

# **Course: Software Project Management**

**Week 5: Stepwise Project Planning Approach**

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- Introduction
- Overview of Stepwise project planning
- The steps in Stepwise project planning
- Project Planning frameworks and methodologies

# Learning Outcomes

After completing this lesson, you will be able to:

- Describe the key concepts of stepwise project planning.
- Explain the steps involved in stepwise project planning.
- Identify the activities in each stage of the stepwise planning
- Apply project planning frameworks and methodologies to a given project scenario.

# Introduction

- Planning is the process of defining objectives, scope, and the steps needed to complete a project successfully.
- Project planning is an essential phase of the project management.
  - It is the foundation for successful execution of any projects

**“Plans are nothing. But planning is everything”** → Dwight D. Eisenhower

**No plan, No Control  
poor planning leads to  
project failure**

# Introduction

- **Statistic:**
  - 70% of projects fail due to poor planning (PMI)
- Structured planning is important to
  - Avoid confusion & miscommunication
  - Ensure deadlines & budgets are met
  - Increase project success rate
- Different techniques may be used in project planning.
  - This lecture provides one of the techniques
    - **Stepwise project planning**

# Stepwise Project Planning

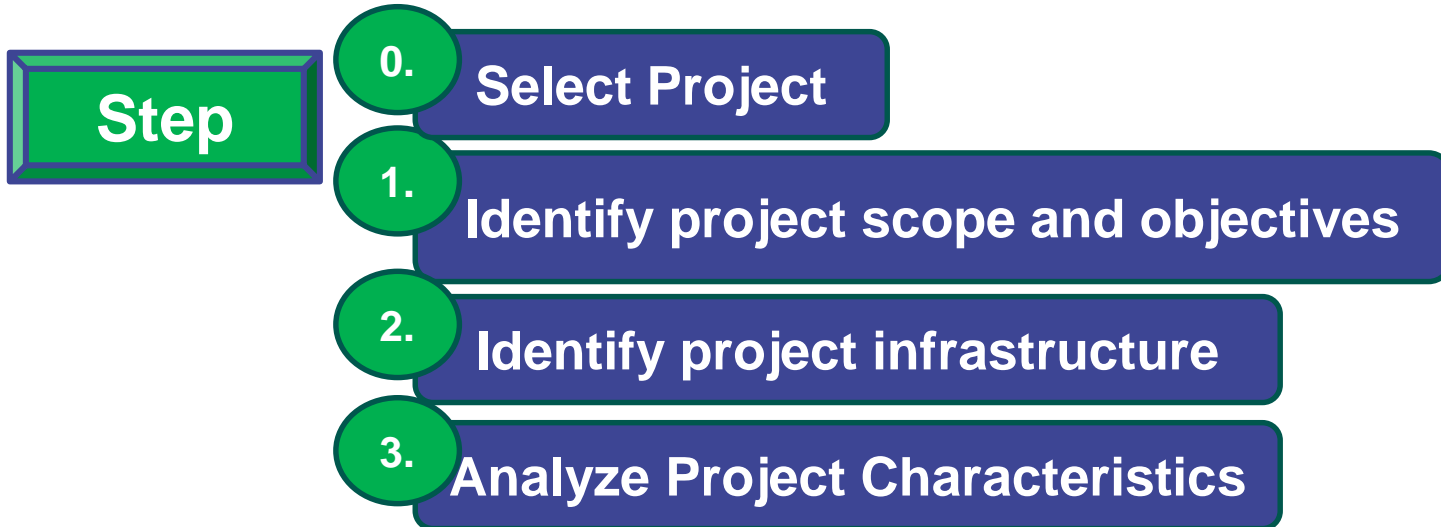
- Stepwise project planning is a structured approach to managing and organizing a project by breaking it down into
  - clearly defined **stages** or **steps**
- Each step builds on the previous one, allowing for careful planning, execution, and control throughout the project lifecycle.
- It's commonly used in software development.
- The main idea is to reduce uncertainty by making decisions progressively as more information becomes available.

# Stepwise Project Planning

- Therefore, the stepwise project planning approach
  - A planning framework or methodology for software projects
  - Provides a general **step by step** methodology for planning.
  - Consists of **ten steps** that guide project managers from
    - **Initiation to execution.**
  - Useful for small and large projects

# Overview of the Steps

- According to the software project management book (Bob Hughes, 2011),
  - The following are the steps in stepwise planning approach starting from project selection up to execution and monitor the plan.



