A Practical Approach to

Project Management Professionals

PMP ®

Based on PMI PMBOK® 6th & 7th Edition.

By : Talaat Al-Awadhi International Trainer.

Malaysia july 2024

Your business card

- NAME
- ACADEMIC MAJOR
- JOB title

1
2
3

TRAINE IN LINES

- I have been working for an American Oil Company named JHOC on a rotational basis for the past 21 years.
- Founder and General Director of the Creativity House Center for Administrative and Leadership Empowerment.
- An international trainer who has offered his courses in more than 10 countries.
- Previous lecturer in MAHSA University
- Certified by the Project Management Institute (PMI) and a member of the Institute’s branch in Malaysia .
- Certified trainer from the American Management Institute (AMI).

AMI
AMERICAN MANAGEMENT INSTITUTE

U.S Certified Instructor

This is to hereby attest that

TALAAT ALAWADHI

Has been awarded the U.S Certified Instructor in

Management and Leadership

The holder of this certificate has complied with the professional standards established for recognition as a professional U.S Certified Instructor by the American Management Institute and is hereby granted this certificate of U.S Certified Instructor

Date of Certification: October 15, 2019 To October 15, 2024

With all honors, rights and privileges appertaining under the rules and regulations of the American Management Institute

Date of Issue: October 15, 2019

MAHSA ACADEMY

1058504-D

Certificate of appreciation

Is awarded to

DR. TALAAT AL-AWADHI

For his outstanding contribution in conducting the training course of

Oil & Gas Engineering

From **November 2017** to **July 2018**

MAHSA ACADEMY PROFESSIONAL DEVELOPMENT

MOHAN DASS A/L SOUNDRARAJ

MAHSA ACADEMY MANAGER

Project Management Institute.

THIS IS TO CERTIFY THAT

Talaat Hassan Alhaj Ali Alawadhi

HAS BEEN FORMALLY EVALUATED FOR DEMONSTRATED EXPERIENCE, KNOWLEDGE AND PERFORMANCE IN ACHIEVING AN ORGANIZATIONAL OBJECTIVE THROUGH DEFINING AND OVERSEEING PROJECTS AND RESOURCES AND IS HEREBY BESTOWED THE GLOBAL CREDENTIAL

Project Management Professional (PMP)®

IN TESTIMONY WHEREOF, WE HAVE SUBSCRIBED OUR SIGNATURES UNDER THE SEAL OF THE INSTITUTE

Jennifer Tharp | Chair, Board of Directors

Pierre Le Manh | President & CEO

PMP® Number: 3553112

PMP® Original Grant Date: 27 June 2023

PMP® Expiration Date: 27 June 2026

Digital Product System

Upon recommendation of Tony Robbins & Dean Graziosi,
the DPS Board of Trustees hereby grant

TALAAT HASSAN ALHAJ ALI ALAWADHI

a certificate of

Digital Product System Graduation

Cum Laude

We would like to celebrate you, your sacrifices, your time and your effort into officially graduating the Digital Product System and getting this official diploma certificate as a symbol of your hard work and exciting future. We hope this serves as a daily reminder of what you are capable of!

Tony Robbins

Dean Graziosi

talaat_ali@yahoo.com

talaat alawadhi

talaat.alawadhi

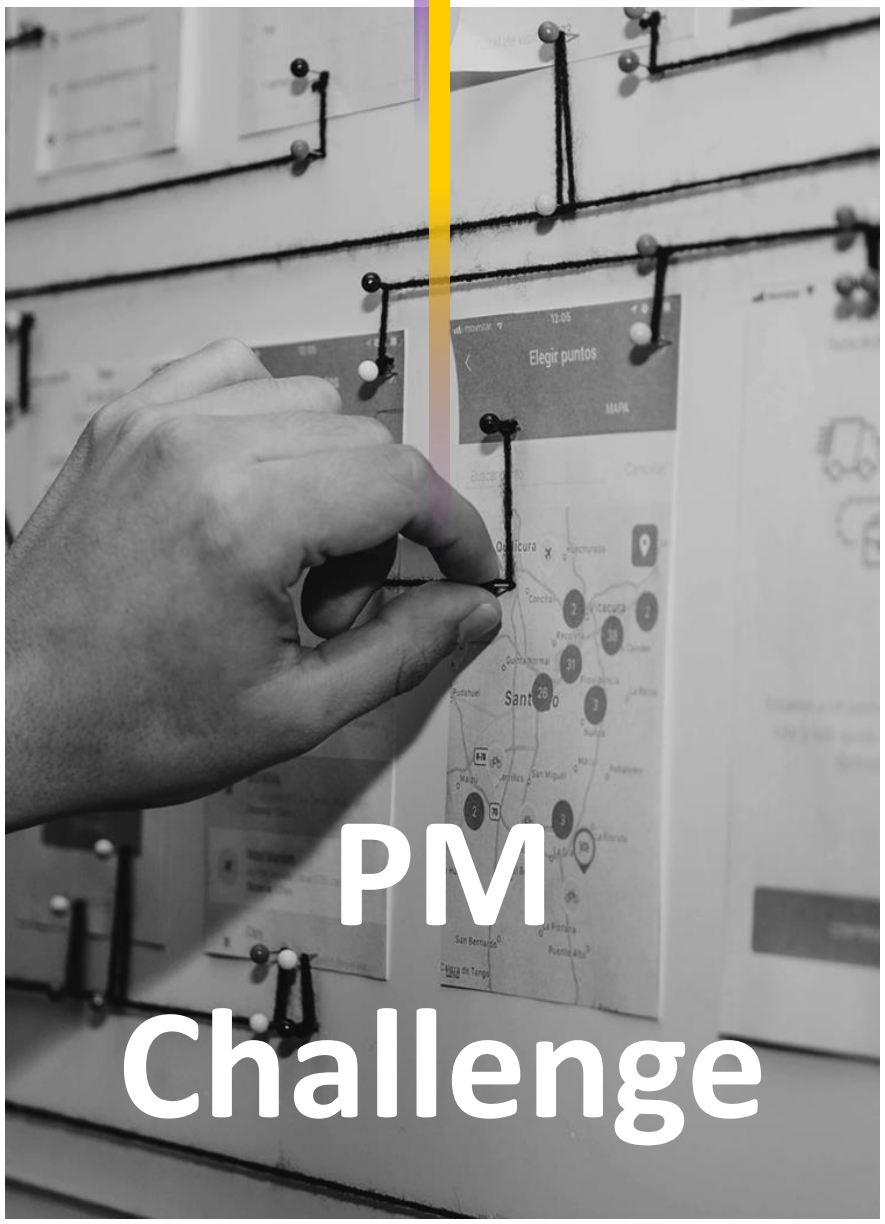
Talaat alawadhi

Chaos report
1995

ONLY16.2%
SUCCEED
Completed on time and on budget

31%
CRITICAL FAILURE
Not completed

Over Half
of all projects
will cost more than 189% of original estimates



Report
2012

%34
SUCCEED
Completed on time and on budget

15 %
CRITICAL FAILURE
Not completed

The larger the project is, the greater the risk of failure

Why do projects fail?

User Wanted

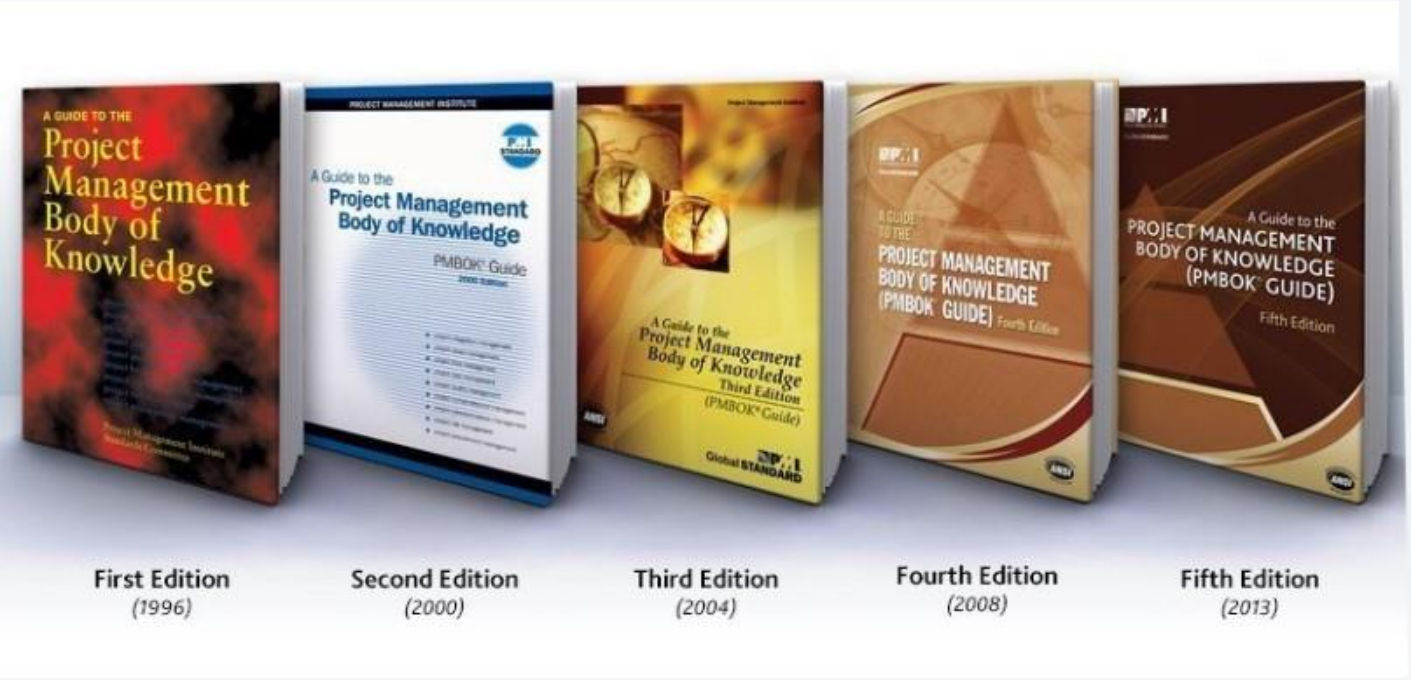
Budget Allowed for

Timescale Allowed for

Technician Designed

Final

HISTORY OF PMBOK



First Edition *(1996)*

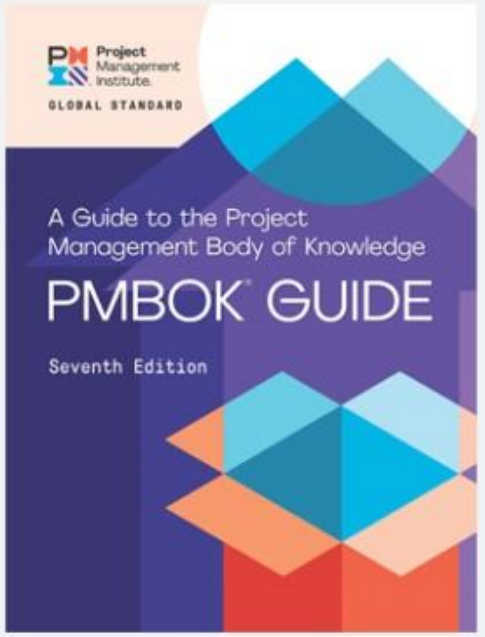
Second Edition *(2000)*

Third Edition *(2004)*

Fourth Edition *(2008)*

Fifth Edition *(2013)*

Sixth Edition + Agile Practice Guide
(2017)



Seventh Edition (2021)

INTRODUCTION TO

PROJECT MANAGEMENT

Introduction to Project Management

- What is a Project.
- What is Project Management.
- What is a Difference Between Project & Operation.
- The Project Constraints.
- What is a Relationships Between Portfolio, Program, and Project Management.
- What is the Project Management Office (PMO).
- The Characteristics of the Project Life Cycle.
- Organizational Process Assets (OPA).
- Enterprise Environmental Factors (EEF).

Introduction to Project Management

What is a Project.

A project is **a temporary** endeavor undertaken to create a **unique** product, service, or result.

Temporary: indicates that a project has a definite beginning and end.

Unique: because the characteristics of the project will not be repeated.

What is Project Management?

Application of knowledge, skills, tools, and techniques to project activities **to Meet the Project Requirements.**

Introduction to Project Management

Operations or Project?

- Operational work is on-going while project work has a beginning and end.

- After a project is completely finished we start operation

Introduction to Project Management

What is PMP

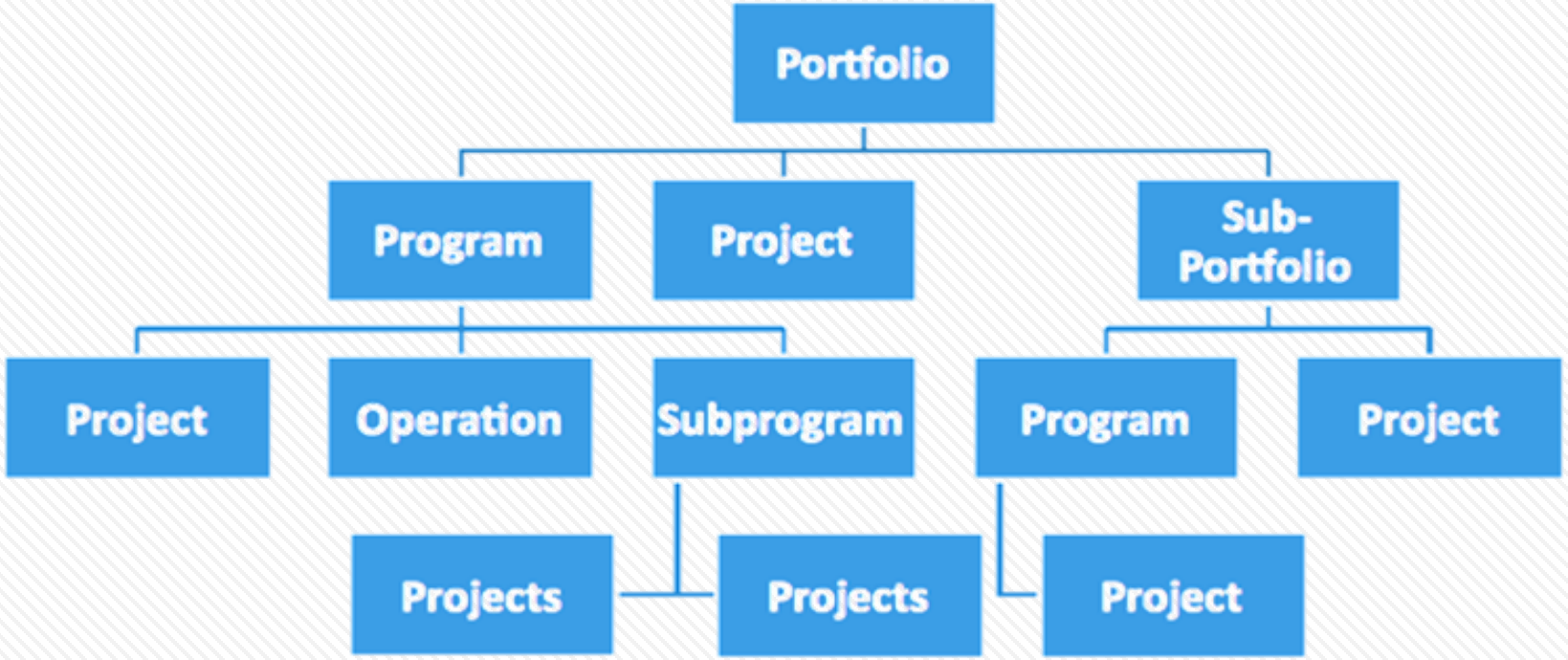
- PMP stands for **P**roject **M**anagement **P**rofessional
- A worldwide respected accreditation in project management granted by the **P**roject **M**anagement **I**nstitute PMI (www.pmi.org)
- PMI researches world best practices in project management and publishes them in a standard called Project Management Book (PMBOK)
- Latest PMBOK version considered for the Exam is the 6th Edition & 7th Edition
- More than 1.4 M certified professionals in the globe 6% from All project Managers

Introduction to Project Management

Introduction to Project Management

Introduction to Project Management

The Relationships Between Portfolio, Program, and Project Management (1.4)



Introduction to Project Management

The Relationships Between Portfolio, Program, and Project Management (2.4)

A Project is a temporary initiative to create a unique result, product & services.

Introduction to Project Management

The Relationships Between Portfolio, Program, and Project Management (3.4)

A Program is a group of related projects that all contribute to the same business objective or benefit. The program as a whole has a clear, defined goal, and each project within the program assists in meeting those goals.

Introduction to Project Management

The Relationships Between Portfolio, Program, and Project Management (4.4)

A Portfolio is a group of programs, individual projects and related operational work to achieve a specific strategic business goal.

Project Management Office (PMO)

- A PMO is a centralized unit within an organization to organize and control project management
- The main three types of PMOs are:

Supportive	Provides documents, policies and methodology
Controlling	Provides what is provided by a supportive PMO plus a governance over implementing the methodology.
Directive	Provides what a supportive and controlling PMOs provide plus a directing role over projects.

Organizational Structure

1- Functional Organizations

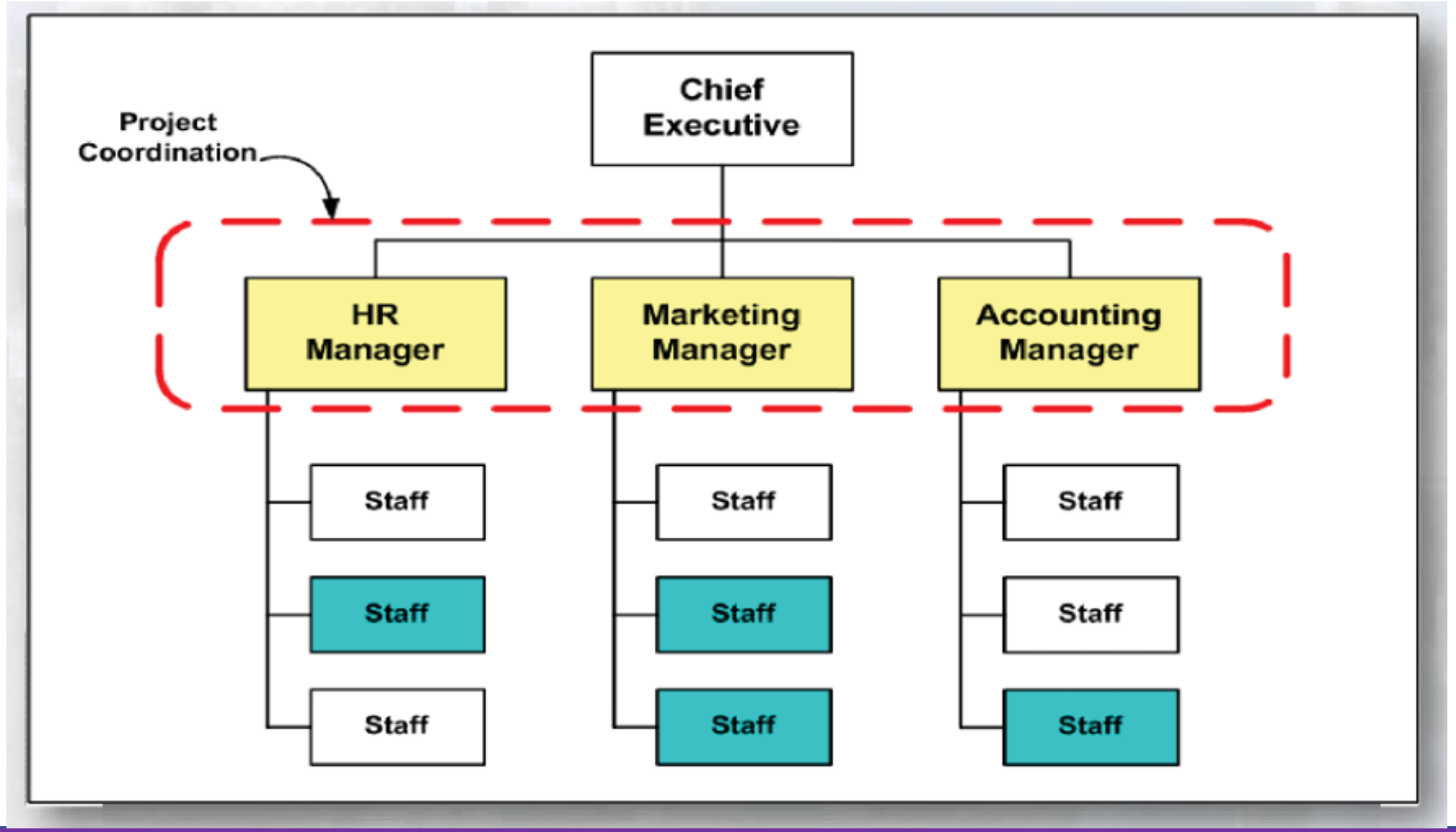
- Projects are usually within the department
- Communication through department head

2-Projectized Organization :

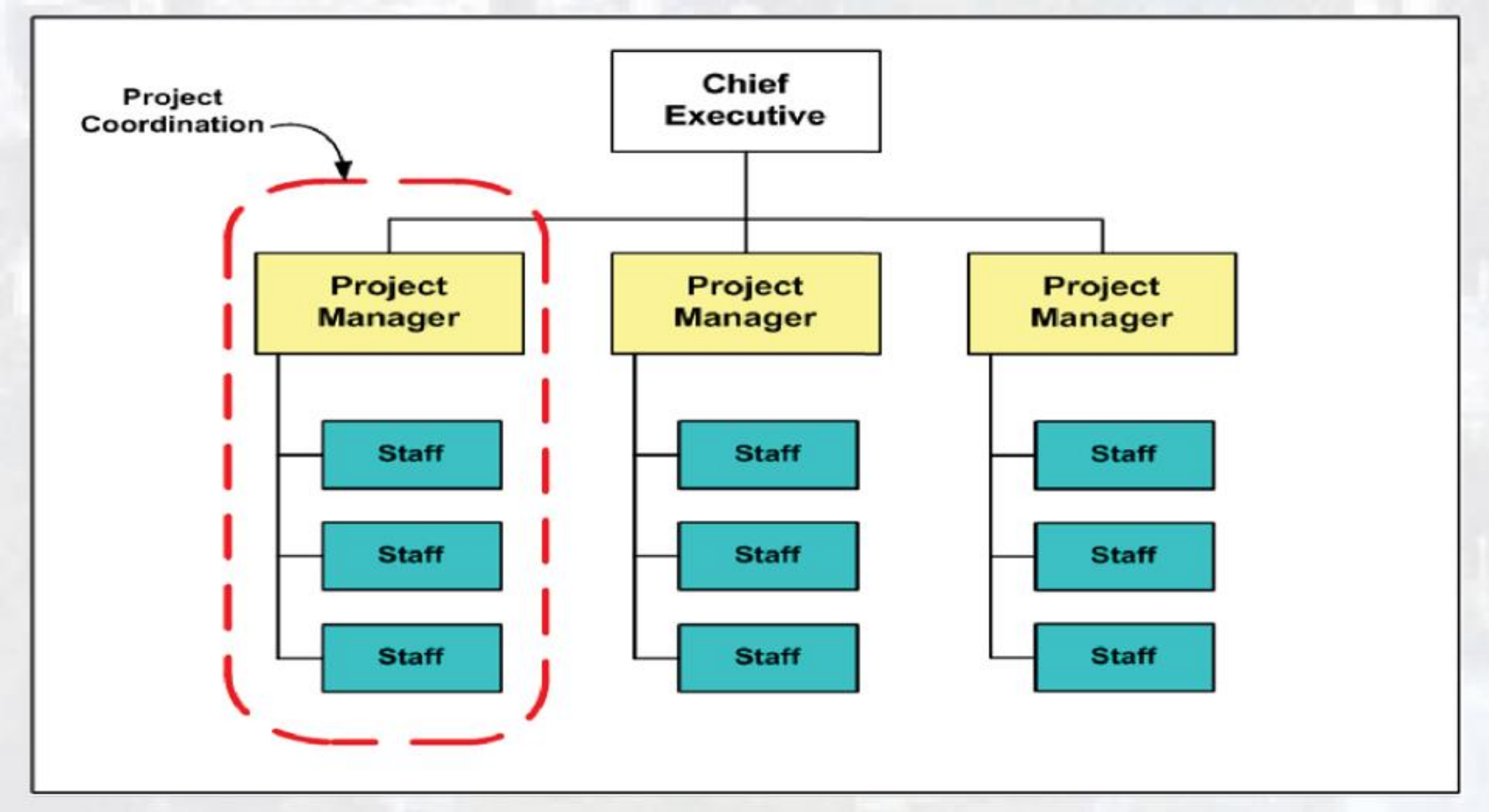
- The entire company is organized by projects
- Resources have no home after project completion

3- Matrix Organizations :

1- Functional organization



2- Projectized organization

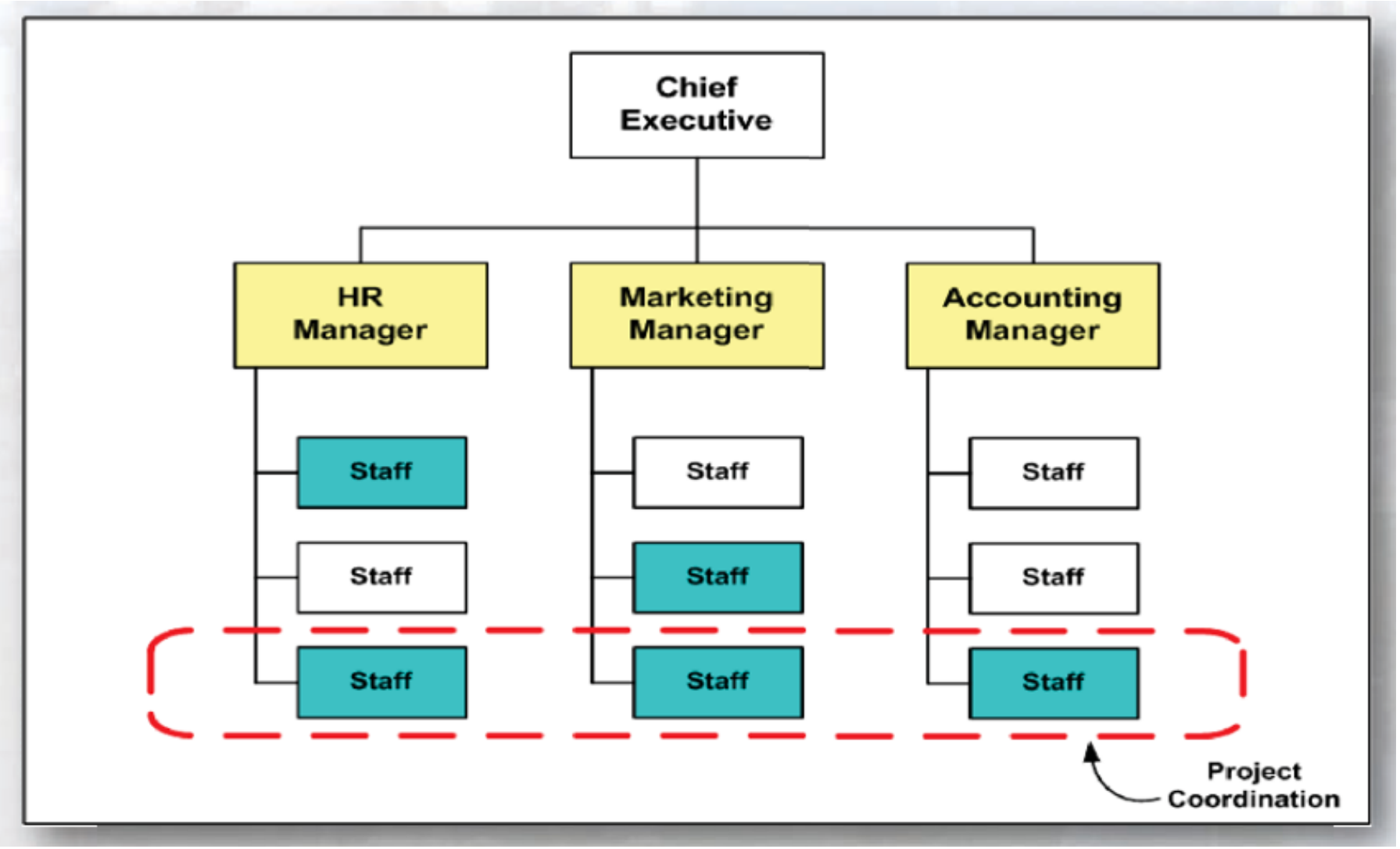


Matrix-based organizational structure

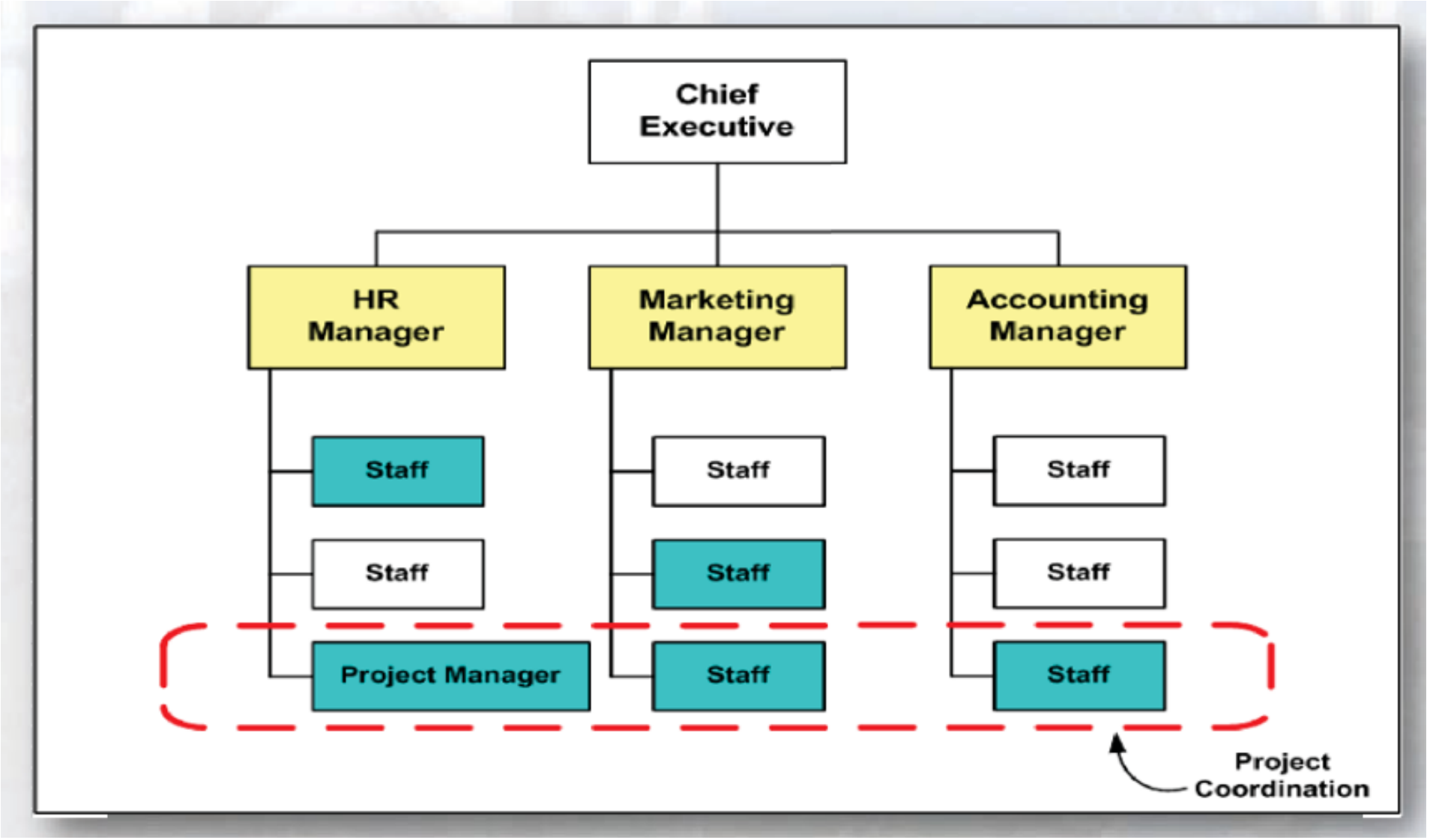
- ✓ Team members write reports to tow managers
- ✓ Project team members perform project work in addition to regular administrative work
- ✓ In a strong matrix powers are given to the project manager
- ✓ In a weak matrix, powers are granted to the functional manager
- ✓ In a balanced matrix, they both share powers

There are 3 types of Matrixes : Weak matrix Balanced matrix The Strong matrix

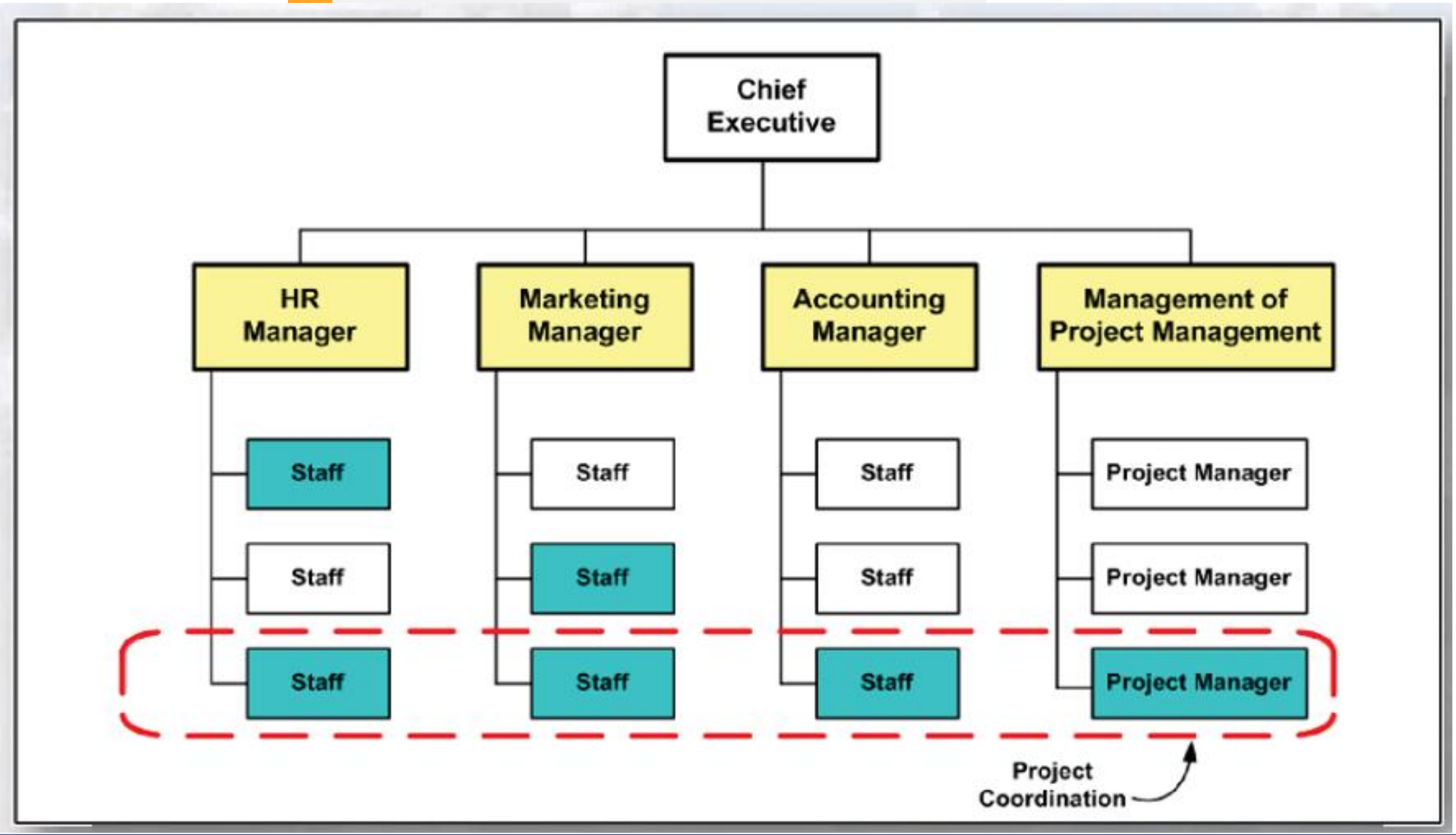
Weak Matrix Organization



Balanced Matrix Organization



Strong Matrix Organization



Project Leader titles :

Project Leader Titles:

* **Project Manager,**
* **Project Coordinator,**
* **Project Expeditor**

- **Project Manager:** relatively makes more decisions.
- **Project Coordinator**: has **some** power of making decisions
- **Project Expeditor**: Can not personally force or make decisions

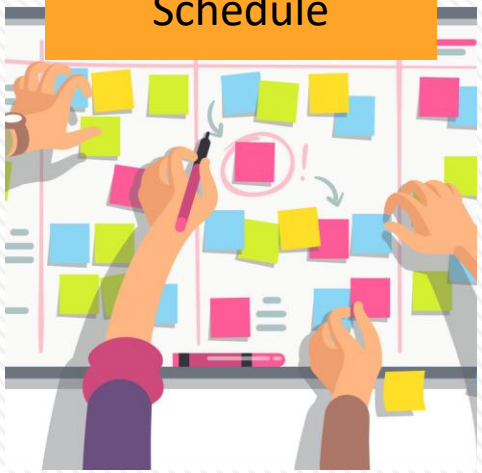
Project Management Process Groups

The 10 Knowledge Areas

Integration

Scope

Schedule



Cost

Quality

Resources

Communication

Risk

Procurements

Stakeholders

Project Constraint

Project Constraints

- **SCHEDULE , Budget** and **Scope** are called **Triple- Constraint**

- **Quality, Risk and Resources** were also added to expand the definition.

