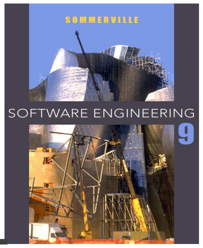
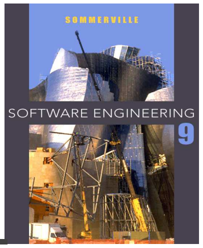


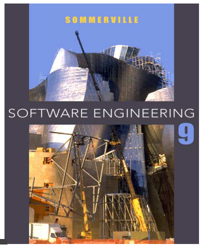
Chapter 23.2 – 23.3
Project Planning / Project Scheduling

Why do we need a project plan?



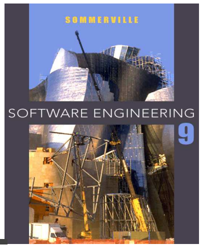
- It communicates how work will be done to project team and customers
- It helps assess progress

Planning stages



✧ Planning stages:

- At proposal stage when bidding for a contract (to set price)



Planning stages

- Planning stages:
  - At proposal stage when bidding for a contract (to set price)
  - During project startup phase

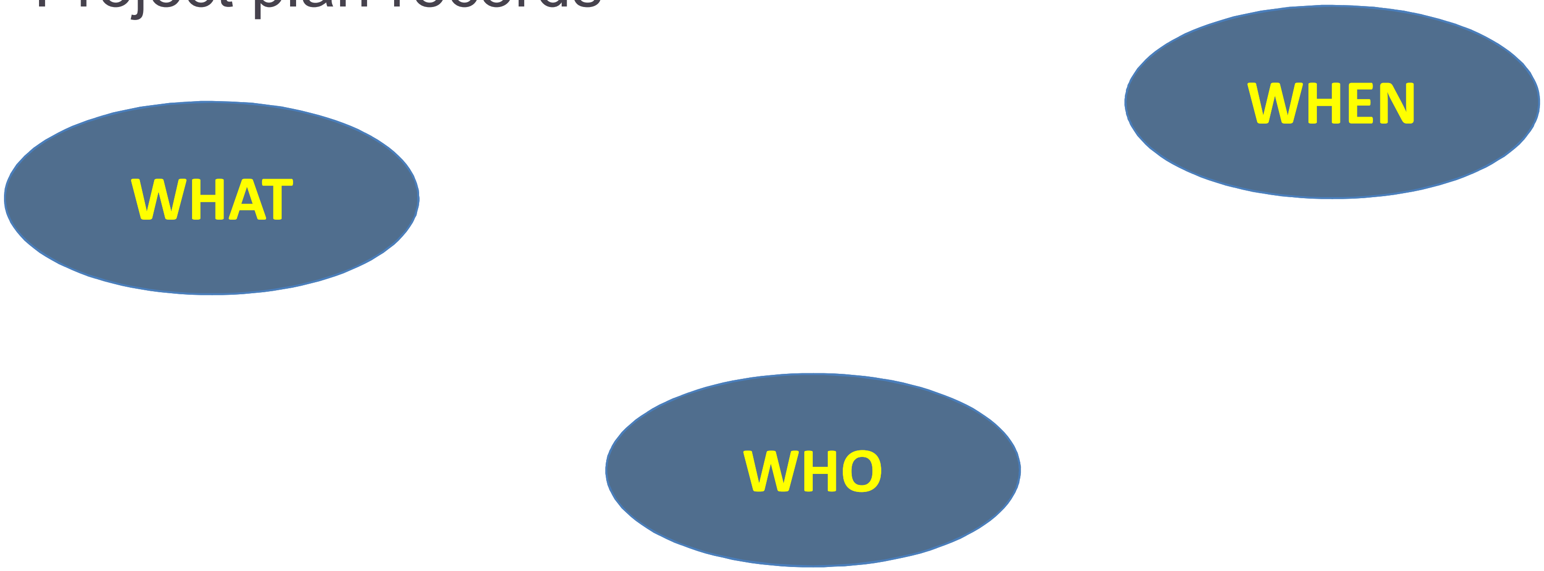
Planning stages

✧ Planning stages:

- At proposal stage when bidding for a contract (to set price)
- During project startup phase
- Periodically throughout the project

