Contents

Chapter 4

Start a Project

Creating New Projects

One of the very first things you need to do to create a project is to choose an approach.

The approaches to start a project include the following:

- Blank – clean schedule
- New From Existing – copy from existing schedule
- New From Excel – importing information from Excel
- New From SharePoint Tasks List – shortcut to bring SharePoint tasks into your schedule
- Get Started Wizard – guided approach with visuals to help individuals feel more comfortable working in a schedule
- Template – public or private pre-built schedules that can be used as examples

If you do not have Internet access, you may not have all of these choices.

Office 365 or cloud users may have different choices depending on their organization's configuration.

How to Start a New Project

1. Click the File tab
2. Click **New**
3. Click the desired item from the previews
4. If needed, click **Create** to obtain a copy of that item to start your schedule

Templates available are simply examples and may not map to your organization's project management practices. Be sure to review the templates for modifications that you might need to make.

Saving a project

Saving a project is all about storing a project for quick and easy retrieval. You may choose to store your project on your computer, on a network location, or on a cloud storage solution. As each organization's configuration is different, we will focus on the procedures for saving to your local computer.

How to Save a New Project

1. Click the **File** tab
2. Click **Save** or **Save As**
3. Click **Computer**
4. Click **Browse**
5. Navigate to the desired folder
6. Enter the desired name for the schedule
7. Click **Save**

The folder you just used with be available under Recent Folders to simplify this process for future new projects.

When making changes to the same project, you can use the Save icon on the Quick Access Toolbar as a fast method to ensure your project changes are being captures.

Opening a Project

Since opening projects is such a frequent task, you should take advantage of quick methods to do this. The following steps will help you optimize your environment for speedy retrieval of projects.

How to Open a Project

1. Click the File tab
2. Click Open
3. Click Computer
4. Click Browse
5. Navigate to the desired folder
6. Select the name for the schedule
7. Click Open

Click Recent Projects to quickly retrieve a project you have previously opened.

Pin a project to the top of the recent project list is you anticipate you will be using it on a regular basis.

Creating a New Project

When Project 2013 is initiated, a new blank project schedule will automatically appear.

To create a blank project schedule:

- Click **File → New**

  Backstage choices shown below will give you an array of choices of where to begin a new project schedule. As you click the various choices, options and additional data will appear on the right side of the view.
- Double clicking **Blank project** or click **Blank project** and click **Create** will result in creating a blank project file
- **Recent Templates**: Create a project from a recently used template
- **My templates**: Template created my you and saved to your desktop
- **New from an existing project**: Use an existing project schedule to create a new project

- **New project from Excel workbook**: Columns in the Excel workbook will be mapped to fields within Project 2013. The import process is discussed in the next lesson.
- **New from Sharepoint task list**: Project 2013 Professinal only. Tasks will be imported using the URL and security of the Sharepoint site.
- **Office.com templates**: Create a new project from a template that would be downloaded from Office.com on-line
- If the Quick Access Bar was customized to add the **New** button, pressing that button will create a new project schedule

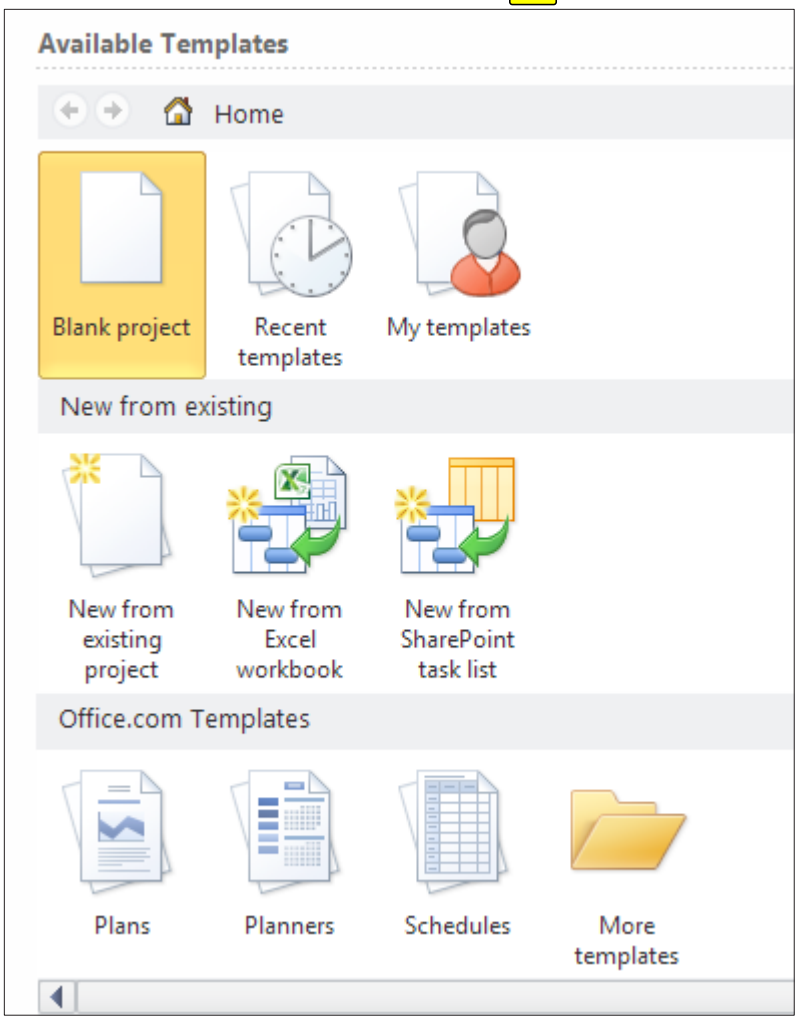

Figure 4-1 PLACEHOLDER

Creating a Project from an Excel Workbook

A project schedule can be created using an Excel Workbook task list. Keep in mind that the fields or columns that are being imported from Excel will be mapped to fields or columns within Project 2013. Pre-planning to know which Excel fields should be mapped to which Project 2013 fields would be helpful.

All options should be pre-set before importing tasks.

To create a project schedule from an Excel Workbook:

1. Click **File → New → New From Excel Workbook**
2. Navigate to the Excel file that contains the tasks to be imported into the schedule, click **Open**
3. Project 2013 Import Wizard will start running – Click **Next**
4. Select whether to use a new map that will be created or an existing Project import map. For this example we will create a new map. Click the radio button next the **New Map** and click **Next**
5. Import can start a new project file, append to the end of an existing project file or merge the data using a merge field. In this example we will create a new project schedule. Click **As a new project** and click **Next**.
6. When the data is brought into Project 2013, select if the data is to be mapped to the Task fields, Resource fields or Assignment fields. Click **Tasks**.
7. If the originating Excel file contains header or title information, click **Import includes Headers**. The system will remove this row (the first line only) as the header row. Click **Next**
8. The Task Mapping form will be used to view some of the data and map which Excel fields will be imported into which Project 2013 fields. Pull down the values in the **Select worksheet name** option and select the sheet name in Excel that contains the data to be imported. After the choice has been made, the data from the sheet will be available for viewing.
9. In the example below, the duration field from the Excel Workbook was able to be automatically mapped to the duration field in Project 2013. However, the Task Name field could not find a match. The correct field name for the

task name field in Project 2013 is “Name”. Click the red error message (**not mapped**) and select the field name of **Name**. Repeat for other fields to be imported. Not all fields are required during the import process which allows the user to pick and choose which ones are appropriate to the schedule. Click **Next** to continue after all columns have been mapped.

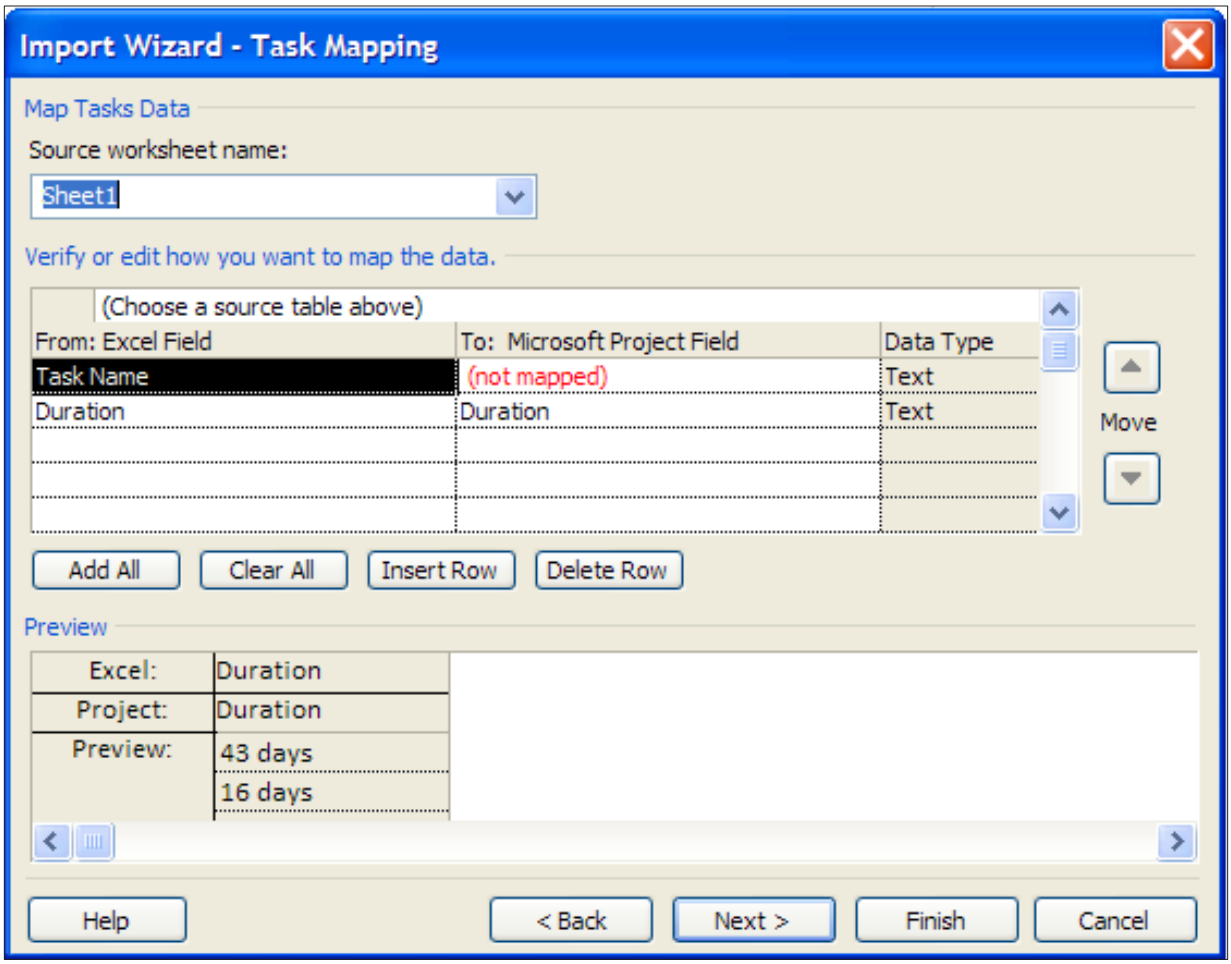

Figure 4-2 PLACEHOLDER

10. The next step offers the option to save the map for future reuse.
    a. To skip saving the map, click **Next**.
    b. To save the map, click **Save Map** and give the map a name.

    An option will be available to use the Organizer to copy the import map into the Global.mpt and save it for future use. The Organizer will be discussed in Module 10.

Click **Finish** to start the import.

11. The new Project 2013 schedule will open with the columns imported.

Creating a Project from a SharePoint Task List

Project 2013 Professional allows for creating a new project by importing a task list from a SharePoint site. The user must have appropriate permissions to the access the SharePoint site and the URL path to insert into the form directing Project 2013 Pro to the location of the task list.

To import tasks from a SharePoint task list into Project 2013 Professional:

1. Click **File** → **New** → **New** from SharePoint Task List

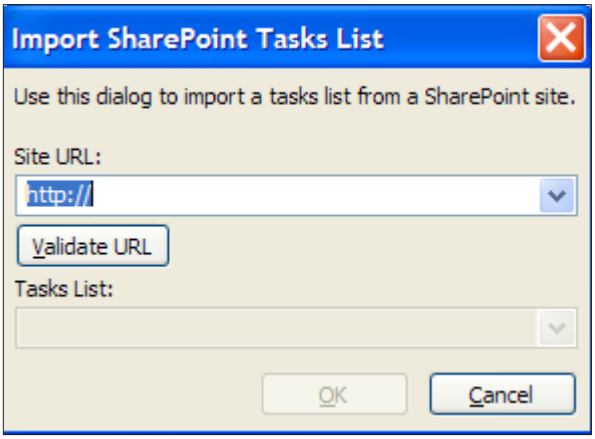

Figure 4-3 PLACEHOLDER

2. Enter the URL in the form as shown above and click **Validate URL**. A list of all the task lists included in the SharePoint site will be displayed. Select the appropriate list and click OK.

The list will be imported from the SharePoint site.

This is Pro only – Rolly should add a screen shot here.

Saving the Schedule

Project 2013 provides multiple file formats for a project schedule. The steps to save a file are very similar to other MS Office files.

To save the Project 2013 schedule:

1. Click **File → Save as → select file location**
2. Enter the file name in the File Name area
3. Click **Save** to complete the save. The file will be given a Project 2013 default file extension of .mpp

There is also an option to save the Project 2013 schedule in an alternative file format. Some of the formats are:

- MS Project 2007
- MS Project 2000-2003
- MS Project template 2013 - .mpt file extension
- MS Project template 2007 - .mpt file extension
- MS Excel
- PDF
- XPS
- XML
- CVS
- Text

Save and Send Options

A new feature in Project 2013 is the Save and Send from the backstage view. These options are an easy method of saving projects and sharing project schedules with others. There is also an option to send project files as an attachment to an email as well as publishing the project schedule to a SharePoint site (Project 2013 Pro users only).

To navigate to the options available for Save and Send:

- Click **File → Save and Send → select one of the options offered**

The right side of the screen will change as options are selected

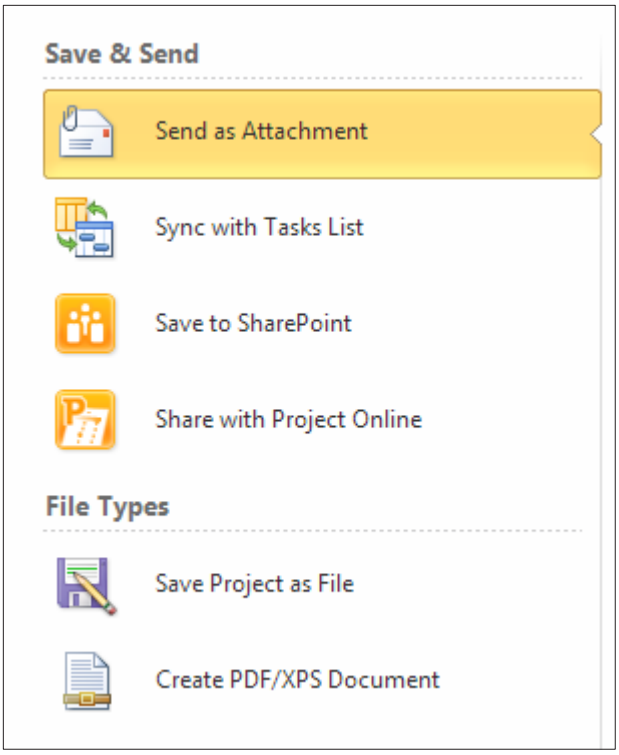

Figure 4-4 PLACEHOLDER

- **Send as Attachment**: sends the project schedule as an attachment to an Outlook email
- **Sync with Tasks List**: use this option to synchronize with a task list in SharePoint. Team members can update task status and the updates can be synchronized back to the project schedule. The URL to the SharePoint site and the task list name will be needed at the time of the synchronization.
- **Save to Sharepoint**: this option will save the project schedule to a Share-point site. (Project 2013 Pro users only)
- **Share with Project Online**: used with Project Server and SharePoint

  Save Project as a file: when clicked the right side of the view is shown below. There are several file type options available. Click **Project** and **Save As** to start the save process.

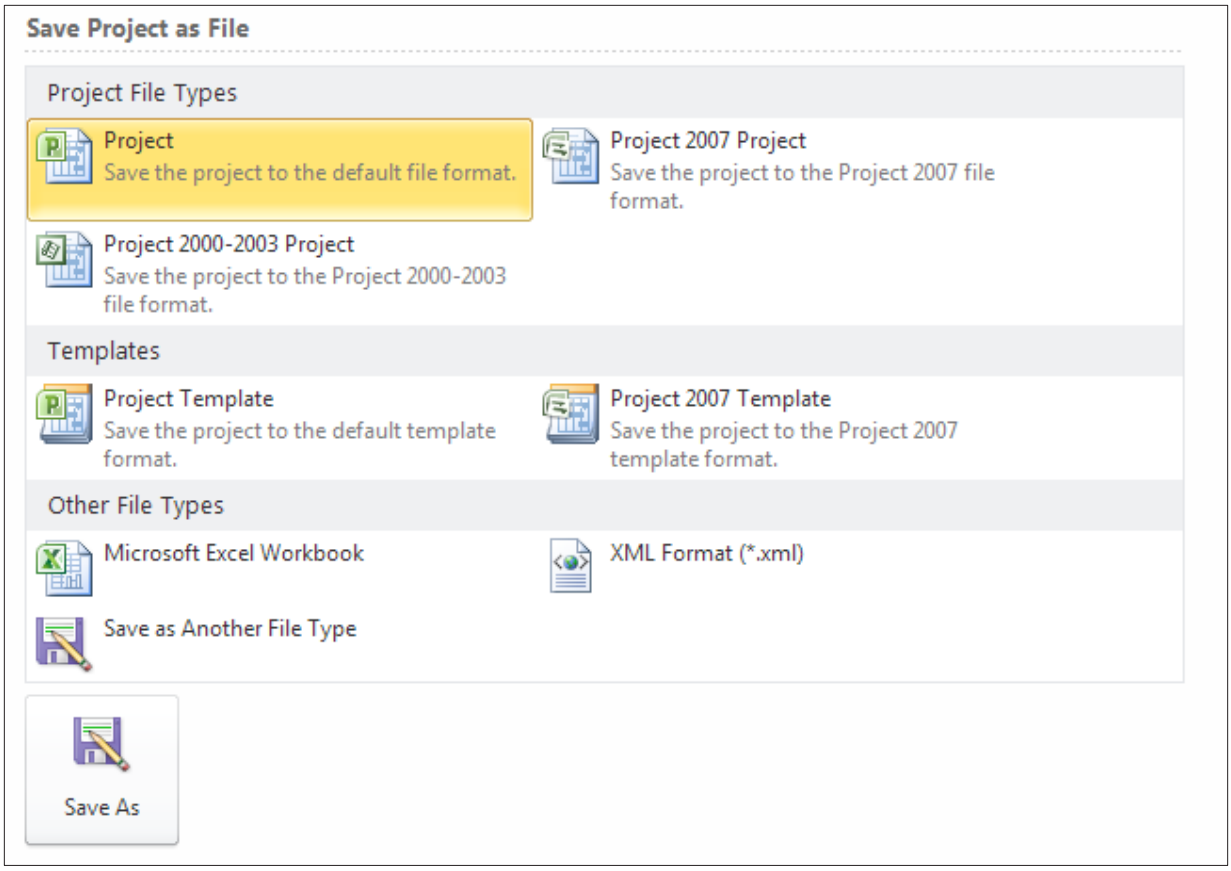

Figure 4-5 PLACEHOLDER

- **Create a PDF/XPS document**: Click Create PDF/XPS, name the file and select PDF or XPS, click OK to complete the save.

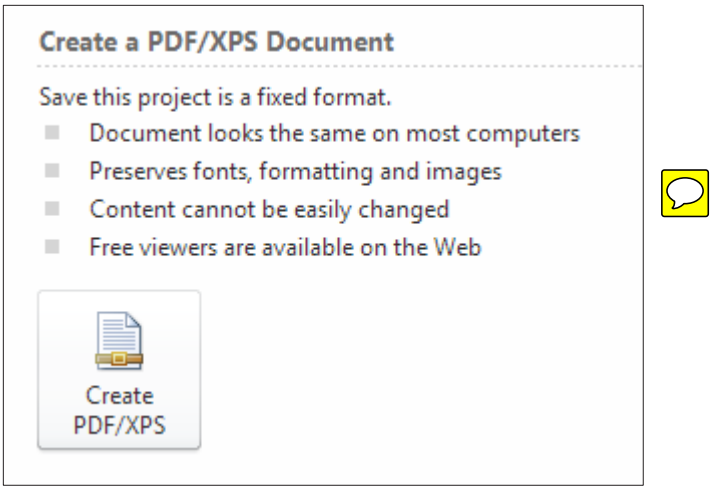

Figure 4-6 PLACEHOLDER

Saving the Schedule

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1. Click **File → Save as → select file location**
2. Enter the file name in the File Name area
3. Click **Save** to complete the save. The file will be given a Project 2013 default file extension of .mpp

There is also an option to save the Project 2013 schedule in an alternative file format. Some of the formats are:

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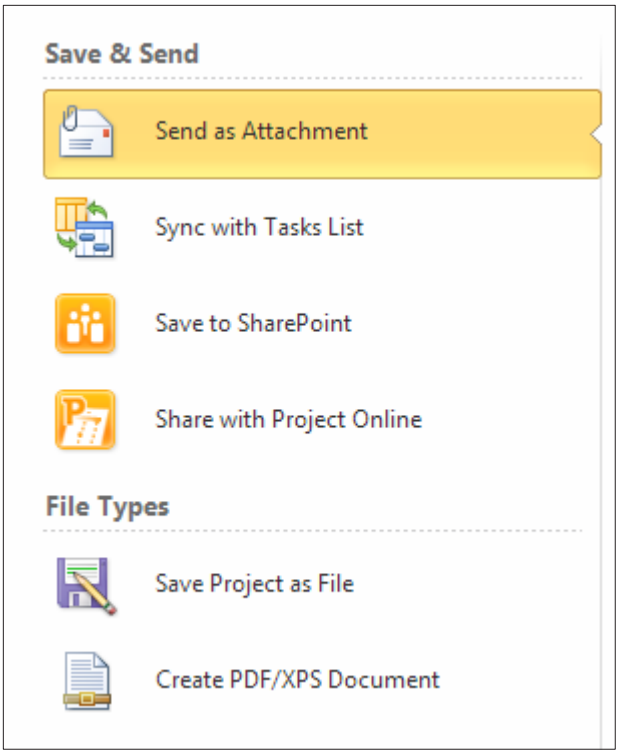

Figure 4-7 PLACEHOLDER

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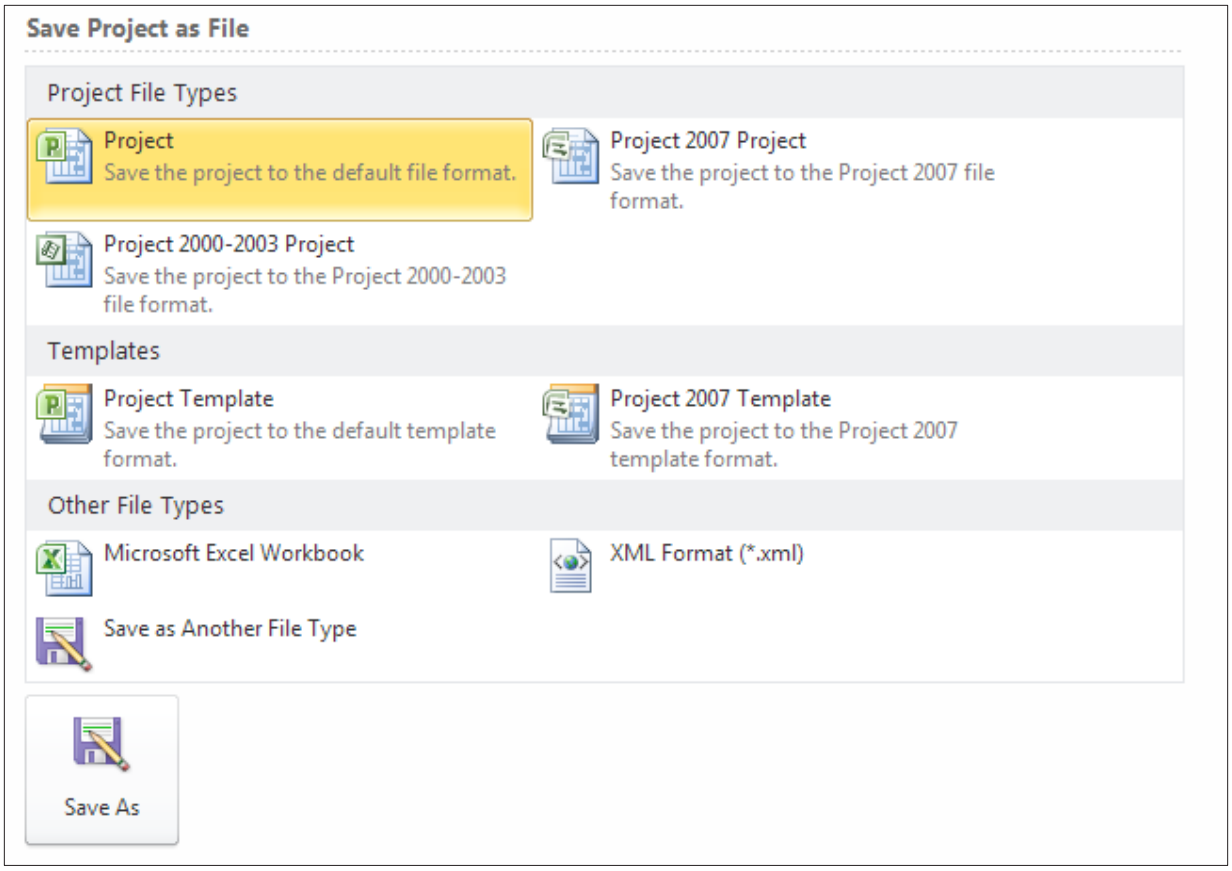

Figure 4-8 PLACEHOLDER

- **Create a PDF/XPS document**: Click Create PDF/XPS, name the file and select PDF or XPS, click OK to complete the save.

