






Syllabus Content:

4.4 Software development

4.4.3 Project management

-  show understanding that large developments will involve teams
-  show understanding of the need for project management
-  show understanding of project planning techniques including the use of GANTT and Program Evaluation Review Technique (PERT) charts
-  describe the information that GANTT and PERT charts provide
-  construct and edit GANTT and PERT charts



4.2.3: Project Management:

PERT Chart:

PERT **Program Evaluation Review Technique (PERT)** charts, was developed for the US Navy to simplify the planning and scheduling of a large and complex project. It is a method to analyse the activities required to complete a project, especially the time required to complete each activity. It also helps to identify the minimum time needed to complete the project (critical path analysis).

Program Evaluation Review Technique (PERT) charts show each task in a project as a node. An activity may result in a document, a report or some other building block of the project. Such a building block is called a deliverable.

A milestone is a scheduled event signifying the completion or submission of a deliverable





-  Dependencies between tasks (e.g. where one task requires another one to be completed before it can start) are clearly shown by interconnections between the task nodes.
-  PERT charts also show timing information for each task.

KEY TERMS

Deliverable: the result of an activity, such as a document or a report

Milestone: a scheduled event signifying the completion or submission of a deliverable

Project managers can use PERT charts to:

-  set a realistic timetable for project completion
-  make sure focus is maintained on the most critical tasks for the critical path – since the path leads to the minimum time the project requires, any delays to these tasks will result in a delay to the overall project
-  identify tasks that need to be shortened if the overall project time needs to be reduced
-  identify tasks that can be carried out simultaneously

WORKED EXAMPLE 30.02

Reading a PERT chart

A software developer is to produce software for a customer. The activities, deliverables and milestones in Table 30.03 have been identified.

Activity	Description	Weeks to complete	Deliverables	Milestone
			Start	1
A	Identify requirements	1	Requirement specification	2
B	Produce design	2	Program design	3
C	Write program code	8	Complete program code	4
D	Test modules	5	Tested program modules	5
E	Integration testing	2	Tested integrated software	6
F	Install software	1	Software ready to use	7
G	Acceptance testing	2	Software signed off	8
H	Write documentation	4	Technical documentation	9
J	Write training material	2	User documentation	8
K	Train users	3	Users trained	10
L	Go live	1	Finish	11

The project manager produces the PERT chart shown in Figure 30.01 for this project.

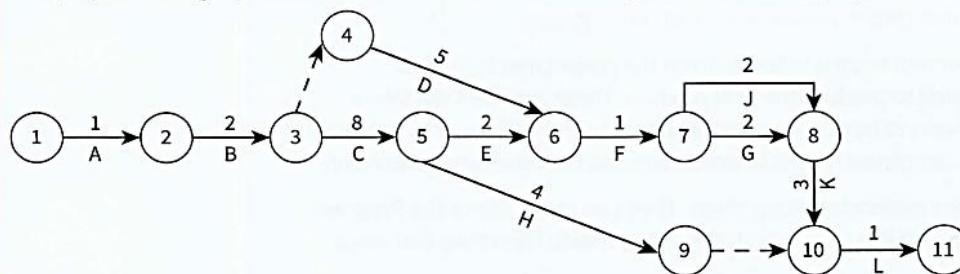


Figure 30.01 PERT chart

Milestones are shown as numbered nodes.

- 🌱 Activities are represented by arrows linking the milestones. The arrows are labelled with the activity code below the arrow and the duration above the arrow.
- 🌱 Nodes 1, 2, 3, 5, 6, 7, 8, 10 and 11 are joined by solid arrows.
- 🌱 These activities must be completed in sequence; they are called 'dependent activities'.
- 🌱 Activities that must be completed in sequence but that don't require resources or completion time are represented by dotted lines and are called 'dummy activities'.
- 🌱 The dotted line between milestones 3 and 4 indicates that the program modules must be tested before software installation can begin, but the time required to do the testing is on another path (path D).

Critical path

The critical path is the longest possible continuous pathway from Start to Finish. It determines the shortest time required to complete the project. Any time delays along the critical path will delay the final milestone

KEY TERMS

Critical path: the longest possible continuous pathway from Start to Finish

In Worked Example 30.02, the critical path is A, B, C, E, F, G, K, L. This means the shortest possible time to complete the project is 20 weeks.

