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Faculty of Computers
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Department of
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Agile Methods

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Lecture 4

Project Management

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Project Management

- What is a Project Management
- Creating a Work Breakdown Structure
- Identifying Task Patterns
- Project Monitoring and Control
- Risk Management





Project Management

To manage a large-scale IT project, specific tools and techniques are needed. A **project manager** is also needed.



Project Management

A **project manager** is someone who is responsible for overseeing all relevant tasks.

Project management for IT professionals includes planning, scheduling, monitoring and controlling, and reporting on information system development.



What Shapes a Project?

A successful project must be completed on time, within budget, and deliver a quality product that satisfies users and meets requirements.

Systems development projects tend to be dynamic and challenging.

There is always a balance between constraints and interactive elements such as project cost, scope, and time.



PROJECT TRIANGLE

Decisions do not need to be all-or-nothing, but recognize that any change in one leg of the triangle will affect the other two legs.

A project triangle, where the three legs are cost, scope, and time.

The challenge is to find the optimal balance among these factors.



Planning

- identifying all project tasks
- estimating the completion time and cost of each.

Scheduling

- creation of a specific timetable.
- Project scheduling uses Gantt charts and PERT/CPM charts

Monitoring

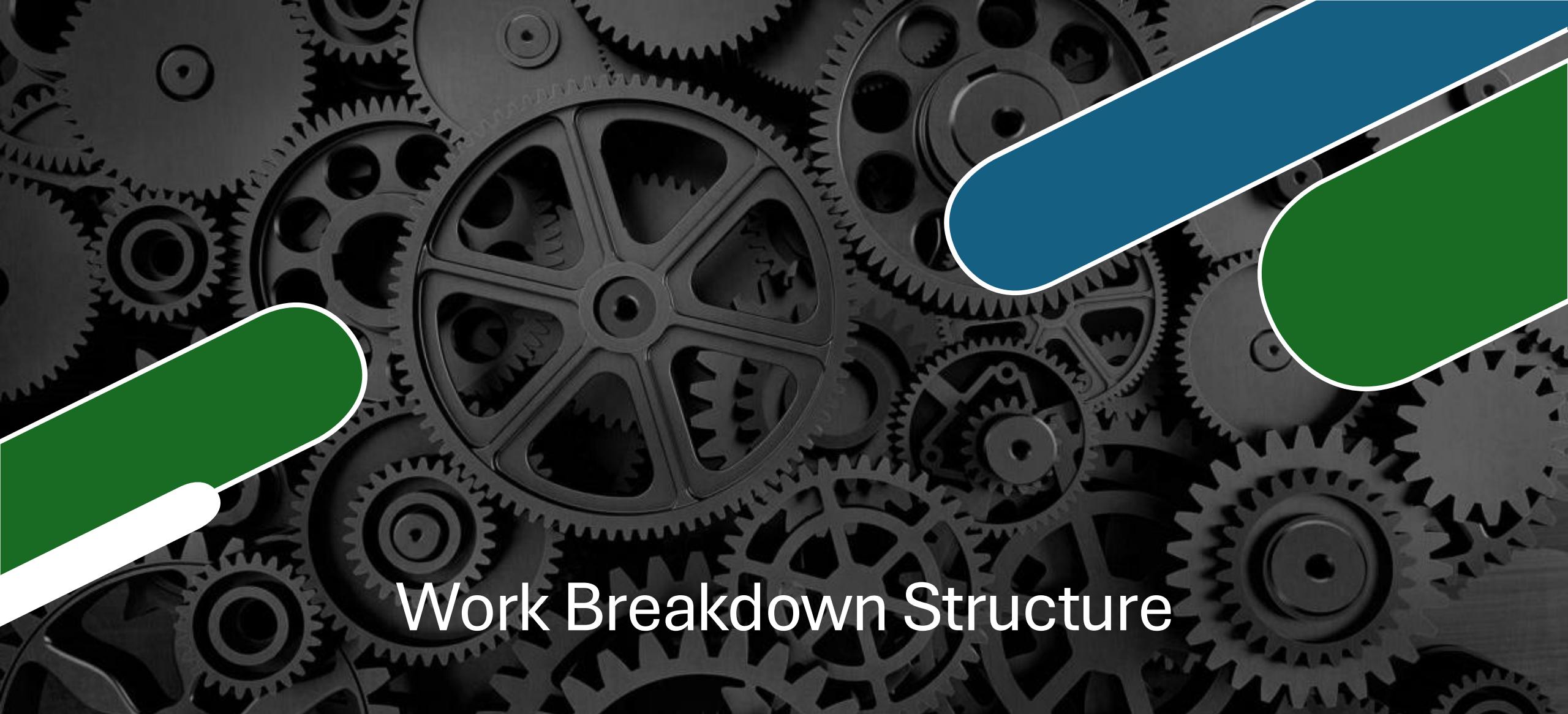
- guiding, supervising, and coordinating the project team's workload.
- monitor the progress, evaluate the results, and take corrective action