Customer Satisfaction

Project STAKEHOLDERS

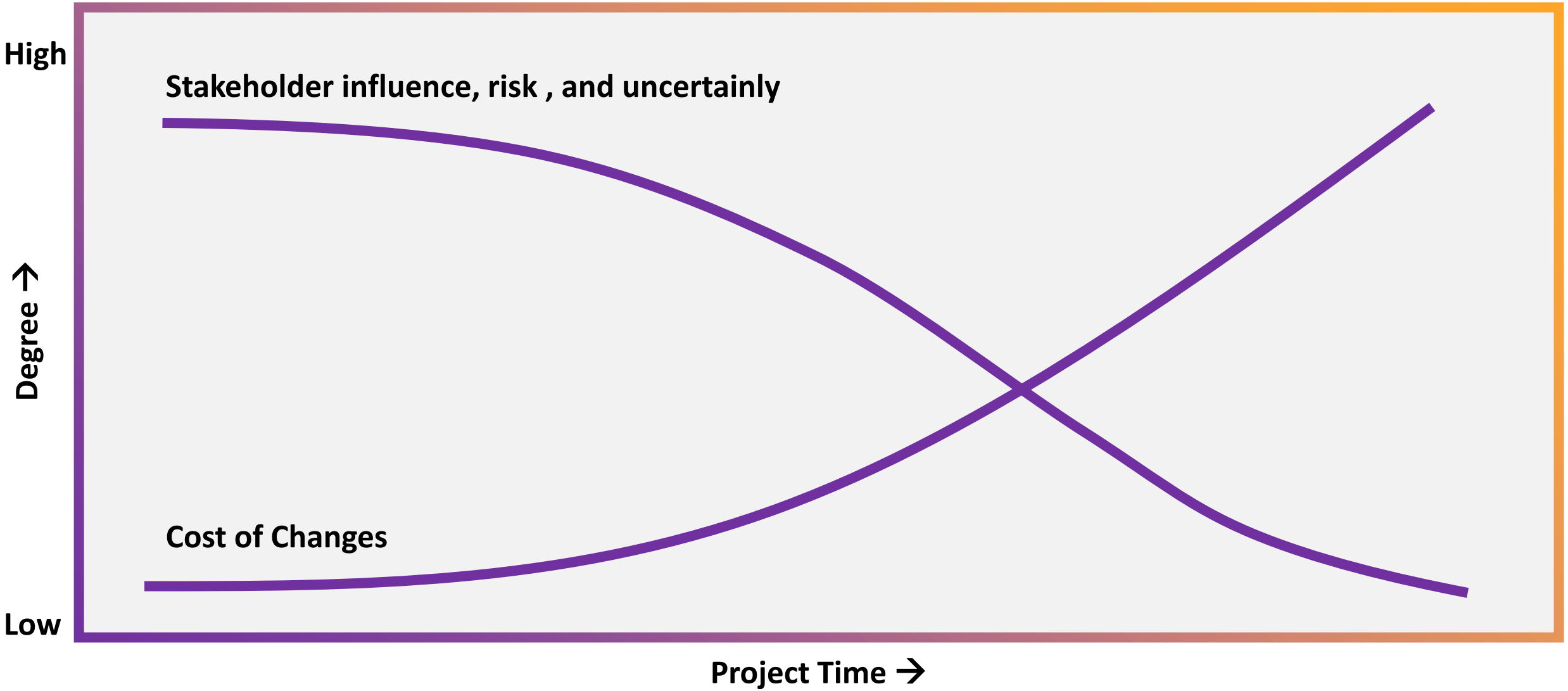
A stakeholder is someone whose interests may be ***positively*** or ***negatively*** **impacted** by the project

Key stakeholders include:

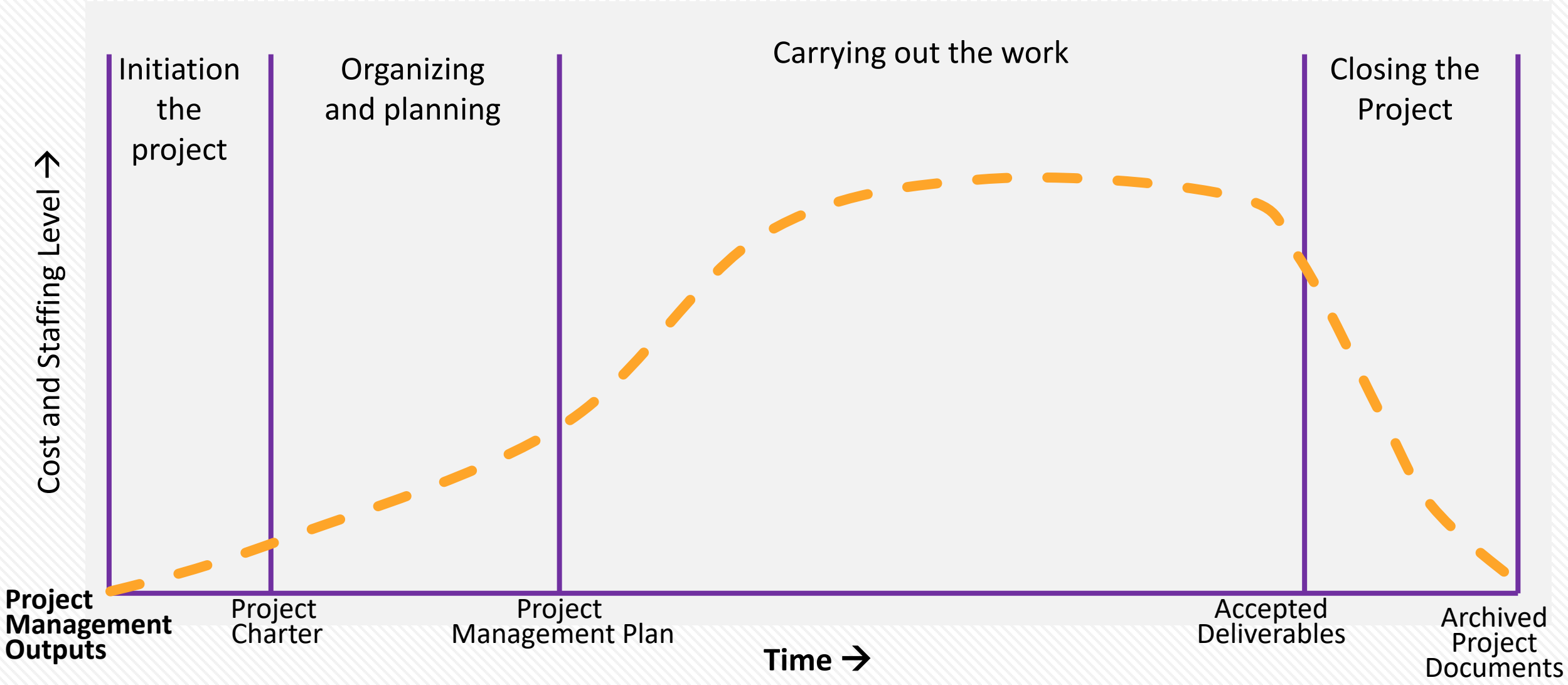
Project Manager	Customer	Performing organization	Project team
Sponsor	PMO	Suppliers and	Vendors

Most of the time there is a conflict and different objectives between the stakeholders

The Project Life Cycle Overview



The Project Life Cycle Overview | General Life Cycle Structurer



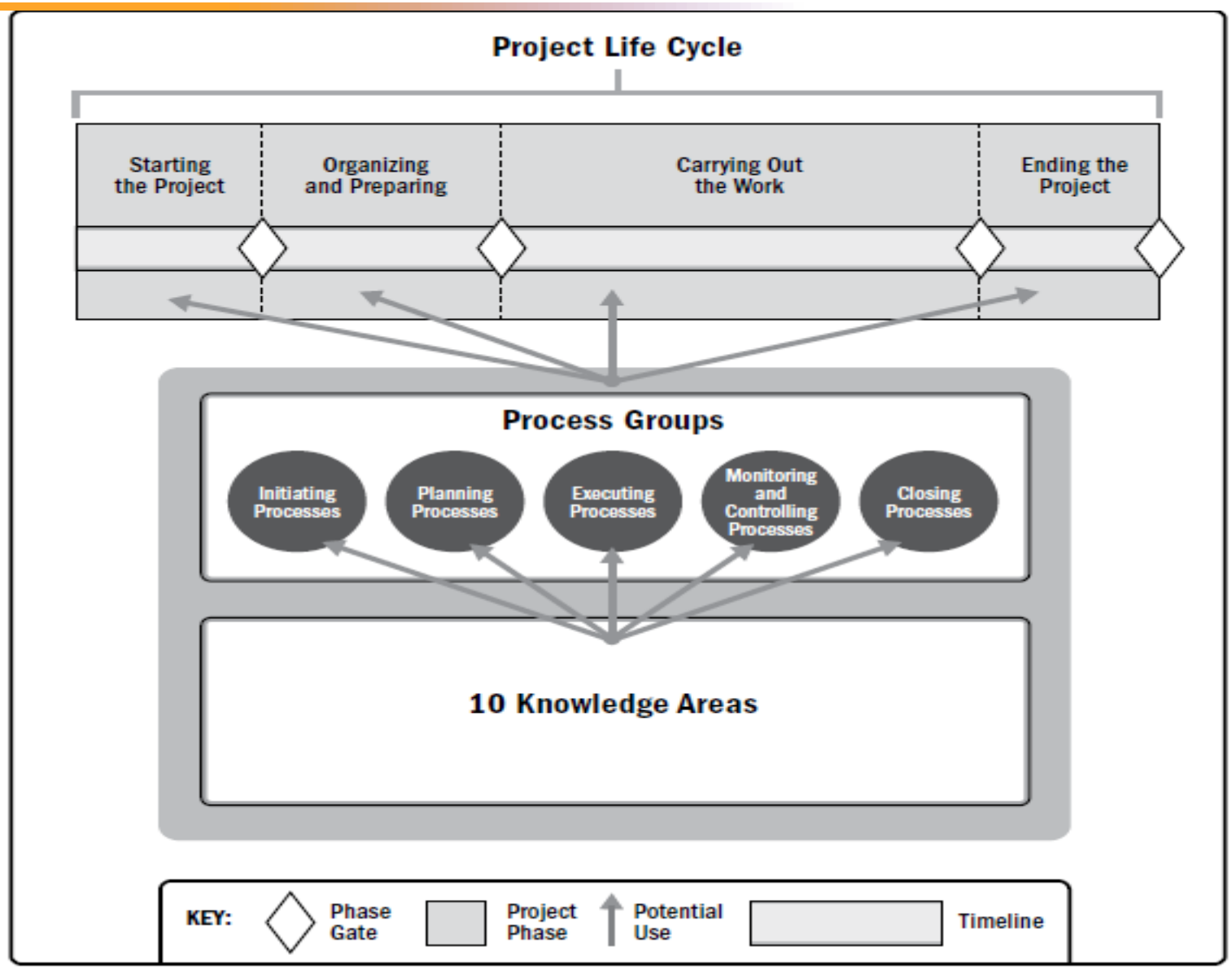
The Project Life Cycle Overview

Project Management life cycle

vs

Project life cycle (phases) Is unique for every project

What are phases of your project ?


Project Life Cycle
Starting the Project
Organizing and Preparing
Carrying Out the Work
Ending the Project
Process Groups
Initiating Processes
Planning Processes
Executing Processes
Monitoring and Controlling Processes
Closing Processes
10 Knowledge Areas
KEY:
Phase Gate
Project Phase
Potential Use
Timeline

Valued Cross!

Remember these two slides?

Valued Cross!

10 Knowledge Areas

x5 Process Groups

	Project Management Process Groups				
Knowledge Areas	Initiating	Planning	Executing	M & C	Closing
Integration Management	Develop Project Charter	Develop Project Management Plan	Direct and Manage Project Work **Manage Project Knowledge**	Monitor and Control Project Work Perform Integrated Change Control	Close Project or Phase
Scope Management		Plan Scope Management Collect Requirements Define Scope Create WBS		Validate Scope Control Scope	
Schedule Management		Plan Schedule Management Define Activities Sequence Activities Estimate Activity Durations Develop Schedule		Control Schedule	
Cost Management		Plan Cost Management Estimate Costs Determine Budget		Control Costs	
Quality Management		Plan Quality Management	Manage Quality	Control Quality	
Resource Management		Plan Resource Management Estimate Activity Resources	Acquire Resources Develop Project Team Manage Project Team	Control Resources	
Communications Management		Plan Communication Management	Manage Communications	Monitor Communications	
Risk Management		Plan Risk Management Identify Risks Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Responses	Implement Risk Responses	Monitor Risks	
Procurement Management		Plan Procurement Management	Conduct Procurements	Control Procurements	
Stakeholder Management	Identify Stakeholders	Plan Stakeholder Management	Manage Stakeholder Engagement	Monitor Stakeholder Engagement	

Project management Processes - PMBOK 6

Initiating

- Develop Project Charter
- Identify Stakeholders

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Legend

- Integration
- Scope
- Time
- Cost
- Quality
- Human Resource
- Communications
- Risk
- Procurement
- Stakeholder

Planning

- Plan Stakeholder Management
- Develop Project Management Plan
- Plan Scope Management
- Collect Requirements
- Plan Quality Management
- Define Scope
- Create WBS
- Plan Communications Management
- Plan Schedule Management
- Define Activities
- Plan Human Resource Management
- Plan Risk Responses
- Perform Quantitive Risk Analysis
- Perform Qualitative Risk Analysis
- Plan Risk Management
- Identify Risks
- Plan Procurement Management
- Plan Cost Management
- Estimate Costs
- Determine Budget
- Sequence Activities
- Develop Schedule
- Estimate Activity Resource
- Estimate Activity Durations

Executing

- Direct And Manage Project Work
- Manage Project Knowledge
- Perform Quality Assurance
- Implement Risk Response
- Acquire Project Team
- Manage Communications
- Develop Project Team
- Conduct Procurements
- Manage Project Team
- Manage Stakeholder Engagement

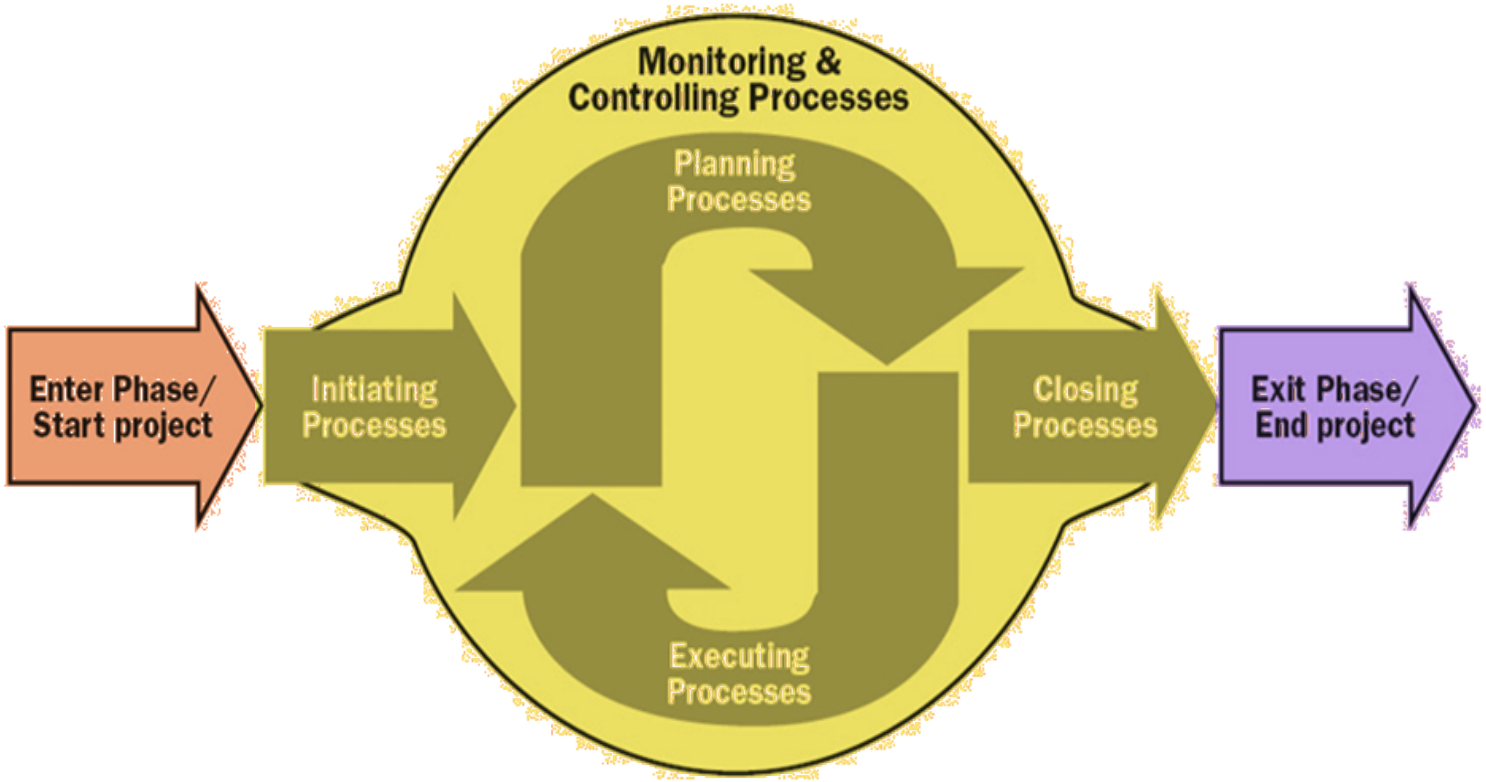
Closing

- Close Project or Phase

Monitoring & Controlling

- Monitor And Control Project Work
- Validate Scope
- Control Scope
- Control Schedule
- Control Costs
- Control Quality
- Control Communications
- Control Risks
- Control Procurements
- Control Stakeholder Engagement
- Control Resource
- Perform Integrated Change Control

PMI Project Management Methodology



PMI Project Management Methodology Based on the 5 Process Groups:
Initiation, Planning Executing, Monitoring & Controlling and Closing.

ITTO


Inputs
Tools
& Techniques
Outputs
The Complete Guide
to PMP ITTO
Project
Management
Institute
PM PrepCast

ITTO

Each Process from **49 Process** have:

Input

- Input1
- input2
- input3
- input4

Output

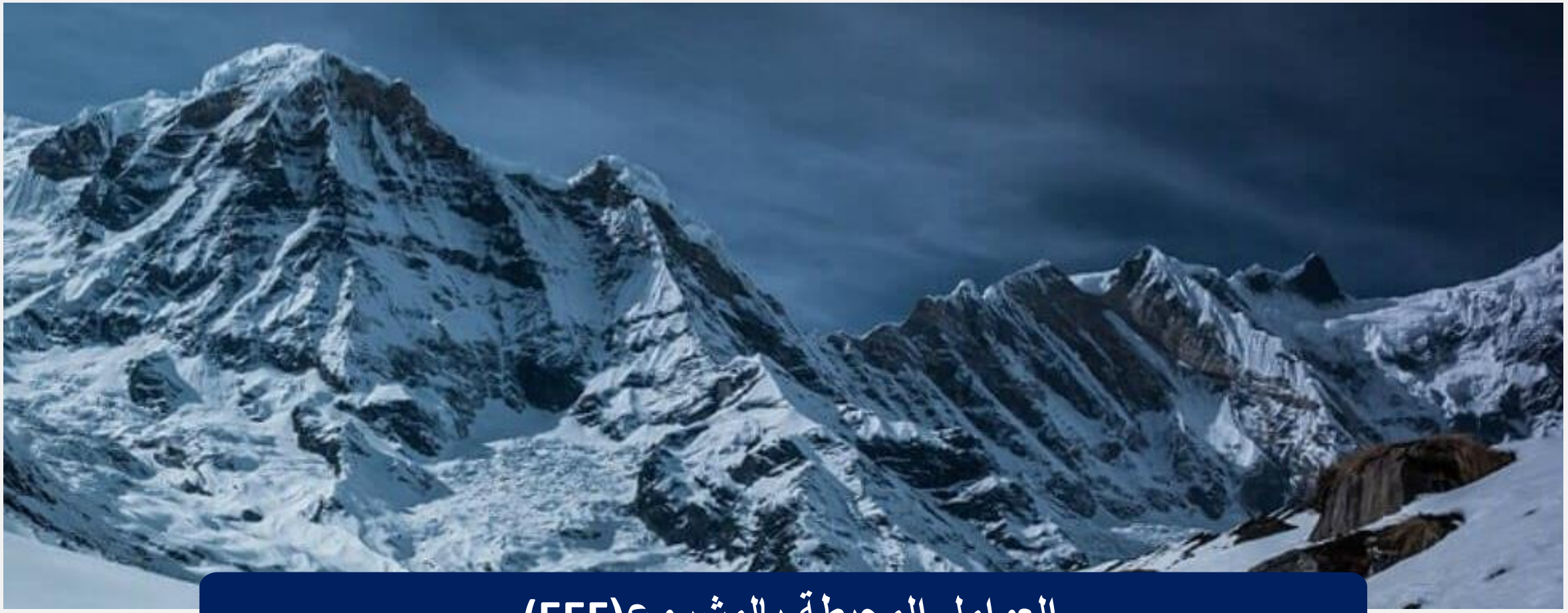
- Output 1
- Output 2
- Output 3
- Output 4

Tools and Techniques

OPA vs. EEF

Organizational Process Assets (OPA)

أصول عمليات المؤسسة (OPA)vs العوامل المحيطة بالمشروع (EEF).



العوامل المحيطة بالمشروع(EEF)

EEF (**Enterprise Environmental Factors)**

INTERNAL EEF's

- Org Culture, Structure, Governance
- Geographical distribution of facilities, resources
- Infrastructure
- IT Software
- Resource Availability
- Employee Capability

EXTERNAL EEF's

- Market conditions
- Social and cultural influences
- Legal restrictions
- Govt and industry standards
- Physical environmental considerations
- Financial considerations
- Commercial databases


SMART Tunnel
Malaysia

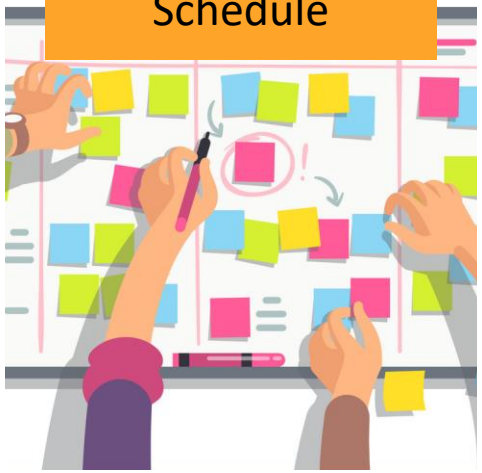
Project Management Process Groups

The 10 Knowledge Areas

Integration

Scope

Schedule



Cost

Quality

Resources

Communication

Risk

Procurements

Stakeholders

Question 1 :

A primary function of a Project Management Office (PMO) is to support project managers in a variety of ways, which may include all of the following EXCEPT:

A. Intervening in project execution directly and without involving the project manager.
B. Managing shared resources across all projects administered by the PMO.
C. Identifying and developing project management methodology, best practices, and standards.
D. Coaching, mentoring, training, and oversight.

Questions

2 : The five Project Management Process Groups are:

A. Planning, Checking, Directing, Monitoring, and Recording.
B. Initiating, Planning, Executing, Monitoring and Controlling & Closing.
C. Planning, Executing, Directing, Closing, and Commissioning.
D. Initiating, Executing, Monitoring, Evaluating & Closing.

3: All of the following are external environmental factors EXCEPT:

A. Legal restrictions.
B. Organizational values and principles.
C. Competitive movements.
D. Economic conditions .

4: Project Management Processes:

A. May be overlapping activities that occur throughout the project.
B. May be overlapping activities that generally occur at the same level of intensity within each phase of the project.
C. Are generally discrete, one-time events.
D. Are discrete, repetitive events that occur generally at the same level of intensity throughout each phase of the project.

Questions

5. Portfolio management refers to:

A. Managing various contents of the project file.
B. Managing of the levels of financial authority to facilitate project decision making
C. The centralized management of one or more portfolios to achieve strategic objectives.
D. Applying resource leveling heuristics across all the organization's strategic objectives.

6. Project managers are similar to conductors of large orchestra, EXCEPT:

A. They are responsible for the final result of the team.
B. They communicate with the team.
C. They need to integrate multiple disciplines.
D. They need to be an expert or knowledgeable of all aspects of their endeavor.

7 . Different or conflicting objectives among project stakeholders:

A. Should be encouraged.
B. Should be ignored.
C. Can make it difficult for project managers to manage stakeholder expectations.
D. Generally make it easy for project managers to manage stakeholder expectations

Questions

8. All of the following are true about project phases and the project life cycle EXCEPT:

A. Stakeholder influences, risk, and uncertainty are greatest at the start of the project. These factors decrease over the life of the project.

B. The ability to influence the final characteristics of the project's product, without significantly impacting cost, is highest at the start of the project and decreases as the project progresses toward completion.

C. The cost of changes and correcting errors typically increases substantially as the project approaches completion.

D. Cost and staffing levels are generally steady throughout the project life cycle .

9. All of the following are generally true about leadership in a project environment EXCEPT:

A. It involves focusing the efforts of a group of people toward a common goal and enabling them to work as a team.

B. It is the ability to get things done through others.

C. Respect and trust, rather than fear and submission, are the key elements of effective leadership.

D. Although important throughout all project phases, effective leadership is critical during the Closing phase of a project when the emphasis is on stakeholder acceptance of the project.

Questions

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D. Although important throughout all project phases, effective leadership is critical during the Closing phase of a project when the emphasis is on stakeholder acceptance of the project.

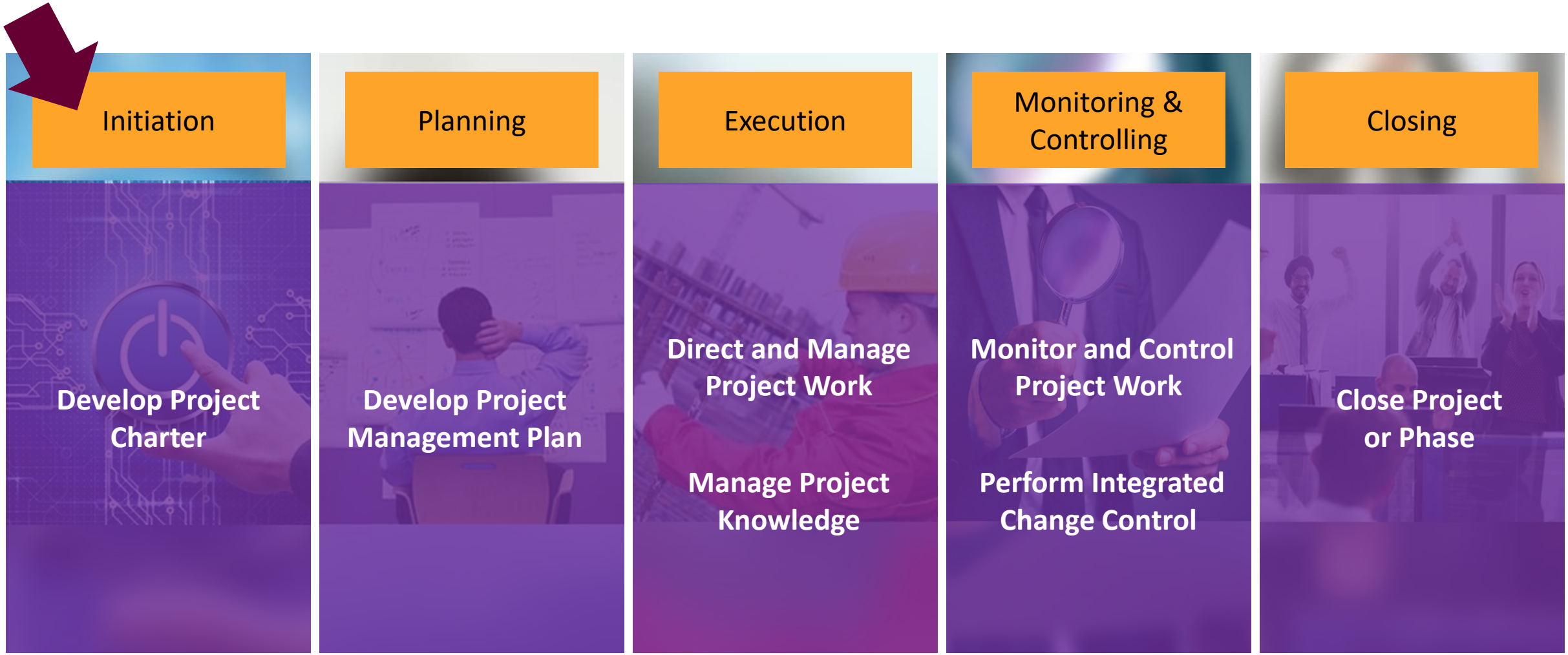
Knowledge Areas

1 Integration

Integration

“Identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.”

Integration



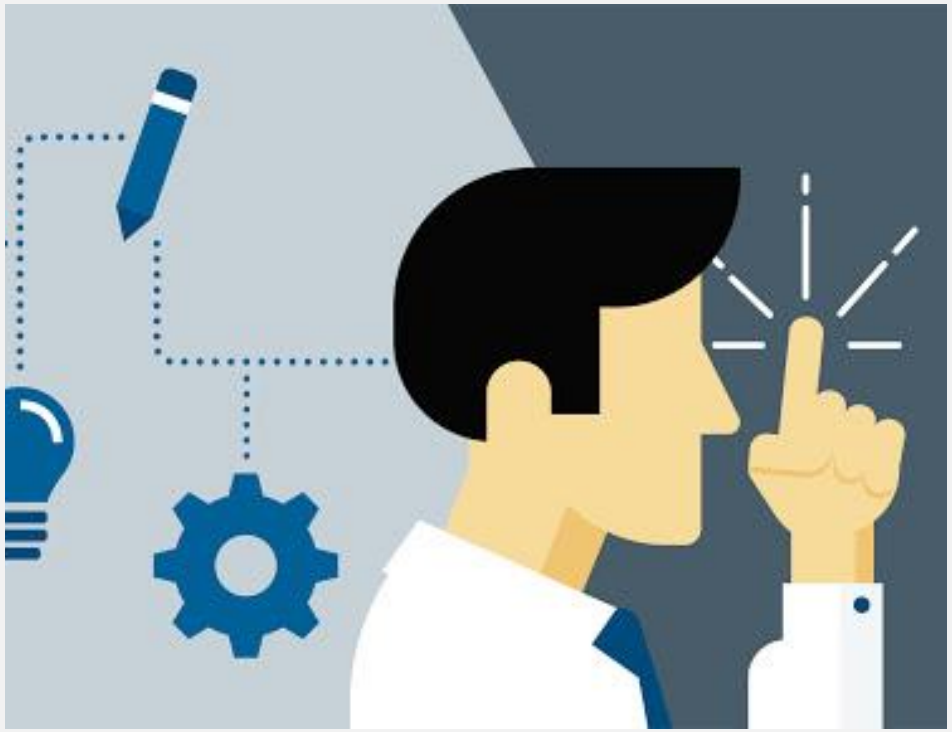
Integration

Integration

Develop Project Charter

"The process of developing a document that formally authorizes a project or a phase and documenting initial requirements that satisfy the stakeholder's needs and expectations."

- When is the best time to assign a project manager?
- Can the PM be delegated by sponsors to develop the charter?

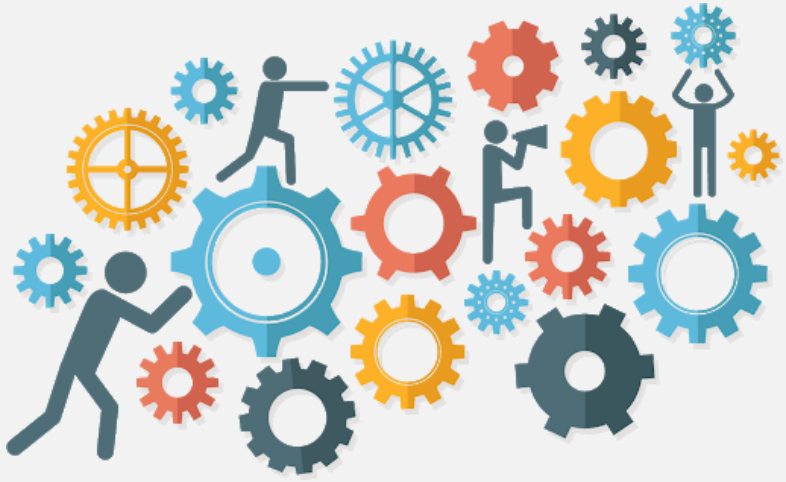


تمرين لعمل الوثيقة

Integration ▸ Initiation ▸ Develop Project Charter - ITTO

Input

- Business Documents
- Agreements
- Enterprise Environmental Factors - EEF
- Organizational Process Assets - OPA



Tools and Techniques

- Expert Judgment
- Data Gathering
- Interpersonal & Team Skills & Meetig

Output

- Project Charter
- Assumptions Log

Inputs

Business Documents

- Business Case ex. Software upgrade
- Benefits Management Plan

Agreements

In case if you are implementing a project for an external customer

Inputs

EEF

Like Governmental or industry standards, Organizational infrastructure, or Marketplace conditions

OPA

Like Organizational standard processes, Templates (e.g. charter template), historical Info and lessons learned

Tools & Techniques

Expert Judgment

Can help developing the project charter and examples include:

- Consultants, Stakeholders,
- Professional and technical associations
- Subject matter experts
- PMO

Tools & Techniques

Data Gathering

- Brainstorming
- Focus Groups
- Interviews

Meetings

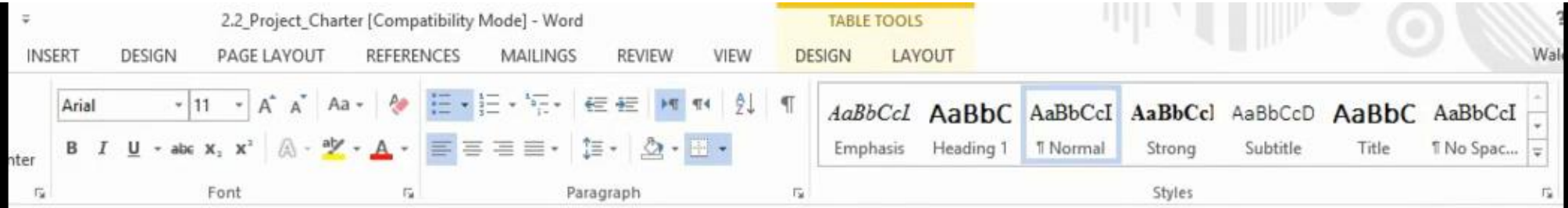
Tools & Techniques

Interpersonal & Team Skills

- Conflict Management
- Facilitation
- Meeting Management

Output

- Project purpose or justification
- Project Objectives
- Success Criteria
- High-level requirements
- High-level project description
- High-level risks
- Summary milestone schedule
- Summary budget
- Project approval requirements (who signs during project)
- **Assigned project manager**
- Name and authority of the sponsor or other person(s) **authorizing** the project charter



PROJECT CHARTER

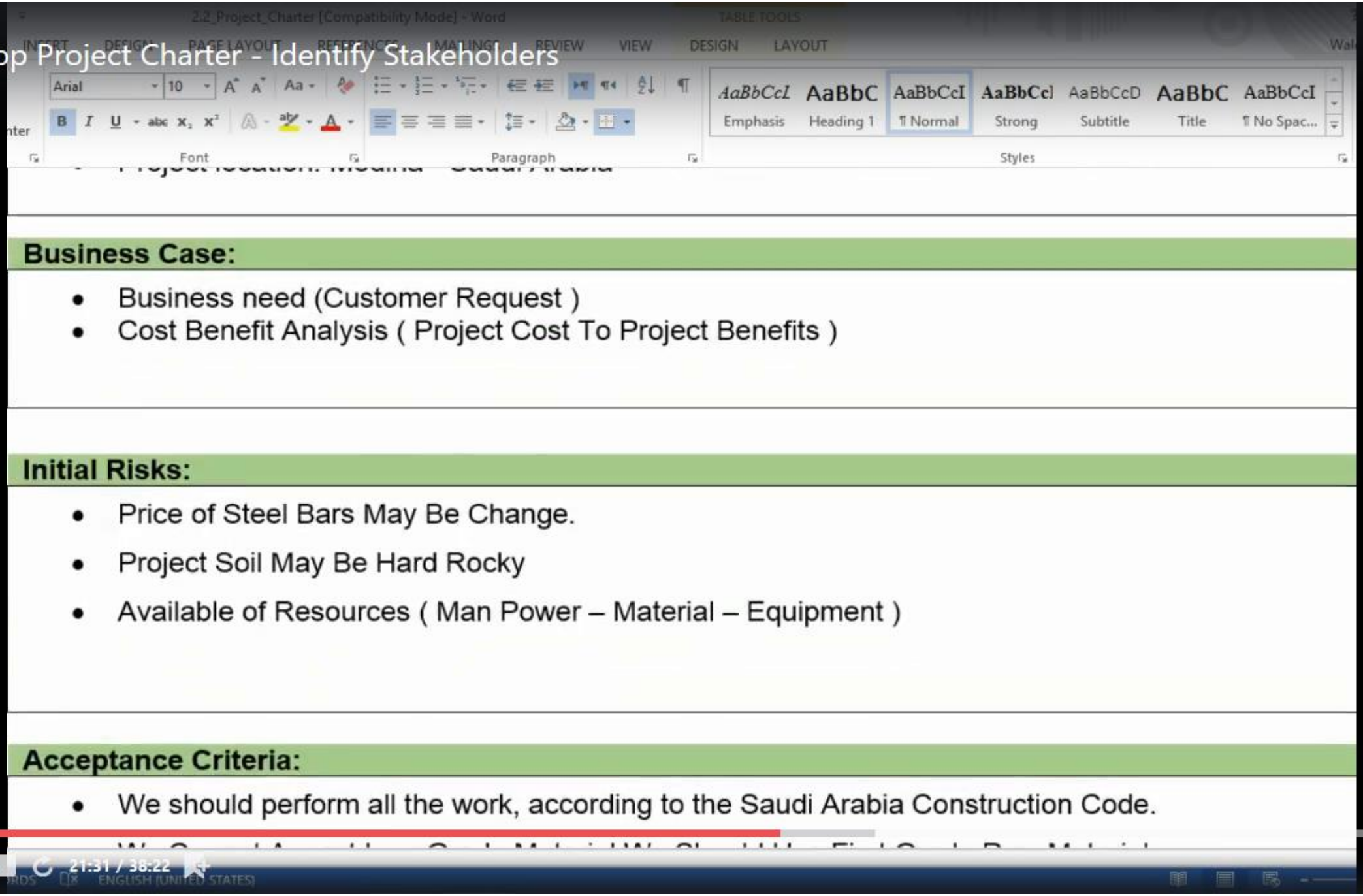
Project Title:	**Residential villa**		
Project Sponsor:	**Al Rajhi Bank**	**Date Prepared:**	**Sunday, November 06, 2016**
Project Manager:	**Eng. Waleed Elbasyouni**	**Project Customer:**	**Dr. Noura El Dawood**

بسم الله الرحمن الرحيم

Project Description: (Project Statement of Work)

- Construct of Residential villas Content of Ground Floor, First Floor and Upper Roof.
- Land Area of 2500 m2
- Building Construction area (60%) 1500 m 2
- Project location: Medina - Saudi Arabia

5. Develop Project Charter - Identify Stakeholders



Business Case:

- Business need (Customer Request)
- Cost Benefit Analysis (Project Cost To Project Benefits)

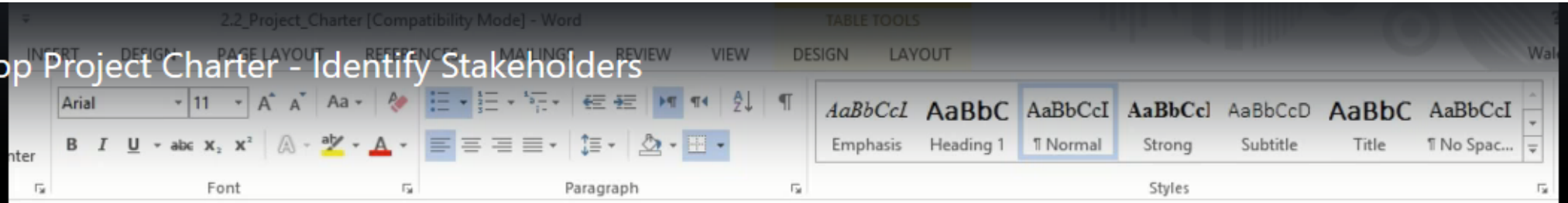
Initial Risks:

- Price of Steel Bars May Be Change.
- Project Soil May Be Hard Rocky
- Available of Resources (Man Power – Material – Equipment)

Acceptance Criteria:

- We should perform all the work, according to the Saudi Arabia Construction Code.

