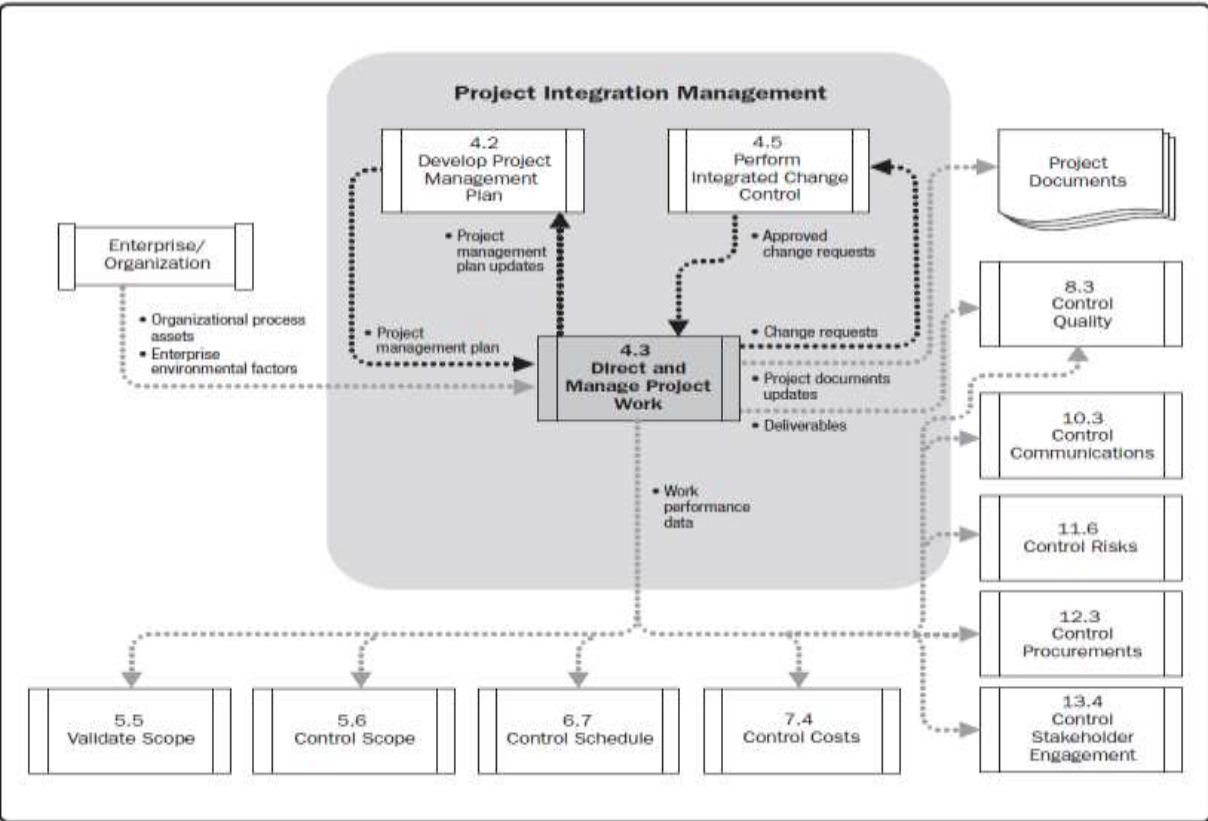


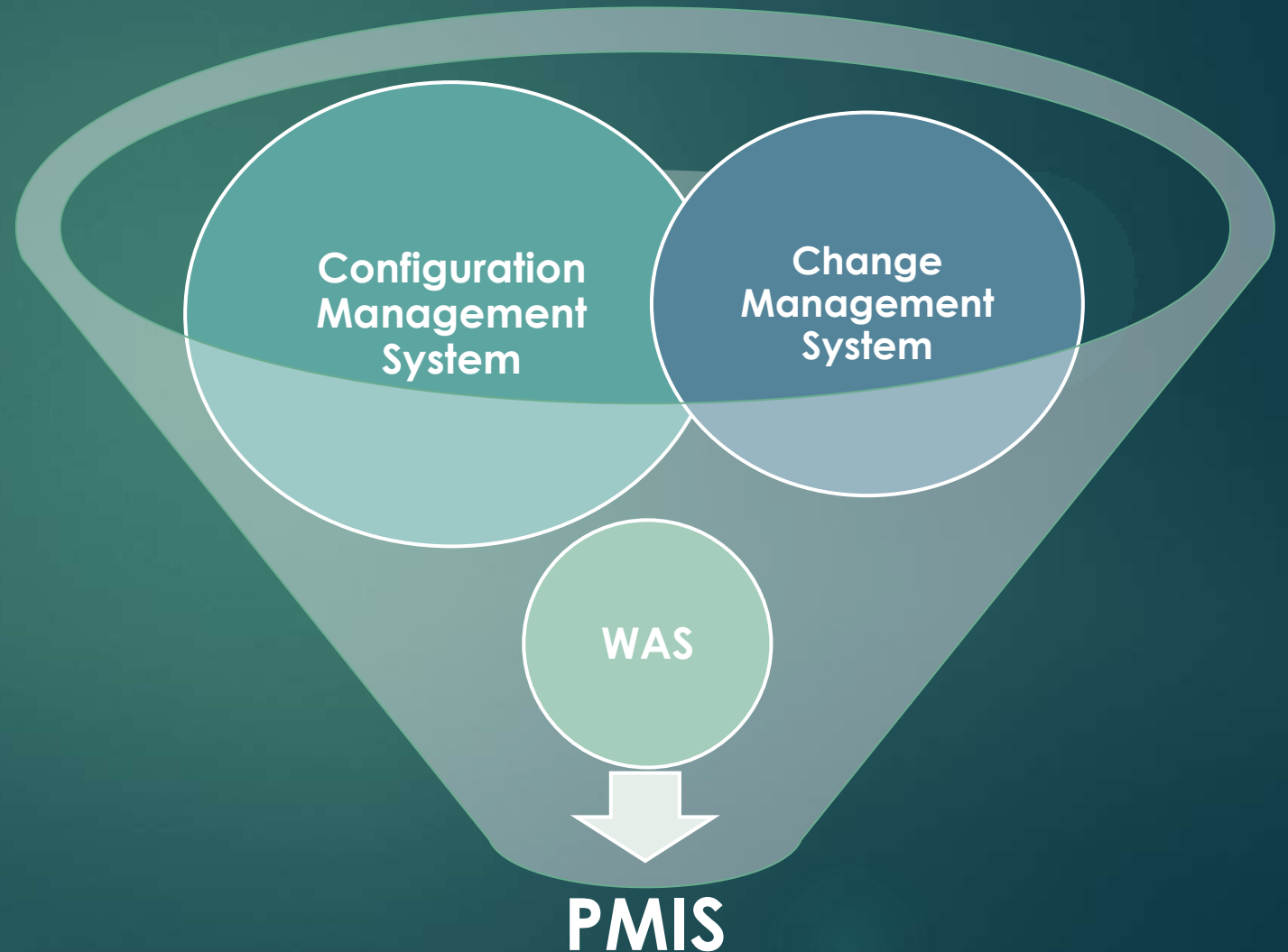
Figure 4-6. Direct and Manage Project Work: Inputs, Tools and Techniques, and Outputs