Gantt charts

A Gantt chart is a horizontal bar chart developed by Henry Gantt. It is a graphical representation of a project schedule and helps to plan specific activities in a project. Gantt charts can be produced on paper, in spreadsheet software or in specific project management software.

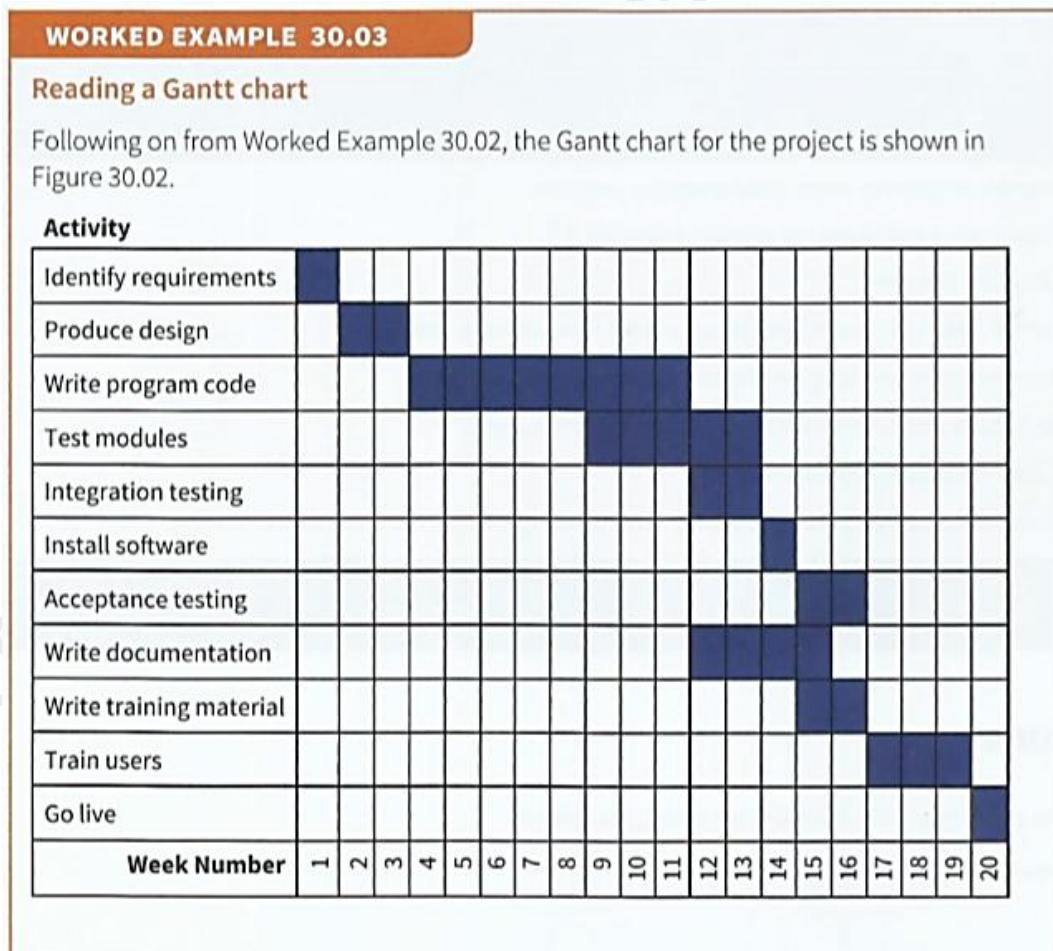







Figure 30.02 demonstrates the following features:

-  The horizontal axis represents time. In this example the schedule is worked out in weekly steps. This could be done on a daily or monthly basis, depending on the overall length of the project.
-  Individual activities are shown as horizontal bars, one activity per row.
-  Activities can overlap. In this example, module testing can begin before all the program code has been written. The documentation can be started before all the testing has been completed.
-  Some activities can only begin when others have been completed. In this example, integration testing can only start after all modules have been successfully tested.
-  Software can only be installed after integration testing has been successfully completed.

If any activities take longer than planned, the chart may need to be modified to represent the revised schedule. For example, if serious problems are encountered during acceptance testing, further design, program coding, module testing and integration testing may be required.

References:

-  AS & A level Course Book by Sylvia Langfield & Dave Duddell
-  A level 9608 Pastpapers