5. Develop Project Charter - Identify Stakeholders



Initial Risks:

- Price of Steel Bars May Be Change
- Project Soil May Be Hard Rocky
- Available of Resources (Man Power – Material – Equipment)

Acceptance Criteria:

- We should perform all the work, according to the Saudi Arabia Construction Code.
- We Cannot Accept Low-Grade Material We Should Use First Grade Raw Material.
- We cannot terminate the Contract unilaterally, only after discuss with all Project Party.

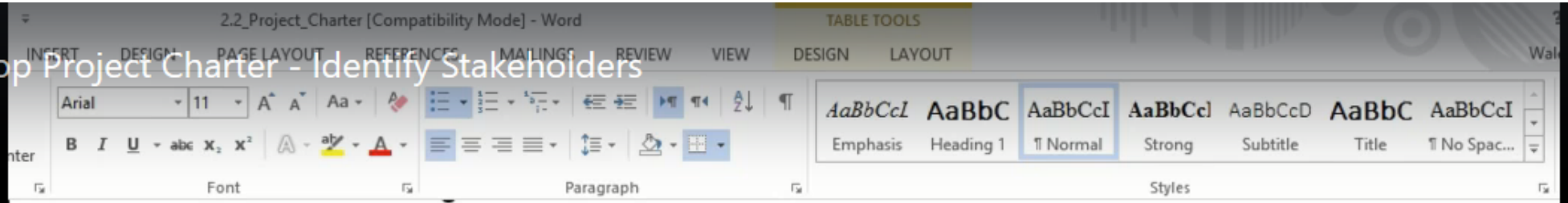
Summary Milestones	Due Date
• Site Receiving	15-11-2016

Pause

1× 22:03 / 38:22 ENGLISH (UNITED STATES)

- We cannot terminate the Contract unilaterally, only after discuss with all Project Party.

Summary Milestones	Due Date
• Site Receiving	15-11-2016
• Finalize Skeleton	15-02-2017
• Finalize Finishing Work	30-06-2017
• Project Handing Over	15-07-2017



Project Manager Authority Level

- Manage The Project Budget.
- Manage And Select His Team Work.
- Can Takes Any Decision Making About Project Time Schedule.
- Manage and Defined The Project Quality Standers and Measurements.
- He don't Have any authority to approve to Project Change Requests without Coordinates with C.C.B (Change Control Board).

- He don't Have any authority to approve to Project Change Requests without Coordinates with C.C.B (Change Control Board).

Approvals:

Project Manager Signature	Sponsor or Originator Signature
Waleed ElBasyouni	**Al Rajhi Bank**
Project Manager Name	Sponsor or Originator Name
Date	Date

Stakeholders Management

Identify Stakeholders

"Identifying all people or organizations impacted by the project, and documenting relevant information regarding their interests, involvement and impact on project success."

- Stakeholders are all persons/parties who are **positively** or **negatively** affected by the project.

- Stakeholders should be identified and classified according to their interest, influence, and involvement in the project.

Stakeholders Management ▶ Initiation ▶ Identify Stakeholders

Input

- Project charter
- Business documents
- Project management plan
- Project documents
- EEF
- OPA

Tools and Techniques

- Expert judgment
- Data gathering
- Data analysis
- Data representation
- Meetings

Output

- Stakeholder register
- Change Requests

Tools & Techniques

Data gathering

- Questionnaires and surveys
- Brainstorming

Tools & Techniques

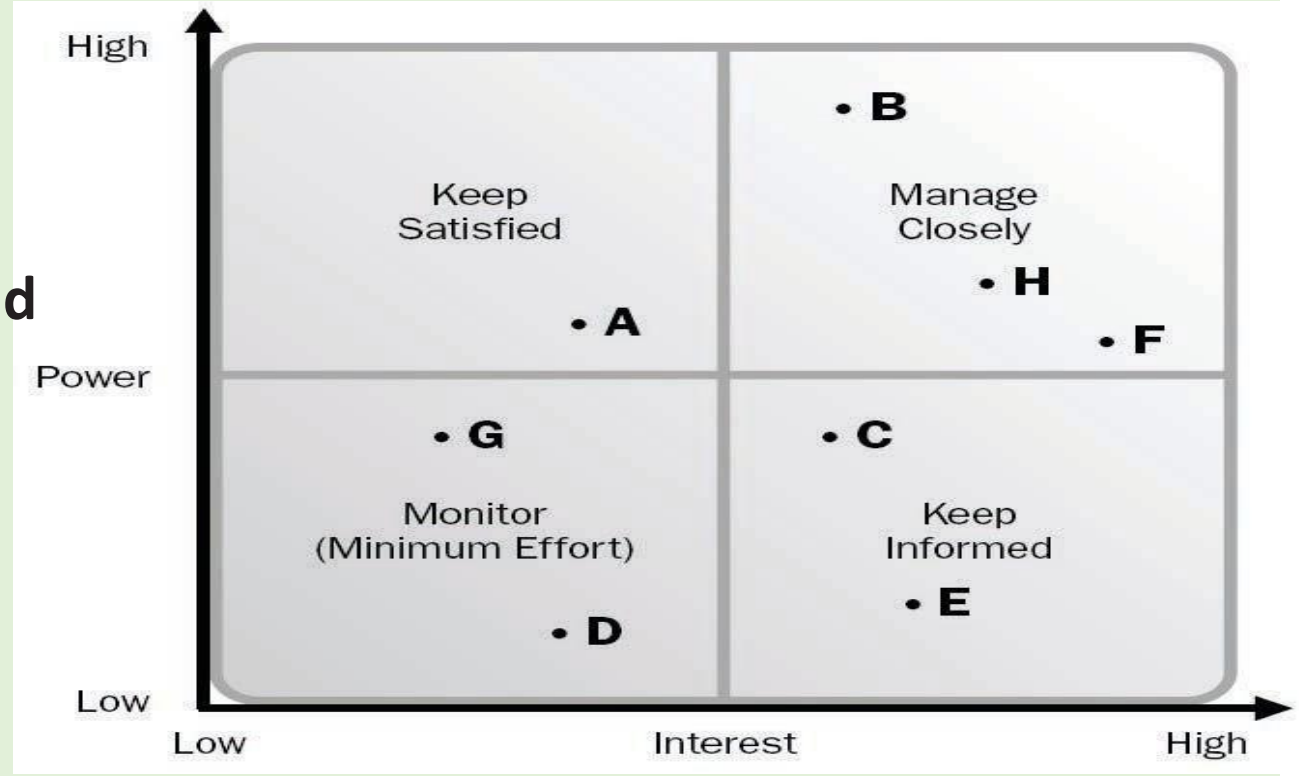
Data analysis

- Stakeholder analysis
- Document analysis

Tools & Techniques

Data representation

Example: Stakeholder power-interest grid



Source: PMBOK 6, PMI, www.pmi.org

The Outputs

Stakeholder register

- Identification information
- Assessment information
- Stakeholder Classification

اعمل قائمة المعنيين بالمشروع

QUESTIONS :

1-Stakeholders are:

A. The project engineers who design and construct the project.
B. The people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project.
C. The organization's corporate attorneys.
D. The individuals or agencies that control contingency funds and their disbursement through the project management office (PMO)

2- In developing a stakeholder register, you need to include all of the following EXCEPT:

A. Identification information.
B. Assessment information.
C. Stakeholder classification.
D. Project risk information

QUESTION :

The power/interest grid classification model for stakeholders analysis suggests:

A. Keep informed high-power/high-interest stakeholders.
B. Keep satisfied high-power/low-interest stakeholders.
C. Monitor low-power/high-interest stakeholders.
D. Manage closely low-power/low-interest stakeholders

QUESTION :

Overview of Leadership

Management Focus vs Leadership Focus

Critical Thinking

Emotional Intelligence with me with others

Servant Leadership

Centralized vs. Distributed Management and Leadership

Communication Skills

The Flow of Communication

The Five Cs of Communication

QUESTION :

Communication Models
Effective Listening
Communication Blockers

Situational Leadership Models
The OSCAR Model

Other Leadership Concepts

Conflict Management

Knowledge Areas

2 Scope

Scope Management

"The process required to ensure that the project includes all the work required, and **only** the work required to complete the project successfully"

Product Scope

features and **functions** that characterize a product, service or result. Customer needs

Project Scope

The **work** that needs to be accomplished to deliver a product, service, or result to satisfy project objectives.

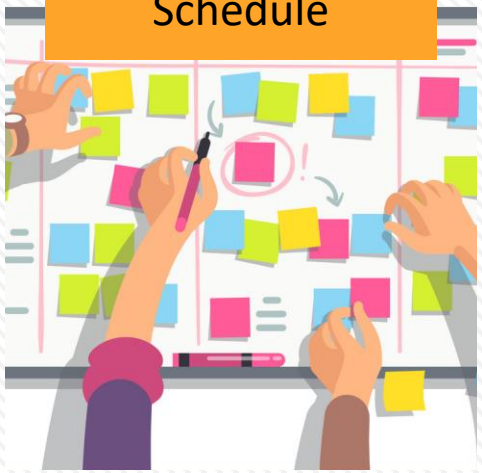
Scope Management

The 10 Knowledge Areas

Integration

Scope

Schedule



Cost

Quality

Resources

Communication

Risk

Procurements

Stakeholders

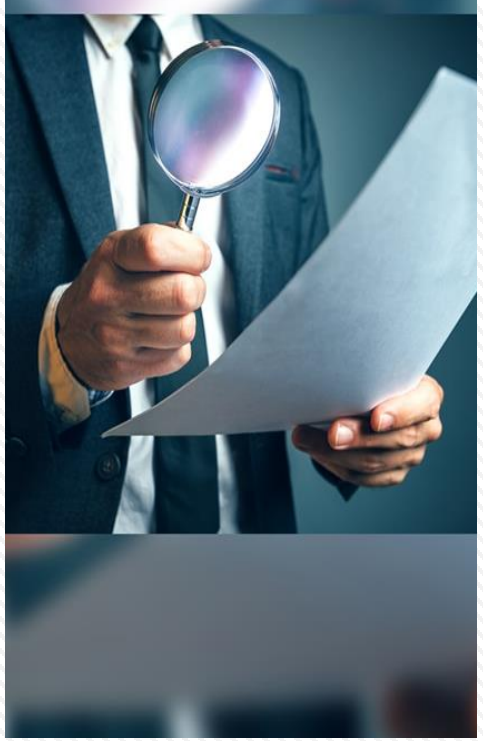
Scope Management

Initiation

Planning

Execution

Monitoring & Controlling

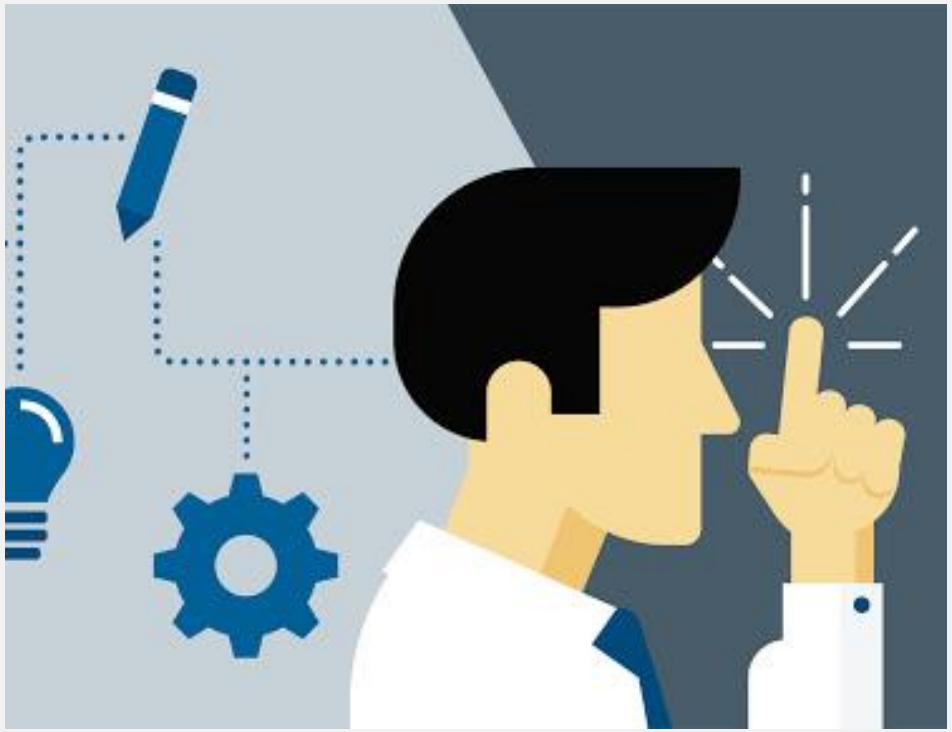


Closing

Scope Management

Plan Scope Management

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



Scope Management ▸ Planning ▸ Plan Scope Management - ITTO

Input

- Project charter
- Project management plan (quality)
- Enterprise Environmental Factors - EEF
- Organizational Process Assets - OPA

Tools and Techniques

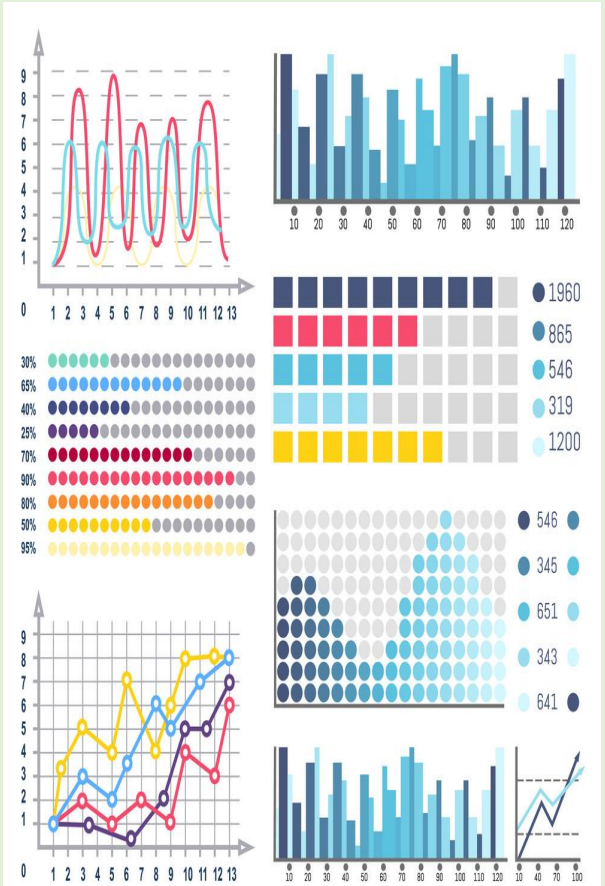
- Expert judgment
- Data analysis
- Meetings

Output

- Scope management plan
- Requirements management plan

Tools & Techniques

- Expert Judgment
- Data analysis
  - Like Alternative Analysis
- Meeting



The Outputs

Scope Management Plan

describes how the scope will be defined, developed, monitored, controlled, and validated

- Process for preparing a detailed project **scope statement**
- Process that enables the creation of the **WBS**
- Process that specifies how formal **acceptance** of the completed project deliverables will be obtained
- Process to control how requests for **changes** will be processed

The Outputs

Requirements Management Plan

- Description on how requirements **activities** will be planned, tracked, and reported
- **Configuration** management activities such as: how changes to the product will be initiated
- Requirements **prioritization** process
- Product **metrics** that will be used

Scope Management

Collect Requirements

"Defining and documenting stakeholders' needs to meet the project objectives"

Project Requirements

- Business Requirements
  - Project Management Requirements

Product Requirements

- Safety and Security Requirements
- Performance Requirements

Scope Management ▸ Planning ▸ Collect Requirements - ITTO

Input

- Project charter
- Project management plan
- Project scope
- Stakeholders plan
- Agreements
- EEF
- Opa

Tools and Techniques

- Expert judgment
- Data gathering
- Data analysis
- Decision making
- Data representation
- Interpersonal and team skills
- Context diagram
- Prototypes

Output

- Requirements documentation
- Requirements traceability matrix

Tools & Techniques

Data Gathering

- **Interviews :** w/ stakeholders

One to one or …….

- **Focus Groups**

➢ Joins prequalified stakeholders and/or **Subject matter experts** for specific opinions on requirement.

➢ A trained **moderator** guides the group through interactive discussion.

Tools & Techniques

Data Gathering

- **Facilitated Workshops**

➢ Requirements workshops are focused session that bring **stakeholders** together to define different product requirements.

- **Brainstorming**
- **Questionnaires and surveys**
- **Benchmarking**

Tools & Techniques

Data Analysis

- **Document Analysis**

Decision Making Techniques

Unanimity : every one agrees
Majority : more than half
Plurality : largest number of supporter
Dictatorship : one person make the decision

s

Tools & Techniques

Data Representation

- **Affinity Diagram**

Hardware ,software, network ,data.

(IT project)

Website Design

- Master Page Design complies with company theme
- Company Logo on all Pages
- Easy navigational links

Arabization

- Automatic switch between Arabic and English
- Ability to select default language

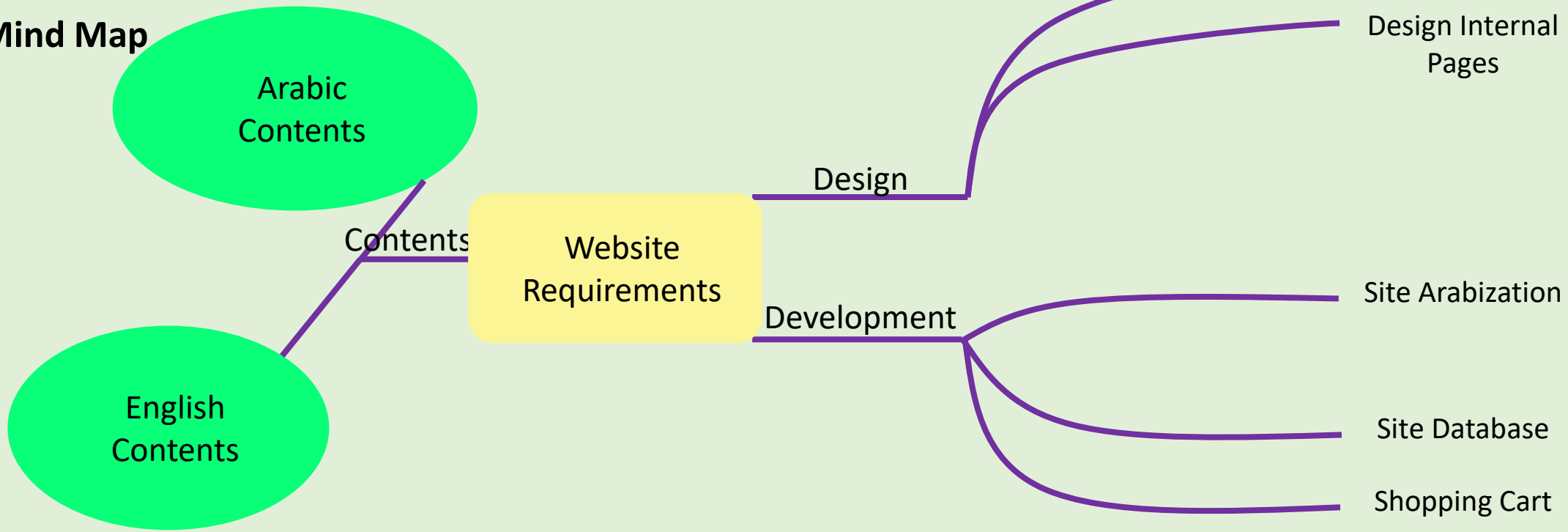
Content

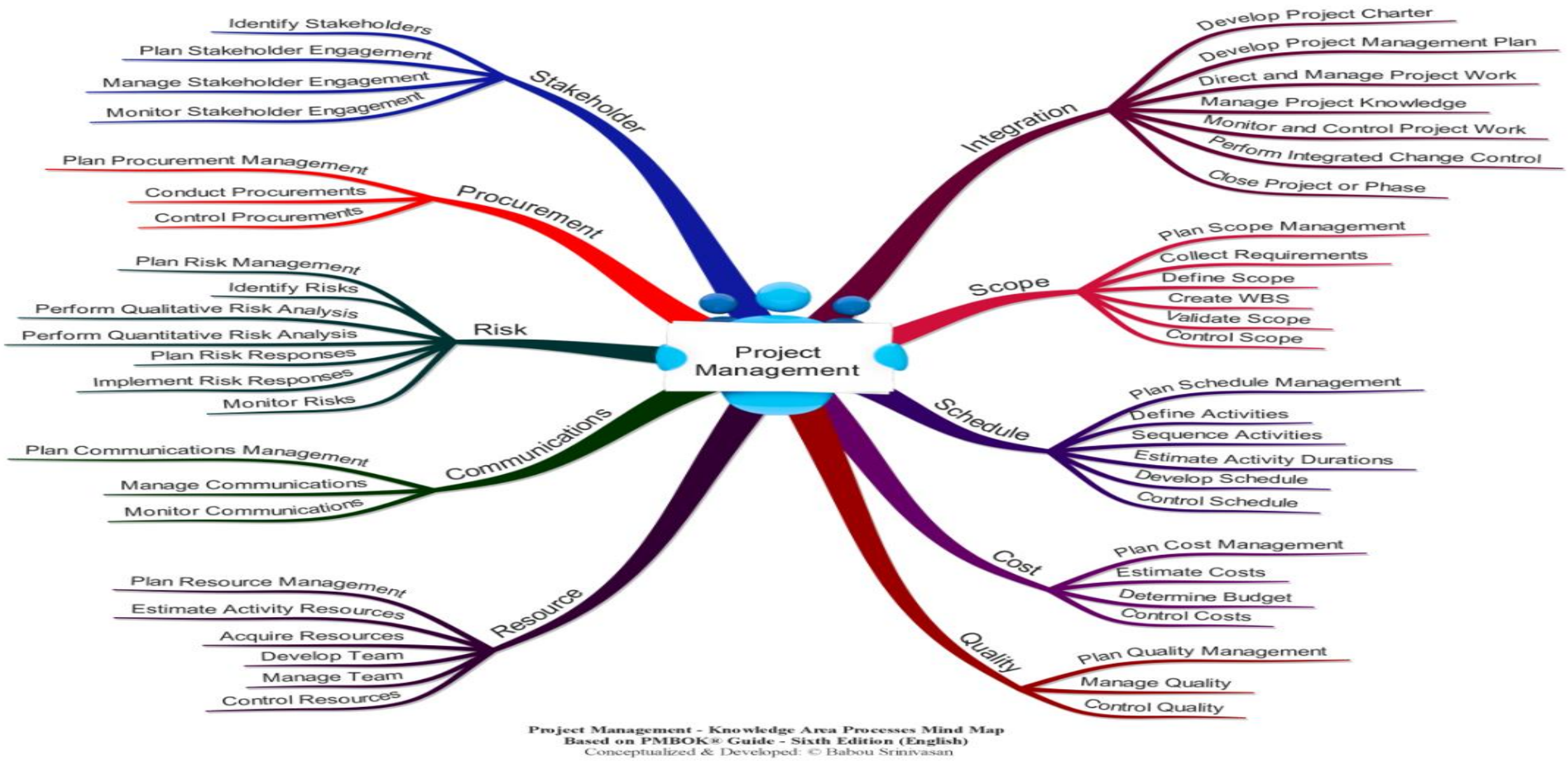
- Arabic Contents
- English Contents
- Webmaster tool to update contents
- Display latest update date

Tools & Techniques

Data Representation

- **Mind Map**





Project Management - Knowledge Area Processes Mind Map
Based on PMBOK® Guide - Sixth Edition (English)
Conceptualized & Developed: © Babou Srinivasan

Tools & Techniques

Interpersonal and Team skills

- **Nominal Group Technique (similar to brain storming plus voting)**
- **Observation and Conversation**
- **Facilitation**

Tools & Techniques

Prototyping

method of obtaining early feedback on requirements by providing a model of the expected product before actually building it.

Prototypes allow stakeholders to experiment with a model of the final product rather than being limited to discussing abstract representations of their requirements.

The Outputs

Requirements Documentation

- Before being baselined, requirements must **be unambiguous (measurable and testable), traceable, complete, consistent, and acceptable to key stakeholders.**
  - **Requirements document can contain:**
    - Business need or opportunity
    - Business and project objectives
    - **Functional requirements**
    - **Non-functional requirements** such as level of service, Performance, safety, security, compliance, supportability . . . etc.
    - Quality requirements
    - Acceptance Criteria
    - Support and training requirements
    - Requirements assumptions and constraints(triple constraints)

Questions

1. All of the following are true about the project scope management plan EXCEPT:

A. It enables the creation of the WBS from the detailed project scope statement.

B. It describes how the scope will be defined, developed, monitored, controlled, and validated.

C. It can be formal or informal, broadly framed or highly detailed, based on the needs of the project.

D. It is not related to the project management plan

2. You are involved in collecting requirements for your project. You are likely to use the stakeholder register for all of the following EXCEPT:

A. Identify stakeholders who can provide information on the requirements.

B. Capture major requirements that stakeholders may have for the project.

C. Capture main expectations that stakeholders may have for the project.

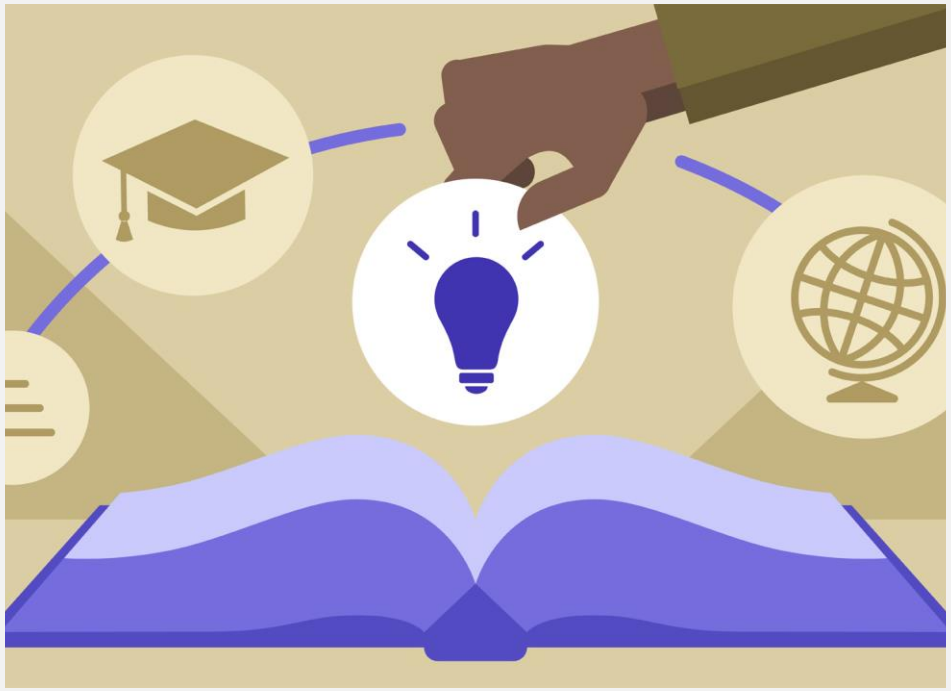
D. Evaluate the product breakdown structure (PBS) associated with each of the key stakeholder

Scope Management

Define Scope

"Developing a detailed **description** of the project and product."

Builds upon major **deliverables**, assumptions, and constraints documented during initiation & previous process.



Scope Management ▸ Planning ▸ Define Scope

Input

- Project charter
- Project management plan
- Project documents(requirement)
- EEF
- OPA

Tools and Techniques

- Expert judgment
- Decision making
- Data analysis
- Product analysis
- Interpersonal and team skills

Output

- Project scope statement

Tools & Techniques

Expert judgment

- Often used to analyze the information needed to develop the project scope statement

Tools & Techniques

Product Analysis

- For projects leading to a product rather than service or result.
- Examples: Product breakdown, systems analysis, requirements analysis, systems engineering value engineering.

The Outputs

Project Scope Statement

- Describes in detail **deliverables** and work required to create those deliverables

Forms Baseline for determining changes

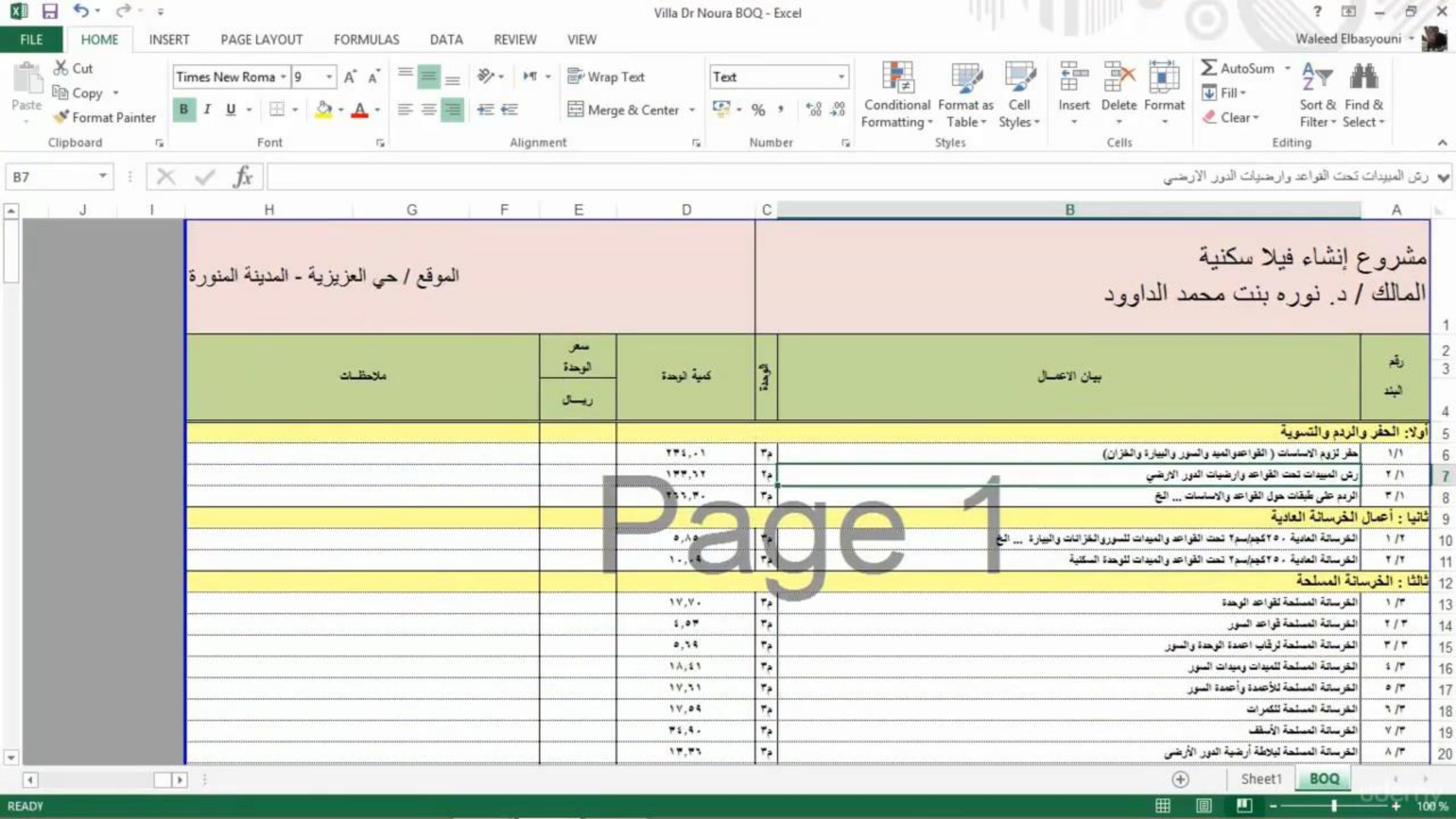
- Includes
  - Product &project scope description
  - Product acceptance criteria
  - Project deliverables
  - Project exclusions :stating what is out of scope for the project helps manage stakeholders' expectations and can reduce scope creep.
  - Project constraints in details .
  - Project assumptions in details.

