

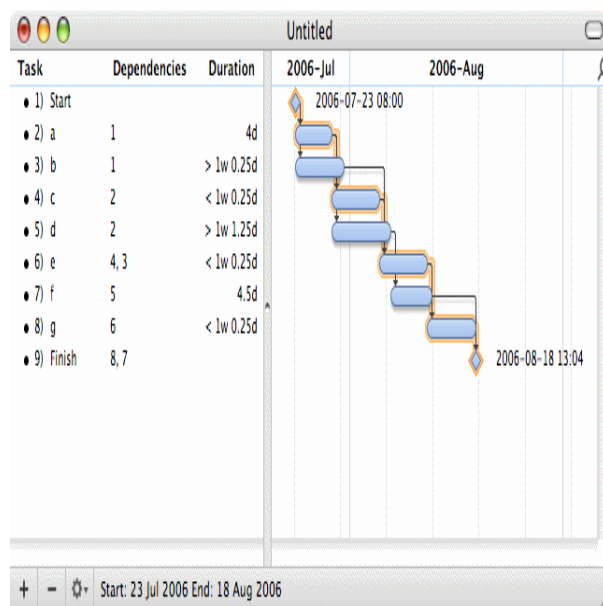
Gantt Charts - Tutorial and How to Create

What is the definition of a Gantt Chart?

A Gantt Chart is a first-rate tool when used by PM's that seek to envision, prepare, and track estimated and true progress of projects. Its graphical way of showing data its executive leadership and front-line staff alike to readily recognize the flow of a project, without necessitating a full tutorial about project management.

Each occasion we, in our [project management careers](#) , go through the efforts of our working lives, toiling to meet and exceed the self-set targets, a quiet moment of appreciation extends onward to Henry Gantt for innovating this easy-to-use diagram to communicate project schedules, as the timeline makes it possible for us to excel as project managers.

Additional Resources



Project Timeline Sample Gantt Chart

Background

[Henry Gantt](#) was a management consultant and engineer. Henry Laurence Gantt devised the Gantt chart in the 1910's. At that time, Gantt Charts were quite innovative and unheard of. Huge construction projects like the Hoover Dam and the Eisenhower National Defense Interstate Highway System necessitated a tool such as the Gantt diagram,



Henry Gantt

Now, a staple project management tool and buzzword in every [leader's](#) repertoire of modern project administration tools today, Gantt Charts are routinely deployed in the by PM's, planners, and system developers. Working on projects without them is unthinkable, except in the rare case when the inherent nature of the work does not require them.

The Gantt Chart has found universal status, known in French as diagramme de Gantt and Spanish as carta Gantt, graficas de Gantt, and diagrama de Gantt], indeed the whole world speaks this common language of project representation.

HL Gantt's global contribution to the modern project management is honored today through the Henry Laurence Gantt Medal. This medal, established in 1929, is awarded for distinguished achievement in management and service to the community.

Practical Application

So, how does someone use a project plan? These charts are generally introduced during the planning and scheduling stages of projects. A visual tool, the charts allow us to obtain a bird's eye view of the project in its totality. From beginning to the end, the charts force us to:

1. Make a realistic assessment of the end-time of the project.
2. Align the effort (or phases) – in sequential order, as well as in parallel.
3. Think in terms of task dependencies – which task is dependent on what.
4. Concentrate on the necessary resources, both when and where, throughout the run of the project.

After the project timeline charts are drawn, and project execution begins, we start comparing our actual, ground-level performance against what was planned. This

comparison is possible by checking the field reports against the project Gantt charts. Thus, we get to benefit from them in two immediate ways:

1. **To observe work in progress.** At the minimum, a percentage of completion can be worked out, by taking a snapshot of the progress “right-now”, and comparing it with the chart, for the “right-now” point of time. If there are any slip-ups in terms of time or cost, we are forced to question our optimism (or hope?) that the tasks would get completed earlier than they actually did, at the planning stage. This introspection helps in more realistic planning for a now more matured manager in their future projects.
2. To also **consider ways to speed up future tasks**, while there is still time, to ensure completion by the total project’s estimated deadline. Perhaps resources (better manpower, more funds, or additional material) need to be allocated far in advance for a task that is going to be initiated later down the line? Maybe a task or two can be rescheduled more efficiently, in order to meet some unforeseen contingencies that occurred after project initiation?

