Computing Project

(COMP08053)

Lecture 2

Project Planning

The process of planning a project…

The project plan

Should contain the following elements…

1. Overview – brief description of the project and its deliverables, list of major milestones or events and any constraints on the project scope

2. Objectives – more detailed description of project scope, its deliverables and outcomes

The project plan

3. General approach – the technological and managerial approaches to the work are described. Relationship between project and other work being considered by organisation

4. Contractual aspects – agreements made with clients or third parties, reporting requirements, technical specifications of all deliverables, agreements on delivery dates, performance requirements

The project plan

5. Schedules – outline of all schedules and milestones. Work breakdown structure (see later slides)

6. Resource requirements – details of costs associated with each task, details of material acquisition

The project plan

7. Personnel – details of project work force, any special skill requirements, managerial responsibility for control of each area, managerial / informational accountability requirements for each person

8. Risk management – planners should list the major and minor disasters that may strike project such as unreasonable deadlines, equipment failures, coordination problems, changes in project scope. Contingency plans should be produced

The project plan

9. Evaluation methods – description of all project evaluation procedures and quality standards, procedures to ensure compliance with all corporate requirements

Graphical project planning techniques…

Gantt chart

PERT charts

Critical path management (CPM)

The Gantt chart

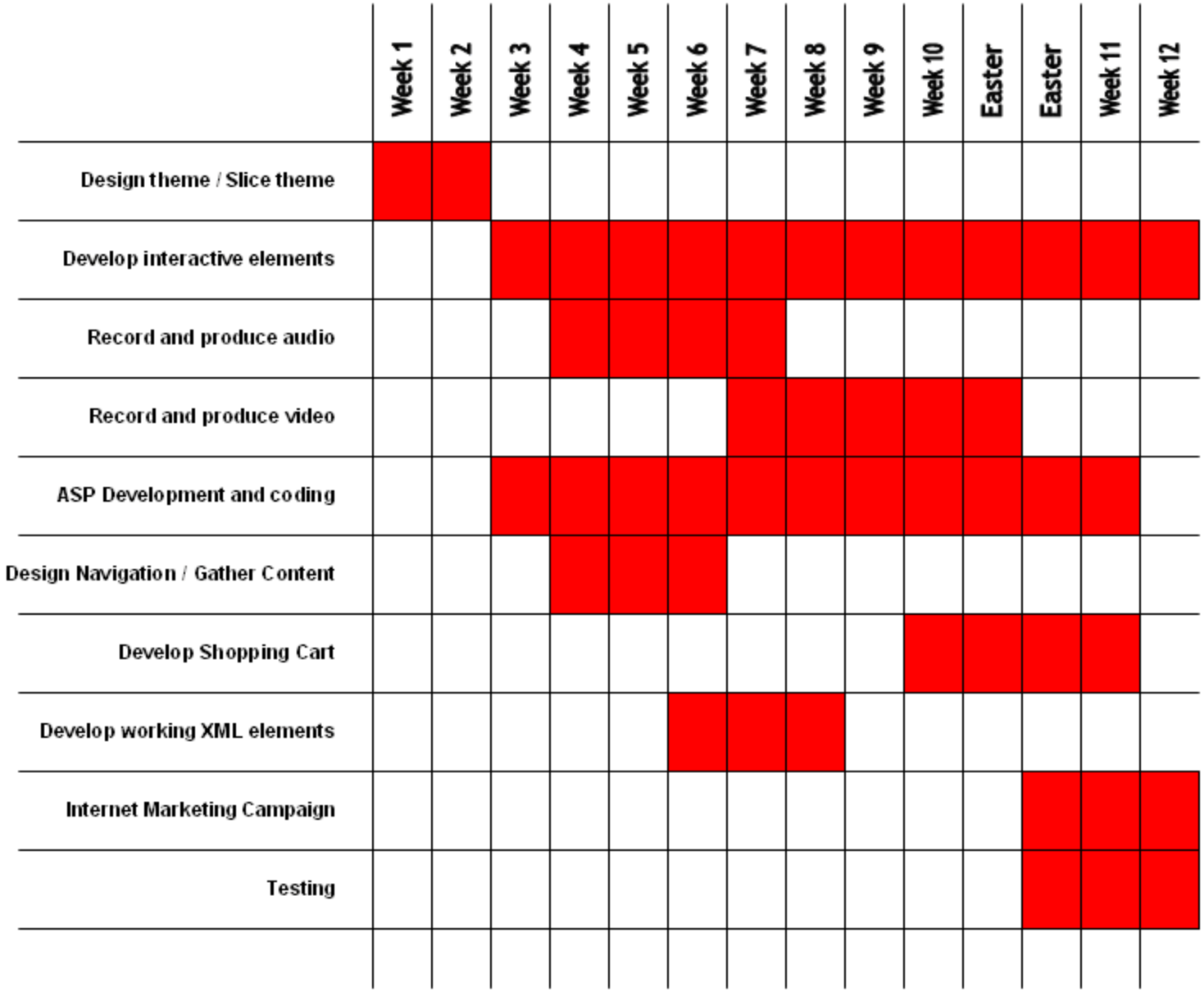
Invented in early 1900's by Henry L. Gantt – an American engineer and social scientist