Reporting

- includes regular progress reports to management, users, and the project team itself
- Effective reporting requires strong communication skills and a sense of what others want and need to know about the project.

WHAT DOES A PROJECT MANAGER DO?

Project managers typically perform four activities, or functions: planning, scheduling, monitoring, and reporting:



Work Breakdown Structure

A work breakdown structure (WBS) involves breaking a project down into a series of smaller tasks.



Gantt Chart

Before creating work breakdown structures, the two primary chart types should be understood: **Gantt charts and PERT/CPM charts.**

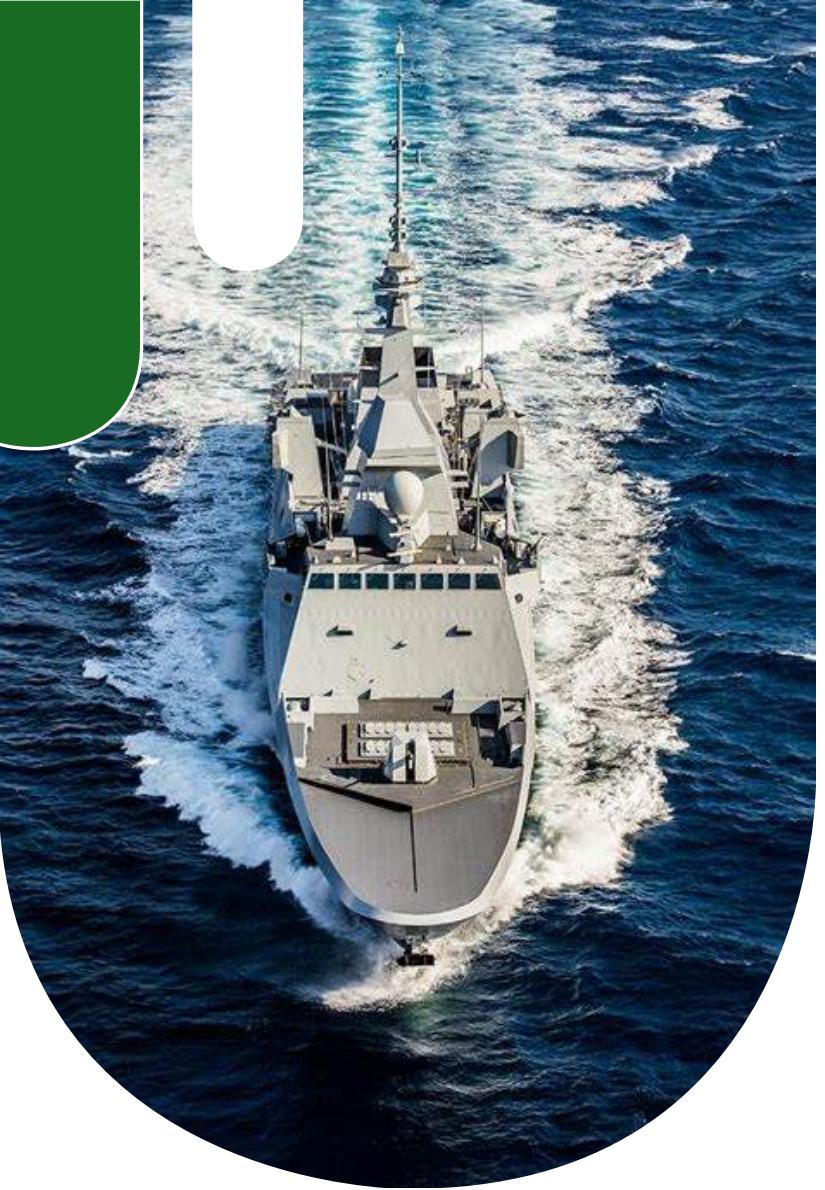
Henry Gantt, who designed such a chart around the years 1910–1915.