Tools & Techniques

► Project Management Information System (PMIS)

- ❑ It is considered as **EEF**.
- ❑ It is used to report on **KPI**.



output

- ▶ **Deliverables**
- ▶ **Work Performance Data**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**



4.4 Monitor and Control Project Work

- ▶ The process of **tracking, reviewing, and reporting** the progress to meet the **performance** objectives defined in the project management plan.
- ▶ **The key benefit** of this process is that it allows stakeholders to understand **the current state** of the project, the steps taken, and budget, schedule, and scope **forecasts**.

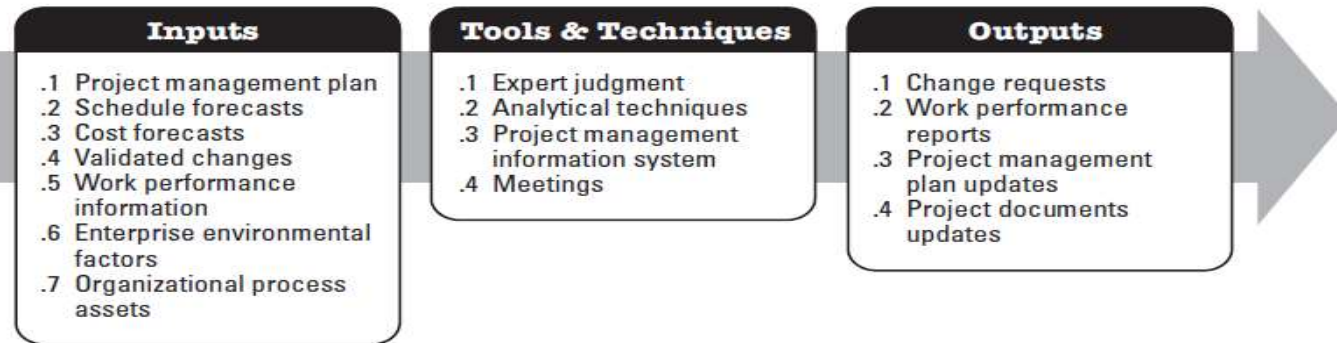
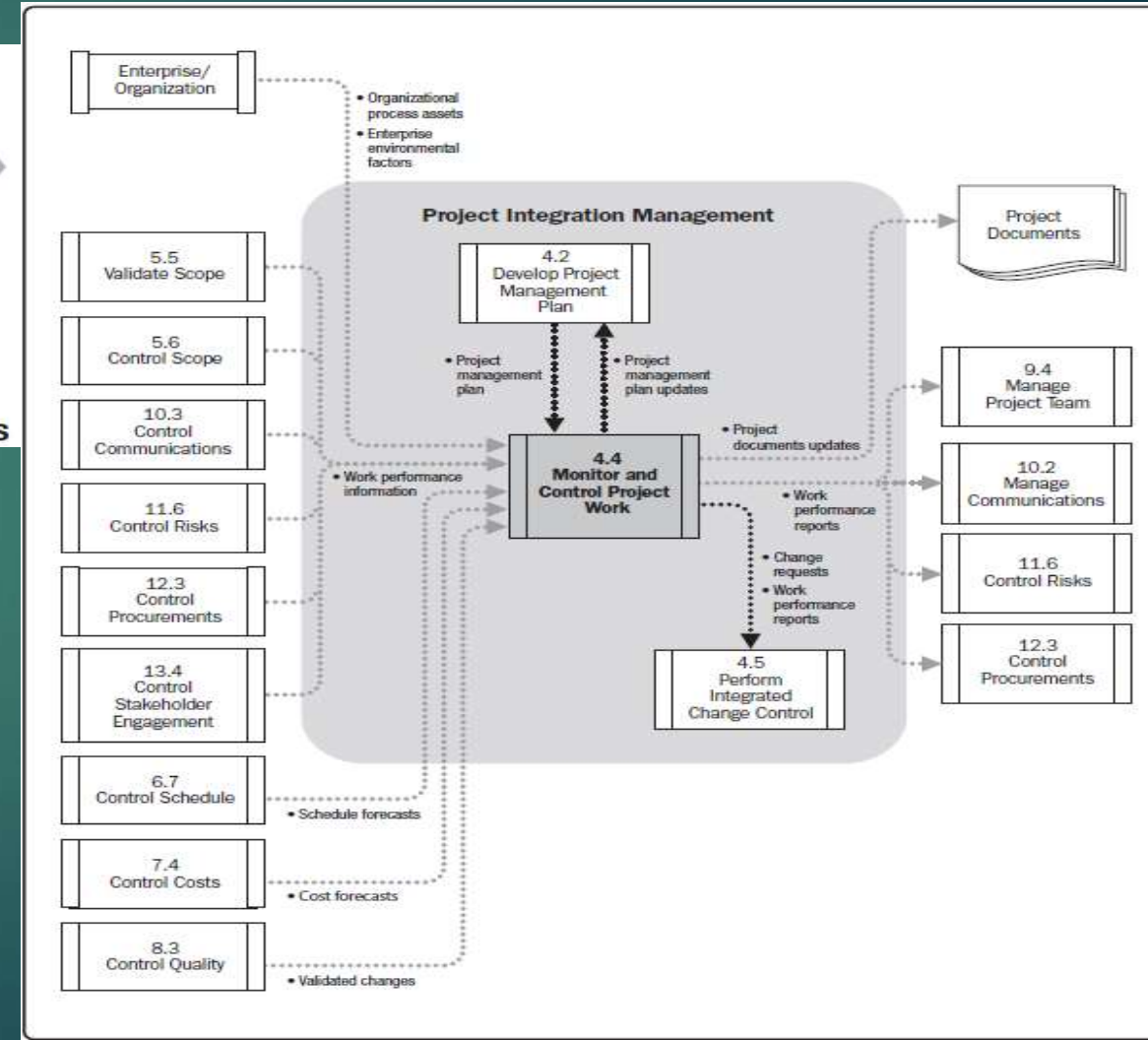
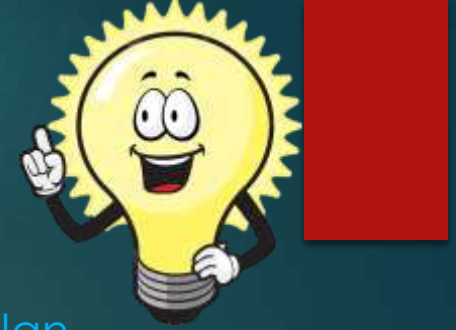