Gantt chart displays project activities as bars measured against horizontal time scale

Most popular way of exhibiting sets of related activities in the form of schedules

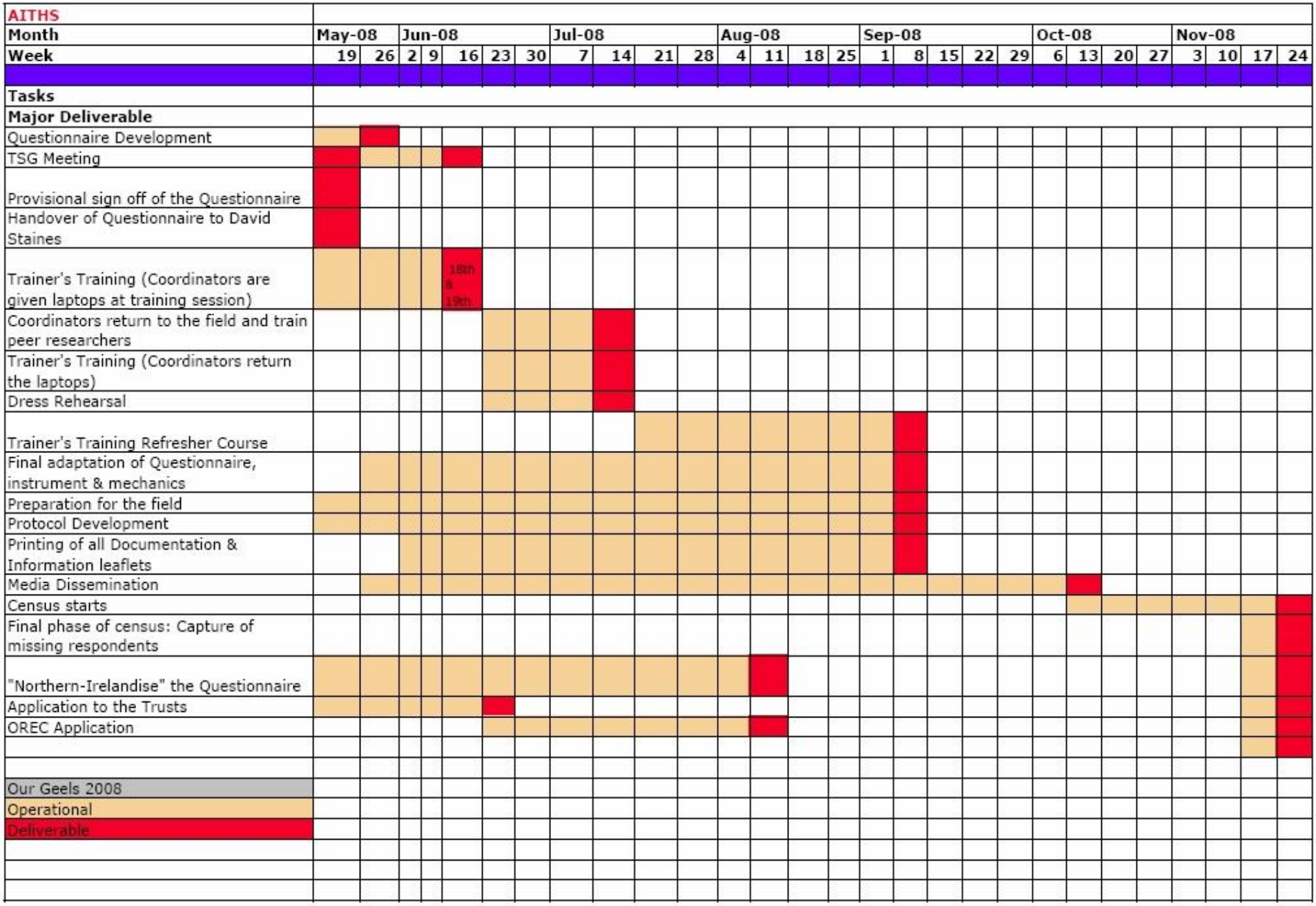
A simple Gantt chart is shown in the next slide

