Software Engineering

Part II.

Project Management & Risk Management

Avinanta Tarigan

Gunadarma University

Outline

For Your Information

Material Presented are mostly captured from Sommerville (2004)

Software Project Management

- Activities in ensuring :
  - software is delivered on time
  - accordance with the requirements
- Budget and schedule constraints
- Software is intangible & flexible
- There is no standard on software development process
- Many software projects are “one-time” and “sangkuriang” projects

Activities

- Activities :
  - Proposal writing
  - Project planning, scheduling & costing
  - Project monitoring and reviewing
  - HR selection and evaluation
  - Report writing and presentations
- Project Planning
  - time-consuming activity
  - Continuous activity initial concept $\rightarrow$ system delivery, regularly revised
  - the main project plan is concerned with schedule and budget, others can be developed to support it

Types of Project Plan

Plan	Description
Quality Plan	Describes the quality procedures and standards that will be used in a project
Validation Plan	Describes the approach, resources and schedule used for system validation
Configuration management plan	Describes the configuration management procedures and structures to be used
Maintenance plan	Predicts the maintenance requirements of the system, maintenance costs and effort required
Staff development plan	Describes how the skills and experience of the project team members will be developed

Project Planning Process

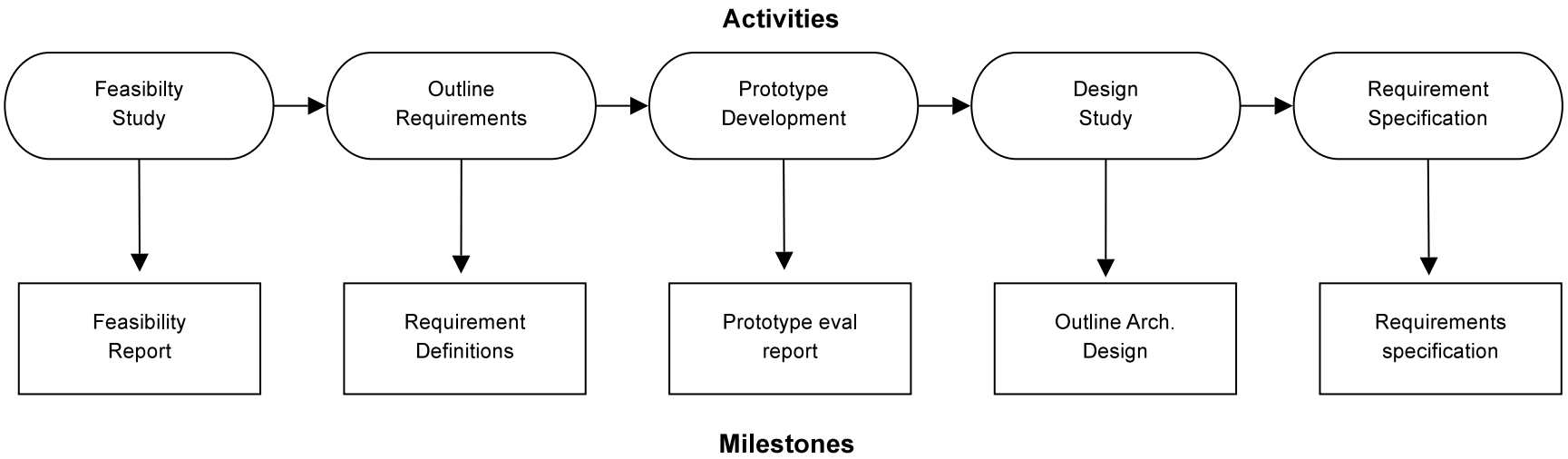
- Establish the project constraints
- Make initial assessments of the project parameters
- Define project milestones and deliverables
- while project has not been completed or cancelled loop
  - Draw up project schedule
  - Initiate activities according to schedule
  - Wait (for a while)
  - Review project progress
  - Revise estimates of project parameters
  - Update the project schedule
  - Re-negotiate project constraints and deliverables
  - if (problems arise) then
    - Initiate technical review and possible revision
  - end if
- end loop

Project Plan

- The project plan sets out:
  - The resources available to the project;
  - The work breakdown;
  - A schedule for the work.
- Structure
  - Introduction.
  - Project organisation.
  - Risk analysis.
  - Hardware and software resource requirements.
  - Work breakdown.
  - Project schedule.
  - Monitoring and reporting mechanisms.

