Introduction to Project Management

Lecture notes · Project Management Foundations · Module 1: What project management is

Learning objectives

O1	Explain what a project is, and how it differs from everyday work (operations).
O2	Describe objectives, scope, schedule, resources, stakeholders and risk.
O3	Follow a project through its life cycle, from start to close.
O4	Use a simple schedule and budget to make decisions.

Prerequisites: None. Addition and simple percentages are used for schedules and budgets.

Contents: 1. Projects and operations · 2. Objectives and scope · 3. Schedule: dependencies, Gantt charts and the critical path · 4. Resources and budget · 5. Stakeholders and risk · 6. The life cycle, control and closing · Worked examples · Summary · References

1. Projects and operations

PMI defines a project as a temporary endeavour undertaken to create a unique product, service or result. Temporary: it has a defined start and end. Unique: its result is new in some way, even if similar to earlier work.

Operations are the ongoing, repeated work that keeps an organisation running: baking bread every morning, answering customer calls, paying salaries. Projects change things; operations keep things running.

Project management is the application of knowledge, skills, tools and techniques to project activities to meet the project's requirements. It matters because unmanaged projects often finish late, over budget, or deliver the wrong thing.

2. Objectives and scope

A good objective is specific and measurable, with a deadline: 'hold a one-day festival with at least 20 vendors and 2,000 visitors, in 8 weeks, within $20,000'. Anyone can tell afterwards whether it was achieved.

Scope states what the project will and will not deliver. Writing down what is out of scope prevents scope creep: small additions that accumulate until the project is late and over budget.

A work breakdown structure (WBS) divides the total work into smaller pieces, down to tasks small enough to assign to one person and estimate.

3. Schedule: dependencies, Gantt charts and the critical path

A dependency means one task cannot start (or finish) until another has. Most dependencies are finish-to-start: set-up cannot start until the venue, vendors, marketing and permits are finished.

A Gantt chart shows each task as a bar against time. The critical path is the longest chain of dependent tasks; its length is the shortest possible project duration. Any delay on a critical task delays the whole project.

Float (slack) is how long a task can slip without delaying the project. Critical tasks have zero float. Float is found with a forward pass (earliest start and finish times) and a backward pass (latest start and finish times): float = latest start - earliest start.

4. Resources and budget

Resources are the people, money, equipment, materials and time a project needs. Give every piece of work a single owner, so that nothing falls between people.

A budget lists the estimated cost of each part of the work. Because estimates are uncertain, project managers keep a contingency reserve: money set aside for identified risks. In the festival, 10% ($2,000) of the $20,000 grant was kept as reserve.

Tracking actual costs against the budget throughout the project allows early action when spending runs ahead of progress.

5. Stakeholders and risk

A stakeholder is anyone who affects or is affected by the project. A power-interest grid helps decide the level of attention: manage closely (high power, high interest), keep satisfied (high power, low interest), keep informed (low power, high interest), monitor (low power, low interest).

A risk is an uncertain event that, if it occurs, affects the project's objectives. For each risk, estimate probability and impact, then choose a response: avoid it, reduce it (mitigate), transfer it (for example, insurance), or accept it (with a contingency plan).

A risk register records each risk, its rating, its response and its owner, and is reviewed regularly because new risks appear as the project progresses.

6. The life cycle, control and closing

The PMBOK Guide (6th edition) groups project work into five process groups: initiating, planning, executing, monitoring and controlling (which runs throughout), and closing. Adaptive (agile) approaches plan and deliver in short cycles, but use the same core ideas.

Monitoring compares reality with the plan; controlling takes corrective action, such as moving a person from a task with float to a delayed critical task.

Change control: every requested change is assessed for its impact on scope, time, cost and risk, then formally approved or rejected, and the plans are updated.

Closing is real work: final payments, cost comparison, handover of results and resources, releasing the team, confirming acceptance, and recording lessons learned.

Earned value basics: are we on time and on budget?