Production plan



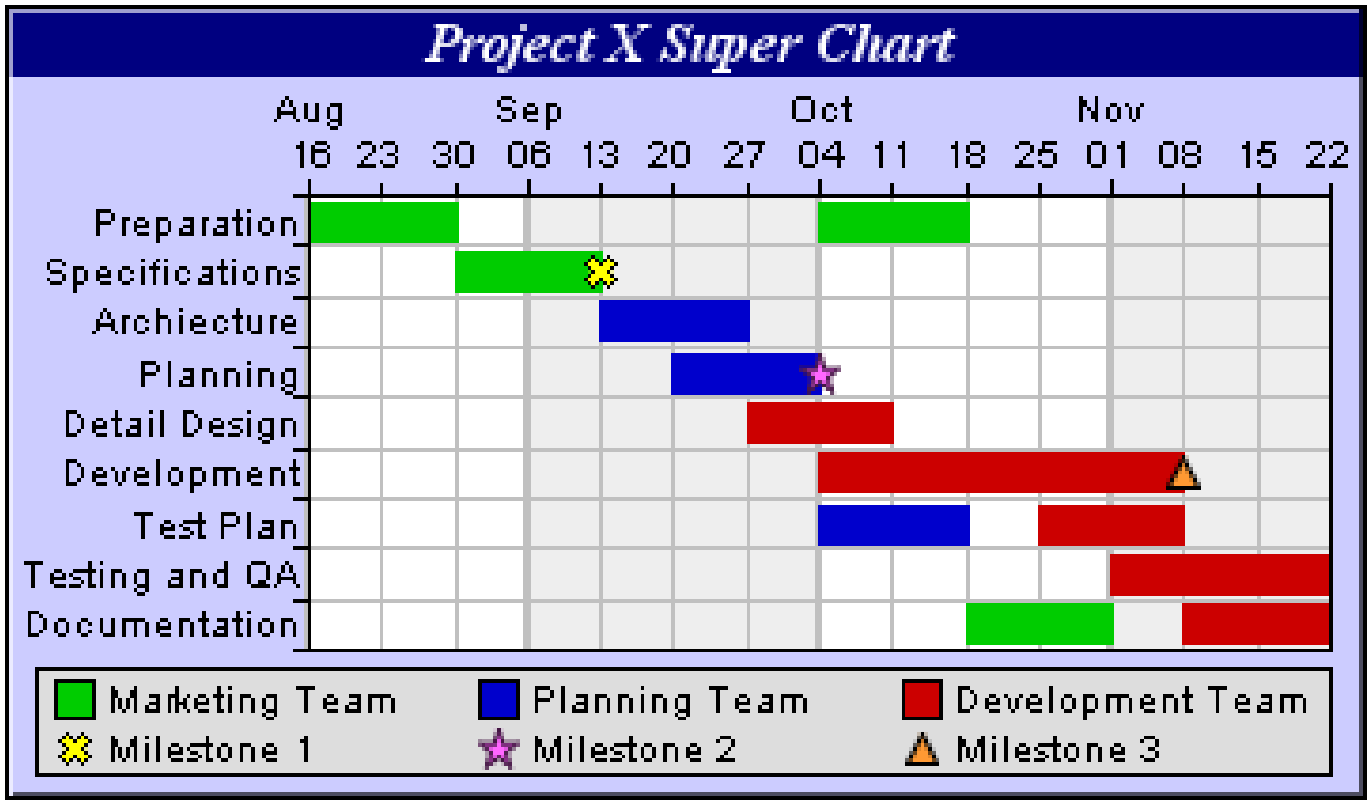
A more detailed time scale of actual dates and weeks is shown in the next example, as well as a more detailed list of activities

