

LEARNING OUTCOMES

1. Explain a Gantt Chart.
2. Describe the main steps involved in creating a Gantt Chart using Excel.
3. Describe the main steps involved in creating a Gantt Chart using Microsoft Project.

Introduction

Many people and organizations today have a new or renewed interest in project management. Until the 1980s, project management primarily focused on providing schedule and resource data to top management in the military and construction industries. This tracking of a few key project parameters is still an important element, but today's project management involves much more.

In 1917, Henry Gantt developed the famous Gantt chart as a tool for scheduling work in factories. A *Gantt chart* is a standard format for displaying project schedule information by listing project activities and their corresponding start and finish dates in a calendar format. Managers drew Gantt charts by hand to show project tasks and schedule information, and this tool provided a standard format for planning and reviewing all the work on early military projects.

Today's project managers still use the Gantt chart as the primary tool to communicate project schedule information, but with the aid of computers, it is no longer necessary to draw the charts by hand.

Today, most people use project management software to create versions of Gantt charts that are more sophisticated and allow for easy updates of information. They can also show dependencies in some format using project management software.

Figure T12.1 shows a simple Gantt chart created using Microsoft Excel. Figure T12.2 shows a Gantt chart created using a more sophisticated tool, Microsoft Project. This plug-in will focus on creating a Gantt chart using these two tools.

Project management and Gantt charts are explained in more detail in Plug-In B15, "Project Management." Here we will deal only with the tools, not the actual concepts.

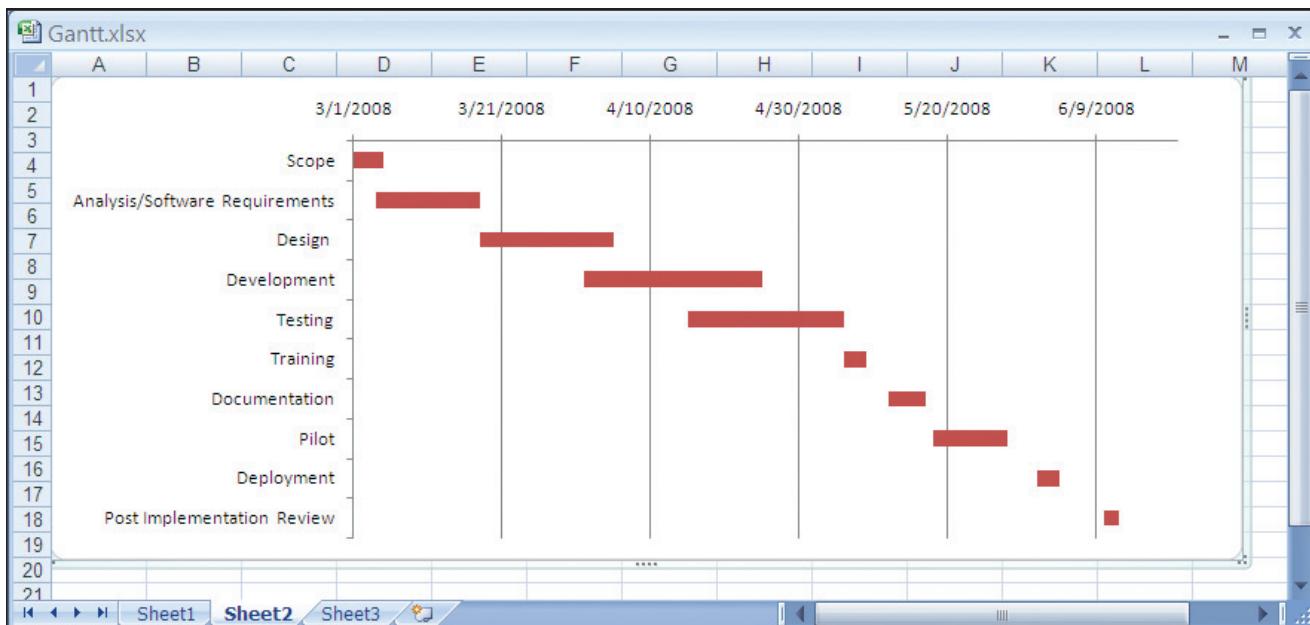


FIGURE T12.1

Gantt Chart in Excel

Creating Gantt Charts with Excel

Microsoft Excel can easily be used for scheduling and resource management, with columns to track planned and actual start and finish dates. Excel is a practical solution for a small project in a small organization since many businesses have access to Excel and therefore do not have to buy any additional tools.

This section is written with the expectation that you possess some basic knowledge of the Excel and spreadsheet concepts presented in Plug-In T2, “Basic Skills Using Excel 2007.”

Excel does not offer Gantt as a chart type, but it is fairly easy to create such a chart by using a stacked bar chart. To do so, follow these steps:

1. Start with a new workbook and enter the task data, as shown in Figure T12.3.

Column A contains the task descriptions; column B, the start date for each task; and column C, the number of days to complete the task. Column D contains

FIGURE T12.2

Gantt Chart in Microsoft Project

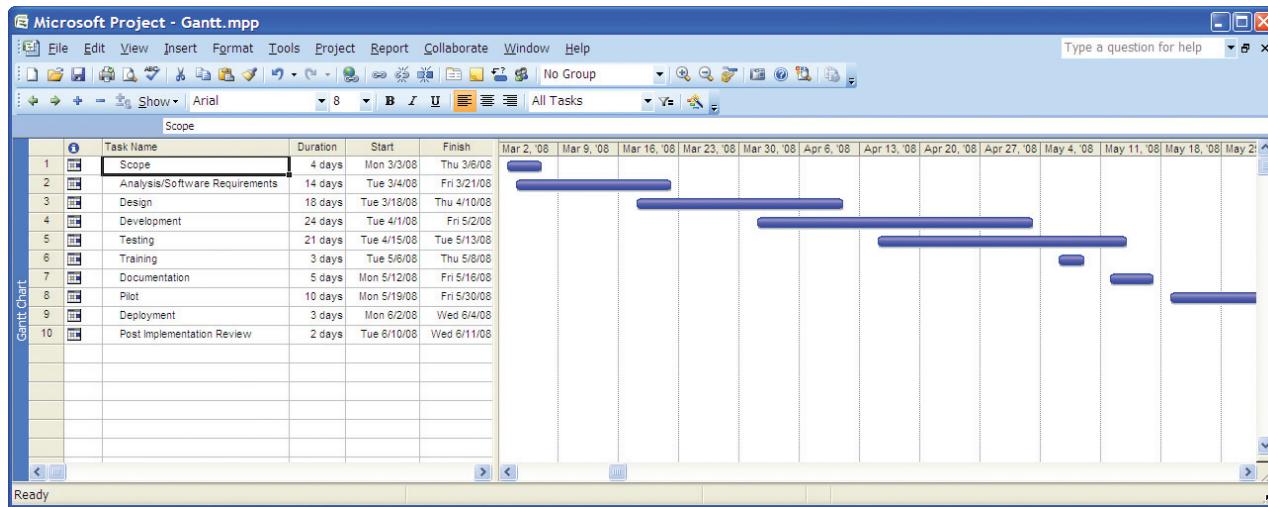


FIGURE T12.3

Project Tasks

The screenshot shows a Microsoft Excel spreadsheet titled "Gantt.xlsx". The first row contains the header "Software Development". Below it is a table with columns: TASK, START DATE, DURATION (Days), and END DATE. The tasks listed are Scope, Analysis/Software Requirements, Design, Development, Testing, Training, Documentation, Pilot, Deployment, and Post Implementation Review. The duration for each task is calculated as the difference between the start date and end date.

Software Development				
	A	B	C	D
1	Task	Start Date	Duration (Days)	End Date
4	Scope	3/1/2008	4	3/4/2008
5	Analysis/Software Requirements	3/4/2008	14	3/17/2008
6	Design	3/18/2008	18	4/4/2008
7	Development	4/1/2008	24	4/24/2008
8	Testing	4/15/2008	21	5/5/2008
9	Training	5/6/2008	3	5/8/2008
10	Documentation	5/12/2008	5	5/16/2008
11	Pilot	5/18/2008	10	5/27/2008
12	Deployment	6/1/2008	3	6/3/2008
13	Post Implementation Review	6/10/2008	2	6/11/2008
14				
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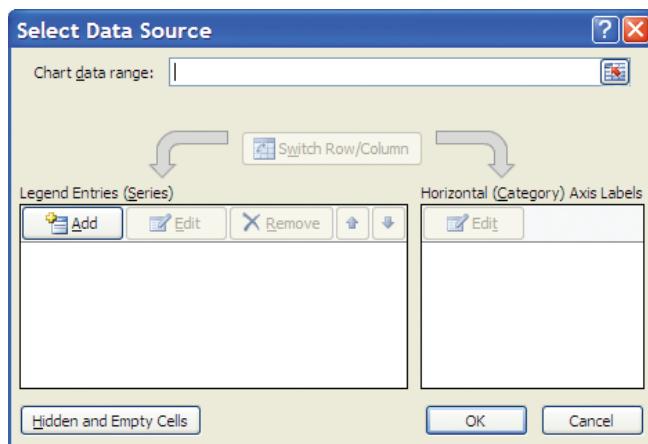
At the bottom, there are tabs for Sheet1, Sheet2, and Sheet3, along with standard Excel navigation buttons.

formulas that determine the end date for each task. For example, the formula used in our example (e.g., Figure T12.3) in cell **D4** is **=B4+C4**.

2. Create a stacked horizontal bar chart by selecting the **Insert** tab, then choose the **Bar** button in the Charts ribbon, and then the **2-D Stacked Bar Chart** option.
3. A blank chart appears in your spreadsheet. To select the data, right-click anywhere inside the blank chart, then choose **Select Data**. The Select Data dialog opens as shown in Figure T12.4.
4. Under the **Legend Entries (Series)** section, click on the **Add** button. The Edit Series dialog box opens. The first series to add will be the label containing the start date. Under the **Series Name**, select cell **B3**. Under the **Series Values**, select cells **B4:B13**, the range of cells containing the various start dates. Click **OK**.