Activity & Milestones

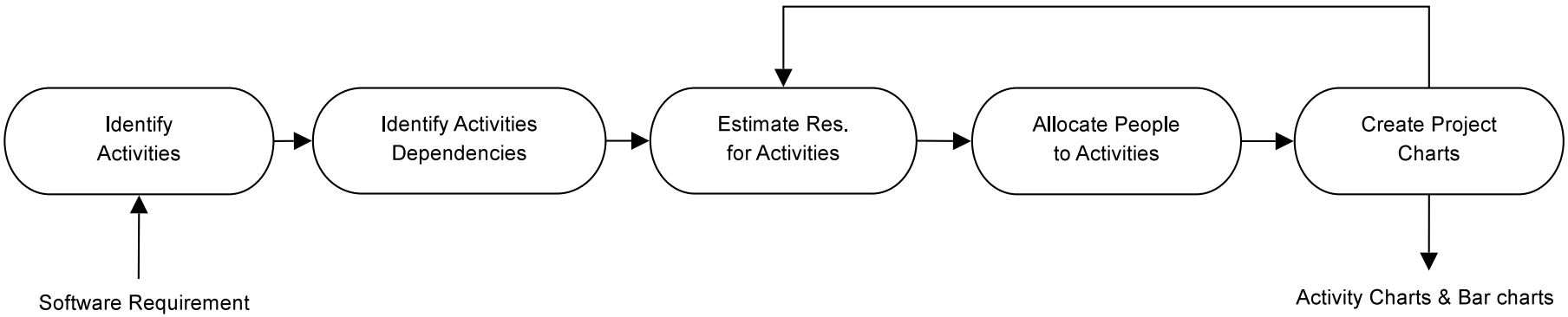
- Activity Organization
  - Activities in a project should be organised to produce tangible outputs for management to judge progress.
  - Milestones are the end-point of a process activity.
  - Deliverables are project results delivered to customers.
  - The waterfall process allows for the straightforward definition of progress milestones.



Scheduling

- Project Scheduling
  - Split project into tasks and estimate time and resources required to complete each task.
  - Organize tasks concurrently to make optimal
  - use of workforce.
  - Minimize task dependencies to avoid delays
  - caused by one task waiting for another to complete.
  - Dependent on project managers intuition and experience.

Scheduling Process



Scheduling Problem

- Estimating the difficulty of problems and hence the cost of developing a solution is hard.
- Productivity is not proportional to the number of people working on a task.
- Adding people to a late project makes it later because of communication overheads.
- The unexpected always happens. Always allow contingency in planning.