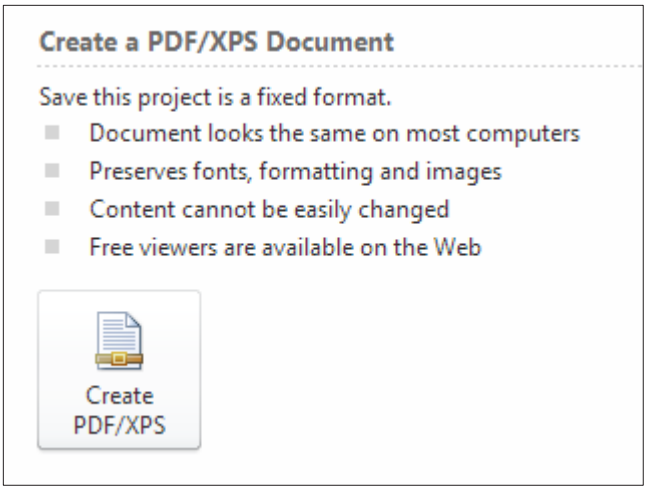

Figure 4-9 PLACEHOLDER

Save and Send Options

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To navigate to the options available for Save and Send:

- Click **File → Save and Send → select one of the options offered**

The right side of the screen will change as options are selected

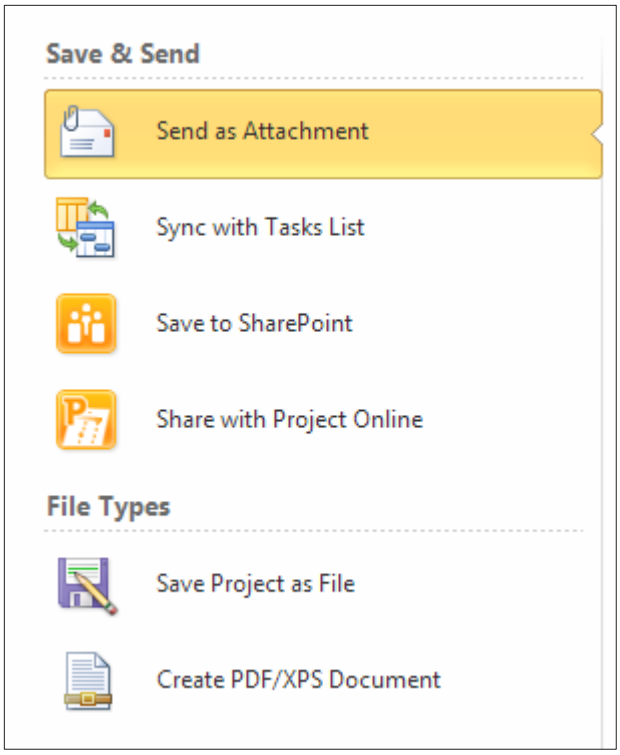

Figure 4-10 PLACEHOLDER

Save and Send Options

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To navigate to the options available for Save and Send:

- Click **File → Save and Send → select one of the options offered**

The right side of the screen will change as options are selected

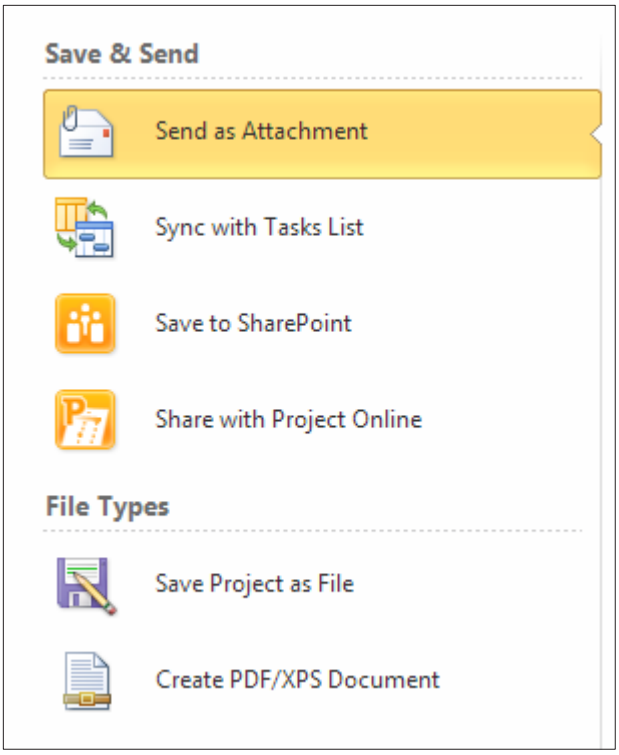

Figure 4-11 PLACEHOLDER

- **Send as Attachment**: sends the project schedule as an attachment to an Outlook email
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- **Share with Project Online**: used with Project Server and SharePoint

Save Project as a file: when clicked the right side of the view is shown below. There are several file type options available. Click **Project** and **Save As** to start the save process.

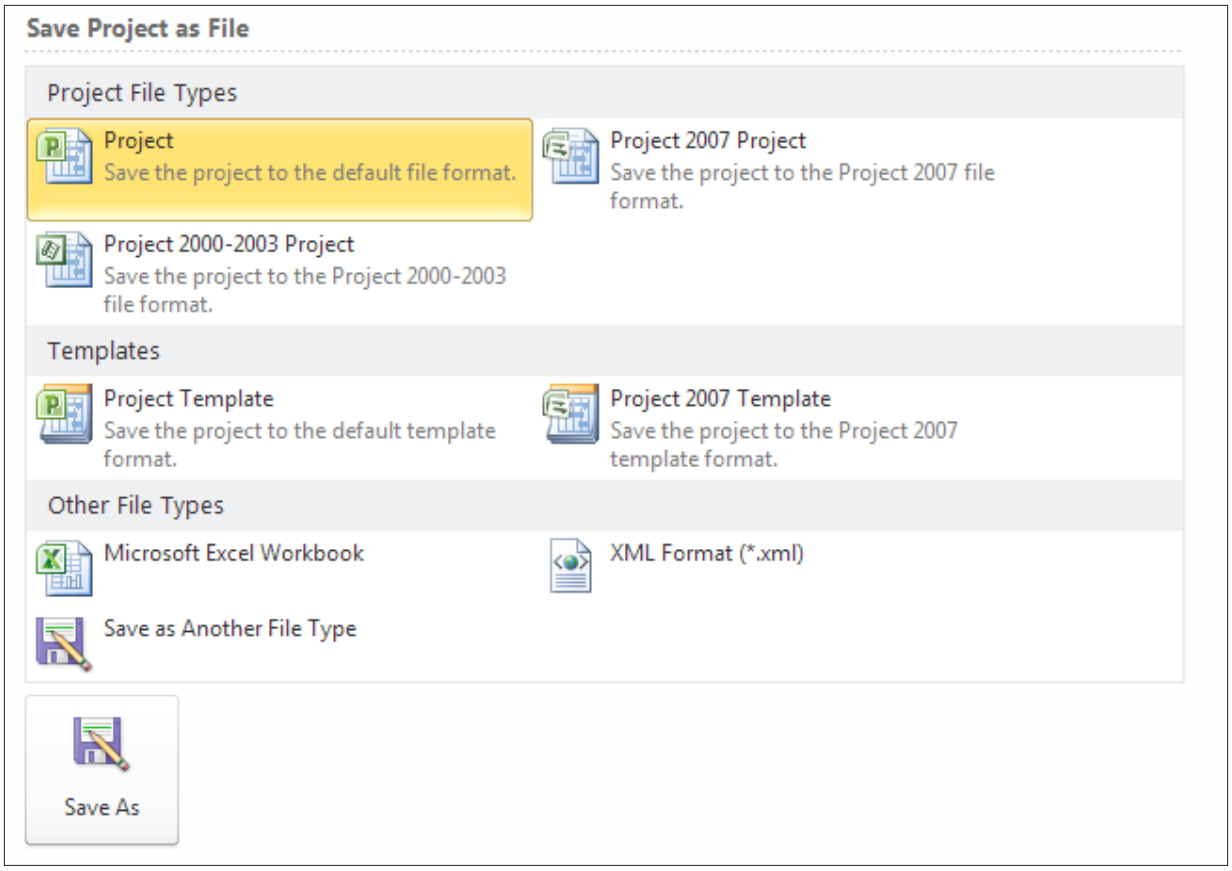


Figure 4-12 PLACEHOLDER

- **Create a PDF/XPS document**: Click Create PDF/XPS, name the file and select PDF or XPS, click OK to complete the save.

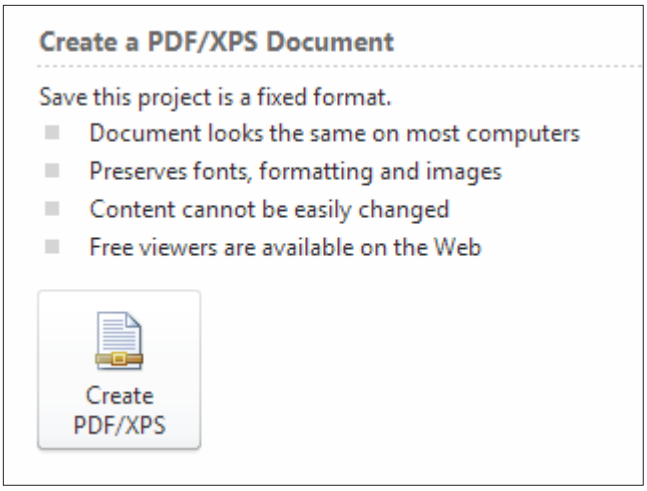


Figure 4-13 PLACEHOLDER

Calendar Overview

Calendars in Project 2013 will determine when a task may be scheduled within the project schedule. It will also influence what defines a day, a week and a month. The calendars will also work hand-in-hand with the calendar options to determine when and how the tasks will be scheduled.

In this lesson we will explore:

1. How calendars work in Project 2013
2. How to create a base calendar
3. How to Set Working Hours and Days
4. How to Set Non-Working Hours and Days
5. How to Set Calendar Options

How Calendars Work in Project 2013?

There are several types of calendars within the Project 2013 system. The following are definitions of available calendars:

- **Base Calendar**: The base calendar which may be used to as a template to create other calendars. A base calendar may also be used as a Project, Resource or Task calendar.
- **Project Calendar**: The project calendar is the calendar assigned to a project and it defines the project working and non-working days. The default name for the Project Calendar is “Standard”.
- **Resource Calendar**: Each resource will have its own calendar which may be based off of a base calendar or the project calendar. Unique resource calendars may also be created.
- **Task Calendar**: A task calendar is assigned to a task to allow for the scheduling of that task in a unique timeframe. For example: tasks which have to occur on a weekend.

How the calendars are used by the software:

A task will be scheduled based on the Project calendar until a resource is assigned to the task. At that time, the Resource calendar will control the scheduling of most tasks. Unless – there is a task calendar assigned which will override the Project and the Resource calendars.

When a project schedule is created, a default calendar of “Standard” is applied to the schedule. This is called the project calendar for the project. The default values on the Standard calendar are: Monday through Friday which are working days, and working time is 8:00 am to 12:00 pm and 1:00 pm to 5:00 pm daily. No holidays are indicated on the calendar. The Standard calendar is also the calendar that will be viewed in the background of the Gantt Chart views. The Calendar Options work hand in hand with the Project Calendar to determine number of hours in a day or week and these values should be in sync with one another. The Calendar options will be discussed in the next section.

By default, 2 additional calendars are included in Project 2013: a 24 hour calendar and a Night Shift calendar. Either of these may be used as Project, Resource or Task calendars.

FAQ’s

Q: Why are there no holidays on the calendars?

A: This is an international program. Holidays vary from country to country.

Q: Is there the ability to add holidays to a calendar the way they can be added in Outlook?

A: No – this is not a capability of the software.

Q: Do I have to recreate the calendar for each project?

A: No – calendars may be created and saved through the Organizer to use in future projects.

The default calendar name for the system is “Standard”. If a different calendar name is selected, each Gantt view will also require changing because Gantt Chart views are set to display the Standard calendar. This change can be made by right clicking in the Gantt view and select Non-working time and changing to the calendar to be seen in the view. Most users keep the Standard calendar because of ease of use.

Setting Working Hours and Days

After the base calendar has been created decide what the working days (business days) of the project schedule will be. Decide also, how many hours will make up a working day and what times the hours will be. By default, the working days of the calendar are Monday through Friday and the working time is 8:00 am to 12:00 pm and 1:00 pm to 5:00 pm daily or 8 hours working per day.

Ask yourself, how many hours per day do you feel your resources work productively on project work?

The average amount of productive project time in a day for a full time resource is 6 to 6.5 hours. If you are planning projects using an 8 hour day and your resources produce 6.5 hours per day are you planning an unreasonable timeline for your project schedule. After resources are assigned to tasks, the resource availability calendar will be considered in the scheduling equation and the timeline for the project schedule will alter substantially. It is expected that schedules will double in length once actual resources are assigned to tasks.

This difference to the schedule may be handled through adjustments to the project calendar, to the assignments or to the resource calendars. Consider choosing one of the methods and using it as the standard for scheduling projects. Each of the above options has their pros and cons, but it is the crossing of methods that will result in unreliable results in planning a schedule.

To Change the Working Hours of all Days on a Calendar:

1. Click **Project → Change Working Time**

2. Check to ensure the calendar you wish to change is displayed in the **For calendar** list
3. Click **Work Weeks** near the bottom of the dialogue box

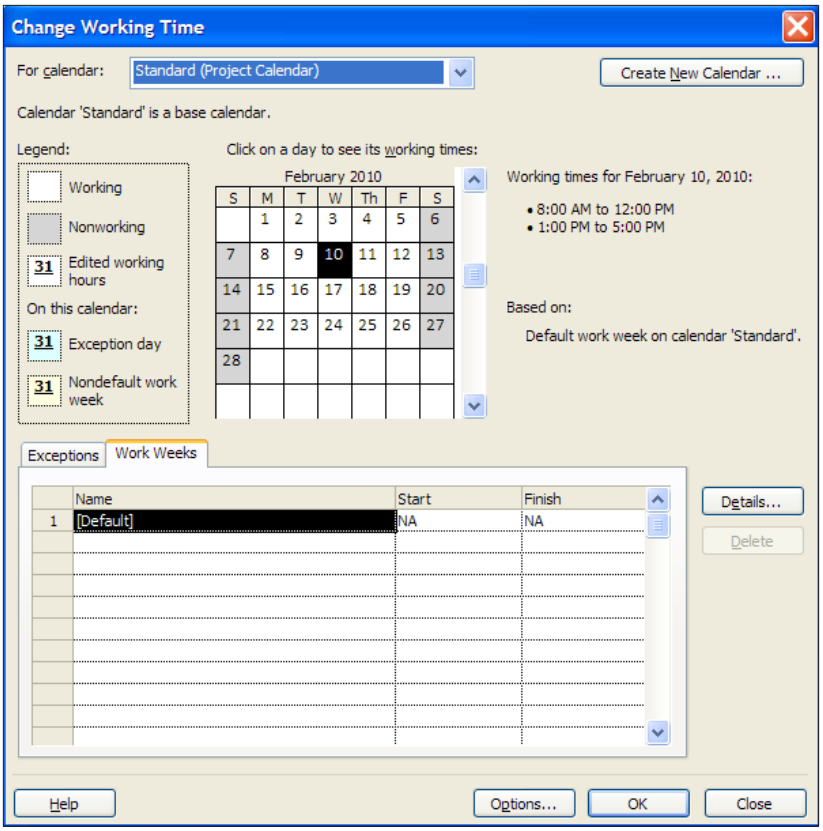


Figure 4-14 PLACEHOLDER

1. After clicking on the **Work Weeks** tab, the word **Default** should be highlighted. Click the **Details** button to the right of the form
2. Click **Monday**, press and hold the **shift** key and click on **Friday**. All of the working days will be selected
3. Click the **3rd radio button, Set day(s) to these specific working times**
4. You will see the standard working times. Make changes to reflect the new values
5. Click **Enter** or **Tab** to move away from the value you have changed
6. Click **OK** to close the form

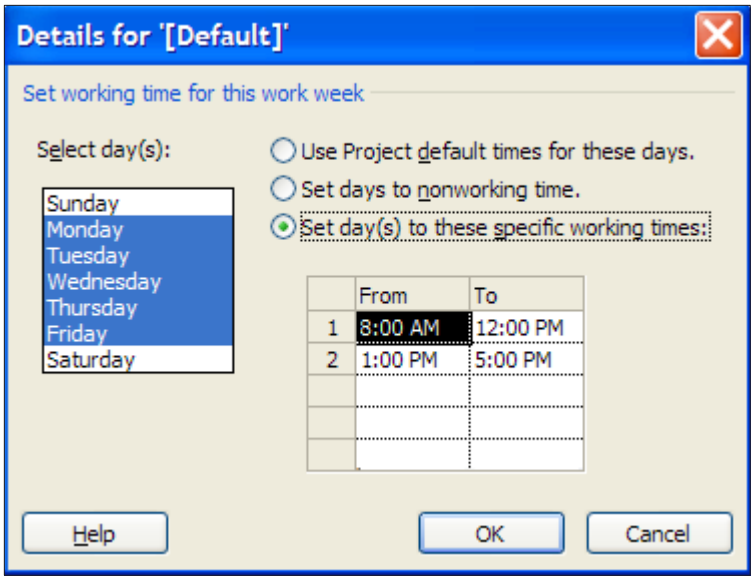


Figure 4-15 PLACEHOLDER

Military time is valid when entering hour values. To change 5:00 pm to 4:00 pm to shorten the work day, simply enter **16** where 5:00 pm is located and click **Enter** or **Tab** and 4:00 pm will appear.

Setting Non-Working Hours and Days

Non-working time is defined in the software as days where work will not be planned or performed. Examples are: national and organizational holidays, training days, company shutdowns, summer hours, etc. Adding these non-working days and times to the project calendar will allow for the scheduling of the tasks to be excluded from these dates.

A frequently asked question is: Is there the ability to add holidays to a calendar the way they can be added in Outlook? The answer is no - this is not a capability of the software. However, creating recurring holidays and

non-working times is a feature of Project 2013.

How to Create a Non-working Day for a Calendar:

1. Click **Project → Change Working Time**
2. Check to ensure sure that the calendar you wish to change is displayed in the **For Calendar** field
3. Click **Exceptions** tab near the bottom of the dialogue box

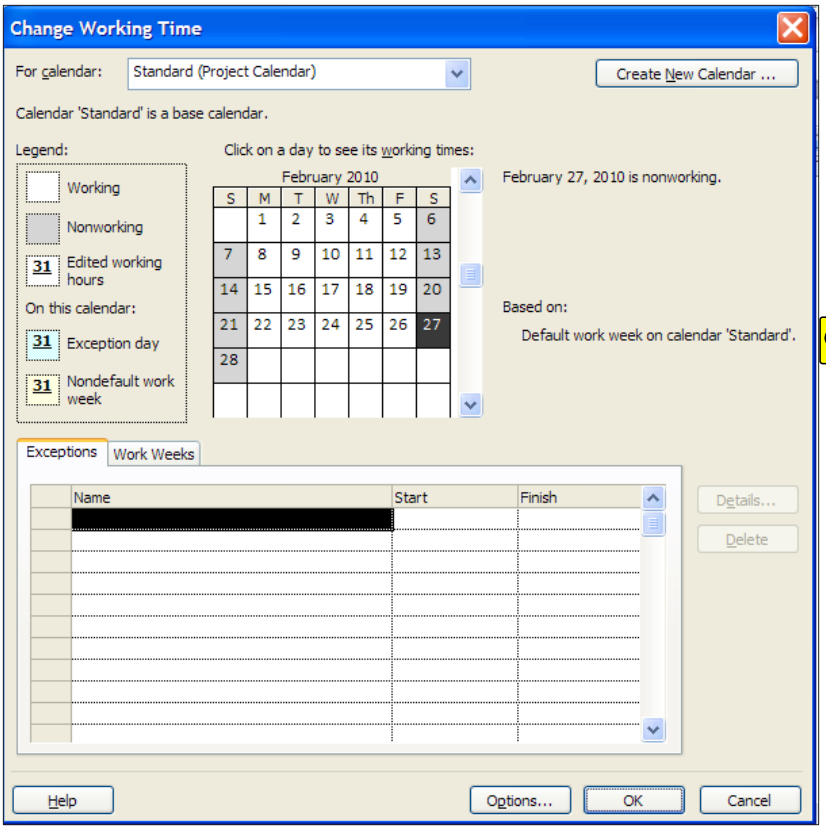


Figure 4-16 PLACEHOLDER

4. In this example, we will set April 8, 2011 as a non-working day. Move the slider on the right side of the calendar down until **April 2011** is displayed in the calendar
5. Click **April 8, 2011**
6. Click in the name field and enter a reason for the non-working day, ie: Company holiday
7. Click **Enter**
8. Repeat for additional non-working days. See the result below

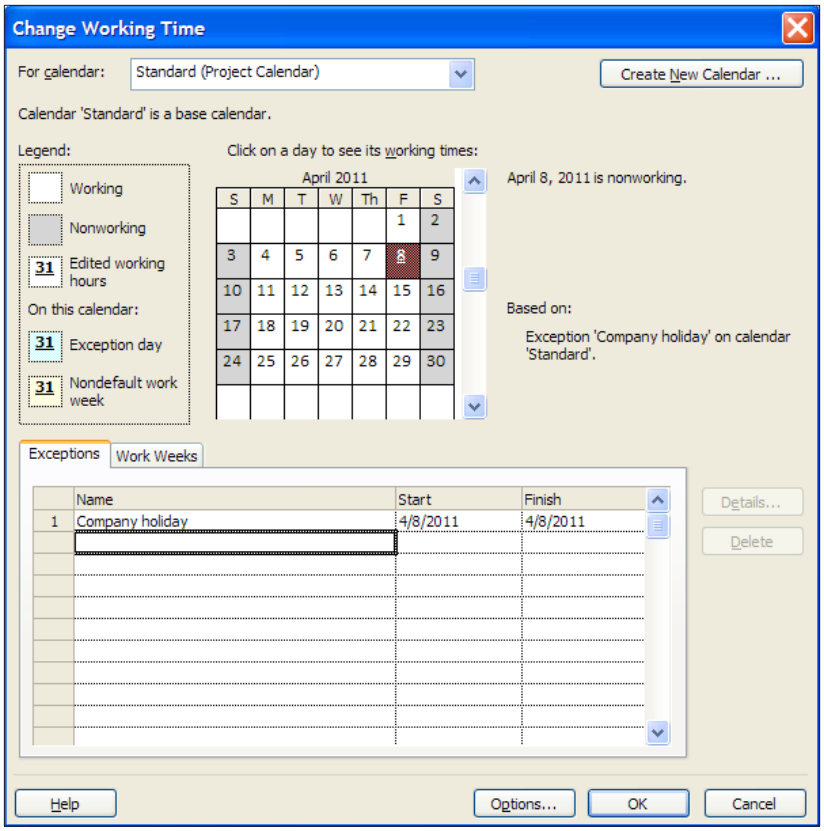


Figure 4-17 PLACEHOLDE

To Create a Recurring Non-working Day for a Calendar:

1. Click **Project → Change Working Time**
2. Check to make sure that the calendar you wish to change is showing in the **For calendar** field
3. Click **Exceptions** the tab near the bottom of the dialogue box
4. In this example, we will set January 1 (New Year's Day) as a recurring non-working day. Move the slider on the right side of the calendar down until **January 2** is displayed on the calendar
5. Click **January 1, 2013**
6. Click in the first open line in the **Name** field and enter **New Year's Day** for the non-working day
7. Click **Enter**
8. Click back on the words **New Year's Day** and then click on the **Details** button to the right of the form

9. Click **Yearly**
10. Click on January 1
11. Enter the start date
12. Enter a recurrance value or an End by date
13. Click **OK** to close box
14. Check for the recurrance values in the Exceptions line for New Year's Day.