How to Create a Gantt Chart

A Gantt Chart, after all this mess, is just a chart with rows and columns. One simply writes all the tasks, one below the other, so that each task occupies a single row. Alongside the names, columns are drawn to indicate the dates. The dates may be in increments of days, weeks or months. Depending on the total length of the project, we may decide the granularity of the date increments which is appropriate – days, weeks or months.

Now, for each task in a row, we draw a horizontal (preferably hollow) bar alongside, with its start point in the column representing the date when it is scheduled to begin, and the end point in the column of the date when it is expected to end. Once these horizontal bars are drawn, we step back and get to observe the tasks that are going to run sequentially, in parallel, or overlap.

After the project has started, PM’s just fill in the hollow bars to a length that is in proportion to the fraction of the work that has been completed, for every task. In order to judge where we stand on any given date – say today, we can draw an imaginary vertical line through the chart at the current date – this is a “snapshot line”. The tasks that are supposed to have completed fully shall be to the left of this snapshot line. If they are indeed completed, their hollow bars shall have been completely filled. Partial filling indicates slip-ups. Tasks that are crossing the snapshot line are current tasks in hand; well, at the least they are tasks that were scheduled to have begun before today. If the horizontal bar on such tasks is filled in to the left of the line, then the current tasks are behind schedule; if they are filled in to the right of the line, then they are ahead of schedule. Future tasks, of course, will lie completely on the right of the snapshot line.

Complex projects

The aforementioned description is for simpler projects. Ideally, tasks in simple projects would not go beyond a single page, which makes them manageable. Often, and especially in complex projects, each task may be broken into smaller and more easily manageable subtasks. These subtasks may be moved to subordinate charts, with their own timelines. In management terminology, the process – of breaking up of these tasks into independent unit-tasks that can be completed on their own – has been given an exotic name of Work Breakdown Structure. The Work Breakdown Structure enables the project coordinator's mind to grasp the project in its entirety as well as to think in terms of allocating resources, assign responsibilities, and measure and control the project, for every task and sub-task.

Further, in team-oriented projects, where each task is to be handled by different personnel, there might be an additional column against each task, where initials of these personnel may be entered, to identify who is supposed to be doing what.

Project Milestones

Finishing milestones are occasions for celebration, to pop the champagne. They help to boost the morale of personnel involved in making the project a success. If the project timeline is drawn up along with suitable (and achievable!) milestones, by using some special symbol such as brightly-colored diamonds, and the chart is kept in some centrally visible place, it would motivate all the people to achieve them. These milestones could range from perhaps the approval of project design by the customer, or completion of project prototype, to delivery of individual modules by different teams.