A **Gantt chart** is a horizontal bar chart that represents a set of tasks.

Gantt Chart

- It can simplify a complex project by combining several activities into a task group that contains subsidiary tasks. This allows a complex project to be viewed as a set of integrated modules.
- This chart lists the tasks to be performed on the vertical axis, and time intervals on the horizontal axis.





PERT/CPM

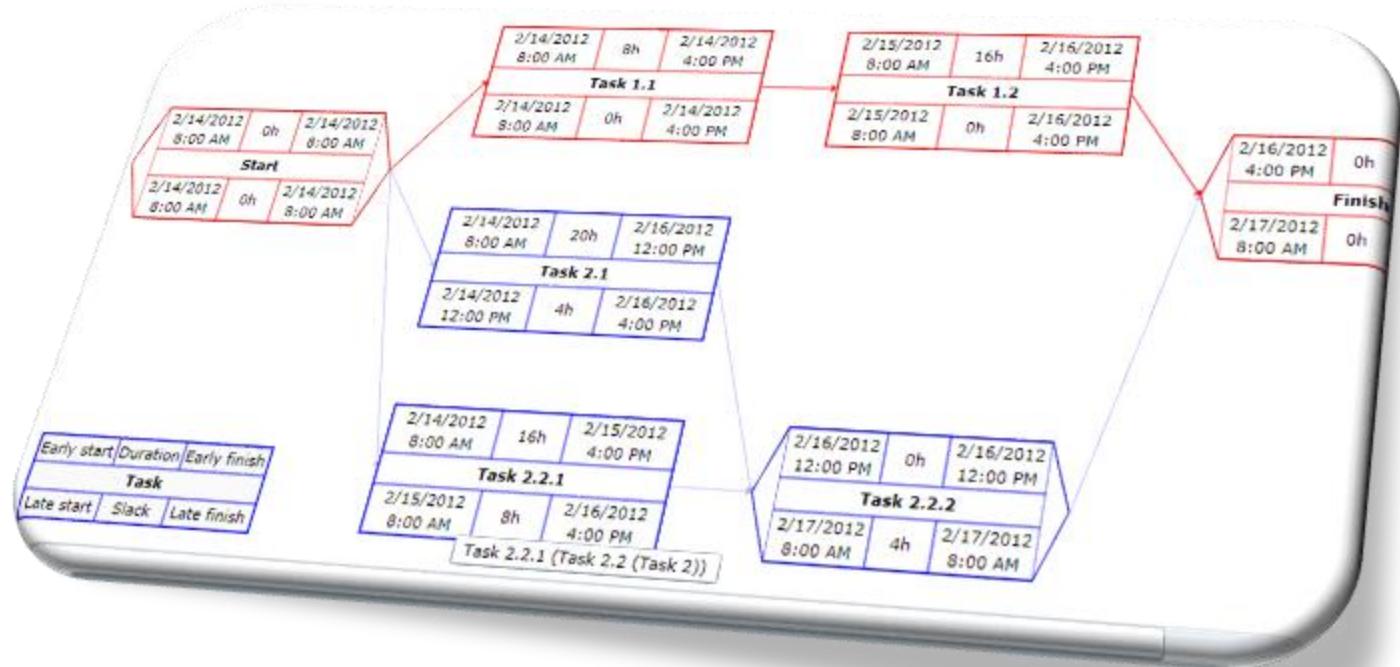
The Program Evaluation Review Technique (PERT) was developed by the U.S. Navy to manage very complex projects, such as the construction of nuclear submarines.

The Critical Path Method (CPM) was developed by private industry to meet similar project management needs.