Setting Calendar Options

The Calendar options work hand in hand with the project calendar to determine how tasks will be scheduled. It is imperative that the calendar options match the project calendar to create a consistency in the scheduling values for tasks and assignment values.

To access the Calendar options:

Click **File → Options → Schedule**

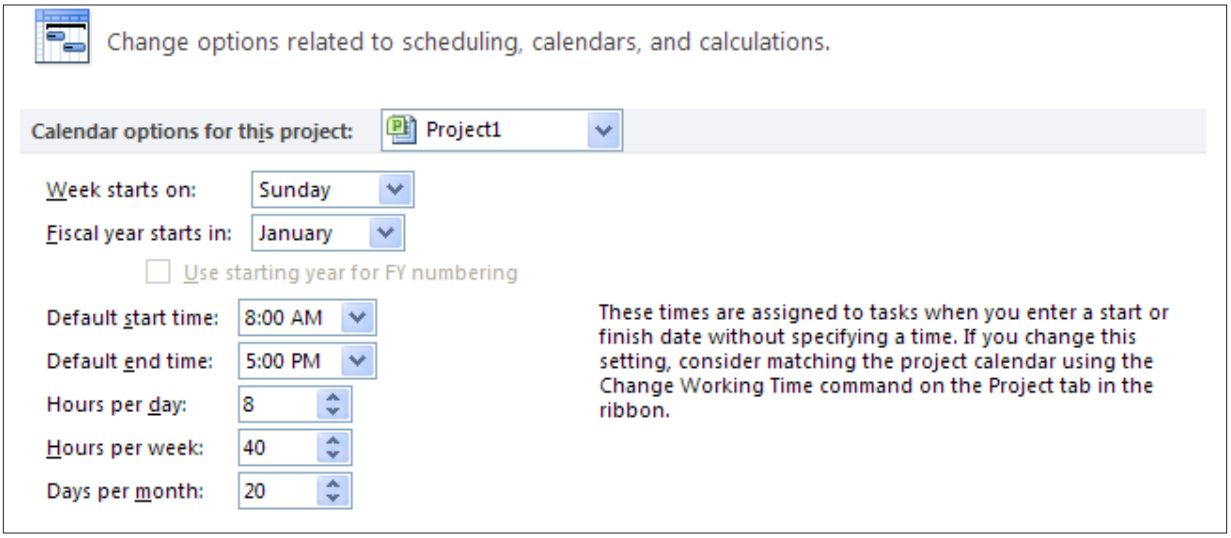


Figure 4-18 PLACEHOLDER 

What the options mean:

- **Calendar options for this project**: option to select whether your option choices for the calendar will be held within an individual project or if they will be applied to all new projects.
- **Week starts on**: this choice will affect what is assigned and viewed as the first day of the week. The day chosen will be reflected on the Gantt Chart, Resource Usage, Task Usage and other calendar views.
- **Fiscal Year starts in**: if using this option, select which month will be the start of the fiscal year.
- **Default start and end times**: these values should match the time values on the project calendar. Assigning the project calendar will be discussed in the next lesson. The times stated here will be used to schedule tasks when time is not specified for a task. It will also be used to schedule tasks that do not use relationships. For example: if recurring tasks are created, the tasks will always be scheduled at the start time represented in this option.
- **Hours per day**: when 1 day of work is scheduled, how many hours should 1 day consist of?
- **Hours per week**: when 1 week of work is scheduled, how many hours should 1 week consist of?
- **Days per month**: when 1 month of work is scheduled, how many days should 1 month consist of?

Saving the Calendar

In Project 2013, the calendar that was just created is known as a "custom object". Custom or customized objects may be saved for use in the project the object was created in and used in other projects as well. To save objects the Organizer is used. When Project 2013 was installed on your system, a file named Global.mpt was created. The Organizer is the function that will copy objects into the Global.mpt as well as between project schedules. Calendars are only one of many object types that may be customized and saved for use in other project schedules. The other objects will be discussed in Chapter 12, *Printing and Reporting*. In this lesson, we will only address the Calendar.

To save the custom or customized calendar, the object must be copied

using the Organizer.

To copy a New Base Calendar into the Global.mpt:

1. Click **File → Info → Organizer**
2. Click the **Calendars** tab
3. Click **New Base Calendar** to the right and click **<<Copy**
4. Click **Cancel** to close the box

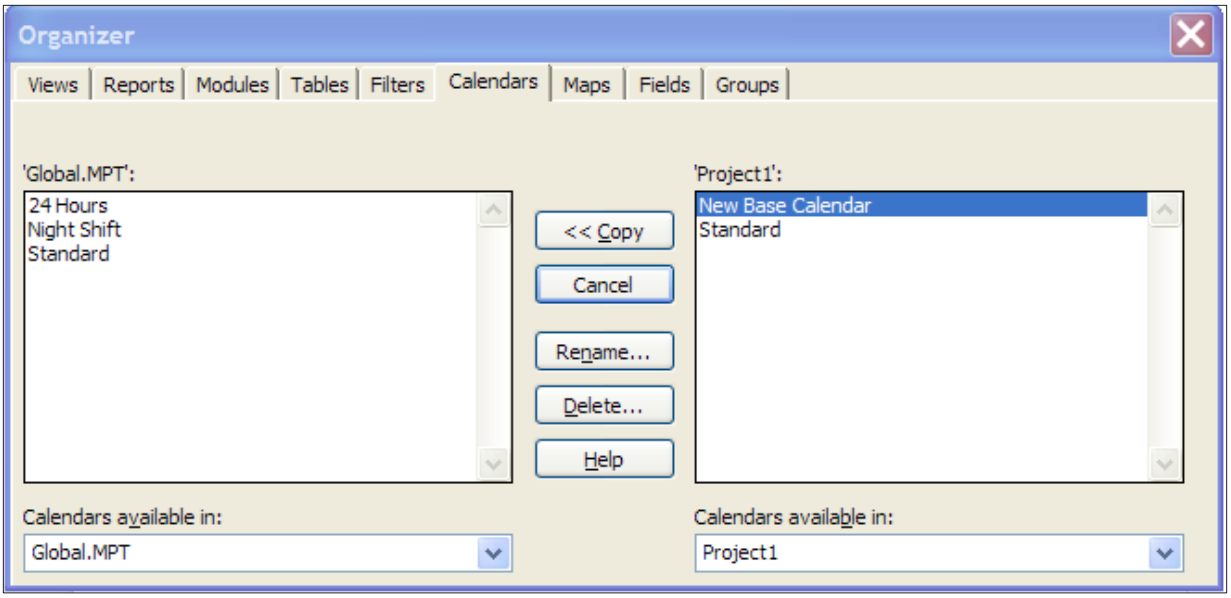


Figure 4-19 PLACEHOLDER

The Calendar will be copied into your local Global.mpt.

Create New Calendar 

Calendar Options

The Calendar options work hand in hand with the project calendar to determine how tasks will be scheduled. It is imperative that the calendar options match the project calendar to create a consistency in the scheduling values for tasks and assignment values.

To access the Calendar options:

Click **File → Options → Schedule**

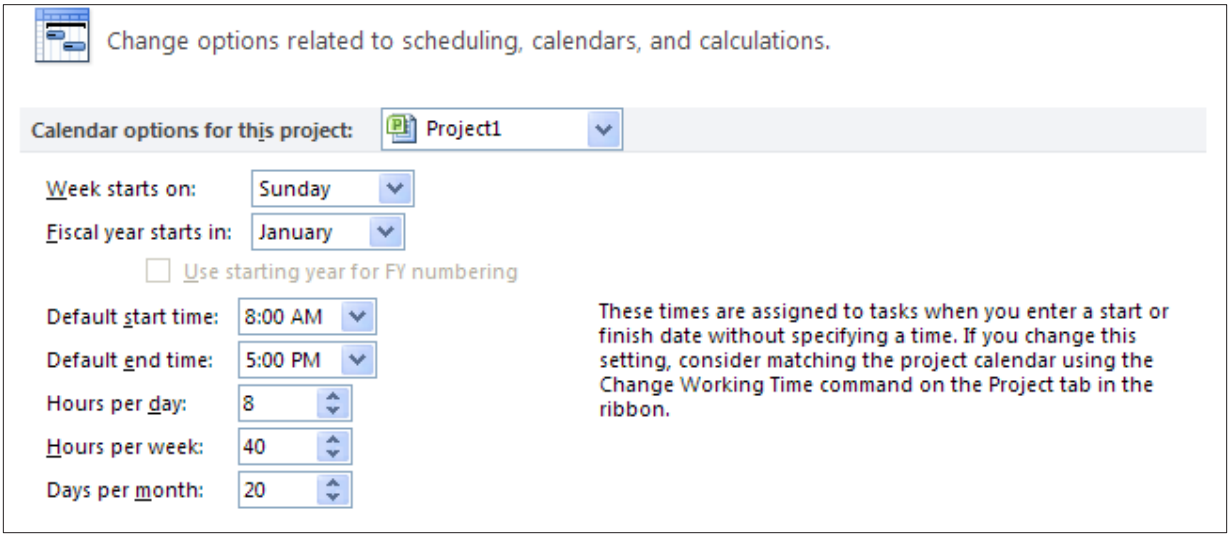


Figure 4-20 PLACEHOLDER

What the options mean:

- **Calendar options for this project**: option to select whether your option choices for the calendar will be held within an individual project or if they will be applied to all new projects.
- **Week starts on**: this choice will affect what is assigned and viewed as the first day of the week. The day chosen will be reflected on the Gantt Chart, Resource Usage, Task Usage and other calendar views.
- **Fiscal Year starts in**: if using this option, select which month will be the start of the fiscal year.
- **Default start and end times**: these values should match the time values on the project calendar. Assigning the project calendar will be discussed in the next lesson. The times stated here will be used to schedule tasks when

time is not specified for a task. It will also be used to schedule tasks that do not use relationships. For example: if recurring tasks are created, the tasks will always be scheduled at the start time represented in this option.

- **Hours per day**: when 1 day of work is scheduled, how many hours should 1 day consist of?
- **Hours per week**: when 1 week of work is scheduled, how many hours should 1 week consist of?
- **Days per month**: when 1 month of work is scheduled, how many days should 1 month consist of?

Project Information

The final project information that should be entered before proceeding with project schedule development is the project start or project finish date as well as indicating which calendar will be used as the project calendar. This information is entered through the Project Information box.

To navigate to the Project Information dialogue box:

Click Project → Project Information

Deciding whether to enter the Project Start date or the Project Finish date will take some consideration. There are pros and cons to either choice:

FAQ: Should I enter a project start and finish date?

Answer: Project 2013 will accept either the start or the finish date but not both.

Entering a start date will indicate that you are planning your schedule as forward scheduling. This will result in:

- All tasks will be scheduled As soon as possible
- The work of the project will determine the project ending date
- You will have a date to manage to and know when you are on time or late with the progress of the project

Entering a finish date will indicate that you are planning your schedule as backward scheduling. This will result in:

- All tasks will be scheduled As late as possible
- The ending date of the project will be locked to a date on the calendar
- You might be planning a project where each task will be required to be completed as planned to achieve the ending date goals.

The most used planning method is that projects are planned from the project start date.

Project Calendar: The default calendar is “Standard”. Whatever calendar is selected will become the scheduling calendar for the project. All tasks will be scheduled using this calendar until a resource is assigned to the task.

Click **OK** to close the box.

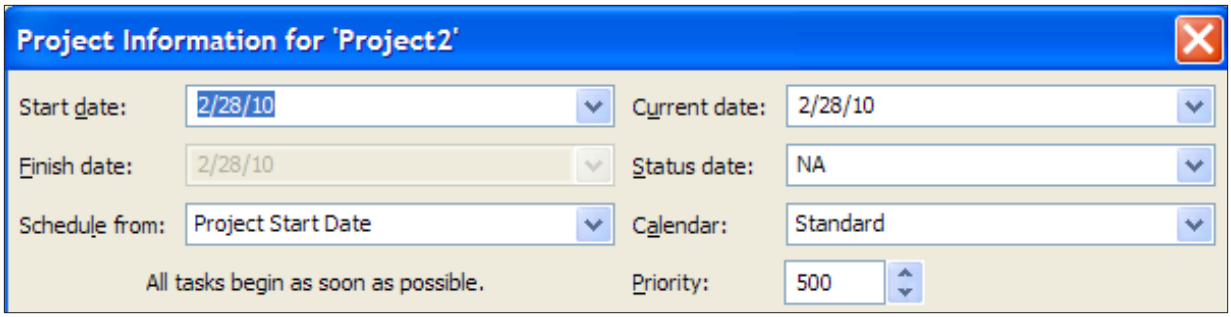


Figure 4-21 PLACEHOLDE

Most project managers have definite deadlines. Consider planning the schedule from ending date to get the schedule short term goals, deadlines and milestone dates. Then switch the project to the start date to manage. Reset the constraints to as soon as possible to enable the schedule to include slack and aid in schedule management.

Plan from Start

Plan from Finish

Project Start Date

Assign Project Calendar

Options

General vs Per Project

General options are options which affect how the installation of Project 2013 on a desktop will operate. Display options are options that will help the user interface with Project 2013 software. The options selected are unique to each user and are a personal preference. These options do not have an influence on the ability to create a project schedule.

To navigate to General options:

Click **File → Options → General**

In the Project view section, the user may select the default view for usage of Project 2013 and the date format for dates for reports and views (tables).

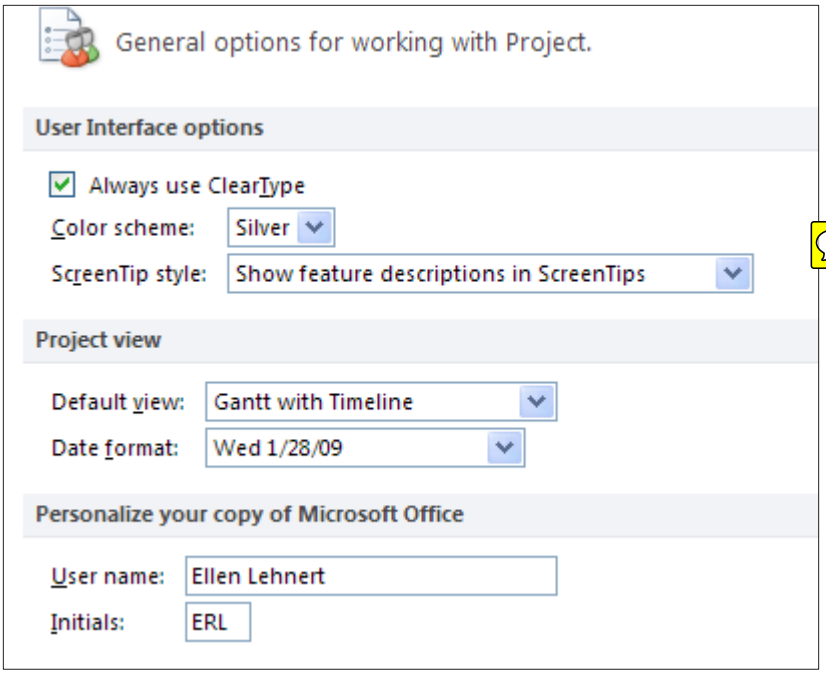


Figure 4-22 PLACEHOLDE

To navigate to Display options:

Click **File → Options → Display**

These options refer to which elements should be viewed on the screen. These options will control which indicators are shown in the indicator column, currency values and if the Entry bar is visible or not.

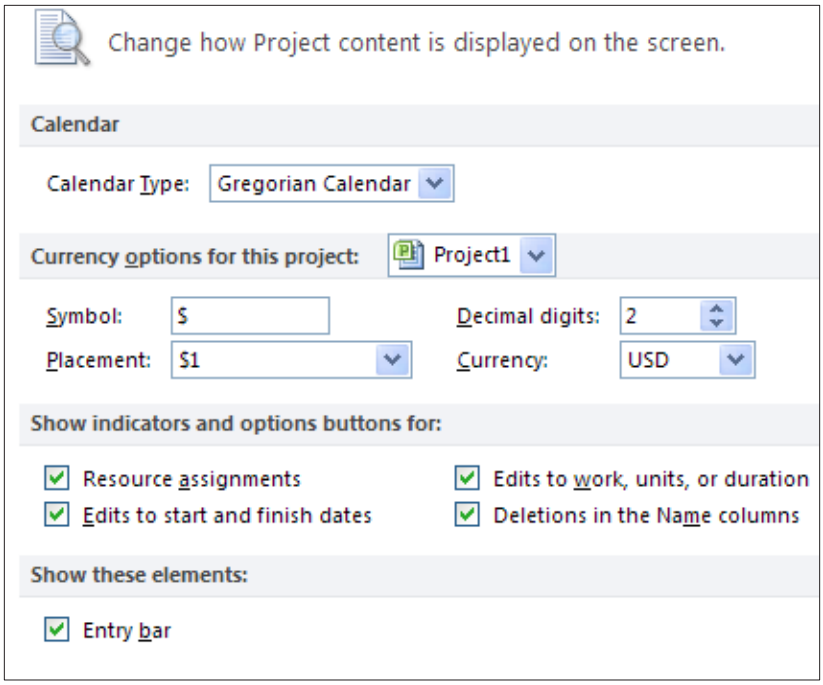


Figure 4-23 PLACEHOLDER

Additional display options are available at:

Click **File → Options → Advanced**

Some of the options that should be considered are:

- **Show this number of recent documents** – optional number, list will show in the Recent tab in the backstage
- **Automatically add new views, tabls, filters and groups to the global** - recommended
- **Settings for duration label values** – Minutes, Days, etc. - may alter as needed
- **Show project summary task** – recommended

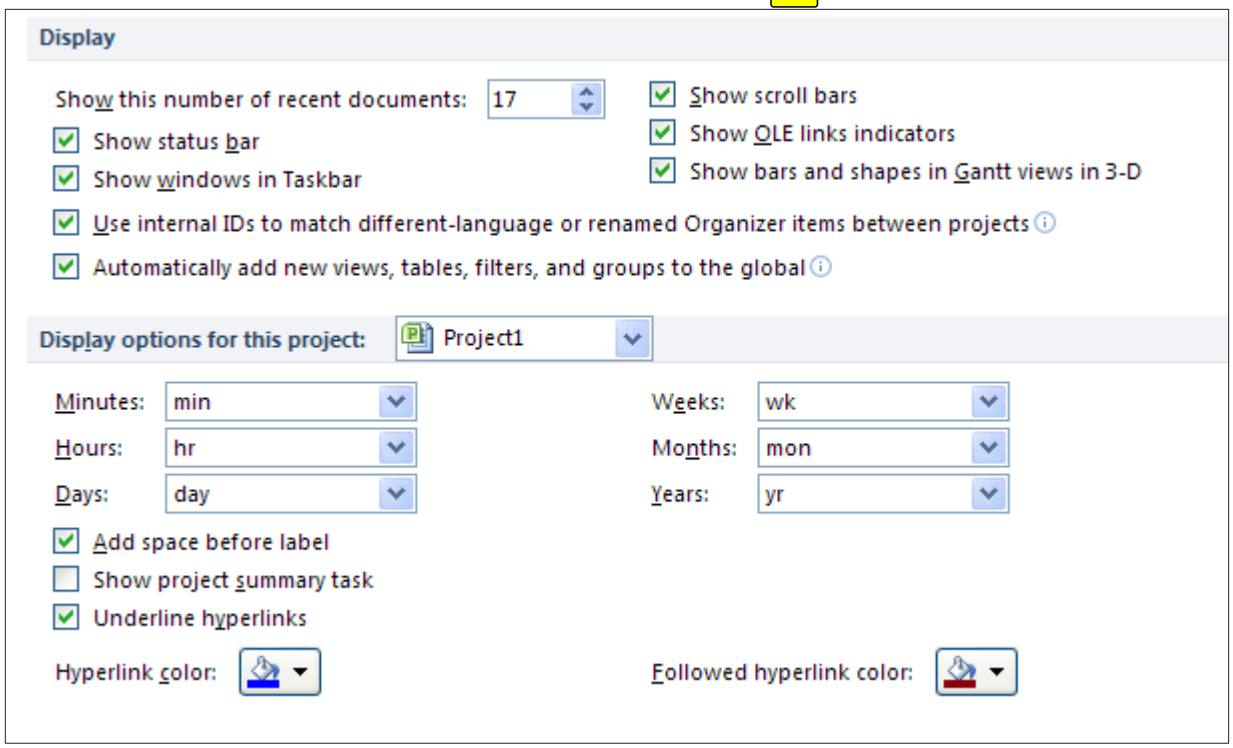


Figure 4-24 PLACEHOLDER

Each project schedule has the ability to contain a Project Summary task. The Project Summary task is a zero level task that will serve as a constant grand total for the project schedule. The setting in the above options may be used to turn on the project summary task or use the directions below.

To turn on the Project Summary task:

Click **Task → Gantt Chart**

Click **Format → Project Summary Task** (on the right side of the ribbon)

General: Change the Default View to Gantt Chart

Display: Entry Bar

Scheduling

Define Duration, Work, Task Types and Effort Driven

Scenario 1: Entering a Constant Duration Value

Let's say you would like to enter a duration value that remains constant regardless of the resources that are added or subtracted.

The recommended practice is to estimate the task by entering a duration value, set the task type to Fixed Duration and then assign the resources.

This will cause total work for the task to be calculated.