FIGURE T12.4

Select Data Dialog Box



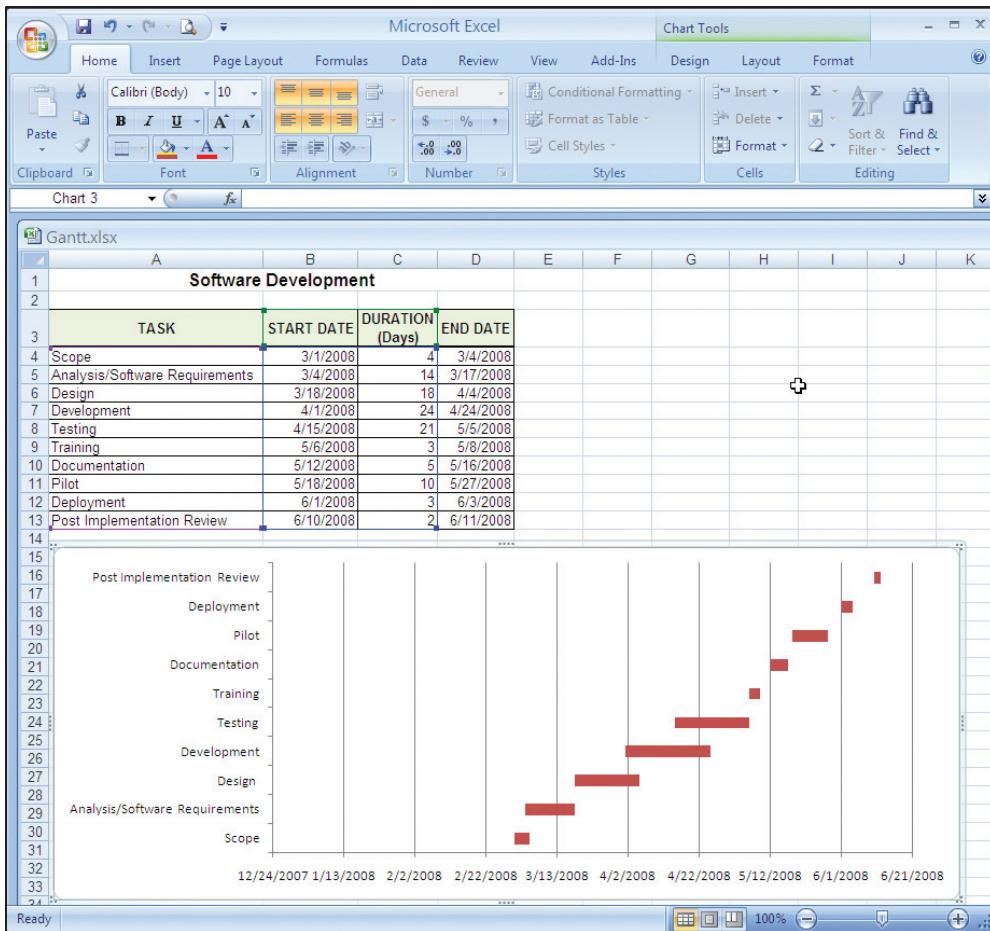
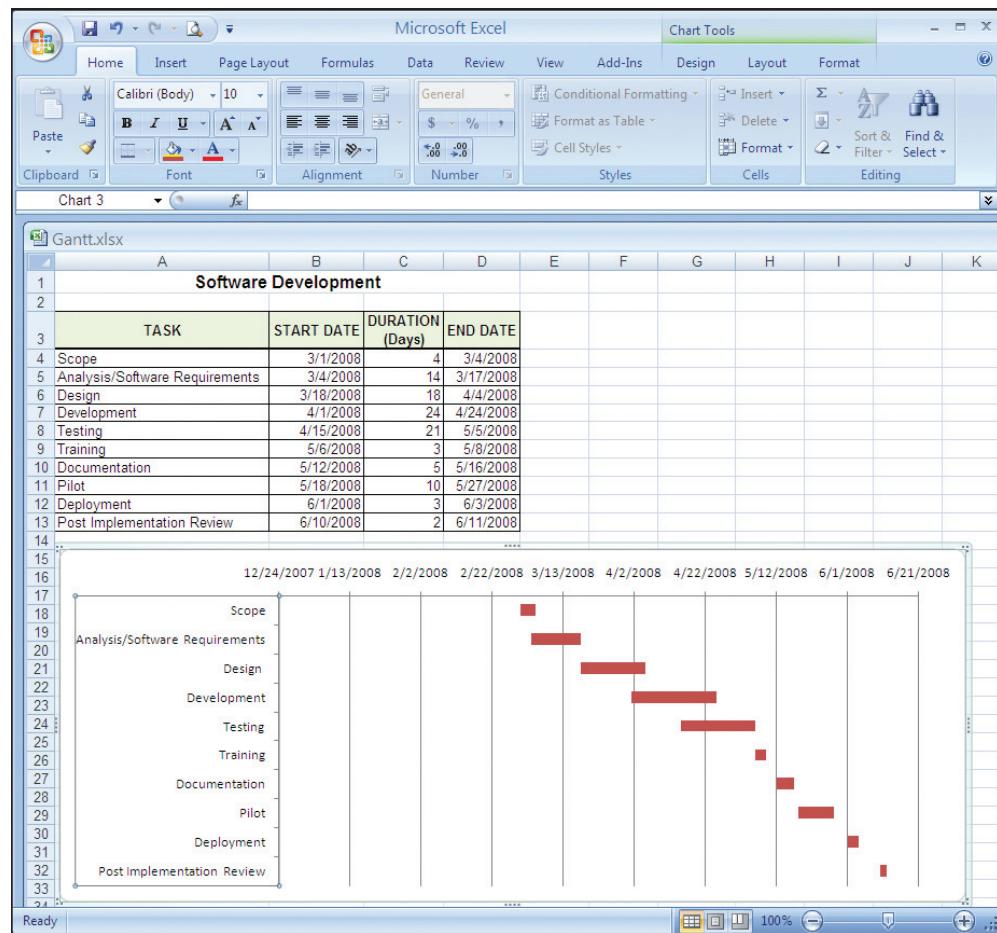


FIGURE T12.5
Gantt Chart with Durations

5. Another series is needed; therefore, click on the **Add** button. This series will be the duration. When the Edit Series dialog opens, select cell **C3** for the **Series Name**, then select **C4:C13** for the **Series Values**.
6. Edit the labels by selecting the **Edit** button under the **Horizontal (Category) Axis Labels** section. The Axis Label dialog opens. Select cells **A4:A13**, the various task names. Click **OK**. Click **OK** again to close the Select Data Source dialog box.
7. Remove the chart's legend by selecting it and pressing the **Delete** key or the **Backspace** key, since the legend is not needed for a Gantt chart. You may need to adjust the chart's height (or change to a smaller font) so that all x-axis labels are visible.
8. Since you do not want to see the Start data series, select that series (by default it should be a blue color) by clicking on any one of the data items, right-click, and select **Format Data Series**. The Format Data Series dialog opens. Select the **Fill** tab on the left and select **No Fill**. Then select the **Border Color** tab and select **No Line**. Click **Close**. The start dates are gone, but the durations are visible; this is more like a Gantt chart as shown in Figure T12.5.
9. You need to now reverse the order of the y-axis labels. Right-click on any one of the labels, then select **Format Axis**. The Format Axis dialog opens. Under the **Axis Options** tab, click on the **Categories in reverse order**. Click **Close**. Your chart now should look like Figure T12.6.

FIGURE T12.6

Categories in Reverse Order



10. To get a better view of the actual dates, you need to adjust the date range. Excel does not view (i.e., interpret) dates as we do. In other words, dates are displayed as 3/1/2008 to you, but Excel interprets that date as 39508. Dates are in numerical value, simply formatted to look like dates. Since the first task in the project is set to 3/1/2008, you need to convert that to a numeric value. And the same is true for the last task; however, you can extend the date a few days past the end date for visual effect. To do this, find an empty cell, such as F4; enter 3/1/2008. Repeat the process for the end date, select another empty cell, such as F5, and enter 6/20/2008. Choose both F4 and F5 and select the **Comma Style** format from the Number ribbon. You will see that these dates are now represented by their numerical value. You will use these numbers to set the Minimum and Maximum values for the date range in the next step.
11. Right-click on any of the dates at the top of your chart, then select **Format Axis**. Using the Axis Options tab, select **Fixed** for the **Minimum**, and type in **39508** (which is the numeric value for 3/1/2008, the start date that you converted in the previous step). Select **Fixed** for the **Maximum**, then type in **39619** (the numeric value for 6/20/2008). Click **Close**. Your Gantt chart should now look like Figure T12.7.
12. Apply other formatting as desired. For example, you can add grid lines and a title. If you adjust your project schedule, the chart will be updated automatically. If you use dates outside the original date range, you will need to change the scaling for the y-axis.

You now have a very functional Gantt chart; you can clearly see when various tasks begin and end, as well as when tasks overlap.

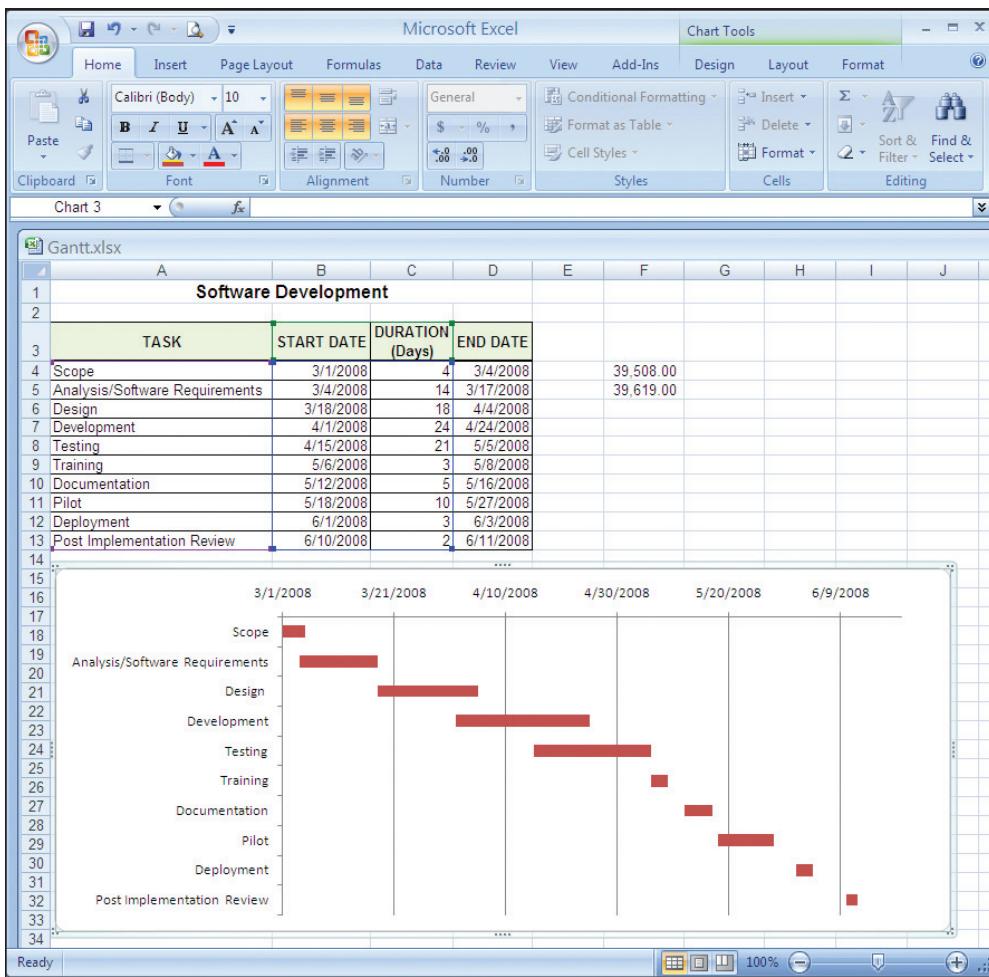


FIGURE T12.7
Gantt Chart in Excel

Creating Gantt Charts with Microsoft Project

This section will provide you with a basic introduction to Microsoft Project, a powerful project management software tool that can help manage schedules and resources and track project progress. Microsoft Project, with its familiar Microsoft Office user interface, is one of the most widely used project management software applications available.

While the use of project management software can enhance and support the project management function, project management software should not be used in lieu of becoming familiar with the project management concepts presented in this textbook. This section is written with the expectation that you possess some basic knowledge of the project management concepts presented in Plug-In B15, “Project Management.”

MICROSOFT PROJECT BASICS

If you do not already have Microsoft Project 2007 (the current version as of this writing), a trial version can be downloaded from Microsoft at www.microsoft.com/project/. Click on the link *Try Project 2007* and follow the directions on the Web site to install on your computer. During the installation process, you will be asked whether you prefer the “typical” installation or whether you want a “complete” or “custom” installation. The typical installation includes the most commonly used features of Microsoft Project, which we will use for this plug-in.