23.2 Plan-driven development

- ✧ Development process planned in detail.
- ✧ ‘Traditional’ way of managing large software projects.
- ✧ Project plan records



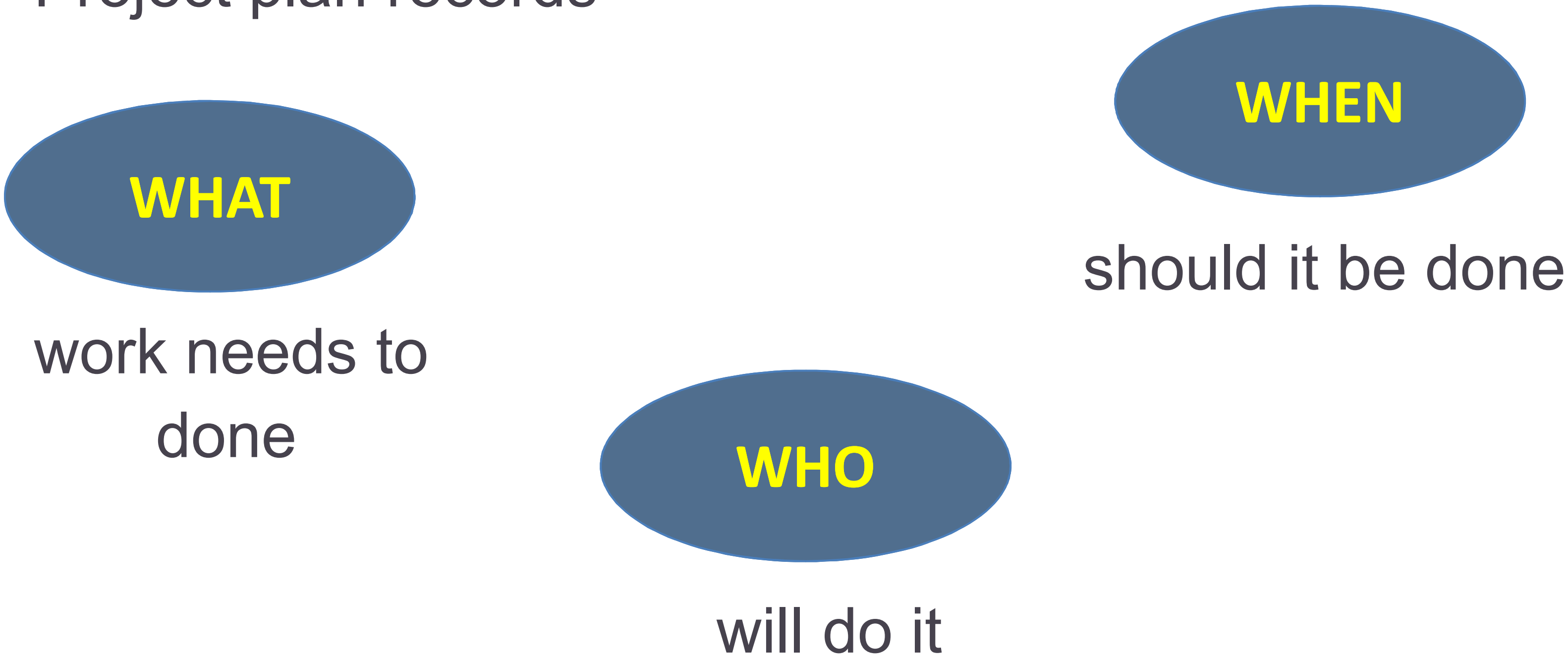
WHEN

WHAT

WHO

23.2 Plan-driven development

- Development process planned in detail.
- ‘Traditional’ way of managing large software projects.
- Project plan records

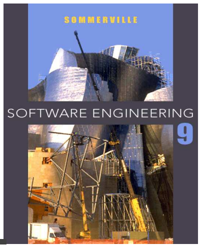


WHAT work needs to done

WHEN should it be done

WHO will do it

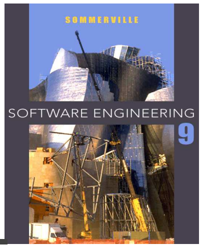
Plan-driven development – pros and cons



✧ Pro:

- organizational issues (availability of staff, other projects, etc.) can be closely taken into account
- potential problems and dependencies can be discovered before the project starts
- Managers can use plan to support project decision making and to measure progress

