

Research Development & Grant Writing News

Developing Timelines and Milestone Charts for Your Proposal

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By Lucy Deckard co-publisher

Many solicitations require that you provide a schedule, timeline or milestone chart for your proposal, and even when they aren't explicitly required it's often a good idea to include one. These schedules can serve a number of essential functions:

- They help reviewers understand how you plan to stage and conduct your project tasks (and in the process, reassure the reviewers that you actually do have a detailed action plan).
- They help provide evidence that you have a plan to finish the work in the time allotted.
- They provide an easy-to-find list of the main tasks you need to accomplish in order to achieve your proposed goals.
- For team proposals, they can also provide a summary of who will have responsibility for which tasks.

However, many PIs are unsure how to develop timelines and milestone charts. Below we provide an overview of various approaches to developing this component of your proposal.

Understand the Expectations of Your Funder

When developing a project schedule, it's important to understand the level of detail expected by your funder. Of course, if the solicitation specifically states what must be included in the project schedule, you need look no further. However, solicitations are often not that explicit. In that case, consider the culture of your funder and the complexity of your project.

Basic research agencies such as NSF, NIH and the DOE Office of Science are accustomed to giving researchers broad discretion in how they conduct their basic research projects, so you don't need to provide a highly detailed schedule, but you do need to communicate your approach and the major tasks you will need to accomplish as part of that approach. Therefore, schedules for single-PI or small team proposals to basic research agencies are typically high-level, with several subtasks under each main objective or aim, specified based on semester or quarter. Even so, don't make it so high level that it doesn't communicate your plan of work (such as just including your aims or objectives by year). So, for example, if you were a reviewer considering Schedule 1 in a proposal...

Schedule 1 (main objectives only)

Task	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1: Development of the hoosit					
Objective 2: Assess XYZ					
Objective 3: Integrate the hoosit with XYZ					

...what is your impression of how well the PI has planned the proposed project compared to if Schedule 2 provided more detail as below?

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Schedule 2 (with objectives and tasks)

Task	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1: Development of the hoosit					
Integration and calibration					
Optimization of frumpits measurement methodology					
Objective 2: Assess XYZ					
XYZ spectroscopy					
MOA microscopy					
ABC testing					
Pandax studies					
Objective 3: Integrate the hoosit with XYZ					
Instrument integration					
Instrument testing					
Demonstration					

For larger team proposals or more logistically complex projects, even the basic research agencies are likely to expect a more detailed schedule. Think about your project from the reviewers' and program officers' point of view. Are logistics likely to be a challenge? Are there several tasks (perhaps led by different members of the team) that must be coordinated? Is there one critical task that could derail the project if it isn't accomplished on time? What is the "critical path," i.e., the sequence of tasks that determine when the project will be completed? If these and similar schedule-related questions are likely to be of concern to your reviewers, be sure to include enough detail in your schedule to show you have a plan to address them. For team proposals, it's usually a good idea to indicate next to the task who will be leading that task.

In addition, mission agencies often expect more detailed project plans and more finely detailed schedules. For example, the Department of Defense tends to place a high priority on scheduling and accountability, and often expects schedules down to the month (and even sometimes down to the week). In these cases, a project schedule could take up a half page or more. However, this is not always the case, so you should talk to your DoD Program Officer to determine what the expectations are for the particular program.

What is the Difference Between a Scheduled Task and a Milestone?

Many PIs, particularly those who haven't worked in industry, are confused by the requirement that "milestones" be shown. Simply put, a milestone is an event that occurs (or should occur) at a specific point in time and is an important indicator of progress of your project. It might be the start or completion of an important task (e.g., "all study subjects have been recruited," or "flight testing begins"), a deadline such as "final report submitted", or a short event, such as "meeting of External Advisory Board." If your project has any "deliverables," i.e., products (hardware, software, data, reports, etc.) that you must supply to the funder, the dates when you will provide those deliverables usually should be specified as milestones. Milestones, which are often shown as triangles or diamonds, are usually interspersed within the schedule along with tasks that require some significant length of time. When you specify these milestones, remember that, should you win the grant, they will be key indicators that the funder will use to determine whether your project is on schedule, so consider carefully where you place these milestones and make sure they are realistic.

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The Gantt charts shown above are very simple and don't show the relationships between various tasks: for example, cases where one task can't be started until a previous task has been completed. However, you can configure your Gantt task to do that using arrows to indicate tasks that depend on each other (Schedule 3).

Schedule 3. Gantt chart with milestones that also indicates dependent tasks

Task	Year 1	Year 2	Year 3	Year 4	Year 5
Objective 1: Development of the hoosits (Dr. Jones lead)					
Integration and calibration					
Optimization of frumpits measurement methodology					
Objective 2: Assess XYZ (Dr. Wang lead)					
XYZ spectroscopy					
MOA microscopy					
ABC testing					
Pandax studies					
Objective 3: Integrate hoosit with XYZ (Dr. Ramirez lead)					
Instrument integration					
Instrument testing					
Demonstration					
Final report submitted					

Formatting

The most commonly used format for providing schedules is the Gantt Chart, such as the ones shown in Schedule 1 through 3 above. While Gantt charts at the level shown above are of limited use in actual project planning, they are easy to read in a proposal and don't take up too much space. Gantt charts can easily be generated using MS Word's table function or Excel. There are also numerous Gantt chart software packages available for use in the actual planning and management of your project, such as [GanttProject](#), which is free. Flow charts are also sometimes used, such as Program Evaluation and Review Technique (PERT) Charts (Figure 1). This format has the advantage that you can show the critical path, but it is relatively difficult to read and takes up quite a bit of space in a proposal. For this reason, you may be asked to provide a Gantt chart in your proposal and then, after the award or as a supplement, be asked to provide a PERT or similar chart with more detail. A modified flow chart with better labeling can help show the work flow, which may be helpful in some