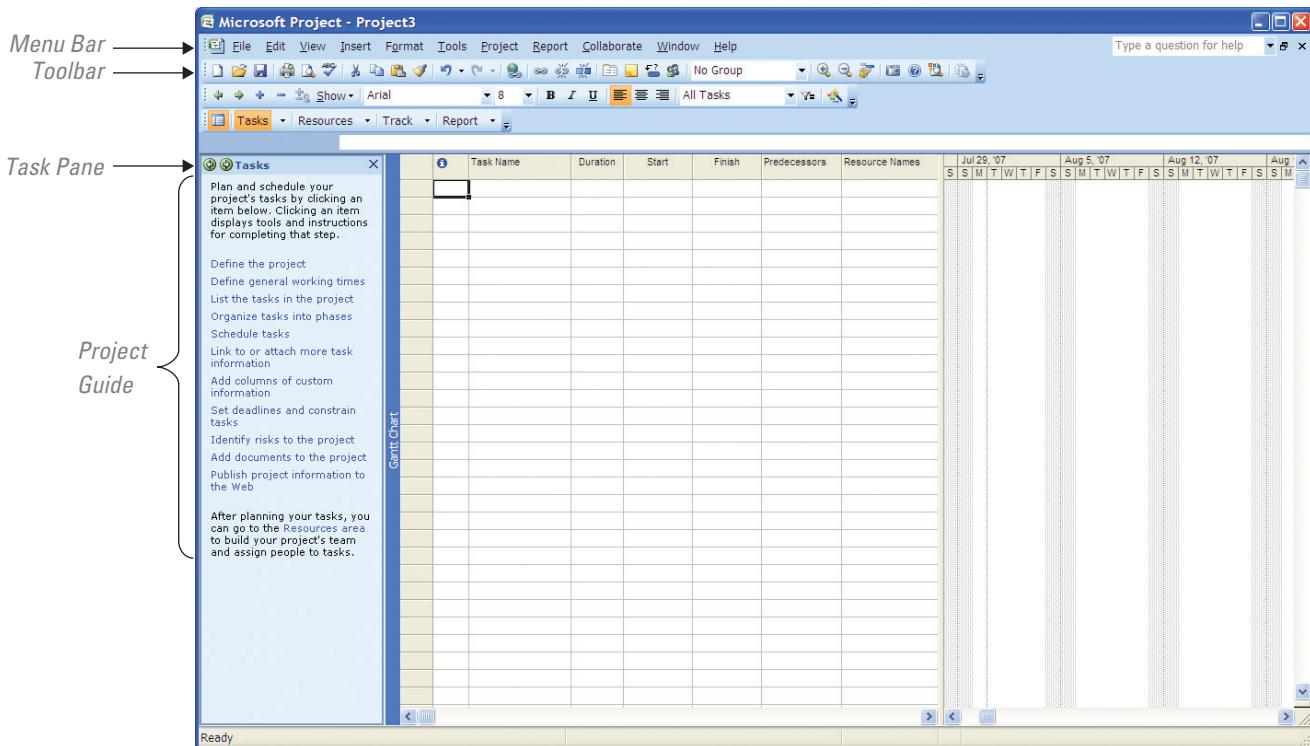


FIGURE T12.8

Microsoft Project Interface

Microsoft Project is a Microsoft Office application, so it has many elements similar to other Office titles such as Word, Excel, and PowerPoint. To begin using Microsoft Project, start the application by clicking on the Start menu, All Programs, and select Microsoft Project, which is located in the Microsoft Office folder by default. The application will open with the screen shown in Figure T12.8.

As you can see, elements of the user interface should be familiar, specifically, the menu bar and the toolbar (see Figure T12.8). Depending on settings specific to your computer, your opening screen may not appear exactly as shown, but the differences will be minor.

The Project Guide is an interactive interface element in Microsoft Project that helps you work through your project from the standpoint of project management processes and goals. This complements the existing menus and toolbars, which allow you to approach your project plan from a strictly feature-oriented point of view. Although a great option, we will not be using it in this plug-in.

To turn off the Project Guide, do this:

1. Click the **Close** button in the Project Guide pane, or click **View** from the menu bar, then select **Hide Project Pane**.

CREATING A PROJECT FILE

The Microsoft Project workspace is called the *view*, and the view that comes up by default when you first open Microsoft Project is the Gantt chart. The Gantt chart is a *combination view*; it has a task table on the left side and the chart with Gantt bars on the right.

You can create a new project from one of the 41 templates included in Microsoft Project. These templates reflect various types of product, service, or activity projects in different industries and are based on widely accepted industry standards for projects of these types.

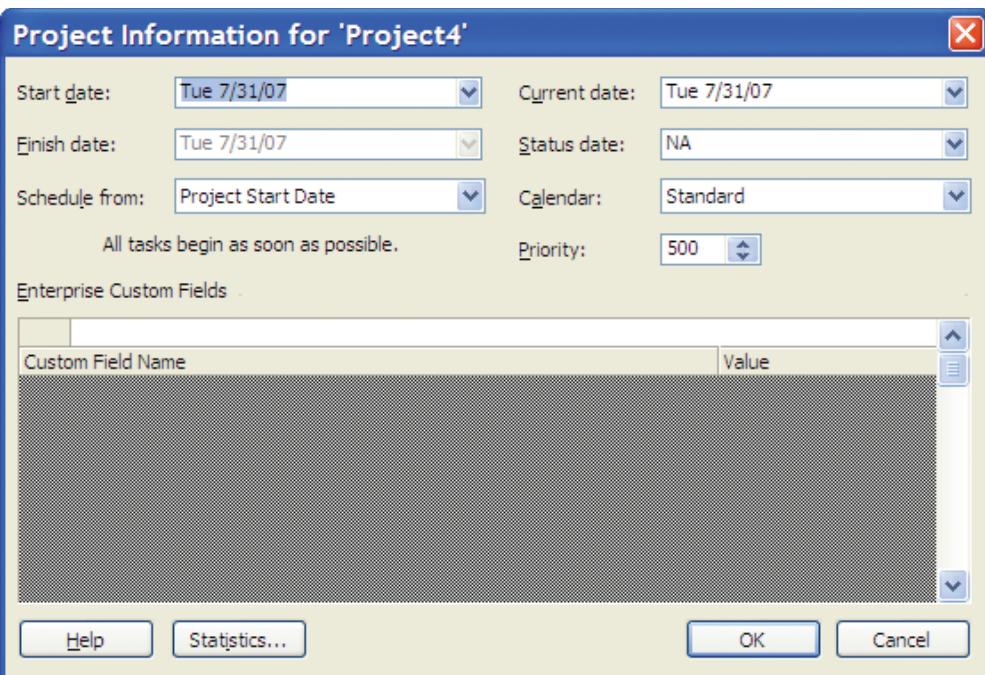


FIGURE T12.9
Project Information Dialog Box

Although template helps you start your project more quickly, for this plug-in you will use the blank project to create your Gantt chart. To do this, follow these steps:

1. On the **File** menu, click **New**. The New Project task pane appears.
2. Under New, click the **Blank Project** link. Microsoft Project creates a new project, and the New Project task pane is replaced by the Tasks pane of the Project Guide.

Your first decision affecting how your project will be scheduled is whether you want to schedule your project from a start date or from a finish date. Often, you have a finish date in mind, but you can still schedule from the start date and then make sure you hit the targeted finish date. You will get results that are more predictable when you schedule from a start date. To set up your project plan to be scheduled from the project start date and finish date, do this:

1. Click **Project**, then select **Project Information**. The Project Information dialog box appears (see Figure T12.9).
2. In the Start Date box, enter the **start date**. By default, the Start Date box shows today's date.
3. In the Schedule From box, click the **Project Start Date**.
4. Leave the Project Finish Date box as is. Microsoft Project will calculate this date for you later.
5. Click **OK**.

SAVING YOUR PROJECT

Whether you are creating a new project from scratch, from a template, or from an existing project file, your next step is to save your new project. To do this:

1. Click **File**, then select **Save As**.
2. In the Save As dialog box, choose the drive and folder in which you want to save the new project.
3. In the File Name box, enter a descriptive name for your project, and then click the **Save** button.

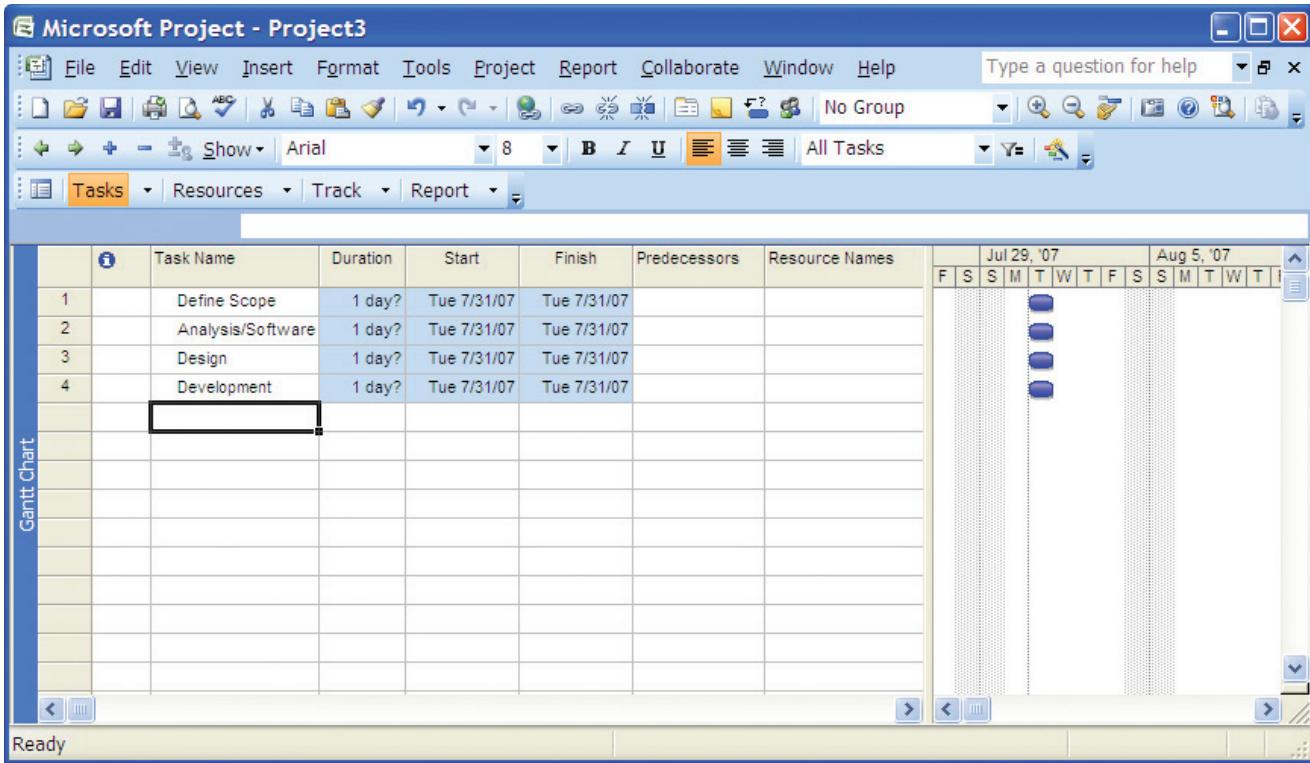


FIGURE T12.10

Project Tasks

ENTERING TASKS

When your project file is set up, you are ready to enter tasks. To enter tasks directly into your project plan, follow these steps:

1. Make sure you are working in the Gantt chart. You can see the name of the current view in the Active View bar that runs vertically along the left side of the view. If it does not say Gantt chart, click **View**, then select **Gantt chart**.
2. Type the name of the task in the Task Name field. For example, a typical task in any project would be **Define Scope**.
3. Press **Enter** or your **down arrow** key to move to the next row. The task name is not recorded and other commands remain unavailable until you press Enter or the down arrow key. Figure T12.10 displays a few tasks entered into a new project.