	Task Name	Duration	Type	Effort Driven
1	Prepare Facilities	1 day?	Fixed Duration	No
2	Begin Registration	5 days	Fixed Duration	No
3				

Figure 4-25 Entry Table with Duration and Optional Fields

The Effort Driven option provides a shortcut to divide the total work for the task across the resources assigned. This is useful for organizations that track costs or track resource assignments in detail.

To follow this approach, insert the Type and Effort Driven columns in the Entry table of Gantt Chart view or display Task Entry view which provides these fields in the lower pane. For more information about modifying views, refer to Chapter 10, *Fine Tune the Project Schedule*.

Scenario 2: Entering a Constant Work Value

You also have the choice to enter a total work value for the task that remains constant regardless of the resources that are added or subtracted. This is also called effort-driven estimating.

The recommended practice is to estimate the task by entering a Work value, set the task type to Fixed Work, and then assign the resources.

This will cause total duration for the task to be calculated.

	Task Name	Duration	Work
1	Prepare Facilities	1 day?	40 hrs
2			

Figure 4-26 Entry Table with Work Field

To follow this approach, insert the Work column in the Entry table of Gantt Chart view. This is where you will enter your total Work estimate.

Do not enter anything in the Duration field. The Type field is also needed and may be inserted as a column or displayed in Task Entry view.

For more information about modifying views, refer to Chapter 10, *Fine Tune the Project Schedule*.

For a more detailed discussion of Task Types, refer to Chapter 5, *Task Development*.

Task Types, Effort-Driven

Scheduling options are per project options which establish the defaults how a project will be scheduled. These options are unique per project and should be checked before entering tasks into a project schedule. These options also may be changed at any time over the life of the project schedule.

To set the scheduling options:

Click **File → Options → Schedule**

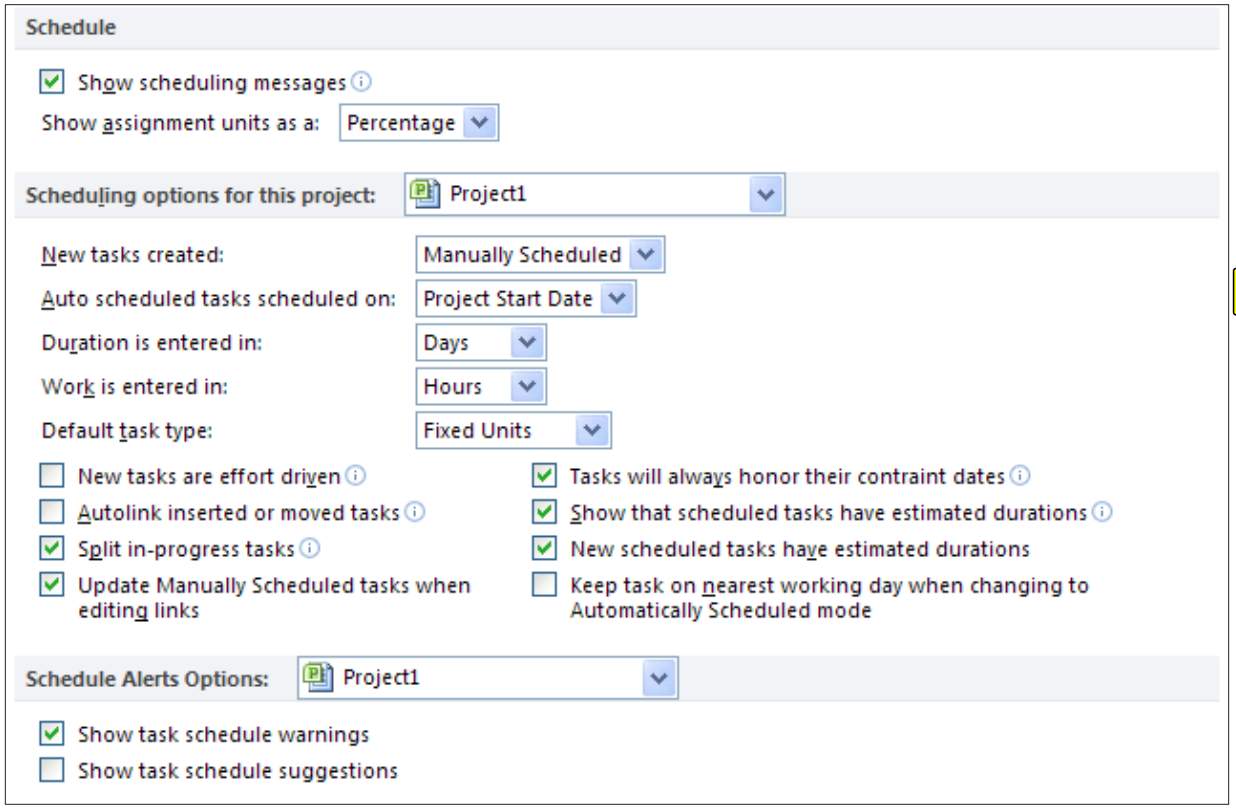


Figure 4-27 PLACEHOLDER

- **Show scheduling messages**: gives the scheduler error messages concerning scheduling inconsistencies and warnings.
- **Show assignment units as a**: options are percentage or decimal. This is user preference. It may be changed at any time without affecting the schedule.

- **Scheduling options for this project**: options that can be assigned to a specific project or all projects.
- **New tasks created**: manually scheduled or automatically scheduled. This is the default value and may be adjusted per task.
  - **Manually scheduled**: tasks will be entered without a start or finish date and without task duration. All values are entered manually.
  - **Auto scheduled**: tasks will be entered with a default duration of 1 day and a start and finish date.
- **Auto scheduled tasks scheduled on**: project state date or current date. If you are managing a long project it might be easier to change this option for all new tasks to start on the current date.
- **Duration is entered in**: minutes, hours, days, weeks, months
- **Work is entered in**: minutes, hours, days, weeks, months
- **Default task type**: Fixed Units, Fixed Duration, or Fixed Work
- **New tasks are effort driven**: check for yes
- **Update Manually Scheduled tasks when updating links**: when tasks are manually scheduled should the project schedule successor tasks based on realtionship links

It is a good idea within an organization to establish a standard for Duration and Work. When duration is discussed or appears on a report it will be easier for stakeholders to understand that duration always means hours or the value that works for the specific project. If you have a 3 year project, you probably will not be planning work at the hour level so weeks might be the duration standard.

Change to Auto Schedule

The column or field in Project 2013 that determines which scheduling mode a task will be scheduled by is called “Task Mode”. By default, you will see this field on the Entry table of the Gantt Chart. This column may be added to any task table.

Setting the automatic or manual scheduling mode may be accomplished in several ways:

To set the scheduling mode for a project or for all future projects:

- **File → Options → Schedule**

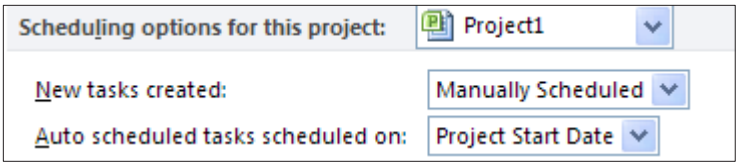


Figure 4-28 PLACEHOLDER

After several tasks are entered you may decide to switch to a different scheduling mode for the addition of future tasks for the project. This can be done quickly using the choice option at the bottom left hand corner of the Gantt Chart view which is shown below. Changing this option will not affect existing tasks in the schedule; it will only affect future added tasks. Click on the button highlighted below for the option to change scheduling modes:

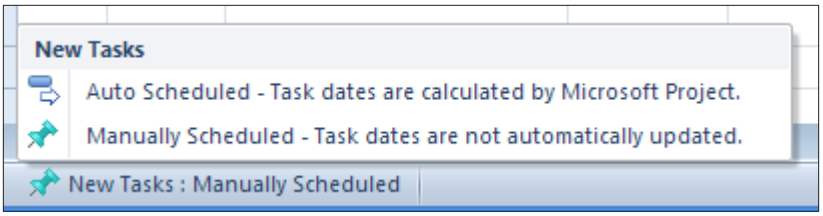
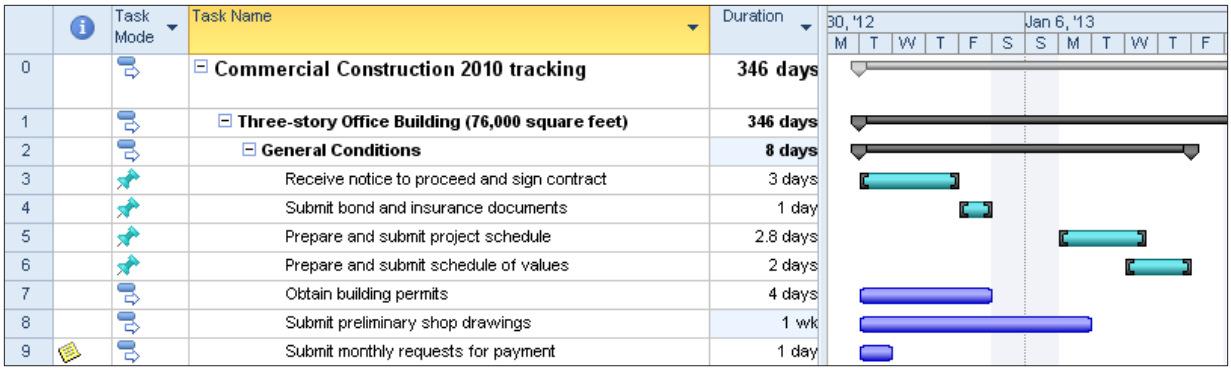


Figure 4-29 PLACEHOLDER

The default Entry Table for the Gantt Chart includes the “Task Mode” column inserted to the left of the Task Name column. This column may be inserted into any table as needed.. The indicators in this column indicate the scheduling mode for the task. In the view below the automatically scheduled tasks have a icon and the manually scheduled tasks have a icon in the Task Mode column. Hover your mouse pointer over the icon and the scheduling mode description will appear. Clicking on the icon will allow for scheduling mode changes per task. Note the different Gantt bar formats for manual v automatically scheduled tasks.



	Task Mode	Task Name	Duration
0		**Commercial Construction 2010 tracking**	**346 days**
1		**Three-story Office Building (76,000 square feet)**	**346 days**
2		**General Conditions**	**8 days**
3		Receive notice to proceed and sign contract	3 days
4		Submit bond and insurance documents	1 day
5		Prepare and submit project schedule	2.8 days
6		Prepare and submit schedule of values	2 days
7		Obtain building permits	4 days
8		Submit preliminary shop drawings	1 wk
9		Submit monthly requests for payment	1 day

Figure 4-30 PLACEHOLDER

To change the scheduling mode from the Task ribbon:

- Click task to be changed
- Click **Task → Manual Schedule** or **Automatic Schedule**

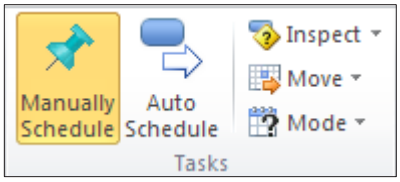


Figure 4-31 PLACEHOLDER

Another way to change the schedulig mode is to double clicking a task to open the Task Information dialogue box. An option is located on the General tab to change the scheduling mode. The options are highlighted in the view below.

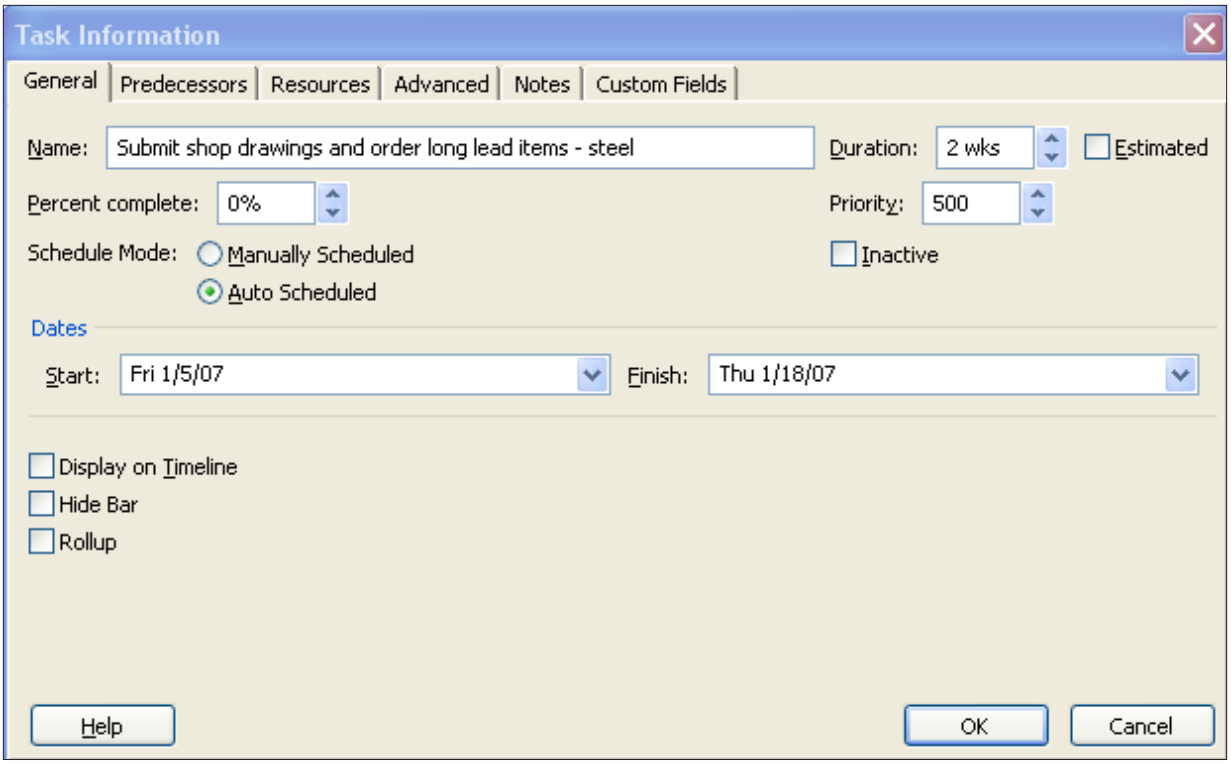


Figure 4-32 PLACEHOLDER

Chapter 5

Task Development

Overview of WBS

Task Categories

What is a WBS?

Simple projects like grocery shopping might not need a plan to accomplish the project. When grocery shopping, most people will make of list of the items that need to purchase. Everything on the list is purchased and the project is completed. Not all projects are this simple.

Larger projects like building a house will require more planning and detail to accomplish the goals of the project. More tasks will be required, more detail and organization to the detail. More data will be accumulated regarding how the project was performed. To accomplish these types of projects, a work breakdown structure or WBS will be required.

The WBS is a hierachitcal structure much like an outline list. This structure will contain the work of the project. How it is organized will determine how effective and helpful the project schedule will be. Within the structure will be titles and well as details. The structure will also contain goal points or milestones to help manage target dates.

Consider the WBS of a project the same as the foundation for a building. Without a stable foundation the building will not be stable. Having a stable or well-planned WBS will be an asset to the performance of a project. Having an unstable WBS may adversely affect the management of the project schedule.

Creating the Work Breakdown Structure

Once the tasks of the project are established, the next step is to enter the tasks into the project schedule and create a WBS structure. Entering tasks may be a manual keying process or they may be imported from a SharePoint list (Project 2013 Pro only), an Excel workbook, an Outlook task list or a Word document. Tasks may also be copy and pasted into project schedules. This lesson addresses the manual entering of tasks into the project schedule.

In this lesson, we will discuss:

- Entering tasks
- The Task Information Form
- Outlining tasks into a WBS Hierarchy
- Displaying WBS code values
- Customizing WBS code numbers

Entering Tasks

Entering tasks into Project 2013 is as easy as typing the task name into the Task Name field. When entering a new task, keep in mind that data is being populated in an array of fields for that row; several hundred fields will be created and some populated. After tasks are entered they may be moved, deleted, or copy/pasted to other areas of the schedule. It is also recommended that the Project Summary Task be turned on to aid in schedule development.

To turn on the Project Summary task:

- Click on **Format → Project Summary Task** (In the show/hide section on the right)
- Click the **check box** to turn on

To enter a new task:

- Click the **Task Name** field on the row you would like to enter and type the task name.

To move a task to another location in the schedule:

- Left Click on the task number (ID) in the left column. Hold the click down and wait for the 4 way arrow to appear and drag to the task to the new location. (Works well when the new location can be seen on the screen)

OR

- Click on the **task number** of the task you wish to move
- Click **copy** (or cut)
- Scroll to the new location
- Click **Paste** – Project 2013 will insert the pasted task

Entering blank lines to receive the moved tasks is not necessary. The schedule will insert the lines and move tasks down to accommodate the moved tasks.

To add blank lines schedule between existing tasks:

- Right click on the **task** below the location of the new task to be inserted
- Click **Task → Task** – a blank row will be created above the task selected

OR

- Click on a task
- Click **Insert** key on the keyboard

In the view below task 3[illegible]s entered using the Task → Task insert method. Note the default data and <New Task> name entered. Task 40 was the result of clicking the Insert key on the keyboard.

	Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
36	Review modular code	5/8/13	5/15/13	4/18/13	4/24/13	14.75 days	14.75 days
37	Test component modules to product specifications	5/15/13	5/17/13	4/25/13	4/26/13	14.75 days	14.75 days
38	<New Task>	5/17/13	5/20/13	NA	NA	0 days	0 days
39	Identify anomalies to product specifications	5/20/13	5/23/13	4/29/13	5/1/13	15.75 days	15.75 days
40							
41	Modify code	5/23/13	5/28/13	5/2/13	5/6/13	15.75 days	15.75 days

Figure 5-1 PLACEHOLDER

To delete tasks from the schedule:

- Right click the task to be deleted
- Click **Delete Task** option

OR

- Click the task to be deleted
- Click the **Delete** key on the keyboard

If you have clicked anywhere within the task row and deleted the task a Smart Tag will appear to ask if you want to clear the field or delete the task.

In the view below the result of clicking on the Smart Tag (the X with the down arrow) is shown. Make your selection from the choices in the box below.

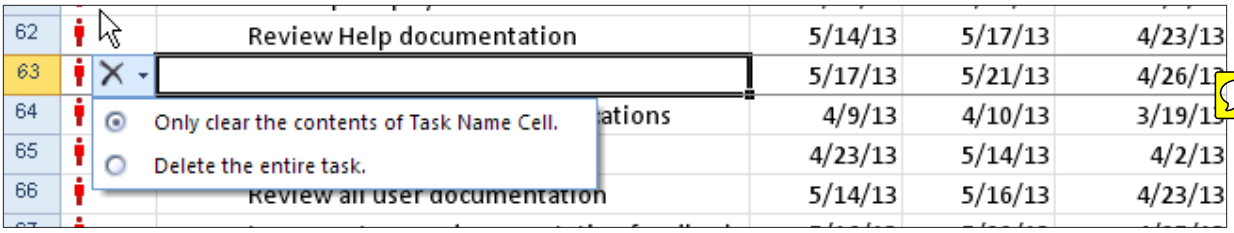


Figure 5-2 PLACEHOLDER

Project 2013 has the ability to temporarily inactivate a task from the schedule. This is an alternative to deleting a task.

This option is only available in Project 2013 Professional.

The benefits of inactivating tasks as opposed to deleting tasks are:

- The task will remain in the schedule and could be reactiated if necessary
- The inactive task will not be considered by the scheduling engine.
- Relationships will stay in tack and should be removed which will be discussed in Chapter 6, *Estimating, Linking and Lead and Lag*.
- It a task was previously included in the baseline for the project, the data will stay in with the project
- If there is a question whether a task should be included it could be entered in an inactive state so it is not forgotten
- The inactive task has unique formatting to indicate that it is inactivated.

In the view below task 27 has been inactivated. Note the alternate formatting:

Figure 5-3 PLACEHOLDER

To inactivate tasks in the schedule:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section

To reactivate an inactivated task:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section

When tasks are entered you will note that the column to the left of the task name is a column called “Task Mode” This column will reflect the default task mode for scheduling of the tasks. By default the task mode is manual, with the other option being automatic. The status of this mode will make a difference in the appearance of the entered task. This is an option that is controlled either on a per task basis or as a preset option as a default of the schedule. We discuss this new Project 2013 scheduling option in *Manual scheduling* on page 123.

Task Information Form

The Task Information box is a source of easy access for some of the frequently used fields on the task side of the data for a Project 2013 project schedule. Data entered in the form is the same as entering data into a column in a table for a task. Using this box is a quick and easy way to view and maintain task information.

To access the Task Information Form:

- Double click an **task data** field within a task

OR

- Click on a **task**
- Task **ribbon** → **Information**

The form below will appear:

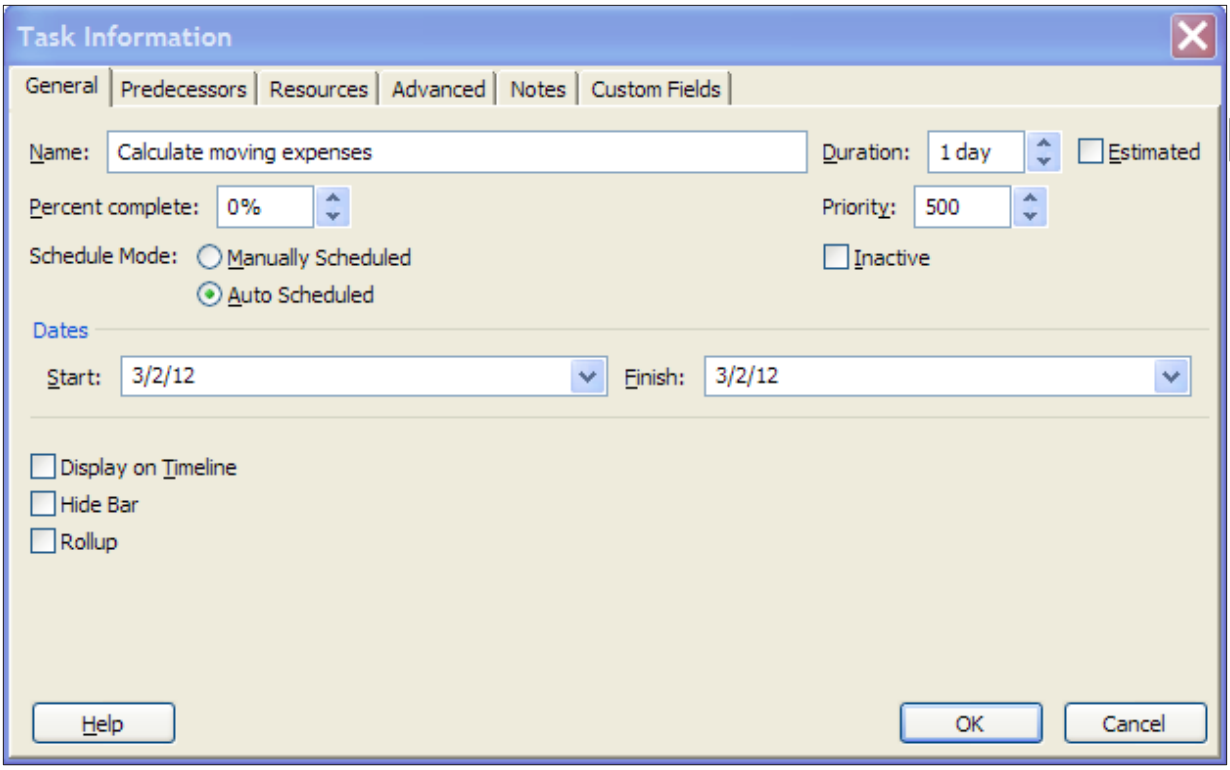


Figure 5-4 PLACEHOLDER

The form contains several tabs of information, grouped by subject. Each tab will allow access to the Task name, Duration and Estimated flag.