Figure 4-8. Monitor and Control Project Work: Inputs, Tools & Techniques, and Outputs



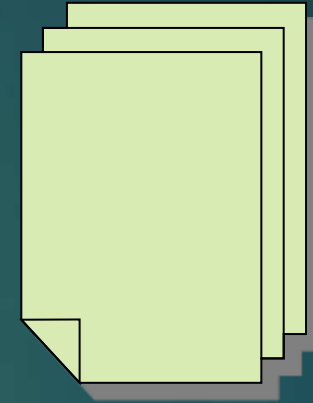
Monitor and Control Project Work process:



- ▶ Comparing **actual** project performance against the **project management plan**.
- ▶ Providing forecasts to update current **cost** and current **schedule** information.
- ▶ Identifying new **risks** and analyzing, tracking, and monitoring existing project risks and perform timely responses.
- ▶ Providing information to support **status reporting**, **progress measurement**.
- ▶ Determining whether any corrective or preventive **actions** are indicated.
- ▶ Monitoring implementation of **approved changes** as they occur.

Output

- ▶ **Work Performance Reports**
- ▶ **Change Requests**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**

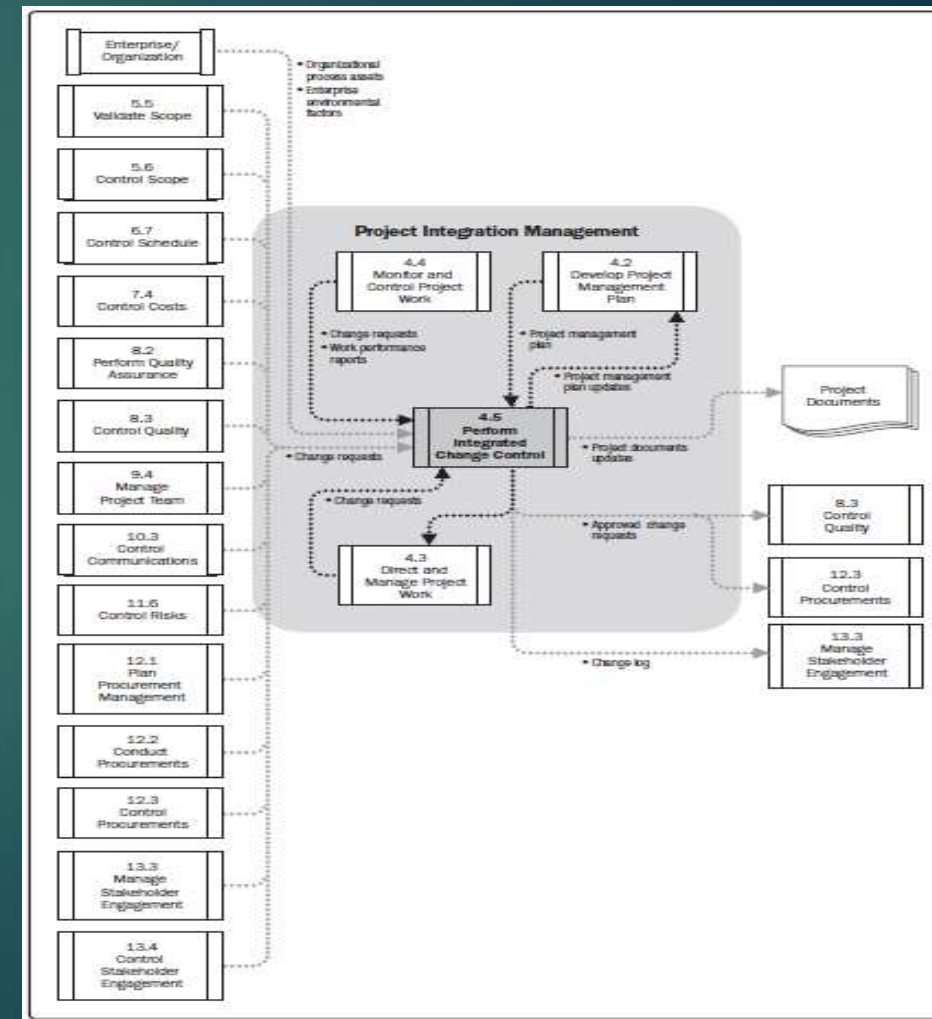


4.5 Perform Integrated Change Control

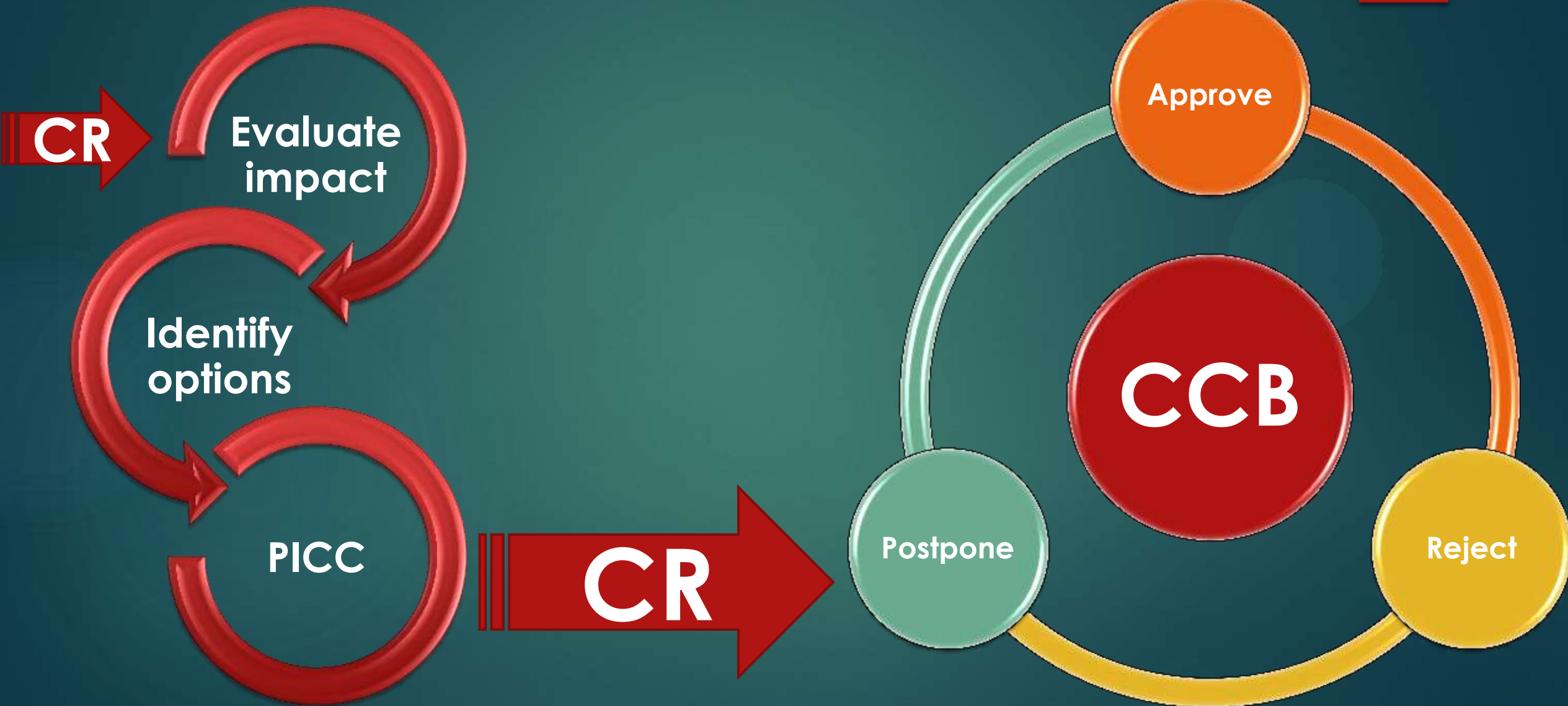
- ▶ The process of **reviewing all change requests**; **approving** changes and **managing** changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition.
- ▶ **The key benefit** of this process is that it allows for **documented changes** within the project to be considered in an integrated fashion while **reducing project risk**, which often arises from changes made **without consideration to the overall project objectives or plans**.



Figure 4-10. Perform Integrated Change Control: Inputs, Tools & Techniques, and Outputs



Objectives



Definitions



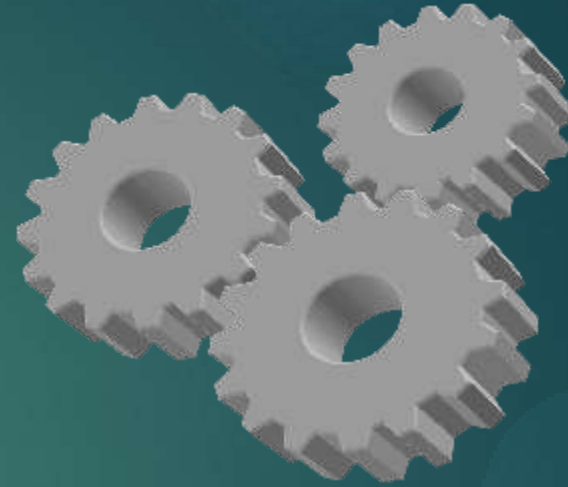
- ▶ Changes may be requested by **any stakeholder** involved with the project.