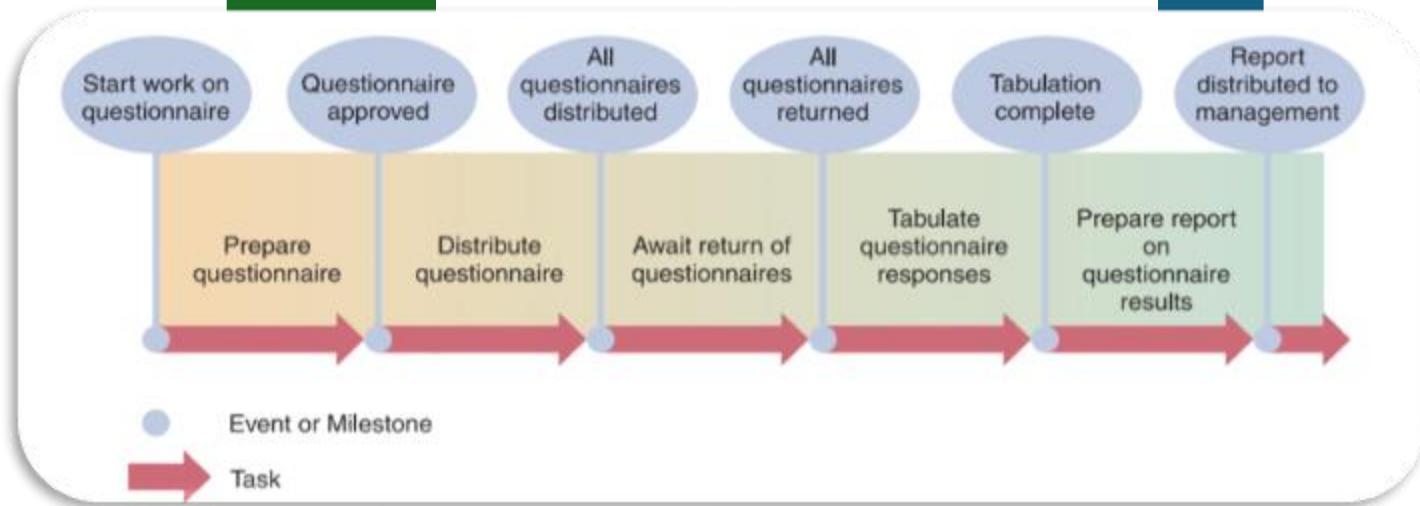
The distinction between the two methods has disappeared over time.

PERT/CPM

- PERT/CPM chart is a **bottom-up technique** because it analyzes a large, complex project as a series of individual tasks.
- This chart lists the tasks to be performed on the vertical axis, and time intervals on the horizontal axis.
- Microsoft called this chart a **Network diagram**.



IDENTIFYING TASKS IN A WBS



A WBS must clearly identify each task and include an estimated duration.

A task, or activity, is any work that has a beginning and an end and requires the use of company resources such as people, time, or money.

Every project has events, or milestones. An event, or milestone, is a recognizable reference point that can be used to monitor progress.

First version

First, reserve the meeting room. Then order the marketing materials and brief the managers. After the briefings, send out customer emails and burn sample DVDs. When the emails are sent and the DVDs are ready, load the new software. When the marketing materials have arrived and the software is ready, do a dress rehearsal.

Second version

First, *reserve the meeting room*. Then *order the marketing materials* and *brief the managers*. After the briefings, *send out customer emails* and *burn sample DVDs*. When the emails are sent and the DVDs are ready, *load the new software*. When the marketing materials have arrived and the software is ready, *do a dress rehearsal*.

Third version

- First, *reserve the meeting room*.
- Then *order the marketing materials* and *brief the managers*.
- After the briefings, *send out customer emails* and *burn sample DVDs*.
- When the emails are sent and the DVDs are ready, *load the new software*.
- When the marketing materials have arrived and the software is ready, *do a dress rehearsal*.

Task No.	Description
1	Reserve the meeting room
2	Order the marketing materials
3	Brief the managers
4	Send out customer emails
5	Burn sample DVDs
6	Load the new software
7	Do a dress rehearsal

LISTING THE TASKS

- First collect the bulk of steps using timing words (**First-Then-After-When-Finally**) shown in first version.
- Then **Highlight individual tasks**, easy something start with verb shown in second version.
- After **Highlighting** make them as bullets shown in Third version.
- Finally **List them in a table** to go to next step of time estimation.
- The previous steps is list of tasks, did you notice?

