Gantt Charts
Planning and scheduling more complex projects

Gantt Charts (Gant Charts) are useful tools for analyzing and planning more complex projects. They:

- Help you to plan out the tasks that need to be completed
- Give you a basis for scheduling when these tasks will be carried out
- Allow you to plan the allocation of resources needed to complete the project, and
- Help you to work out the critical path for a project where you must complete it by a particular date.

When a project is under way, Gantt Charts help you to monitor whether the project is on schedule. If it is not, it allows you to pinpoint the remedial action necessary to put it back on schedule.

Sequential and parallel activities:

An essential concept behind project planning (and Critical Path Analysis) is that some activities are dependent on other activities being completed first. As a shallow example, it is not a good idea to start building a bridge before you have designed it!

These dependent activities need to be completed in a sequence, with each stage being more-or-less completed before the next activity can begin. We can call dependent activities 'sequential' or 'linear'.

Other activities are not dependent on completion of any other tasks. These may be done at any time before or after a particular stage is reached. These are nondependent or 'parallel' tasks.

Drawing a Gantt Chart

To draw up a Gantt diagram (Gant diagram), follow these steps:

Step 1. List all activities in the plan

For each task, show the earliest start date, estimated length of time it will take, and whether it is parallel or sequential. If tasks are sequential, show which stages they depend on.

You will end up with a task list like the one in figure 1. This example shows the task list for a custom-written computer project.

Figure 1. Gantt Chart Example: Planning a custom-written computer project

Task	Earliest start	Length	Type	Dependent on...
A. High level analysis	Week 0	1 week	Sequential	
B. Selection of hardware platform	Week 1	1 day	Sequential	A
C. Installation and commissioning of hardware	Week 1.2	2 weeks	Parallel	B
D. Detailed analysis of core modules	Week 1	2 weeks	Sequential	A

E. Detailed analysis of supporting modules	Week 3	2 weeks	Sequential	D
F. Programming of core modules	Week 3	2 weeks	Sequential	D
G. Programming of supporting modules	Week 5	3 weeks	Sequential	E
H. Quality assurance of core modules	Week 5	1 week	Sequential	F
I. Quality assurance of supporting modules	Week 8	1 week	Sequential	G
J. Core module training	Week 6	1 day	Parallel	C,H
K. Development and QA of accounting reporting	Week 5	1 week	Parallel	E
L. Development and QA of management reporting	Week 5	1 week	Parallel	E
M. Development of Management Information System	Week 6	1 week	Sequential	L
N. Detailed training	Week 9	1 week	Sequential	I, J, K, M

Step 2. Set up your Gantt Chart

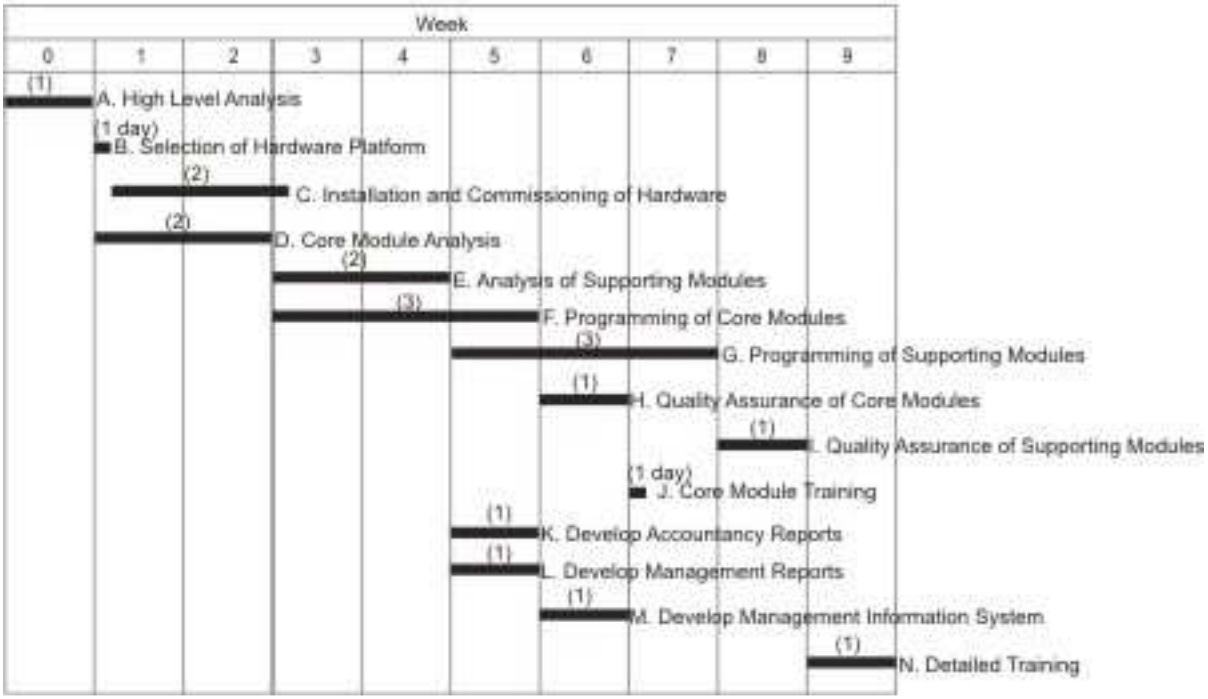
Head up graph paper with the days or weeks through to task completion.