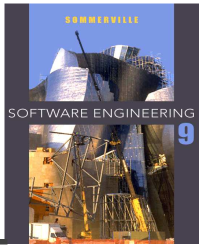
Plan-driven development – pros and cons



✧ Con:

- Early decisions might have to be revised
  => rework

23.2.1 Project plan



✧ Typical Plan Sections:

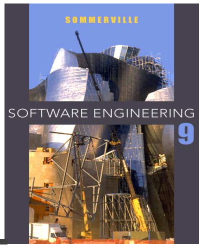
- Introduction (objectives, constraints)
- Project organization (development team, roles)
- Risk analysis
- Hardware and software resource requirements
- Work breakdown (tasks, mile stones, deliverables)
- Project schedule (task dependencies, time required for mile stone, assign people to activities)
- Monitoring and reporting mechanisms

Project plan

✧ Principal project plan should focus on

- Risks
- Schedule

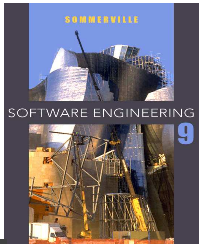
Project plan



- Principal project plan should focus on
  - Risks
  - Schedule
- There may be supplementary plans

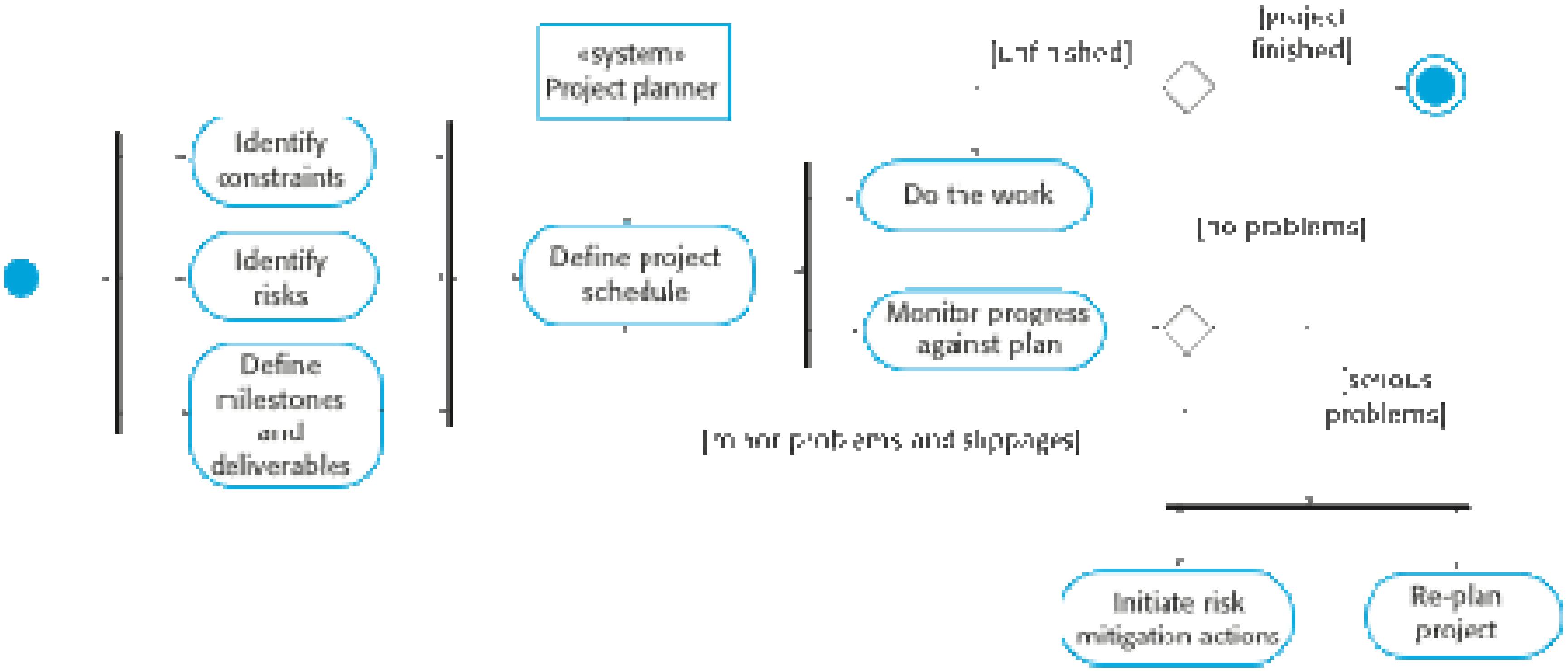
  Quality plan, Configuration management plan, Staff development plan, …

