
Q1. What are the two stages of Project Life Cycle?

The Project Life Cycle is broadly divided into two major stages:

- **Project Definition Stage:** This covers the initial phases where the project is conceived, defined, and planned. It includes activities such as feasibility analysis, scope definition, resource planning, and obtaining approvals. The goal is to establish a clear roadmap before any work begins.
 - **Project Implementation Stage:** This covers the actual execution of the project plan, including development, testing, deployment, and final closure. It translates the plans made during the definition stage into tangible deliverables and outcomes.
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Q2. What are the different phases of Project Life Cycle?

A typical Project Life Cycle consists of five well-defined phases:

- **1. Initiation Phase:** The project is formally authorized, objectives are identified, stakeholders are recognised, and a Project Charter is created.
 - **2. Planning Phase:** Detailed plans are developed covering scope, schedule, cost, quality, resources, communication, risk, and procurement.
 - **3. Execution / Development Phase:** The actual work of the project is carried out. Teams are mobilised, resources are deployed, and deliverables are produced according to the plan.
 - **4. Monitoring & Control Phase:** Project performance is tracked against baselines. Variances are identified and corrective actions are implemented. This phase runs in parallel with Execution.
 - **5. Closing Phase:** The project is formally closed — deliverables are handed over, contracts are closed, lessons learned are documented, and the project team is released.
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Q3. What are the activities of the Project Initiation phase?

The Initiation Phase is the first formal phase of the project life cycle. Key activities include:

- Identifying business need, problem, or opportunity that justifies the project.
 - Conducting a feasibility study to assess viability (technical, financial, operational).
 - Defining high-level project objectives, scope, and success criteria.
 - Identifying key stakeholders and understanding their expectations.
 - Appointing the Project Manager and assembling a core team.
 - Developing and issuing the Project Charter — the formal authorization document.
 - Seeking approval from the project sponsor or governing authority to proceed.
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Q4. What is Project Charter, and what are its elements?

A **Project Charter** is a formal document that officially authorizes the existence of a project. It gives the project manager the authority to apply organizational resources to project activities. It serves as a reference agreement between the project sponsor and the project team.

Key Elements of a Project Charter:

- **Project Title and Description:** Name and brief overview of the project.
- **Business Need / Purpose:** The problem or opportunity the project addresses.
- **Project Objectives:** Specific, measurable goals the project must achieve.
- **High-Level Scope:** What is included and excluded from the project.

- **Key Deliverables:** Major outputs or outcomes expected.
 - **Assumptions and Constraints:** Factors taken as true and limitations imposed.
 - **High-Level Risks:** Major risks identified at the outset.
 - **High-Level Budget and Schedule:** Rough cost estimate and milestone dates.
 - **Stakeholder List:** Key stakeholders and their roles.
 - **Project Manager Authority:** Level of authority granted to the PM.
 - **Sponsor Signature:** Formal approval and authorization.
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Q5. What is the role of stakeholders in the Project Initiation phase?

Stakeholders are individuals or groups who have an interest in or are affected by the project. Their role in the Initiation phase is critical:

- **Project Sponsor:** Provides funding, champions the project, and formally authorizes the Project Charter.
- **Client / Customer:** Communicates business needs, requirements, and success criteria.
- **Project Manager:** Identified during initiation; leads planning and execution.
- **Senior Management:** Provides strategic direction and approves resources.
- **Team Members:** May be consulted for feasibility inputs and initial effort estimates.
- **External Stakeholders (Vendors, Regulators):** Provide constraints, compliance requirements, and resource options.

Overall, stakeholders shape the project objectives, influence the scope, and ensure organizational buy-in from the very beginning.

Q6. What are the steps of Project Planning Phase?