Project Manager



A person who thinks nine women can deliver a baby in one month

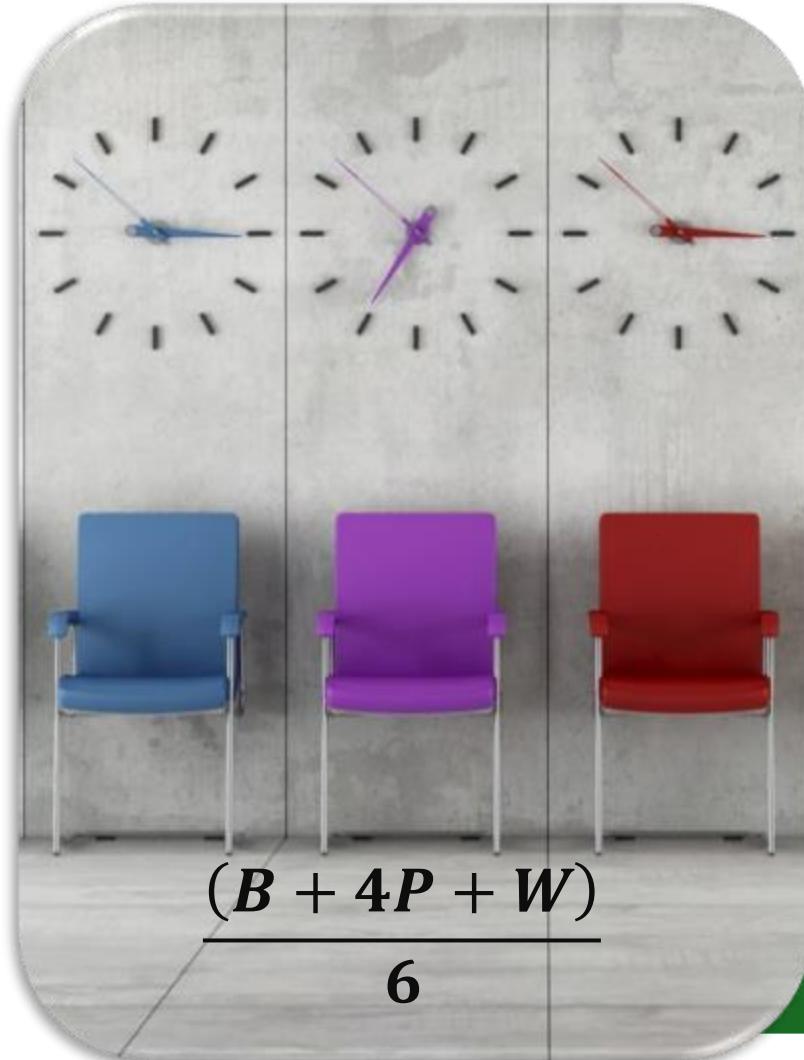
Project manager

ESTIMATING TASK DURATION

- A **person-day** represents the work that one person can complete in one day. This approach, however, can present some problems.
- if it will take one person 20 days to perform a particular task, it might not be true that two people could complete the same task in 10 days.

ESTIMATING TASK DURATION

- Project managers often use a weighted formula for estimating the duration of each task.
- An optimistic, or best-case estimate (**B**), a probable-case estimate (**P**), and a pessimistic, or worst-case estimate (**W**).
- The manager then assigns a weight, which is an importance value, to each estimate.



$$\frac{(B + 4P + W)}{6}$$





FACTORS AFFECTING DURATION

When developing duration estimates, project managers consider four factors:

- I. Project size
- II. Human resources
- III. Experience with similar projects
- IV. Constraints