Also note the colour coding to denote when deliverables a due to be provided in the project time scale


AITHS
Month
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Week
19 26 2 9 16 23 30 7 14 21 28 4 11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24
Tasks
Major Deliverable
Questionnaire Development
TSG Meeting
Provisional sign off of the Questionnaire
Handover of Questionnaire to David Staines
Trainer's Training (Coordinators are given laptops at training session)
18th & 19th
Coordinators return to the field and train peer researchers
Trainer's Training (Coordinators return the laptops)
Dress Rehearsal
Trainer's Training Refresher Course
Final adaptation of Questionnaire, instrument & mechanics
Preparation for the field
Protocol Development
Printing of all Documentation & Information leaflets
Media Dissemination
Census starts
Final phase of census: Capture of missing respondents
"Northern-Irelandise" the Questionnaire
Application to the Trusts
OREC Application
Our Geels 2008
Operational
Deliverable

The next example on the following slide shows when project milestones are to be achieved…

…as well as using colour coding to denote which project team members are responsible for specific project tasks


Project X Super Chart
Aug
Sep
Oct
Nov
16 23 30 06 13 20 27 04 11 18 25 01 08 15 22
Preparation
Specifications
Archiecture
Planning
Detail Design
Development
Test Plan
Testing and QA
Documentation
Marketing Team
Planning Team
Development Team
Milestone 1
Milestone 2
Milestone 3

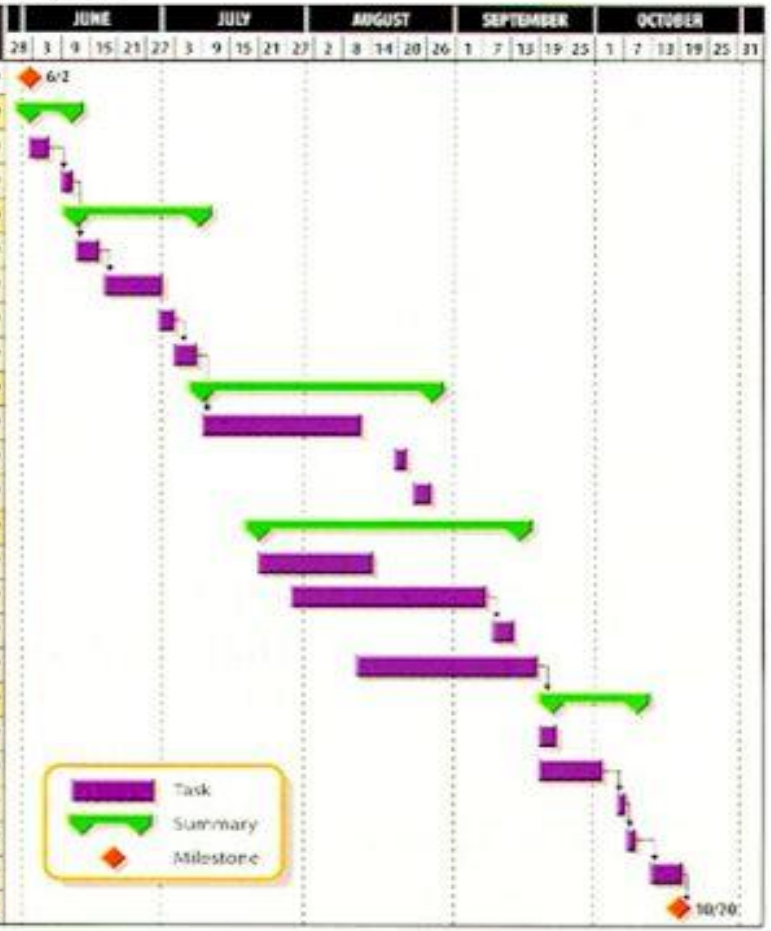
The next example shows main tasks broken down into subtasks…