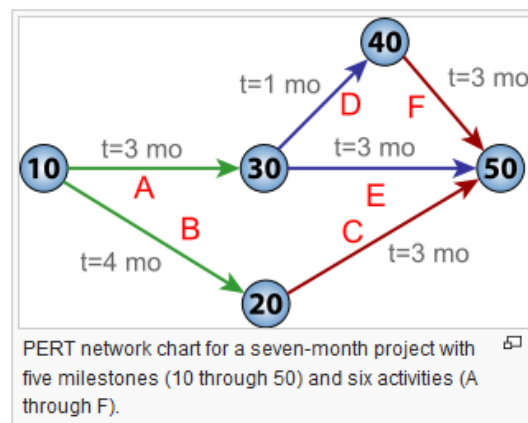


Figure 1. Wikipedia's example of a PERT chart, which is usually used more for project management because of its complexity.

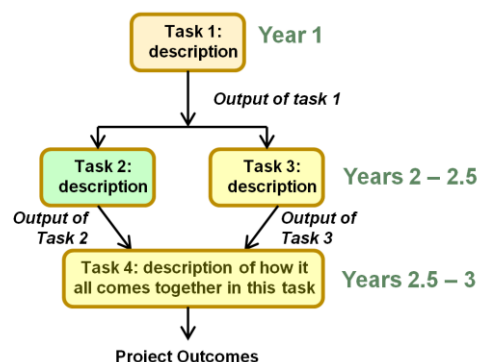


Figure 2. A task flow chart that provides information on how the tasks interrelate as well as some general scheduling information.

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cases where the work flow may be confusing to reviewers (Figure 2).

Other Formats

There are also a number of other formats (usually versions of Gantt charts), many of which are produced by project management software. The figures below provide some examples. The key to deciding on which format to use is to put yourself in the reviewer's place and think about what that reviewer needs to know about how your project will get done, what likely questions they will have, and what risks you need to address. The answers to these questions will help determine the level of detail and kind of information you should include.

Most importantly, be absolutely sure to double-check that the tasks and timing that you show in your schedule are consistent with what you say in your proposal text and with your budget.

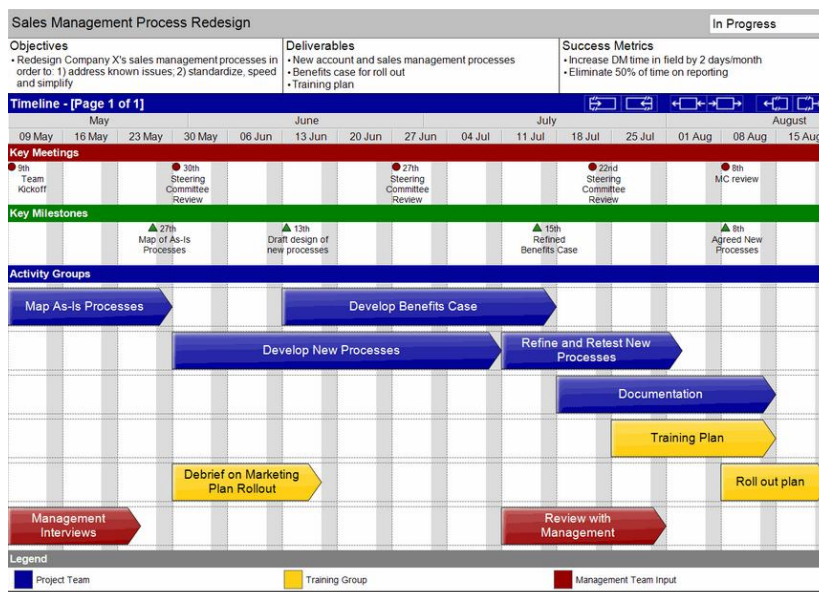


Figure 3. This version of a Gantt chart is produced by [Swiftlight project management software](#).

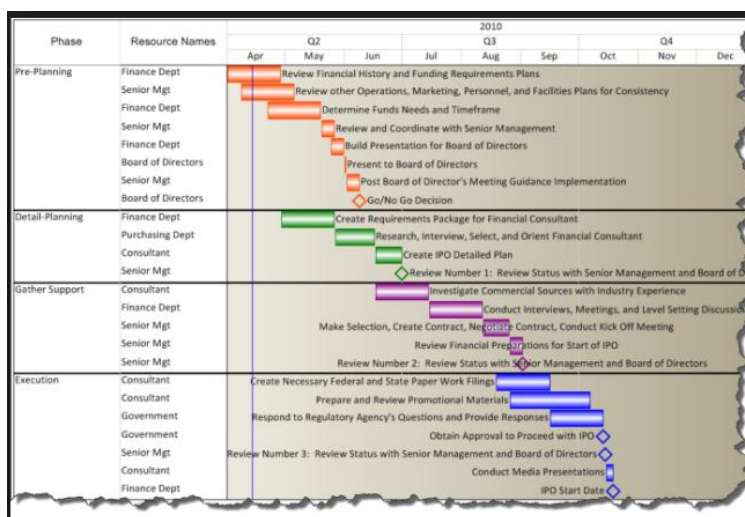


Figure 4. Another example with project phases resources (which could also be faculty team members or project thrusts/themes) from [Chronicle Graphics](#).