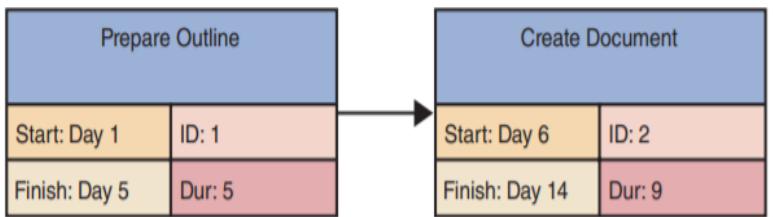


Identifying Task Patterns

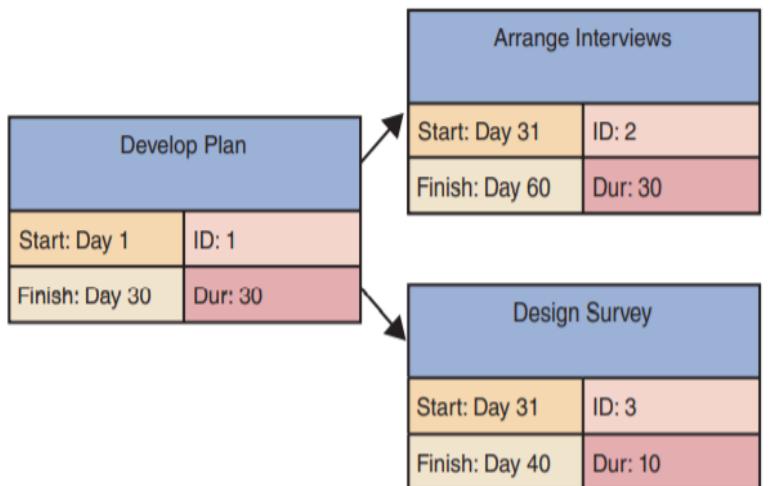
Tasks in a work breakdown structure must be arranged in a logical sequence called a task pattern.