…and the planned timescales for main tasks (shown in green) and subtasks (shown in purple)

Also shown are the duration of tasks with start date and finish date

GANTT chart for a multimedia project

ID	TASK NAME	DURATION	START	FINISH
1	Project acceptance	0w	6/2/97	6/2/97
2	**Analysis**	**1.6w**	**6/2/97**	**6/11/97**
3	Data collection and analysis	5d	6/2/97	6/6/97
4	Presentation and approval	3d	6/9/97	6/11/97
5	**Design**	**3.8w**	**6/12/97**	**7/8/97**
6	Data collection	4d	6/12/97	6/17/97
7	Detail documentation	10d	6/18/97	7/1/97
8	Prototype	3d	6/30/97	7/2/97
9	Presentation and approval	4d	7/3/97	7/8/97
10	**Scripting/writing**	**7.2w**	**7/9/97**	**8/27/97**
11	Script main lessons	25d	7/9/97	8/12/97
12	Script word search and index	5d	8/15/97	8/21/97
13	Write learner/administrator guides	4d	8/22/97	8/27/97
14	**Production**	**8.2w**	**7/21/97**	**9/15/97**
15	Produce graphics/visuals	20d	7/21/97	8/15/97
16	Author lessons	32d	7/28/97	9/9/97
17	Program tests/CBM/WEB	4d	9/10/97	9/15/97
18	Client review	30d	8/11/97	9/19/97
19	**Pilot test**	**3w**	**9/22/97**	**10/10/97**
20	Pre-pilot test revisions	5d	9/22/97	9/26/97
21	Pilot test - prep	10d	9/22/97	10/3/97
22	Pilot test - conduct	3d	10/6/97	10/7/97
23	Pilot test - report/recommendations	3d	10/8/97	10/10/97
24	Finalize the project	6d	10/13/97	10/20/97
25	Project acceptance	0d	10/20/97	10/20/97



Work breakdown structure (WBS)

A project plan requires clear and detailed understanding of tasks involved, estimated length of time each task will take, dependencies between tasks and sequence of tasks to be performed

WBS hierarchical breakdown of a project into successive levels

WBS Number	Task Description
1.0	**Project initiation**
1.1	Draft project plan
2.0	**Analysis phase**
2.1	Plan user interview
2.2	Schedule user interviews
3.0	**Requirements analysis**
4.0	**Design**
5.0	**Test**
6.0	**Implementation**
7.0	**Post implementation review**

Steps to producing a Gantt chart

Step 1:

List all known milestones, deadlines and deliverables

Step 2:

Create a list of tasks

Brainstorm a list of as many possible tasks for the project, some might be tasks, others might be general categories of tasks

Group these brainstormed tasks into categories, some elimination of ideas can be done at this point

Review each category and brainstorm additions within the category

Steps to producing a Gantt chart

Step 3:

Because these tasks have been brainstormed, go back and eliminate any tasks that are not significant or relevant

Step 4:

For each task in the list, specify:

-Time (in person-hours, then estimate calendar)

- Dependencies (other tasks)

- Resources (equipment, knowledge)
- Who will be doing it (a function of required knowledge / skill or time)

Steps to producing a Gantt chart

Step 5:

Organise the task groups by starting date and tasks within groups by starting date

Step 6:

Use Excel or other tool such as Microsoft Project to create the Gantt chart, remember:

- Include only working days on the time axis
- Significant milestones or deadlines can be shown as tasks – as vertical lines at the appropriate date or on the time axis
- Provide a table of symbols or any other necessary information to interpret the chart

Steps to producing a Gantt chart

The following short video shows how to create a Gantt chart in Excel 2007:

http://www.youtube.com/watch?v=HQwE0Xv1lAA&feature=channel

If you don’t know where to start in identifying tasks, look at some of the example Gantt charts for ideas