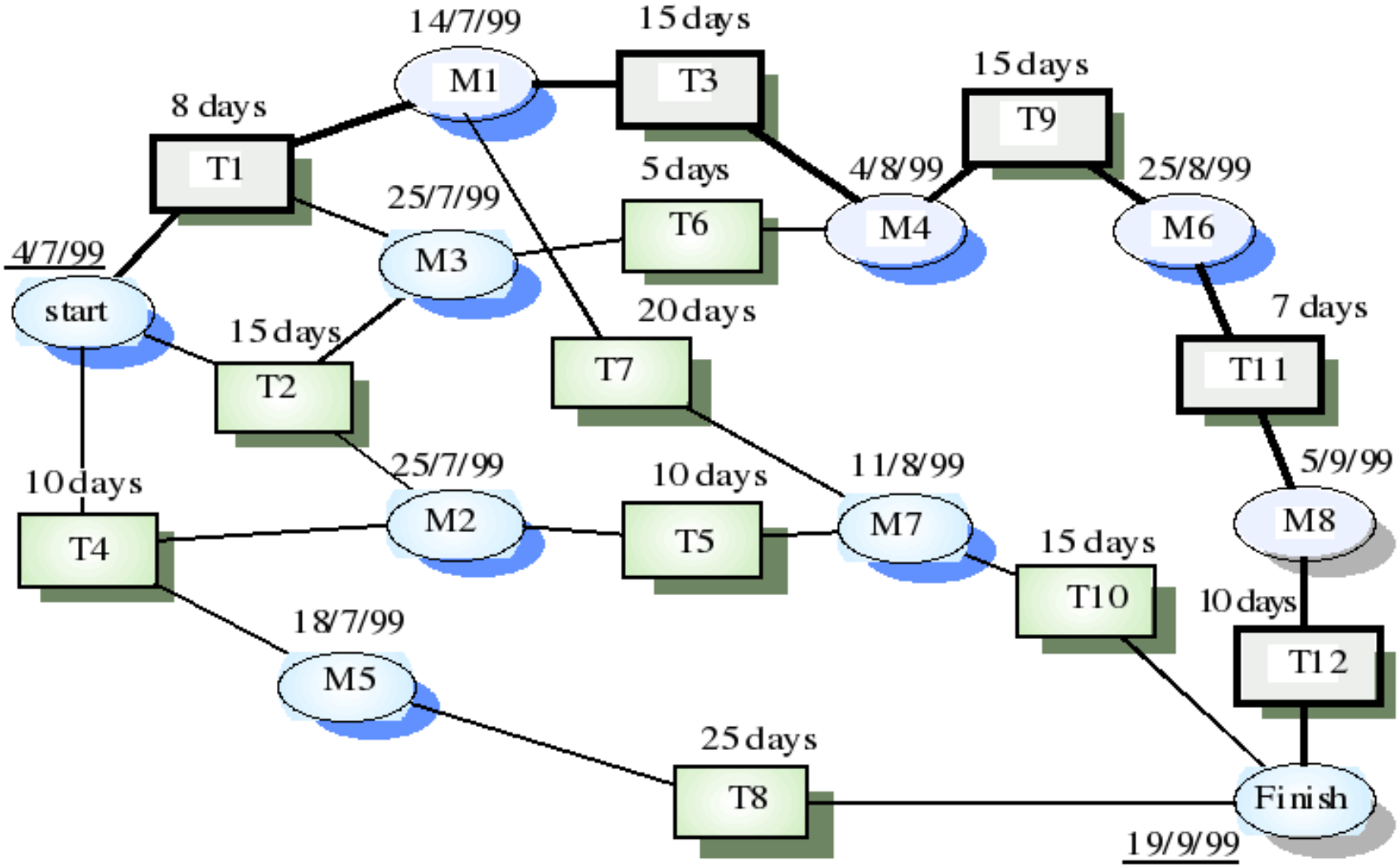
Bar Charts and Activity Network

- Graphical notations used to illustrate the project schedule.
- Show project breakdown into tasks. Tasks should not be too small. They should take about a week or two.
- Activity charts show task dependencies and the the critical path.
- Bar charts show schedule against calendar time.