 - ▶ Changes should be recorded in **written form** and entered into the **change management / configuration management system**. (as part of PMIS)
 - ▶ According to Project roles and **responsibilities** and **authorizations**; the **PM** in conjunction with the **CCB** may manage change request (approve, reject or defer).
 - ▶ A **configuration management system** with **integrated change control** provides a standardized, effective, and efficient way to **centrally manage** approved changes and baselines within a project.
-
- ▶ **Change requests** are subject to the process specified in the **change control / configuration control systems**.
 - ▶ **Configuration control** is focused on the specification of both the **deliverables** and the **processes**.
 - ▶ **Change control** is focused on identifying, documenting and controlling changes to the **project** and the **product baselines**.

Definitions



- The configuration management activities included in the PICC process are as follows:
1. **Configuration identification.**
 2. **Configuration status accounting.** Information is **recorded** and **reported** as to when appropriate data about the configuration item should be provided.
 3. **Configuration verification and audit.** That ensure the composition of a project's **configuration items** is **correct** and that corresponding changes are **registered**, **assessed**, **approved**, **tracked**, and **correctly implemented**.

Tools & Techniques



- ▶ **Expert Judgment**

- ▶ **Meetings (CCB)**

- A change control board (CCB) is responsible for **meeting** and **reviewing** the change requests and **approving, rejecting, or deferring** of those changes.