Advantages of Gantt chart:

Time is explicit

All tasks visible in relationship to others

Deadlines are shown

Can show progress by ‘filling in’ task boxes

Disadvantages of Gantt chart:

Person hours not indicated, only calendar time

Solution: Tag tasks with initials of people responsible

Other resources not shown (e.g. financial)

Solution: Note resources in description or near task box

Does not record difference between original plan and actual

Solution: Enhance the task box to show different durations – e.g. an upper (actual) and lower (estimated)

The PERT chart

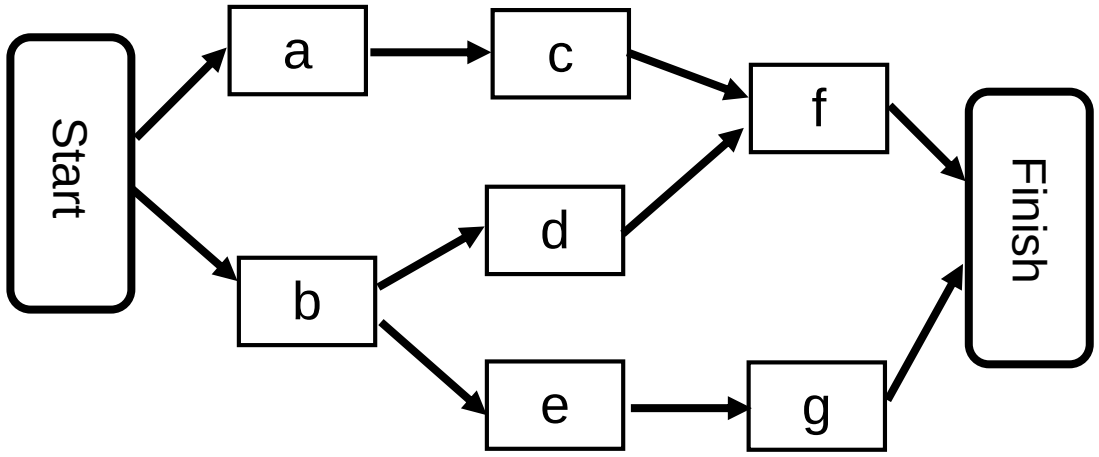
Program Evaluation and Review Technique (PERT) developed by U.S Navy in 1950s

Graphic illustration of a project as a network diagram consisting of **nodes** (shown as circles or rectangles) representing *events* or *milestones*

Nodes are linked by labelled **vectors** (directional lines) representing *tasks* in a project

Building the Network

Task	Predecessor
A	-
B	-
C	a
D	b
E	b
F	c, d
G	e



The PERT chart

A PERT chart shows **task dependencies** for example in the next slide the tasks between nodes 1,2,4,8 and 10 must be completed in a sequence