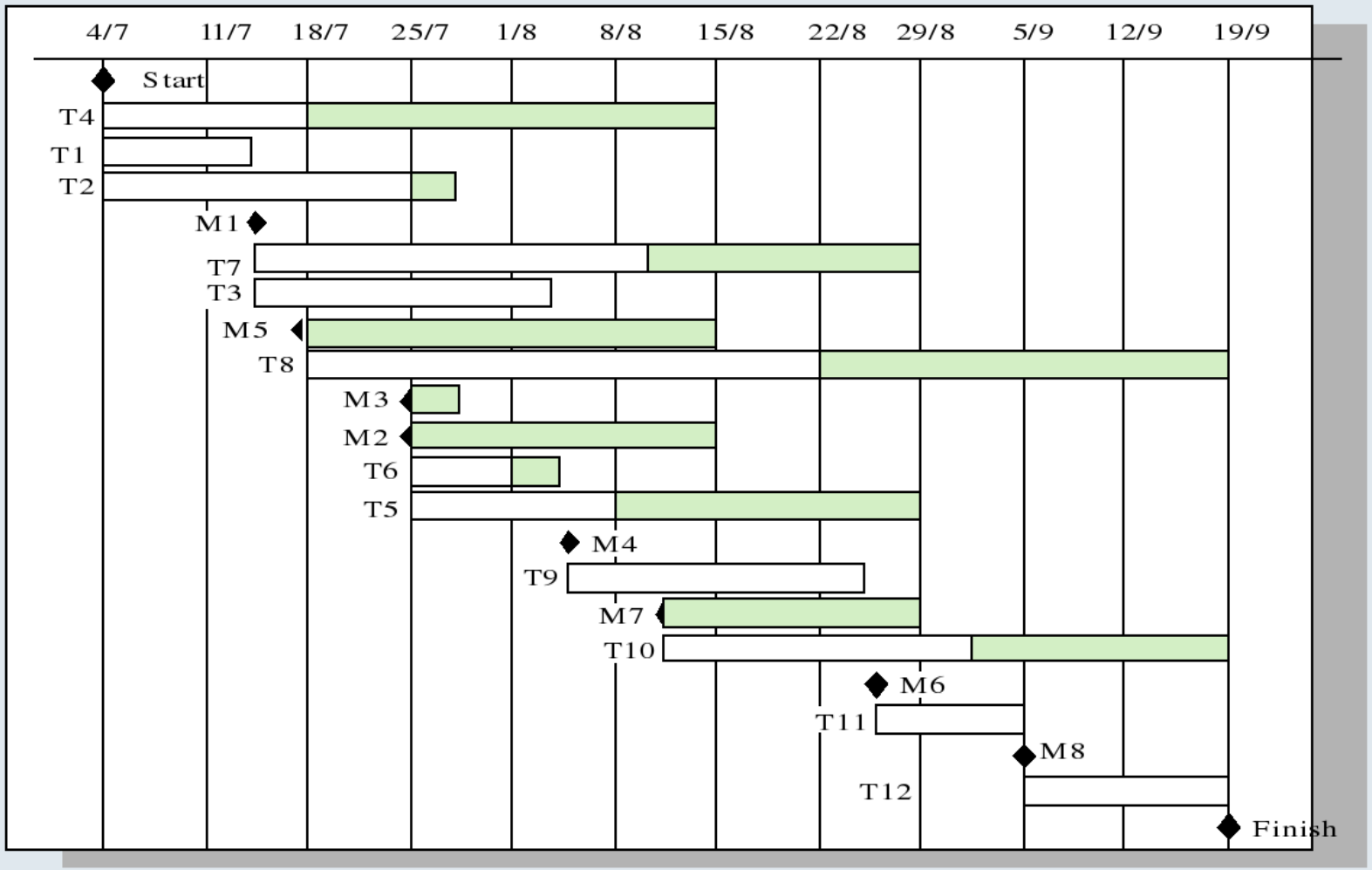
Task Duration & Dependencies

Tasks	Duration (Days)	Dependencies
T1	8	
T2	15	
T3	15	T1 (M1)
T4	10	
T5	10	T2, T4 (M2)
T6	5	T1, T2 (M3)
T7	20	T1 (M1)
T8	25	T4(M5)
T9	15	T3, T6 (M4)
T10	15	T5, T7 (M7)
T12	10	T11 (M8)

