

# A Brief Tutorial on Gantt charts

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## Using Gantt Charts to Manage Your 2031 Design Project

Your team is expected to produce a Gantt chart and to keep it up to date for use in planning your project. You may create your Gantt chart using any available software, including online generators. Excel is *not* recommended, because it makes it difficult to cleanly show start and end dates and task dependencies.

Follow these guidelines while creating your chart:

- Use weeks as the main time unit, with smaller divisions as desired.
- Include the due dates of the Proposal, Final Demo, and Design Report as milestones. Have up to four additional milestones, including any specific “core demos” if present in your project.
- Show more detail (i.e. subtasks) on design tasks, less detail on reports / documentation / presentation tasks. Your chart should be about 3/4 design tasks, 1/4 documentation/presentation related tasks.
- Debugging and testing are time consuming tasks. Be sure that your chart reflects the reality of how you spend your time.
- Review and update Gantt chart every week, more often if needed.

## Project Planning Basics

A "Project" is a set of activities that ends with specific accomplishment and that has (1) non-routine tasks, (2) distinct start/finish dates, and (3) resource constraints (time/money/people/equipment).

"Tasks" are activities that must be completed to achieve the project goals. Break the project into tasks and subtasks. Tasks have start and end points, are short relative to the project and are significant (not "going to library", but rather, "search literature"). Use **verb-noun** form for naming tasks (e.g. "create drawings" or "build prototype"). Use action verbs such as "create," "define," and "gather," rather than "will be made." Each task has a duration. It is very difficult to estimate durations accurately. Doubling your best guess usually works well.

"Milestones" are important checkpoints or interim goals for a project. Milestones can be used to catch scheduling problems early. Name milestones by **noun-verb** form, (e.g. "report due," "parts ordered" "prototype completed").

Your plan will evolve, so be flexible and update your chart on a regular basis. It also helps to identify risk areas for project; for example, things you don't know how to do but will have to learn. These are risky because you may not have a good sense for how long the task will take. Or you may not know how long it will take to receive components you purchased for a project.

## Work Breakdown Statement

A work breakdown statement (WBS) is a categorized list of tasks with an estimate of resources required to complete the task. An example WBS appears below.

WBS #	Task Description	Est Person -Hrs	Who	Resources	M&S
5	Profile motor power				
5.1	Design test stand	20	SE, JM	Pro/E	
5.2	Build test stand	15	SE, JM	Frame & brake parts	\$35
5.3	Test 3 motors	3	SE, JM	Stroboscope	\$75
5.4	Plot torque vs. speed	2	JM	Excel	

(M&S = Materials & Supplies)

## Gantt Chart Basics

Gantt charts are a project planning tool that can be used to represent the timing of tasks required to complete a project. Because Gantt charts are simple to understand and easy to construct, they are used by most project managers for all but the most complex projects.