Conclusion

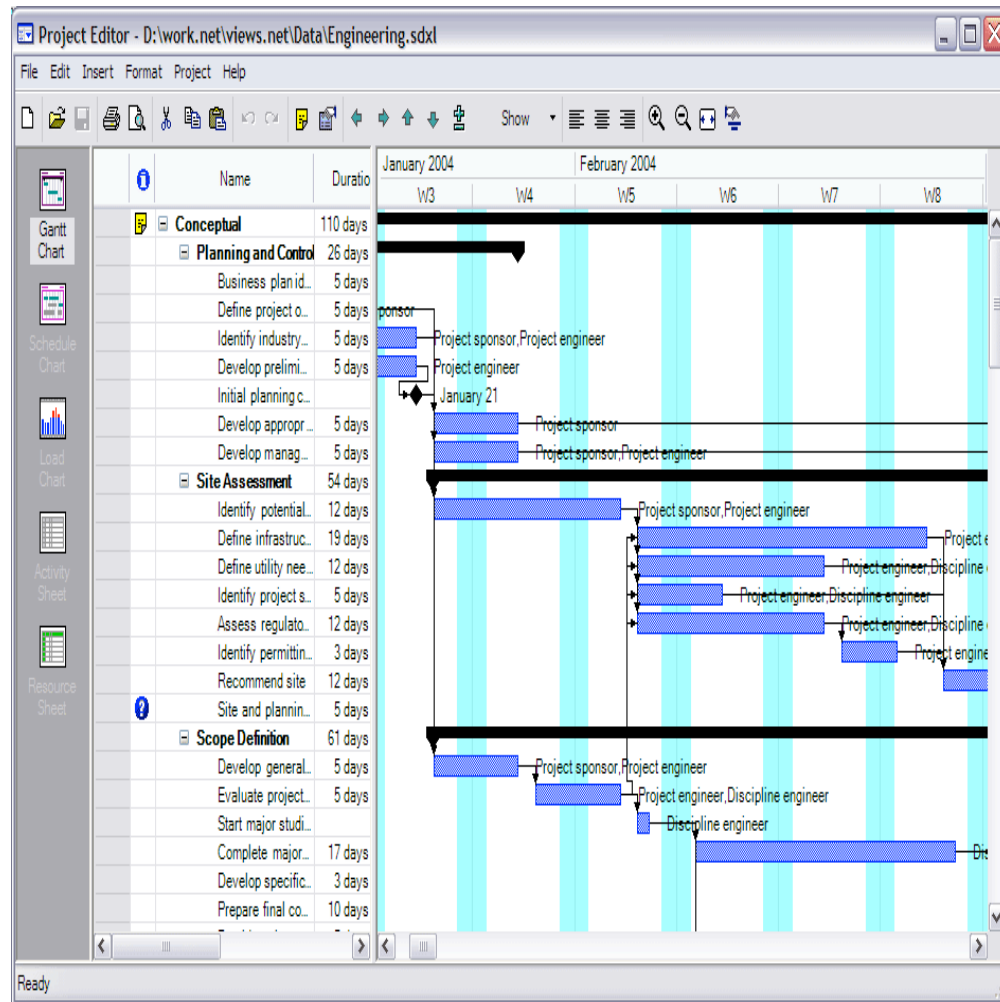
Since HL Gantt guided us toward enlightenment, such a library of books about management have been written on managing projects. Indeed, Project Management is a full-fledged discipline in itself, deserving of a separate academic degree for those who pursue it as a career and profession. More powerful models have evolved in the past few decades, which strive to capture the complexity of human endeavor and track and monitor its progress. The schedule continues to be used in some avatar or the other in all such models. And for simple projects, The project timeline is the solution.

A Gantt Diagram is a graphical demonstration of work effort as segments of work across time. It aids planning and tracking of project development and resource allotment. On the left-hand section of the Gantt Diagram flows a column with the WBS (essentially, a series of tasks). The chart component shows time progression, conveyed either in absolute or relative time.

When building a Gantt Diagram, each unit of work consumes one row. Dates go across the top, staggered as appropriate to the enormity of the project under review. Bars are

shown as rows in the Gantt Diagram depict the beginning and end times of every piece of work in the project. Tasks may happen concurrently, one after the other, and overlap.

Practically every planning and scheduling of projects software (like Basecamp) allows project management through Gantt diagram representation of project workflow. These tools provide managerial toolsets to start, track and report projects.



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. We will use this same example for both this section and the section on [Critical Path Analysis and PERT](#). This will allow you to compare the results of the two approaches.

Figure 1. Gantt Chart Example: Planning a band set up and recording

Task	Earliest start	Length	Type	Dependent on...
A. High level analysis / strategy	Week 0	1 week	Sequential	
B. Instrumentation and skills	Week 1	1 day	Sequential	A
C. Preparing information, target lists	Week 1.2	1 week	Parallel	B
D. Audition info	Week 1	3 weeks	Sequential	A
E. Hold auditions	Week 3	2 weeks	Sequential	D
F. Band and dep selection	Week 3	1 week	Sequential	D
G. Jam sessions	Week 5	5 weeks	Sequential	E
H. Band agreement / business terms	Week 5	1 week	Sequential	F
I. Songwriting and rehearsal	Week 8	6 week	Sequential	G
J. Live gig/s	Week 6	6 days	Parallel	C,H
K. Demo recording, mix	Week 5	2 weeks	Parallel	E
L. Digital set ups/promo	Week 5	2 weeks	Parallel	E
M. Live showcases	Week 6	2 weeks	Sequential	L
N. Debut single/remix release	Week 9	12 weeks	Sequential	I, J, K, M
O. Songwriting / reahearsal etc...	Week 10	etc	etc	

