Project management

- Software project management
  - Organising
  - Planning
  - Scheduling
  - Monitoring
  - Controlling
Objectives

- To introduce software project management and to describe its distinctive characteristics
- To discuss project planning and the planning process
Topics covered

- Management activities
- Project planning
- Project scheduling
Software is a Risky Business

- All surveyed projects used waterfall lifecycle.
- 53% of projects cost almost 200% of original estimate.
Moving Target Problem

- Change is *inevitable*

- planning/preparation
  - Growing companies are always going to change
  - Markets evolve and needs of people change

- There is no solution to the moving target problem, so we need to learn to live with it
Software Project Management

- Why S/W Project Management?

- Because software development is always subject to
  - budget and
  - schedule constraints
  - quality constraints
  that are set by the organisation developing the software

- Minimise risk of failure
Software Project Management (Cont.)

- Amateur programmer:
  - No need for s/w project management

- Professional s/w developer:
  - Needs for s/w project management

- Good s/w project management
  - Will not guarantee project success

- Bad s/w project management
  - Will certainly result in project failure !!!
Management Activities

- S/W manager responsibilities include:
  - **Proposal writing**: Objectives, methodology, deliverables, cost & schedule estimates
  - **Project planning and scheduling**: Goals, activities, resources, milestones
  - **Project costing**: Resources needed for activities
  - **Project monitoring and reviews**: Track actual versus planned cost and time
  - **Personnel selection and evaluation**
  - **Report writing and presentations**
Activity organization: Milestones & Deliverables

- Activities in a project should be organised to produce tangible outputs for management to judge progress

- **Milestones**
  - Check point based on:
    - Time
    - Budget
    - Deliverable
  - End-point of logical stage (activity) in the project
  - Has no duration
  - At each milestone there should be a formal output (report) presented to management
    - Management needs documentation & information to judge project progress

- **Deliverables**
  - are project results delivered to customers
  - Deliverables are usually milestones but milestones need not be deliverables
Milestones Example: Requirements Engineering process (prototyping)

Deliverables are usually milestones
The Project Scheduling Process

1. Identify activities
2. Identify activity dependencies
3. Estimate resources for activities
4. Allocate people to activities
5. Create project charts

Software requirements

Activity charts and bar charts
Project Scheduling

- Identify activities
- Estimate activity effort
- Estimate resources needed per activity
- An activity
  - At least one week duration
  - Maximum 8-10 weeks.
  - If greater subdivide into sub activities
- Increase your original estimate to cover anticipated & unanticipated problems
  - Add 30% for anticipated problems
  - Add 20% for omissioning (unanticipated problems)
## Project Precedence Table

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration (Weeks)</th>
<th>Precedence</th>
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<tbody>
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<td>8</td>
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<tr>
<td>B</td>
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<td>E, F</td>
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Critical Path

Critical Path: B-D-F-G
**Project Precedence Table**

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<th>Task</th>
<th>Duration (Weeks)</th>
<th>Precedence</th>
<th>Earliest start</th>
<th>Earliest finish</th>
<th>Latest start</th>
<th>Latest finish</th>
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Critical task
## Task durations and dependencies: Precedence Table

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<th>Dependencies</th>
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</tr>
<tr>
<td>T3</td>
<td>15</td>
<td>T1 (M1)</td>
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<td>T11 (M8)</td>
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Activity network (Task dependency)

T: Task
M: Milestone