23.2.2 The planning process

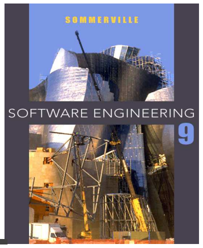

SOMMERVILLE
SOFTWARE ENGINEERING
9

- Iterative process
- Starts with initial project plan during the project startup phase
- More information becomes available during the project => regularly revise plan to reflect requirements, schedule, and risk changes

The project planning process



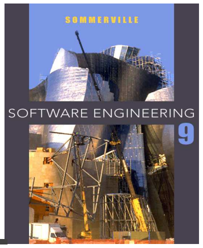
23.3 Project scheduling



The project schedule shows:

- When tasks will be executed
- Dependencies between tasks
- Estimated time required
- Allocation of people
- Resources needed

23.3 Project scheduling



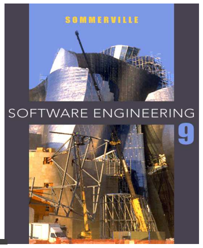
The project schedule shows:

- When tasks will be executed
- Dependencies between tasks
- Estimated time required
- Allocation of people
- Resources needed

Task size: 1 week – 2 month

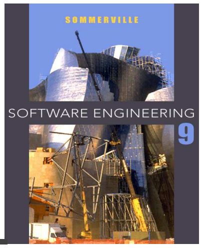
Organize tasks concurrently / minimize task dependencies