Note: By default, the Gantt chart table includes the Task Name, Duration, Start, Finish, Predecessors, and Resource Names fields as columns. A natural impulse when entering tasks is to enter project information into each of these fields. The best approach is to enter the task names first, and then the durations if you know them. Leave the Start and Finish fields as they are for now, and let Microsoft Project calculate them for you as you add other project information. The Predecessors field will be filled in when you start creating links between tasks. At that point, with durations and links in place, Microsoft Project will calculate the Start and Finish dates. If you then need to constrain the dates, you can edit them as you need. We will cover dates later in this plug-in.

Entering Recurring Tasks

You might have certain tasks that need to be scheduled at regularly occurring intervals. For example, you might have a project team meeting every Thursday morning.

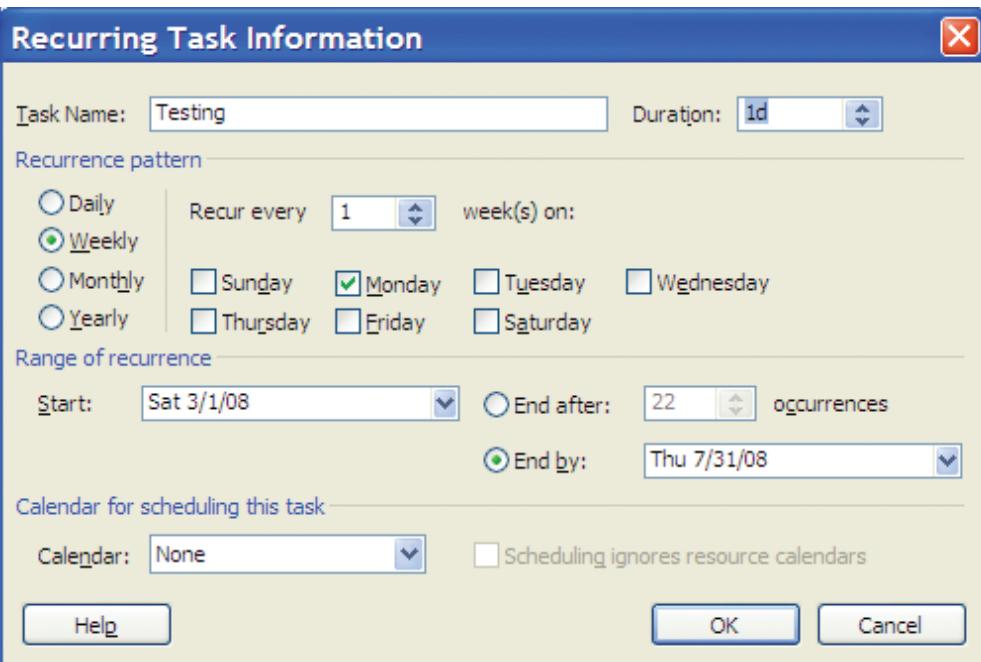


FIGURE T12.11
Recurring Task Dialog Box

You might need to gather information and generate a resource management report the first Monday of each month. Instead of entering the same task every week or every month throughout the span of the project, you can enter a recurring task. To do this, follow these steps:

1. In the Task Name field, click the row below where you want the recurring task to appear.
2. **Click Insert, then choose Recurring Task.**
3. In the Recurring Task dialog box, type the name of the recurring task in the Task Name field, for example, "Testing" (see Figure T12.11).
4. Under Recurrence Pattern, specify how often the task is to be scheduled, that is, **daily, weekly, or monthly**.
5. Specify the details of when the task is to take place during that frequency; for example, every other Thursday or every Monday, as in Figure T12.11.
6. Under Range of Recurrence, specify when the recurring task is to begin and end.
7. When finished, click **OK**. The recurring task is marked with a recurring task indicator. It is represented with a summary task with all occurrences of the task as subtasks.

Moving Tasks

To move a task from one row to another, follow these steps:

1. In the table portion of the Gantt chart, select the entire task row by clicking the gray row heading, which includes the task number.
2. With your mouse pointer still over the row heading (the pointer should appear as a black crosshair), drag the task to the location in the Gantt chart where you want to place it. A gray line along the row border follows your mouse movements, indicating where the task will be inserted when you release the mouse button.
3. Release the mouse button to insert the task in the new location.

Inserting Additional Tasks

To add a new task to other existing tasks, follow these steps:

1. In the table portion of the Gantt chart, click the row below where you want the new task to be inserted.
2. **Click Insert, then select New Task.**
3. Type the name of the new task, and then press **Enter**.

Copying Tasks

You can copy one or more tasks to use as the basis for other tasks. The following list describes the various copy techniques:

- *Copy a single task name.* Click in the Task Name field, and then click **Copy Cell** on the Standard toolbar. Click the Task Name field in a blank row, and then click **Paste**.
- *Copy multiple adjacent task names.* Click the first task name you want to select, hold down the **Shift** key, and then click the last task name. All task names between the first and last are selected. Click **Copy Cell**. Click the first Task Name field where you want the selected tasks to be pasted, and then click **Paste**.
You can also simply drag to select the tasks. If you want to copy the selected tasks to empty rows directly under a particular task, drag the fill handle in the lower right corner of the cell into those empty rows.
- *Copy multiple nonadjacent task names.* Click the first task name you want to select, hold down the **Ctrl** key, and then click any additional task names you want to add to the selection. Click **Copy Cell**. Select the Task Name field where you want the selected tasks to start to be added, and then click the **Paste** button. The tasks are added in the order that you selected them.
- *Copy a single task and its task information.* Click the row heading of the task you want to copy. This selects the entire task and its associated information. Click **Copy Cell**. To add the task into an empty row, select the row, and then click **Paste**. To insert the task between two existing tasks, select the task below where you want the pasted task to appear, and then click **Paste**.
- *Copy multiple adjacent tasks and their task information.* Click the row heading of the first task you want to copy. Hold down the **Shift** key, and then click the row heading of the last task. Click **Copy Cell**. Click the Task Name field where you want the selected tasks to start to be added, and then click **Paste**.

Deleting Tasks

To delete a task you do not need, do this:

1. Select the row heading, and then press the **Delete** key.
 - a. If you want to delete the entire task, click the indicator.
 - b. If you simply want to clear the task name, press **Enter** or click elsewhere in the view.

Organizing Tasks into an Outline

Tasks need to be structured representing the hierarchy of tasks from the broader perspective to the deep and detailed perspective where real work will actually occur.

A task at a higher outline level than other tasks is called a *summary task*. The tasks beneath that summary task are called *subtasks* as displayed in Figure T12.12. Summary tasks typically represent phases in a project. For example, in a new business start-up project, you might have summary tasks for developing the strategic plan, defining the business opportunity, planning for action, and proceeding with the start-up plan.

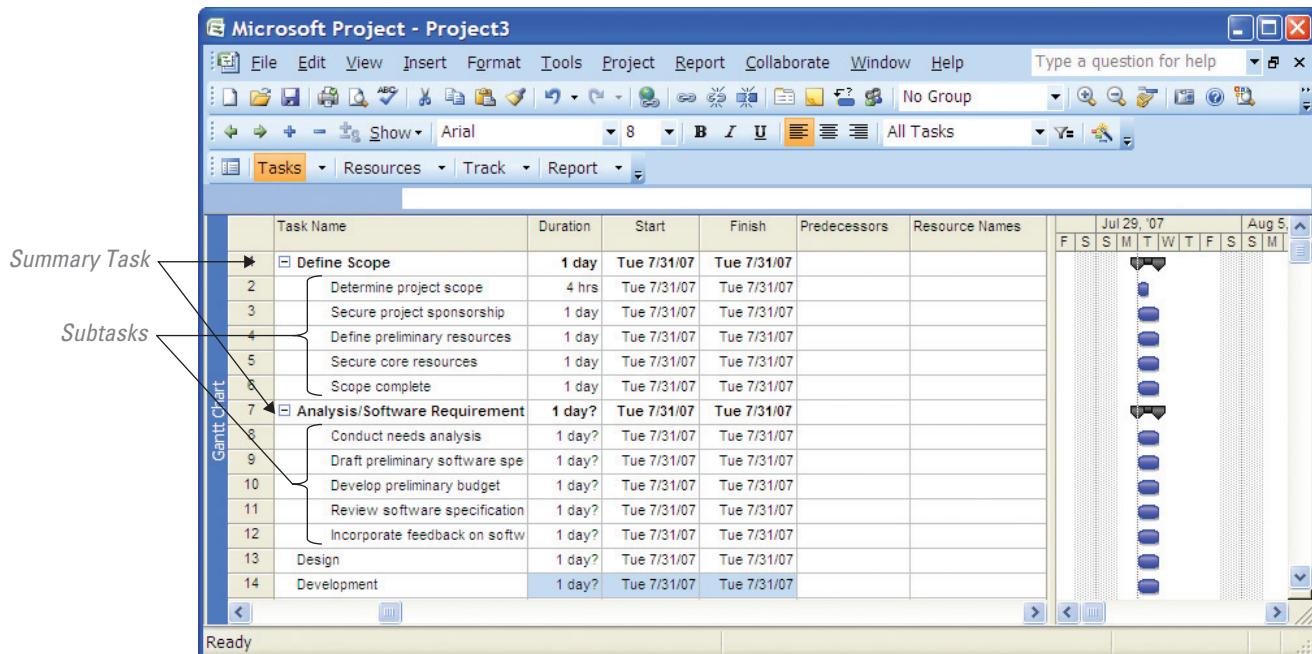


FIGURE T12.12

Summary Tasks
and Subtasks

The subtasks under those phases could be actual tasks that are assigned to resources (we will explain resources later). Or they could be another set of summary tasks. Subtasks can be summary tasks to still more subtasks. You can have up to nine outline levels.

All your tasks are initially at the first outline level. To make a summary task, you need to indent subtasks beneath it. The following list describes various outlining techniques:

- **Make a task a subtask.** Click the task. On the Formatting toolbar, click **Indent** (see Figure T12.13). The task is indented, and the task above it becomes its summary task. Summary tasks are highlighted in bold in the table portion of the Gantt chart and are marked with a black bar spanning the summary tasks in the chart portion of the Gantt chart.
- **Create a subtask under a subtask.** Click a task under a subtask. Click **Indent** twice. It is now in the third outline level, as a subtask of a subtask.
- **Move a subtask to a higher level.** Click a subtask, and then click **Outdent** (see Figure T12.13).

Next to each summary task is a plus or minus sign (see Figure T12.13). The plus sign indicates that there are hidden subtasks for this summary task. Click the plus sign, and the subtasks appear. The minus sign indicates that the subtasks are currently displayed. Click the minus sign, and the subtasks will be hidden.