- ▶ **Change Control Tools**

Output

- ▶ **Approved Change Requests**
- ▶ **Change Log**
- ▶ **Project Management Plan Updates**
- ▶ **Project Documents Updates**

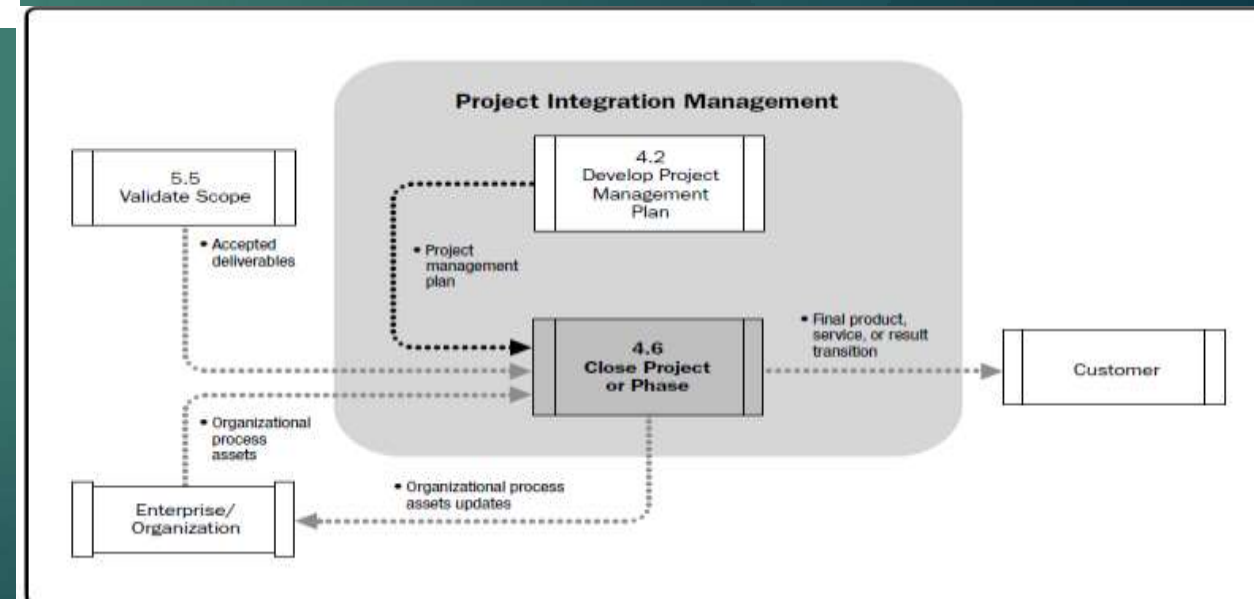


4.6 Close Project or Phase

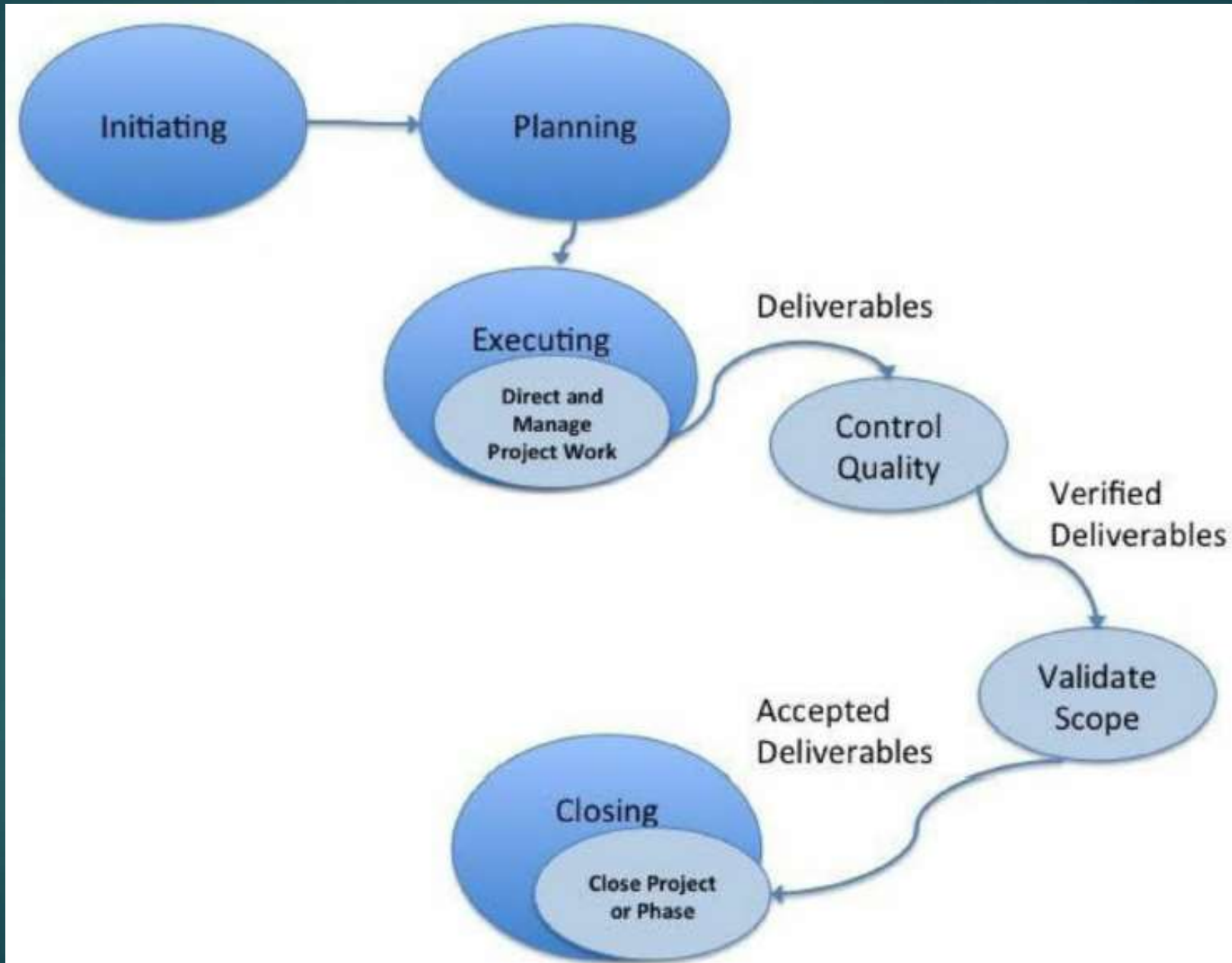
- ▶ The process of finalizing all activities across all of the Project Management Process Groups to formally complete the project or phase.
- ▶ **The key benefit** of this process is that it provides lessons learned, the formal ending of project work, and the release of organization resources to pursue new endeavors.