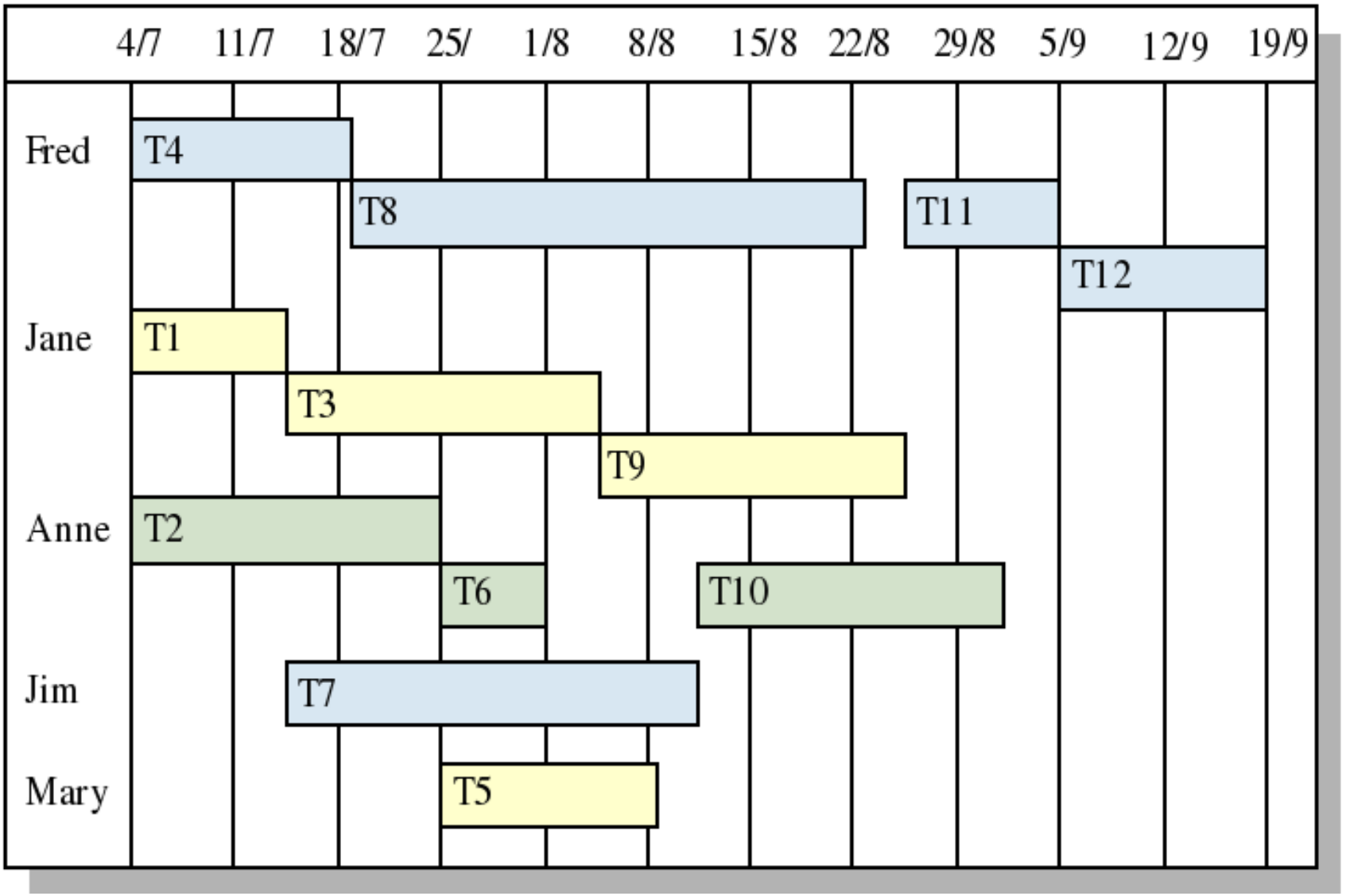
Activity Network



Timeline Activity



People Allocation



Risk Management

- Risk management is concerned with identifying risks and drawing up plans to minimise their effect on a project.
- A risk is a probability that some adverse circumstance will occur
  - Project risks affect schedule or resources;
  - Product risks affect the quality or performance of the software being developed;
  - Business risks affect the organisation developing or procuring the software.