FIGURE T12.13

Indent, Outdent, and
Subtask Buttons

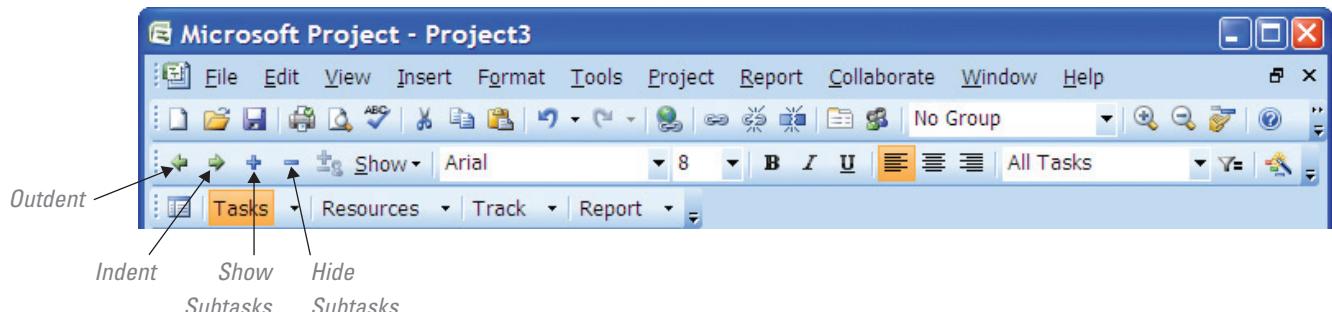
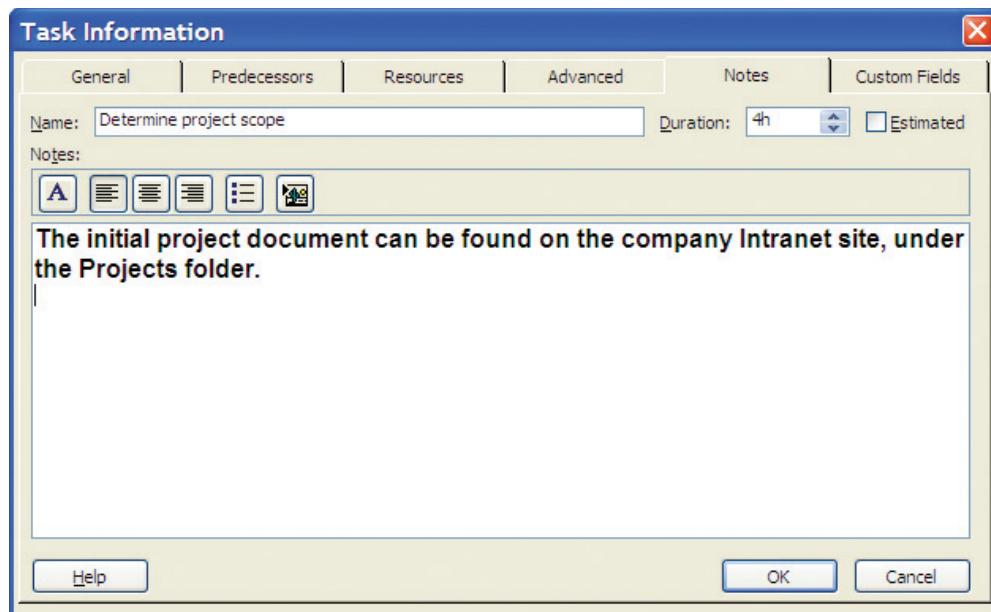


FIGURE T12.14

Annotating a Task



Adding Supplementary Information to Tasks

You can annotate an individual task by adding notes. You can also provide documentation or references in support of a task by linking it to other documents or Web sites.

To add a note to a task, follow these steps:

1. Click the task, and then click **Task Information** on the Standard toolbar or press **Shift-F2**.
2. Click the **Notes** tab.
3. In the Notes area, type a note; for example, Figure T12.14 displays a note explaining where to get further documentation if someone needs it.
4. When finished, click **OK**.

SCHEDULING TASKS

Although there are many knowledge areas (including scope management, cost management, and resource management) that contribute to successful project management, time management is most related to development of your project schedule—your road map for completing tasks, handing off deliverables, passing milestones, and finally, achieving the goals of your project in a timely manner.

To develop an accurate and workable schedule that truly reflects how your project will run, you need to:

- Set task durations.
- Identify dependencies, or the relationships, among tasks.
- Schedule certain tasks to achieve specific dates when necessary.

Setting Task Durations

To create a realistic schedule, enter the amount of working time you believe each task will take to complete, that is, the task duration. As soon as you enter a task, Microsoft Project assigns it an estimated duration of one day, just to have something to draw in the Gantt chart. You can easily change that duration.

Entering accurate durations is very important to creating a reliable project schedule. Microsoft Project uses the duration of each task to calculate the start and

finish dates for the task. If you will be assigning resources, the duration is also the basis for the amount of work for each assigned resource.

Any value in the Duration field that is followed by a question mark is considered a duration estimate. Technically, all planned durations are only estimates, because you do not know how long a task takes until it is completed and you have an actual duration. However, the question mark indicates what you might consider an “estimate of a duration estimate.” Estimated durations are calculated into the schedule the same as confirmed durations. They simply serve as an alert that a duration is still somewhat of a guess.

Note: If you have no use for the estimated durations question mark, you can turn it off. Click **Tools**, **Options**, and then click the **Schedule** tab. Clear the Show That Tasks Have Estimated Durations check box. Also, clear the New Tasks Have Estimated Durations check box.

By default, a duration estimate of one day is entered for any newly added task (e.g., 1d?). Use this value as a flag to indicate that the duration still needs to be entered for this task. You can also enter a question mark (?) after a duration, for example, 2w?. Use this value as a flag to indicate that the duration is still under consideration, and might be changed after you receive more information. When you remove the question mark from a duration, the duration is confirmed.

You can enter a duration in different time period units, such as:

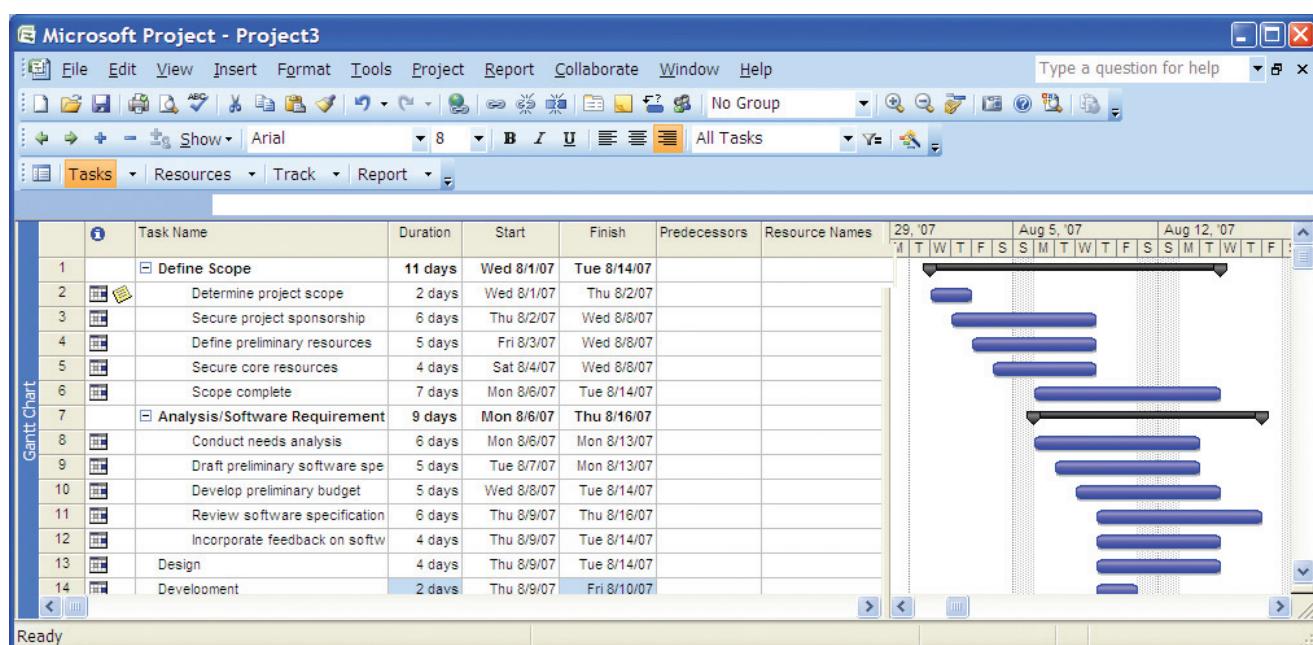
- Minutes (m or min).
- Hours (h or hr).
- Days (d or dy).
- Weeks (w or wk).
- Months (mo or mon).

You can use different duration units throughout your plan. One task might be set with a duration of 2w, and another task might be set for 3d. To enter a duration, follow these steps:

1. In the Duration field for each task, type the duration, for example, 1w or 4d.
 - a. If a duration is an estimate, add a question mark after it, for example, 1w? or 4d?.
2. Press **Enter**. The Gantt bar is drawn to represent the time period for the task(s) (see Figure T12.15). In addition, the Finish field is recalculated for the task. Microsoft Project adds the duration amount to the Start date to calculate the Finish date.

FIGURE T12.15

Task Durations



Note: Whether you type "h," "hr," or "hour" in your duration entry, by default Microsoft Project enters "hr." You can change which abbreviation of the time unit appears in the Duration field. Click **Tools**, **Options**, and then click the **Edit** tab. In each of the fields under View Options For Time Units, set the abbreviation of the time unit you want to see. This setting applies to that project file only. If you want it to apply to all new projects you create, click the **Set As Default** button.

Establishing Task Dependencies

The most typical link is the finish-to-start task dependency. With this link, the predecessor task must finish before the successor task can begin. To link tasks with the finish-to-start task dependency, follow these steps:

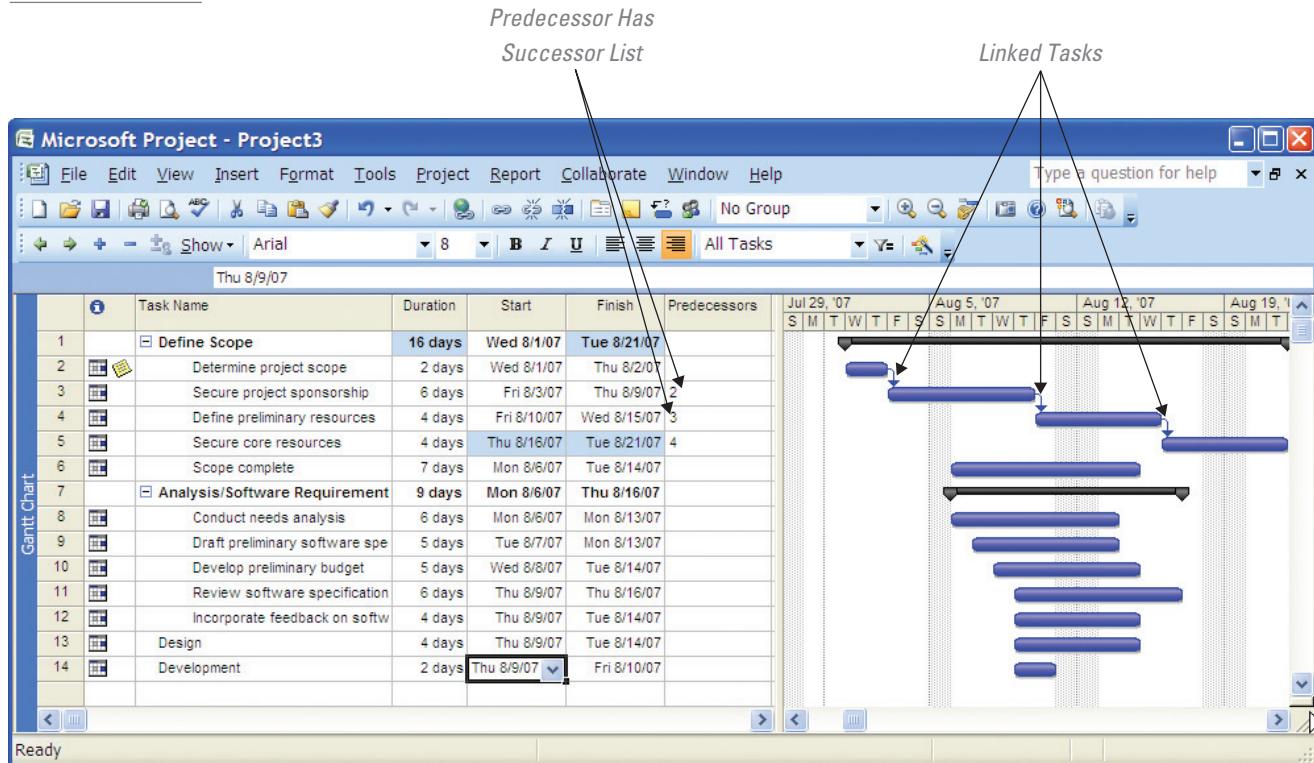
1. In the task sheet, select the two tasks you want to link. Drag from the predecessor to the successor task if they are right next to each other. If they are not adjacent tasks, click the predecessor, hold down the **Ctrl** key, and then click the successor.
2. On the Standard toolbar, click **Link Tasks**.
3. The tasks are linked in the chart portion of the Gantt chart. In addition, the Predecessor field of the successor task lists the task number for its predecessor (see Figure T12.16).