See attached file

The Outputs

Project Document Updates

- Project Document that could be updated includes:
  - Stakeholder register
  - Requirements documentation
  - Requirements traceability matrix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Waleed Elbasyouni
Cut Copy Format Painter Paste
Times New Roma 9
Wrap Text Merge & Center
Text
Conditional Formatting Format as Table Cell Styles
Insert Delete Format
AutoSum Fill Clear
Sort & Filter Find & Select
Clipboard Font Alignment Number Styles Cells Editing
B7
رش الميدات تحت القواعد وارضيات الدور الارضي
مشروع إنشاء فيلا سكنية
المالك / د. نوره بنت محمد الداوود
الموقع / حي العزيزية - المدينة المنورة
رقم البند
بيان الاعمال
الوحدة
كمية الوحدة
سعر الوحدة ريال
ملاحظات
أولا: الحفر والردم والتسوية
١/١ حفر لزوم الاساسات (القواعدوالميد والسور والبيارة والخزان) م٣ ٢٣٤,٠١
٢/١ رش الميدات تحت القواعد وارضيات الدور الارضي م٢ ١٣٣,٦٢
٣/١ الردم على طبقات حول القواعد والاساسات ... الخ م٣ ٢٦٦,٣٠
ثانيا : أعمال الخرسانة العادية
١/٢ الخرسانة العادية ٢٥٠كجم/سم٢ تحت القواعد والميدات للسورالخزانات والبيارة ... الخ م٣ ٥,٨٥
٢/٢ الخرسانة العادية ٢٥٠كجم/سم٢ تحت القواعد والميدات للوحدة السكنية م٣ ١٠,٠٤
ثالثا : الخرسانة المسلحة
١/٣ الخرسانة المسلحة لقواعد الوحدة م٣ ١٧,٧٠
٢/٣ الخرسانة المسلحة قواعد السور م٣ ٤,٥٣
٣/٣ الخرسانة المسلحة لرقاب اعمدة الوحدة والسور م٣ ٥,٦٩
٤/٣ الخرسانة المسلحة للميدات وميدات السور م٣ ١٨,٤١
٥/٣ الخرسانة المسلحة للأعمدة وأعمدة السور م٣ ١٧,٦١
٦/٣ الخرسانة المسلحة للكمرات م٣ ١٧,٥٩
٧/٣ الخرسانة المسلحة الأسقف م٣ ٣٤,٩٠
٨/٣ الخرسانة المسلحة لبلاطة أرضية الدور الأرضي م٣ ١٣,٣٦
Page 1
Sheet1 BOQ
READY
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A	B	C	D	E	F	G	H
٣/٤	مباني بلوك مصمت ٤٠*٢٠*٢٠ سم	م٢	١٩,٨٥				
٤/٤	مباني بلوك ٤٠*٢٠*٢٠ سم للبياره بسمك ٤٠ سم	م٢	٧,٣٤				
٥/٤	مباني بلوك لحماية عزل خزان المياة الارضي ٤٠*٢٠*١٠ سم	م٢	٣٨,٤٠				
خامسا : أعمال اللياسة							
١/٥	لياسة الجدران الخارجية للمبنى	م٢	٦٠٥,٠٠				
٢/٥	لياسة خارجية وداخلية لجدران السور و٣ جوانب داخلية فى بيارة الصرف	م٢	٣٥٤,١٦				
٣/٥	لياسة كافة جدران الطوب الداخلية والسقف الخرساني بالاضافة الى لياسة الدرج وبطانيات السلالم وجوانب بطانيات الجسور الخرسانية	م٢	٥٩٥,٥٧				
١٣/٥	اعمال لياسة خلف سيراميك جدران الحمامات والمطابخ بالوحدات السكنية	م٢	١٣٢,١٨				
سادسا : أعمال العزل							
١/٦	عزل القواعد ورقاب الاعمدة للمبني	م٢	٣١٥,٠٩				
٢/٦	عزل مائي افقي لزوم الاسطح	م٢	١٣٩,٣٢				
٣/٦	خرسانة ميول رغوية	م٢	١٣٩,٣٢				
٤/٦	عازل مائي مكون من شرائح الـ(بي في سي LNTR 1500) لزوم جدران الخزان الارضي	م٢	٣٩,٣٦				
٥/٦	عزل مائي للحمامات والمطابخ مكون من شرائح بى فى سى المبثوق المصقول	م٢	٢٨,٣٠				
٦/٦	عزل حراري لزوم الاسطح	م٢	١٣٥,٩١				
٧/٦	العزل تحت بلاط أرضية الوحدة السكنية بفرش طبقة من البولييثيلين سماكة ٢٥٠ ميكرون وبين العزل المائي والحراري في الأسطح .	م٢	٢٦٩,٨٧				
٨/٦	طبقة حماية من الالياف فوق العزل الحرارى وتحت الدفان للبلاطة الاسطح وفوق عزل الحمامات	م٢	١٦٤,٢١				
٩/٦	تعلة مكونة من البيتومين المبحص والمسطرة الالمونيوم على جوانب السطح	طط	٨٩,٨٠				
سابعا : أعمال البلاط							
١/٧	سيراميك لزوم الارضيات للغرف والصالات والممرات مقاس ٤٠*٤٠*٠,٨ سم شامل الوزرات بارتفاع ١٠ سم	م٢	١٥٧,٧٥				
٢/٧	سيراميك للحمامات والمطابخ جدران وارضية ٢٠*٢٠*٠,٦ سم	م٢	١٥٦,١٨				
٣/٧	رخام من نوع جرانيت سعودى ٩٠*٦٠ سم لزوم بسطات الدرج والمداخل ومنطقة الدرج فى الدور الارضي	م٢	١٥,٠١				
٤/٧	رخام من نوع جرانيت سعودى لدرج مداخل الوحدة السكنية ودرج الدور	طط	٤٧,٧٦				
٥/٧	بلاط تيرازو لزوم الاسطح	م٢	١٣٩,٣٢				

A	B	C	D	E	F	G	H	I	J
٩/٦	تغطية مكونة من البيتومين المبخص والمسطرة الألمونيوم على جوانب السطح	م٢	٨٩,٨٠						
سابعا : أعمال البلاط									
١ /٧	سيراميك لزوم الارضيات للغرف والصالات والممرات مقاس ٤٠*٤٠ *٠,٨ سم شامل الوزرات بارتفاع ١٠ سم	م٢	١٥٧,٧٥						
٢ /٧	سيراميك للحمامات والمطابخ جدران وارضية ٢٠*٢٠ *٠,٦ سم	م٢	١٥٦,١٨						
٣ /٧	رخام من نوع جرانيت سعودى ٦٠*٦٠ سم لزوم بسطات الدرج والمداخل ومنطقة الدرج فى الدور الارضي	م٢	١٥,٠١						
٤ /٧	رخام من نوع جرانيت سعودى لدرج مداخل الوحدة السكنية ودرج الدور	م٢	٤٧,٧٦						
٥ /٧	بلاط تيرازو لزوم الاسطح	م٢	١٣٩,٣٢						
٦ /٧	ترابيع أسمنتية ٢م × ٢م × ٠,٢ م تحتوي على تسليح شبكي لزوم موقف السيارة	م٢	٢٤,٠٠						
٧ /٧	بلاط المشايات حول الوحدة السكنية ٤٠ * ٤٠ * ٢,٥ سم	م٢	٠,٠٠						
ثامنا : أعمال الدهانات									
١ /٨	رشة بروفايل حوائط خارجية للمبنى والسترة والسور من الداخل والخارج	م٢	٩٥٥,٦٨						
٢ /٨	دهانات بلاستيكية للحوائط الداخلية القابلة للغسيل (مطفى)	م٢	٤١٦,٤٠						
٣ /٨	دهانات بلاستيكية للاسقف الداخلية القابلة للغسيل	م٢	١٥٢,٠٢						
٤ /٨	الدهانات الزيتية لاسقف الحمامات والمطبخ	م٢	٢٧,١٦						
٥ /٨	الدهانات البلاستيكية لزوم حوائط السور من الداخل وكذلك سترة السطح من الداخل	م٢	٠,٠٠						
تاسعا : الأعمال الصحية									
١ /٩	مرحاض افرنجي كامل من الصيني المزجج	عدد	٢,٠٠						
٢ /٩	مرحاض عربي كامل من الصيني المزجج	عدد	١,٠٠						
٣ /٩	حوض غسيل ايدى على عمود من الصيني المزجج	عدد	٣,٠٠						
٤ /٩	حوض الاستحمام (بانيو .مفطس) بجميع المشتملات والتوصيلات	عدد	١,٠٠						
٥ /٩	حوض دش ارضي من الاكريلك (حوض قدم) لا يسمح بالانزلاق	عدد	١,٠٠						
٦ /٩	حوض غسيل اوانى (حوض مطبخ) من الاستنليس ستيل	عدد	١,٠٠						
٧ /٩	خزان علوي من البولي ايثلين سعته ٣٠٠٠ لتر	عدد	١,٠٠						
٨/٩	مضخة سعة ٤ م٣ / ساعة و رفع مانومتري ٢٥ متر عمود ماء	عدد	١,٠٠						

What is gold-plating?

Scope Creep

Scope Management

Initiation

Planning

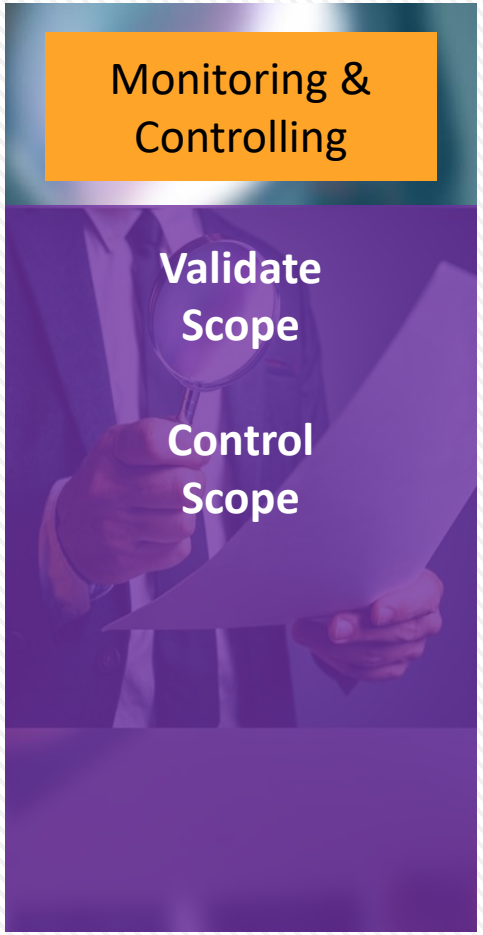
Plan Scope Management

Collect Requirements

Define Scope

Create WBS

Execution



Monitoring & Controlling

Validate Scope

Control Scope

Closing

Create WBS

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

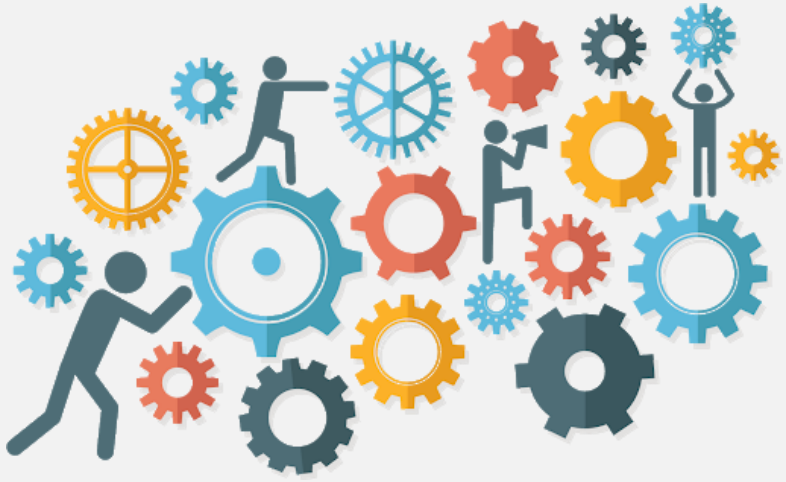
Each descending level of the **W**ork **B**reakdown **S**tructure (**WBS**) represents more detailed definition of the work

WBS organizes and defines the total scope of the project
Planned work contained within the lowest level in WBS components is called **Work Packages**.

Scope Management ▸ Planning ▸ Create WBS

Input

- Project management plan
- Project documents
- EEF
- OPA



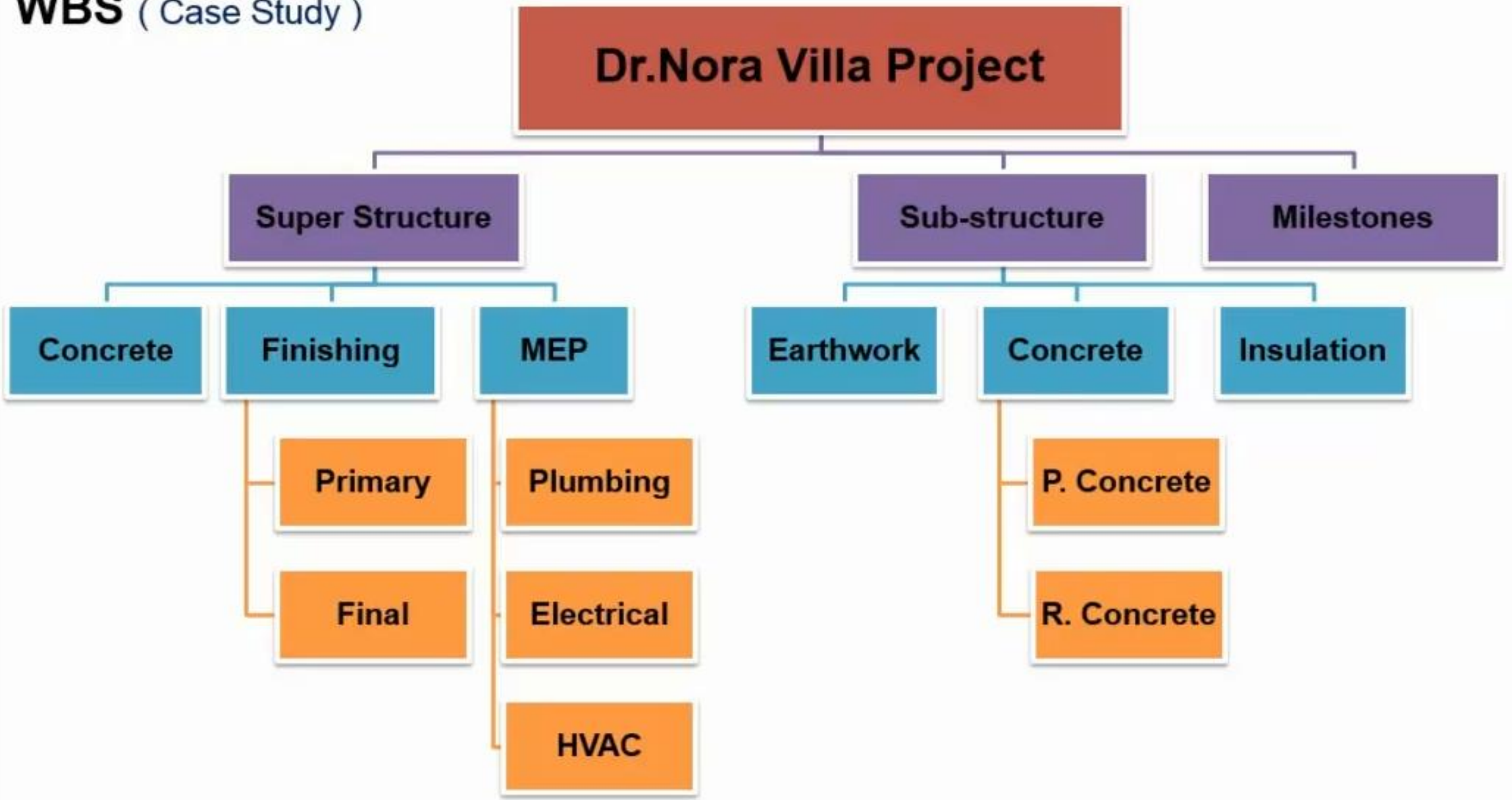
Tools and Techniques

- Expert judgment
- Decomposition

Output

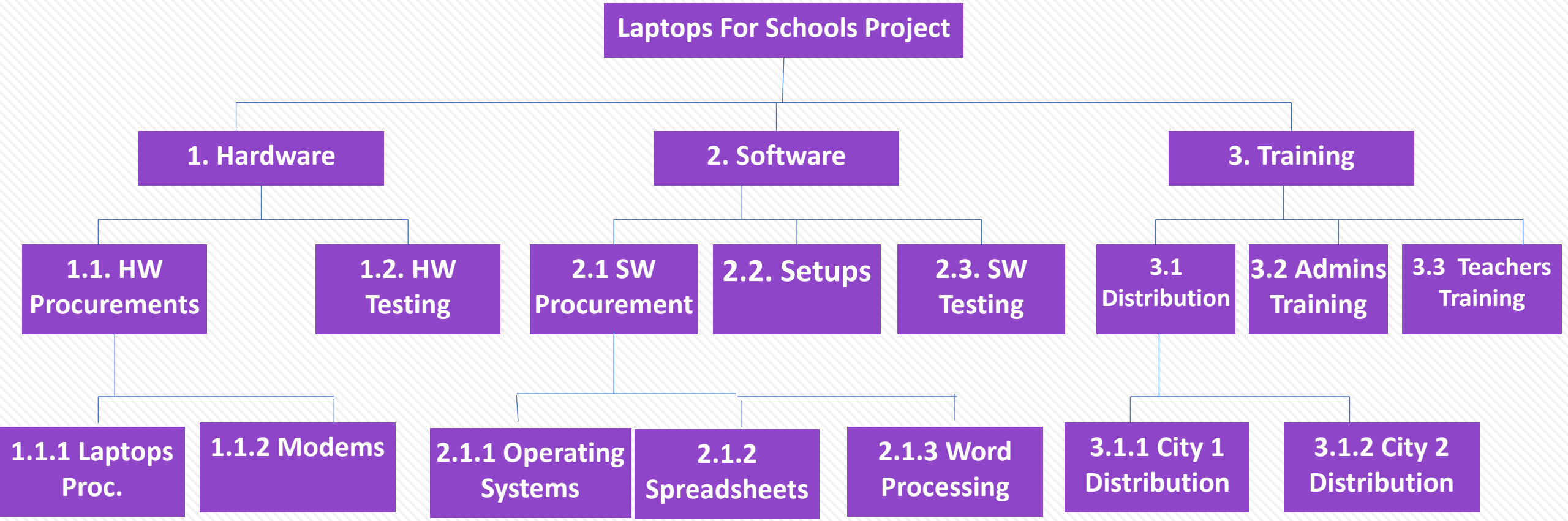
- Scope baseline

WBS (Case Study)



Do a WBS for your project

Scope Management ▸ Planning ▸ Create WBS



Tools & Techniques

- Expert judgment
- Decomposition

- ✓ The **100% rule**: means that nothing is left down in the WBS and nothing extra.

Tools & Techniques

Decomposition

- Is the **subdivision of project deliverables** into smaller more manageable components until reaching the work package level
- The **Work package** level is the **lowest level** in the WBS and is the point at which the cost and activity durations for the work can be reliably estimated and managed.
- Decomposition also includes Developing and assigning **identification codes** to the WBS components

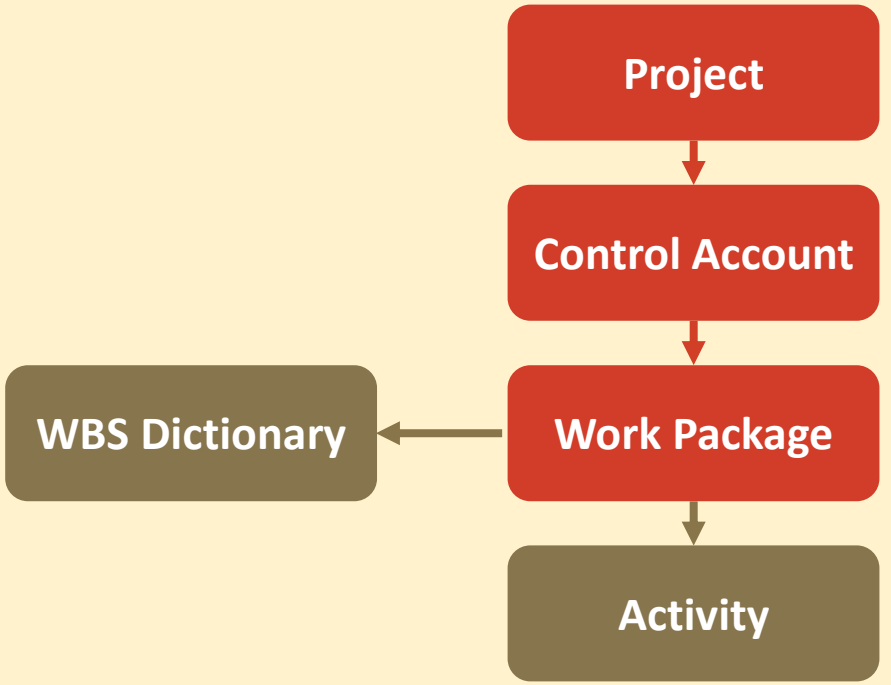
The Outputs

WBS

Which is a deliverable-oriented hierarchical decomposition of work Finalized by establishing control accounts for work packages

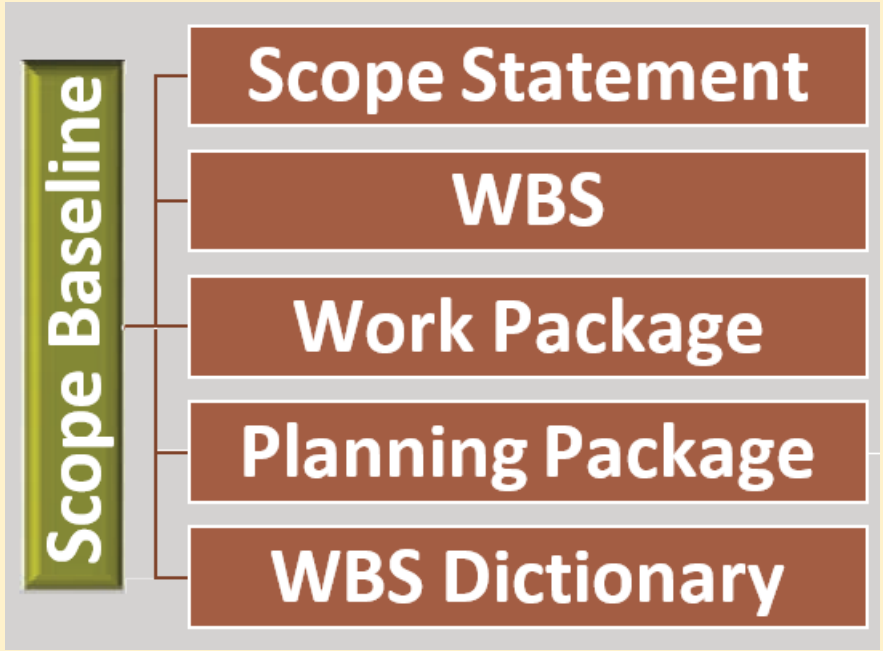
A control account is a management control point where scope, cost, and schedule are integrated

A graph to show how a WBS is arranged



The Outputs

- Scope baseline



Question :

3. What is the WBS typically used for?

A. To organize and define the total scope of the project.
B. To identify the logical person to be project sponsor.
C. To define the level of reporting that the seller provides the buyer.
D. As a record of when work elements are assigned to individuals

4. An output of the Define Scope process is:

A. Work breakdown structure (WBS).
B. Resource breakdown structure (RBS).
C. Project scope statement.
D. Scope and schedule delays control plan.

Question :

5. The following is true about the WBS:

A. The WBS is another term for the bar (Gantt) chart.

B. Each descending level of the WBS represents an increasingly detailed definition of the project work.

C. Work not in the WBS is usually defined in the scope statement of the project.

D. The WBS shows only the critical path activities

6. An input to the Define Scope process is:

A. The type of contract detail language.

B. Project charter.

C. Work breakdown structure (WBS).

D. Decomposition.

Question :

7.Constraints and assumptions are documented in details in the :

A- Project charter
B- project scope statement
C-work breakdown structure
D- All above are not true

8. A Work Breakdown Structure :

A- will help you manage your project scope by dividing it into smaller and more manageable components
B- is not needed in all projects .
C- will be created by the project manager and the project sponsor
D- All above are not true

Scope Management

Validate Scope

"Formalizing **acceptance** of the completed project deliverables"

Scope verification differs from **quality control** in that **scope verification** is concerned with **acceptance of the deliverables . (I need customer to sign)** while **quality control** is concerned with **correctness** of the deliverables(to keep any mistakes out of customer's hand).

Scope Management ▸ Monitoring & Controlling ▸ Validate Scope

Input

- Project management plan
- Project documents
- Verified deliverables
- Work performance data

Tools and Techniques

- Inspection
- Decision making

Output

- Accepted deliverables
- Project documents updates
- Project management plan updates
- Work performance Information
- Change Requests

Tools & Techniques

Inspection

- Includes activities like: **measuring**, examining and verifying work deliverables

Group Decision Making Techniques

Like voting

The Outputs

Accepted Deliverables

- Formally signed off and approved by customer or sponsor

The Outputs

Change Requests

- For deliverables that have not been formally accepted

The Outputs

- Work Performance Information (WPI)

Scope Management

Control Scope

"Monitoring the status of the project and product scope and managing changes to the scope baseline"

Scope control ensures all requested changes and corrective or preventive actions are processed.

Uncontrolled changes are called

scope creep.

Scope Management ▸ Monitoring & Controlling ▸ Control Scope

Input

- Project management plan
- Project documents
- Work performance data
- OPA

Tools and Techniques

- Data analysis

Output

- Work performance Information
- Project documents updates
- Project management plan updates
- Change Requests

Tools & Techniques

Data Analysis

- **Trend Analysis**
- **Variance Analysis**
  - ➢ Determining the degree of variance relative to the scope baseline and deciding wither corrective or preventive action is required.

صورة

The Outputs

Work Performance Information (WPI)

- Includes: planned vs. actual technical performance

Change Requests

Question :

9. Which of the following is not an output of the Control Scope process?

A. Work performance information.

B. Change requests.

C. Project documents updates.

D. Accepted deliverables.

10. Which of the following is true about the Validate Scope process?

A. It is the process of formalizing acceptance of the completed project deliverables.

B. Is not necessary if the project completes on time and within budget.

C. Occurs primarily when revisions or changes are made to project scope.

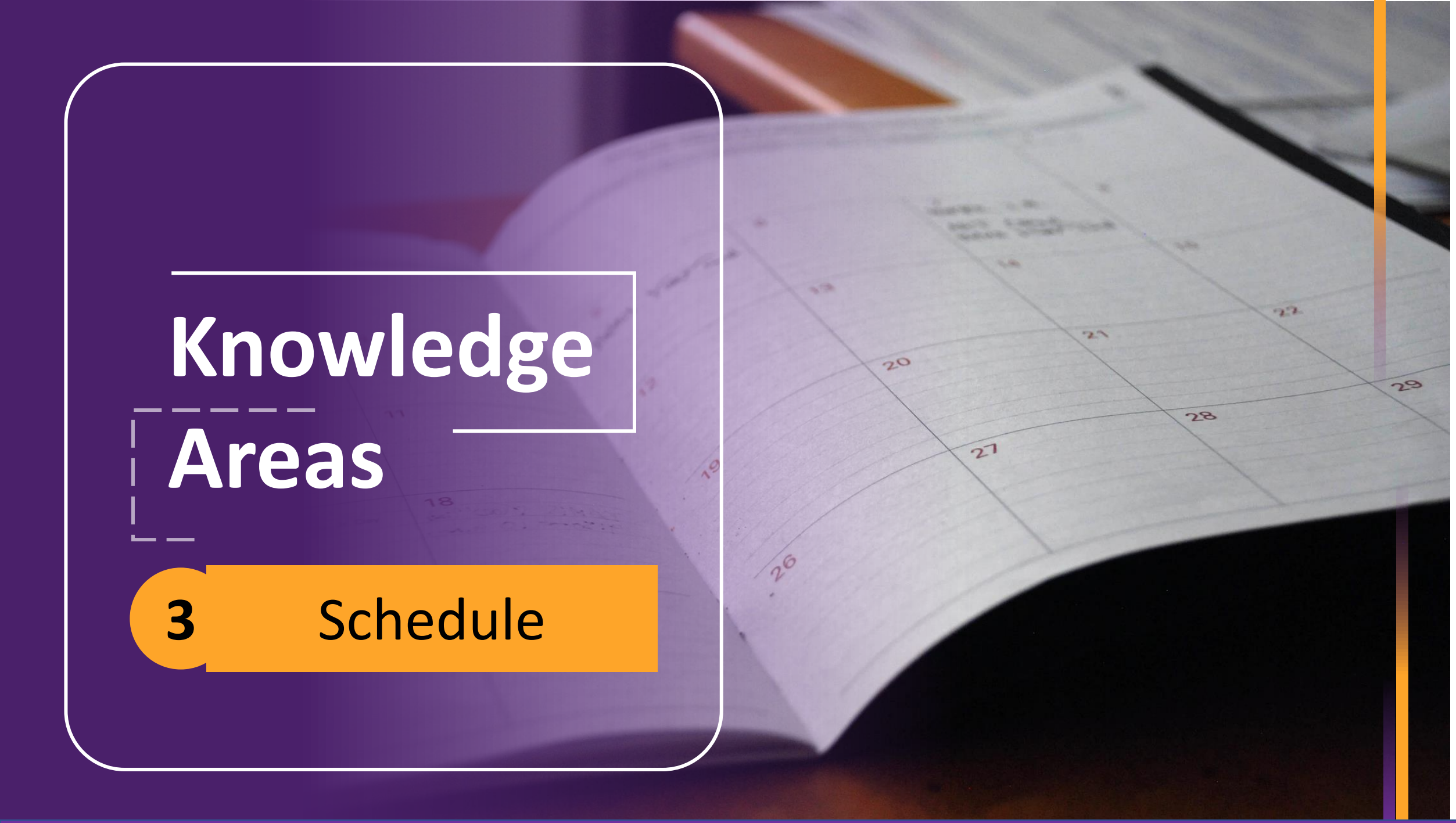
D. Scope verification is primarily concerned with correctness of the deliverables, whereas quality control is primarily concerned with acceptance of the deliverables and meeting the quality requirements specified for the deliverables

Agile Considerations

- In Agile team has less focus on establishing a fixed complete scope at the beginning of the project.
- Emergent projects are adequate for the Agile approach as they speed up the project.
- Agile methods usually build and review prototypes and release versions in order to refine the requirements.
- Scope in defined and redefined throughout the project.
- In Agile, the requirements constitute the backlog.

Knowledge Areas

3 Schedule

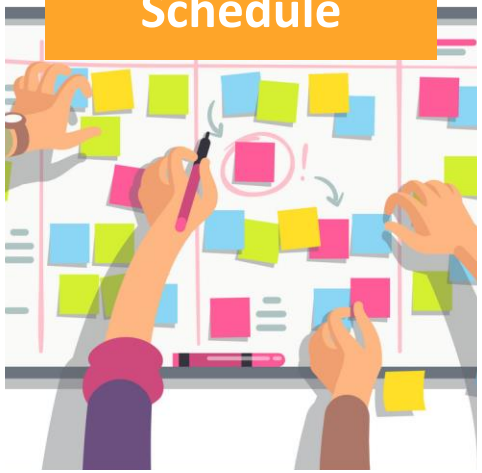


The 10 Knowledge Areas

Integration

Scope

Schedule



Cost

Quality

Resources

Communication

Risk

Procurements

Stakeholders

Schedule Management

"To Manage timely completion of the project"

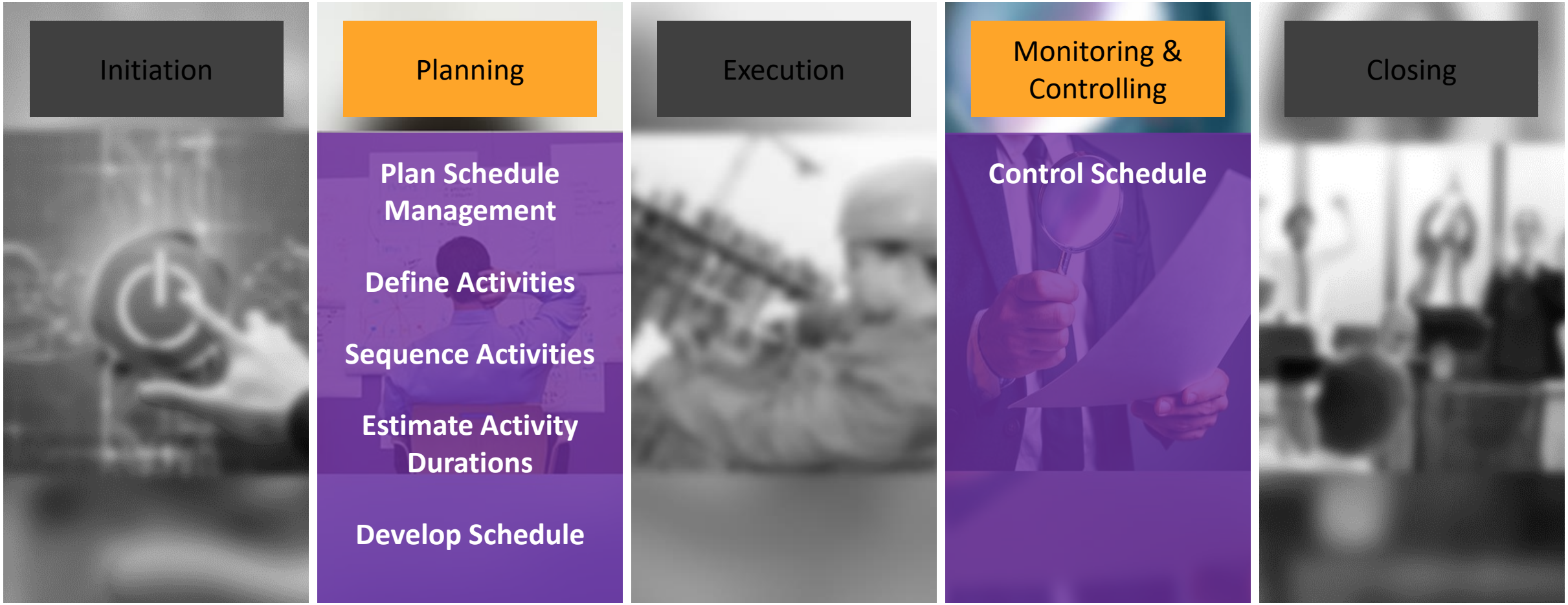
- One of the best scheduling methodologies is

Critical Path Method (CPM)

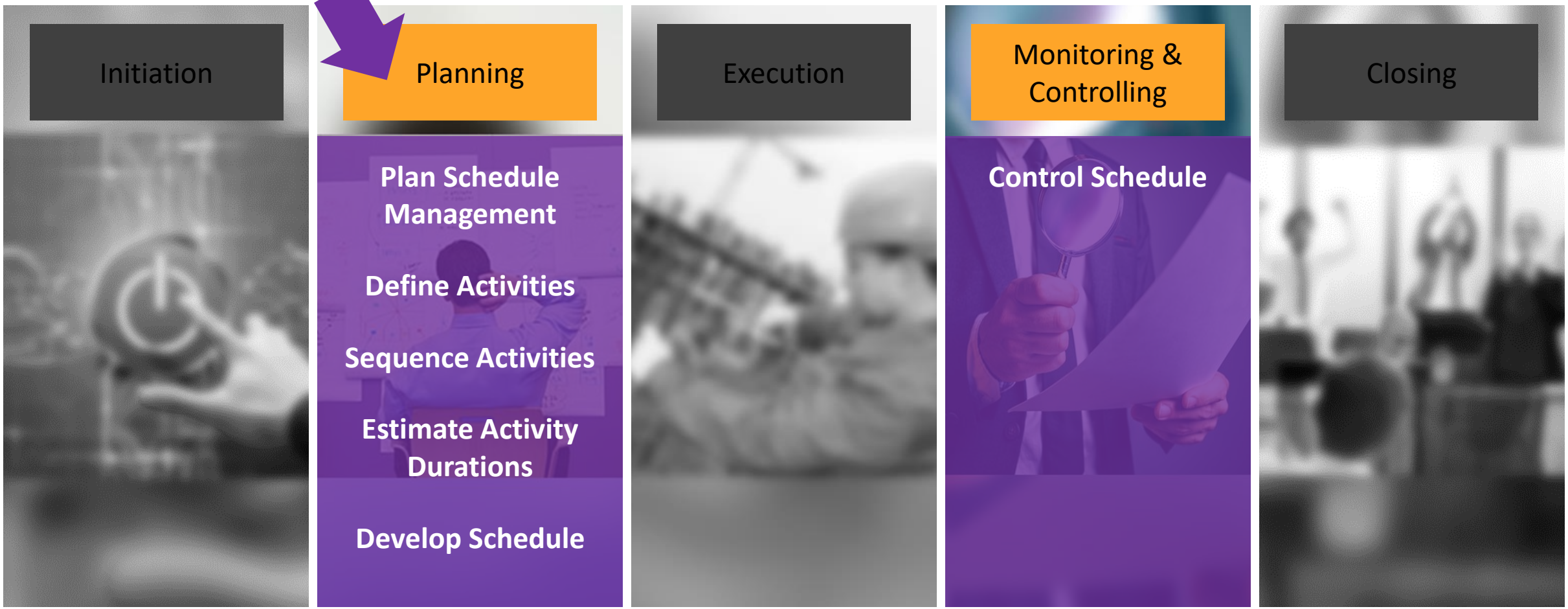
- Schedule management plan is the place for this management process.