General tab: contains Name, Duration, Percent complete, Priority, Schedule Mode, Inactive, Start and Finish dates, Display on Timeline, Hide Bar and Rollup.

Predecessors: contains information concerning task relationships.

Resources: contains information concerning resources assigned to the task.

Advanced: contains information concerning Deadlines, Constraints, Task Types, Task Calendars, Effort-driven flag, WBS number and Milestone flag for the task.

Notes: general notes area for the task

Custom fields: If task level custom fields (user-defined) were created for the project, they would be accumulated and accessible through this area.

Data may be changed in multiple tasks at the same time. Select the tasks to be changed and then click on the Information icon on the Task bar. The box that appears is called the Multiple Task Information box. Make the changes and click OK to update.

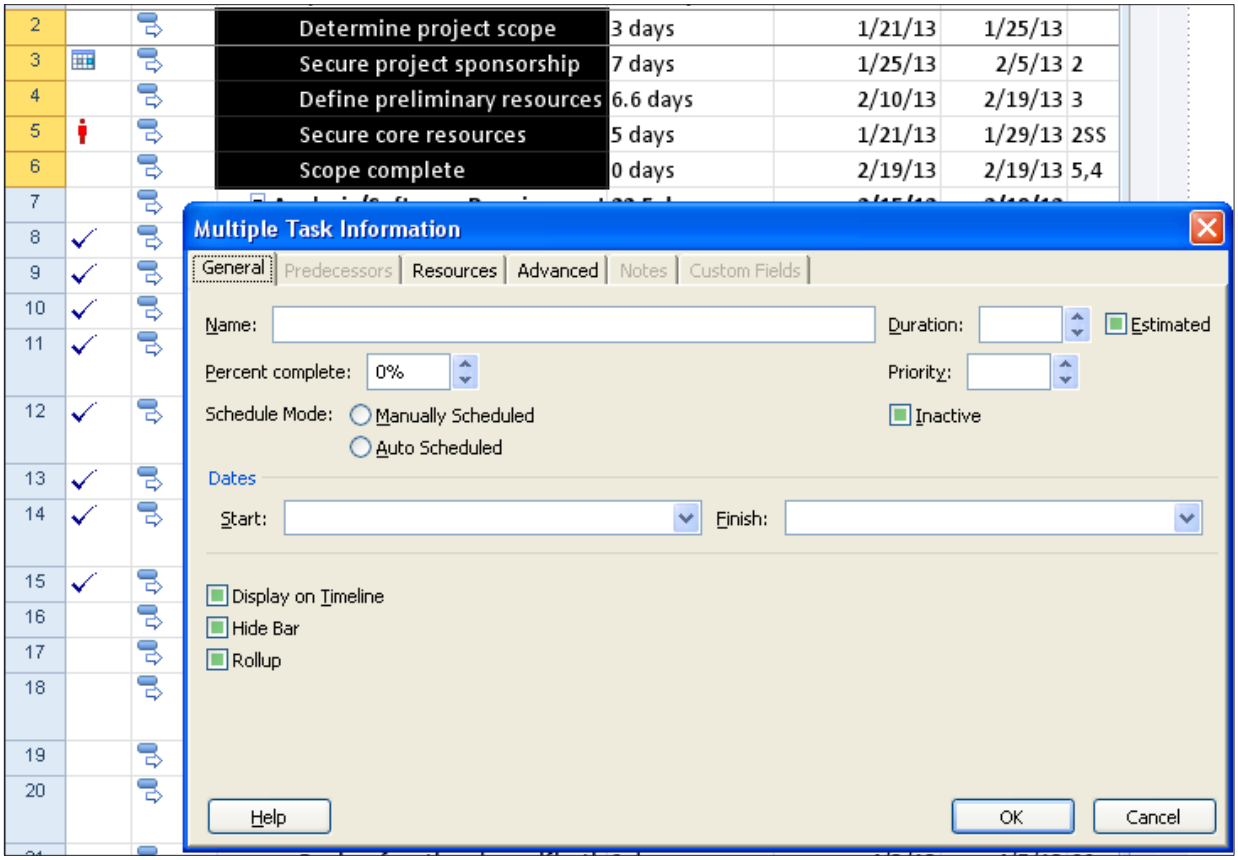


Figure 5-5 PLACEHOLDER

Outlining Tasks into a Hierarchy

Once tasks are entered, the WBS outline structure may be created. To create the outline structure, tasks will be indented or outdented. These buttons are located on the Task ribbon in the schedule section and are the green arrows in the lower left corner. The indent button is pointing to the right. The outdent button is pointing to the left. See below:

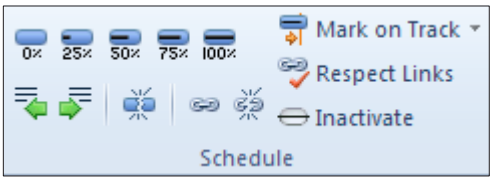


Figure 5-6 PLACEHOLDE

To indent a task:

- Click the task to be indented
- Click the **indent** (pointing right green arrow)

OR

- Place the mouse pointer over the task and a horizontal arrow will appear. Left click and drag the task to the right

To outdent a task or remove an indention:

- Click the task to be outdented
- Click the **outdent** (left pointing green arrow)

OR

- Place the mouse pointer over the task and a horizontal arrow will appear. Left click and drag the task to the left

When a task has an indented task below it, the task becomes a summary task. Summary tasks are represented as black bars on the Gantt chart as shown below:

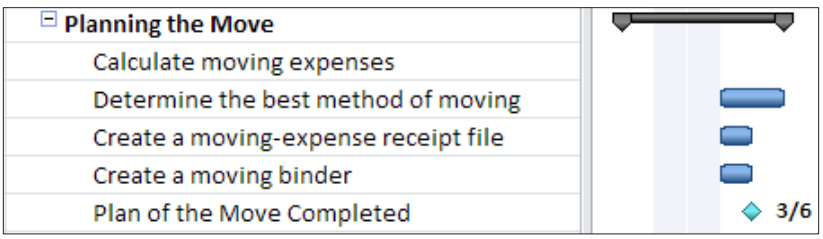


Figure 5-7 PLACEHOLDER

Indenting and outdenting can be confusing. At times it is difficult to achieve the desired structure results.

When indenting, work from the top down. When outdenting, work from the bottom up.

To see the levels of the WBS:

Project Summary tasks and Summary Tasks will have a small box to the left of the summary task name as seen in the screen above.

- Click the **plus** sign + to expand tasks
- Click the **minus** sign – to collapse tasks

Use the Outline button to jump to a level of detail:

Click on **View** → **Outline**:

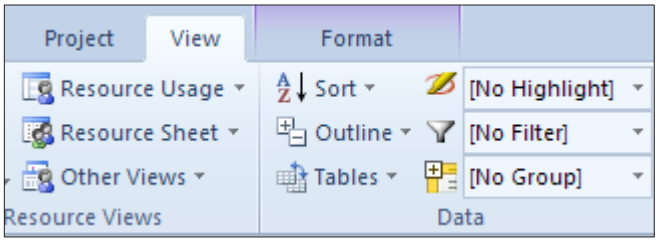


Figure 5-8 PLACEHOLDER

When the **Outline** down arrow is clicked, the following choices appear:

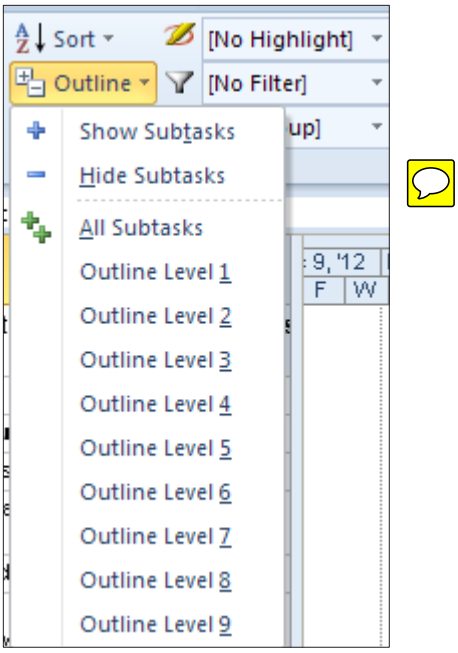
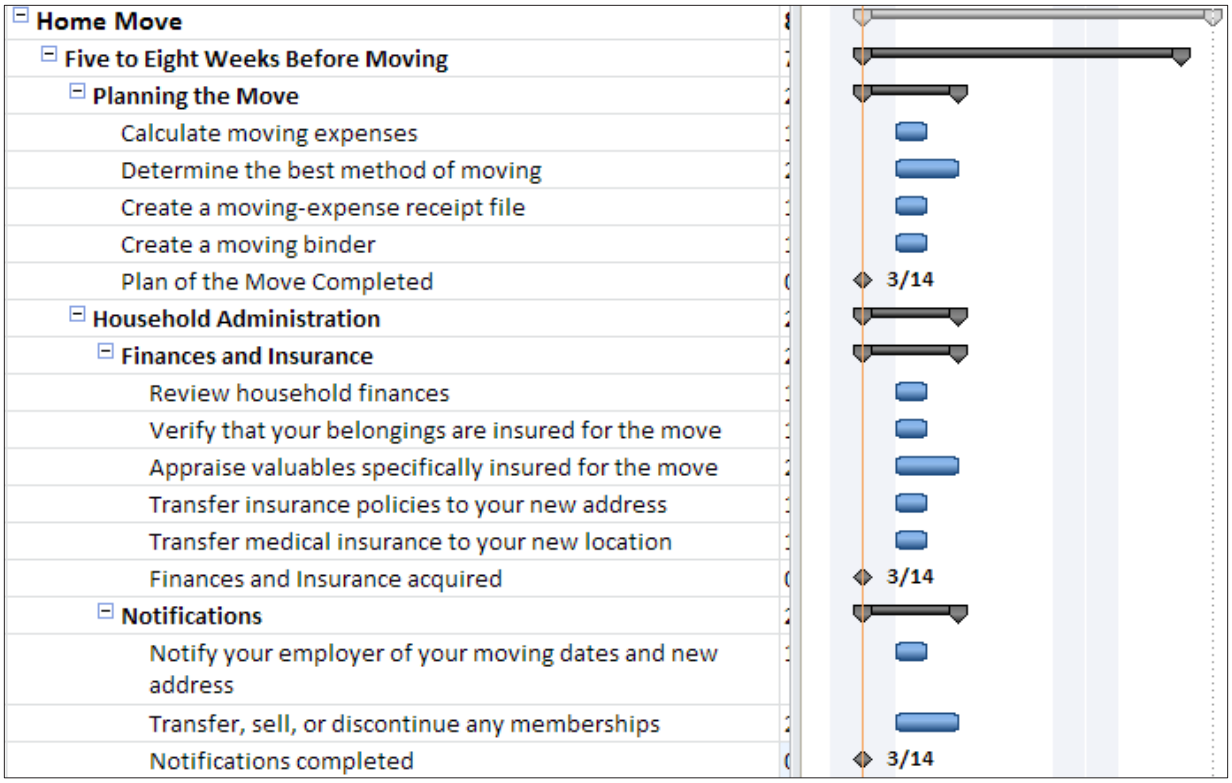


Figure 5-9 PLACEHOLDER

The following image shows a view of a collapsed WBS – **Outline level 1** was selected. Note the rolled up view of the tasks:

Figure 5-10 PLACEHOLDER

The following image shows a view of an expanded outline WBS – **All Subtasks** was selected:



Clicking **Project Summary** task and then **Hide Subtasks** will collapse the project down to just the Project Summary task.

If the outline is collapsed, clicking **All Subtasks** will show all tasks at all levels of the WBS.

The outline list offers the option to create up to 9 WBS levels. There are many more levels available in Project 2013 but it is advised that WBS levels should not exceed 5. The more WBS levels there, the more confusing and cumbersome a WBS may become.

Displaying Outline Numbers & WBS

As the WBS structure is created, an automatic numbering sequence is also created within the task list. The numbers represent where in the WBS structure the tasks reside. This is a unique numbering scheme and numbers are automatically reassigned as tasks are moved around the WBS structure. There are default number values and customized WBS number values. In

this lesson, we will address the standard WBS values; the following lesson will address the customized values available.

To view insert the WBS column into a table:

- In the Gantt chart view right click on a column heading. It is best to right column in the column to the right of where the new column should be inserted
- Select Insert Column
- Click the **W** key on the keyboard
- Select "WBS"
- Click OK

Below is an example of WBS numbering schema:

WBS	Task Name
0	**Municipality of Springfield**
1	**Influent Screens**
1.1	Enter order
1.2	Set-up Progress Schedule
1.3	Engineer Set-up
1.4	Drafting
1.5	Deliver Progress Schedule
1.6	Deliver Shop Drawing Submittal
1.7	HDR Review time for Submittals
1.8	Approval of shop drawing submittal
1.9	Detail Drawings & Bill of Material
1.10	Procurement of Material
1.11	Fabrication
1.12	Transportation of Equipment
1.13	Deliver Equipment to Jobsite
2	**O & M Manuals**
2.1	Create preliminary O & M Manuals
2.2	Deliver Preliminary O & M Manual
2.3	HDR Review of Preliminary O & M Manuals
2.4	Acceptance of Preliminary O & M Manuals
2.5	Create Final O & M manuals
2.6	Deliver Installation and Final O & M Manuals
3	Completed

Figure 5-11 PLACEHOLDER

Because automatic WBS numbers are updated as tasks are moved or added to the WBS, it is not recommended that these numbers be used as a task tracking number. If a task tracking number is desired, consider using the field called "Unique ID". This field is the order, in which tasks were added to the schedule and they will always be unique and will not be duplicated within a schedule.

Customizing WBS Codes

The user has the option of customizing WBS numbers using a **Code Mask** and values entered by the user. When this option is evoked, additional options to re-number the WBS, enforce value uniqueness and optinally generate WBSnumbers become available. The customized number values are helpful when manging multiple projects or if there is a need to reference numbers unique to a project schedule. They are also helpful if using templates that result in frequently used task names. These codes could indicate which tasks are members of which project schedules and where the tasks are located within the project schedule.

To customize the WBS numbers:

- Project → WBS button → Define

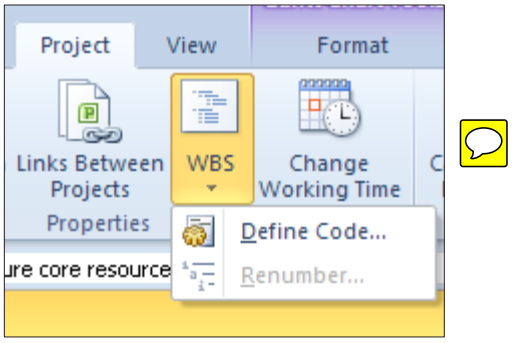


Figure 5-12 PLACEHOLDER

- **Project Code Prefix**: use this value to enter a code that will represent an abbreviation that applies to all WBSs for the project schedule.
- **Sequence**: select the data type for the Code Mask to be created (ie: Numbers, Uppercase letters, lower case letters or numbers)
- **Length**: number of values for the length of the value

- **Separator**: Character symbol - . , - + or /

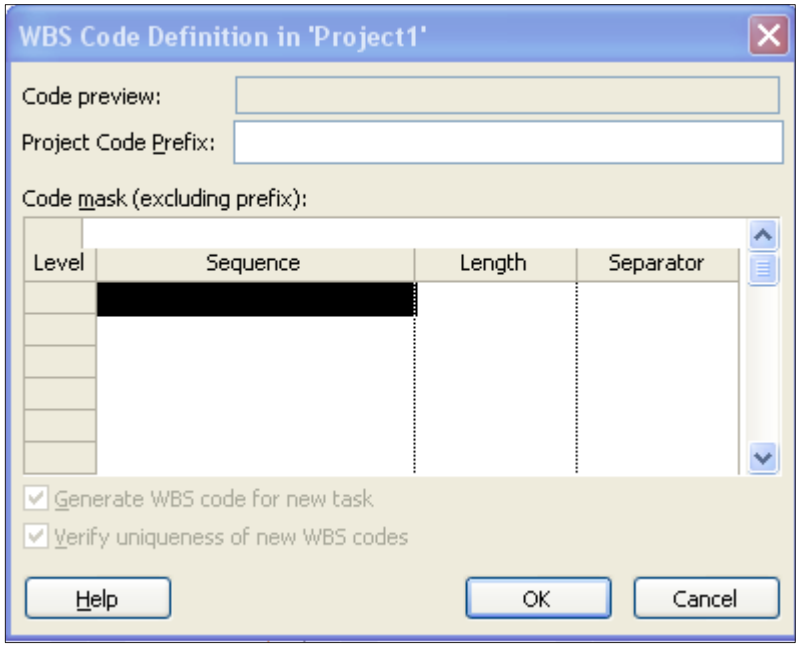


Figure 5-13 PLACEHOLDER

Select as many lines as necessary to create your “Code Mask” and click **OK**

Below is an example of a customized mask for WBS codes:

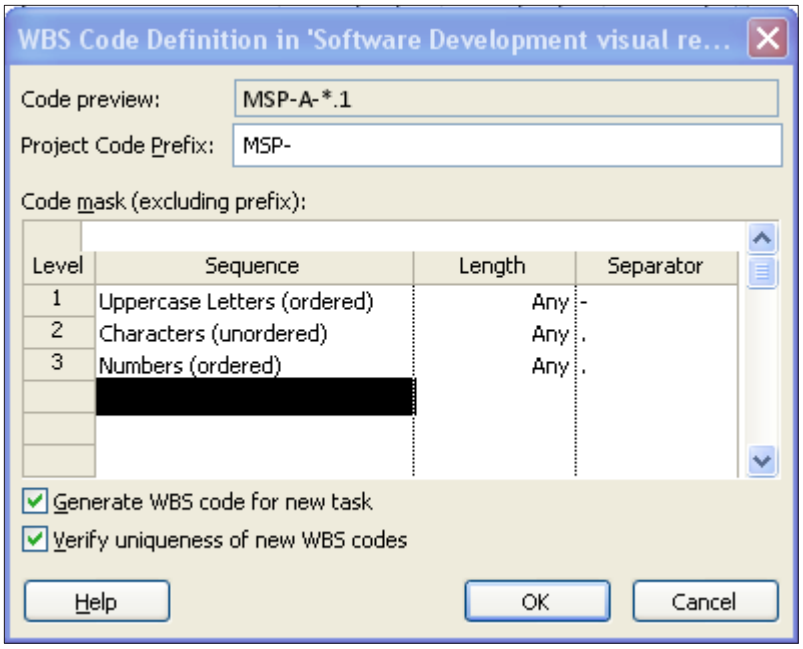


Figure 5-14 PLACEHOLDER

Below is the result of the customized WBS values:

		WBS	Task Name	Start	Finish	Baseline Star
0		**MSP-**	**Software Development visual reports**	**1/16/13**	**7/5/13**	**1/1**
1		**MSP-A**	**Scope**	**1/21/13**	**2/19/13**	**1/1**
2		MSP-A-1	Determine project scope	1/21/13	1/25/13	1/1
3		MSP-A-2	Secure project sponsorship	1/25/13	2/5/13	1/2
4		MSP-A-3	Define preliminary resources	2/10/13	2/19/13	1/3
5		MSP-A-4	Secure core resources	1/21/13	1/29/13	1/1
6		MSP-A-5	Scope complete	2/19/13	2/19/13	2/
7		**MSP-B**	**Analysis/Software Requirements**	**2/15/13**	**3/19/13**	**2/**
8	✓	MSP-B-1	Conduct needs analysis	2/15/13	2/28/13	2/
9	✓	MSP-B-2	Draft preliminary software specifications	3/1/13	3/6/13	2/1
10	✓	MSP-B-3	Develop preliminary budget	3/6/13	3/11/13	2/1
11	✓	MSP-B-4	Review software specifications/budget	3/11/13	3/12/13	2/2

Figure 5-15 PLACEHOLDE

When a **Code Mask** is created, the options to **Generate a new WBS** for a new task and **Verify uniqueness of new WBS codes** become

available.

To renumber the tasks based on the mask values:

- Project → WBS → Renumber

Renumbering may be applied to selected tasks only or the entire project.

Be aware:

To remove a mask: delete lower level entries first and work upwards to higher levels.

After removing the mask, the WBS will not revert back to an unformatted state but will remain as the settings for the customized mask.

If WBS values are turned on as part of the task name the original non-formatted value appears and not the customized value. to turn on the WBS value as part of the task name:

From the Gantt Chart click: View → Outline number

The WBS numbers are shown below included with the task names:

		WBS	Task Name	Start	Finish	Baseline Star
0		MSP-	**Software Development visual reports**	1/16/13	7/5/13	1/
1		MSP-A	**1 Scope**	1/21/13	2/19/13	1/1
2		MSP-A-1	1.1 Determine project scope	1/21/13	1/25/13	1/1
3		MSP-A-2	1.2 Secure project sponsorship	1/25/13	2/5/13	1/2
4		MSP-A-3	1.3 Define preliminary resources	2/10/13	2/19/13	1/3
5		MSP-A-4	1.4 Secure core resources	1/21/13	1/29/13	1/1
6		MSP-A-5	1.5 Scope complete	2/19/13	2/19/13	2/
7		MSP-B	**2 Analysis/Software Requirements**	2/15/13	3/19/13	2/
8	✓	MSP-B-1	2.1 Conduct needs analysis	2/15/13	2/28/13	2/
9	✓	MSP-B-2	2.2 Draft preliminary software specification	3/1/13	3/6/13	2/1
10	✓	MSP-B-3	2.3 Develop preliminary budget	3/6/13	3/11/13	2/1

Figure 5-16 PLACEHOLDER

Best Practices and Standards 

By following some guidelines for creating your Work Breakdown Structure, you can achieve a more effective and manageable project schedule. A WBS's purpose is to help manage a project schedule. When created without guidelines, the project schedule is in danger of becoming another project.

Examples of a few real world project schedules that were not thought out very well:

- Consider a two-task project schedule for a 9-month project. Each task was 6 months long. The first task started on the first day of the project. The second task started during the third month of the project. The project manager could not understand why others could not manage their projects using this WBS. It was later discovered the details of the project were brought out at the weekly status meetings and only told to the team members when they needed to know them. The project manager wanted others to help manage their projects was reluctant to share the details. As a result the lack of communication had an adverse effect on the performance of all projects.
- A resource was tasked with migrating 1500 users from one email system to another. The project schedule contained 1500 tasks – one for each person who was to be migrated. When asked why each name was entered as a task the answer was that the scheduler wanted to know how long the entire project would take. The project schedule was more of a check list than a WBS. The more appropriate level would have been by department. Creating this type of schedule at a higher level would have made managing the work of the schedule more meaningful and easier to maintain.
- A PMO developed a template for their project managers to use while implementing their software packages within organizations that were their clients. Each project implementation took at least a year and each project manager managed 2 to 3 projects simultaneously. The template that was created contained 8500 tasks. The client was not using Project Server and the schedules would need to be updated and maintained manually by the project managers. The PMO created a lot of work for their project managers that would defeat the purpose they were trying to achieve of schedule management. The project schedule they created was a to-do for the projects.

