

Software Engineering

Project Management

- Important goals for most projects are:
 - Timely delivery
 - Keep overall costs within budget
 - Deliver software that meets customer's expectations
 - Maintain happy and well functioning development team
- Challenges:
 - Product is intangible (cannot be seen or touched)
 - Rapid technological changes (lessons learned from previous projects may not be transferable to new projects)
 - Software processes are variable and organization specific

Management Activities

- Project Planning
 - Planning, estimating, scheduling project development and work division
- Reporting
 - Write concise, coherent documents that abstract critical information from detailed project reports
- Risk management
- People management
- Proposal writing

Project Planning

- Takes place in three stages:
 - At proposal stage
 - During project startup
 - Periodically throughout the project
- Main parameters to use while computing costs of software development project.
 - Effort costs (salaries)
 - Hardware and software costs, including maintenance
 - Travel and training costs

Plan-driven Development

- Approach to software engineering where the development process is planned in detail.
- Planning is done in advanced before starting a project, which often leads to revision of such plans due to changes in the environment in which the software is to be developed and used.
- Large security and safety critical systems requires extreme up-front analysis and have to be certified before they are put in use. So, plan driven development is suitable for these types of systems.

Project plans

- Introduction
 - Briefly describes objectives of project and sets out the constraints like budget and time that affect management of project
- Project organization
 - Describes the way in which development team is organized, people involved and their roles in team
- Risk analysis
- Hardware and software resource requirement
- Work breakdown
 - Breaking project into activities and milestones
- Project schedule
 - Shows dependencies between activities and estimated time required to reach each milestone, allocation of people to activities, etc.
- Monitoring and reporting mechanisms
 - Defines management reports that should be produced, when these should be produced and project monitoring mechanisms to be used.

Project Plan Supplements

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, costs, and effort.
Staff development plan	Describes how the skills and experience of the project team members will be developed.

