

Lesson 1: Overview of Project Management

- Project Management (PM) governs the disciplined delivery of a unique product, service, or result through a temporary endeavor with a defined beginning and end.
- What Is a Project?
 - Temporary Endeavor: Projects have a definite beginning and an end, and exist only until objectives are achieved or the initiative is terminated.
 - Unique Outcome: Each project creates a distinct product, service, or result—not routine operations but one-off efforts tailored to the object.
 - The project ends when objectives are met, when it is stopped because objectives cannot be met, or when the need no longer exists.
- Core Characteristics of Projects:
 - Unique: Every project is different in context, constraints, stakeholders, and deliverables.
 - Temporary: Defined start and finish dates; projects are not ongoing operational work.
 - Goal-driven: Projects finish when goals are met or when viability is lost and termination occurs.
 - Stakeholder Expectations: Success is measured by meeting or exceeding stakeholder expectations for scope, quality, time, and cost.
- The Triple Constraint states that every project is influenced by three interdependent factors:
 - Scope: the amount of work or features included.
 - Cost: the budget and financial resources available.
 - Schedule (Time): the time required to complete the work.
- Quality sits at the center: the final quality depends on how well scope, cost, and time are balanced, and changing one factor typically affects one or both of the others.
- Schedule Pressure and Its Effects:
 - When the schedule shortens, options include increasing resources (higher cost), reducing scope, or accepting decreased quality.
 - Extending time may reduce immediate costs but can increase overhead and delay value delivery; it can also allow higher quality or expanded scope.
 - Trade-off decisions should be documented, and stakeholders must align on the new priority (time, cost, or scope) so quality expectations remain clear.
- Key Principle - Manage Trade-offs Intentionally: When scope, cost, or schedule changes, at least one other constraint must change to maintain or redefine quality, requiring early identification of impacts, clear communication, documentation of decisions, and prioritization aligned with project goals.
- Summary & Takeaways:
 - DEFINITION: Projects are temporary, unique endeavors that create distinct products, services, or results; they end when objectives are met or when no longer viable.
 - CHARACTERISTICS: Uniqueness, temporariness, goal-driven completion, and stakeholder expectations define what makes a project and how success is judged.
 - TRIPLE CONSTRAINT: Scope, Cost, and Schedule must be balanced; Quality is the result of managing these trade-offs deliberately.

Lesson 2: The Nature and Importance of Project Management

- Project Management is the disciplined process of planning, organizing, executing, controlling, and monitoring work to achieve specific goals within an agreed time, budget, and quality standard.
- What Is a Project?
 - Example University Website: Developing a university website to provide an online platform for students and faculty as a distinct deliverable with acceptance criteria.
 - Example School Fair: A school fair project begins with planning and ends after event evaluation, showing a clear beginning and end.
- What Does "Integrative" Mean in Project Management? It means bringing different parts together so they work as one, coordinating scope, schedule, budget, quality, people, communication, and risks toward the same objectives.
- Core Integrative Elements:
 - a. Scope: Defines what work must be done and what is included in the project.
 - b. Time: Schedules tasks and milestones to meet deadlines.
 - c. Cost: Estimates, budgets, and controls project expenses to stay within funding limits.
 - d. Quality: Ensures the deliverable meets required standards and specifications.
- Additional Elements Project Managers Integrate:
 - Human Resources: Recruiting, assigning roles, developing teams, and managing performance.
 - Communication: Ensures effective information flow among stakeholders, team members, and sponsors.
 - Risk Management: Identifies, analyzes, and plans responses to potential problems to reduce impact.
 - Procurement: Acquires necessary goods and services from external suppliers under contract.
- Project Management Knowledge Areas (Overview of 10 areas):
 - Project Integration Management: Coordinates and unifies all project activities and knowledge areas.
 - Project Scope Management: Defines what work must be done and what is included in the project.
 - Project Time Management: Plans and controls the project schedule to meet deadlines.
 - Project Cost Management: Estimates, budgets, and controls project expenses to keep the project funded.
 - Project Quality Management: Ensures deliverables meet the required specifications and standards.
 - Project Human Resource Management: Manages people, roles, responsibilities, and team development.
 - Project Communications Management: Facilitates timely, accurate sharing of project information among stakeholders.

