

BAIT 510: Project Management

Lecture 3 – September 12

Topics For Today

- Recap
- Human factors
- Project management activities

Human factors

- All systems have human users and are used in a social and organizational context
- An appropriate user interface is essential for effective system operation
- Human factors are often the most important factor in determining the success or otherwise of a system

Other human factors

- Changes to work processes in the system's environment
 - May be resisted by users if jobs are lost
- De-skilling of users
 - May be resented by professionals
- Changes to organization power structure
 - Managers don't like to lose control
- Work changes
 - Some changes to work practice may be unacceptable

Interface engineering

- User interface determines what system facilities are used. If the interface to some facilities is better than others, they will be more heavily used
- Some reliability problems are actually user interface problems
- User interfaces should be designed to minimize operator error

User interface engineering problems

- What is a mistake?
- How can these mistakes be eliminated?
 - Error avoidance - don't allow the operator to do something that is incorrect
 - Error detection - detect an incorrect action and report it to the operator
- What degree of operator over-riding should be allowed?

Software mgmt distinctions

- The product is intangible
- The product is uniquely flexible
- Software engineering is not recognized as an engineering discipline with the same status as mechanical, electrical engineering, etc.
- The software development process is not standardized
- Most software projects are 'one-off' projects

Project staffing

- May not be possible to appoint the ideal people to work on a project
 - Project budget may not allow for the use of highly-paid staff
 - Staff with the appropriate experience may not be available
 - An organization may wish to develop employee skills on a software project

Project planning

- Probably the most time-consuming project management activity
- Continuous activity from initial concept through to system delivery.
- Plans must be regularly revised as new information becomes available

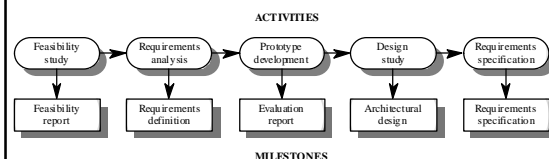
Project plan structure

- Introduction
- Project organization
- Risk analysis
- Hardware and software resource requirements
- Work breakdown
- Project schedule
- Monitoring and reporting mechanisms

Activity organization

- Activities in a project should be organized 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

Milestones and deliverables



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 problems

- 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

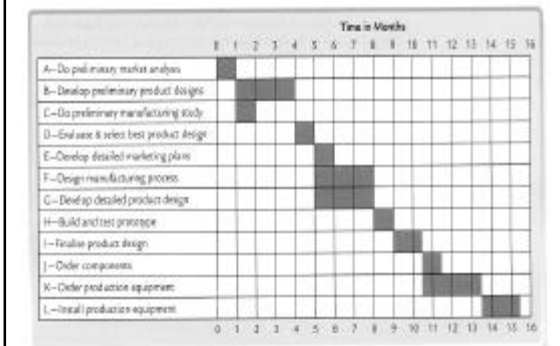
Bar charts and activity networks

- 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

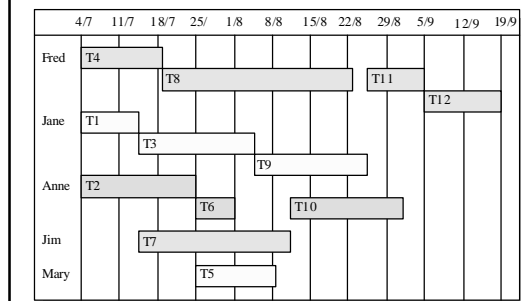
Task durations and dependencies

ACTIVITY	NAME	IMMEDIATE PREDECESSOR	DURATION (months)
A	Market analysis	-----	1
B	Product design	A	3
C	Manufacturing study	A	1
D	Select best product design	B,C	1
E	Detailed marketing plans	D	1
F	Manufacturing process	D	3
G	Detailed product design	D	3
H	Test prototype	G	1
I	Finalize product design	F,H	1.5
J	Order components	I	1
K	Order production equipment	I	3
L	Install production equipment	K	2

GANTT timeline

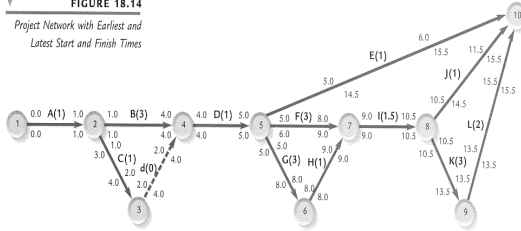


Staff allocation



Activity network

FIGURE 18.14
Project Network with Earliest and Latest Start and Finish Times



Key points

- Good project management is essential for project success
- The intangible nature of software causes problems for management
- Planning and estimating are iterative processes which continue throughout the course of a project
- A project milestone is a predictable state where some formal report of progress is presented to management.
- Activity charts and bar charts are graphical representations of a project schedule