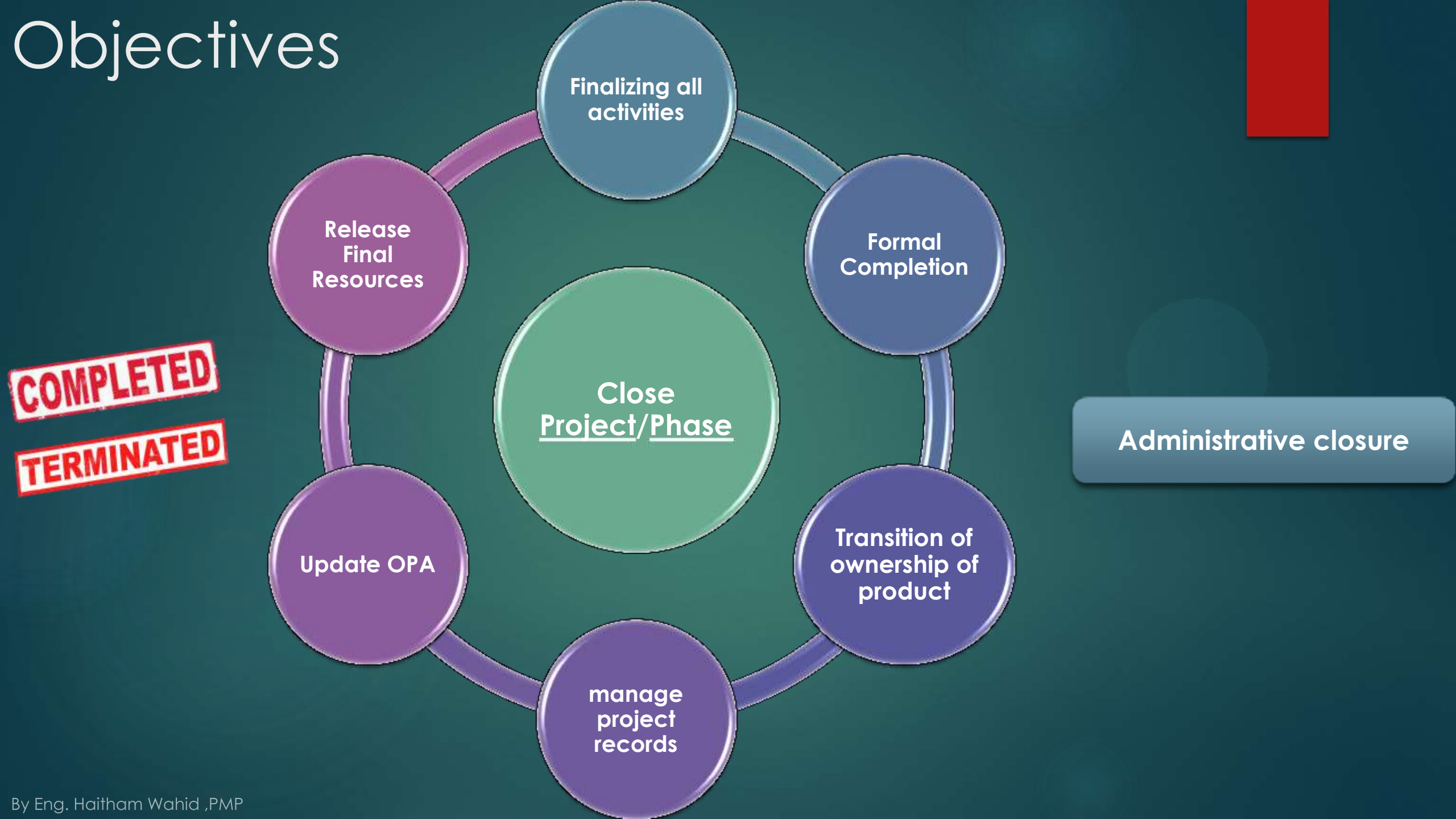
Figure 4-12. Close Project or Phase: Inputs, Tools & Techniques, and Outputs



Objective



Objectives



Output

- ▶ **Final Product, Service, or Result Transition**

- ▶ **Organizational Process Assets Updates**

- ❑ Project Files
- ❑ Project/phase closure documents (reviews)
- ❑ Historical information & lesson learned knowledge base