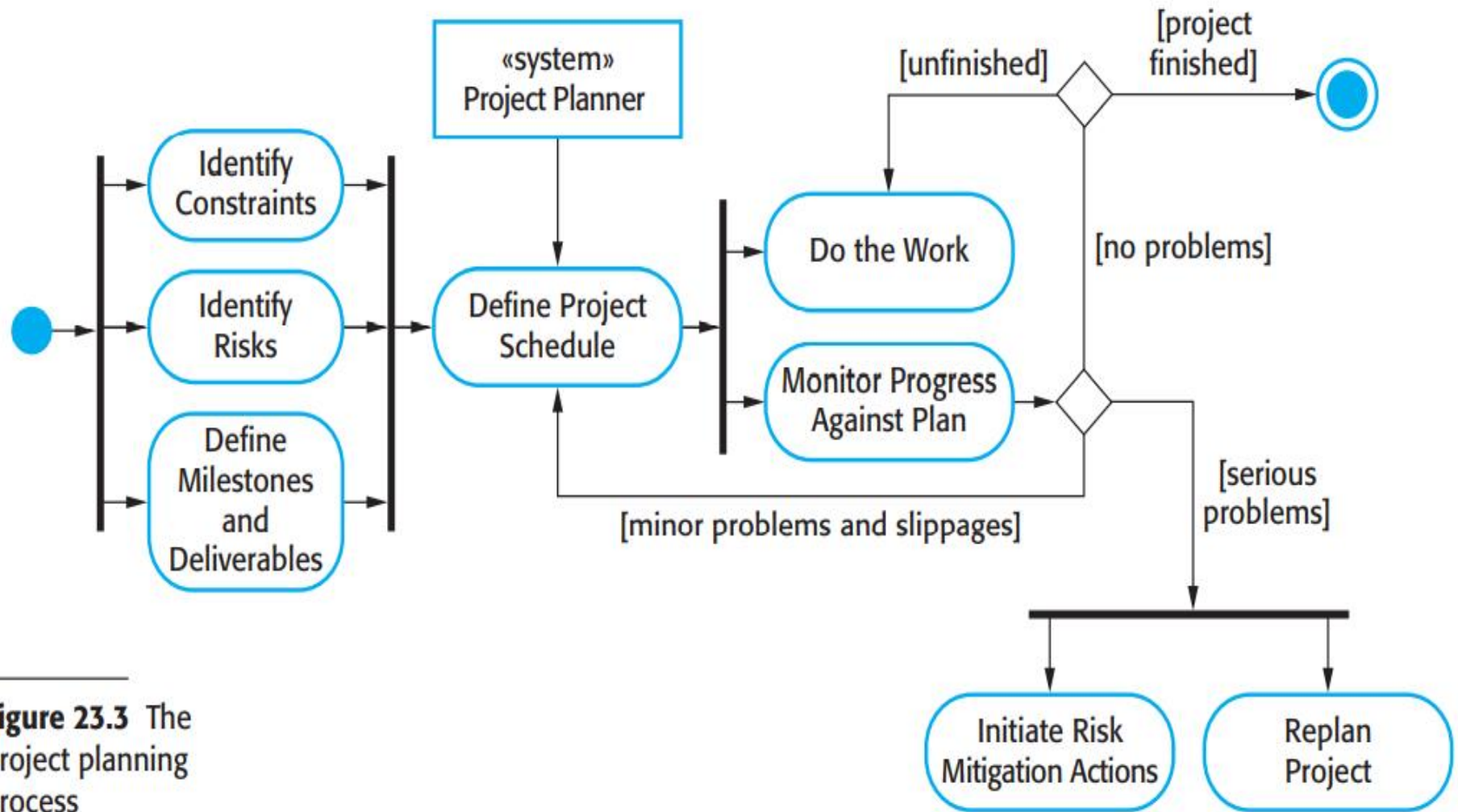


Figure 23.3 The project planning process

Project Scheduling

- Process of deciding how the work in a project will be organized as separate tasks, and when and how these tasks will be executed.
- Major tasks:
 - Estimate calendar time needed to complete each task
 - Estimate effort required
 - Divide tasks among team members
 - Estimate resource required to complete each task (hardware/software)
- Two types of commonly used representations:
 - Bar charts or Gantt charts (calendar-based)
 - Activity networks

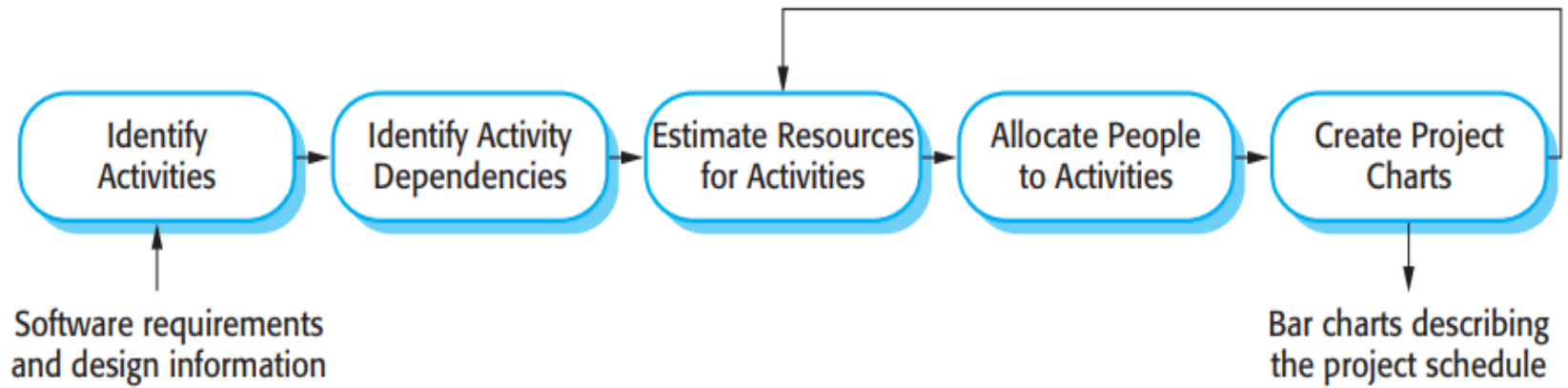


Fig: project scheduling process

Task	Effort (person-days)	Duration (days)	Dependencies
T1	15	10	
T2	8	15	
T3	20	15	T1 (M1)
T4	5	10	
T5	5	10	T2, T4 (M3)
T6	10	5	T1, T2 (M4)
T7	25	20	T1 (M1)
T8	75	25	T4 (M2)
T9	10	15	T3, T6 (M5)
T10	20	15	T7, T8 (M6)
T11	10	10	T9 (M7)
T12	20	10	T10, T11 (M8)