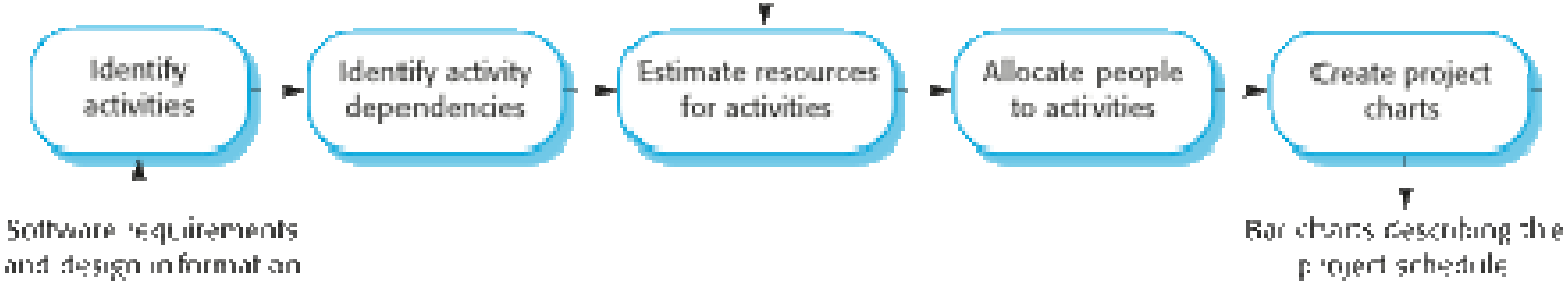
Project schedule

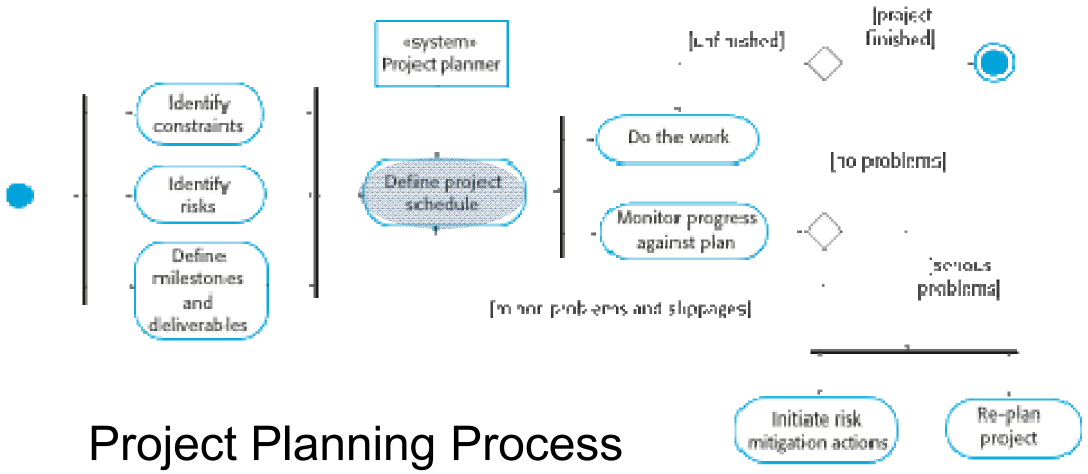


- Iterative process
- Initial project schedule: during project startup
  - **Plan-driven** development:
    complete schedule developed up front
  - **Agile** development: (less detailed)
    identifies when major phases will be completed
    iterative approach to plan each phase
- Schedule is then refined and modified during development planning

The project scheduling process

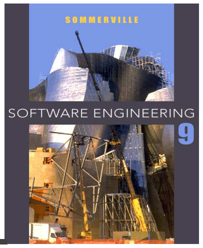



Identify activities
Identify activity dependencies
Estimate resources for activities
Allocate people to activities
Create project charts
Software requirements and design information
Bar charts describing the project schedule



Project Planning Process

Scheduling problems:



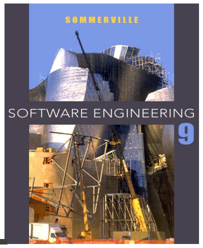
- ✧ Know how difficult or easy a task is (cost)
- ✧ How many people should work on a task

  Productivity vs number of people / Brook’s Law

  Adding manpower to a late software project makes it later
- ✧ What problems / delays should be considered in the schedule?

  1) Estimate as if nothing will go wrong
  2) Increase estimate to cover anticipated problems
  3) Add contingency factor to cover unexpected problems

Scheduling problems:



✧ Know how difficult or easy a task is (cost)

✧ How many people should work on a task

Productivity vs number of people / Brook’s Law

Adding manpower to a late software project makes it later

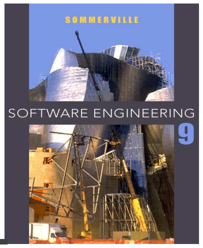
✧ What problems / delays should be considered in the schedule?

1) Estimate as if nothing will go wrong
2) Increase estimate to cover anticipated problems
3) Add contingency factor to cover unexpected problems up to 50%

"If anything can go wrong, it will“

(Murphy’s Law)

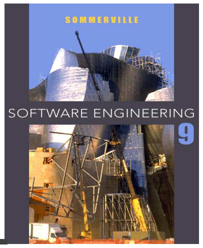
Schedule representation



- ✧ Table / Spreadsheet

  difficult to see relationships and dependencies

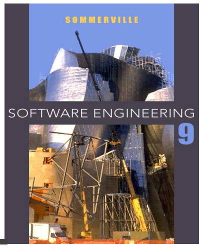
Table listing tasks, effort, durations, dependencies



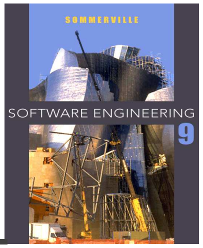
Task	Effort (person-days)	Duration (days)	Dependencies
T1	15	10	
T2	8	15	
T3	20	15	T1 (M1)
T4	5	10	
T5	5	10	T2, T4 (M3)
T6	10	5	T1, T2 (M4)
T7	25	20	T1 (M1)
T8	75	25	T4 (M2)
T9	10	15	T3, T6 (M5)
T10	20	15	T7, T8 (M6)
T11	10	10	T9 (M7)
T12	20	10	T10, T11 (M8)

Milestone

Milestones



- Milestones …points in the schedule against which you can assess progress
  - Can be associated with one or more tasks
  - When reached work done should be documented
- Project Deliverable (special kind of milestone)
  - Work products that are delivered to customer
  - Outcome of significant project phase (specification, design)
  - Usually specified in contract