To avoid some of the above problems and pitfalls, consider using some of the following guidelines:

- The WBS is not a to-do list. Are you managing tasks or are you managing a to–do checklist? Usually, tasks or deliverables are entered into the project schedule. Checklists of how to accomplish the tasks are kept in another location such as a Word Document, Excel Workbook or SharePoint list. Expect that all tasks will have checklists, supporting detail, resource requirements and activity lists outside of the project schedule. Very small lists may be kept in the notes area of the tasks.
- Identify deliverables within the WBS. Work from deliverable to deliverable in the development of the schedule.
- Arranging the tasks into summary areas can be a challenge. Imagine a deck of cards: can you arrange them by suit? By color? By number? The deck hasn't changed, just the order of the cards. There is no right or wrong answers. The answer is what will work best for you to use to manage your project.
- Break the deliverables into assignable work. If you are building a house, you might want a task called "Install Electrical" where Electricians can be assigned to the work. This would be a more appropriate level of detail than a task called "Install All Utilities" where Electricians, Plumbers, Carpenters, etc. will all be assigned. When the task is at too high a level, establishing the work, assignments, order and relationships between tasks becomes more difficult.
- Establish a standard design for each section of work. An example of this would be:
    - Summary Task
        - Detail task
        - Detail task
        - Detail task
        - Milestone task

  Using this format will allow for creating high level reports (Milestone reports) easily as well as moving sections of deliverables around easily.
- Every summary task should have at least two subtasks. Tasks and milestones can be in the WBS without being part of a summary task grouping.
- Establish maximum and minimum lengths of duration for tasks. Create a rule of thumb based on the length of each project. For example: If you have a 6 month project no task should be less than 1 day and no task will be longer than 2 weeks.
- Decide if you will be creating a WBS in the rolling wave approach (develop the schedule phases as the project progresses) or a deliverable orientated schedule. The rolling wave type of schedule development is popular for schedules managing software development and other IT orientated

project schedules. It can be used for any project where all of the details of the project are not known at the beginning of the project. Alternatively, a deliverable orientated project schedule might have different organizations working on different sections of the project which all need to be completed at a specific point in time. For example: building heavy equipment. Each section of the machinery might be built by separate organizations, but all pieces must be ready for assembly by the same target date.

- Deliverables: Completing a section of work means that the deliverable of that section has been accepted. Create a task for the delivery of the deliverable and create a milestone to represent the acceptance of the deliverable. The two are rarely occur at the same time.
- Level of detail. Project 2013 will allow for a maximum of 99 levels of WBS details. Best practices for level of detail is to develop schedules at five or less levels. If a WBS were built 20 levels deep, this would mean the project manager would have to dig through 20 levels of titles before uncovering the work of the project.
- If too much detail is put into the project schedule, the schedule will become a project unto itself. In the third example above, the WBS was a check list and not based on tasks to manage. Schedules will be tracked and tasks will change over the course of the project all of which will require the project manager's attention. The more tasks, the more work.
- Use the WBS to help manage the scope of your project. If the task isn't in the project, consider it out of scope. When you enter tasks into the project schedule, ask yourself if the task is necessary.
- When planning the WBS think about just the work of the project. Many project managers like to start thinking about who will do the work and when. It is a good idea to focus on the work of the project only and think of the work as the "what" of the project. The "who" and "when" will come as the project schedule develops.
- Having the project team or the top level resources help build the WBS for a project is a win-win for the project:
  - Increases resource buy in
  - Encourages resource contribution
  - Many eyes looking at problems from different angles
  - Less probability of missing tasks
  - Encourages team building

Enter Tasks

Project Summary Task

Milestones

A milestone is a check point in your project. It is a status, not a task which means that it has no duration and no resources are needed. For example, an approval or sign-off before the project can proceed and the completion of a stage of the project are both milestones. To Project, a milestone is a task with a zero duration.

To enter a milestone, use the following steps:

1. Insert a new task, or click the Task Name of a blank task.
2. Type the name for the milestone in the **Task Name** field and press the **Tab** key.
3. Type "**0**" in the Duration field, and press the **Enter** key.

Milestones are denoted in the Gantt Chart as a diamond symbol, rather than a bar (since the milestone has no duration).

Indenting

Type in Tasks

Entering tasks into Project 2013 is as easy as typing the task name into the Task Name field. When entering a new task, keep in mind that data is being populated in an array of fields for that row; several hundred fields will be created and some populated. After tasks are entered they may be moved, deleted, or copy/pasted to other areas of the schedule. It is also recommended that the Project Summary Task be turned on to aid in schedule development.

To turn on the Project Summary task:

- Click on **Format → Project Summary Task** (In the show/hide section on the right)
- Click the **check box** to turn on

To enter a new task:

- Click the **Task Name** field on the row you would like to enter and type the task name.

To move a task to another location in the schedule:

- Left Click on the task number (ID) in the left column. Hold the click down and wait for the 4 way arrow to appear and drag to the task to the new location. (Works well when the new location can be seen on the screen)

OR

- Click on the **task number** of the task you wish to move
- Click **copy** (or cut)
- Scroll to the new location
- Click **Paste** – Project 2013 will insert the pasted task

Entering blank lines to receive the moved tasks is not necessary. The schedule will insert the lines and move tasks down to accommodate the moved tasks.

To add blank lines schedule between existing tasks:

- Right click on the **task** below the location of the new task to be inserted
- Click **Task → Task** – a blank row will be created above the task selected

OR

- Click on a task
- Click **Insert** key on the keyboard

In the view below task 38 was entered using the Task → Task insert method. Note the default data and <New Task> name entered. Task 40 was the result of clicking the Insert key on the keyboard.

	Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
36	Review modular code	5/8/13	5/15/13	4/18/13	4/24/13	14.75 days	14.75 days
37	Test component modules to product specifications	5/15/13	5/17/13	4/25/13	4/26/13	14.75 days	14.75 days
38	<New Task>	5/17/13	5/20/13	NA	NA	0 days	0 days
39	Identify anomalies to product specifications	5/20/13	5/23/13	4/29/13	5/1/13	15.75 days	15.75 days
40							
41	Modify code	5/23/13	5/28/13	5/2/13	5/6/13	15.75 days	15.75 days

Figure 5-17 PLACEHOLDER

To delete tasks from the schedule:

- Right click the task to be deleted
- Click **Delete Task** option

OR

- Click the task to be deleted
- Click the **Delete** key on the keyboard

If you have clicked anywhere within the task row and deleted the task a Smart Tag will appear to ask if you want to clear the field or delete the task.

In the view below the result of clicking on the Smart Tag (the X with the down arrow) is shown. Make your selection from the choices in the box below.

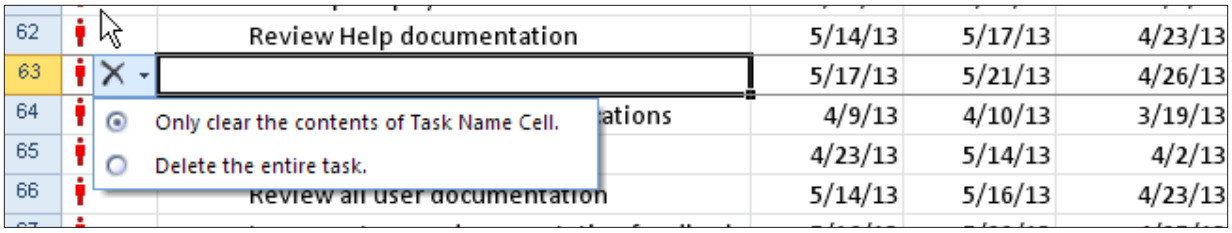


Figure 5-18 PLACEHOLDER

Project 2013 has the ability to temporarily inactivate a task from the schedule. This is an alternative to deleting a task.

This option is only available in Project 2013 Professional.

The benefits of inactivating tasks as opposed to deleting tasks are:

- The task will remain in the schedule and could be reactiated if necessary
- The inactive task will not be considered by the scheduling engine.
- Relationships will stay in tack and should be removed which will be discussed in Chapter 6, *Estimating, Linking and Lead and Lag*.
- It a task was previously included in the baseline for the project, the data will stay in with the project
- If there is a question whether a task should be included it could be entered in an inactive state so it is not forgotten
- The inactive task has unique formatting to indicate that it is inactivated.

In the view below task 27 has been inactivated. Note the alternate formatting:

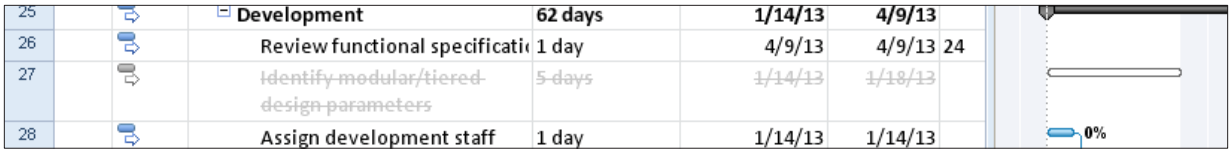


Figure 5-19 PLACEHOLDER

To inactivate tasks in the schedule:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section

To reactivate an inactivated task:

- Click the task
- Click **Task ribbon** → **Inactivate** in the schedule section

When tasks are entered you will note that the column to the left of the task name is a column called “Task Mode” This column will reflect the default task mode for scheduling of the tasks. By default the task mode is manual, with the other option being automatic. The status of this mode will make a difference in the appearance of the entered task. This is an option that is controlled either on a per task basis or as a preset option as a default of the schedule. We will discuss this new Project 2013 scheduling option in *Manual scheduling* on page 123.

Outline Levels

The schedule is listed in a hierarchical format in the Entry table. This is a visual cue as to the grouping of tasks within the project. If you have a large project, you can group certain related tasks together under summary tasks to define the major phases of your project. For example, if you have five tasks in your project that are all related to writing, you can group them under a summary task called “Writing.” The tasks under a summary task are called subtasks.

Summary tasks appear in bold type, while the individual subtasks appear under the Summary task.

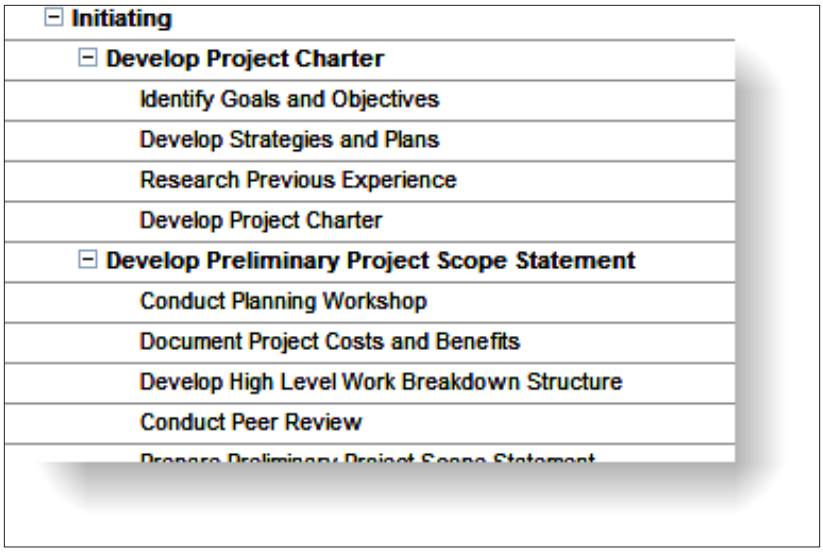


Figure 5-20 Task List

Indenting and Outdenting Tasks

Indenting and outdenting tasks provides a way to create an effective outline structure. The outline format allows you to control the level of detail Project displays. You can display every task in your project, or you can display only the summary tasks. Project allows you to have multiple outline levels in your project, as you would in a complicated report or paper.

When you indent one or more tasks, Project demotes each of the selected tasks one level, converts the task immediately above the first selected task into a summary task, and changes the duration of the summary task to reflect the total (rolled up) duration of the subtasks.

When you outdent one or more tasks, Project promotes the task one level.

As tasks are entered into the Entry table, the task will inherit the level of indenting of the previous task. Tasks can be indented or outdented as needed to create the level of hierarchy needed.

To indent a task:

1. Select a task in the Entry table.

2. On the **Task** tab, **Schedule** group, click the green arrow pointing to the right. Repeat clicking the green arrow icon to continue to move the task to the desired indent level.

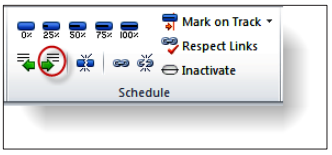


Figure 5-21 Indenting a Task

To outdent a task:

1. Select a task in the Entry table.
2. On the **Task** tab, **Schedule** group, click the green arrow pointing to the left. Repeat clicking the green arrow icon to continue to move the task to the desired indent level.

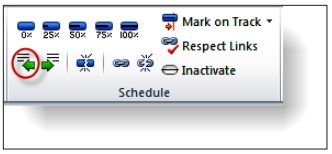


Figure 5-22 Outdenting a Task

Collapsing and Expanding the Outline

One of the main benefits of outlining is that you can control the level of detail that Project displays. For example, if you want to inform upper management about the status of your project, they may not be interested in the daily tasks, only the major phases. You can collapse the outline to display only summary tasks, you can expand the outline to display all of the tasks, or you can display the subtasks for some summary tasks, but not for others.

The boxes containing plus (+) or minus (-) signs to the left of the summary tasks are called outline boxes. If an outline box contains a plus sign, it means that the summary task has subtasks under it and can be expanded. If an outline box contains a minus sign, it means that the sum-

mary task is expanded and can be collapsed.

To collapse the schedule outline:

1. Select the desired Summary task.
2. Click the minus (-) sign icon to the left of the Summary task.

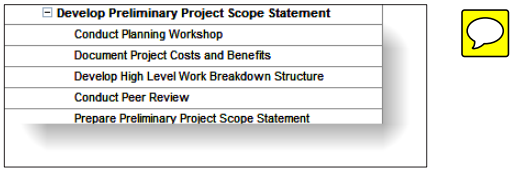


Figure 5-23 Minimize a Summary Task

To expand the schedule outline:

1. Select the desired Summary task.
2. Click the plus (+) sign icon to the left of the Summary task.

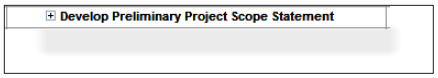


Figure 5-24 Expand a Summary Task

Project provides a Ribbon icon to quickly change the indent level viewing for the schedule. This action will apply the outline level to the complete schedule.

To view different outline levels:

- In the **View** tab, **Data** group, click the **Outline** dropdown arrow and select the desired outline level to view.

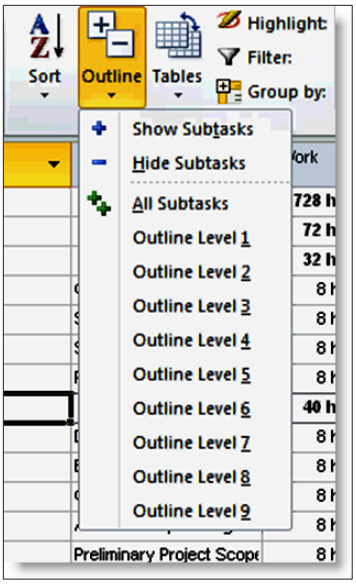


Figure 5-25 Outline Dropdown Menu

Moving and Copying Tasks

If you want to create a task that is similar to an existing task, you can copy the existing task and then modify the copy. If you copy a task either from or into a list of tasks linked with Finish to Start relationships, Project inserts the task and adjusts the links so the original tasks remain sequential.

To copy a task:

1. Select the entire row of the task you want to copy by clicking on its ID field. If you only want to copy one field, such as the task name, select only that field.
2. In the **Task** Tab, **Clipboard** group, click **Copy**. Project copies the task to the Clipboard.
3. Select the task below the line the task will be inserted.
4. In the **Task** tab, **Clipboard** group, click **Paste**.

Keyboard shortcuts `Ctrl+C` (copy) and `Ctrl+V` (paste) will work as well.

You can also copy a single cell of data, rather than the entire task row.

Be aware that when you paste the contents of a single field, Project overwrites the contents of the field into which you paste. If you paste the single field into a blank row, Project creates a new task.

To move a task:

1. Click the ID number of the task to select the entire row.
2. Drag the entire task to the new location, between two existing tasks.

If you drag the contents of a single field to another field, Project overwrites the contents of the field.

If you move a task that is within a series of tasks that are linked sequentially, Project automatically adjusts the link relationships of the remaining tasks to reflect the new task order. Project does this only if the current task is linked to the task directly above and below. The moved task will maintain the original link to predecessors. Linking to a new series will need to be done manually.

Copy, Delete, Edit, Insert, etc.

Move Around

WBS Code Field 

As the WBS structure is created, an automatic numbering sequence is also created within the task list. The numbers represent where in the WBS structure the tasks reside. This is a unique numbering scheme and numbers are automatically reassigned as tasks are moved around the WBS structure. There are default number values and customized WBS number values. In this lesson, we will address the standard WBS values; the following lesson will address the customized values available.

To view insert the WBS column into a table:

- In the Gantt chart view right click on a column heading. It is best to right column in the column to the right of where the new column should be inserted
- Select Insert Column
- Click the **W** key on the keyboard
- Select "WBS"
- Click OK

Below is an example of WBS numbering schema:

WBS	Task Name
0	**Municipality of Springfield**
1	**Influent Screens**
1.1	Enter order
1.2	Set-up Progress Schedule
1.3	Engineer Set-up
1.4	Drafting
1.5	Deliver Progress Schedule
1.6	Deliver Shop Drawing Submittal
1.7	HDR Review time for Submittals
1.8	Approval of shop drawing submittal
1.9	Detail Drawings & Bill of Material
1.10	Procurement of Material
1.11	Fabrication
1.12	Transportation of Equipment
1.13	Deliver Equipment to Jobsite
2	**O & M Manuals**
2.1	Create preliminary O & M Manuals
2.2	Deliver Preliminary O & M Manual
2.3	HDR Review of Preliminary O & M Manuals
2.4	Acceptance of Preliminary O & M Manuals
2.5	Create Final O & M manuals
2.6	Deliver Installation and Final O & M Manuals
3	Completed

Figure 5-26 PLACEHOLDER

Because automatic WBS numbers are updated as tasks are moved or added to the WBS, it is not recommended that these numbers be used as a task tracking number. If a task tracking number is desired, consider using the field called “Unique ID”. This field is the order, in which tasks were added to the schedule and they will always be unique and will not be duplicated within a schedule.

Manual vs Automatic

Intro and the Basics

Project 2013 provides two scheduling methods for creating project schedules. The methods are the traditional or automatic scheduling and manual scheduling.

Traditional or automatic scheduling

This scheduling method was used in prior versions of MS Project and is contained in Project 2013. After tasks are entered relationships or dependencies are created between the tasks. The task durations with their relationships established the timeline for the schedule. This scheduling method allows for bottom up scheduling where the sum of the detail tasks establishes the time line for the project.

Manual scheduling

Manual scheduling allows for top-down scheduling where summary tasks may be added first and the details of the project work is completed later. It also permits more unknowns during scheduling process and the ability to complete the details when known. Tasks do not have to contain relationships and scheduling dates may be entered.

Project scheduling mode will be selected on a task by task basis. Manually scheduled tasks and automatic scheduled tasks may be mixed within the same project schedule. Each task will contain a column called **task mode** which will establish the scheduling mode assigned to a task.

When to Use Manual vs. Automatic Scheduling 

Manual vs. automatic scheduling usage is a personal preference. The project manager's schedule management expectations, experience and goals will be included when deciding to use one method over the other. The amount of information concerning the project that is available to the scheduler when the schedue is created should also be taken into consideration. It may be advantageous to use both scheduling methods within a schedule switching between scheduling methods when needed.

Use Manual scheduling when:

- Minimal information is available about the project and you need to put your ideas into an initial schedule.
- Tasks are assigned to specific dates and you are not comfortable with the schedule moving as other tasks are entered or as resources are assigned.
- Using top-down planning – entering duration values for summary tasks followed by detail tasks and milestones to complete the work of the summary tasks.
- Using free form planning of tasks and durations to produce a Gantt chart.
- Need to build a rough schedule for a future project
- Relationships are not known.
- Manual scheduling is your most preferred method. Enter as many durations, relationships and dependencies as you need to help establish the timeline. This will help with critical path calculation as well.

Use Automatic scheduling when:

- More complete information is known about the goals of the project.
- Using bottom up planning. Enter the summary tasks names only. The detail tasks within the summaries will calculate the duration of the summary tasks.
- You want the schedule to be dynamic. Tasks will be re-scheduled based on work completed and associated dependencies. The scheduling engine will help keep you on track for the project and help you manage to an end date.
- You want the scheduling engine to calculate dates in the schedule.
- Resource allocations, earned value and more accurate metrics are needed.

Consider using a combination of both methods when:

- Initial planning could be in manual mode. As decisions are made and more detail is known, tasks may be converted to automatic mode.

- Consider converting to automatic mode when project execution begins. This may be done for the entire project, by phase or range of tasks.

  Project files from earlier Project versions:

- When Project 2013 opens projects schedules created in earlier versions tasks will be locked in automatic mode and the mode can not be altered unless they are upgraded to a Project 2013 file.
- Saving the file with a new name converts the file to a Project 2013 file and the automatic/manual mode option becomes available.
- The Type Mode field might not be visable when opening projects of earlier versions. When attempting to insert the Task Mode column into a table, the column will not be available.

Basic Discussion 

Project Live Cycle Approach

Chapter 6

Estimating, Linking and Lead and Lag

Overview of Estimating

Estimating is the ability to make an educated guess as to the duration, work or duration and work of a task. It is an art to know how long a task will take and how manyresources are required and of what skills are required for a task.

How Project 2013 Defines and Calculates Work and Duration 

It would be helpful to understand the formula that will be driving the scheduling of the tasks before you enter your estimates:

Work = Duration * Units (quantity of a resource)

OR

Duration = Work / Units (quantity of a resource)

Estimating Techniques

- **Top down estimating**: used when performing the same types of projects frequently. Top-down estimating allows for estimating the length of a phase. The details for tasks will follow. Manual scheduling mode in Project 2013 allows for this type of estimating model.
- **Bottom up estimating**: estimating each task work package or deliverable of the project (this could be at the task level) will allow for the accumulated roll up of the values to create the length of the project. The roll up will accumulate at the summary task levels as totals for duration, work and

cost. In turn, the summary tasks will roll up to the project summary task for a grand total for the project.

What to Estimate?

- Estimate duration (length of time) in minutes, hours, days, months, etc.
- Estimate work (amount of work) in minutes, hours, days, months, etc.
- Estimate duration and work in minutes, hours, days, months, etc.

Where Do the Estimates Come From?

Estimates may come from the project manager, team members, subject matter experts, stakeholders, historic data, experience, etc.

How Do You Get Good Estimates?

Ask the right people: look for the most experienced person in a specific skill area. Chances are, they have worked a project similar to or have actually performed the work in the past. These types of people can be invaluable to a project manager for estimating.

Ask the performing resource: if you are lucky enough to know who your resources will be for the project, the performing resource is always the best source for an estimate. However, how you ask the resource for

the estimate will make a difference. If you ask for an estimate, most people are thinking about fitting the work into their current workload. Framing the question from the point of view that the project will be worked some time in the future will result in a more accurate response. They should only consider how long (or how much work) it would take to perform the task regardless of the specific timeframe.

Ask more than one person: seeking various points of view for estimates will help define what the best estimate is. Project 2013 has an add-in feature called PERT which allows for 3-point estimates for task durations. The 3 points are pessimistic, most likely and optimistic. These values are feed into a formula that will result in an estimated duration of a task. The result will be three Gantt Charts: Pessimistic, Optimistic and Most likely.

Subject Matter Experts: always a good source for advice.

Padding, slack, and time reserve should be included in any schedule. Every organization and project management methodology has its own approach. The important point is that extra time should be built into all schedules to help manage the inevitable contingencies that will occur during the performance of all projects. If padding, slack or time reserves are not included in the planning, the schedule will not be realistic and will result in a reduced probability of completing the project as planned.

Entering Estimates

The Entry table of the Gantt chart is designed for easy entry of task estimates. Adding the work column to the view will enable adding Work estimates.

To insert the work column in to the Entry table of the Gantt Chart view:

1. **Tasks → Gantt Chart** (the default value will be the Entry table)
2. Right click on the column heading **Start**
3. Select Insert Column
4. Click on the "W" key on the keyboard
5. Click on **Work**
6. Click ok to close the box

For each task enter:

- A duration value

- A work value
- A duration and a work value

Valid entry values:

- 1m = 1 minute
- 1h = 1 hour
- 1d = 1 day
- 1w = 1 week
- 1mo = 1 month
- 1 y = 1 year

Abbreviations of the time values may be customized in the Schedule options:

File → Options → Schedule

Duration entries will be scheduled as work days as defined by the project calendar.