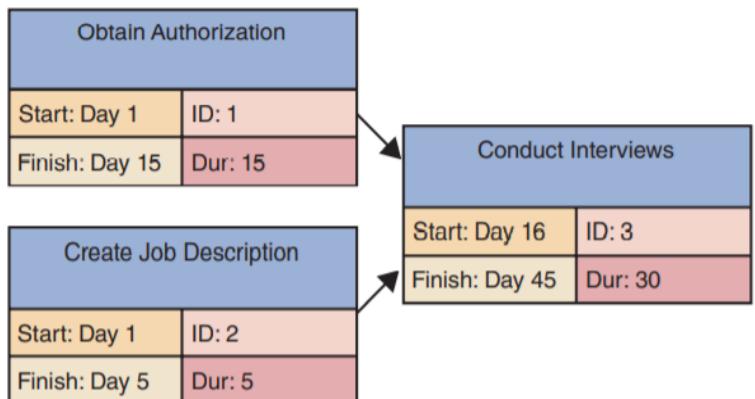
EXAMPLE OF A DEPENDENT TASK



EXAMPLE OF MULTIPLE SUCCESSOR TASKS



EXAMPLE OF MULTIPLE PREDECESSOR TASKS

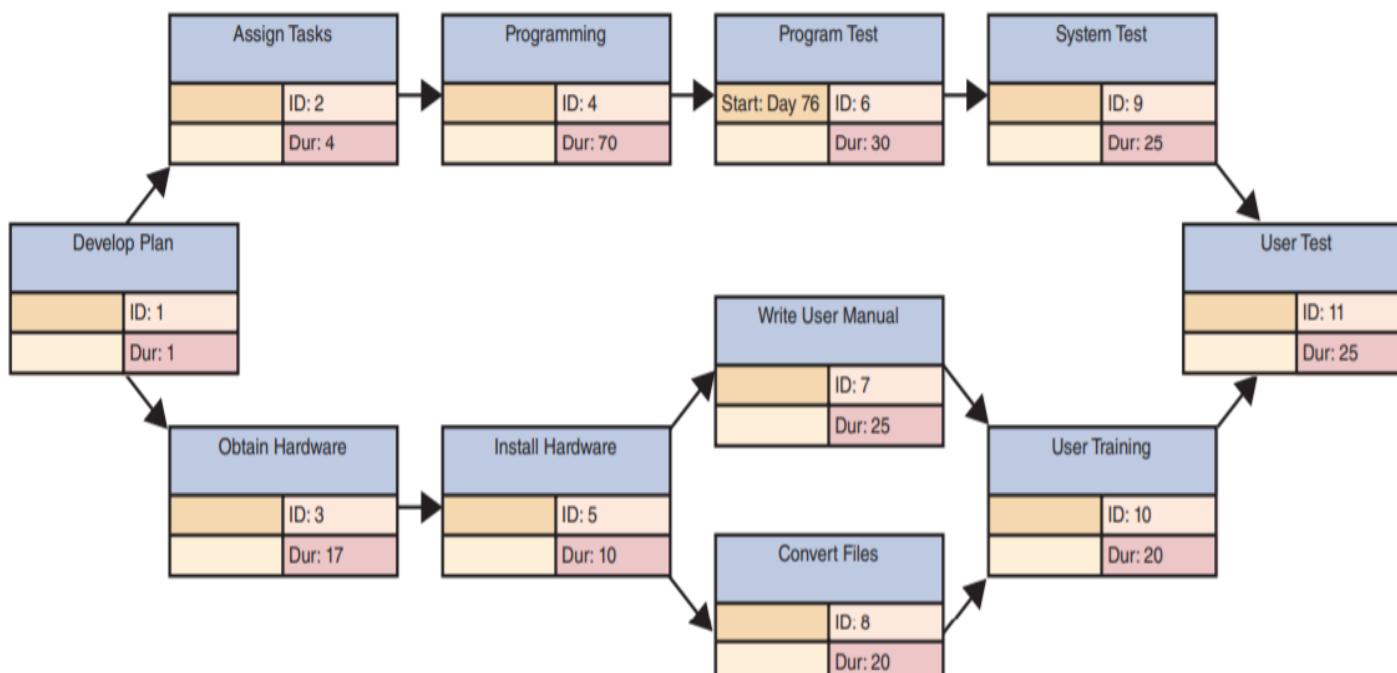


Task Patterns

- Tasks depend on each other and must be performed in a sequence, not unlike the commands in a software program.
- Task patterns can involve dependent tasks, multiple successor tasks, and multiple predecessor tasks.
- In a PERT/CPM chart, project tasks are shown as rectangular boxes, arranged in the sequence in which they must be performed.

Network Diagram

- A complex task pattern is a chain of multiple patterns, if it complete for a project it called a Network Diagram





Project Monitoring and Control

The project manager must keep track of the tasks and progress of team members, compare actual progress with the project plan.





MONITORING AND CONTROL TECHNIQUES

- A structured walk-through is a review of a project team member's work by other members of the team.
- Structured walk-throughs take place throughout the SDLC and are called design reviews => System Design phase, code reviews => Implementation Phase, or testing reviews => Support & maintenance phase , depending on the phase in which they occur.



REPORTING

- Members of the project team regularly report their progress to the project manager, who in turn reports to management and users.
- The project manager collects, verifies, organizes, and evaluates the information he or she receives from the team.



PROJECT STATUS MEETINGS

- Project managers, schedule regular meetings to update the team and discuss project status, issues, problems, and opportunities.
- The most important practice of Agile development is the daily SCRUM practice which called the **Stand Up meeting**.



Daily Standup

- A daily stand-up is a daily status meeting among all team members and it is held roughly for 15 minutes.
- Every member has to answer three important questions:
 - What I did yesterday?
 - What I'll do today?
 - Any impediment I am facing.../ I am blocked due to...





Risk Management

A risk is an event that could affect the project **negatively**.

RISK MANAGEMENT



Risk management is the process of identifying, analyzing, anticipating, and monitoring risks to minimize their impact on the project.