- Project Risk Management: Identifies potential problems and plans mitigation and contingency actions.
- Project Procurement Management: Acquires materials, equipment, and services from suppliers, including contract management and vendor selection.
- Project Stakeholder Management: Identifies stakeholders and manages expectations, engagement, and relationships to secure support and minimize resistance.
- Common Characteristics of Projects:
 - Target Outcome: Every project is created to achieve a specific goal, result, or deliverable.
 - Defined Life Span: Projects are temporary with a clear beginning and end.
 - Cross-Organizational Participation: Often requires collaboration across departments, teams, or external partners.
- The Five Project Management Processes: Initiate, Plan, Implement, Monitor & Control, and Close.
- Process Details:
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 - 1. Initiate: Start the project; identify the idea, purpose, goals, feasibility, and key stakeholders (Key question: why are we doing this project?).
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 - 2. Plan: Create a detailed roadmap; define tasks, responsibilities, schedule, cost estimates, risk identification, and resource allocation (Key question: how will we do it?).
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 - 3. Implement (Execute): Perform the work according to the plan; coordinate team members, manage resources, and communicate with stakeholders (Key question: are we doing the work?).
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 - 4. Monitor and Control: Ongoing throughout implementation; track schedule and budget, measure performance, manage risks, and take corrective actions (Key question: are we on track?).
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 - 5. Close: Finalize and evaluate the project; confirm objectives were met, obtain stakeholder acceptance, document lessons learned, and formally close contracts and accounts (Key question: did we achieve our objectives?).

Lesson 3: Project Management Steps

- Phase 1 Project Initiation:
 - Purpose: Decide whether the project should start by evaluating purpose, value, and feasibility, producing decision documents like the Business Case and Feasibility Study.
 - Key Outputs: Business Case, Feasibility Study, Stakeholder register, High-level Objectives.
 - Main Activities: Define project need, clarify purpose, assess benefits, and assess constraints.
- Phase 2 Project Planning:
 - Purpose: Build a detailed roadmap turning approval into an executable plan defining

scope, schedule, budget, resources, risk responses, communication strategies, and assigned responsibilities.

- Scope and Schedule: Develop a program of activities, map timeline, and create a day-by-day schedule.
- Resources & Responsibilities: Assign committees, define roles, and allocate manpower.
- Risk & Contingencies: Identify potential issues and create contingency plans and triggers.
- Phase 3 Project Execution:
 - Purpose: Carry out the work defined in the plan, mobilizing teams and resources to produce deliverables and realize objectives.
 - Communications: Run promotions, manage invitations, coordinate with sponsors and speakers.
 - Operations: Set up booths, produce competition materials, and manage logistics.
 - Team Coordination: Direct volunteers and committees, ensure tasks are completed as scheduled, and maintain resource availability.
- Phase 4 Monitoring & Control:
 - Purpose: Ensure the project stays on schedule, within budget, and meets quality standards by tracking progress and making corrective actions.
 - Measure Progress: Track task completion, milestone achievement, and schedule performance.
 - Control Cost: Monitor expenditures against the budget and adjust allocations when necessary.
 - Quality & Change Management: Inspect deliverables, manage change requests, and implement corrective measures rapidly.
- Phase 5 Project Closure:
 - Purpose: Formally complete the project by handing over deliverables, releasing resources, obtaining stakeholder approval, documenting lessons learned, and recognizing contributors.
 - Final Deliverables: Submit final reports, deliverables, and documentation to stakeholders for acceptance.
 - Administrative Closeout: Release unused resources, close contracts, finalize financials and archives.
 - Lessons Learned: Conduct a post-mortem, document what worked and what didn't, and circulate recommendations for future events.
- Project Life Cycle At a Glance: Guide projects from concept to completion through iterative phases (Initiate, Plan, Execute, Monitor & Control, Close).
- Practical Checklist - Applying the Five Phases: Write Business Case/Feasibility Study, create scope statement and schedule, mobilize teams, track KPIs, and deliver final outputs while documenting lessons.
- Memory Aid & Takeaways:
 - Mnemonic: I-P-E-M-C (Initiate, Plan, Execute, Monitor, Close) - an easy way to remember the five phases.
 - One-Sentence Summary: Decide whether to do the project, plan it, do the work, monitor

results, then close and learn.

- Practical Tip: Keep monitoring continuous, and practical small corrective actions early cost far less than late fixes.

Lesson 4: Project Management Organizational Structures

- Two Categories of Organizational Work:
 - Ongoing Operational Work: Routine, repetitive activities that sustain the business and sales channels, prioritizing continuity over change.
 - Capital Projects: One-time, unique endeavors with a defined goal, set budget, and clear start and end dates.
- Structure 1: Functional Organization:
 - Company is organized around specialized departments focused on ongoing services rather than unique projects, executing projects inside departmental silos.
 - Dual-Role Managers: Projects are run by divisional managers acting as part-time project leads or "Project Coordinators".
 - Limited Authority: The project leader has low formal authority and little control over budgets, timelines, or personnel.
 - Resource Struggle: Securing staff, equipment, or approvals requires negotiation with functional heads, making projects slow and fragmented.
- Structure 2: Project-Oriented Organization:
 - Built around delivering projects (common in construction, consulting, and architecture), orienting resources, governance, and incentives to project delivery.
 - Dedicated Project Managers: Full-time PMs with central and permanent roles for delivery.
 - High Authority & Autonomy: PMs directly control schedules, budgets, and tasks for fast decision-making.
 - Streamlined Resource Access: Projects draw resources from shared expert pools with minimal bureaucracy.
- Structure 3: Matrix Organization (Overview):
 - Blends functional and projectized approaches where team members hold dual reporting lines (a functional manager for discipline and a project manager for project work).
 - Hybrid Goals: Gain operational efficiency from functions while adding project responsiveness through project managers.
 - Dual Reporting: Staff receive technical direction from functional managers and project direction from PMs.
 - Matrix: PMO and Structural Setup: Many matrix organizations formalize project authority by creating a Project Management Office (PMO) that establishes standards, provides governance, and centralizes project management capability.
- Structure 4: Composite Organization:
 - Places a project-oriented division and a functional operational division side-by-side, both reporting directly to the top executive in parallel with clear, separate mandates.