The Planning Phase produces a comprehensive Project Management Plan. The key steps are:

- **Step 1 – Define Scope:** Develop a detailed Project Scope Statement; create the WBS.
 - **Step 2 – Plan Schedule:** Define and sequence activities, estimate durations, and develop the project schedule (Gantt chart / network diagram).
 - **Step 3 – Plan Cost:** Estimate costs for each activity and establish the cost baseline / budget.
 - **Step 4 – Plan Quality:** Define quality standards, metrics, and assurance procedures.
 - **Step 5 – Plan Human Resources:** Identify roles, responsibilities, and staffing requirements.
 - **Step 6 – Plan Communications:** Define stakeholder communication needs, formats, and frequency.
 - **Step 7 – Plan Risk Management:** Identify, analyse, and plan responses to project risks.
 - **Step 8 – Plan Procurement:** Determine what to buy, from whom, and under what contracts.
 - **Step 9 – Plan Stakeholder Engagement:** Develop strategies to engage stakeholders effectively.
 - **Step 10 – Finalize & Baseline the Plan:** Integrate all subsidiary plans and obtain approval.
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Q7. What is Work Breakdown Structure (WBS) and what are its contents?

A **Work Breakdown Structure (WBS)** is a hierarchical decomposition of the total scope of work that the project team must carry out to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project.

Contents of a WBS:

- **Level 0 – Project Root:** The top node representing the entire project.
- **Level 1 – Major Deliverables / Phases:** Broad categories like Design, Development, Testing, Deployment.
- **Level 2 – Sub-deliverables:** Further breakdown of each major deliverable into components.

- **Work Packages (Lowest Level):** The smallest units of work that can be assigned, scheduled, and cost-estimated. Each work package has a unique WBS code (e.g., 1.2.3).
- **WBS Dictionary:** A supporting document describing each WBS element — its scope, deliverables, owner, and acceptance criteria.

The 100% Rule is fundamental: each level of the WBS must represent 100% of the work of the parent element.

Q8. Explain Management Artifact Set?

The **Management Artifact Set** (also called Management Set) is a collection of documents and plans used by the project manager to plan, control, and close the project. It represents the administrative and governance side of the project.

Key Artifacts:

- **Project Management Plan (PMP):** The master document integrating all subsidiary plans — scope, schedule, cost, quality, HR, communications, risk, and procurement.
 - **Project Charter:** Authorization document that formally initiates the project.
 - **Stakeholder Register:** List of all stakeholders with their interests, roles, and engagement levels.
 - **Risk Register:** Log of identified risks, their probability, impact, and mitigation plans.
 - **Issue Log:** Tracks open issues, their status, owner, and resolution.
 - **Change Log / Change Control Register:** Records all change requests, their approval status, and impact.
 - **Status Reports & Meeting Minutes:** Regular project health updates and records of decisions.
 - **Lessons Learned Register:** Captures knowledge for continuous improvement.
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Q9. Explain the different types of Engineering Set?

The **Engineering Set** (also called the Engineering Artifact Set) contains the technical documents that capture the design, architecture, and implementation details of the system being built.

Types of Engineering Set:

- **Requirements Document / SRS (Software Requirements Specification):** Captures functional and non-functional requirements. It forms the foundation for all design decisions.
- **System Design Document (SDD):** Describes the overall system architecture, modules, components, and their interactions.
- **Detailed Design Document (DDD):** Low-level design including class diagrams, database schemas, API specifications, and algorithms.
- **Interface Control Document (ICD):** Specifies the interfaces between different system components or external systems.
- **Test Plan & Test Cases:** Defines testing strategy, test scenarios, and expected results.
- **Build and Deployment Plan:** Steps for compiling, packaging, and deploying the software.
- **User Manual / Technical Manual:** End-user documentation and operational guides.

Together these documents ensure that technical knowledge is recorded, traceable, and transferable across the team.

Q10. Explain Architecture View from technical perspective?

The **Architecture View** describes the structure of the system from different technical angles. The most widely adopted framework is the **4+1 View Model** proposed by Philippe Kruchten:

- **Logical View:** Describes the functionality the system provides to end-users. Represented using class diagrams, state diagrams, and sequence diagrams (Object-Oriented perspective).