Although the finish-to-start task dependency is the most common, there are four types of dependencies, as follows:

1. *Finish-to-start (FS)*. As soon as the predecessor task finishes, the successor task can start.
2. *Finish-to-finish (FF)*. As soon as the predecessor task finishes, the successor task can finish.
3. *Start-to-start (SS)*. As soon as the predecessor task starts, the successor task can start.
4. *Start-to-finish (SF)*. As soon as the predecessor task starts, the successor task can finish. This type of link is rarely used, but still available if you need it.

FIGURE T12.16

Predecessor and Successor Tasks



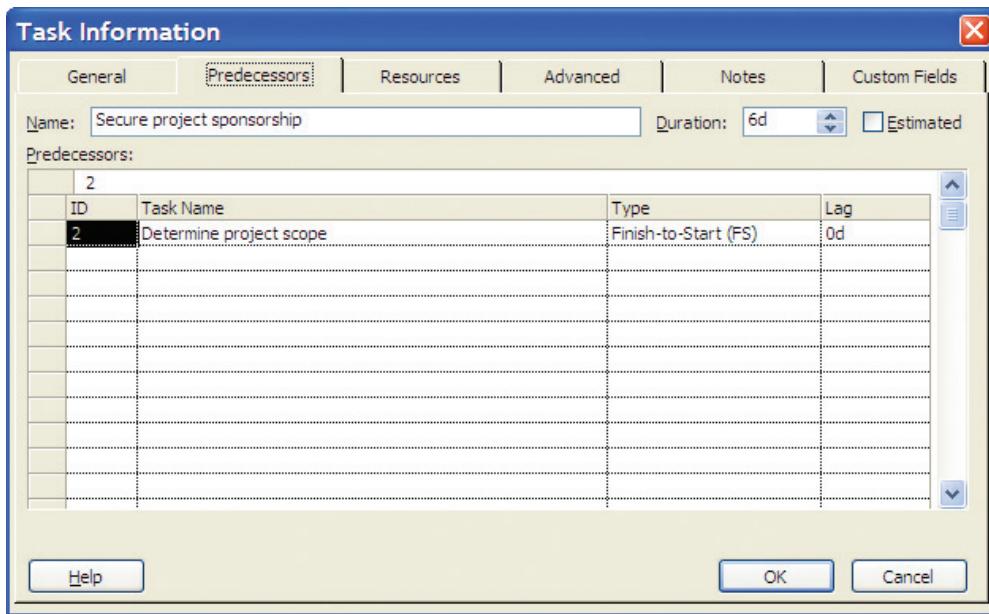


FIGURE T12.17
Predecessor Task Information

To apply a task dependency, follow these steps:

1. Select the task that is to become the successor in the dependency you will be setting.
2. On the Standard toolbar, click **Task Information**. You can also simply double-click a task to open the Task Information dialog box.
3. Click the **Predecessors** tab (see Figure T12.17).
4. Click the first blank row in the Task Name field, and then click the down arrow. The list of tasks in the project appears.
5. Click the task that is to be the predecessor to the current task.
6. Click the Type field, and then select the type of task dependency: **Finish-to-Start (FS)**, **Start-to-Start (SS)**, **Finish-to-Finish (FF)**, **Start-to-Finish (SF)**, or **None**.
7. Click **OK**.

Overlapping Linked Tasks by Adding Lead Time

One way to make your project schedule more efficient is to overlap linked tasks where possible. Suppose you have a task that cannot begin until a previous task is finished. You realize that the predecessor does not actually have to be finished—after it is 50 percent complete, the successor can begin. The successor essentially gets a 50 percent head start, hence the term *lead time*.

Lead time is expressed as a **negative value**. It can be a percentage of the predecessor, for example, -25% . Or, it can be a specific time period, for example, $-4d$ or $-1w$.

To enter lead time for a linked task, follow these steps:

1. Select the successor task that is to have the lead time.
2. On the Standard toolbar, click **Task Information**.
3. In the Task Information dialog box, click the **Predecessors** tab.
4. In the Lag field for the existing Predecessor, type the amount of lead time you want for the successor. Use a negative number, and enter the lead time as a percentage or duration amount.
5. Click **OK**. Figure T12.18 displays a view of several lead-time tasks.

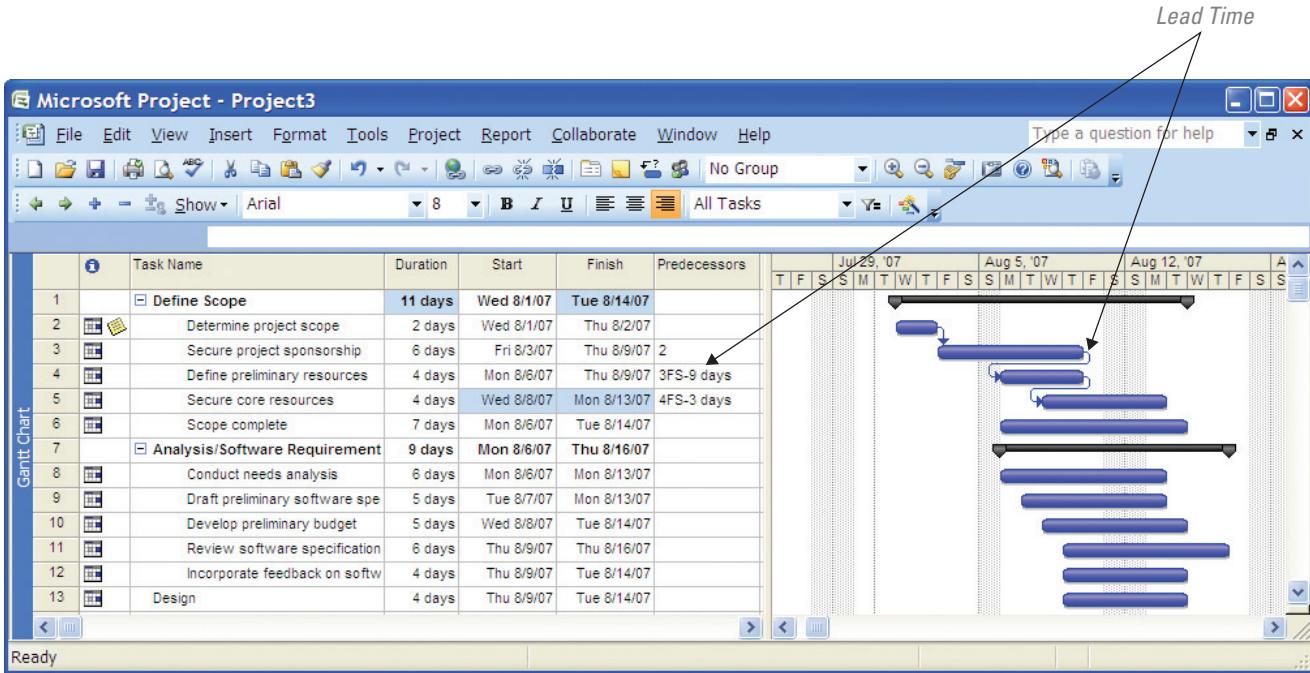


FIGURE T12.18

Lead-Time Tasks

CREATING MILESTONES IN YOUR SCHEDULE

You can designate certain tasks as milestones in your project plan. Having milestones flagged in your project plan and visible in your Gantt chart helps you see when you have achieved another benchmark. *Milestones* often indicate the beginning or ending of major phases or the completion of deliverables in your project. As you complete each milestone, you come ever closer to completing the project. Milestones are also excellent reporting points.

A milestone, as such, has no additional calculation effect on your schedule. However, you typically link a milestone to other tasks. You might also set a date constraint on a milestone.

The simplest method for entering a milestone is to create the task, worded like a milestone, for example, "Needs analysis complete," and enter a duration of 0. Any task with a 0 duration is automatically set as a milestone. The milestone marker and date are drawn in the chart area of the Gantt chart.

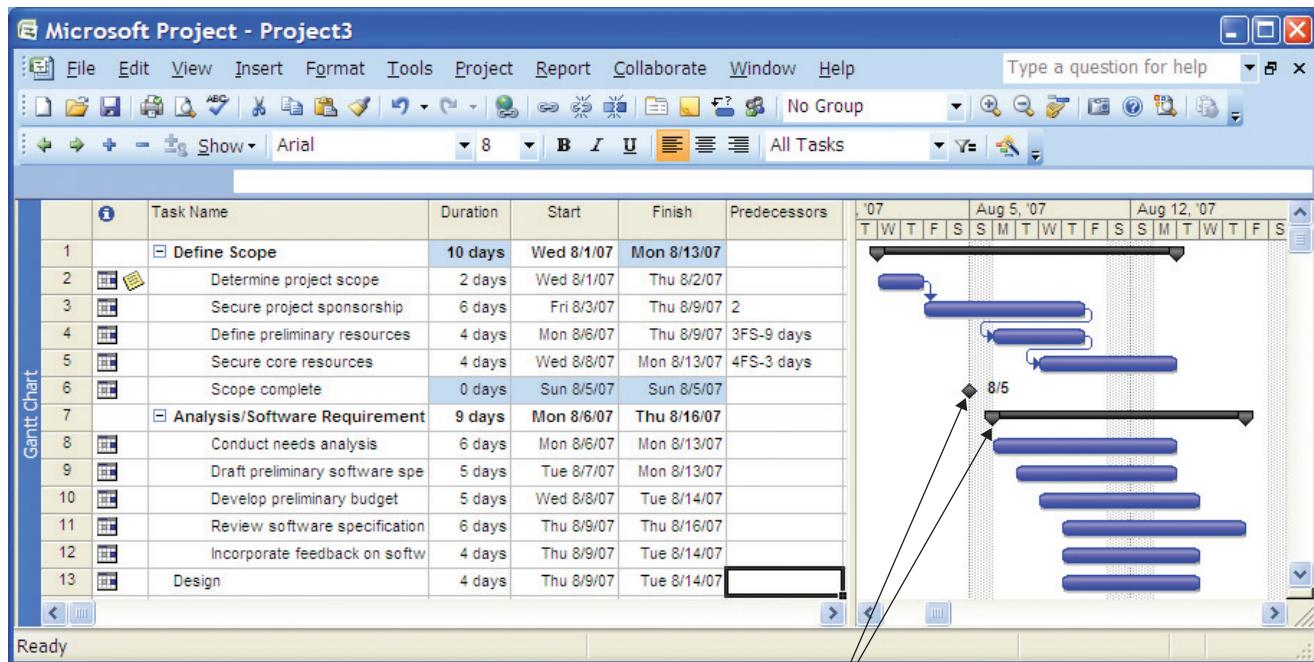
However, a milestone does not have to have a 0 duration. You might want to make the final task in each phase a milestone, and these are real tasks with real durations. To change a regular task into a milestone, follow these steps:

1. Select the task you want to become a milestone.
2. On the Standard toolbar, click **Task Information**.
3. In the Task Information dialog box, click the **Advanced** tab.
4. Select the **Mark Task As Milestone** check box.
5. The Gantt bar for the task changes to the milestone marker in the chart area of the Gantt chart as shown in Figure T12.19.