Step 2. Set up your Gantt Chart

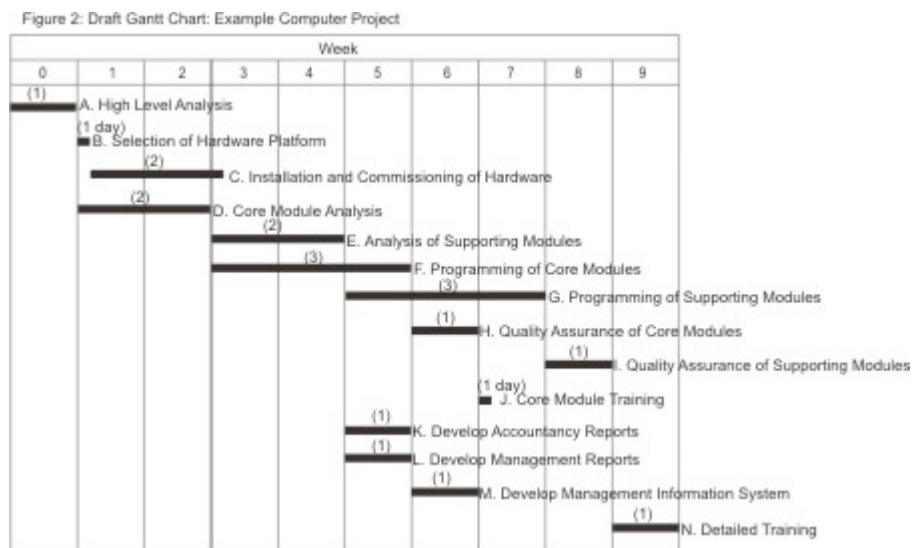
Head up graph paper with the days or weeks through to task completion.

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:



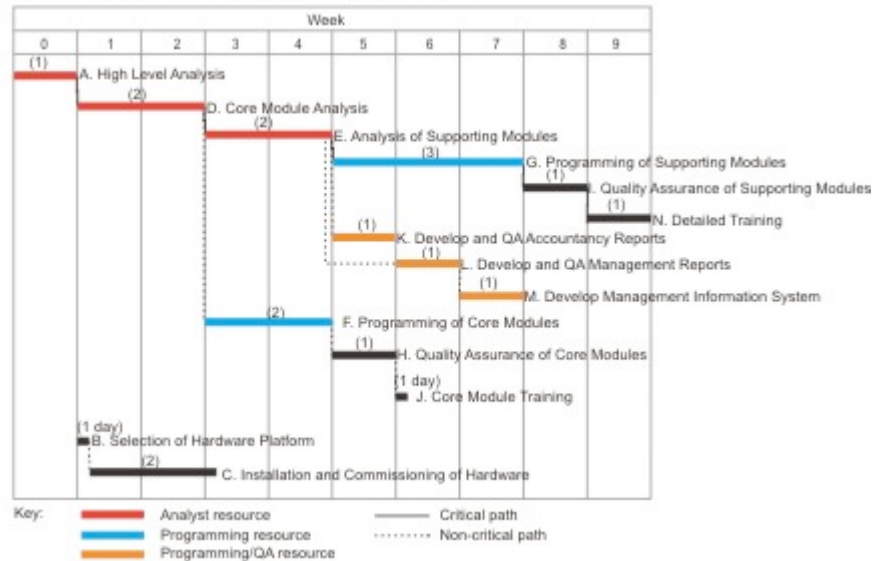
Step 4. Presenting the analysis

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 activities. 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.