Schedule Management

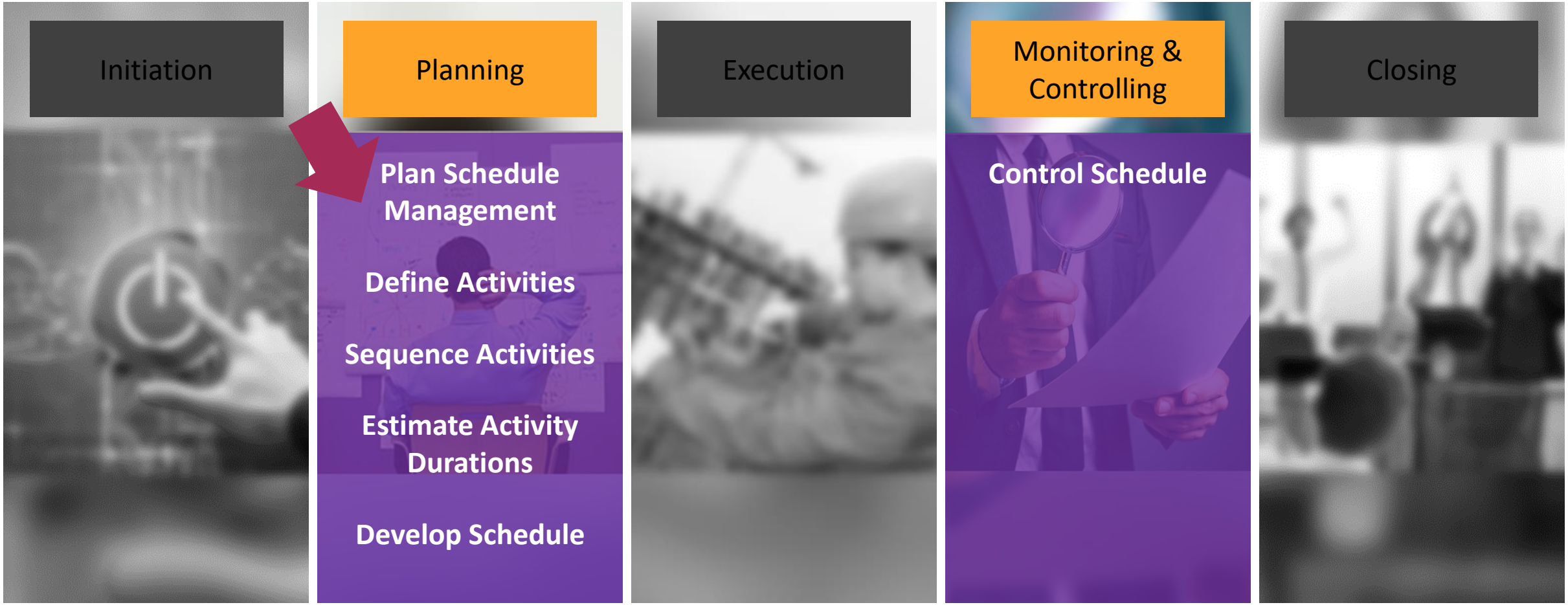
Schedule Management



Schedule Management



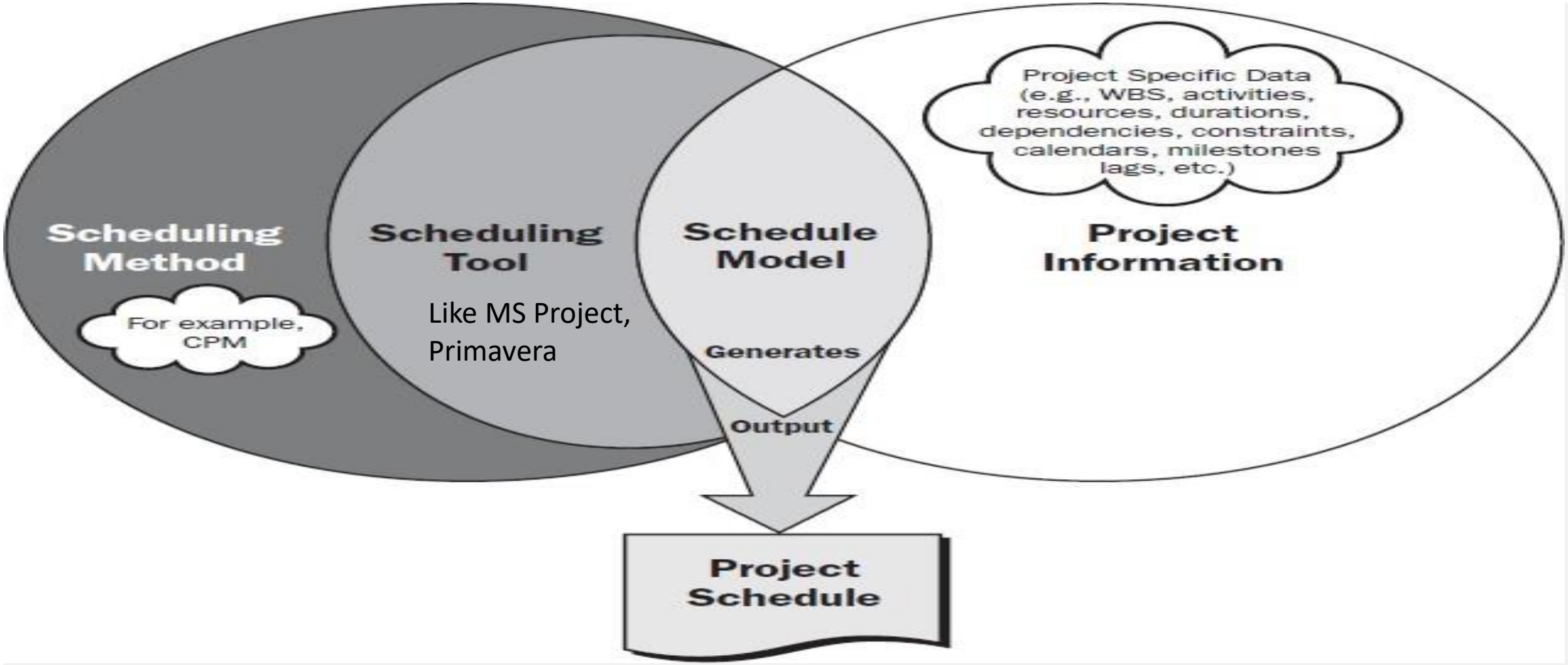
Schedule Management



Plan Schedule

"The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule."

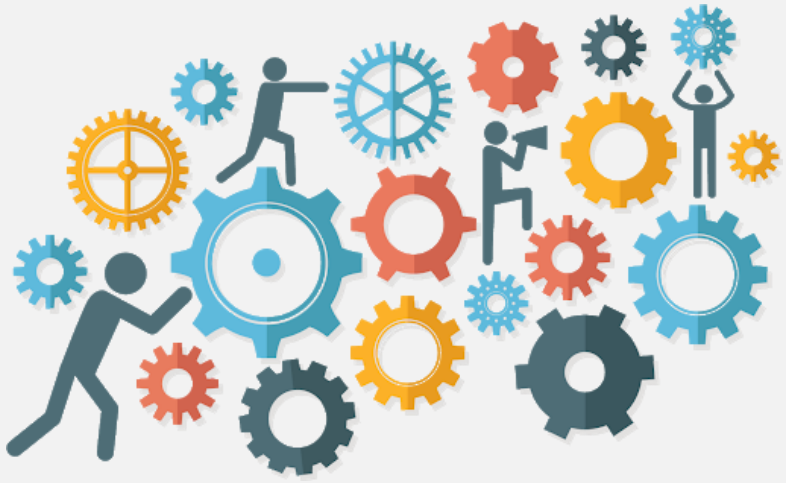
Schedule Management



Schedule Management ▶ Planning ▶ Plan Schedule Management

Input

- Project charter
- Project management plan
  Scope statement ,wbs
- EEF
- OPA



Tools and Techniques

- Expert judgment
- Data analysis
- Meetings

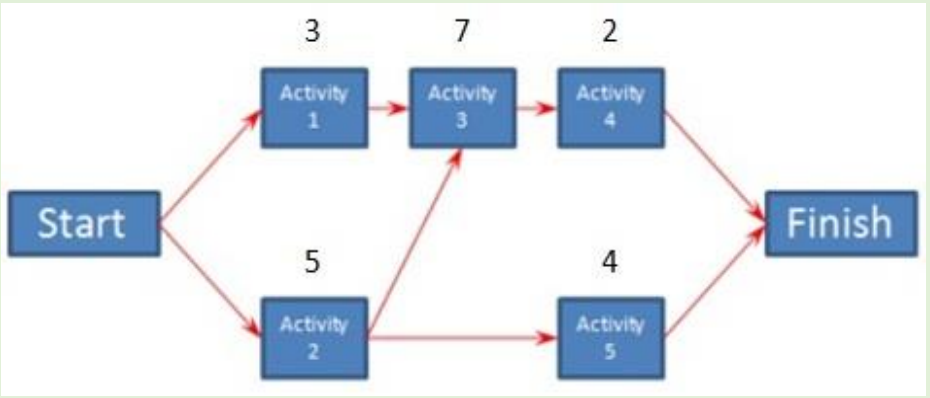
Output

- Schedule management plan

Tools & Techniques

Data analysis

- Scheduling methodologies :
  CPM ,CCM ,PDM(AON)
- Scheduling tools and techniques:
  MS Project ,Primavera
- Estimating techniques : Analogue, parameter , PERT
- Compressing technique
  Fast track , crash



Tools & Techniques

Meetings

- Planning meetings to develop the schedule management plan

Who may participate in these meetings?

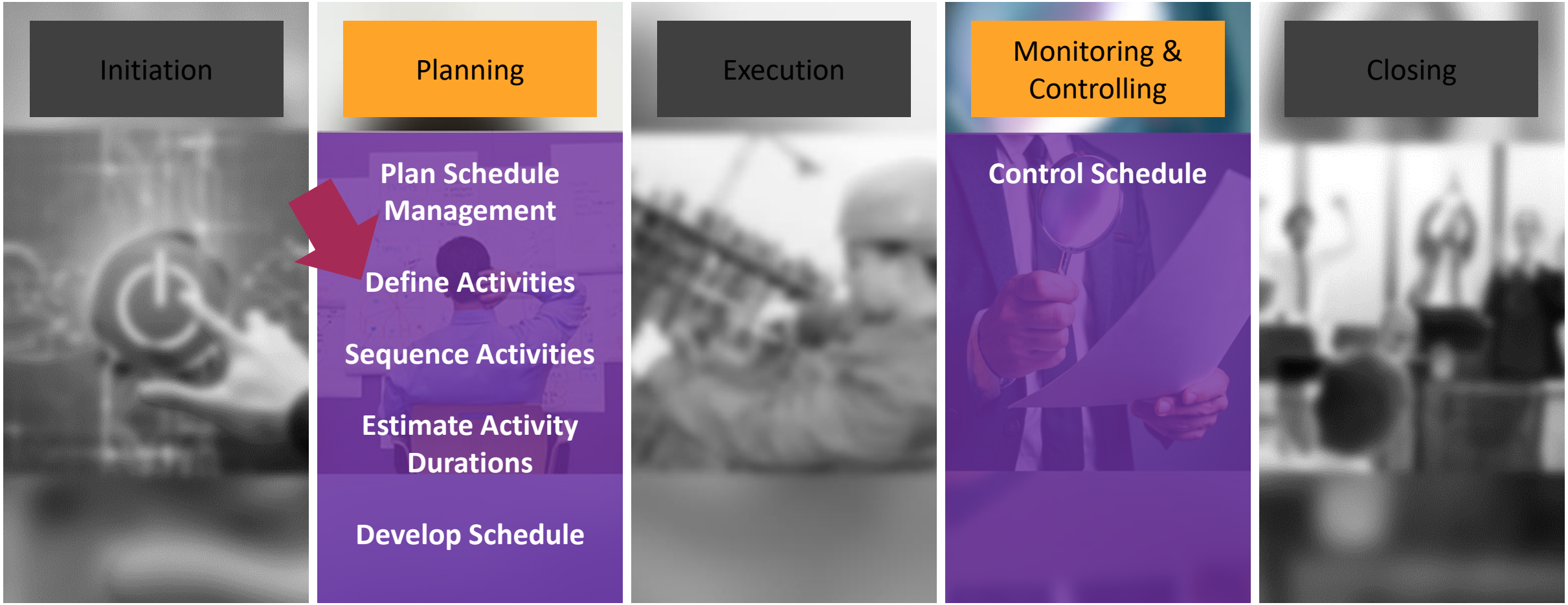
Expert Judgment

The Outputs

Schedule Management Plan

- Project schedule model Selection (which defines the scheduling methodology and tool to be used).
- Level of accuracy (for activity duration estimation).
- Units of measure (like staff hours, staff days, meters, tons, ... for each of the resources).
- Organizational procedures links (like WBS), Rules of performance measurement, Reporting formats.
- **Process descriptions.**

Schedule Management



Define Activities

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

- Work packages in WBS are **decomposed** into smaller components called activities.

Schedule Management ▸ Planning ▸ Define Activities

Input

- Project management plan
- EEF
- OPA
- scope baseline

Tools and Techniques

- Expert judgment
- Rolling wave planning
- Decomposition
- Meetings

Output

- Activity list
- Activity attributes
- Milestone list
- Change Requests

Tools & Techniques

Expert Judgment

- Whether project team members or external experts.

Meetings

Tools & Techniques

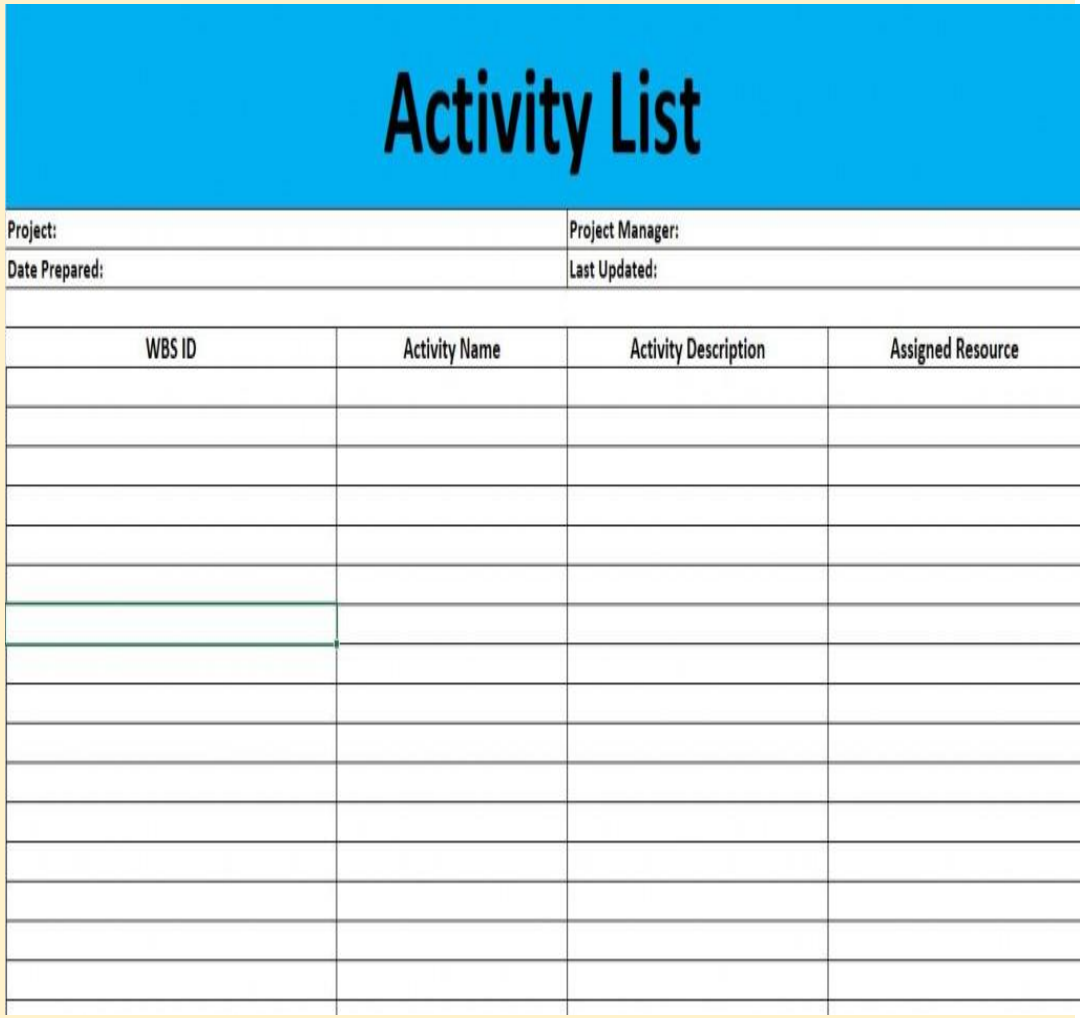
Decomposition

- Subdividing work packages into smaller more manageable components called activities.

The Outputs

Activity List

- includes activity identifier and scope of work description for each activity



Activity List

Project:		Project Manager:	
Date Prepared:		Last Updated:	
WBS ID	Activity Name	Activity Description	Assigned Resource

The Outputs

Activity Attributes

- e.g. Activity ID, WBS ID, Activity Name, Activity Description, predecessor activities, successor activities, logical relationships, resource requirements, dates, ... etc.

ACTIVITY ATTRIBUTES

Project Title: Villa Dr. Nora Eldawood **Date Prepared:** Friday, December 2, 2016

ID: A 1021	**Activity: Wall Painting** دهانات الحوائط

Description of Work:

عام : دهانات بلاستيكية للحوائط الداخلية القابلة للغسيل (مطفى) طبقا للمراحل التاليه

- حف مع صنفرة وتجهيز الحوائط بمعجون الشروخ مع وجه سيلر (اساس)
- عدد 2 سكينة معجون فوتونيت ابيض (B.W.R+ F.W.R)
- عدد 1 سكينة معجون جاهز
- عدد 2 وجه دهان بلاستيك حسب اللون المعتمده من الجهه الاستشارية

Predecessors	Relationship	Lead or Lag	Successor	Relationship	Lead or Lag
Wall Plaster اعمال لياسة الحوائط	SS	Lag 4 Days	Stair handrail ترابزين السلم	FS	0

Number and Type of Resources Required:	Skill Requirements:	Other Required Resources:
4 Mason 2 Labor	Very Good	Painting Equipment

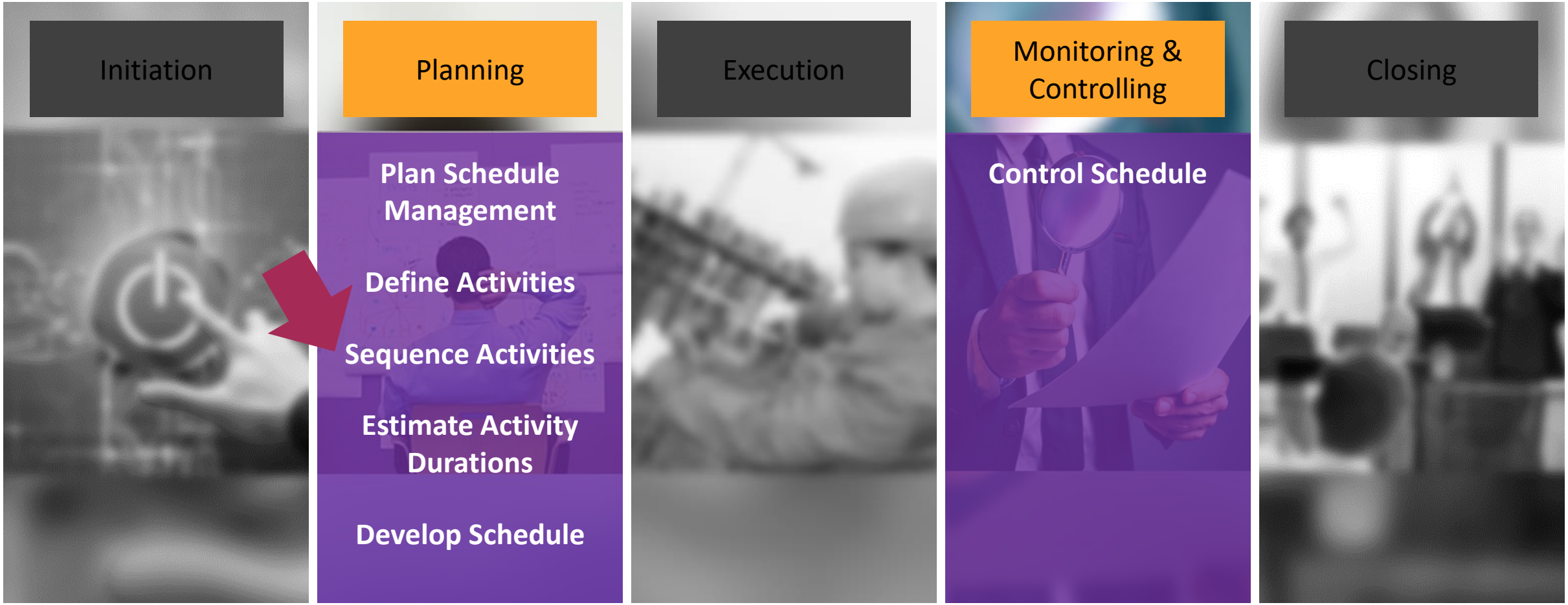
The Outputs

Milestone List

- A milestone is a significant event in the project.
- A milestone list identify all milestones.
- Some milestones can be taken from the contract.

Change Requests

Schedule Management



Sequence Activities

“Identifying and documenting relationships among the project activities”

- Logical relationships are used for sequencing activities.

- Each activity and milestone except the first and last are connected to at least one predecessor and successor

Schedule Management ▸ Planning ▸ Sequence Activities

Input

- Project management plan
- Project documents
- EEF
- OPA

Tools and Techniques

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

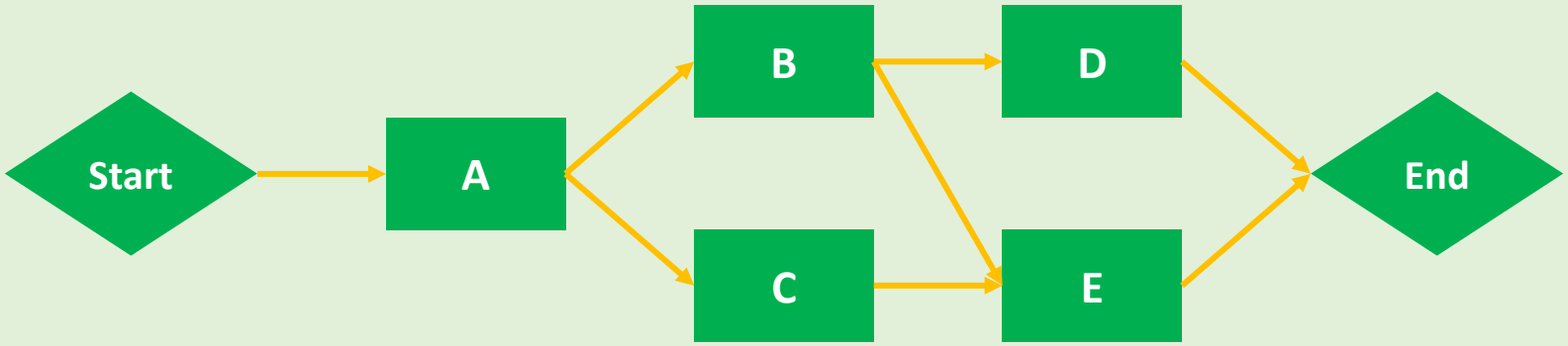
Output

- Project schedule network diagrams

Tools & Techniques

Precedence Diagramming Method

- Precedence Diagramming Method (PDM) using Activity on Node (AON)

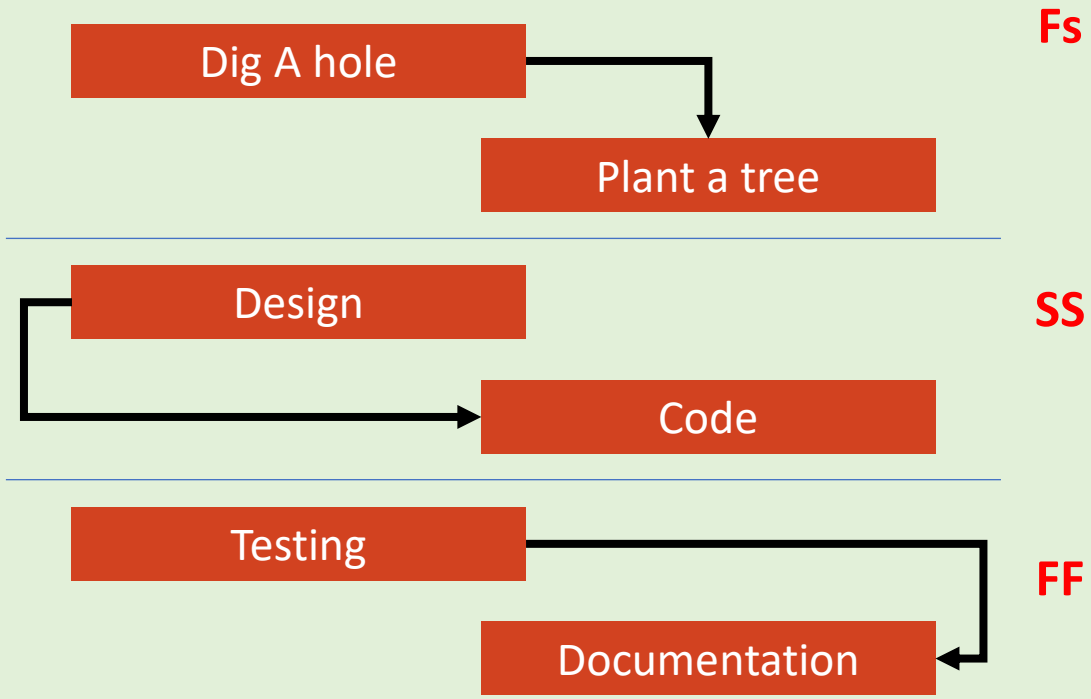


- If the activity is depicted on the node like the this graph, the method will also be called Activity On Node (AON)
- If the activity is depicted on the arrow the method will also be called Activity On Arrow (AOA)

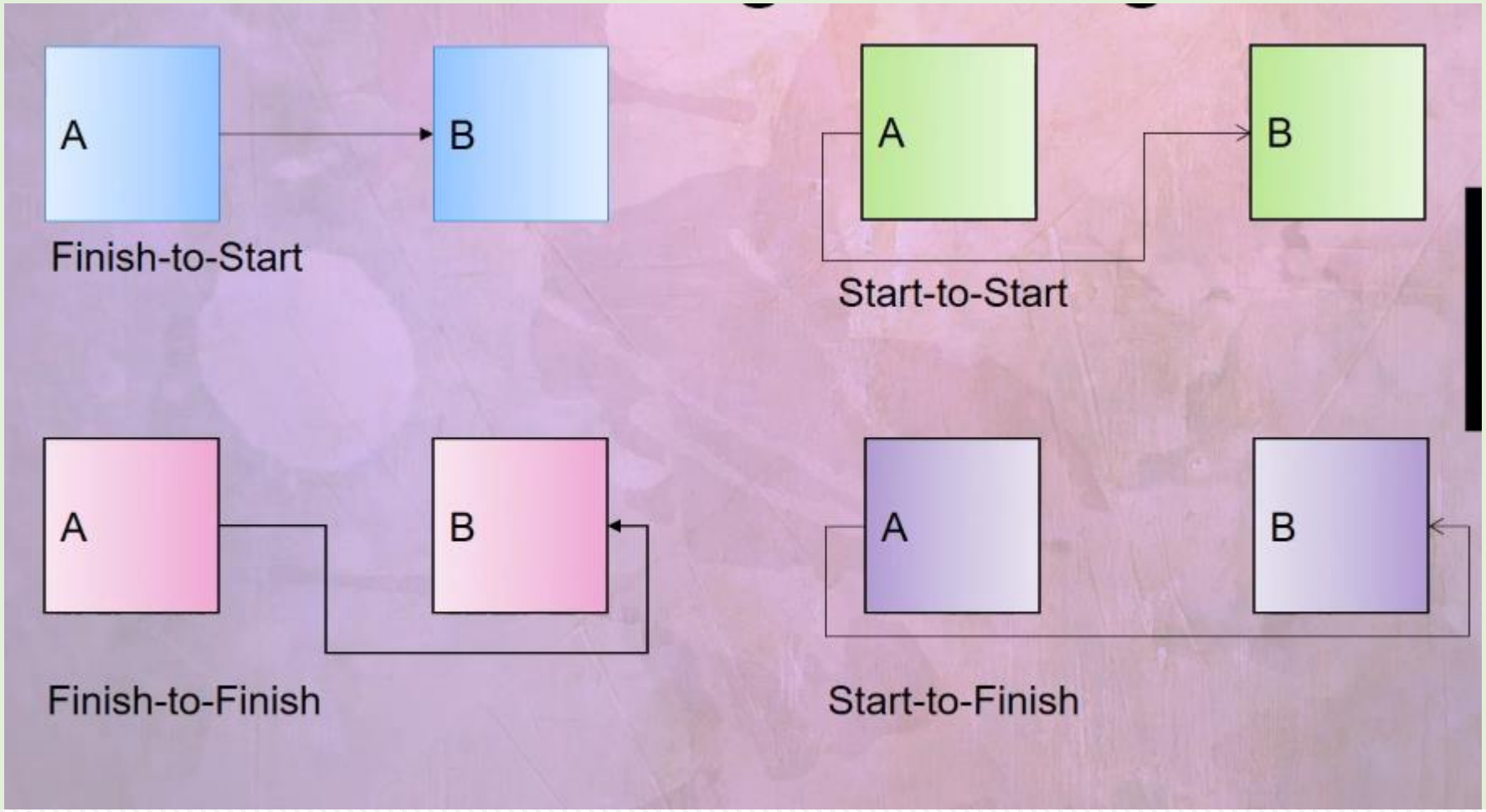
Tools & Techniques

Precedence Diagramming Method

- **FS:** Finish-to-Start e.g. concrete casting then concrete curing
- **SS:** Start-to-Start e.g. Blaster with painting
- **FF:** Finish-to-Finish e.g. touch up(house cleaning) with Hand over . لاتنتهي اعمال تجهيز الكونكريت لحين الانتهاء من الصبff
-
- **SF:** Start-to-Finish e.g. starting new shift
- In PDM, Finish-to-start is the most commonly used, the start-to-finish is rarely used.



Precedence diagramming method



Tools & Techniques

Dependency Determination and Integration

- **Dependency Types:**
  - **Mandatory:**
    - **Mandatory** dependencies: are called **hard logic**. They are usually Contractually required or inherent in the nature of work. (drawings then building)
    - Foundation concrete casting then foundation insulation
  - **Discretionary:**
    - (**Optional**) dependencies: which are Also called **Soft logic**.
    - E.g. Fixing windows and doors after wall painting

Tools & Techniques

Dependency Determination and Integration

- **Dependency Types:**

  - **External: Depend on supplier or inspector**
    - e.g. a testing activity in a software project like accounting program can depend on the delivery of hardware (laptop) from external resource.

  - **Internal : type of hard logic**

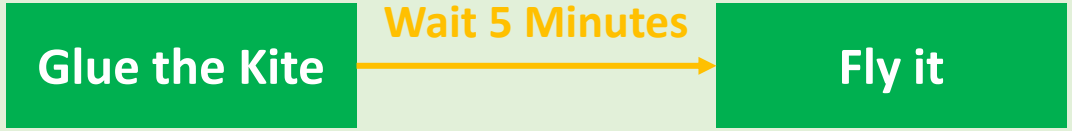
- e.g. your team takes vacation or your management say we need this recourse for another project

Tools & Techniques

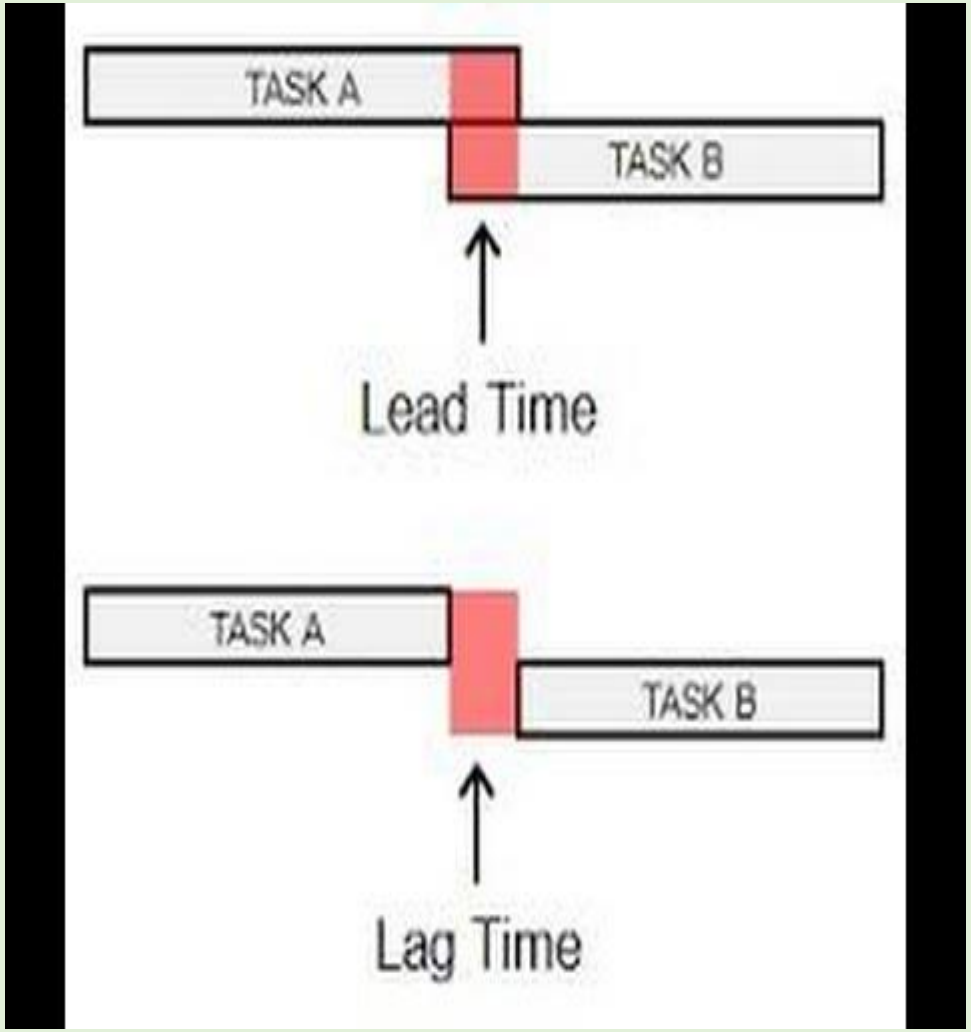
Leads and lags

- A **lead** allows an acceleration of the successor activity (overlapping) e.g. blaster paint

- A **lag** is the waiting time (delay) between two activities.

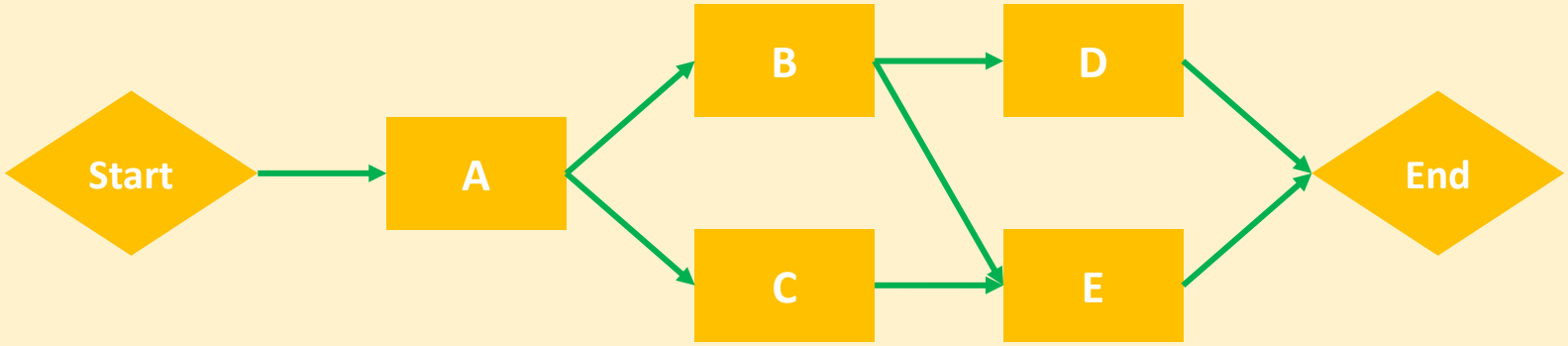


Give me example from your work



The Outputs

- Project Schedule Network Diagrams - ND



Questions

1. The Precedence Diagramming Method (PDM) is:

A. A technique in which activities are represented by nodes and are graphically linked by one or more logical relationships to show the sequence in which the activities are to be performed.

B. A method that uses a probabilistic approach to scheduling project activities.

C. A time-phased graphical representation of the arrow diagramming method (ADM) and shows durations of project activities as well as their dependencies.

D. More accurate than the critical path method for scheduling when there are uncertainties about the durations of project activities

2. An example of a mandatory dependency is :

A. A dependency established based on knowledge of best practices within a particular application area.

B. A dependency established based on some unusual aspect of the project where a specific sequence is desired.

C. On a construction project, to erect the superstructure only after the foundation has been built.

D. On a software development project, to start design only after completion and approval of all project requirements.

Questions

3. Inputs to the Define Activities process are:

A. Schedule management plan, work breakdown structure, project schedule, and network diagram.

B. Project schedule, resource estimates, progress reports, and change requests.

C. Scope management plan, project network diagram, constraints, and assumptions.

D. Schedule management plan, scope baseline, enterprise environmental factors, and organizational process assets.

4. A schedule compression technique used to shorten the schedule duration for the least incremental cost by adding resources is called :

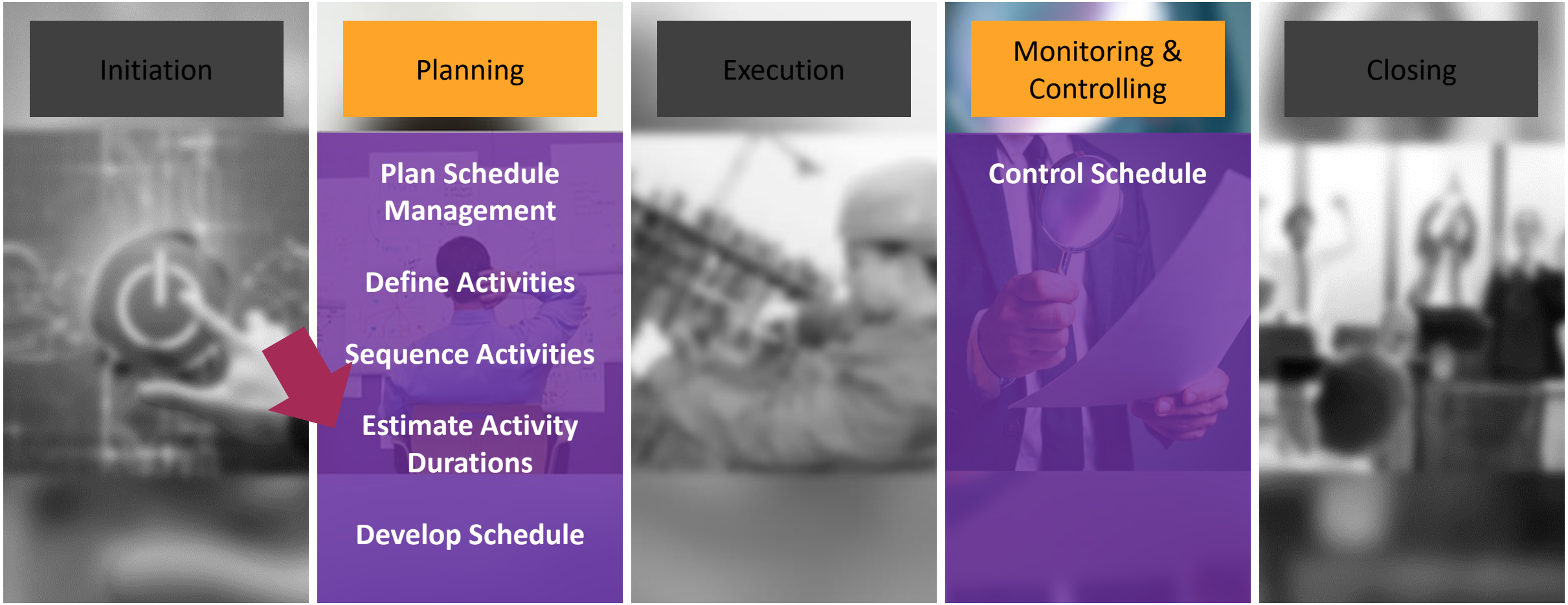
A. Crashing.