Fig: tasks, duration and dependencies

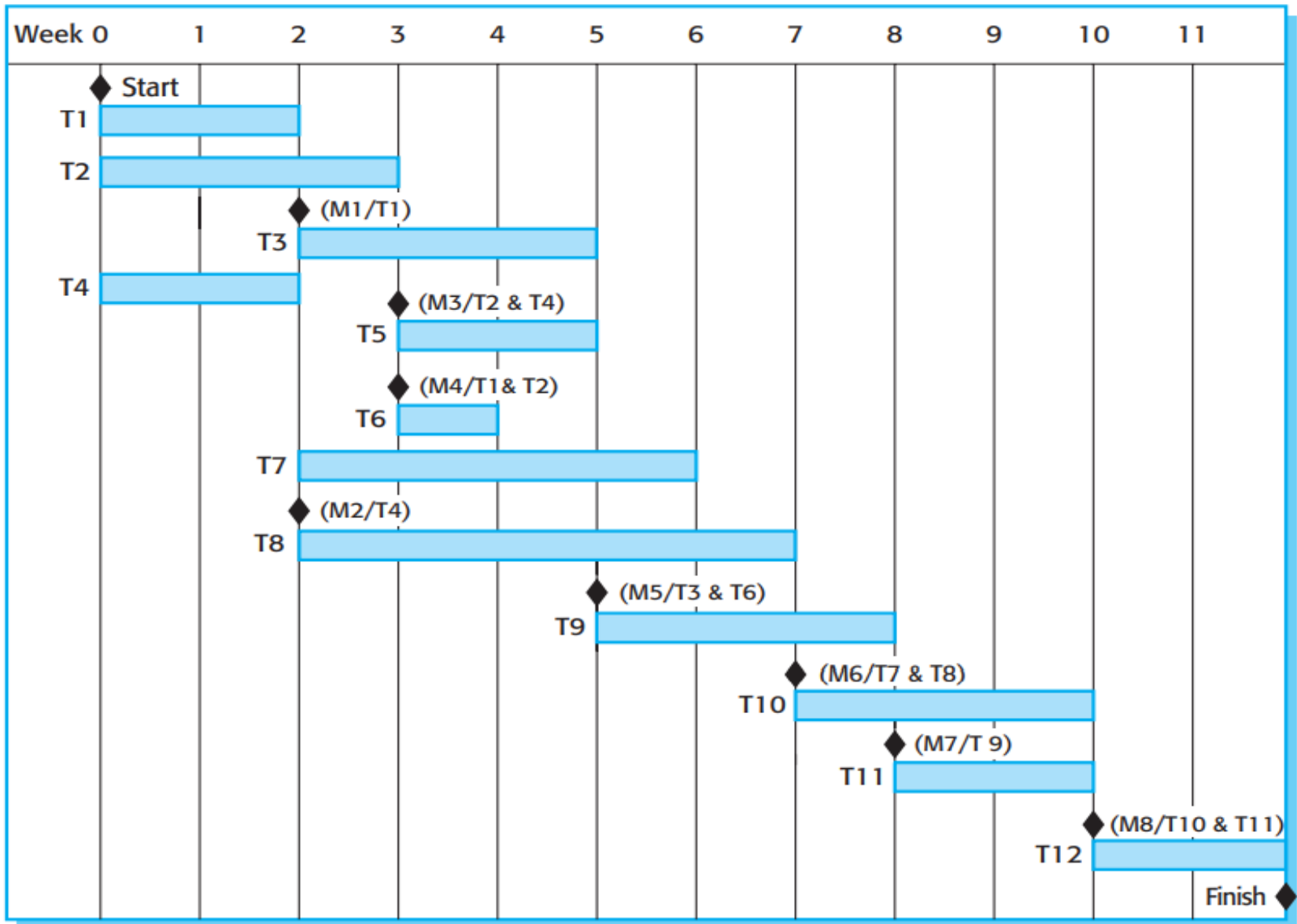


Fig: activity bar chart (Gantt Chart)