Physical days (actual day count including non-working days) may also be achieved by using the **Elapsed** time. By placing an "E" in front of the letter in the duration field, the value will be scheduled in physical number of days. For example: 13 ed = 13 physical days.

In the example below, Task 1 is scheduled as business days (using the project calendar) and Task 2 is scheduled as physical days. Note the scheduling difference:

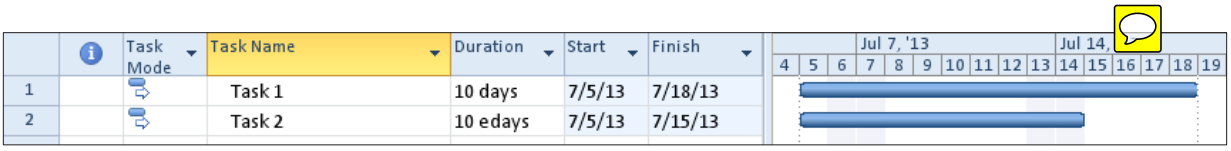


Figure 6-1 PLACEHOLDE

Other helpful information:

- When task durations are entered, a "?" will be added within the duration field. This "?" represents that the task information has not been finalized and considered estimated. This indicator is optional and may be turned off at **File → Options → Schedule** and un-checking the following options:
  - Show that scheduled tasks have estimated durations
  - New scheduled tasks have estimated durations

- Some project mangers plan all tasks in fixed duration. It should be noted, that fixed duration tasks will be tied to calendar dates and might be more difficult to schedule and track in the future.
- Manual scheduling mode for a task has the benefit of not requiring values in duration, start and finish columns. Text may be added as a note to the scheduler. If the task mode is changed to automatic scheduling, the text will be lost and, the software will enter a valid values. Scheduling modes are discussed in *Manual vs Automatic* on page 123. In the view below note the values in the duration, start and finish columns for Task 2:

	Task Mode	Task Name	Duration	Work	Start	Finish
1		Task 1	10 days	0 hrs	7/5/13	7/18/13
2		Task 2	*ask Bob*	0 hrs	*unsure*	*future*

Figure 6-2 PLACEHOLDER

Inserting **Effort-driven** and **Type** columns will allow for setting these values for each task as well. As discussed in Chapter 4, *Start a Project*, each task will be unique in the nature of the work to be performed. As a result, these settings should be adjusted to determine what task type and effort-driven values are appropriate for a task.

Estimating for Unknown Resources

Most project managers plan the work for a project and find out what specific resources will perform the tasks in the future. Tasks might require a specific skill level but the quality of the unfamiliar resource is unknown. How do you plan for unknown resources?

When estimating tasks, consider estimating a task for a senior level resource or a junior level resource:

- The senior level person would accomplish the task faster and would cost more.
- The junior level resource would cost less but needs more time and training.

Outsourcing resources: although there is a quantity of highly qual-

ified contract resources, the recommendation is to estimate these tasks at the junior level. You will need to account for learning curve, assimilation into your organization and ramp up. The project manager might request a specific skill level but it is unknown whether or not that skill will be available when the project requires it.

As mentioned earlier, the PERT estimating method could give a 3 point duration estimate. Using PERT will result in 3 different reports; an optimistic Gantt Chart, a pessimistic Gantt Chart and an expected Gantt Chart. The PERT estimating module is an add-in in Project 2013 and is available at no cost as a download from Microsoft.

Add Elaspsed Time

Duration, Work, or Duration & Work

Types of Durations

Concept of the Scheduling Engine

Dynamic scheduling is the use of task relationships and dependencies to drive the sequence and ultimately the timing of the schedule. Project's scheduling engine supports dynamic scheduling.

This means that as you make adjustments to certain tasks as the project progresses Project automatically recalculates the effect on subsequent tasks. This will also show the project manager if the overall schedule is extended and provide analysis opportunity to monitor if the change creates multiple critical paths, potential resource constraints, and so on.

Project will also highlight those tasks affected by a change so the project manager can easily see the ripple effect of the current proposed task changes. With the 99 levels of undo in Project 2013, a project manager can also utilize this highlighting feature to conduct Monte Carlo or What If, analysis to analyze multiple scenarios of task adjustments to the schedule.

If constraints are utilized to lock in task dates this disables Project's built-in scheduling engine and a project manager will not be able to see the effects downstream in the schedule. Maintaining this dynamic visibility is vital in effectively and proactively managing a schedule. This is why it is a best practice to not use constraints, unless necessary and appropriate to the task.

Linking

Task Dependency Types

Project 2013 allows for 4 types of task dependencies. These dependencies establish the order that the tasks will be performed. Dependencies may also be referred to as links, relationships or relationships between tasks. The result of creating task relationships is a network of related tasks establishing a time line. When referring to linked tasks the following terms will apply:

- A task that has a relationship directly before a task is known as a predecessor task
- A task that has a relationship directly after a task is known as a successor task

In the view below there are 4 tasks. The relationships are established as link lines between tasks.

- The predecessor task or task that comes before Task B is Task A.
- The successor task or task that comes after Task B is Task C.

Pointing to a link line between tasks will reveal information regarding the relationship between tasks. See the highlighted box below which is showing the details of the relationship between Task C and Tack D.

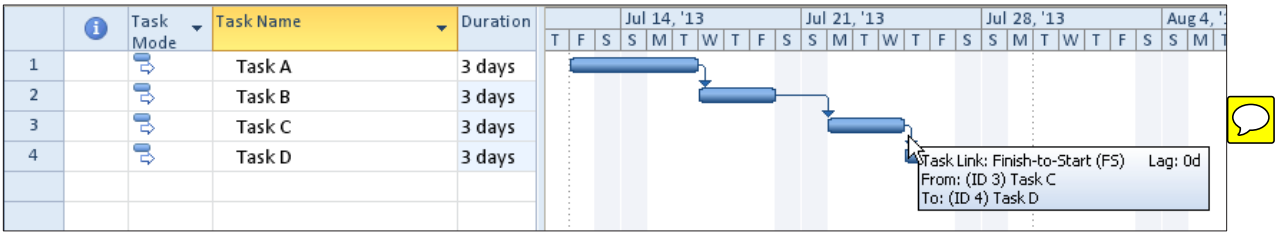


Figure 6-3 PLACEHOLDER

Not all dependencies are the same. Some tasks will start at the same

time where others might be schedule one after the next. To facilitate scheduling needs, there are 4 dependency types which are:

- Finish-to-start
- Start-to-start
- Finish-to-finish
- Start-to-finish

The details of each of the relationship types is described below:

- Finish-to-Start (FS)
  - Default dependency for the Project 2013
  - Task 1 must complete before Task 2 can begin
  - This relationship type creates a waterfall effect
    - Example: Drive to the restaurant, then eat dinner
      Build a wall then paint the wall

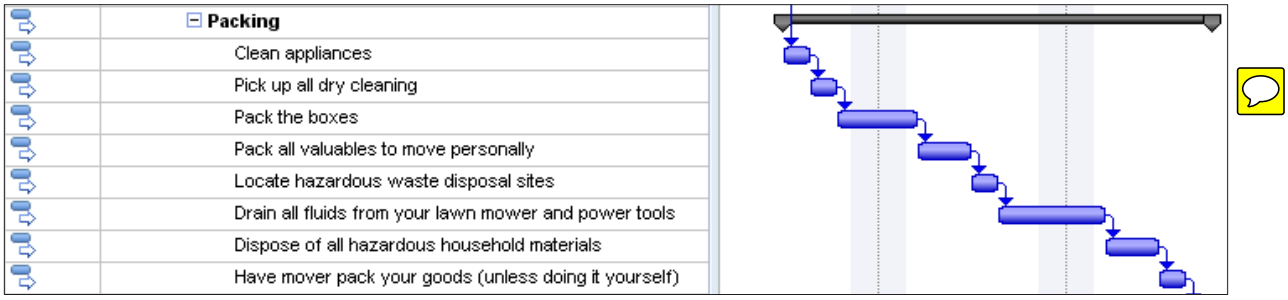


Figure 6-4 PLACEHOLDER

- Start-to-Start (ss)
  - Tasks that are scheduled to start at the same time
    - Example: After the moving expenses are calculated, then determining the best moving method, create a moving-expenses file and create a moving binder may all start at the same time. All 3 tasks should be completed (in this example) to pass the milestone and move on to the next section of work. It should also be noted that the 3 tasks that are starting at the same time are not scheduled to complete at the same time. As a result, the longest task will determine when the milestone will be scheduled.

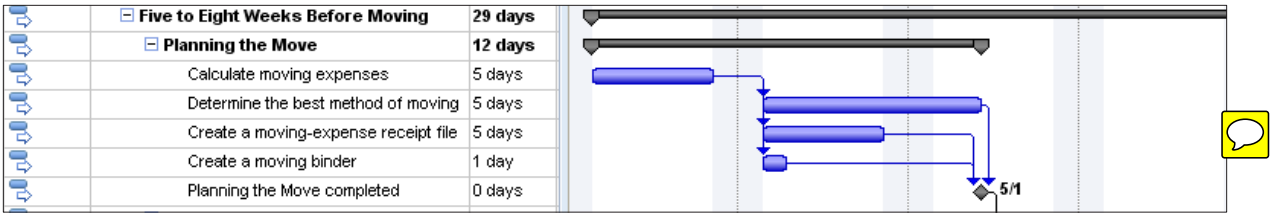


Figure 6-5 PLACEHOLDER

- Finish-to-Finish (FF)
  - Tasks that are scheduled to finish at the same time but not required to start at the same time.
    - Example: The section of work below can all start when the previous section is completed. These tasks will start at different times, but they all need to be completed by the same point in time.

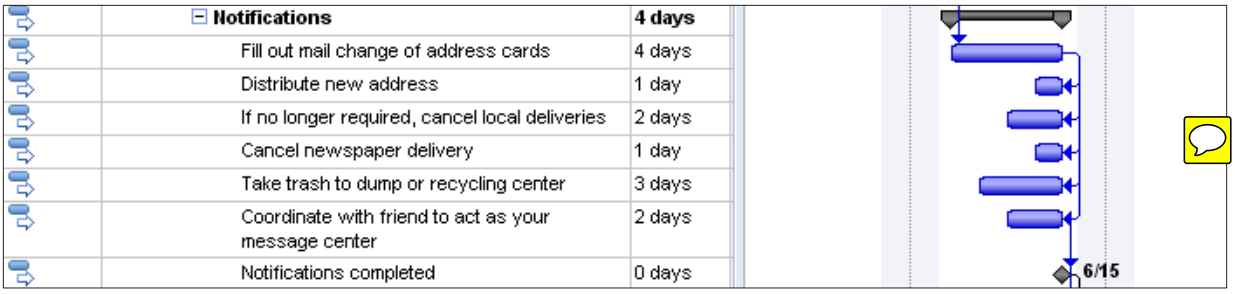


Figure 6-6 PLACEHOLDER

- Start-to-Finish (SF)
  - The start date of the predecessor task will determine the finish date of the successor task.
  - This is the least used dependency type and rarely used.
  - Example: When the new software module comes on line, the old software will be taken off line

When working with manually scheduled tasks, errors might result using dependencies. A warning is viewed when tasks are linked and dates are entered into the start or finish columns. The calculation of the project duration might not match the duration calculated when the entered dates are taken into consideration. Below is an example of an error created when a date was entered in the start column for Task B. The error is represented by the red line under the incorrect date and the dots around the Gantt bars.

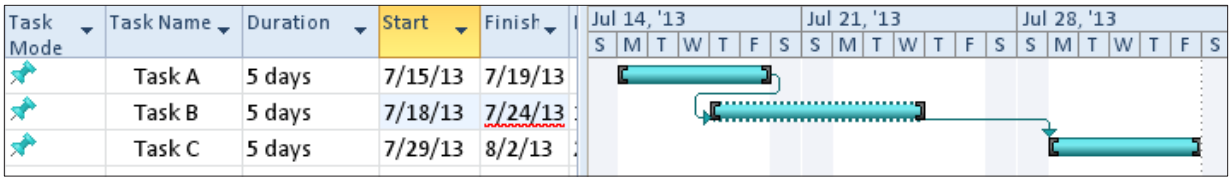


Figure 6-7 PLACEHOLDER

To correct this type of error, Project 2013 has a new feature called Respect Links. Right click on the red error line and following choices appear. Select the Respect Links option and the date will be recalculted based on the task relatioships.

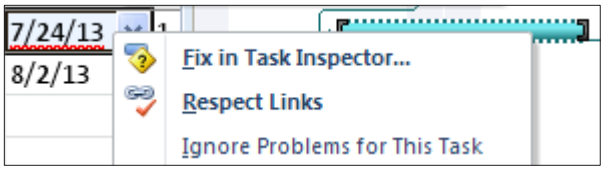


Figure 6-8 PLACEHOLDER

Below is the result of clicking on the Respect Links option for the task. Note the error message is no longer visable and the task in error has been rescheduled.

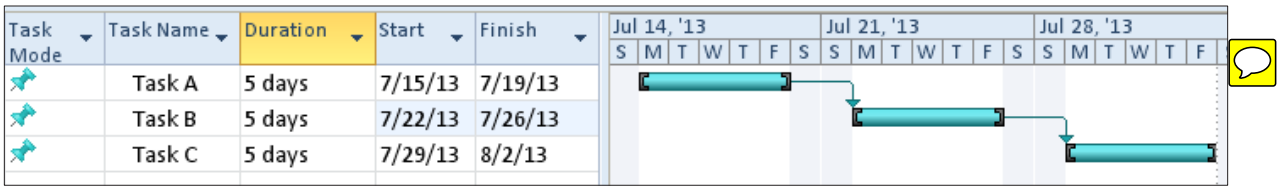


Figure 6-9 PLACEHOLDER

Best Practices for Using Dependencies 

Project 2013 calculates the duration of a project based on how task dependencies are created between tasks. Establishing the order of the tasks is called Sequencing. Sequencing is concerned with establishing the order tasks should or could be performed. Arranging tasks in the most efficient order for the project is not an easy exercise. Sometimes, the order of the tasks is very evident and at other times, more complicated. Sequencing is more option than right or wrong for a project.

For example, the following tasks are tasks that someone would do when they come home after work and before they go to bed:

1. Arrive Home
2. Eat Dinner
3. Walk the dog
4. Run an errand
5. Read the mail
6. Clean up the dinner dishes
7. Cook dinner
8. Go to Sleep
9. Get the mail
10. Watch the news

Take a minute to write down the numbers of the tasks above in the order you would perform these tasks.

Things you might notice:

- You will have some forced relationships:
  - You can't eat dinner until you make dinner
  - You can't read the mail until you get the mail
- You will also notice that Arrive Home and Go to Sleep are the start and finish of the sequence.
- Some tasks can occur at any time and are not dependent upon another tasks
- Some tasks you might consider doing differently, like picking up dinner on the way home. It would accomplish the same purpose and save time.
- Can any tasks be done at the same time as other tasks to save time?
- Should any tasks be eliminated?

Next rework this same sequence of tasks knowing that someone else

will help perform the tasks. Does it turn out differently? Would it take less or more time? Some tasks you have to do yourself and some tasks can be performed by someone else.

Best practices to consider when creating dependencies:

Relationship between tasks will allow you to create network of related tasks. The network will show order the tasks will occur. Below are some best practices which should be considered when creating relationships:

- All tasks should have both a predecessor and a successor. The timeline for the project is based on this concept. If tasks are not linked in the network of tasks, their duration will not be accounted for within the timeline. Making sure all task durations are accounted for will avoid surprises at the end of a project.
- When creating dependencies or relationships, apply the rule – because I can, is it a good idea? Do not link every task to every other task. In the example above, should you should have linked Arrive Home with Go to Sleep with the logic of if you don't come home, you can't go to sleep? The answer is no. Only the last task that is completed before Go to Sleep should be linked to Go to Sleep.
- Think about what task pushes or influences another task. If a task is late, what other tasks will be affected? Link only tasks with a direct affect on a successor task. Ask yourself what needs to be completed before you can do the next step and if it is late, which tasks will be affected.
- Link detailed tasks and milestones only. The completion of tasks will push the milestones or the short term goals. Linking summary tasks means that an entire section of work must be completed before the next section may be started. Ask yourself if that is true for your situation before linking at the summary level. Linking summary tasks is not recommended.
- Tasks should always be linked to push milestones. For example: define what the definition of "project completed" is. The multiple parallel paths that must be completed to conclude the project should all be linked to the ending milestone. If any of the parallel paths take longer than planned, the milestone date will be pushed out in time.

In the example below "Start the Project" is the starting milestone. The next 3 sections of work all start when the project starts. All 3 sections must be completed before the house is ready to sell. If any of the sections take longer, each section has the ability to push the ending milestone or when the house is ready to sell. The longest of the parallel paths will be considered the critical path or the section that determines the timeline of the project.

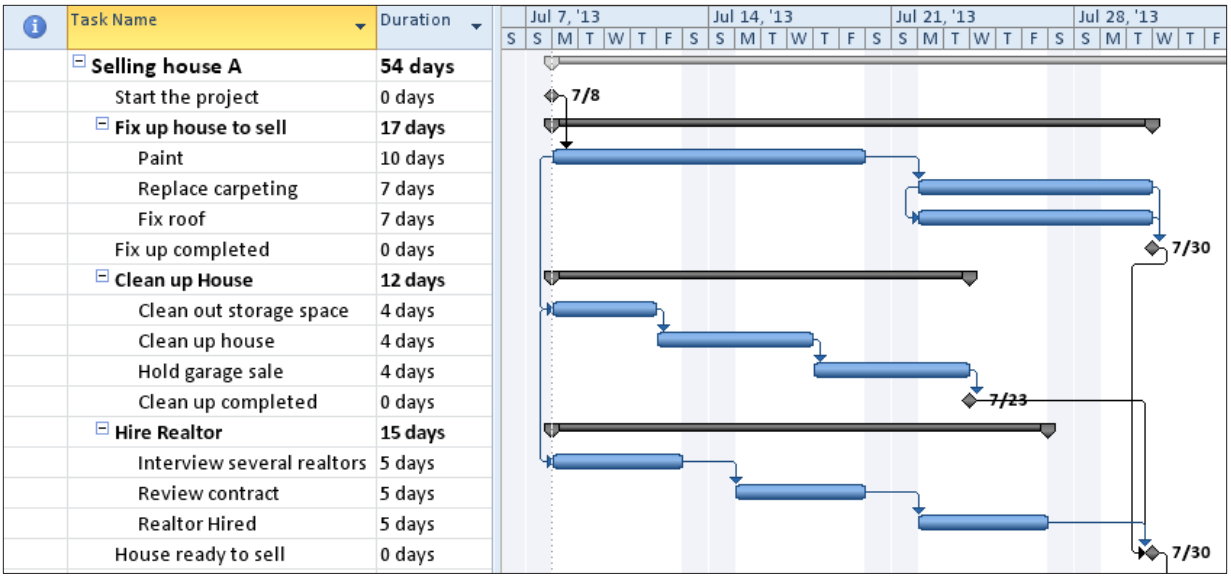


Figure 6-10 PLACEHOLDER

- Create as many parallel paths as possible to shorten the schedule. Use of the Start-To-Start and Finish-To –Finish relationships will help create parallel paths and shorten the project time line. Be aware, however, just because you can schedule tasks in parallel, you might not have the resources to perform the work and which could extend the timeline.
- Do not link tasks based on a resource. Some people will plan tasks to occur at specific times because they think that a resource will be available at that time. Chances are the expected resources will not be available at the planned point in time because other tasks for that resource have changed. Plan the schedule for the work required and plan/arrange for required resources as the time draws nearer to when the task will be performed.
- Links may be external to the project. Project 2013 will allow dependencies to exist in other projects that are linked to tasks in your project. This is similar to links in Excel. In Excel, if links between files are created and the files are relocated, the links will be broken. Project 2013's links between project files will work the same way.

Project 2013 also offers the option for tasks that are moved or added to the schedule to automatically link in a Finish-to-Start relationship or not be linked at all. This is a personal preference and may be applied to a specific project or all projects viewed on your desktop.

To view or change this option: **File → Options → Schedule**

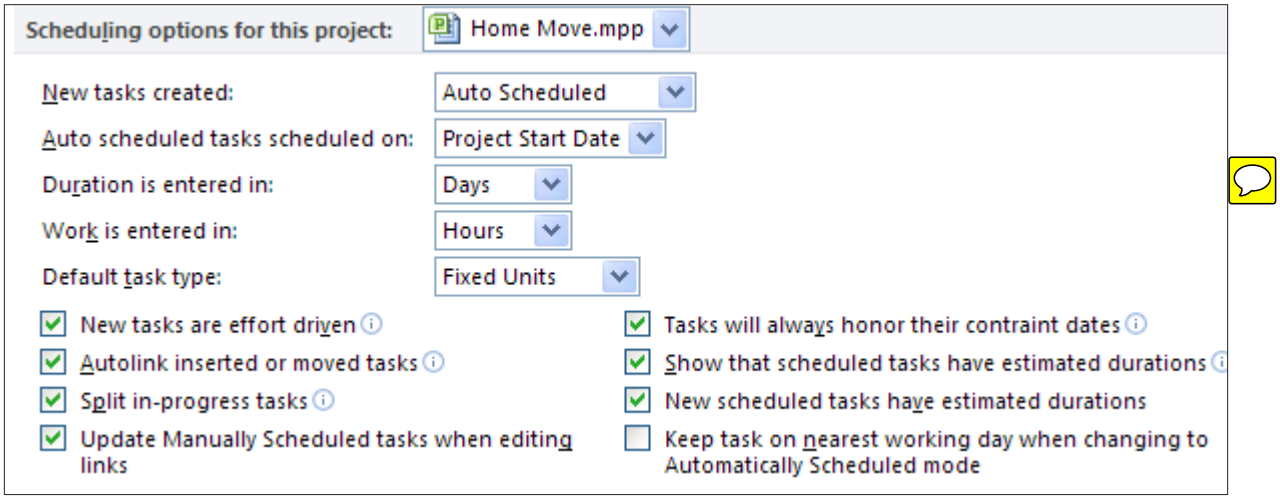


Figure 6-11 PLACEHOLDER

Lead & Lag

Relationships between tasks are not always absolutely defined as described with relationships. Allowing for Lead and Lag time will help refine a schedule to bring it more in line with the actual timeline for the project. Lead and Lag time will allow for wait time between tasks and overlap of task activities.

In this Lesson we will discuss:

1. What is Lag time?
2. What is Lead time?
3. Best Practices for using Lead and Lag time

What is Lag Time?

Lag time is used to provide wait time between tasks. The time will be expressed in business days or valid project calendar working time. Lag time should be used to extend the timeline of the project when only duration needs to be added to a schedule and will not add work or cost. For example: New concrete is poured and you must wait 6 days before you can drive on it. The time must occur but no work or cost is added to the task. A dependency must first exist between tasks before Lag time can be created.

To create Lag time:

Double click the relationship line between tasks where you would like to add the lag time. The task dependency dialog box below will appear. In the illustration below, we see that there are 2 tasks. After the equipment is ordered there will be a 2 week delivery wait time before the equipment is received. To create this wait time, set the Lag field to 2w (2 weeks). Click OK.