B. Program evaluation and review technique (PERT).

C. Precedence diagramming method (PDM).

D. Fast tracking.

Schedule Management



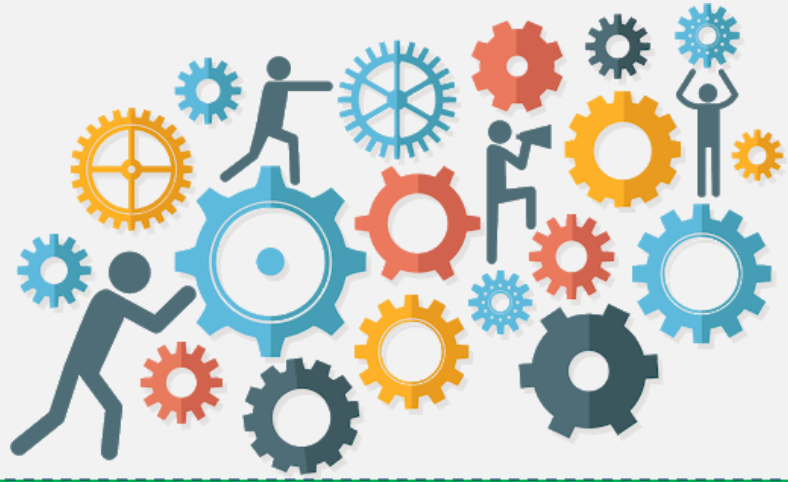
Estimate Activity Duration

"Approximating the number of work periods (days, weeks) needed to complete individual activities with estimated resources"

Schedule Management ▶ Planning ▶ Estimate Activity Durations

Input

- Project management plan (Schedule management plan, Scope baseline)
- Project documents
- EEF
- OPA



Tools and Techniques

- Expert judgment
- Analogous estimating
- Parametric estimating
- Three-point estimating
- Bottom-up estimating
- Data analysis
- Decision making
- Meetings

Output

- Duration estimates
- Basis of estimates

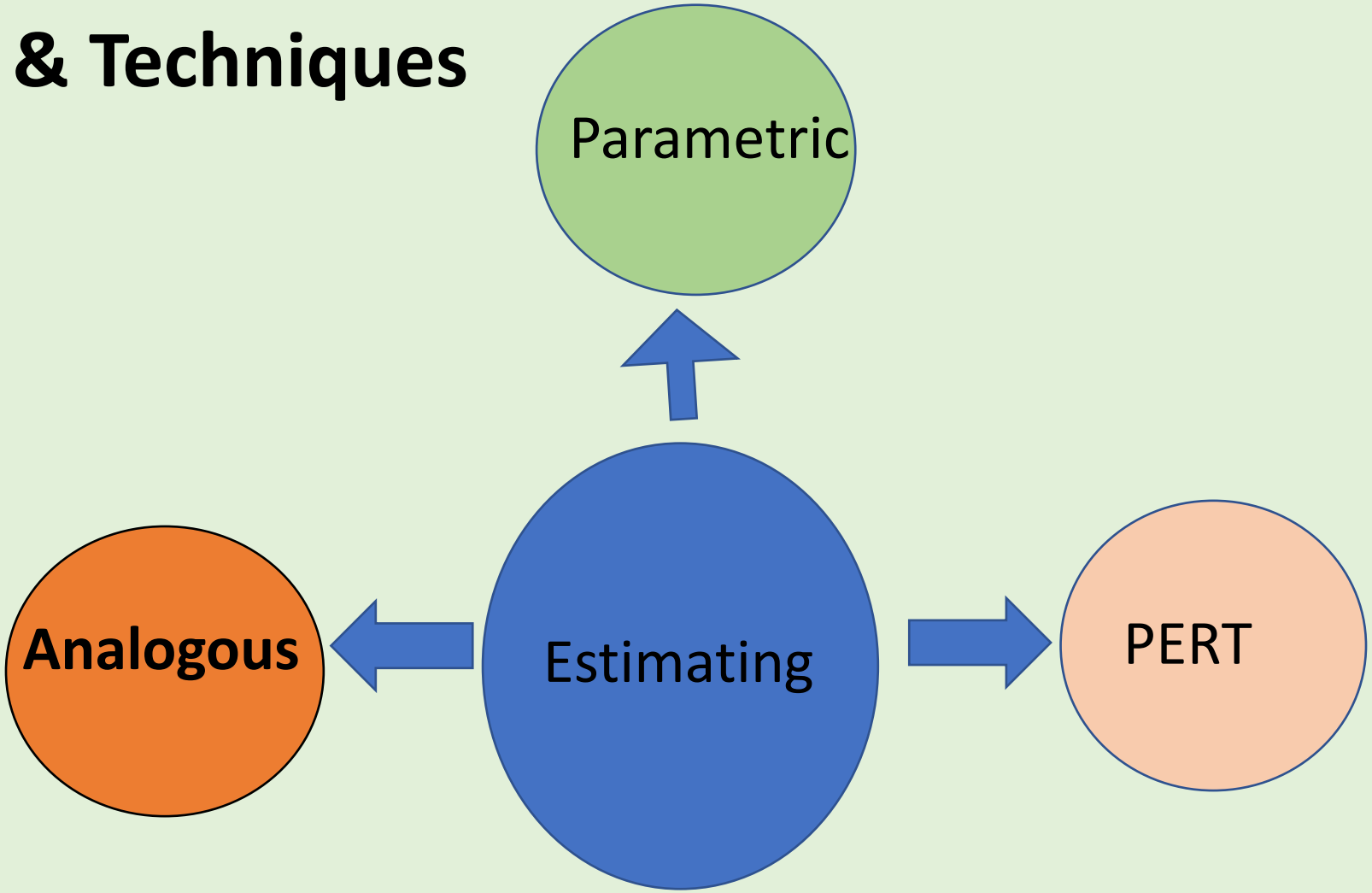
Tools & Techniques

Expert Judgment

- Team or External Expertise may help in duration estimates.

- Schedule development, management, and control; Expertise in estimating; and Discipline or application knowledge.

Tools & Techniques



Tools & Techniques

Analogous Estimate

- Uses information from historical projects to estimate activity duration.

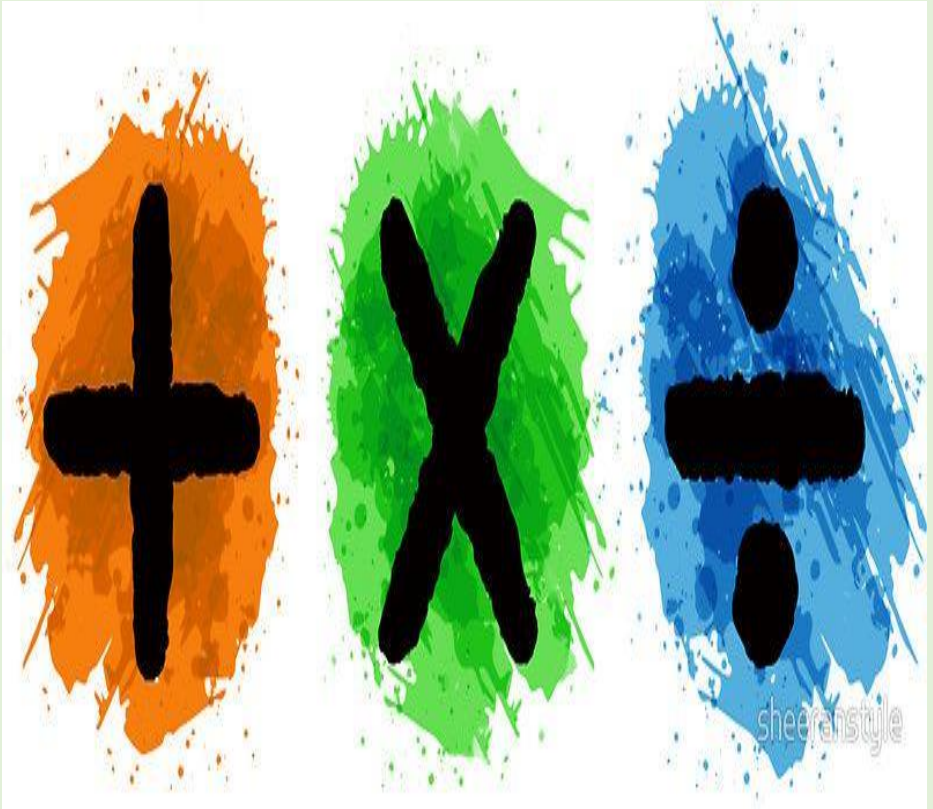
- Less accurate saving time

Tools & Techniques

Parametric Estimate

- Multiplies two parameters taken from historical projects to estimate activity duration.

- MORE ACCURATE



Tools & Techniques

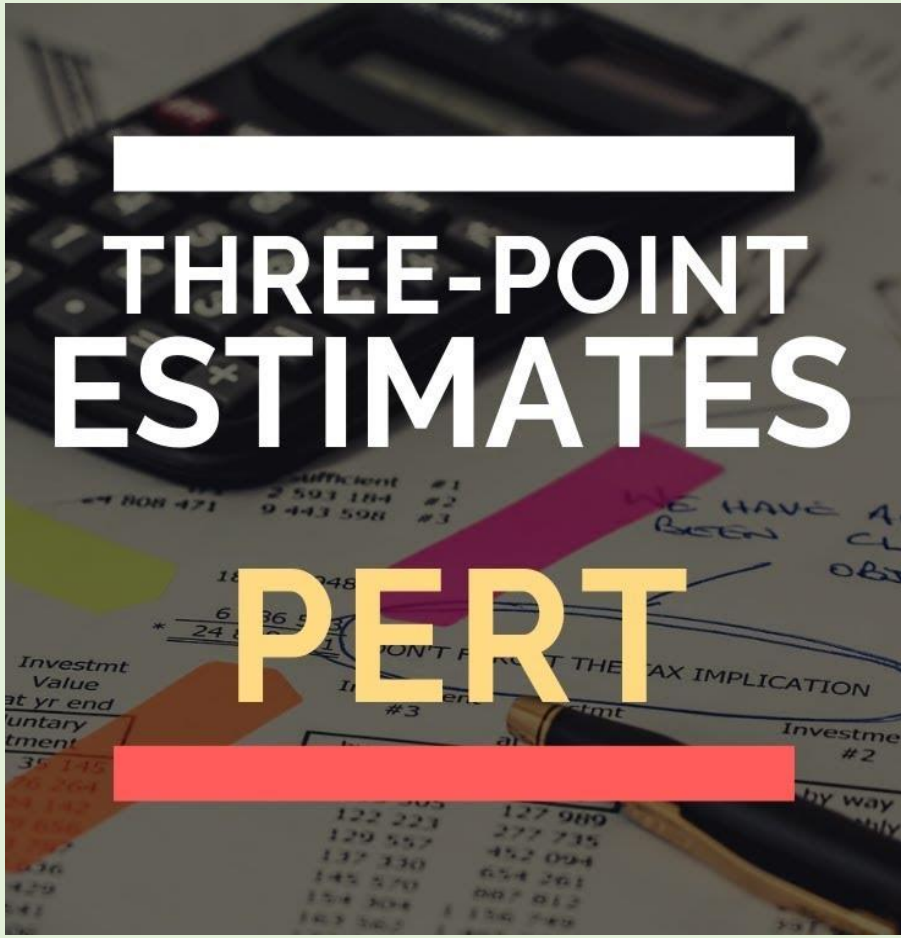
Three Point Estimate (PERT)

- Depends on **PERT** (**P**roject **E**valuation & **R**eview **T**echnique) which Uses three estimates:
- Most likely (**M**), Optimistic (**O**) and Pessimistic (**P**)

in the 2 formulas:

Triangle distribution **E=(O + M + P) / 3**

Beta distribution **E=(O + 4M + P) / 6**



EXERCISE :

Calculate activity duration :

Optimistic =40 hours
Most likely =55 hours
Pessimistic =70 hours

Tools & Techniques

Bottom-Up Estimating

- By dividing an activity to smaller parts, estimating each resulting part then aggregating them up to reach the total estimation.

Tools & Techniques

Group Decision-Making Techniques

- Decisions are needed when different opinions are reached in estimation.

Tools & Techniques

Data Analysis (Alternatives and Reserve Analysis)

- Contingency reserves (or **buffer**) may be percentage or fixed and should be clearly identified in schedule documentation.

Tools & Techniques

Meetings

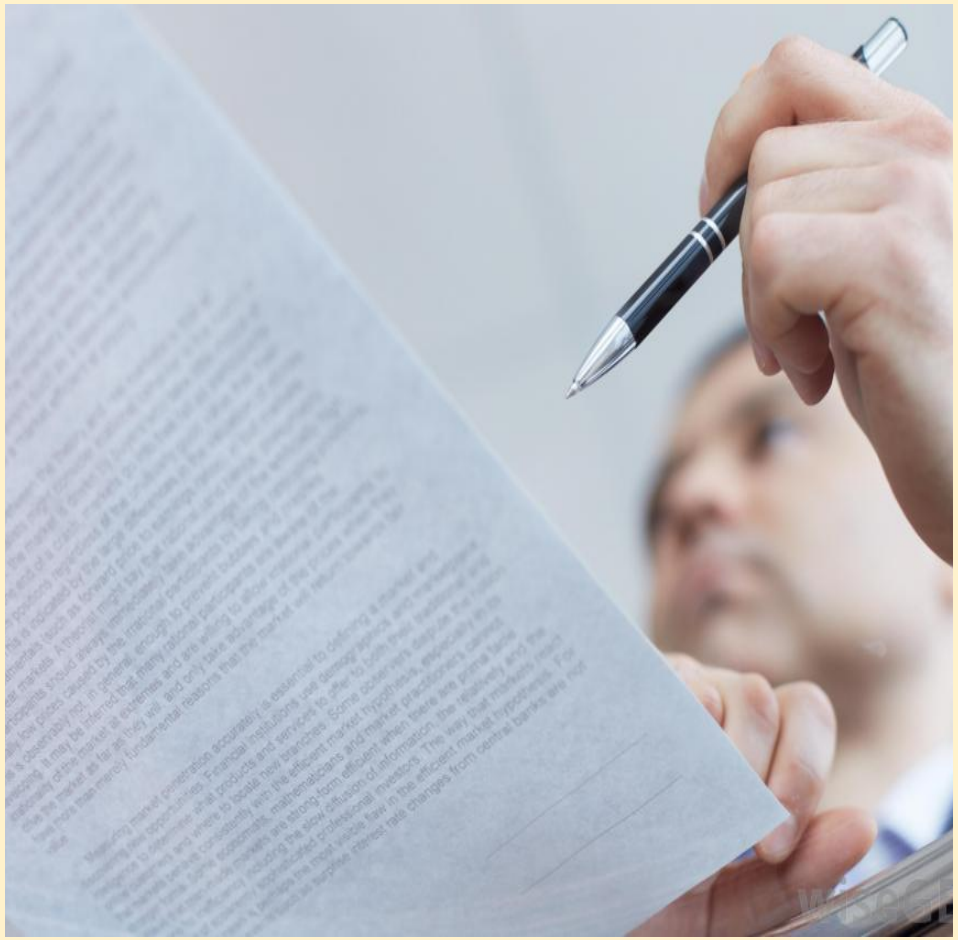
DO A MEETING WITH YOUR TEAM REGULARLY TO REVIEW THE ACTIVITY DURATIONS

The Outputs

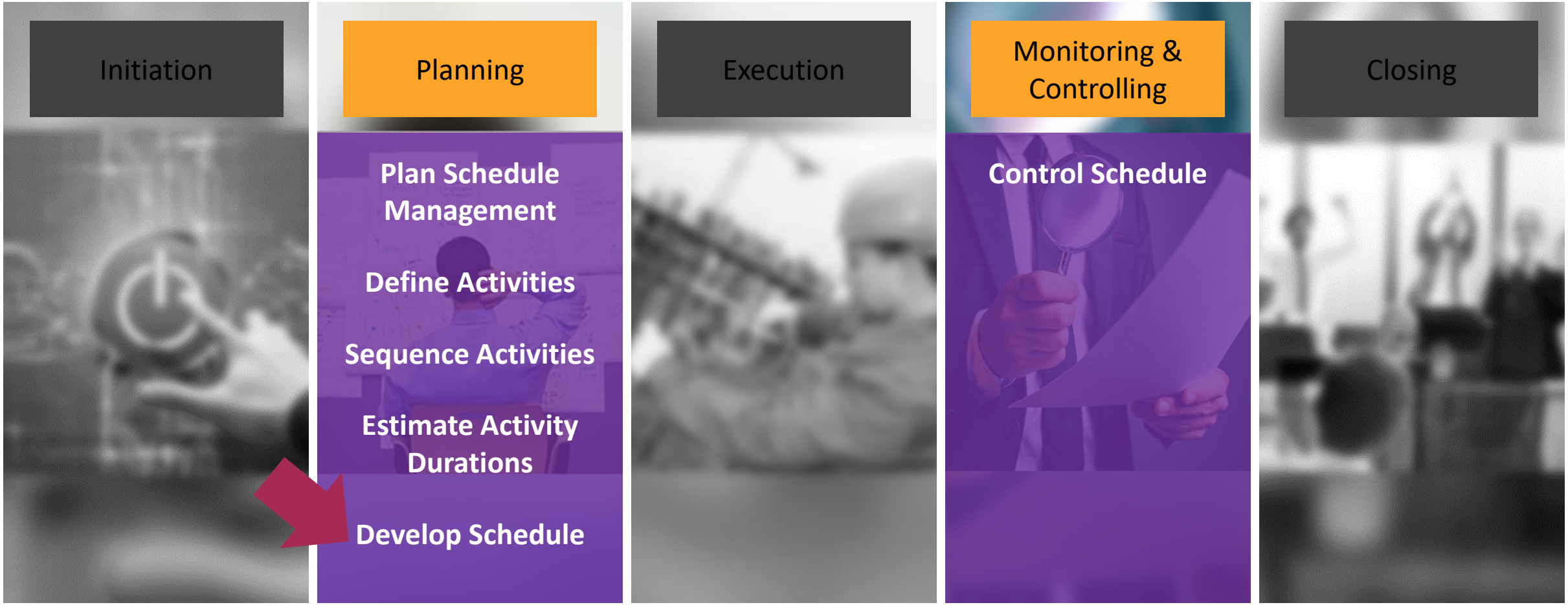
Activity Duration Estimates

- May include some indication of range e.g. + or - 2 days or weeks

Or 15% probability



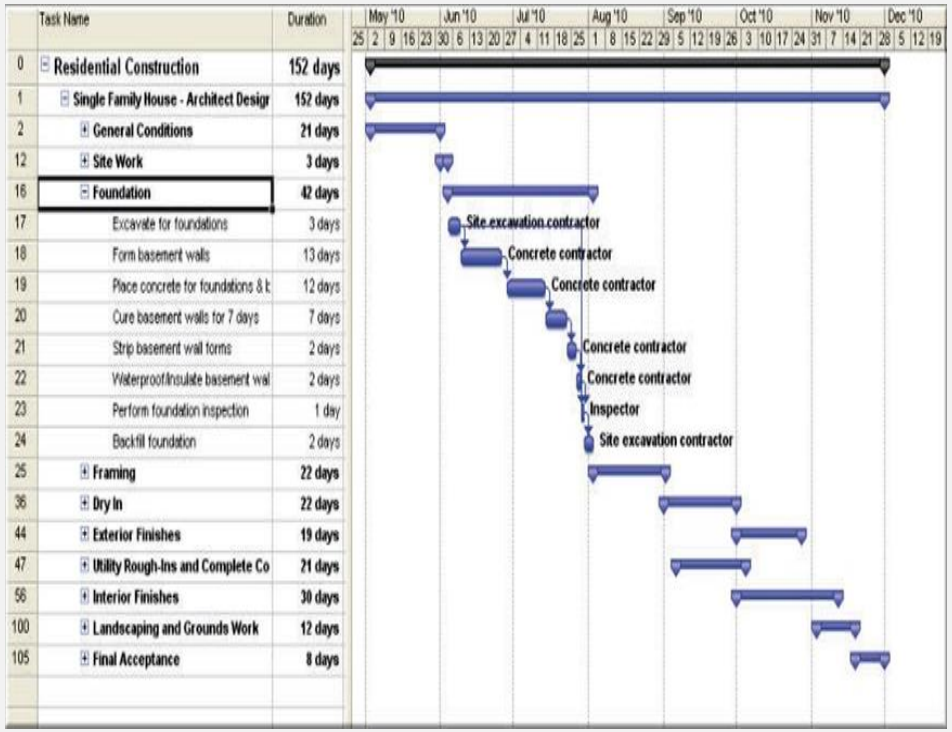
Schedule Management



Develop Schedule

"Analyzing activity sequences, durations, resource requirements and schedule constraints to create the project schedule"

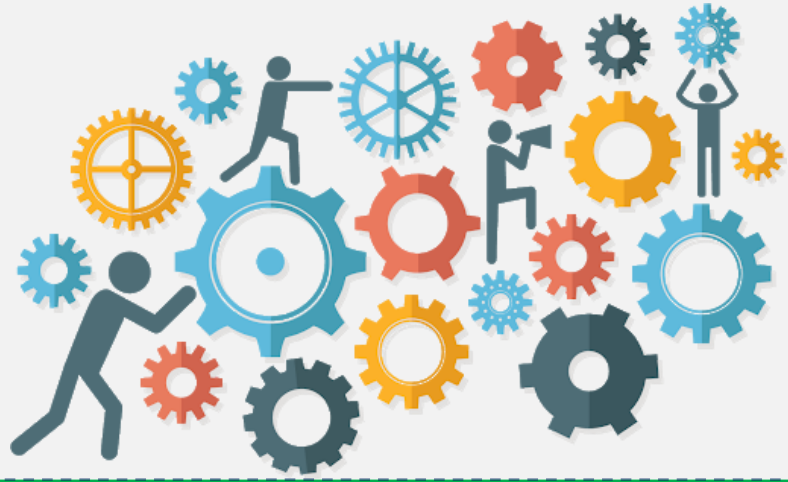
- Develop schedule is an iterative process
- Revising and updating schedule continues through the project



Schedule Management ▶ Planning ▶ Develop Schedule

Input

- Project management plan
- Agreements
- EEF
- OPA



Tools and Techniques

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

Output

- Schedule baseline
- Project schedule
- Schedule data
- Project calendars
- Change Requests

Tools & Techniques

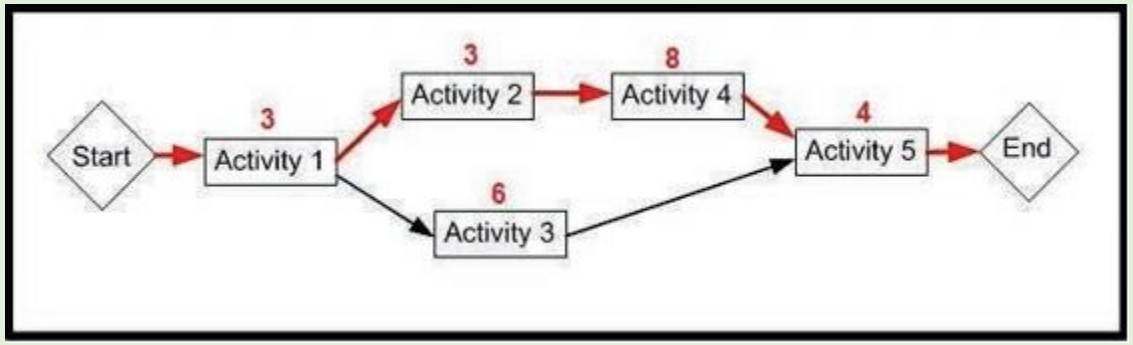
Schedule Network Analysis

- Applying analytical techniques like:
  - Critical Path Method
  - Schedule Compression
  - What-if analysis
  - Resource leveling
  - Critical chain method

Tools & Techniques

Critical Path Method - CPM

- Calculates early start and finish dates and late start and finish for project activities by performing a forward and backward pass analysis through the schedule network.



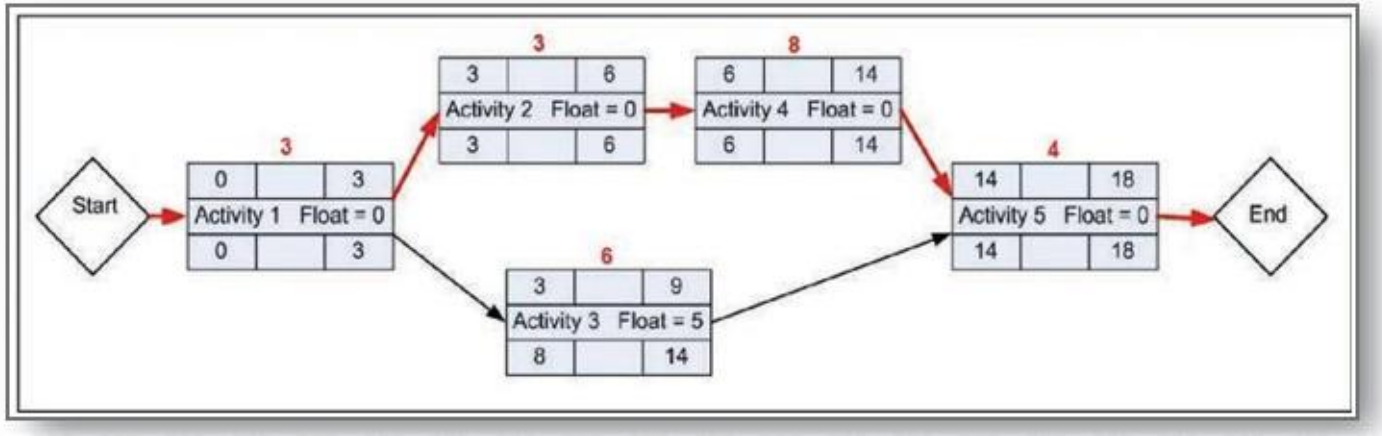
- Path 1 = Start(0) + Activity1(3)+Activity2(3)+Activity4(8)+Activity5(4) = 18
- Path 2 = Start(0) + Activity1(3)+Activity3(6)+Activity5(4) = 13
- Then Critical Path = Path 1 (the longest)

Tools & Techniques

Critical Path Method - CPM

Activity	Preceding Activity	Estimate in Weeks
Start		0
Activity 1	Start	3
Activity 2	Activity 1	3
Activity 3	Activity 1	6
Activity 4	Activity 2	8
Activity 5	Activity 4, Activity 3	4
End	Activity 5	0

Float = LS - ES = LF - EF
Float of Activity3 = 5



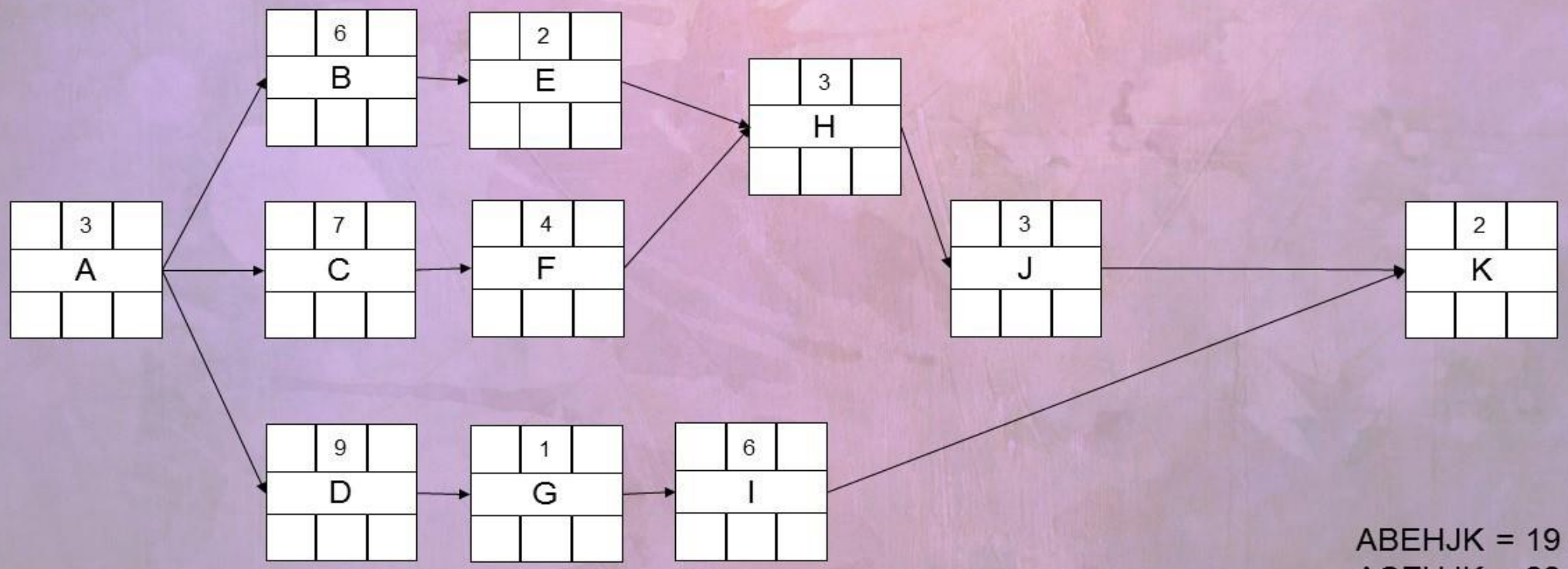
Tools & Techniques

Leads and lags

Lead
Lead is the **acceleration** of a successor activity
FS Activities
In discretionary activities

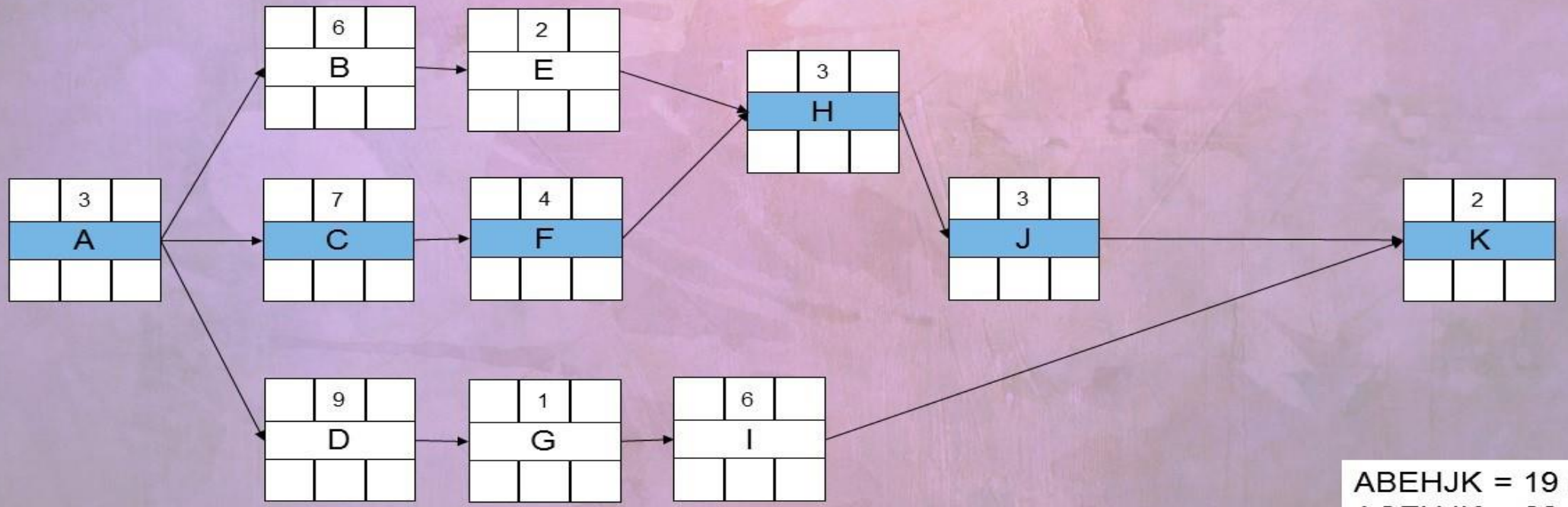
Lag
Lag is the **delay** of a successor activity and represents time that must pass before the second activity can begin.