Planned value (PV): the budgeted cost of the work scheduled to be done by now. Earned value (EV): the budgeted cost of the work actually done. Actual cost (AC): what has actually been spent.

Schedule variance SV = EV - PV (negative means behind schedule). Cost variance CV = EV - AC (negative means over budget).

Example: by week 4, work worth $10,000 was planned (PV), work worth $9,000 was completed (EV), and $9,500 was spent (AC). SV = -$1,000 (behind); CV = -$500 (over budget).

Who does what: a RACI chart

For each task, mark who is Responsible (does the work), Accountable (one person who owns the result), Consulted (gives input) and Informed (kept up to date). Example for 'book venue': Responsible: volunteer A; Accountable: Leila; Consulted: sponsor; Informed: residents' association.

One Accountable person per task prevents the problem of everyone assuming someone else is handling it.

Change request template

Requested by and date; description of the change; reason and benefit; impact on scope, schedule, cost, quality and risk; options considered; decision (approved / rejected / deferred) and by whom; plans updated (yes/no).

Worked examples

Worked example 1: the festival's critical path

Venue 2 weeks; permits 3 weeks (start immediately); vendors 4 and marketing 5 (both after venue); set-up 1 week after everything else. Find the duration, the critical path and the float.

Step 1. Forward pass: venue finishes week 2; permits week 3; vendors 2 + 4 = 6; marketing 2 + 5 = 7.

Step 2. Set-up starts when the latest predecessor finishes (week 7) and ends at week 8.

Step 3. Chains: venue-marketing-set-up 2 + 5 + 1 = 8; venue-vendors-set-up 7; permits-set-up 4. The longest, 8 weeks, is critical.

Step 4. Float: vendors 1 week, permits 4 weeks; venue, marketing and set-up 0.

Worked example 2: building the budget with a reserve

Costs: venue $6,000; stage and sound $5,000; marketing $3,000; permits and insurance $2,000; volunteer supplies $2,000. The grant is $20,000. Find the reserve and the effect of a $1,500 approved change.

Step 1. Planned costs = 18,000 dollars.

Step 2. Contingency reserve = 20,000 - 18,000 = $2,000 (10% of the grant).

Step 3. After the approved $1,500 children's area: reserve left = $500.

Step 4. The scope document and budget must both be updated to record the change.

Worked example 3: a forward and backward pass

A website project: design 3 days; build 6 and content 4 (both after design); test 2 (after build and content); train 2 (after content); launch 1 (after test and train). Find the duration and each task's float.

Step 1. Forward pass: design 0-3; build 3-9; content 3-7; test 9-11; train 7-9; launch 11-12.

Step 2. Project length = 12 days.

Step 3. Backward pass from day 12: launch 11-12; test 9-11; train 9-11 (latest); build 3-9; content: must finish by 9 (test) and by 9 (train), so latest 5-9; design 0-3.

Step 4. Float: content 2 days, train 2 days; design, build, test and launch are critical (0).

Summary

• A project is temporary and creates something unique; operations are ongoing and repeated.

• Write a specific, measurable objective and define scope, including what is out of scope.

• Break down the work, map dependencies and watch the critical path; use float to rebalance.

• Assign owners, keep a contingency reserve, and manage stakeholders and risks actively.

• Monitor and control throughout, use change control, and close properly with lessons learned.

References

References: KN-PRO-PMG-C01-M01-T01-L01
PMI, "What is a project?" (pmi.org: "a temporary endeavor undertaken to create a unique product, service, or result"); PMI, A Guide to the Project Management Body of Knowledge (PMBOK Guide), 6th ed. (process groups) and 7th ed. (principles, performance domains); critical path method as taught in standard PM texts (e.g. Project Management: From Simple to Complex, Saylor/Flat World, ch. 6).
All references were consulted for accuracy; no text or figures from them are reproduced in the video. Verify links before publication.
The Riverside festival is fictional. Every schedule and budget figure is computed and checked automatically.