Step 3. Plot the tasks onto the graph paper

Next draw up a rough draft of the Gantt Chart. Plot each task on the graph paper, showing it starting on the earliest possible date. Draw it as a bar, with the length of the bar being the length of the task. Above the task bars, mark the time taken to complete them.

Schedule them in such a way that sequential actions are carried out in the required sequence. Ensure that dependent activities do not start until the activities they depend on have been completed.
This will produce an untidy diagram like the one below:

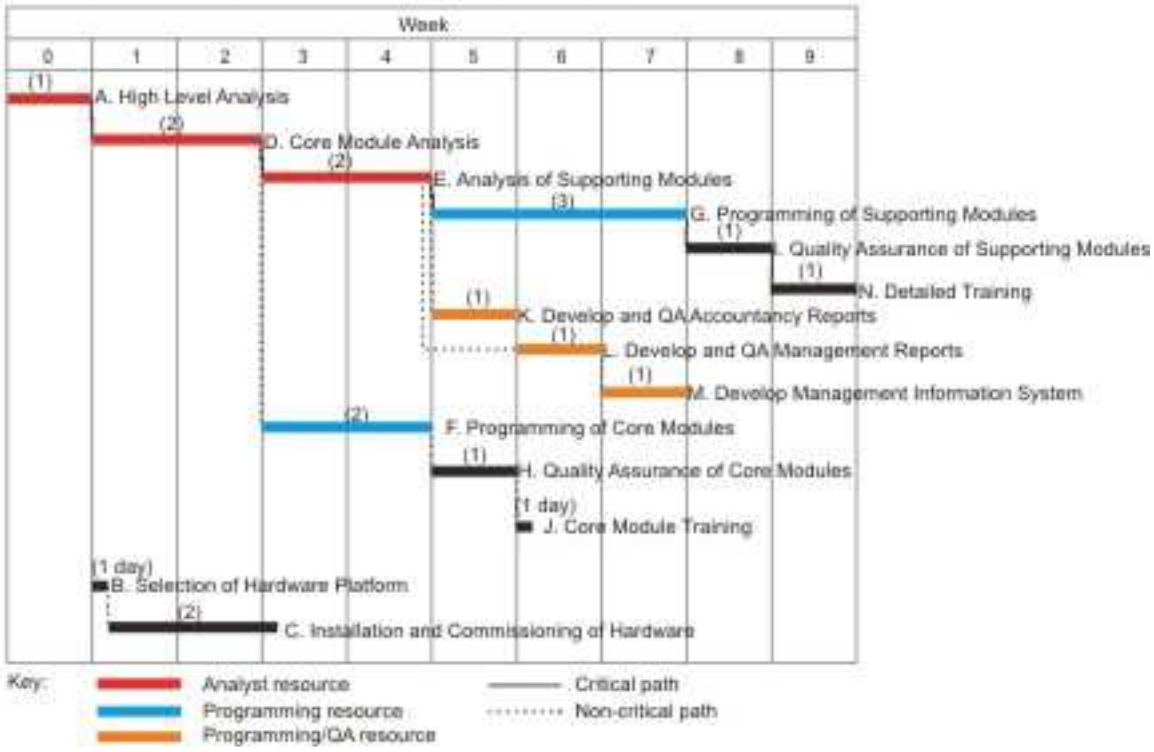
Figure 2: Draft Gantt Chart: Example Computer Project



Step 4. Presenting the analysis

The last stage in this process is to prepare a final version of the Gantt Chart. This shows how the sets of sequential activities link together, and identifies the critical path aftivities. At this stage you also need to check the resourcing of the various activities. While scheduling, ensure that you make best use of the resources you have available, and do not over-commit resource. You can also use color to represent the different resource types that you need to use such as programmers, or analysts. A redrawn version of the example project is shown below:

Figure 3: Critical Path Analysis: Activities Scheduled on a Gantt Chart



By drawing this example Gantt Chart, you can see that:

- If all goes well, the project can be completed in 10 weeks.
- If you want to complete the task as rapidly as possible, you need:
    - 1 analyst for the first 5 weeks.
    - 1 programmer for 5 weeks starting week 4.
    - 1 programmer/QA expert for 3 weeks starting week 6. Note: Activities L and M have been moved back a week. This does not affect the critical path, but it does mean that a single programming/QA resource can carry out all three of activities K, L and M.
- Analysis, development and testing of supporting modules are essential activities that must be completed on time.
- Hardware installation and commissioning is not time-critical as long as it is completed before the Core Module Training starts.

While this section describes how to draw a Gantt Chart manually, in practice project managers use software tools like Microsoft Project to create Gantt Charts. Not only do these ease the drawing of Gantt Charts, they also make modification of plans easier and provide facilities for monitoring progress against plans, as well as generating resource histograms.

Key Points:

Gantt charts are useful tools for planning and scheduling projects. They allow you to assess how long a project should take, determine the resources needed, and lay out the order in which tasks need to be carried out. They are useful in managing the dependencies between tasks.

When a project is under way, Gantt charts are useful for monitoring its progress. You can immediately see what should have been achieved at a point in time, and can therefore take remedial action to bring the project back on course. This can be essential for the successful and profitable implementation of the project.