# Overview of the Steps

Step

4.

Identify the products and activities

5.

Estimate Effort for Each Activity

6.

Identify Activity Risks

7.

Allocate Resources

8.

Review/Publicize Plan

9.

Execute Plan

10

Lower level of planning

*There activities within each steps*

# Activities in each Steps

## Step 0: Project Selection

- Before planning begins, you need to choose which project is worth pursuing.
- Step 0 is all about evaluating potential projects and selecting the one that best aligns with the goals, resources, and strategic priorities.
- Project selection is not part of planning phase, that is why it is step 0.
- Projects can be proposed due to
  - Internal business need or external influences.

# Activities in each Step

## Step 0: Project Selection

- This stage involves:
  - Identifying possible project ideas
  - Evaluating feasibility (technical, financial, operational)
  - Estimating value/benefits (ROI, impact)
  - Considering risks and constraints
  - Getting approval from stakeholders or decision-makers
- It ensures the right project is chosen
  - before investing time and effort in detailed planning.

# Activities in each Step

## Step 1: Identify Project Scope and Objectives

- This step focuses on defining
  - what the project is meant to achieve,
  - who it involves
  - how success will be measured.
- It lays the foundation for planning, team alignment, and communication.
- There are five major activities in this step

# Activities in each Step

## Step 1: Identify Project Scope and Objectives

- **1.1 Identify objectives and measures of effectiveness**
  - What are we trying to achieve?
  - Define clear, specific, and measurable objectives.
- **1.2 Establish a project authority**
  - Determine who is in charge. This could be a project manager, sponsor, or a steering committee.
  - Their role is to provide direction, make decisions, and ensure accountability.

# Activities in each Step

## Step 1: Identify Project Scope and Objectives

- **1.3 Identify stakeholders**
  - List all individuals or groups affected by or involved in the project.
  - Includes customers, team members, sponsors, suppliers, etc.
- **1.4 Modify objectives in light of stakeholder analysis**
  - After identifying stakeholders, revisit your objectives,
  - Are stakeholders expectations aligned?
  - Adjust goals if needed to reflect input from key stakeholders.

# Activities in each Step

## Step 1: Identify Project Scope and Objectives

- **1.5 Establish methods of communication**
  - Set up clear communication channels:
    - Meetings
    - Reports
    - Emails
    - Dashboards.
  - Define how often updates will be shared and with whom.

# Activities in each Step

## Step 2: Identify Project Infrastructure

- In this step, we define the **framework** that will support the project
  - aligning it with organizational strategy, ensuring technical consistency, and organizing the team effectively.
- **2.1 Establish relationship between project and strategic planning**
  - Ensure the project aligns with the organization's long-term goals.
  - How does this project support our mission or strategic objectives?
  - This helps justify the project's importance and secures executive support.

# Activities in each Step

## Step 2: Identify Project Infrastructure

- **2.2 Identify installation standards and procedures**
  - Determine the technical and operational standards to follow.
  - Ensures consistency, compliance, and quality across teams.
- **2.3 Identify project team organization**
  - Define how the team is structured
  - Will the team be cross-functional or hierarchical?
  - Helps clarify who does what and avoids overlaps or gaps in responsibility.

# Activities in each Step

## Step 3: Analyze Project Characteristics

- This step is about understanding the **unique nature of the project**.
  - Its goals, challenges, risks, and requirements, so that we can plan accordingly.
- **3.1 Distinguish the project as either objective- or product-driven**
  - **Objective-driven:** Focus is on achieving a result or solving a problem
  - **Product-driven:** Focus is on delivering a specific product or system
    - This distinction affects how you plan, measure success and manage deliverables.

# Activities in each Step

## Step 3: Analyze Project Characteristics

- **3.2 Analyze other project characteristics**
  - Look at size, complexity, urgency, budget, novelty, technical requirements.
  - Helps determine the right methods, tools, and staffing needs.
- **3.3 Identify high-level project risks**
  - Spot potential obstacles (technical, organizational, external).
  - Begin risk planning early so you can mitigate or avoid issues later.
- **3.4 Take into account user requirements concerning implementation**
  - Understand when, where, and how the solution will be used.