These are called dependent or serial tasks

The number on the lines denotes its duration – can be in days or weeks

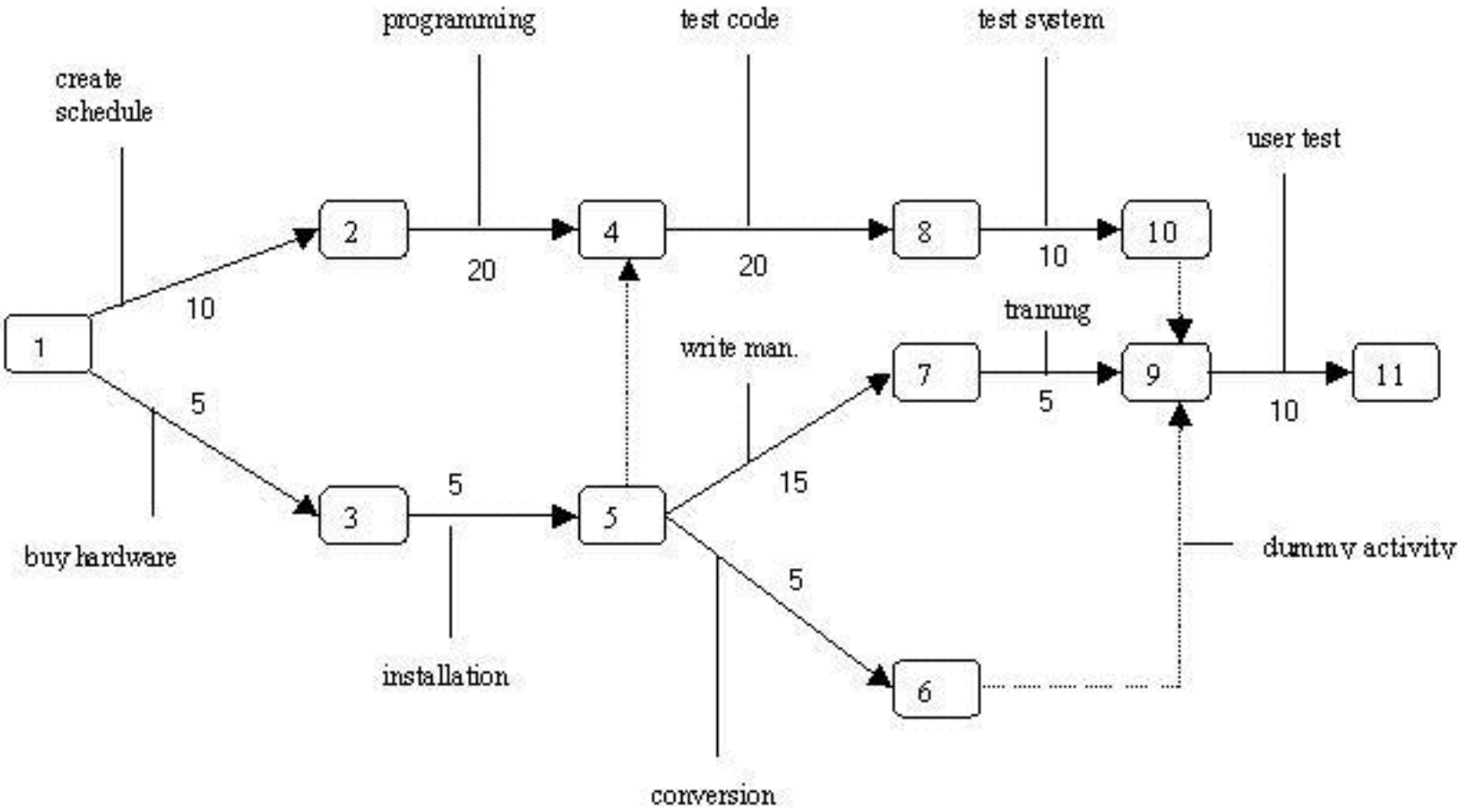


Fig. 1:
PERT Chart

* Numbered rectangles are nodes and represent events or milestones.
* Directional arrows represent dependent tasks that must be completed sequentially.
* Diverging arrow directions (e.g. 1-2 & 1-3) indicate possibly concurrent tasks
* Dotted lines indicate dependent tasks that do not require resources.

Source: http://vceit.com/ganttpert/index.htm

The PERT chart

The tasks between **nodes 1 and 2**, and **nodes 1 and 3** are not dependent on the completion of one to start and can be undertaken simultaneously