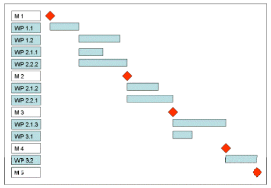


Schedule representation

- Table / Spreadsheet

  difficult to see relationships and dependencies

- Bar Chart (Gantt Chart)

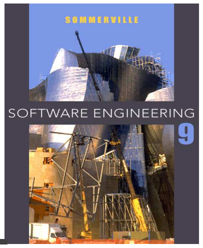


  - calendar based
  - show who is responsible for the tasks
  - begin and end of task / milestone
  - Can show dependencies between tasks
  - Can show progress accomplished

- Activity networks

  Show dependencies between activities (tasks)

Activity bar chart



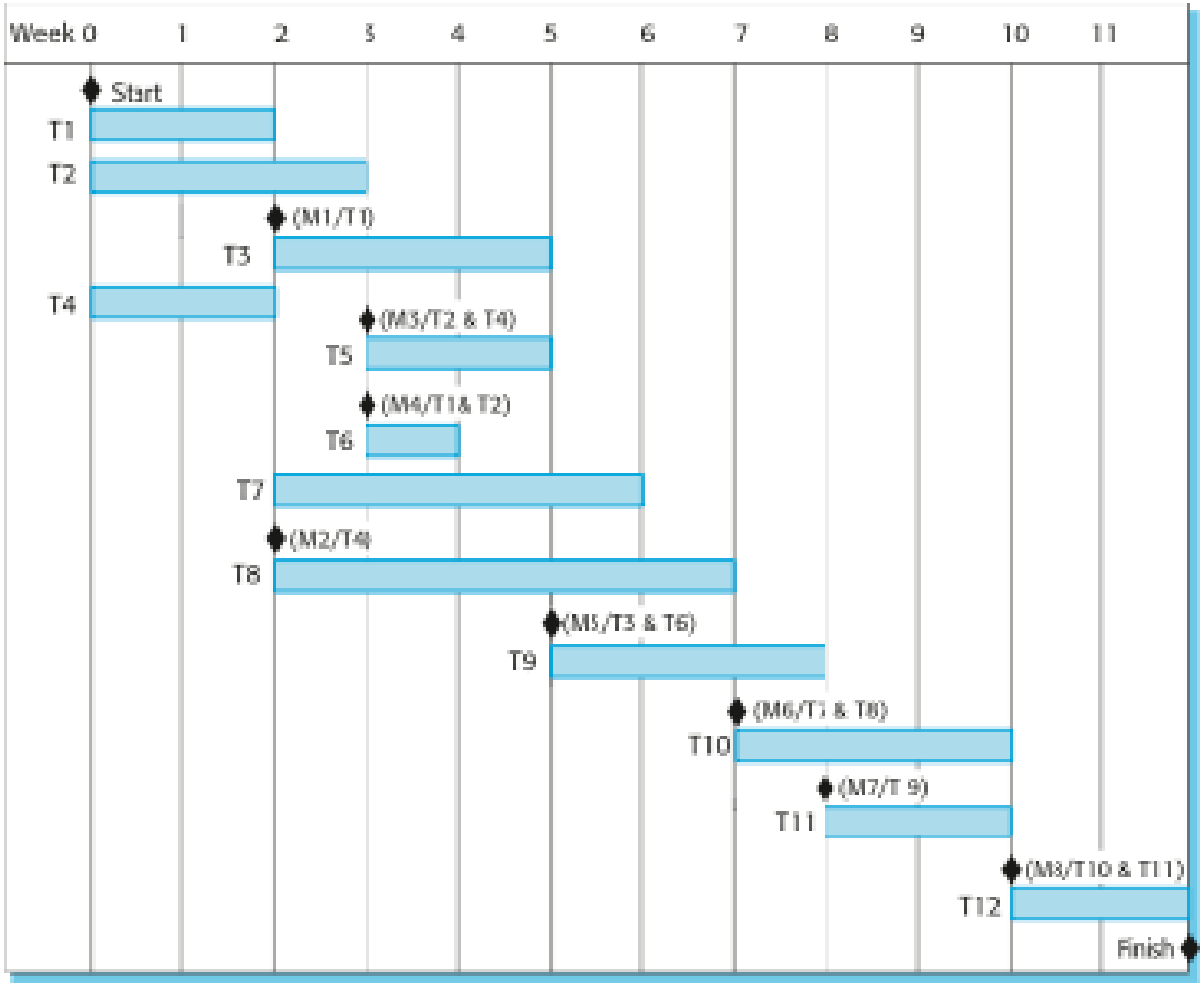
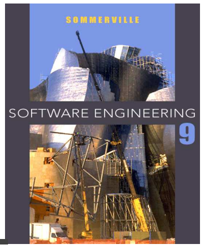
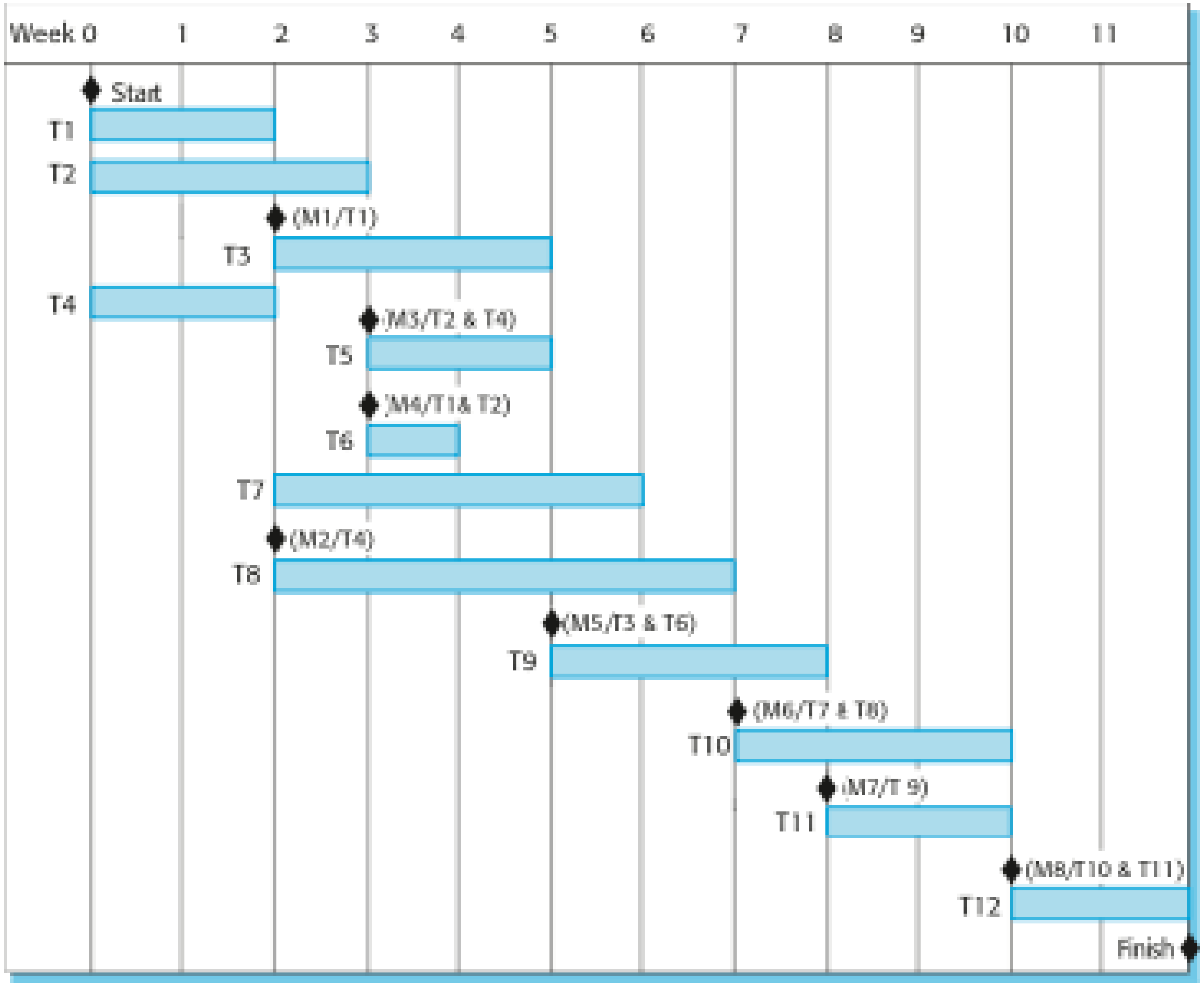