ADDING RESOURCES

The following types of resources can be assigned to your tasks:

- People or equipment
- Materials
- Cost items



Milestone Markers

FIGURE T12.19

Milestone Marker

To add resources to your project, follow these steps:

1. Click **View**, then select **Resource Sheet** to switch to the Resource Sheet view (see Figure T12.20).
2. Make sure the Entry table is applied. Click **View**, choose **Table**, then select **Entry**.
3. In the first Resource Name field, type a resource name, such as Deployment Team (as seen in Figure T12.20) and press **Enter**.
4. Enter the names of other resources in the same way.

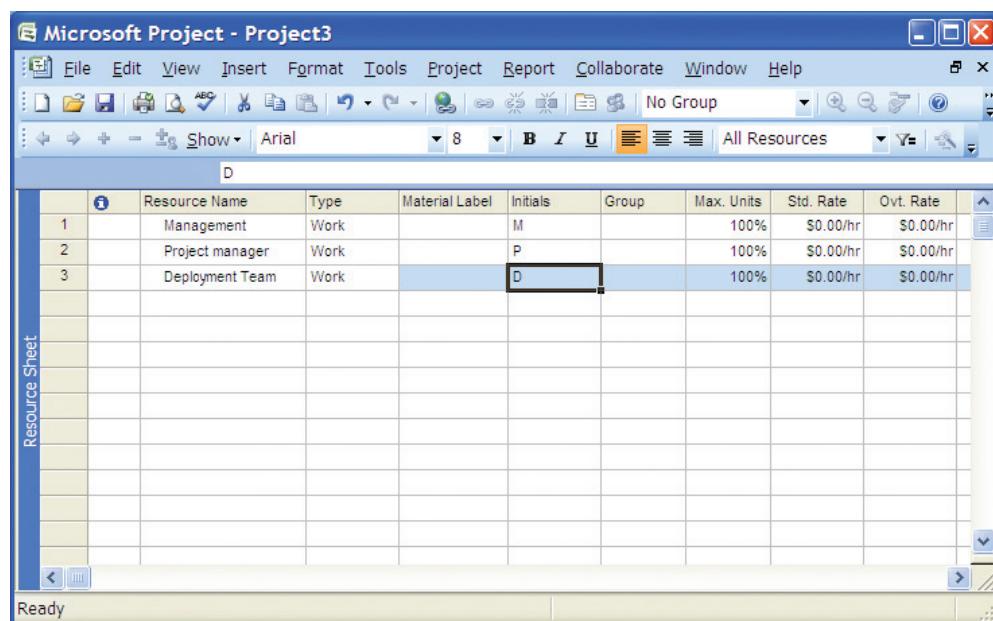


FIGURE T12.20

Resource Sheet

Assigning Work Resources to Tasks

When you assign a work resource, you are attaching the resource name to a task and then indicating how much of the resource's total availability is to be devoted to this task.

When you first add a resource to the project plan, through the use of maximum units (also known as resource units), you specify how available this resource will be to this project. For example, if the resource is available full time on the project, say, 40 hours a week, you would specify that the resource has 100 percent resource units. If another resource is available 20 hours a week, you would probably specify that this resource has 50 percent resource units. If you have three of the same type of resource, for example, three graphic designers, you could indicate that there are 300 percent resource units.

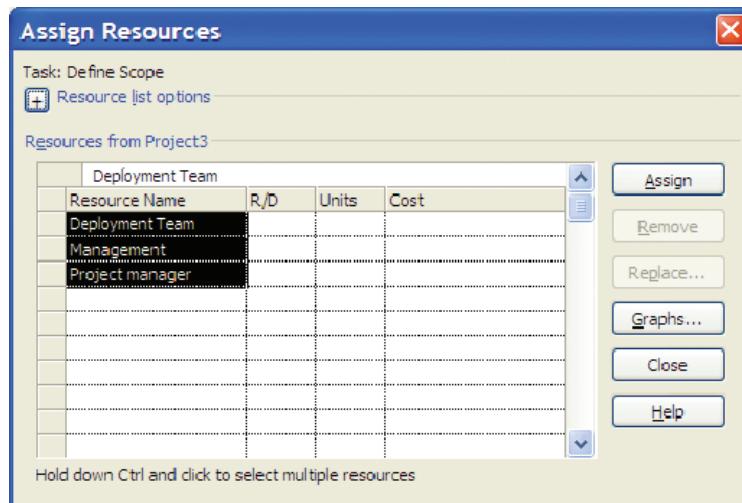
When you assign these resources to tasks, you take the idea of availability a step further by using assignment units. With resource units, you specify resource availability to the project as a whole. With assignment units, you specify resource availability to the specific task to which the resource is assigned.

By creating an assignment, you specify both the resources assigned to a task and their associated assignment units. Using the Assign Resources dialog box, you can assign one resource to a task, multiple resources to a task, or multiple resources to multiple tasks. To assign a work resource to a task, follow these steps:

1. Click the task to which you want to assign resources.
2. On the Standard toolbar, click **Assign Resources**. The Assign Resources dialog box appears (see Figure T12.21).
3. In the dialog box, click the name of the work resource you want to assign to the task, and then click the **Assign** button.
4. The resource name moves to the top of the Resources list in the table and a default percentage appears in the Units field for the resource. For individual resources, the default assignment units are the same as the resource's maximum units.

FIGURE T12.21

Assign Resources Dialog Box



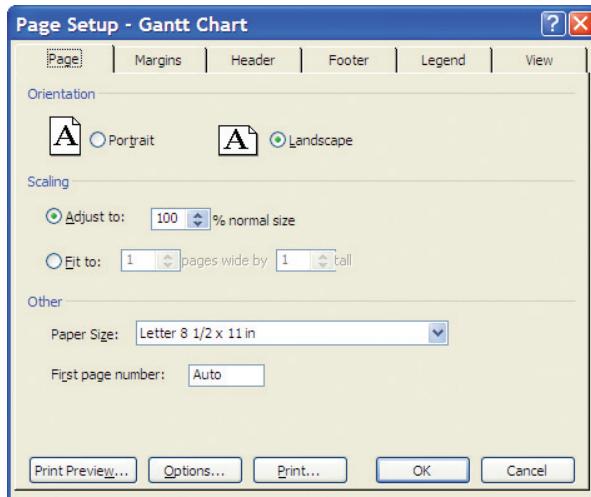


FIGURE T12.22
Print Setup Dialog Box

- a. If you want to assign a second resource, click that resource name, and then click the **Assign** button. Modify the Units field as necessary. If you change the Units field, you need to press **Enter** or click another field. This ends the edit mode for the field, sets your change, and makes the Assign button available.
5. When finished assigning resources to tasks, click the **Close** button.

SETTING UP AND PRINTING

When you print a view, it becomes a type of report that further enhances your ability to manage the project.

To print a view, follow these steps:

1. Open the view, and arrange the data (e.g., columns) as you want it to appear when printed.
2. On the Standard toolbar, click **Print**.

Print Views

To adjust how the view will look when printed, follow these steps:

1. Open the view, and arrange the data (e.g., columns) as you want the information to appear when printed.
2. Click **File**, then choose **Page Setup** to display the Page Setup dialog box. Specify the options you want for the printed view using the controls on the different tabs of this dialog box (see Figure T12.22). When finished, click **OK**.

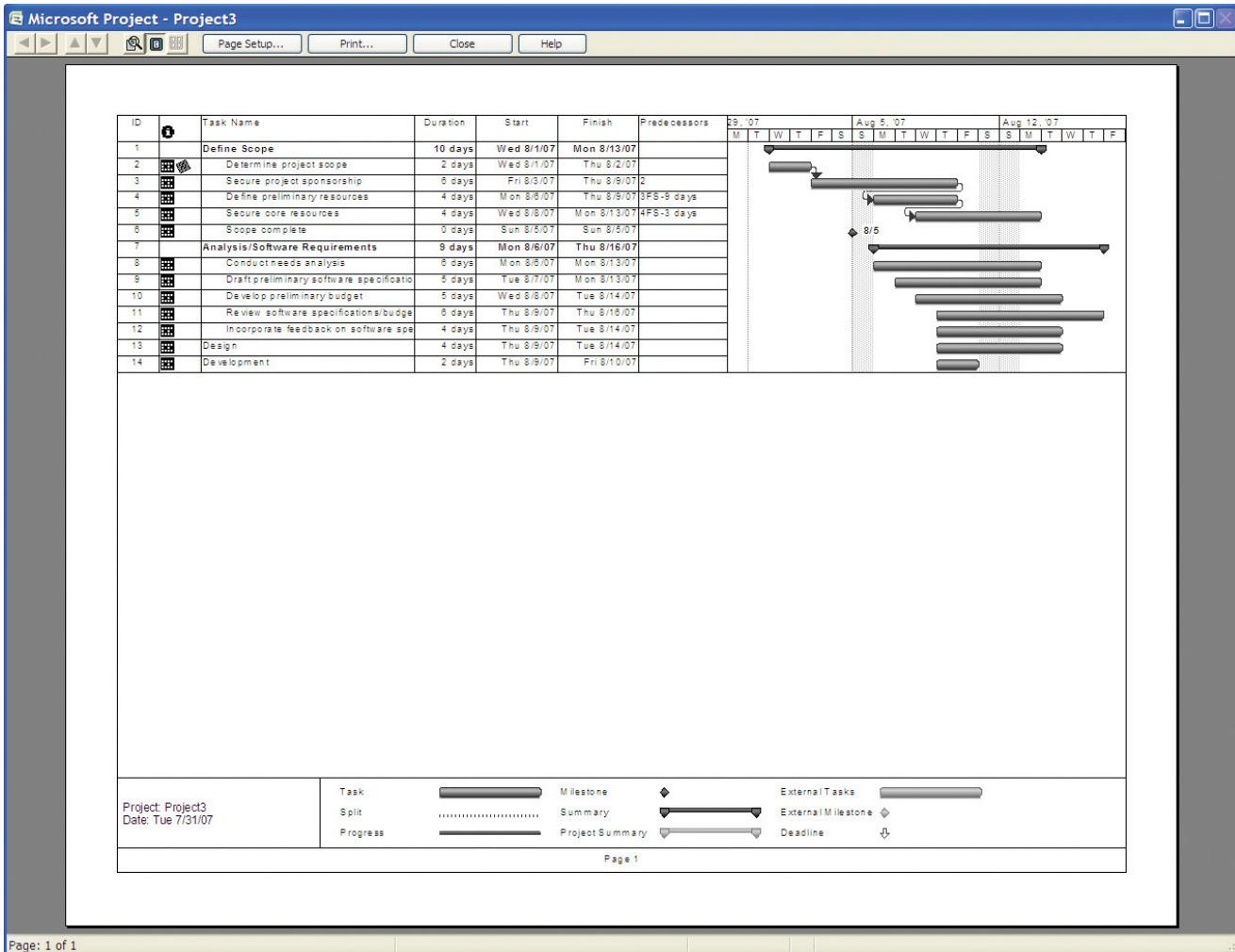


FIGURE T12.23

Print Preview

3. On the Standard toolbar, click **Print Preview**. This opens a window showing how the view will appear when printed and the results of the Page Setup options you selected (see Figure T12.23).
4. To make further adjustments to the print options, click **Page Setup**.
5. To make further adjustments to the view itself, click **Close** on the Print Preview toolbar, and work in the view.
6. When finished with your adjustments, click **Print** on the Standard toolbar.