# Activities in each Step

## Step 3: Analyze Project Characteristics

- **3.5 Select general life-cycle approach**
  - Choose the best-suited project management methodology.
    - **Waterfall, Agile, Iterative**
  - Based on project size, flexibility needed, and risk levels.
- **3.6 Review overall resource estimates**
  - Based on all the above
    - re-evaluate time, cost, people, and technology needs.
  - This ensures your early estimates are realistic and well-informed.

# Activities in each Step

## Step 4: Identify Project Products and Activities

- This step focuses on identifying
  - **what will be delivered (products)** and **how it will be delivered (activities)**.
  - It helps build a structured plan that connects outputs to actions.
- **4.1 Identify and describe project products (including quality criteria)**
  - List all project outputs (documents, systems, components, reports, etc.)
  - Define their **quality criteria**:
    - What does a “good” version of this product look like?
  - This ensures everyone has the same expectations for each deliverable.

# Activities in each Step

## Step 4: Identify Project Products and Activities

- **4.2 Document generic product flows**
  - Show how products are connected or dependent on each other.
  - A generic flow might illustrate that
    - Product A must be completed before Product B can begin.
- **4.3 Recognize product instances**
  - Identify **specific versions or iterations** of generic products.
  - For example, if a training manual is a product,
  - an instance could be the "Beginner's Guide for New Hires."

# Activities in each Step

## Step 4: Identify Project Products and Activities

- **4.4 Produce ideal activity network**
  - Create a visual map (like a network diagram) showing the **ideal sequence of activities** needed to produce the products.
  - Helps visualize task dependencies and workflow.
- **4.5 Modify ideal to take into account need for stages and checkpoints**
  - Adjust the ideal activity network to include **project stages, milestones,** and **checkpoints** for progress review.
  - This brings realism and control into the plan.

# Activities in each Step

## Step 5: Estimate Effort for Each Activity

- In this step, we assign realistic effort estimates to the activities identified in S-4.
- It's all about turning tasks into measurable work units, making the plan practical and executable.
- **5.1 Carry out bottom-up estimates**
  - Estimate effort starting at the lowest level of detail.
  - Each task is reviewed by the person or team who will actually perform it.
  - Estimates are then rolled up to form the full project effort.

# Activities in each Step

## Step 5: Estimate Effort for Each Activity

- **5.2 Revise plan to create controllable activities**
  - After estimating,
    - review and adjust activities to ensure each
      - manageable, trackable, and assignable.
  - Split large tasks into smaller ones if needed.
  - This step turns your project plan into something you can control, monitor, and update as the project progresses.

# Activities in each Step

## Step 6: Identify Activity Risks

- This step is about identifying and managing **risks linked to specific project activities**.
  - **not just general or high-level project risks (those were covered earlier in S-3).**
- **6.1 Identify and quantify activity-based risks**
  - Look at each activity from your plan and ask:
    - What could go wrong? What's the likelihood?
    - What's the potential impact?
  - Quantify risks using probability and impact scoring.

# Activities in each Step

## Step 6: Identify Activity Risks

- **6.2 Plan risk reduction and contingency measures where appropriate**
  - For high-risk activities, develop **mitigation strategies** (to reduce likelihood) and **contingency plans** (to deal with consequences).
- **6.3 Adjust plans and estimates to take account of risks**
  - Update your activity network, schedules, and effort estimates to reflect the risk-informed reality.
  - This might include adding time buffers, changing resource allocation, or even adjusting scope

# Activities in each Step

## Step 7: Allocate Resources

- Once risks are accounted for and effort is estimated, it's time to assign the **actual resources: people, equipment, time, and budget** to each activity.
- This is a **reality check**:
  - **Can we actually do what we planned with what we have?**
- **7.1 Identify and allocate resources**
  - Determine **who** will do each task, **what tools** or **systems** they'll need, and **how long** they'll be available.
  - Consider availability, skill level, workload, and cost.