Process Group interaction

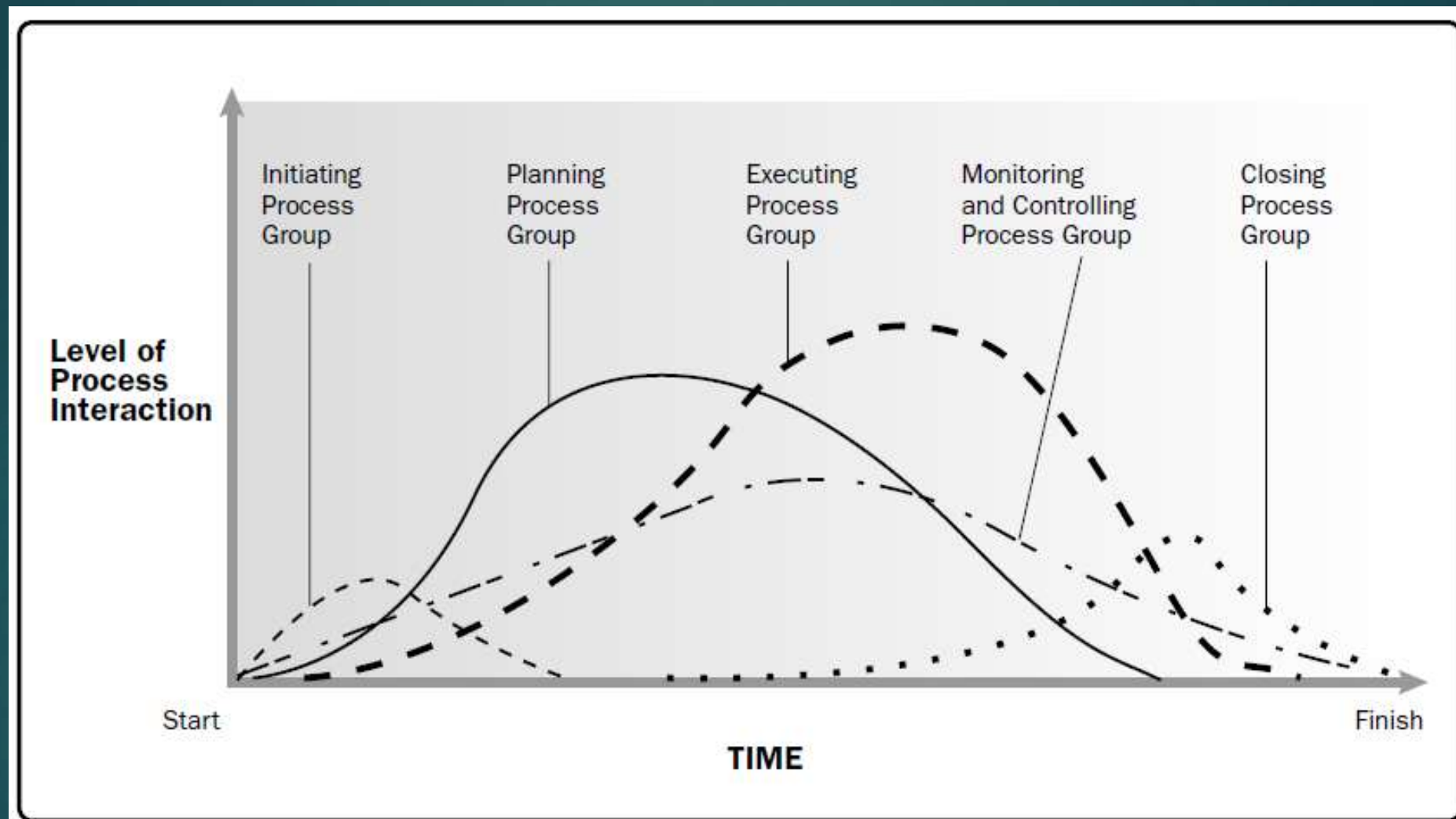


Figure 3-2. Process Groups Interact in a Phase or Project

1. Initiating



Domain I	Initiating – 13%
Task 1	Perform project assessment based upon available information, lessons learned from previous projects, and meetings with relevant stakeholders in order to support the evaluation of the feasibility of new products or services within the given assumptions and/or constraints.
Task 2	Identify key deliverables based on the business requirements in order to manage customer expectations and direct the achievement of project goals.
Task 3	Perform stakeholder analysis using appropriate tools and techniques in order to align expectations and gain support for the project.
Task 4	Identify high level risks, assumptions, and constraints based on the current environment, organizational factors, historical data, and expert judgment, in order to propose an implementation strategy.
Task 5	Participate in the development of the project charter by compiling and analyzing gathered information in order to ensure project stakeholders are in agreement on its elements.
Task 6	Obtain project charter approval from the sponsor, in order to formalize the authority assigned to the project manager and gain commitment and acceptance for the project.
Task 7	Conduct benefit analysis with relevant stakeholders to validate project alignment with organizational strategy and expected business value.
Task 8	Inform stakeholders of the approved project charter to ensure common understanding of the key deliverables, milestones, and their roles and responsibilities.

Work Performance Indicators (KPI)

- 1- It is WPD.
- 2- PMIS(EF) reports on it.
- 3- It may be included in project charter as a success criteria.

*At the end of “Initiating” we get approved charter.

2. Planning



Domain II	Planning – 24%
Task 1	Review and assess detailed project requirements, constraints, and assumptions with stakeholders based on the project charter, lessons learned, and by using requirement gathering techniques in order to establish detailed project deliverables.
Task 2	Develop a scope management plan, based on the approved project scope and using scope management techniques, in order to define, maintain, and manage the scope of the project.
Task 3	Develop the cost management plan based on the project scope, schedule, resources, approved project charter and other information, using estimating techniques, in order to manage project costs.
Task 4	Develop the project schedule based on the approved project deliverables and milestones, scope, and resource management plans in order to manage timely completion of the project.
Task 5	Develop the human resource management plan by defining the roles and responsibilities of the project team members in order to create a project organizational structure and provide guidance regarding how resources will be assigned and managed.
Task 6	Develop the communications management plan based on the project organizational structure and stakeholder requirements, in order to define and manage the flow of project information.
Task 7	Develop the procurement management plan based on the project scope, budget, and schedule, in order to ensure that the required project resources will be available.
Task 8	Develop the quality management plan and define the quality standards for the project and its products, based on the project scope, risks, and requirements, in order to prevent the occurrence of defects and control the cost of quality.
Task 9	Develop the change management plan by defining how changes will be addressed and controlled in order to track and manage change.
Task 10	Plan for risk management by developing a risk management plan; identifying, analyzing, and prioritizing project risk; creating the risk register; and defining risk response strategies in order to manage uncertainty and opportunity throughout the project life cycle.

Task 11	Present the project management plan to the relevant stakeholders according to applicable policies and procedures in order to obtain approval to proceed with project execution.
Task 12	Conduct kick-off meeting, communicating the start of the project, key milestones, and other relevant information in order to inform and engage stakeholders and gain commitment.
Task 13	Develop the stakeholder management plan by analyzing needs, interests, and potential impact in order to effectively manage stakeholders' expectations and engage them in project decisions.

Kick-off Meeting

- 1- Who lead it?
- 2- When is it held?
- 3- What is it's Purpose?



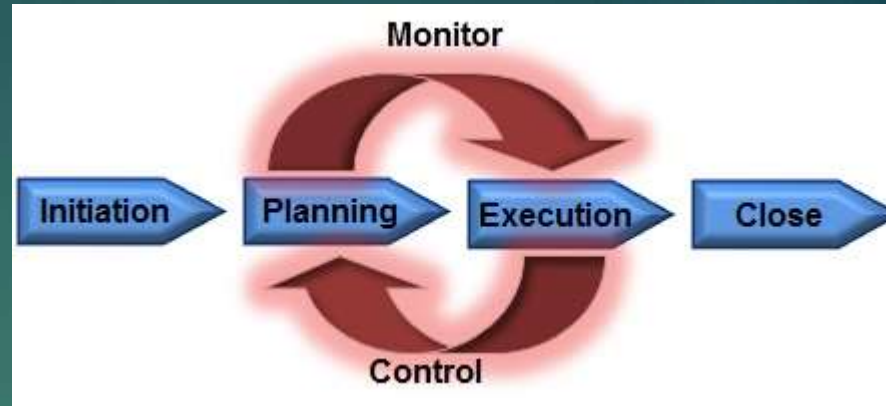
*At the end of “Planning” we get approved Project Management plan.