Find Paths and Durations



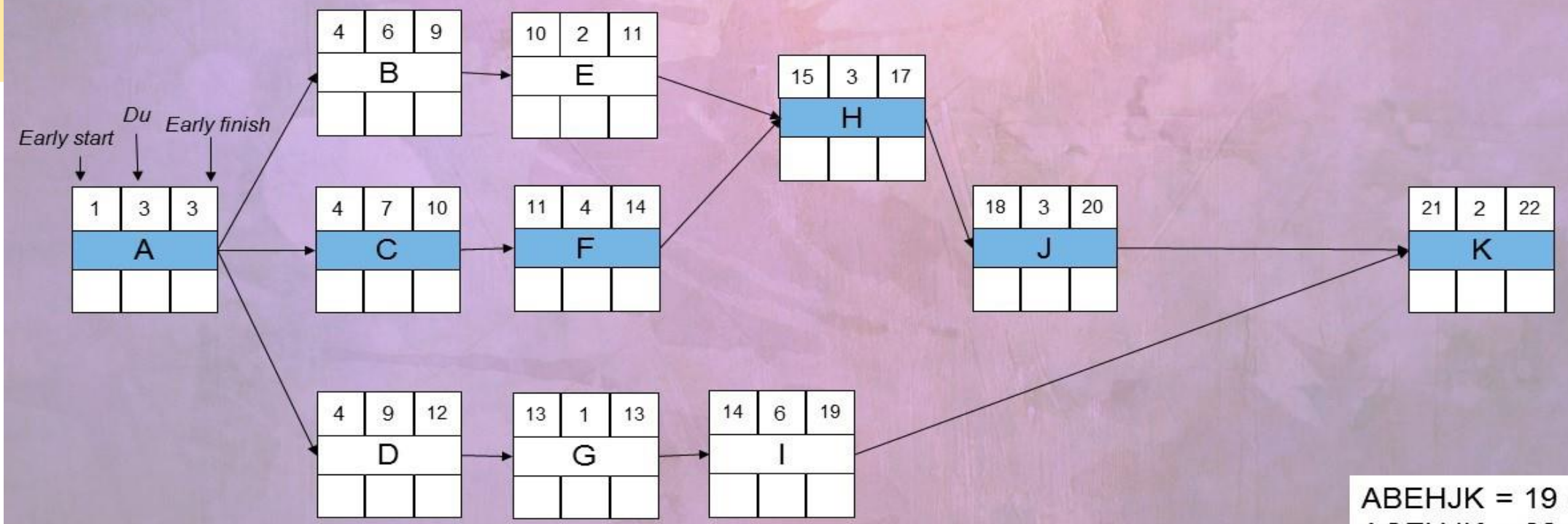
ABEHJK = 19 days
ACFHJK = 22 days
ADGIK = 21 days

Critical Path is Longest



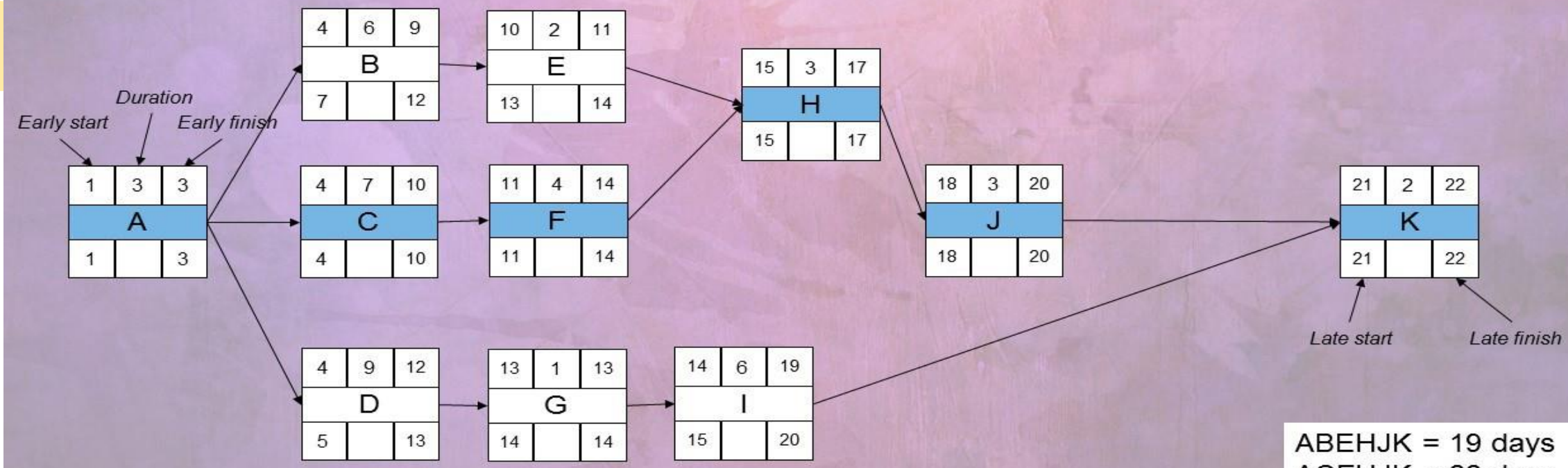
ABEHJK = 19 days
ACFHJK = 22 days
ADGIK = 21 days

Forward Pass: ES +du -1 = EF Path



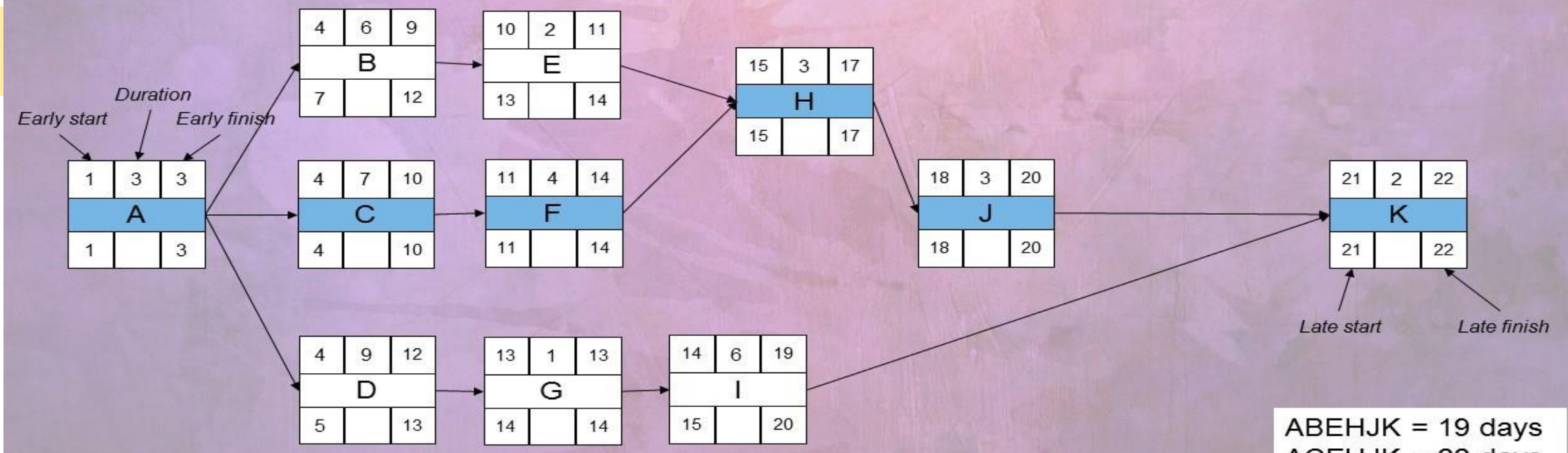
ABEHJK = 19 days
ACFHJK = 22 days
ADGIK = 21 days

Backward Pass: LF -du +1 = LS

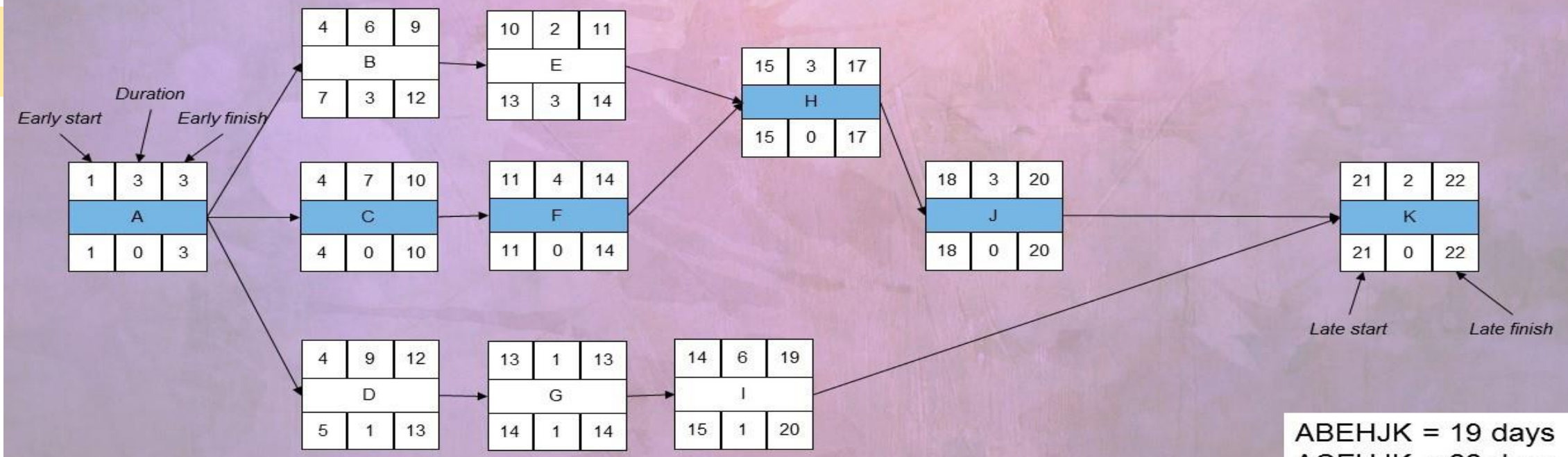


ABEHJK = 19 days
ACFHJK = 22 days
ADGIK = 21 days

Find Float: LF-EF or LS-ES



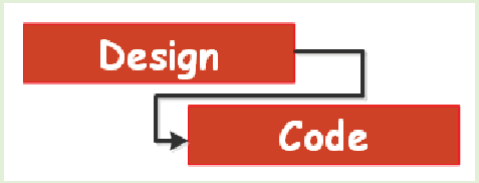
Find Float: LF-EF or LS-ES



Tools & Techniques

Schedule Compression

- **Crashing:**
  - Where schedule is compressed by increasing the cost, examples are: overtime and additional resources.
- **Fast Tracking:**
  - Where phases or activities normally performed in sequence are performed in parallel.



  - Fast-Tracking could be implemented by methods like applying leads or completely running two tasks in parallel.

Tools & Techniques

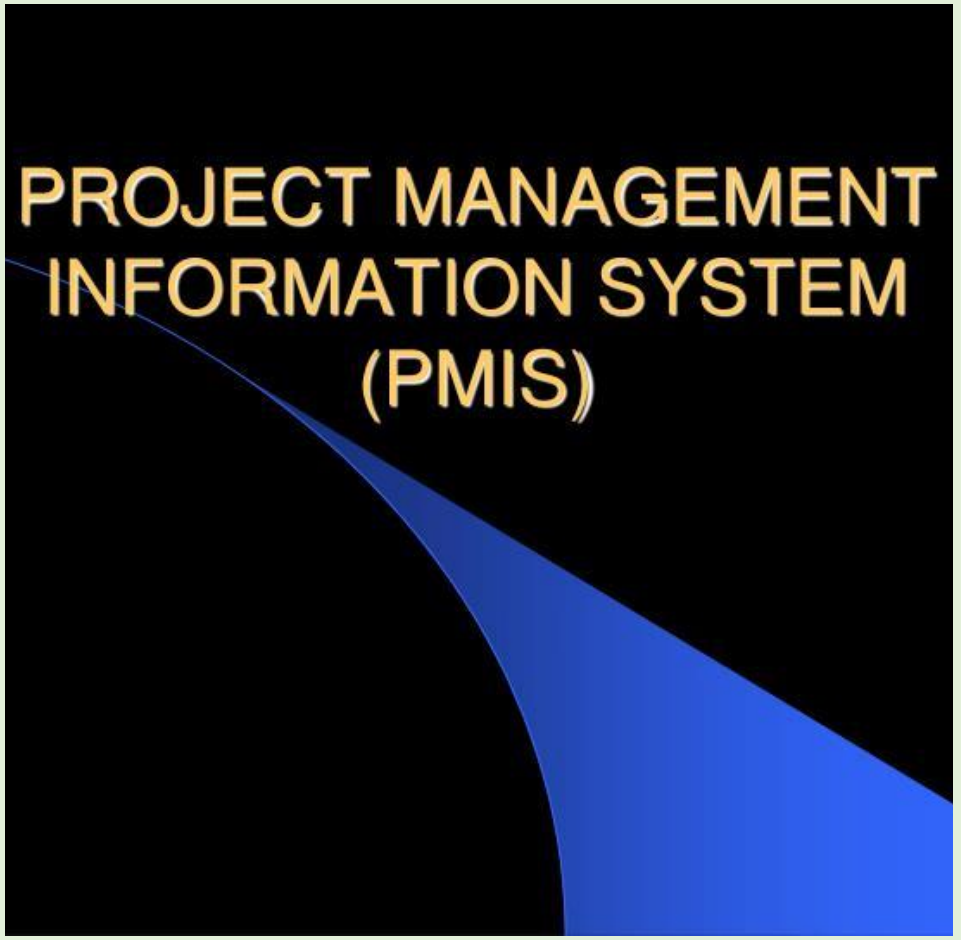
Resource Optimization techniques (Leveling)

- Can be used to keep resource usage at a constant level.
- Resource leveling is necessary when resources have been over-allocated.
- Resource leveling can cause the original critical path to change.

Tools & Techniques

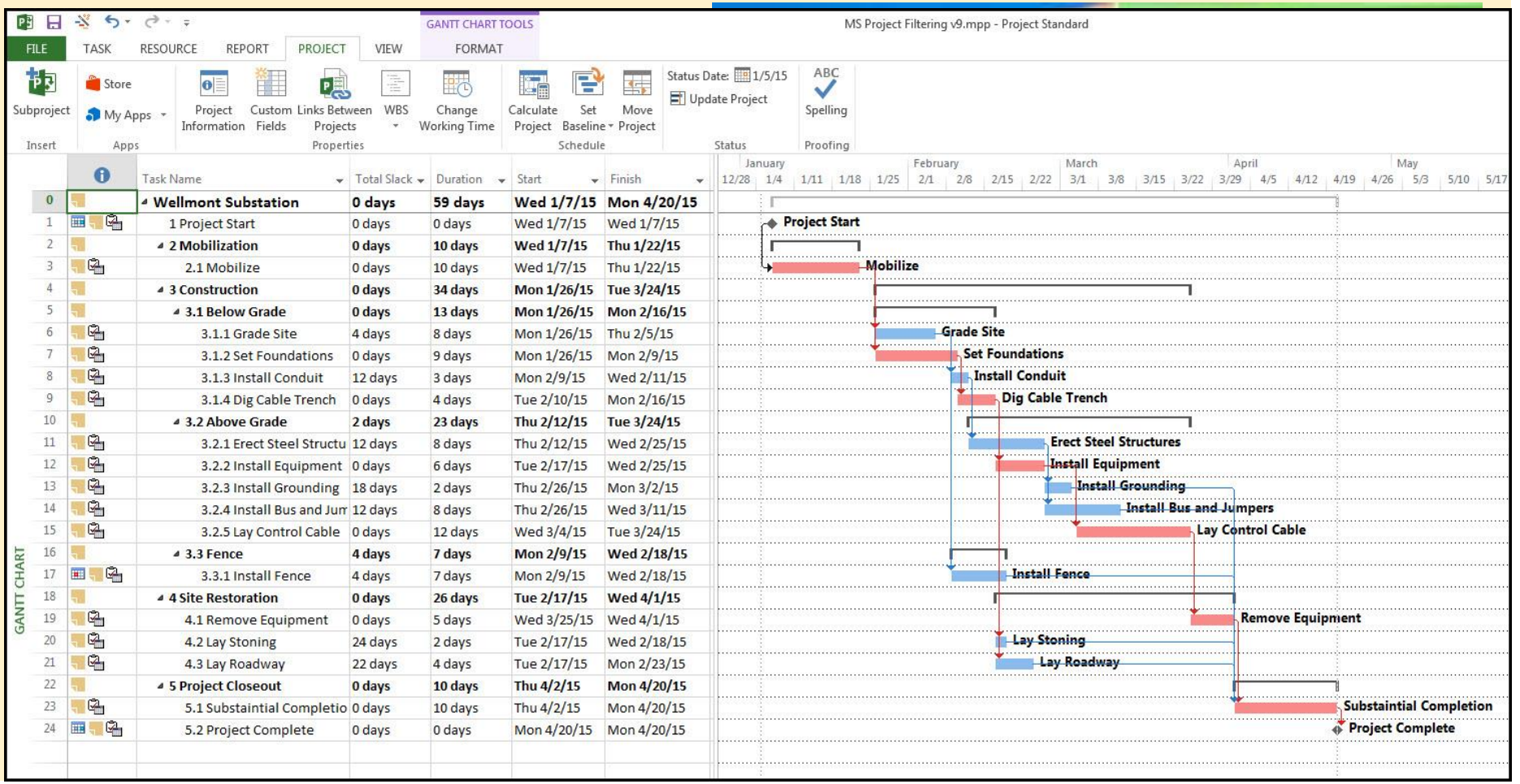
Project Management Information System - PMIS

- Like Scheduling Tools and the resulting information.



The Outputs

Project Schedule



The Outputs

Schedule Baseline

- Is a specific version of the project schedule developed from the schedule network analysis and **approved** by the project management team
- It is a component of the project management plan.
- It’s frozen

The Outputs

Schedule Data

- Includes at least the schedule milestones, schedule activities, activity attributes and documentation of identified assumptions and constraints.

The Outputs

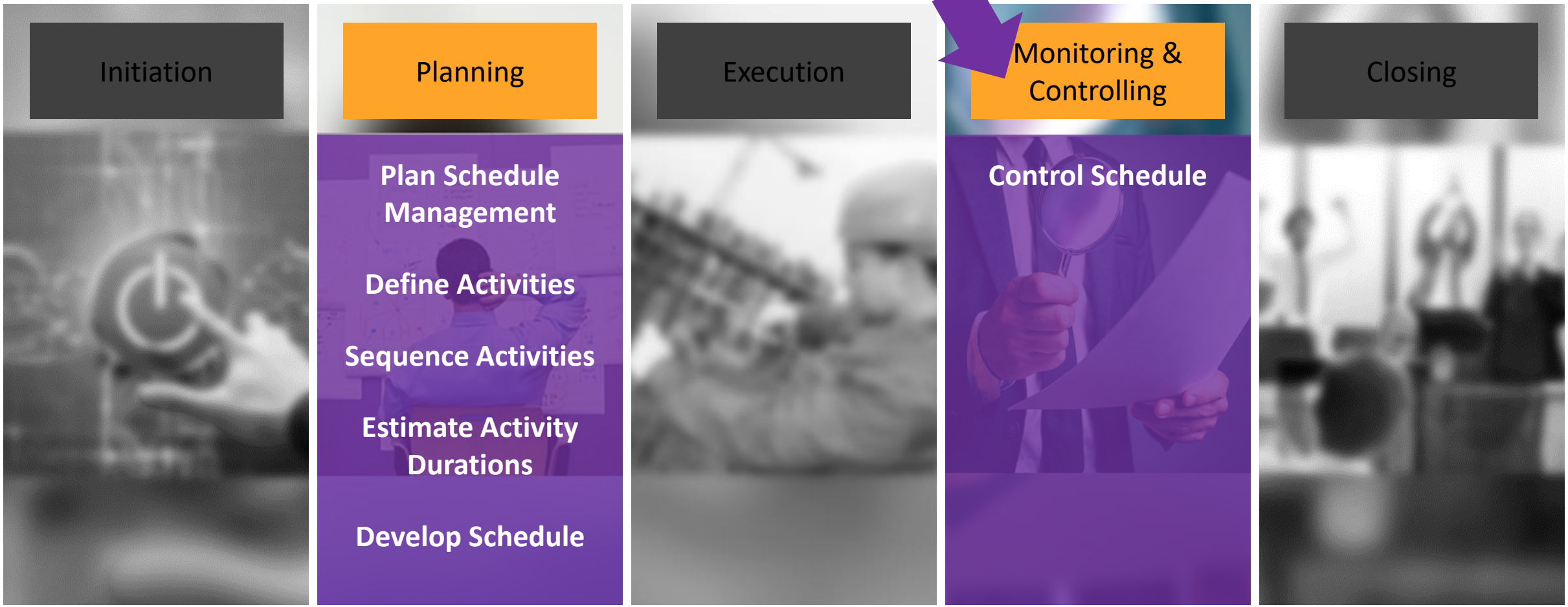
Project Calendar

A project calendar identifies working days and shifts that are available for scheduled activities. It distinguishes time periods in days or parts of days that are available to complete scheduled activities from time periods that are not available for work (**you have to know the holidays national days etc….**

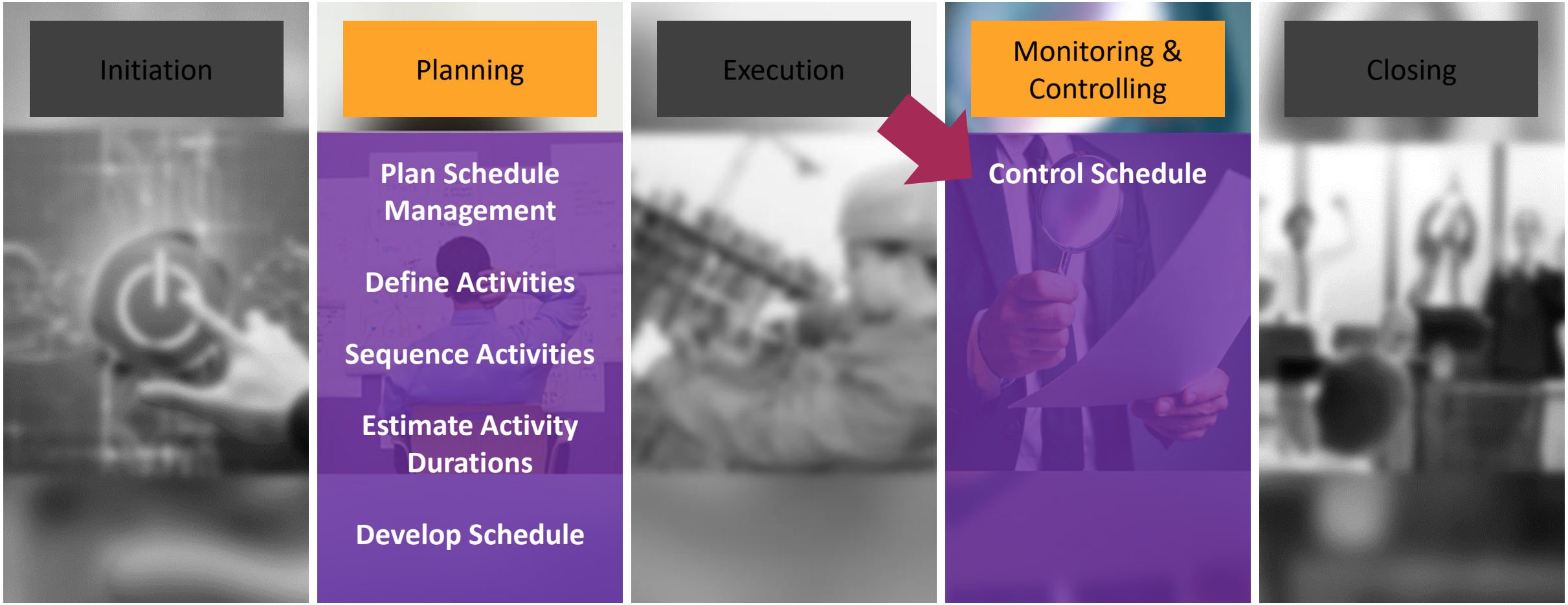
The Outputs

- Change Requests

Schedule Management



Schedule Management



Control Schedule

“Monitoring the status of the project to update project progress and manage changes to the schedule baseline.”

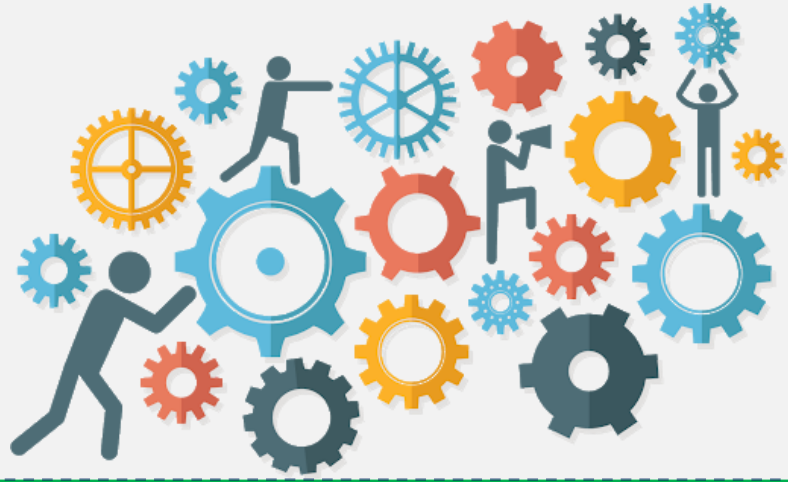
This includes:

- Determining current status of project schedule.
- Managing schedule changes.

Schedule Management ▸ M&C ▸ Control Schedule

Input

- Project management plan
- Project documents
- Work performance data
- OPA



Tools and Techniques

- Data analysis
- Resource optimization
- Project management information system
- Leads and lags
- Schedule compression

Output

- Work performance information
- Schedule forecasts
- Change Requests

Tools & Techniques

Data analysis

- Performance reviews
- Earned value analysis
- Trend analysis
- Variance analysis
- What-if scenario analysis
- Critical path method

Tools & Techniques

- Project Management Information System - PMIS

Tools & Techniques

Resource Optimization Techniques (Leveling)

A technique in which start and finish dates are adjusted based on resource constraints with the goal of balancing the demand for resources with the available supply.
Resource leveling can be used when shared or critically required resources are available only at certain times or in limited quantities

Tools & Techniques

- Leads and Lags

Tools & Techniques

Schedule Compression

Fast track

Crash

The Outputs

Schedule forecasts

Estimates or predictions of conditions and events in the project's future based on information and knowledge available at the time of the forecast. Forecasts are updated and reissued based on work performance information provided as the project is executed.

The Outputs

Change Requests

Schedule variance analysis, as well as reviews of progress reports, results of performance measures, and modifications to the project scope or project schedule, may result in change requests to the schedule baseline, scope baseline, and/or other components of the project management plan

Questions

5. The “fast tracking” method of schedule compression involves

A. The use of industrial engineering techniques to improve productivity, thereby finishing the project earlier than originally planned.

B. Performing in parallel for at least a portion of their duration activities or phases that are normally done in sequence, which may result in rework and increased risk.

C. Going on a “mandatory overtime schedule” to complete the project on schedule or earlier if possible.

D. Assigning “dedicated teams” to critical path activities to achieve project schedule objectives

6. The Project Schedule Management processes include :

A. Plan Schedule Management , Define Activities , Sequence Activities , Estimate Activity Durations , Develop Schedule And Control Schedule .

B. Activity Definition, Sequence Activities , Estimate Activity Durations, Control Schedule and Report Activity Results.

C. Activity Definition, , Sequence Activities , Estimate Activity Durations , , Control Activities and Activity Execution.

D. Sequence Activities , Estimate Activity Durations, Execute Activities, Control Activities, and Monitor Schedule Result

Questions

7. The duration of the activity is affected by all of the following EXCEPT:

A. The estimated activity resource requirements.

B. The types of resources assigned to the activity.

C. The availability of the resources assigned to the activity.

D. Using the precedence diagramming method (PDM) for scheduling activities instead of using the critical path method (CPM)

8. Consider the following three estimates for the duration of an activity:
Optimistic (tO) = 4 weeks. Most likely (tM) = 5 weeks. Pessimistic (tP) = 9 weeks.
Using the beta distribution and the three- point estimating approach, the calculated Expected activity duration (tE) is:

A. 4.0weeks.
B. 4.5weeks.
C. 5.5weeks.
D. 6.5weeks.

Questions

9. Consider the following information about the duration of an activity:
Calculated expected (tE) = 5 weeks. Optimistic (tO) = 4 weeks.
Pessimistic (tP) = 8 weeks.
Using the beta distribution and the three- point estimating approach, the Most likely (tM) activity duration is:

A. 4.0weeks.
B. 4.5weeks.
C. 5.0weeks.
D. 6.0weeks.

10 . Consider the following three estimates for the duration of an activity: Optimistic (tO) = 6 weeks Most likely (tM) = 9 weeks Pessimistic (tP) = 15 weeks Using the triangular distribution, the calculated Expected activity duration (tE) is:

A. 10.0 weeks.
B. 10.5 weeks.
C. 11.5 weeks.
D. 12.0 week

Questions

11. **Ben is a project manager in a successful product launch in Silicon Valley. He often comes across factors in the planning process that are considered to be true, real, or certain, without proof or demonstration.**

These are called:

A. Constraints.

B. Dependencies.

C. Leads and lags.

D. Assumptions.

12. An activity in a project network has the following characteristics: ES = 5, EF = 10, and LF = 14. Therefore, LS.=

A. 9.0weeks.

B. 10.0weeks.

C. 11.0weeks.

D. 12.0weeks .

Agile Considerations

- Agile approaches cycles and their rapid feedback manifest as iterative scheduling and on-demand, pull-based scheduling.
- In large organizations, scaling factors may be used to classify and manage project, these factors may include:
  - Team size
  - Geographical distribution
  - Regulatory compliance
  - Organizational complexities
  - Technical complexities.
- A range of techniques utilizing, predictive approach, adaptive approach or a hybrid of both may need be adopted.
- The project manager role does not change, however, he needs to understand how to apply Agile techniques effectively.

Knowledge Areas

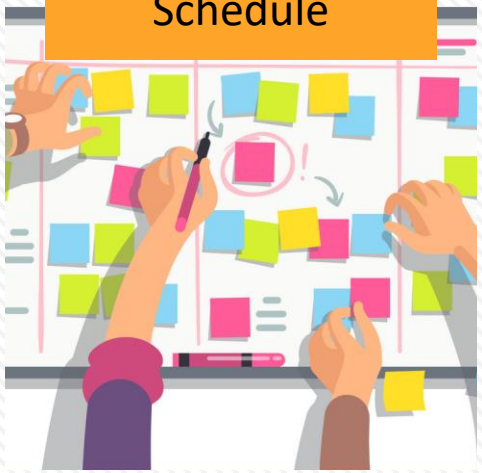
4 Cost

The 10 Knowledge Areas

Integration

Scope

Schedule



Cost

Quality

Resources

Communication

Risk

Procurements

Stakeholders

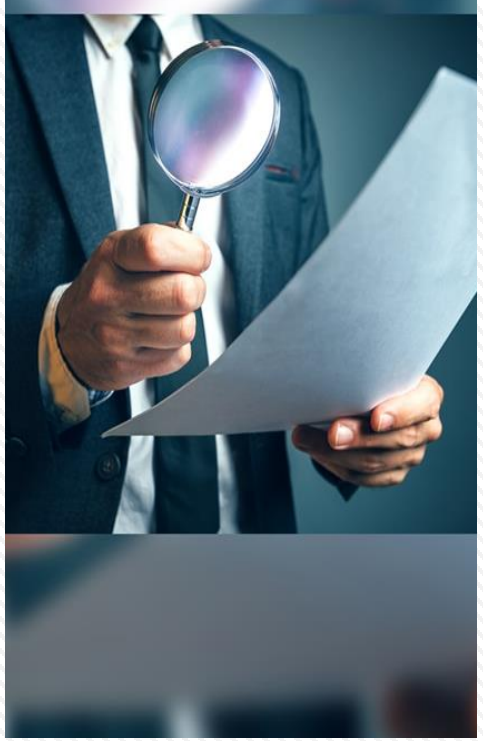
Cost Management

Initiation

Planning

Execution

Monitoring & Controlling



Closing

Cost Management

Project management Processes - PMBOK 6

Initiating

- Develop Project Charter
- Identify Stakeholders

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Legend

- Integration
- Scope
- Time
- Cost
- Quality
- Human Resource
- Communications
- Risk
- Procurement
- Stakeholder

Planning

- Plan Stakeholder Management
- Develop Project Management Plan
- Plan Scope Management
- Collect Requirements
- Plan Quality Management
- Define Scope
- Create WBS
- Plan Communications Management
- Plan Schedule Management
- Define Activities
- Plan Human Resource Management
- Plan Risk Responses
- Perform Quantitive Risk Analysis
- Perform Qualitative Risk Analysis
- Plan Risk Management
- Identify Risks
- Plan Procurement Management
- Plan Cost Management
- Estimate Costs
- Determine Budget
- Sequence Activities
- Develop Schedule
- Estimate Activity Resource
- Estimate Activity Durations

Executing

- Direct And Manage Project Work
- Manage Project Knowledge
- Perform Quality Assurance
- Implement Risk Response
- Acquire Project Team
- Manage Communications
- Develop Project Team
- Conduct Procurements
- Manage Project Team
- Manage Stakeholder Engagement

Closing

- Close Project or Phase

Monitoring & Controlling

- Monitor And Control Project Work
- Validate Scope
- Control Scope
- Control Schedule
- Control Costs
- Control Quality
- Control Communications
- Control Risks
- Control Procurements
- Control Stakeholder Engagement
- Control Resource
- Perform Integrated Change Control

Cost Management

"Estimating, budgeting and controlling costs so that the project can be completed within the approved budget.“

Cost Management

Initiation

Planning

Plan Cost Management

Estimate Costs

Determine Budget

Execution

Monitoring & Controlling

Control Costs

Closing

Cost Management

Plan Cost Management

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

Cost Management ▸ Planning ▸ Plan Cost Management

Input

- Project charter
- Project management plan
- EEF
- OPA

Tools and Techniques

- Expert judgment
- Data analysis
- Meetings

Output

- Cost management plan

Tools & Techniques

- Expert Judgment

Tools & Techniques

Meetings

- Planning meetings to develop the cost management plan

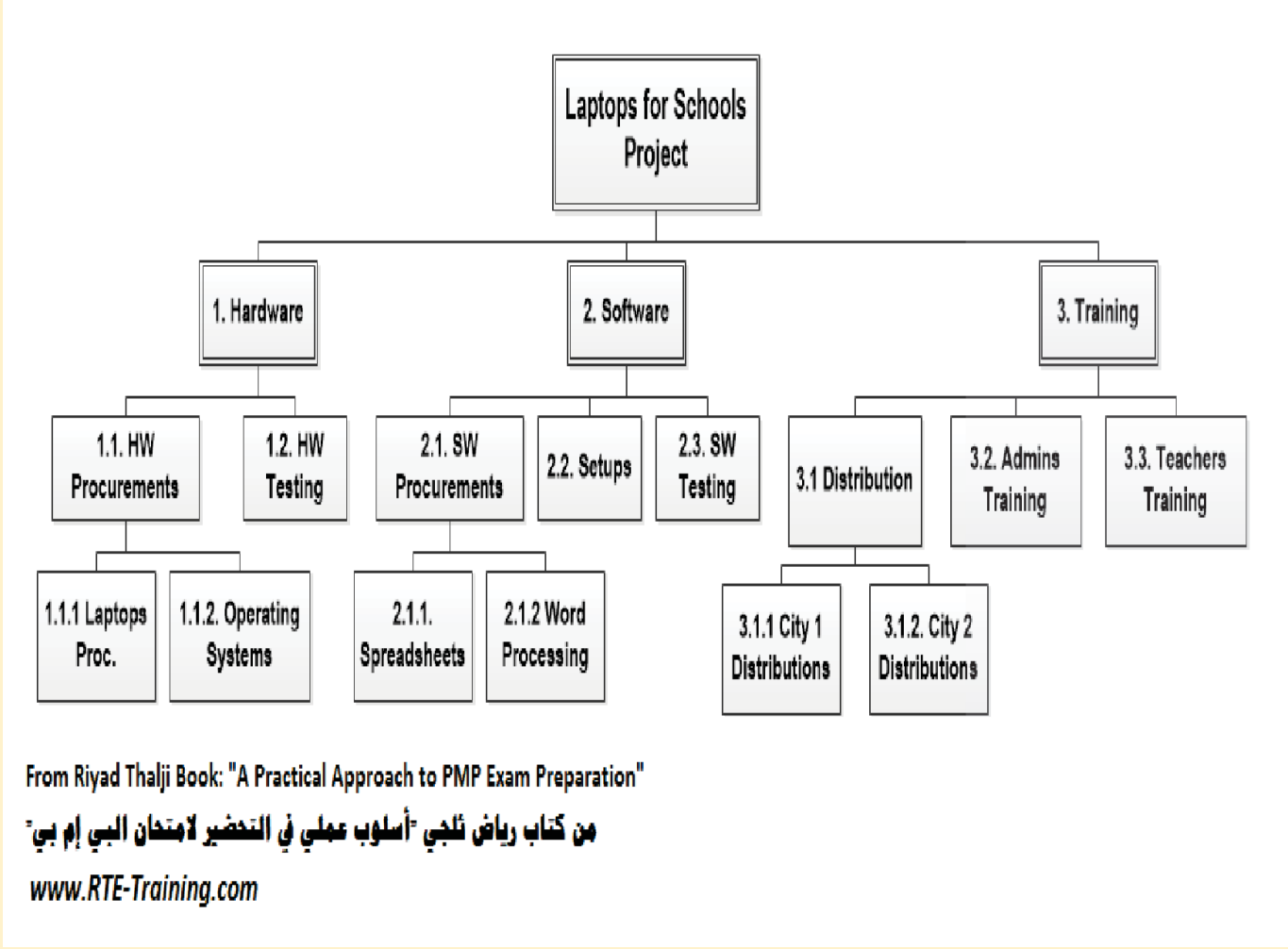
The Outputs

Cost Management Plan

- **Level of accuracy:** To which precision data will be rounded. 10% or 15%
- **Units of measure:** Each unit used in measurements like staff hours is it in $ or EU or S.A
- **Organizational procedures links:** like using WBS as framework of cost management plan. The WBS component used for project cost accounting is called the control account (CA). Each control account is assigned a unique code or account number linked directly to the organization's accounting system.
- **Control threshold**
- **Rules of performance measurements: (E.V.M)**
- **Reporting formats:** formats and frequency for various cost reports

The Outputs

- Cost Management Plan



From Riyad Thalji Book: "A Practical Approach to PMP Exam Preparation"

من كتاب رياض ثلجي "أسلوب عملي في التحضير لامتحان البي إم بي"

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Cost Management

Estimate Costs

"Developing an approximation of the monetary resources needed to complete the project activities."

Make versus buy, Buy versus Lease and resource sharing should be considered ,
Cost estimates are usually expressed in currency.
Cost estimates are iterative and become more refined in advanced stages
Direct Cost: Costs related to project activities like overtime, salary, team travel . . .
Indirect Costs: Costs shared between more than one project like taxes, employee medical insurance . . .

Cost Management ▸ Planning ▸ Estimate Costs

Input

- Project management plan
- Project documents
- EEF
- OPA

Tools and Techniques

Analogous estimating	Data Analysis
Parametric estimating	Project management information system
Three-point estimating	Expert judgment
Bottom-up estimating	Decision making

Output

- Cost estimates
- Basis of estimates

Tools & Techniques

Expert Judgment

- Team, Stakeholder or External Expertise may help in cost estimates.

Tools & Techniques

Analogous Estimate

- Uses information from historical projects to estimate cost of the current project

- Relies on the actual cost of previous, similar projects as the basis for estimating the cost of the current project.

Tools & Techniques

Parametric Estimate

- Multiplies two parameters taken from historical projects to estimate activity cost.

Using a statistical relationship between relevant historical data and other variables to calculate a cost estimate for project work.