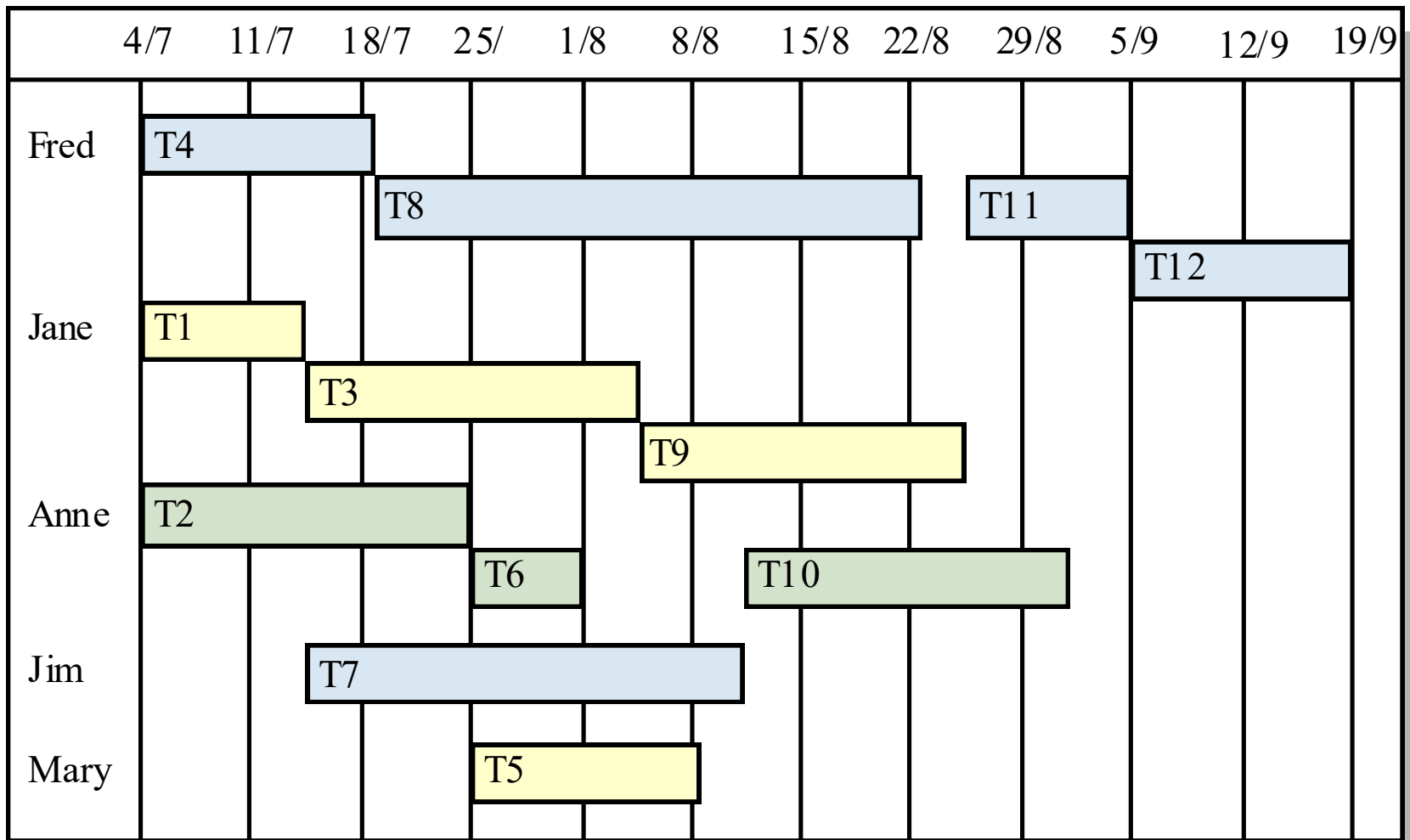


Fig: staff allocation chart

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