- Side-by-side Coexistence: Distinct divisions run independently, insulating project teams from operational reporting lines.
- Direct Executive Reporting: Leaders of both divisions sit at the same hierarchical level and report directly to the chief executive.
- Clear Boundaries: Projects do not operate inside functional departments; they belong exclusively to the project division.
- How Structure Affects Project Managers & Teams:
 - Implications for Authority: Functional has low PM authority; Projectized has high PM authority; Matrix has mixed authority; Composite PMs enjoy clear mandates within their arm.
 - Implications for Resource Allocation: Functional requires negotiation; Projectized grants quick access; Matrix requires shared resource planning; Composite separates resource pools by division.
 - Team Reporting & Incentives: Determines performance evaluations and career paths within disciplines versus project delivery experience.
 - Speed vs. Stability Trade-off: Projectized and strong-matrix favor speed; functional favors operational stability; composite aims to preserve both.
- Choosing & Managing the Right Structure: Align structure to strategic priorities, then invest in governance, role clarity, and resourcing mechanisms.

Lesson 5: Project Management Selection Methods

- Overview: Two Categories of Selection Methods:
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 - 1. Benefit Measurement Methods: Comparative and scoring approaches evaluating projects side-by-side using financial estimates, weighted criteria, and intuitive scoring.
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 - 2. Constrained Optimization Methods: Mathematical and algorithmic methods (LP, NLP, Integer, Dynamic, Multi-objective) finding optimal portfolios under resource and interdependency constraints.
- Financial & Return-Based Tools:
 - Net Present Value (NPV): Present value of future cash inflows minus initial investment, discounted for time and risk (Rule: Choose projects with $NPV > 0$ and prefer the highest positive NPV).
 - Internal Rate of Return (IRR): Discount rate that makes $NPV = 0$ (Rule: Prefer the highest IRR exceeding the organization's minimum required rate of return).
 - Payback Period: Time required to recover initial investment from project-generated cash flows (Rule: Choose the shortest payback; notes that it ignores cash flows after payback).
- Further Financial Measures & Considerations:
 - Benefit-Cost Ratio (BCR): Total Benefits / Total Costs (Rule: $BCR > 1$ indicates benefits exceed costs; prefer highest BCR for mutually exclusive options).
 - Discounted Cash Flow (DCF): Converts future cash inflows to present value using a discount rate to account for time value of money, inflation, and risk.

- Opportunity Cost: The value or benefits forgone by choosing one project over the next-best alternative (managers should select the portfolio maximizing total return while minimizing opportunity cost).
- Comparative & Scoring Tools:
 - Scoring Models (Weighted Scoring): Assign criteria, set weights, and score projects on each, summing weighted scores to rank projects when strategic alignment and qualitative factors are key.
 - Economic Value Added (EVA): Measures net value created after subtracting the cost of capital to quantify whether a project generates returns above capital costs.
- Why Use Constrained Optimization Methods? When projects are interdependent, resources are limited, or decisions are discrete, constrained optimization methods provide mathematically optimal solutions rather than heuristic rankings.
- Core Mathematical Methods:
 - Linear Programming (LP): Optimizes a single objective (e.g., maximize profit) subject to linear constraints; best when relationships are linear and requirements can be modeled precisely.
 - Non-Linear Programming (NLP): Handles problems with non-linear relationships (e.g., diminishing returns); more realistic for complex systems but computationally harder than LP.
 - Integer Programming: Enforces whole-number decision variables (e.g., build 1 or 2 factories, not 1.5); essential when projects cannot be fractionally funded or are discrete by nature.
 - Dynamic Programming: Breaks a complex optimization into smaller subproblems, solves each once, and assembles the global optimal solution; useful for sequential decision-making and staged investments.
 - Multiple Objective Programming (MOP): Balances multiple, conflicting objectives simultaneously (e.g., maximize ROI while minimizing risk and time), producing trade-off solutions (Pareto front).
- Decision Guidance: Matching Method to Context:
 - When to Use Benefit Measurement: Quick decisions, limited data, projects evaluated mostly on financial metrics or straightforward strategic fit.
 - When to Use Constrained Optimization: Complex portfolios with resource constraints, discrete choices, interdependent projects, or multiple objectives.
 - Hybrid Approach: Use comparative methods to screen and reduce candidate projects, then apply constrained optimization or MOP to construct the final portfolio.