Printing Reports

Project has more than 40 built-in, preformatted reports. These reports compile the most commonly used sets of information needed to manage a project, coordinate resources, control costs, analyze potential problems, and communicate progress.

When you select and generate a report, information is drawn from selected fields throughout your project. That information is laid out in the predetermined report design or template, in either discrete or summarized form, depending on the specific report.

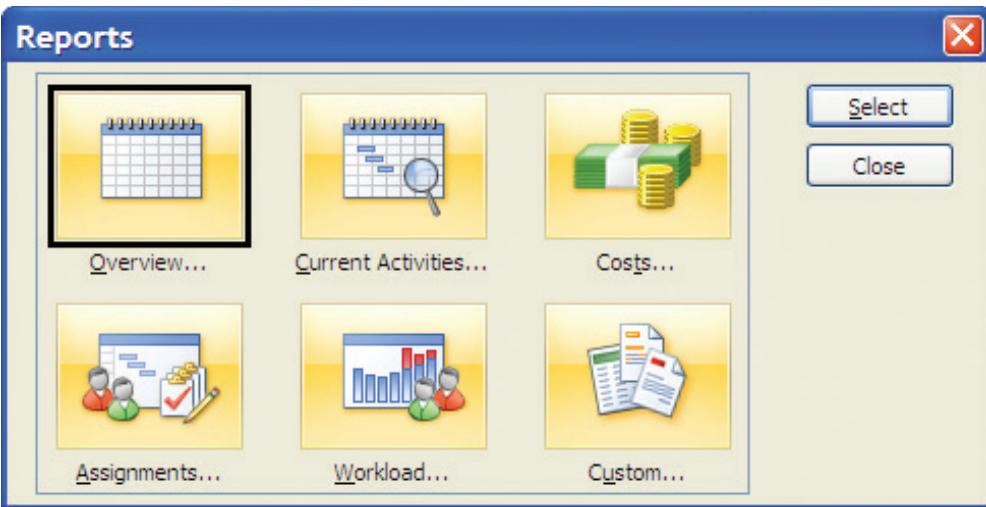


FIGURE T12.24

Available Report Categories

You can generate two categories of reports: text-based reports and visual reports. The text-based reports compile information into a tabular format within Microsoft Project. Visual reports automatically compile and export project information to either Excel or Visio, where it is presented in a graphic such as a column chart or flow diagram.

To see the built-in reports available, click **Reports**  and select **Reports**. The Reports dialog box appears, showing the available report categories (see Figure T12.24).

The text report categories are:

1. Overview
2. Current Activity
3. Costs
4. Assignments
5. Workload
6. Custom

Each category focuses on a specific type of information. You might find that certain reports are best suited to one type of audience, whereas other reports are better for another type of audience. For example, Cost reports might be most appropriate for meetings with the finance department, whereas you might prefer to distribute Assignment reports to team leads.

To generate these reports, Microsoft Project gathers information from a particular period, from certain tables, and with a particular filter applied as appropriate for the requirements of the specific report. Information is formatted with highlights, fonts, and other layout considerations.

To select and print a report, follow these steps:

1. Click **View**, then select **Reports**.
2. In the Reports dialog box, double-click the report category you want.
3. Double-click the report you want.
4. If a dialog box prompts you for more information, such as a date range, enter it, and click **OK**.

The screenshot shows the Microsoft Project application window titled "Microsoft Project - Project3". The toolbar includes buttons for Page Setup..., Print..., Close, and Help. A status bar at the bottom indicates "Tasks Starting Soon as of Tue 7/31/07" and "Projected". The main area displays a table of tasks:

ID	Task Name	Duration	Start	Finish	Predecessors
3	Secure project sponsorship	6 days	Fri 8/3/07	Thu 8/9/07	2
6	Scope complete	0 days	Sun 8/5/07	Sun 8/5/07	
4	Define preliminary resources	4 days	Mon 8/6/07	Thu 8/9/07	3FS-9 days
8	Conduct needs analysis	6 days	Mon 8/6/07	Mon 8/13/07	
9	Draft preliminary software specifications	5 days	Tue 8/7/07	Mon 8/13/07	
5	Secure core resources	4 days	Wed 8/8/07	Mon 8/13/07	4FS-3 days
10	Develop preliminary budget	5 days	Wed 8/8/07	Tue 8/14/07	
11	Review software specifications/budget with team	6 days	Thu 8/9/07	Thu 8/15/07	
12	Incorporate feedback on software specifications	4 days	Thu 8/9/07	Tue 8/14/07	
13	Design	4 days	Thu 8/9/07	Tue 8/14/07	
14	Development	2 days	Thu 8/9/07	Fri 8/10/07	

Page: 1 of 2 Size: 1 row by 2 columns

FIGURE T12.25

Report in Print Preview

5. The report appears in a Print Preview window (see Figure T12.25). Click any portion of the report to zoom in on it. Click a second time to zoom back out again. Click **Page Setup** to change the page orientation, scaling, margins, header, or footer.
6. When ready to print the report, click **Print** on the Print Preview toolbar.
7. The Print dialog box appears. Select the page range and number of copies you would like to print, and click **OK**.

A Gantt chart is a popular type of bar chart that illustrates a project schedule. There are many ways to create a Gantt chart. For example, Microsoft Project, a task-planning program, makes it easy to track and chart project timelines with a built-in Gantt chart view. Another option is to use Microsoft Excel. Excel does not contain a built-in Gantt chart format; however, you can create a Gantt chart in Excel by customizing the stacked bar chart type.

 MAKING BUSINESS DECISIONS

1. Project Me

Now that you have learned about Gantt charts, it is time to see how valuable they can be when managing a project—any project. Understanding every task (scope), each project member (resource), and required time frames (time) is the most important piece of managing a project. If you can understand these three components (scope, resource, time) and how they impact each other, you can manage most projects.

Project Focus

You are ready to test your project management skills. Select a project of your choice and create a Gantt chart to manage the project using either Microsoft Excel or Microsoft Project. The project can be anything including reorganizing your dorm room, cleaning your car, or even making coffee. It is important that your Gantt chart include all of the following:

1. All tasks associated with completing the project.
2. All resources involved in completing the project.
3. All time frames required to complete the project.

Once you have completed your Gantt chart give it to a friend and see if he can execute the plan. Then answer the following questions:

- What happened when he followed the plan?
- Did he understand each task from your description well enough to perform it?
- Was the amount of time you allowed for each task appropriate?
- If you could rewrite the plan what would you change and why?
- How can this project plan help you when you begin running real business projects?

2. Project Plan My College Career

Your best friend, Paul Bauer, is simply brilliant. He has aced all of his courses since he started college while working full-time and heading three committees. Paul comes to you completely distraught. He has somehow missed one of his graduation requirements and needs to attend summer school. You are very concerned as Paul is a diligent student and if he could misunderstand his graduation requirements then there is a chance you could have done the same. You want to make sure you are on track to graduation and decide that a Gantt chart is the perfect tool to help you succeed.

Project Focus

You have many requirements (milestones) to meet before you can graduate from your current college. Create a Gantt chart in Microsoft Project or Microsoft Excel that takes you

from your freshman year to graduation in your senior year. Be sure your Gantt chart includes all of the following:

1. Each course you must take to graduate.
2. The time frames required to complete each course.
3. Any resources required to complete each course (you are the primary resource).

3. Web Site Development Project

A nonprofit organization would like you to lead a Web site development project for them. The organization has Internet access that includes space on a Web server, but has no experience developing Web pages or Web sites. In addition to creating the Web site, the group would like you to train two people on the staff to do simple Web page updates. The organization wants the Web site to include the following basic information, as a minimum: description of the organization (mission, history, and recent events), list of services, and contact information. The Web site should include graphics (photographs and other images) and have an attractive, easy-to-use layout.

Project Focus

1. Using Microsoft Project create milestones and summary tasks. Some of the specific analysis, design, and implementation tasks will be to:
 - a. Collect information on the organization in hard copy and digital form (brochures, reports, organization charts, photographs, and so on).
 - b. Research Web sites of similar organizations.
 - c. Collect detailed information about the customer's design preferences and access to space on a Web server.
 - d. Develop a template (background color for all pages, position of navigation buttons, layout of text and images, typography, including basic text font and display type, and so on).
 - e. Create a site map or hierarchy chart showing the flow of Web pages.
 - f. Digitize the photographs and find other images for the Web pages; digitize hard-copy text.
 - g. Create the individual Web pages for the site.
 - h. Test the pages and the site.
 - i. Implement the Web site on the customer's Web server.
 - j. Get feedback.
 - k. Incorporate changes.
 - l. Create training materials on how to update the Web pages.
 - m. Train the staff on updating the Web pages.
2. Create the timeline.
 - a. Enter realistic durations for each task, and then link the tasks as appropriate. Be sure all tasks are linked (in some fashion) to the start and end of the project. Assume that you have four months to complete the entire project.
 - b. Allocate appropriate resources, including one other person that will assist you in the project.
 - c. Save your project as **WebSite.mpp**.
 - d. Print the Gantt chart view for the project.

4. Software Training Project

Hands On IT Company has 50,000 employees in its headquarters. The company wants to increase employee productivity by setting up an internal software applications training program for its employees. The training program will teach employees how to use software programs such as Windows, Word, Excel, PowerPoint, Access, and Project 2007. Courses will be offered in the evenings and on Saturdays and will be taught by qualified volunteer employees. The instructors will be paid \$40 per hour. In the past, various departments sent employees to courses offered by local vendors during company time. In contrast to local vendors' programs, this internal training program should save the company money on training as well as make its people more productive. The human resources department will manage the program, and any employee can take the courses. Employees will receive a certificate for completing courses, and a copy of the certificate will be put in their personnel files. The company has decided to use off-the-shelf training materials, but is not sure which vendor's materials to use. The company needs to set up a training classroom, survey employees on what courses they want to take, find qualified volunteer instructors, and start offering courses. The company wants to offer the first courses within six months. One person from human resources is assigned full-time to manage this project, and top management has pledged its support of the project.

Project Focus

1. Using Microsoft Project create milestones and summary tasks. Assume that some of the project management tasks you need to do are similar to tasks from the Project Tracking Database example. Some of the tasks specific to this project will be to:
 - a. Review off-the-shelf training materials from three major vendors and decide which materials to use.
 - b. Negotiate a contract with the selected vendor for the materials.
 - c. Develop communications information about this new training program. Disseminate the information via department meetings, e-mail, the company's intranet, and fliers to all employees.
 - d. Create a survey to determine the number and type of courses needed and employees' preferred times for taking courses.
 - e. Administer the survey.
 - f. Solicit qualified volunteers to teach the courses.
 - g. Review résumés, interview candidates for teaching the courses, and develop a list of preferred instructors.
 - h. Coordinate with the facilities department to build two classrooms with 20 personal computers in each, a teacher station, and an overhead projection system (assume that the facilities department will manage this part of the project).
 - i. Schedule courses.
 - j. Develop a fair system for signing up for classes.
 - k. Develop a course evaluation form to assess the usefulness of each course and the instructor's teaching ability.
 - l. Offer classes.
2. Enter realistic durations for each task and then link appropriate tasks. Be sure all tasks are linked in some fashion to the start and end of the project. Assume that you have six months to complete the entire project.
3. Allocate appropriate resources, including one other person that will assist you in the project.
4. Save your project as **SoftwareTraining.mpp**.
5. Print the Gantt chart view for the project.