# Activities in each Step

## Step 7: Allocate Resources

- **7.2 Revise plans and estimates to take account of resource constraints**
  - If there are conflicts (e.g., one person needed in two places at once, or limited access to a tool), adjust:
    - Schedules
    - Task dependencies
    - Even staffing, if possible
  - This step ensures the plan is **realistic and executable within the resource limitations.**

# Activities in each Step

## Step 8: Review/Publicize Plan

- This step ensures the project plan is not only solid but also **understood and agreed upon** by all key players.
  - It's about quality, clarity, and commitment.
- **8.1 Review quality aspects of the project plan**
  - Check the plan for **completeness, consistency, and feasibility**.
  - Are all deliverables covered?
  - Are timeframes realistic? Are risks addressed?
  - This review might involve quality assurance teams or senior management.

# Activities in each Step

## Step 8: Review/Publicize Plan

- **8.2 Document plans and obtain agreement**
  - Finalize all documentation:
    - Timelines
    - resources, roles, risk plans
    - deliverables.
  - Share the plan with stakeholders, sponsors, and team members.
  - Seek **formal approval** or sign-off to lock in commitment and accountability.

# Activities in each Step

## Step 9 & 10: Execute Plan/Lower Levels of Planning

- Step 9 → **action phase** where all the planning pays off & actual work begins.
  - Implement the project according to the approved plan.
  - Manage tasks, track progress, and ensure deliverables are produced as planned.
  - Monitor performance against key metrics: time, cost, quality, and scope.
  - Use control mechanisms like daily stand-ups, progress reports, or dashboards.
  - Address issues, manage risks, and adapt when changes are needed.

# Activities in each Step

## Step 9 & 10: Execute Plan/Lower Levels of Planning

- While the high-level plan provides the overall structure, Step 10 focuses on **detailed, short-term planning** at the task or team level.
  - Break down top-level tasks into **detailed work packages** or **sprints**.
  - Adjust plans based on progress, risks, or resource changes.
  - Refine estimates and schedules as new information becomes available.
  - Often used in iterative or agile environments where frequent updates are needed.
- This may require the **reiteration** of the planning process at a lower level

# Frameworks & Methodologies

- To help organize and manage the process of project planning, several frameworks and methodologies exist.
- These guide how to
  - Plan
  - Execute
  - Control software projects.
- Project planning frameworks give structure and guidance to the planning process.

# Frameworks & Methodologies

- They define how we approach a project
  - **Traditional frameworks like waterfall** for predictable, linear projects.
    - A linear, phase-by-phase approach where each stage must be completed before moving to the next.
    - **Strengths:**
      - Simple to manage, Clear milestones,
      - Suitable for well-defined, fixed-scope projects
    - **Weaknesses:**
      - Poor flexibility, Late testing may reveal big issues
      - Hard to adapt to change

# Frameworks & Methodologies

- They define how we approach a project
  - **Adaptive frameworks like Agile** for dynamic and evolving environments.
    - A flexible, team-focused framework where work is divided into small iterations (called sprints), and the product evolves over time through feedback and collaboration.
    - **Popular Agile Frameworks:**
      - Scrum
      - Kanban
      - XP

# Frameworks & Methodologies

- They define how we approach a project
  - **Adaptive frameworks like Agile** for dynamic and evolving environments.
    - **Core Principles (Agile Manifesto):**
      - Individuals and interactions over processes and tools
      - Working software over comprehensive documentation
      - Customer collaboration over contract negotiation
      - Responding to change over following a plan

# Frameworks & Methodologies

- They define how we approach a project
  - **Adaptive frameworks like Agile** for dynamic and evolving environments.
    - **Strengths:**
      - High flexibility, continuous feedback
      - Early detection of problems
    - **Weaknesses:**
      - Requires disciplined teams,
      - Less suitable for fixed-price contracts
      - Documentation might be lighter

# Project Planning Tools

- These are software or techniques that help you
  - Plan
  - Schedule
  - Track projects
- Examples of techniques include
  - Gantt charts
  - Critical path methods
  - PERT diagrams

# Summary

- A stepwise planning is a structured approach,
  - Consists of **ten steps** that guide project managers from **Initiation** to **execution**
- It is the best planning approach specially for software development projects.
  - Brings order to project execution and simplifies complex projects.
  - Facilitates communication between teams.
  - Aids in tracking progress and milestones.
  - Allows room for revision and risk management.
- Project planning is an iterative process.

# References

1. PMI. (2013). A Guide to the Project Management Body of Knowledge (5th ed.). PMI, Inc.
2. Bob Hughes, M. C. (2011). Software Project Management (5th ed.). McGraw-Hill.