3. Executing



Domain III Executing – 31%	
Task 1	Acquire and manage project resources by following the human resource and procurement management plans in order to meet project requirements.
Task 2	Manage task execution based on the project management plan by leading and developing the project team in order to achieve project deliverables.
Task 3	Implement the quality management plan using the appropriate tools and techniques in order to ensure that work is performed in accordance with required quality standards.
Task 4	Implement approved changes and corrective actions by following the change management plan in order to meet project requirements.
Task 5	Implement approved actions by following the risk management plan in order to minimize the impact of the risks and take advantage of opportunities on the project.
Task 6	Manage the flow of information by following the communications plan in order to keep stakeholders engaged and informed.
Task 7	Maintain stakeholder relationships by following the stakeholder management plan in order to receive continued support and manage expectations.

4. Monitoring and Controlling



Domain IV	Monitoring and Controlling – 25%
Task 1	Measure project performance using appropriate tools and techniques in order to identify and quantify any variances and corrective actions.
Task 2	Manage changes to the project by following the change management plan in order to ensure that project goals remain aligned with business needs.
Task 3	Verify that project deliverables conform to the quality standards established in the quality management plan by using appropriate tools and techniques to meet project requirements and business needs.
Task 4	Monitor and assess risk by determining whether exposure has changed and evaluating the effectiveness of response strategies in order to manage the impact of risks and opportunities on the project.
Task 5	Review the issue log, update if necessary, and determine corrective actions by using appropriate tools and techniques in order to minimize the impact on the project.
Task 6	Capture, analyze, and manage lessons learned, using lessons learned management techniques in order to enable continuous improvement.
Task 7	Monitor procurement activities according to the procurement plan in order to verify compliance with project objectives.

5. Closing



Domain V		Closing – 7%
Task 1	Obtain final acceptance of the project deliverables from relevant stakeholders in order to confirm that project scope and deliverables were achieved.	
Task 2	Transfer the ownership of deliverables to the assigned stakeholders in accordance with the project plan in order to facilitate project closure.	
Task 3	Obtain financial, legal, and administrative closure using generally accepted practices and policies in order to communicate formal project closure and ensure transfer of liability.	
Task 4	Prepare and share the final project report according to the communications management plan in order to document and convey project performance and assist in project evaluation.	
Task 5	Collate lessons learned that were documented throughout the project and conduct a comprehensive project review in order to update the organization's knowledge base.	
Task 6	Archive project documents and materials using generally accepted practices in order to comply with statutory requirements and for potential use in future projects and audits.	
Task 7	Obtain feedback from relevant stakeholders using appropriate tools and techniques and based on the stakeholder management plan in order to evaluate their satisfaction.	

Code of Ethics & Professional Conduct



Responsibility

- Make decisions based on the best interests of the company (society ,safety ,environment).
- Accept only assignments you are qualified for, commit to it.
- We accept accountability for any issues resulting from our errors.
- Protect confidential information.
- uphold organization policies & Report unethical behavior and violations.

Respect

- Maintain an attitude of mutual cooperation.
- Respect cultural differences.
- Deal with conflict directly.
- Negotiate in good faith.
- Do not use your position to influence others

Fairness

- Transparency, impartiality in decision making, equality(opportunities/info.)
- Act impartially without bribery/favoritism.
- Look for and disclose conflicts of interest and avoid.
- Do not discriminate (gender, race, age, religion, disability, nationality)

Honesty

- Seek to understand the truth & provide effective communication.
- Avoid dishonest behavior with the intention of personal gain or at the expense of another.

Formulas



- ▶ Pert (Mean - Weighted average - more accurate - consider uncertainty)
- ▶ Triangular (average - less accurate – doesn't consider uncertainty)
- ▶ EVM: EV,PV,AC,SPI,CPI,ETC,VAC,TCPI
- ▶ $EMV = P * I$
- ▶ Lease or Buy
- ▶ Number of Communication channels

ASSUMPTIONS to make before the exam



- ▶ You are the **project manager** for the project. You are **not** a program manager. You are **not** a portfolio manager.
- ▶ The project manager manages **only** one project at a time.
- ▶ The project will span **several years**. (Big Project)
- ▶ The team has hundreds if not thousands of **members**, and will **cost millions of US dollars**. (Big Project)
- ▶ The project manager has **access to historical documents** from previous projects. (lesson learned - OPA)
- ▶ The organization has **documented processes** that the project management team will use to guide the current project.

What To Expect When Taking the Exam:

- ▶ *Time.*
- ▶ *Number of questions.*
- ▶ *Organization of questions.*
- ▶ *Question format.*
- ▶ *Strategy for selecting the best answer.*
- ▶ *Score.*



Domains	Percentage of Items/Domain
1. Initiating	13%
2. Planning	24%
3. Executing	31%
4. Monitoring and Controlling	25%
5. Closing	7%
Total Number of Scored Questions	175
Total Number of Unscored (Pretest) Questions	25
Total Number of Questions	200

Exam Tips



- ▶ Don't try to Memorize PMBOK ,but **understand**.
- ▶ Understand each process/TT (when/where to use).
- ▶ **Practice..Practice..Practice** with time limits one question/minute (like real exam) till you fill gaps in your knowledge.
- ▶ Wear **only PMI hat** that you are **PM** for large project ,as you are **responsible** for project success ,you should (**analyze ,investigate ,find root causes ,develop options ,and evaluate**) before **making any decision**.
- ▶ Schedule your Exam, when your score is above 75%.
- ▶ **Sleep** enough time the day before the exam.
- ▶ Read **full question** and all four answers ,before choosing one answer.
- ▶ Use **eliminate Method** to reach the right answer.
- ▶ No question should take more than **one minute** ,if so "Mark" it and press "NEXT".
- ▶ **Keep calm "you are going to pass PMP exam"**.



Tell me what you think



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