These are called parallel or concurrent tasks

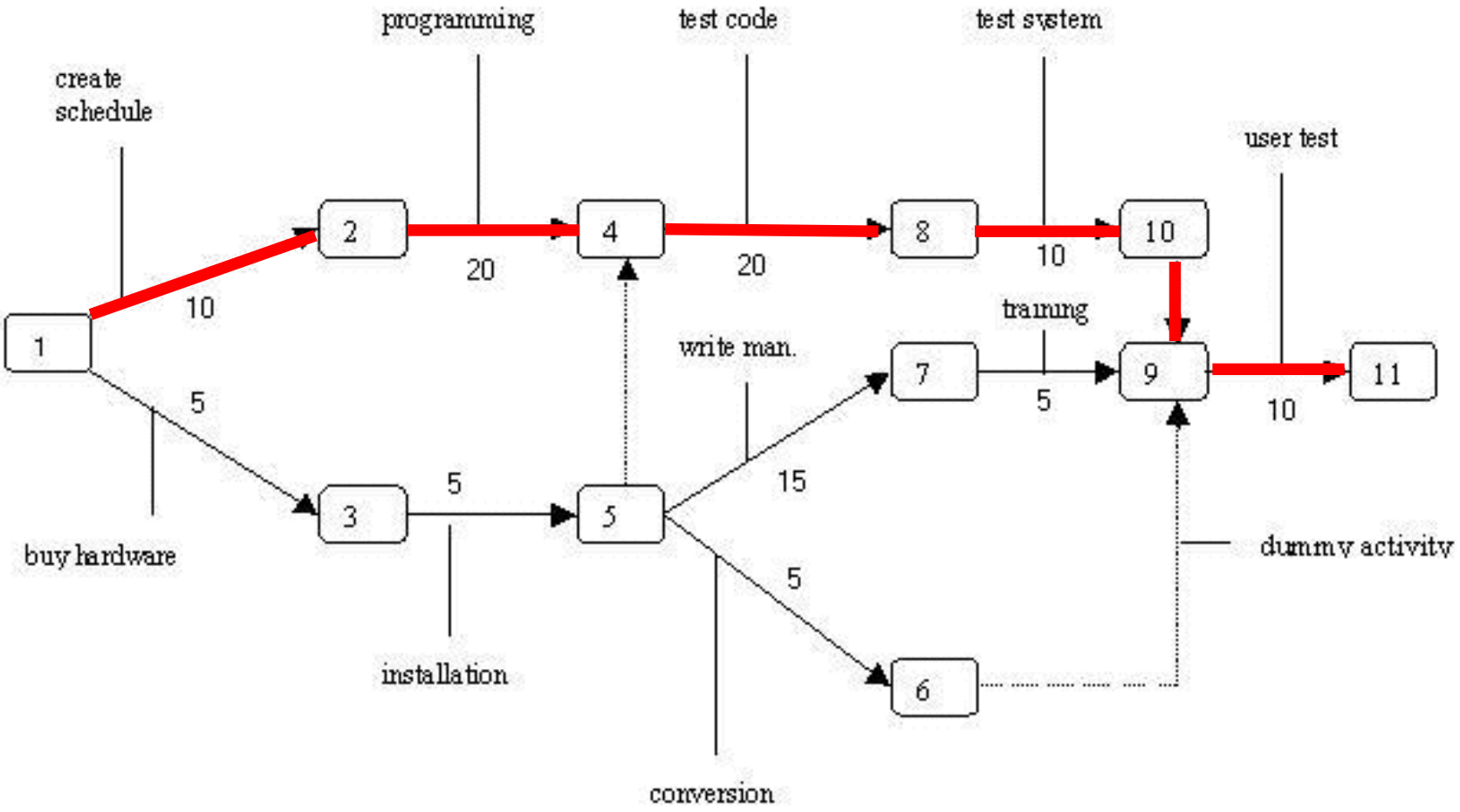
Dotted lines indicate **dummy activities** and don't require resources or completion time (these are on another path) but still must be completed in sequence

CPM

Critical Path Management (CPM) similar to the PERT chart but includes an explicit indication of the “critical path”

Critical path consists of set of dependent tasks (each dependent upon the preceding one which together take the **longest time** to complete

Tasks on critical path should be noted in some way by using a thicker line such as in the next slide



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CPM

Tasks falling along the black lines can be completed behind schedule (within reasonable limits) and the project will still remain on course for the planned completion date…

…hence these are not critical tasks

Tasks falling along the red line if they fall behind schedule then the entire project will fall behind the planned completion date…

…hence these are critical tasks

CPM

For complex, time-critical projects, the CPM/PERT charts can be useful in providing a clear indication of the critical sequence of tasks necessary to keep the project on schedule

Tasks falling along critical path should receive special attention of project manager and team assigned to them

Critical path may shift as tasks completed behind or ahead of schedule causing other tasks still on schedule to fall on new critical path

For your Computing Project coursework you should include:

Gantt chart

PERT chart

CPM