STEPS IN RISK MANAGEMENT

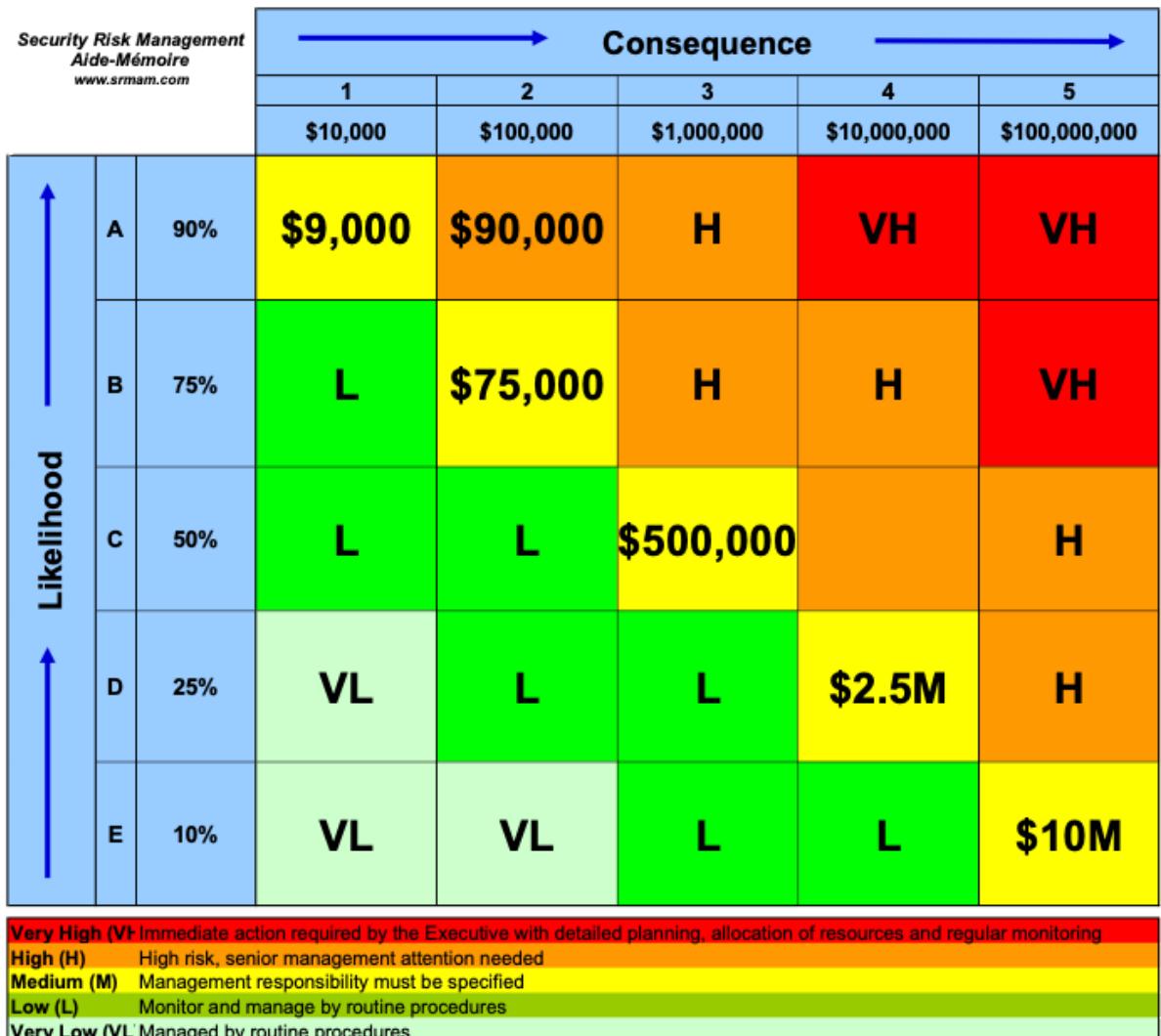


The first step in risk management is to develop a specific plan.

A **risk management plan** includes a review of the project's scope, stakeholders, budget, schedule, and any other internal or external factors that might affect the project.

Risk identification: the analyst lists each risk and assesses the likelihood that it could affect the project.

Qualitative risk analysis evaluates each risk by estimating the likelihood or probability that it will occur and the degree of impact. And mapping the evaluation to the **risk matrix**



STEPS IN RISK MANAGEMENT

The purpose of **quantitative risk analysis** is to understand the actual impact in terms of dollars, time, project scope, or quality.

The most used method here is the What-if analysis and can estimate the yellow areas in risk matrix with money.

In some situations, adding more people to a project actually might increase the time necessary to complete the project because of a principle called **Brooks' Law**.

THANK YOU!