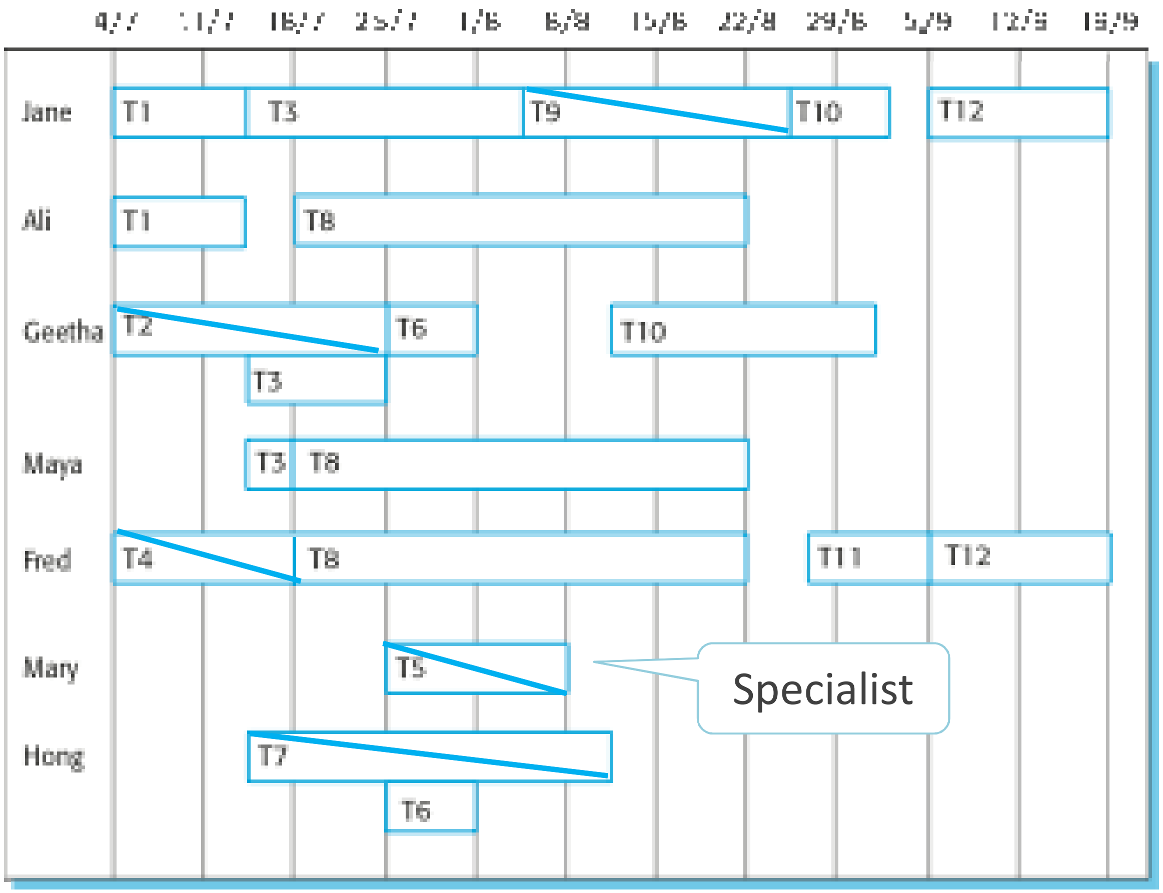
Table columns and Gantt Chart



T1	
T2	
T3	T1 (M1)
T4	
T5	T2, T4 (M3)
T6	T1, T2 (M4)
T7	T1 (M1)
T8	T4 (M2)
T9	T3, T6 (M5)
T10	T7, T8 (M6)
T11	T9 (M7)
T12	T10, T11 (M8)



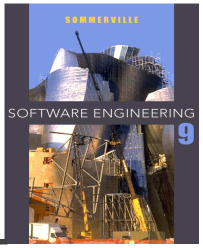
Staff allocation chart



Specialist

Diagonal line .. Part time job

Project planning tools



Project planning tools often used to manage project schedule information

e.g:

MS Project / MS Visio, SmartDraw, etc.

http://www.smartdraw.com/videos/babm/mlp_projectchart.htm

If you are aware of a comparable software that is free to students, and easy to use, let me know