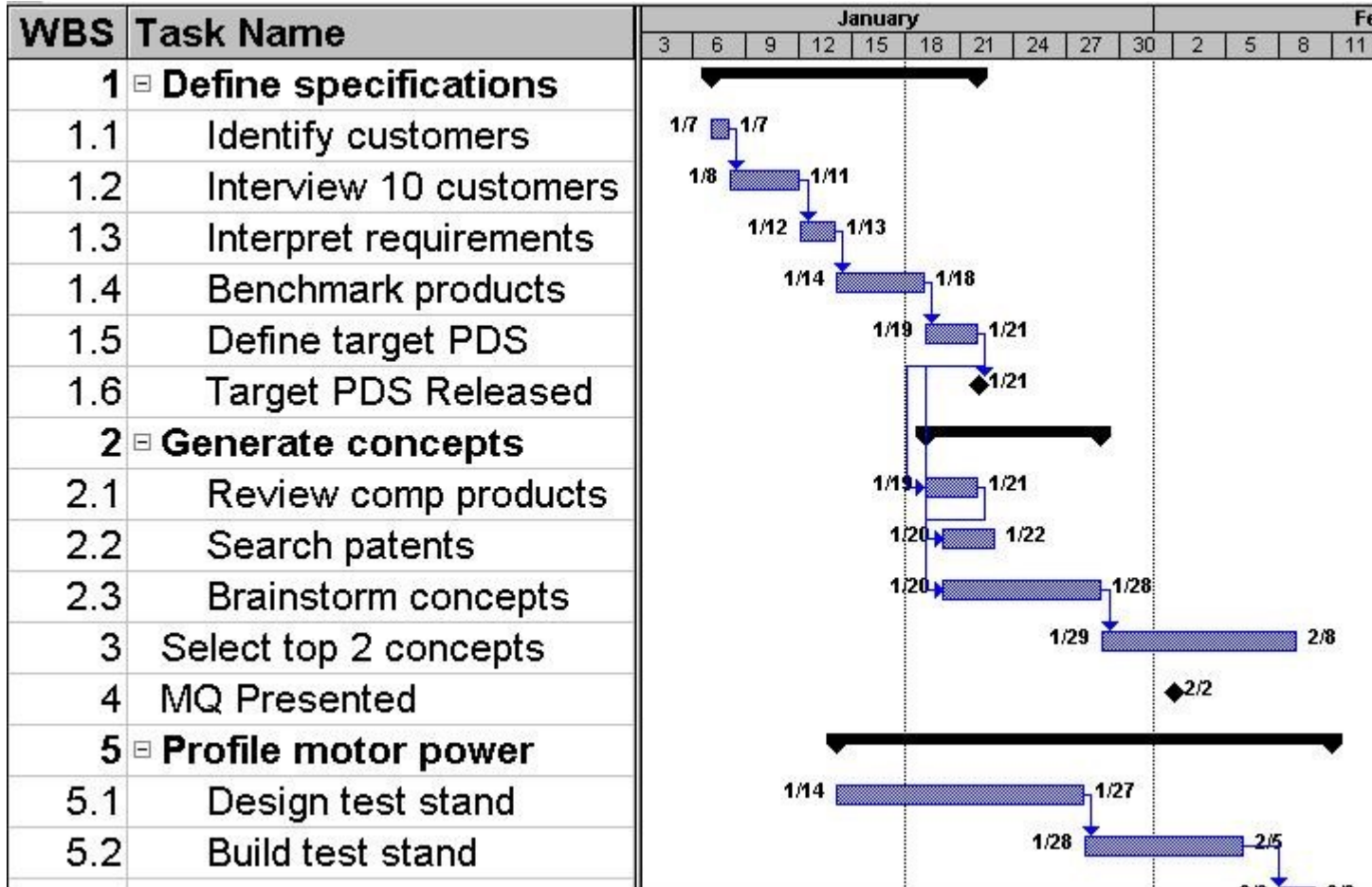
- In a Gantt chart, each task takes up one row.
- Dates run along the top in increments of days, weeks, or months, depending on the total length of the project.
- The expected time for each task is represented by a horizontal bar whose left end marks the expected beginning of the task and whose right end marks the expected completion date.
- Tasks may run sequentially, in parallel or overlapping.
- As the project progresses, the chart is updated by filling in the bars to a length proportional to the fraction of work that has been accomplished on the task. This way, you can get a quick reading of project progress by drawing a vertical line through the chart at the current date.
- Completed tasks lie to the left of the line and are completely filled in.
- Current tasks cross the line and are behind schedule if their filled-in section is to the left of the line and ahead of schedule if the filled-in section stops to the right of the line.
- Future tasks lie completely to the right of the line.

In constructing a Gantt chart, keep the tasks to a manageable number (no more than 15 or 20) so that the chart fits on a single page. More complex projects may require sub-charts which detail the timing of all the subtasks which make up one of the main tasks, but that is not expected for your project. For team projects, it often helps to have an additional column containing numbers or initials which identify who on the team is responsible for the task.

Often the project has important events which you would like to appear on the project timeline, but which are not tasks. For example, you may wish to highlight when a prototype is complete or the date of a design review. You enter these on a Gantt chart as "milestone" events and mark them with a special symbol, often an upside-down triangle or diamond.

## Example Gantt Chart in Microsoft Project

A sample chart made using Microsoft Project appears below. Project is a widely used scheduling tool for small projects, and is excellent for creating Gantt charts, but there are other options if you don't have access to Project.



To embed a Project Gantt chart into a Word document, get the chart showing on the screen, then Edit > Copy Picture... > to GIF file. From there you can import the gif file into Word. You may have to rotate it 90 degrees in MS Paint to get it to fit and be readable.