- **Process View:** Addresses the dynamic aspects — concurrency, synchronization, and process communication. Focuses on performance and scalability.
- **Development View (Implementation View):** Describes the static organization of the software in its development environment — packages, modules, layers, and subsystems.
- **Physical View (Deployment View):** Maps software components to hardware nodes. Shows how the system is distributed across servers, networks, and devices.
- **Scenarios (+1 View):** Use cases or scenarios that tie all other views together. They validate that the architecture satisfies the requirements.

From a purely technical perspective, architecture also covers NFRs (Non-Functional Requirements) such as security, reliability, scalability, and maintainability.

Q11. What is Plan Schedule Management and what are its inputs and outputs?

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. It is defined in PMBOK as a planning process.

Inputs:

- Project Charter — provides high-level milestones.
- Project Management Plan — specifically the Scope Management Plan.
- Enterprise Environmental Factors (EEFs) — scheduling tools, culture, resource availability.
- Organizational Process Assets (OPAs) — historical data, templates, scheduling policies.

Outputs:

- **Schedule Management Plan:** The primary output. It defines the scheduling methodology (CPM, Agile, etc.), scheduling tool to be used, level of accuracy required, units of measure, control thresholds, performance measurement rules, and reporting formats.
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Q12. What is Sequence Activities?

Sequence Activities is the process of identifying and documenting the relationships among the project activities. It determines the logical order in which activities must be performed and produces a network diagram of the project schedule.

Key Dependency Types:

- **Finish-to-Start (FS):** Successor starts only after predecessor finishes. (Most common — e.g., Design must finish before Coding starts.)
- **Start-to-Start (SS):** Successor starts only after predecessor starts.
- **Finish-to-Finish (FF):** Successor finishes only after predecessor finishes.
- **Start-to-Finish (SF):** Successor finishes only after predecessor starts. (Rare.)

Types of Dependencies:

- **Mandatory (Hard Logic):** Inherent in the nature of the work (e.g., foundation before walls).
- **Discretionary (Soft Logic):** Based on best practices or preference.
- **External:** Depends on activities outside the project (e.g., vendor delivery).
- **Internal:** Dependency between project activities.

Outputs include the **Project Schedule Network Diagrams** and updates to the activity list and attributes.

Q13. What are the inputs and outputs of Estimating Activity Resources?

Estimate Activity Resources is the process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity.

Inputs:

- Project Management Plan (Resource Management Plan, Scope Baseline)
- Project Documents: Activity List, Activity Attributes, Assumption Log, Cost Estimates, Resource Calendars, Risk Register
- Enterprise Environmental Factors (EEFs): Resource location, availability, market conditions
- Organizational Process Assets (OPAs): Resource estimation policies, historical data, templates

Outputs:

- **Resource Requirements:** Type and quantity of resources needed for each activity and work package.
 - **Basis of Estimates:** Supporting documentation on how estimates were derived.
 - **Resource Breakdown Structure (RBS):** Hierarchical representation of resources by category and type.
 - **Project Document Updates:** Activity attributes, Assumption log updates.
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Q14. What are the inputs and outputs of Estimating Activity Durations?

Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources. It provides a quantitative assessment of the likely number of time periods required.

Inputs:

- Project Management Plan (Schedule Management Plan, Scope Baseline)
- Project Documents: Activity List & Attributes, Assumption Log, Lessons Learned Register, Milestone List, Project Team Assignments, Resource Breakdown Structure, Resource Calendars, Resource Requirements, Risk Register
- Enterprise Environmental Factors (EEFs): Productivity metrics, commercial databases, team location
- Organizational Process Assets (OPAs): Historical duration data, project calendars, estimation policies

Outputs:

- **Duration Estimates:** Quantitative assessments (likely, optimistic, pessimistic) of the number of work periods needed for each activity. Can be expressed as ranges or single-point values.
 - **Basis of Estimates:** Documentation describing the estimation approach, assumptions, constraints, and confidence levels.
 - **Project Document Updates:** Updates to Activity Attributes and Assumption Log.
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