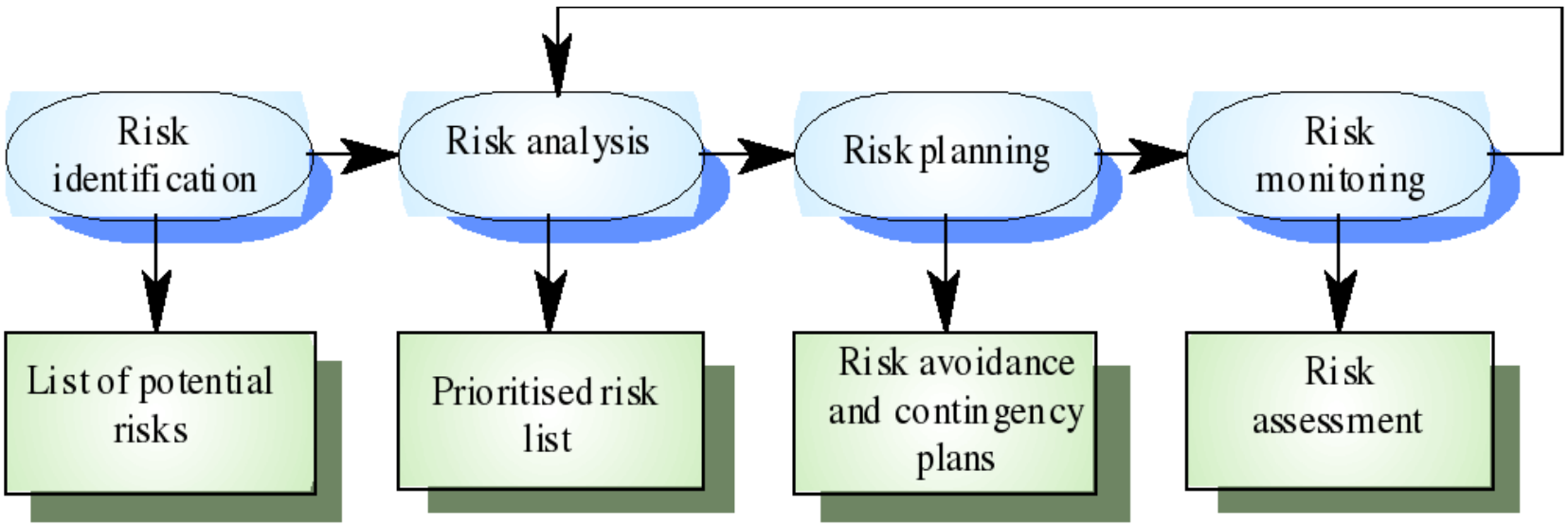
Software Risk I

Risk	Affects	Description
Staff turnover	Project	Experienced staff will leave the project before it is finished.
Management change	Project	There will be a change of organisational management with different priorities.
Hardware unavailability	Project	Hardware that is essential for the project will not be delivered on schedule.
Requirements change	Project and product	There will be a larger number of changes to the requirements than anticipated.
Specification delays	Project and product	Specifications of essential interfaces are not available on schedule

Software Risk II

Size under-estimate	Project and product	The size of the system has been underestimated.
CASE tool under-performance	Product	CASE tools which support the project do not perform as anticipated
Technology change	Business	The underlying technology on which the system is built is superseded by new technology.
Product competition	Business	A competitive product is marketed before the system is completed.

Risk Management Process



Risk Indicators

Risk type	Potential indicators
Technology	Late delivery of hardware or support software, many reported technology problems
People	Poor staff morale, poor relationships amongst team member, job availability
Organisational	Organisational gossip, lack of action by senior management
Tools	Reluctance by team members to use tools, complaints about CASE tools, demands for higher-powered workstations
Requirements	Many requirements change requests, customer complaints
Estimation	Failure to meet agreed schedule, failure to clear reported defects

Key Points

- Good project management is essential for project success.
- The intangible nature of software causes problems for management.
- Managers have diverse roles but their most significant activities are planning, estimating and scheduling.
- Planning and estimating are iterative processes which continue throughout the course of a project.
- A project milestone is a predictable state where a formal report of progress is presented to management.
- Project scheduling involves preparing various graphical representations showing project activities, their durations and staffing.
- Risk management is concerned with identifying risks which may affect the project and planning to ensure that these risks do not develop into major threats.

End

That's All Folks

How About Your Projects ???