Tools & Techniques

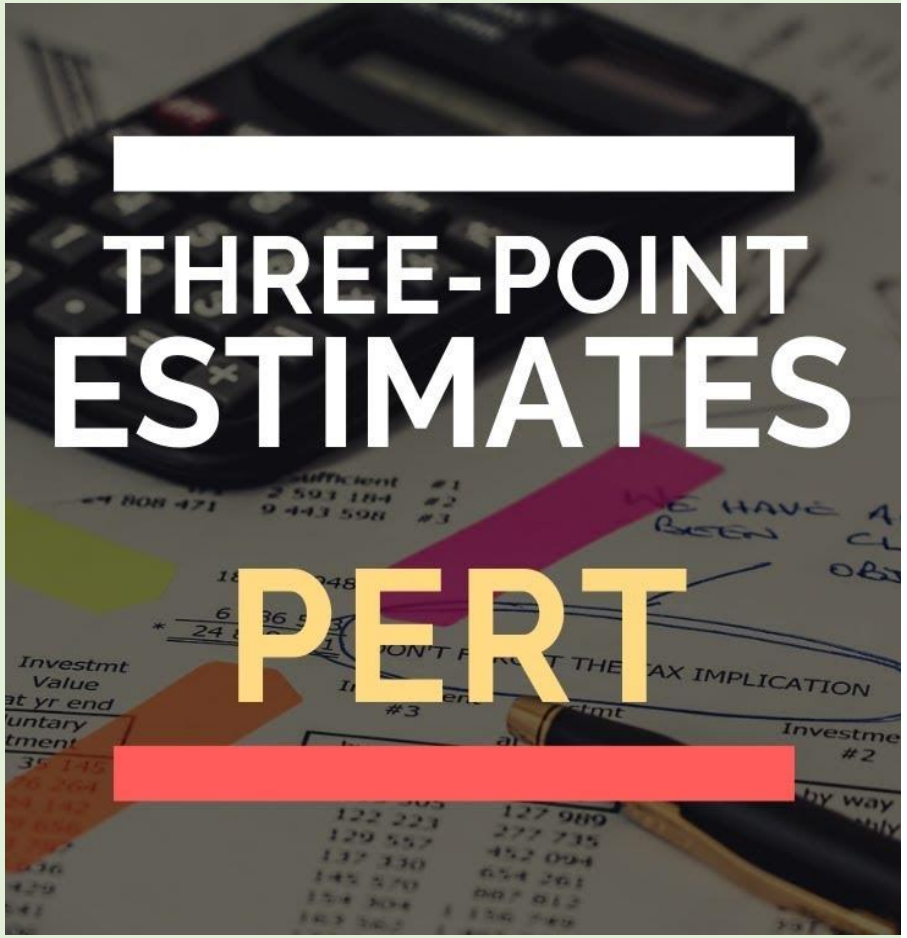
Three Point Estimate (PERT)

- Depends on **PERT** (**P**roject **E**valuation & **R**eview **T**echnique) which Uses three estimates:
- Most likely (**M**), Optimistic (**O**) and Pessimistic (**P**)

in the 2 formulas:

Triangle distribution **E=(O + M + P) / 3**

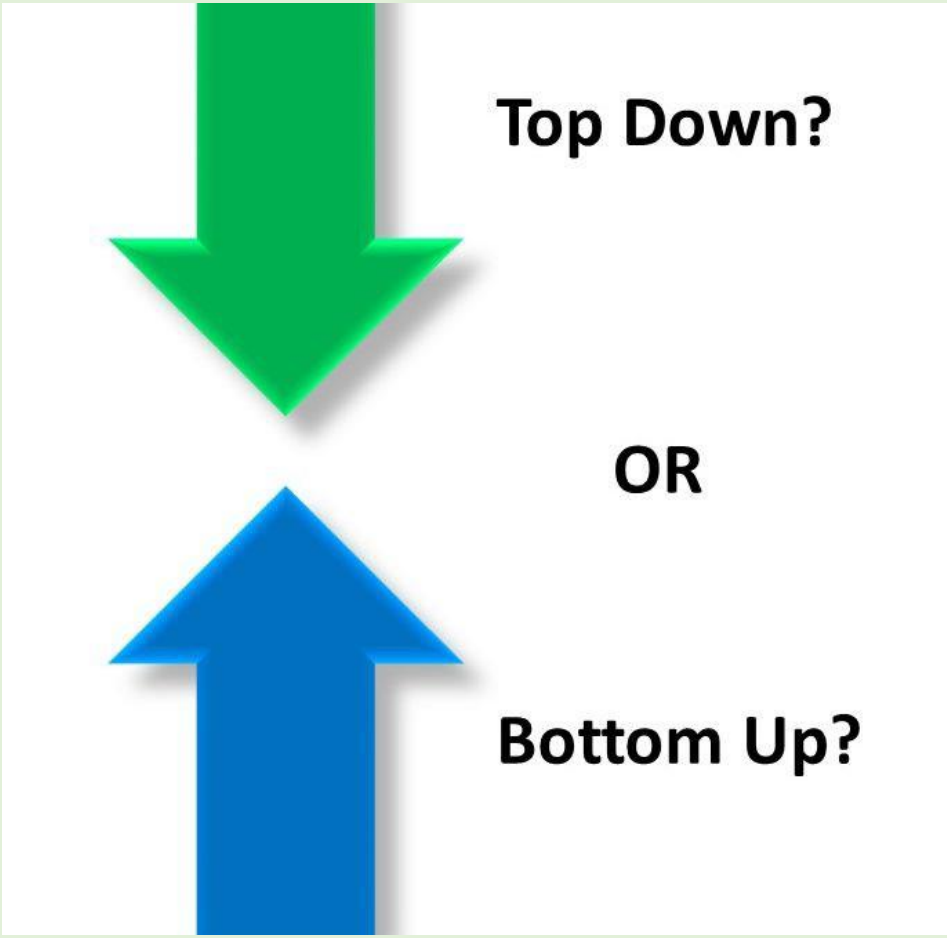
Beta distribution **E=(O + 4M + P) / 6**



Tools & Techniques

Bottom-Up Estimate

- Estimating individual activities then rolling up to higher levels.



Tools & Techniques

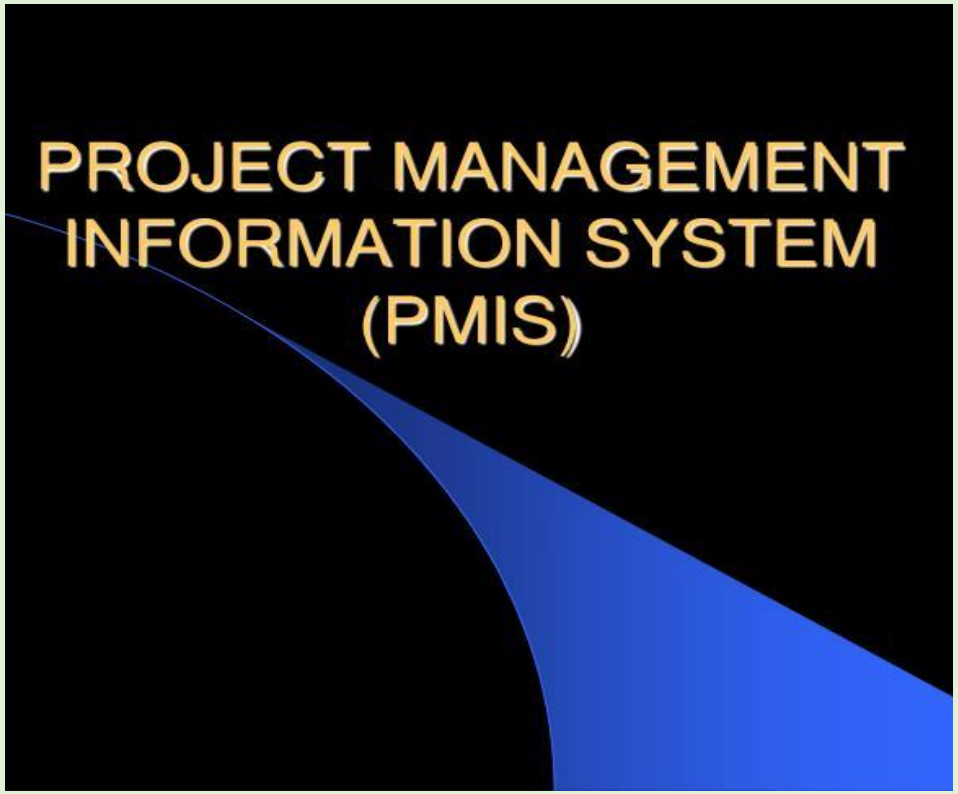
Data Analysis

- Alternatives Analysis
- Reserve Analysis
  - Contingency reserves (or contingency allowances) may be percentage or fixed.
- Cost of Quality – COQ
  - Assumptions of costs of quality may be used in cost estimation

Tools & Techniques

Project Management Information System - PMIS

- Like spreadsheets and statistical tools which facilitates estimating



Tools & Techniques

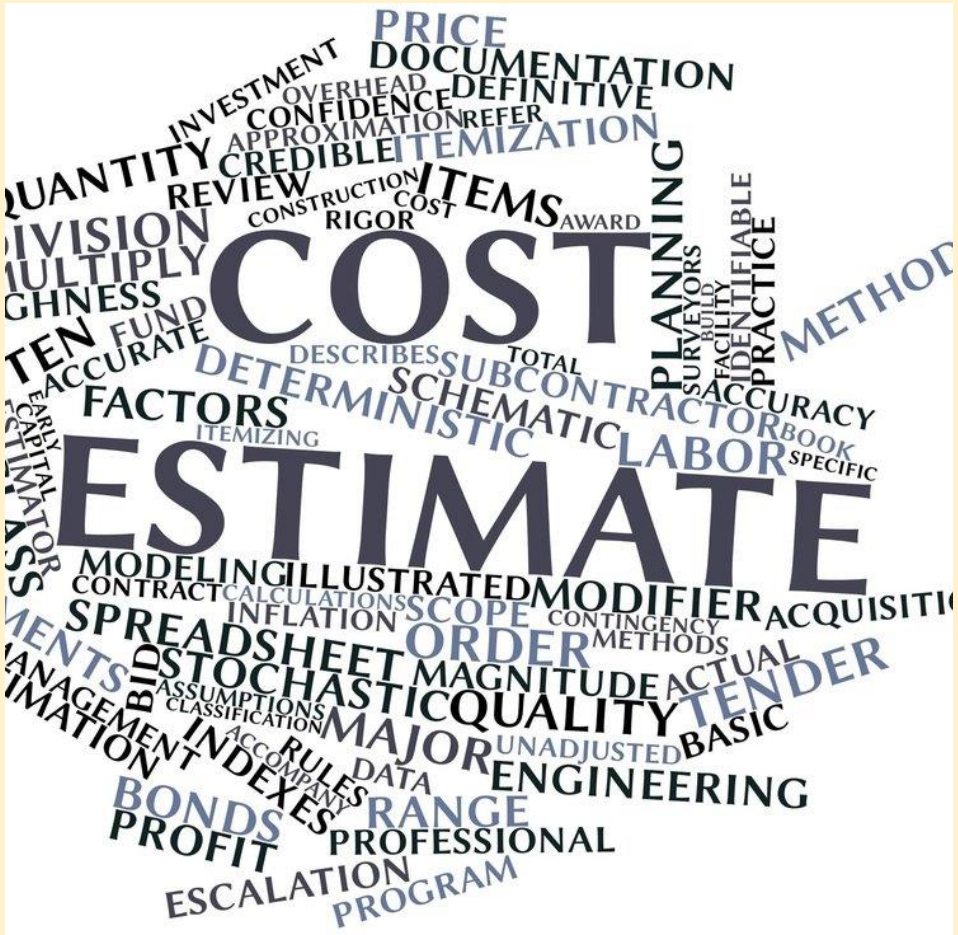
Decision-Making Techniques

- Voting
- Autocratic decision making
- Multicriteria decision analysis

The Outputs

Activity Cost Estimates

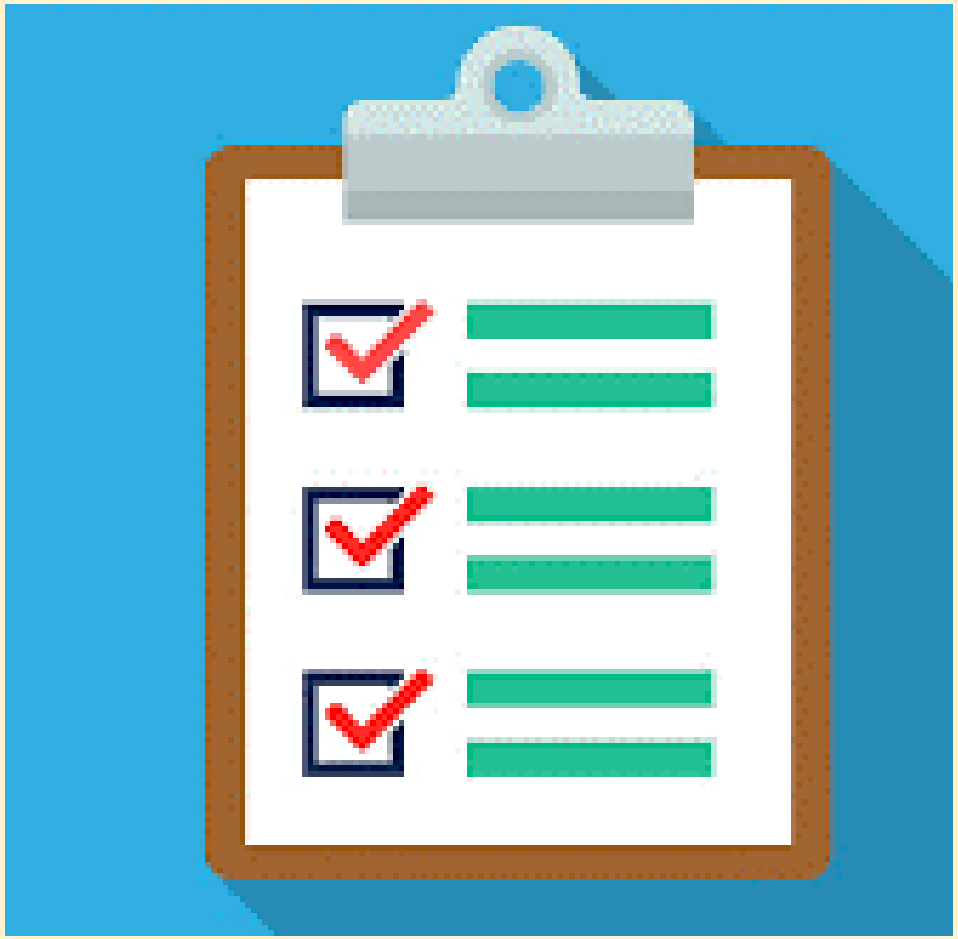
- Quantitative assessments of the probable costs required to complete project work
- Costs are estimated for all types of resources this may include inflation allowance or cost contingency reserve



The Outputs

Basis of Estimates

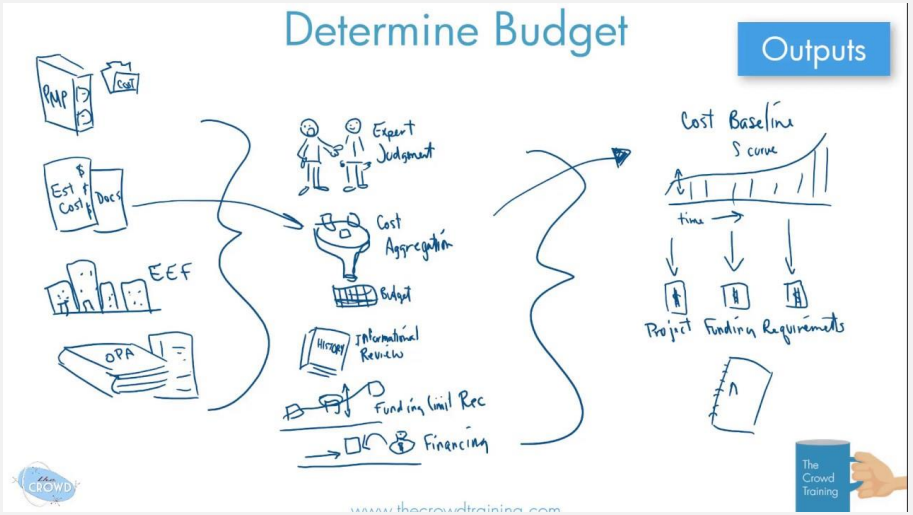
- Are Supporting details for activity cost and may includes for example:
  - Documenting how estimates have been done (which way you use)
  - Documenting of all assumptions and constraints



Cost Management

Determine Budget

"Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline."



Cost Management ▸ Planning ▸ Determine Budget

Input

- Project management plan
- Project documents
- Business documents
- Agreements
- EEF
- OPA

Tools and Techniques

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

Output

- Cost baseline
- Project funding requirements

Tools & Techniques

Expert Judgment

Expertise should be considered from individuals or groups with **specialized knowledge or training** in the following topics:
Previous similar projects; information in the industry, discipline, and application area; Financial principles; and Funding requirement and sources.

Tools & Techniques

Cost Aggregation

- Cost estimates are aggregated by work packages of WBS then for higher levels such as control accounts, then for the whole project.

Tools & Techniques

Data Analysis (Reserve Analysis)

Contingency Reserves

Which can result from **risks** identified in the risk register

Management Reserves

Which are budgets reserved for unplanned **changes** in scope and cost

Tools & Techniques

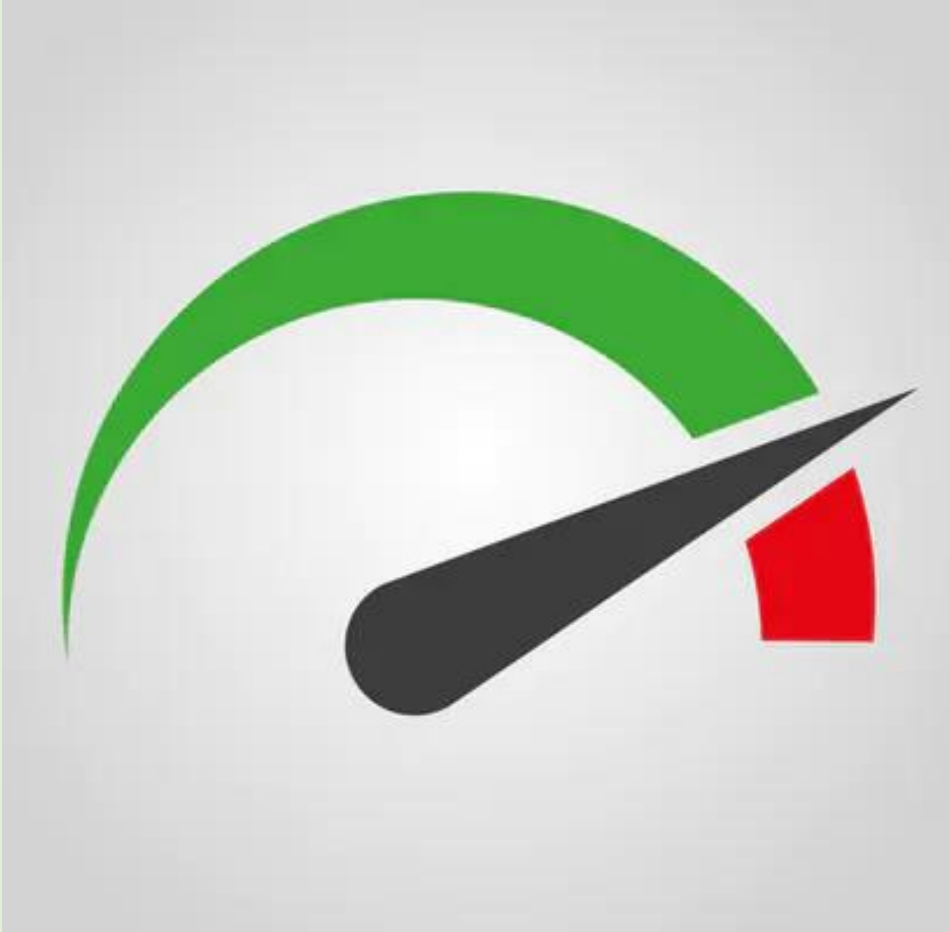
Historical Information Review

- Which may result in parametric estimates or analogous estimates

Tools & Techniques

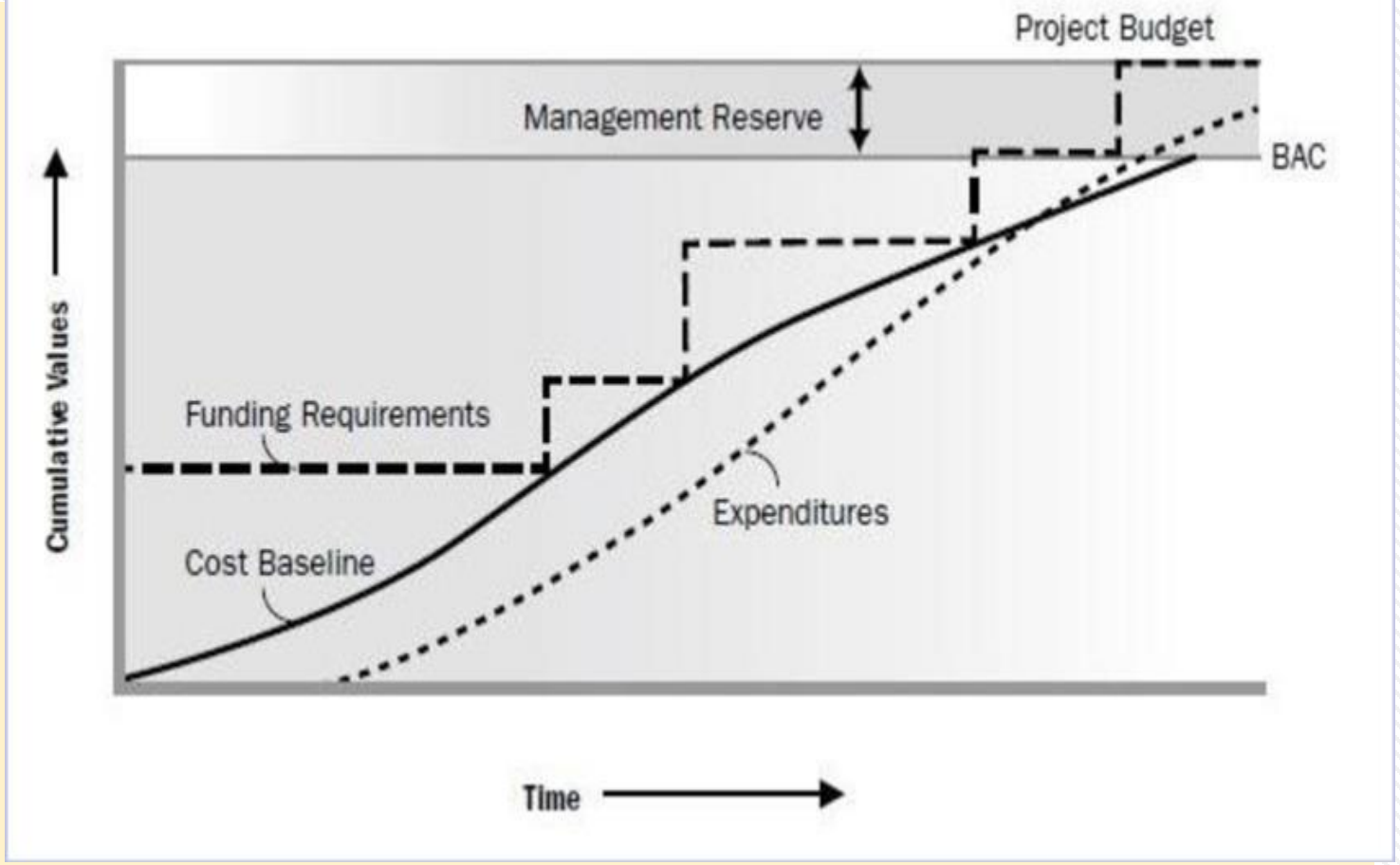
Funding Limit Reconciliation

- The expenditure of funds should be reconciled with any funding limits on the commitment of funds for the project
- A variance between the funding limits and the planned expenditures sometimes implies rescheduling of work



The Outputs

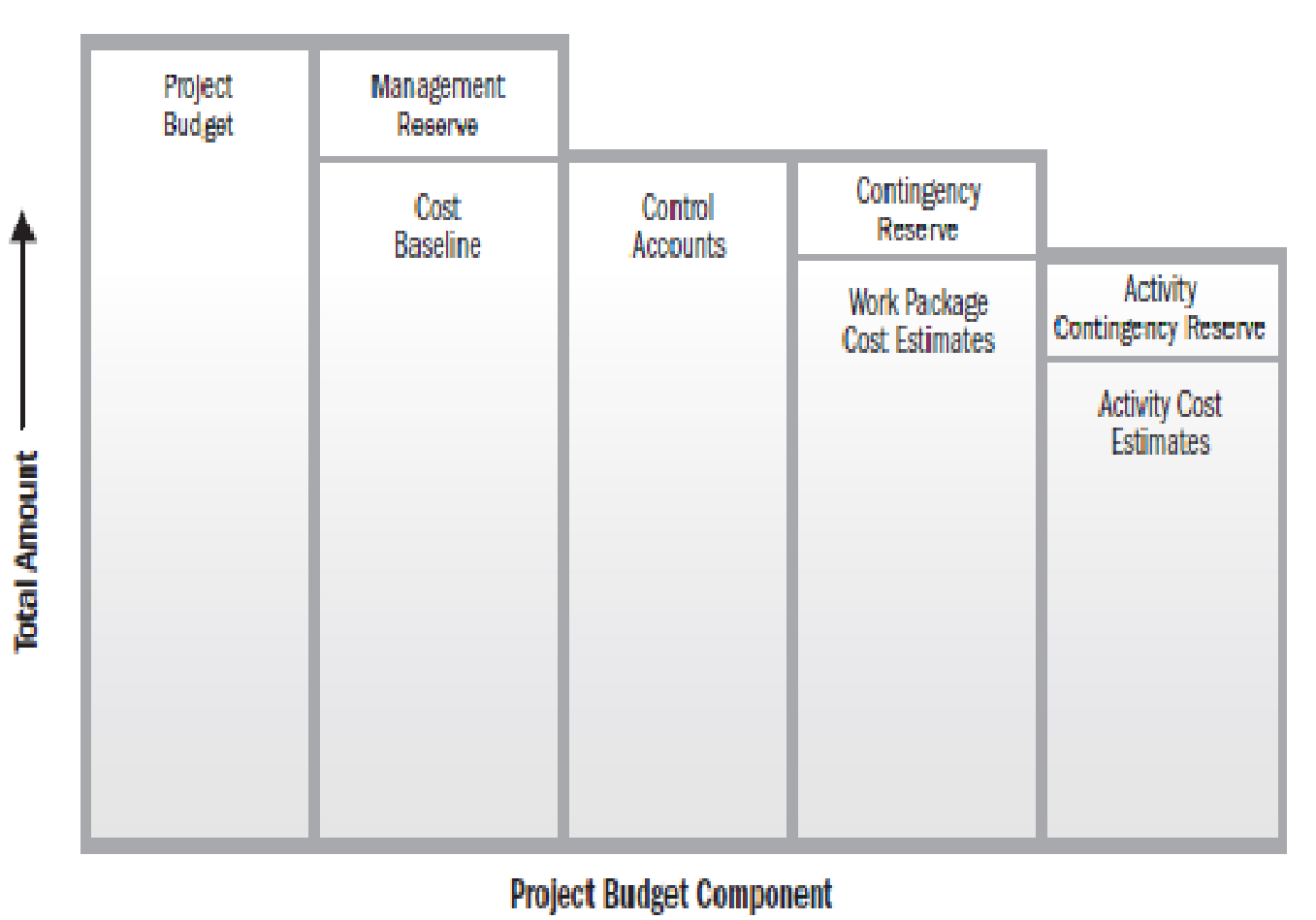
- Cost Baseline
- Project Funding Requirements



Cost Baseline, Expenditures, and Funding Requirements

The Outputs

Project budget components



Questions

1.Project Cost Management includes all of the following processes EXCEPT:

A. Plan cost management.

B. Level resources.

C. Determine budget.

D. Control costs.

2.Jane, a project manager of a large defense project, is using a technique for estimating the duration of an activity in her project using historical data from a similar activity or project.

A. Bottom-up estimating.

B. Top-down estimating.

C. Analogous estimating.

D. Parametric estimating

Questions

3. An activity cost estimate includes all of the following resource categories EXCEPT:

A. Labor.

B. Materials.

C. Equipment.

D. Time shortages.

4. Parametric estimating involves:

A. Defining cost or duration parameters of the project life cycle.

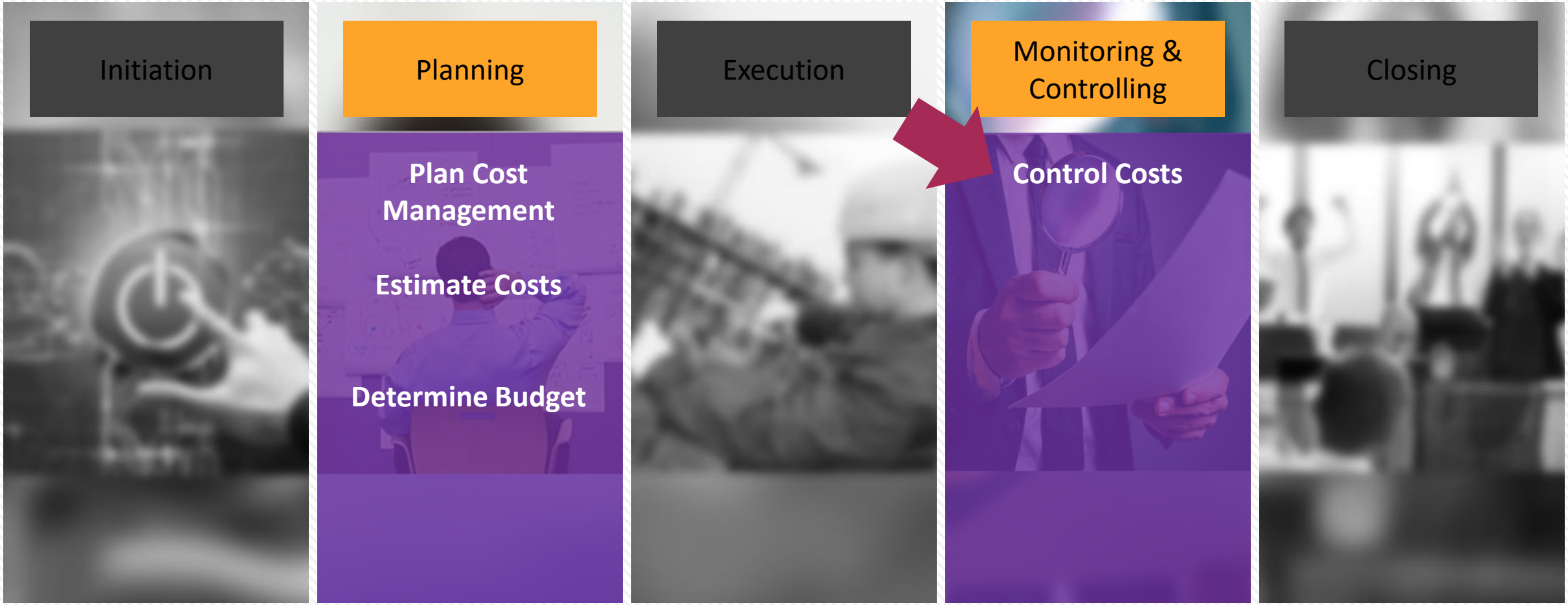
B. Calculating individual cost estimates for each work package and integrating them to obtain the total cost of the project.

C. Using a statistical relationship between relevant historical data and other variables to calculate a cost estimate for project work.

D. Using the actual cost of a previous similar project to estimate the cost of the current project

Cost Management

Cost Management



Control Costs

"Monitoring the status of the project to update the project budget, and managing changes to the cost baseline.“

Any increase to the authorized budget can only be approved through "**Perform Integrated Change Control**" process. Analyzing the relationship between the consumption of project funds to the physical work being accomplished for such expenditures. EVM.

EVM IS THE TOOL TO MEASURE THE PROJECT’S PERFORMANCE

Cost Management ▸ M & C ▸ Control Costs

Input

- Project management plan
- Project documents
- Project funding requirements
- Work performance data
- OPA

Tools and Techniques

Expert judgment	Data analysis
EVM	index
Project management information system	

Output

- Work performance information
- Cost forecasts
- Change Requests

Tools & Techniques

Earned Value Management (EVM)

PV	Planned Value	The work planned to be completed as of today
BAC	Budget At Completion	The total estimated budget for the project at the beginning
AC	Actual Cost	The total valued paid on the project as of today
EV	Earned Value	The value of the work really completed as of today
EAC	Estimate At Completion	The total estimated budget for the project as of today estimation
ETC	Estimate To Complete	The remaining value needed to complete the project from today to the project end
VAC	Variance At Completion	The expected variance between BAC and EAC as of today's information

Tools & Techniques

EVM Measures

CV (Cost Variance)	CV = EV – AC	(>0) is good, (<0) is bad
SV (Schedule Variance)	SV = EV – PV	(>0) is good, (<0) is bad
CPI (cost performance index)	CPI= EV / AC	(>1) Under Budget, (<1) Overspending, Defines how much we get from each $1 we spend
SPI (Schedule Performance Index)	SPI = EV / PV	(>1) Ahead of schedule (<1) Behind Schedule

Tools & Techniques

Forecasting

- The project team forecasts for the Estimate At Completion (EAC).

EAC Calculations (commutative):	
EAC = AC + ETC	Is the most common use
EAC = BAC / CPI	Used if we want to continue at the same rate of spending or there is no variance from BAC
EAC = AC + (BAC-EV)	Used if the current variances are not typical for the future
EAC = AC + [(BAC-EV)/(CPI + SPI)]	Used if the current variances are typical for the future

EVM Foundation

EV= %Complete x BAC
EV = 40% x 250,000
EV = $100,000

PV= %Planned x BAC
PV = 55% x 250,000
PV = $137,500

Finding the Variances

Cost variance
EV-AC
$100k -112k = -12k

Schedule variance
EV-PV
$100k-137,500 = -37,500

Measuring Performance

Cost Performance
Index
EV/AC
100k/112k = .89

Schedule Performance
Index
EV/PV
100k/137,500 = .73

Predicting the Future

Estimate at
Completion
BAC/CPI
$250k/.89 = $280k
Estimate to Complete
EAC-AC
$280k - $112k = $168k

The Outputs

- Work Performance Information - WPI

The Outputs

- Cost forecasts

The Outputs

- Change Requests

Questions

5. Earned Value Management (EVM) is a commonly used:

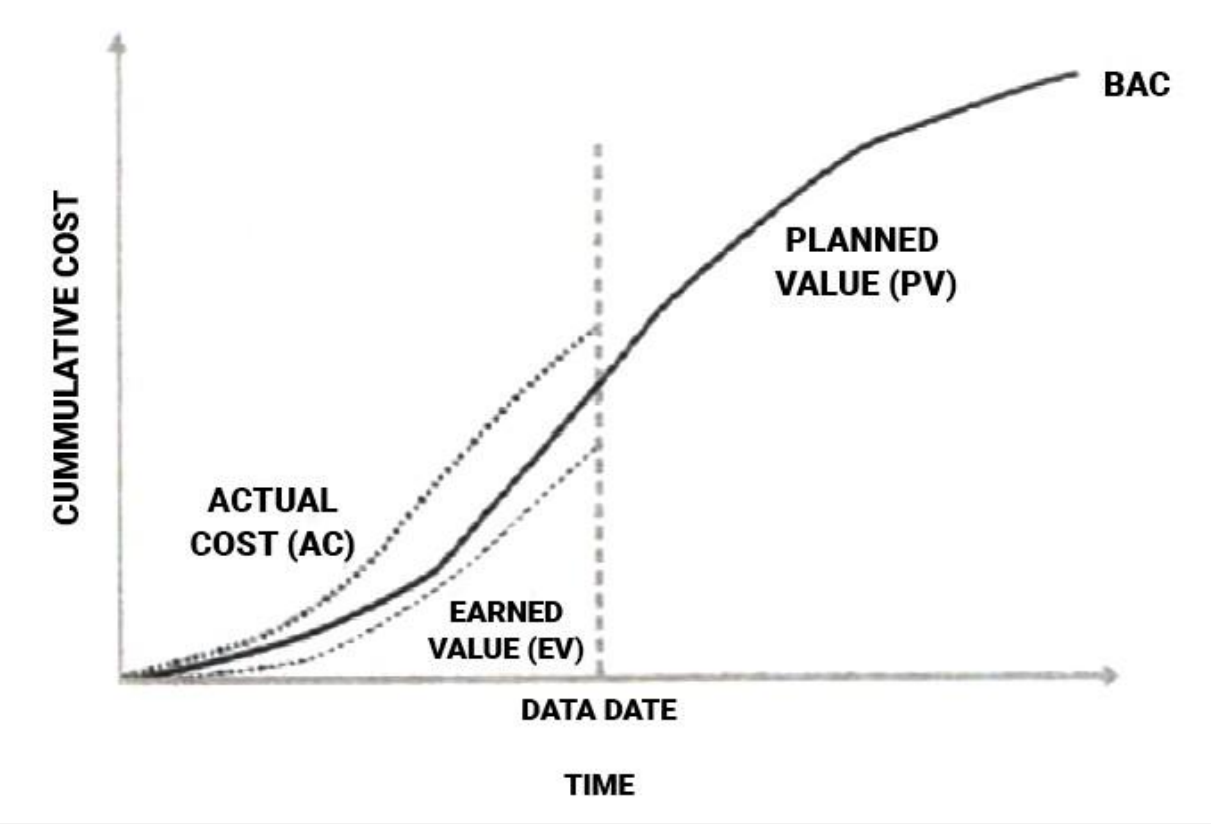
A. Analysis of the value of the equipment that has been installed in the project as of the status date.
B. Analysis of the sum of the labor costs that have been incurred on the project to date.
C. Method of performance measurement for projects.
D. Method of measuring the amount of money that has been spent on the project to date.

6. Your earned value management analysis indicates that your project is falling behind its baseline schedule. You know this because the cumulative EV is much:

A. Higher than the cumulative AC.
B. Higher than the cumulative PV.
C. Lower than the cumulative PV.
D. Lower than the cumulative CPI .of the current project.

Questions

7.You have been promoted to the position of project manager for a large project, due to the abrupt transfer of the previous project manager. On the first day in your new, exciting position, you find a folder on your desk entitled: Earned Value Management. In that folder, you find only the following chart related to your project with the Data Date of a few days ago:



Based on this chart, you conclude that:

A. The project is below budget and probably ahead of schedule.
B. The project is over budget and probably behind schedule.
C. The project is below budget but probably behind schedule.
D. The performance on this project compared to budget and schedule cannot be determined because this chart does not show any values

Questions

8. Which of the following cumulative measures indicates that your project is about 9% under budget?

A. The cumulative AC was 100, and the cumulative EV was 110.
B. The cumulative PV was 100, and the cumulative AC was 110.
C. The cumulative AC was 110, and the cumulative EV was 100.
D. The cumulative EV was 100, and the cumulative PV was 110

9-Earned value (EV) involves all of the following EXCEPT:

A. Value of the work performed expressed in terms of the budget authorized for that work.
B. Actual cost for an activity or work breakdown structure (WBS) component.
C. Progress measurement criteria, which should be established for each WBS component to measure work in progress.
D. Budget associated with the authorized work that has been completed

Agile Considerations

- In project with high degree of uncertainty, high level project cost estimates may be used, then detailed estimates are done on a just-in-time method.
- If the budget is strict, the scope and schedule are adjusted to stay within the cost constraints.