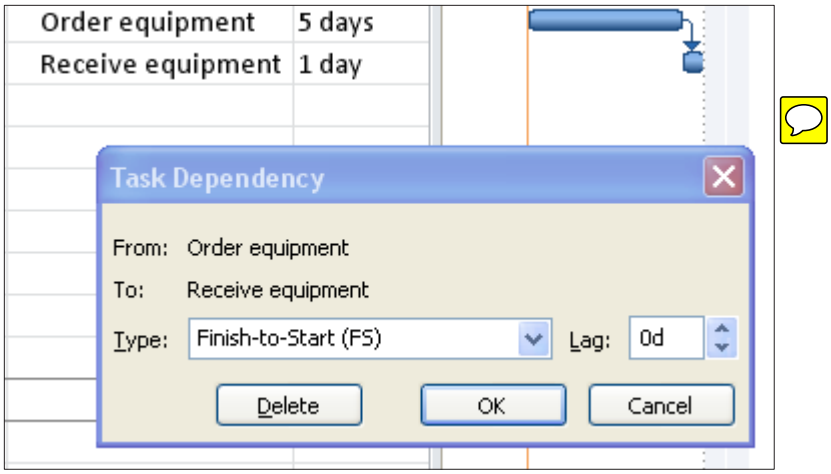


Figure 6-12 PLACEHOLDER

The result is of adding a 2 week lag shown in the illustration below:

Figure 6-13 PLACEHOLDER

An alternate method of entering lag time is by adding the value of the lag into the predecessor column as shown below:

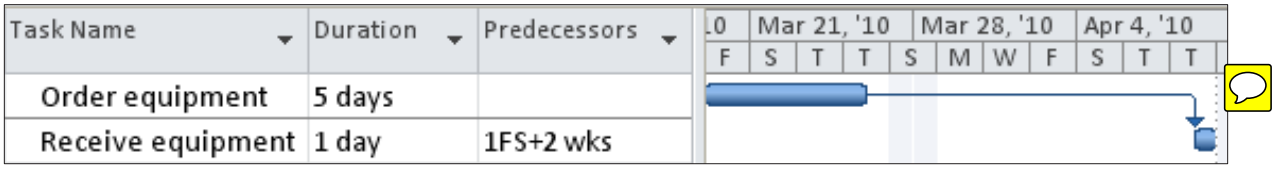


Figure 6-14 PLACEHOLDER

Lag time may also be expressed as a percentage of the duration of the predecessor task. Order equipment is a 5 day task. 50% Lag would mean that the length of the lag time would be 2.5 days or half of the 5 days duration of the Order equipment task.

What is Lead Time?

Lead time shortens the time line of the project. Consider tasks that do not need to be 100% completed before the successor task can start. Lead time is a good tool to help refine the schedule when trying to cut time from a timeline. Project 2013 does not have a field or box called Lead time. Instead, to create Lead time negative Lag time is entered.

To create Lead time:

The diagram below allows 10 days to unpack equipment and 10 days to set up the equipment. The same resources are performing both tasks. The 2 tasks together will require 20 days to complete if the equipment was set up after all of the equipment has been unpacked. If you had more resources to work on the tasks could you get these tasks accomplished quicker? In the example below the task to set up equipment will be scheduled to start when the equipment is half unpacked.

Below is a view of the tasks before lead time is entered. The tasks are scheduled for 20 days of duration.

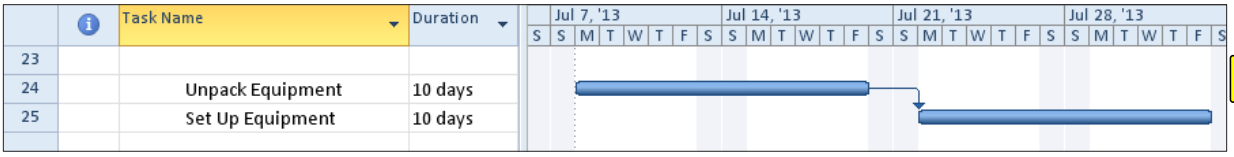


Figure 6-15 PLACEHOLDER

To enter Lead time between two tasks:

- Double click the relationship line between tasks where lead time is to be added.
- Enter "-5da[illegible]n the Lag field value
- Click OK to close the box

The task dependency dialog box shown below will appear.

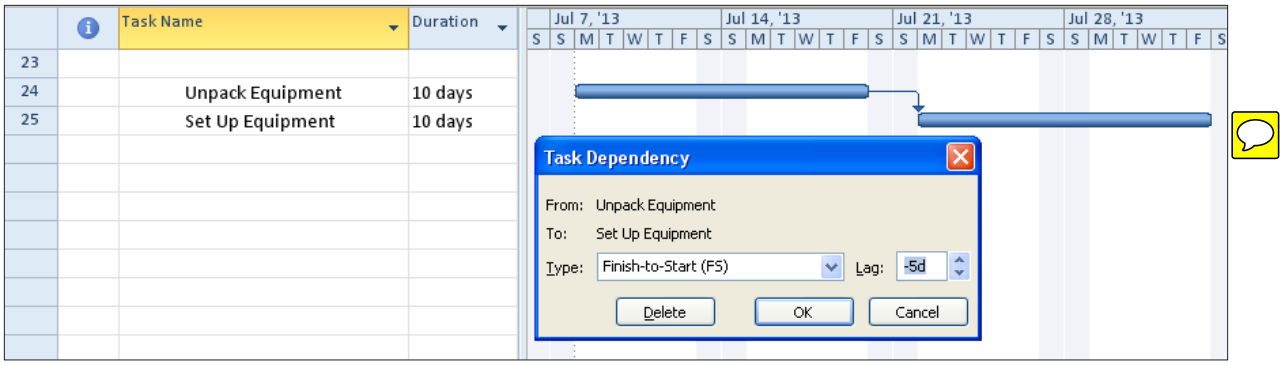


Figure 6-16 PLACEHOLDER

Below is the result of adding lead time between two tasks. Note the overlap of tasks and the total scheduling time has been shortened.

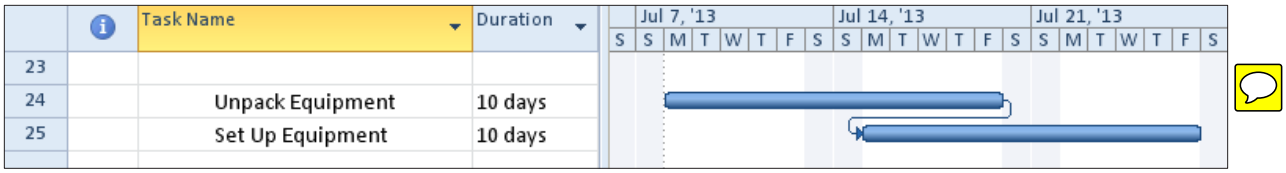


Figure 6-17 PLACEHOLDER

Lead time can also be expressed in percentages. The advantage to using percentages is if the predecessor task length changes, the successor task will automatically adjust its starting date.

For example:

- Task A is 10 days long and has a Finish-to-start relationship with Task B with -50% lead time
- Task B will is scheduled to start when Task A has 5 days of work completed
- Task A is taking longer than expected and is now scheduled to take 15 days
- Task B will be rescheduled to start when Task A has 7.5 days of work completed

A -50% would move the successor task to the left 50% of the duration of the predecesser task. The diagram below demonstrates the result of applying -50% for Lead time to the relationship between these two tasks.

To enter Lead time between two tasks as a percentage value:

- Double click the relationship line between tasks where lead time is required.
- Enter “-50%” in the Lag field value
- Click OK to close the box

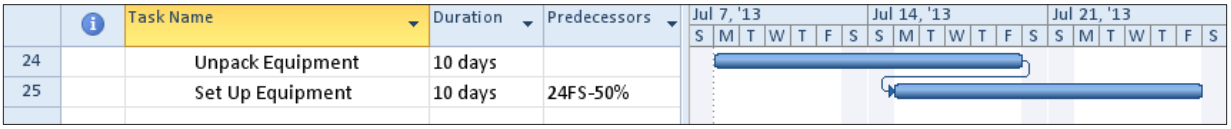


Figure 6-18 PLACEHOLDER

Best Practices

Use Lag time when extending the timeline without adding cost or work to the project.

Best practices for the use of **Lag** time in a project schedule:

Time must go by without a work or cost applied to the time. Lag is considered to be wait time like a delivery of equipment or concrete hardening

Adding slack into the schedule to extend the timeline to allow for possible contingencies

Adding wait time between phases of a project

Adding wait time between parallel sections of a project to allow others to catch up

Lag time may also be expressed in elapsed time to allow nights and weekends to be included

Planning the work for a factory crew. For example: the crew needs to be at work for 9 hours but 8 of that is actual work. The remaining hour is meal and breaks. Use Lag to extend the time for the work of the crew to accommodate breaks.

Use lead time when the schedule needs to be shortened. More resources will be needed to accomplish the tasks. Lead time can increase risk of re-work and could increase cost for tasks.

Best practices for the use of **Lead** time in a project schedule:

Piece work – when X number of items or time has been completed, giving the completed work to the next group to start their work.

Testing – when X percentage of the testing is completed and successful, giving the completed work to the next group to start their work.

When it is not necessary for the predecessor task to achieve 100% completion before starting the successor task.

Inactivate Tasks

When developing a schedule or even after a schedule is being executed, you may have portions of the schedule that may be optional or you may be looking for ways to run a scenario which leaves out a portion of the schedule from the scheduling engine. Choosing to inactivate a collection of tasks is a way to temporarily or permanently remove tasks from the rest of the schedule, but still leave the information about those tasks intact so you can reactivate them at a later time as desired, or keep this inactive data for historical purposes. This feature saves time over having to delete and re-enter task information. All tasks by default are active unless you make them inactive.

This feature is in Project Professional 2013 only.

To inactivate a task:

1. Select the task(s).
2. On the **Task** tab, **Schedule** group, click **Inactivate**.

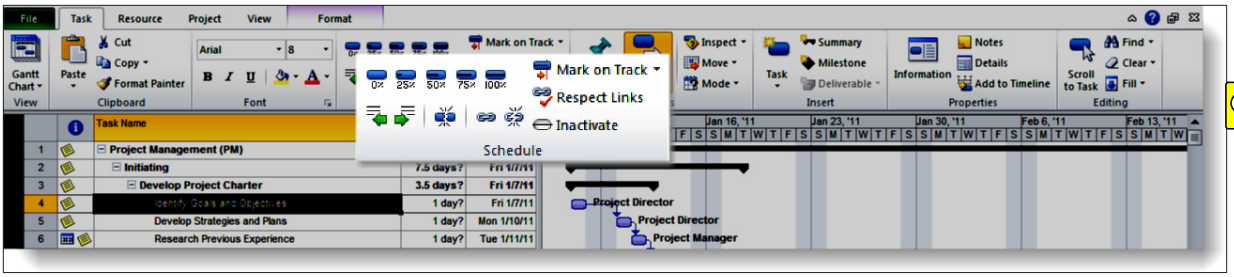


Figure 6-19 Project Ribbon – Inactivate Task

If you made a mistake and accidentally inactivate the wrong task(s), simply click **Inactivate** again to make them active.

This feature is especially useful when you are struggling with test/retest cycles. Simply inactivate the extra cycles until they are needed.

Inactive tasks are a great way to include contingency actions which only apply if a planned risk actually manifests itself in the future.

Chapter 12

Printing and Reporting

Printing

Most of the print settings in Project 2013 are similar to other Microsoft Office products. Unique to Project 2013 is the ability to include project and task data in report titles using the header and footer options. Printing Gantt charts on paper or using Gantt charts in presentations will also be discussed in this lesson.

In this lesson, we will discuss:

- Print Settings
- Define Page Setup
- Copy Picture

Print Settings

Project 2013 gives you the ability to customize how a report will be printed. Seeing the final report before it is printed assures the user that they are printing the correct report. Print options allow the user to select a printer and fine-tune which data will be printed. When the print options are selected, the current active project view will be printed.

To display print settings options view:

- File → Print

To close print settings options view:

- Click any tab above the ribbon bar

Below is a view of the print option screen. When the options were selected, the Gantt Chart was the active view. On the left side of the view, several options are available:

Table 12.1 PLACEHOLDER

Option	Action and result
Print	Sends the report to the selected printer.
Copies	Determines the number of copies that will be printed.
Printer	Clicking the arrow on the right side of the box will open a drop-down menu and display all available printers.
Printer Properties	Clicking on the link will display additional printing properties.

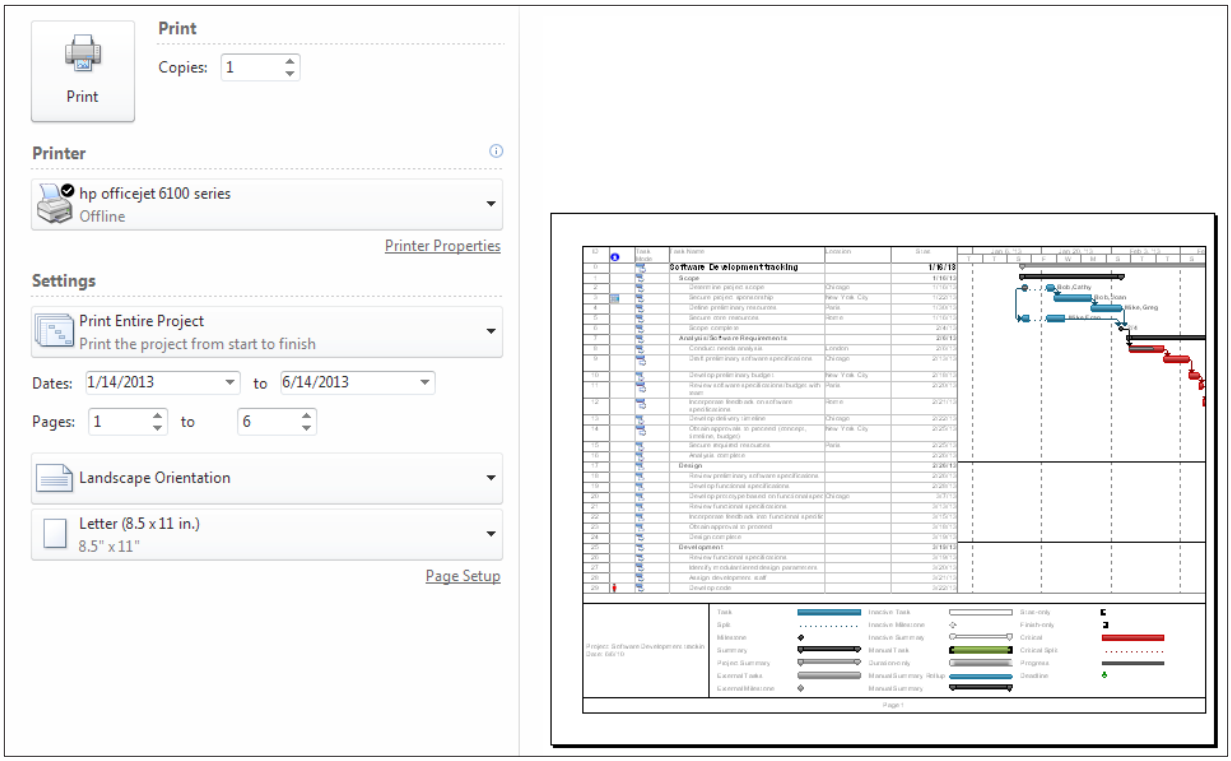


Figure 12-1 PLACEHOLDER

Click the down arrow on Settings to display more options to further refine the final printed report. These options are:

Table 12.2 PLACEHOLDER

Option	Action and result
Print Entire Project	Default value. The entire project schedule will be printed using the current view.
Print Specific Dates	Only the data between the date range will be printed. This option is not available for all reports.

Table 12.2 PLACEHOLDER

Option	Action and result
Print Specific Pages	Select specific page numbers to print.
Print Custom Dates and Pages	Date range and page number range will be printed.
Notes	Add the project notes to the printed report. Notes will be printed on a separate notes page.
All Sheet Columns	When selected, all columns within the current view will print.

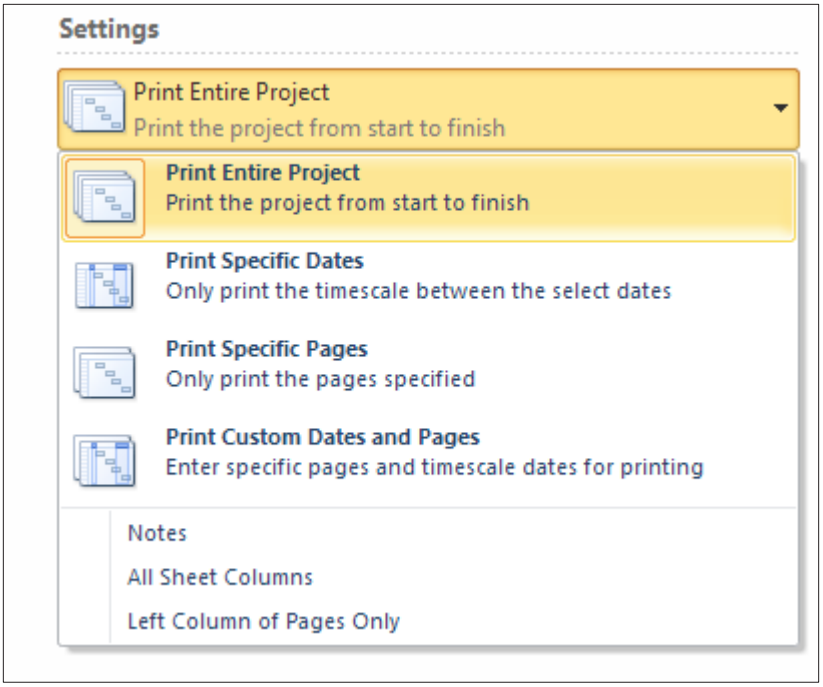


Figure 12-2 PLACEHOLDER

Page orientation and paper size options are also available.

Viewing options to preview the final report are available by clicking on the buttons below the active project view in the lower right corner of the screen. The buttons are shown below.

Table 12.3 PLACEHOLDER

Button	Represented by	Result
Left arrow		Move one page to the left.
Up arrow		Move one page up.
Down arrow		Move one page down.
Right arrow		Move one page to the right.
Actual size view		Actual size of printed report. Use sliders to see the entire page.
One page		Report will show one page at a time.
Multiple pages		Report will show in multiple page format.

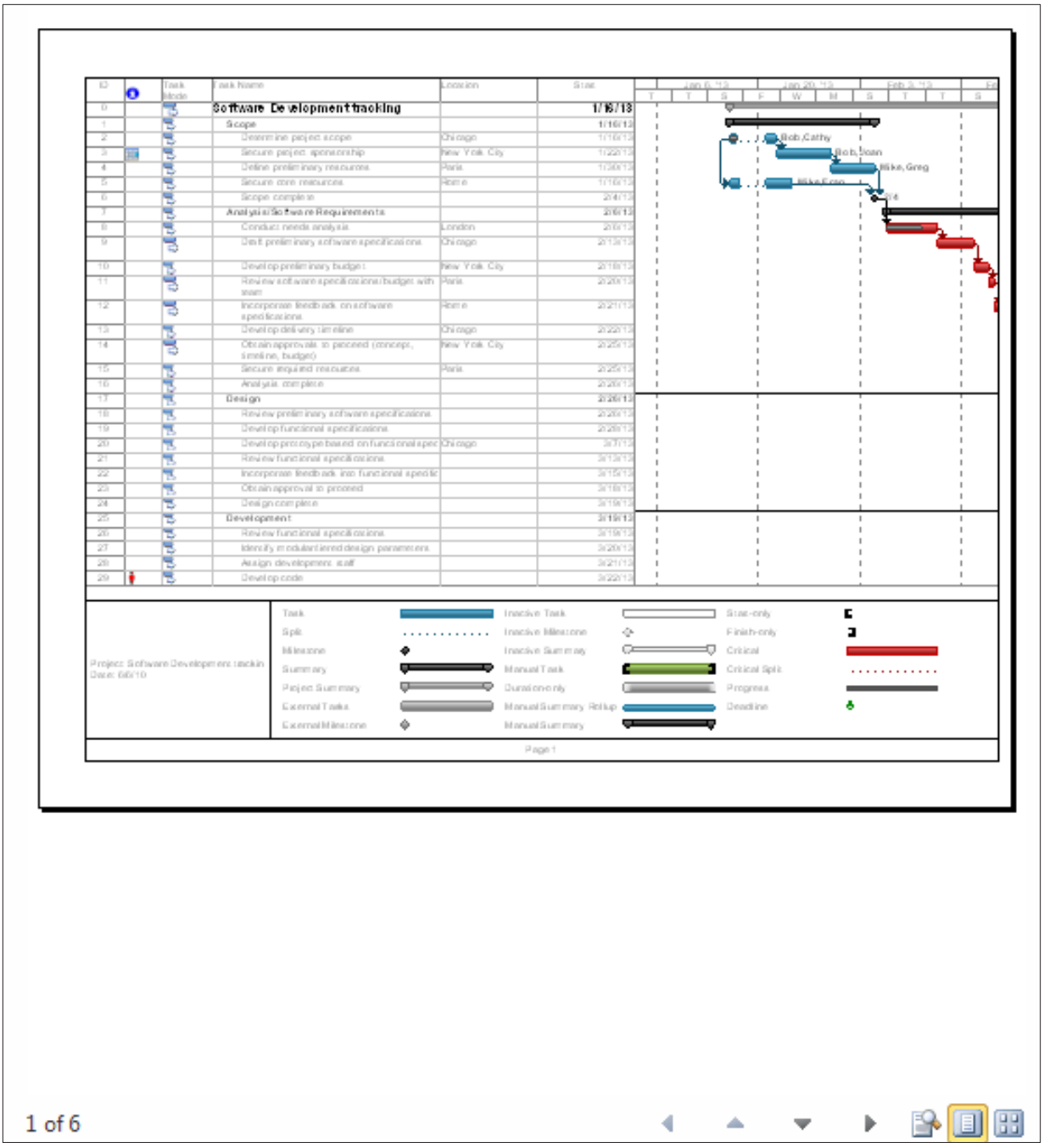


Figure 12-3 PLACEHOLDER

Add the Print Preview button to the Quick Access Toolbar:
Click on the down arrow on the right side of the Quick Access toolbar
Select **Print Preview**

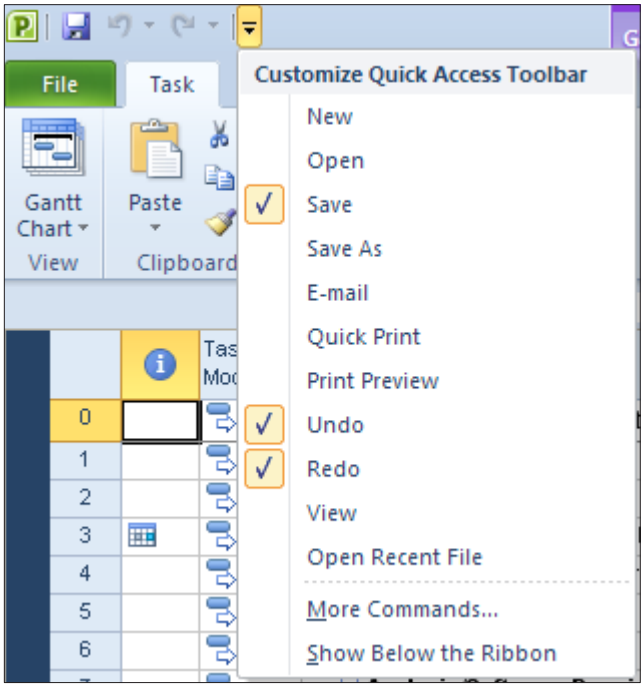


Figure 12-4 PLACEHOLDER

Page Setup: Header, Footer, Note Print Option

Define Page Setup

Page setup options are similar to options available in other Microsoft Office products. Project 2013 has some unique options specifically for the types of views available in the application. These unique options will be discussed in this lesson.

Project level data may be entered for project name, author, company, etc. and applied to the project header and footer information. This information is entered using the Advanced Properties dialog box. Once the data has been entered, the header and footer information is configured per report using the Page Setup options.

To add information in the Advanced Properties dialog box:

- File → Info → Project Information → Advanced Properties

The dialog box is shown below:

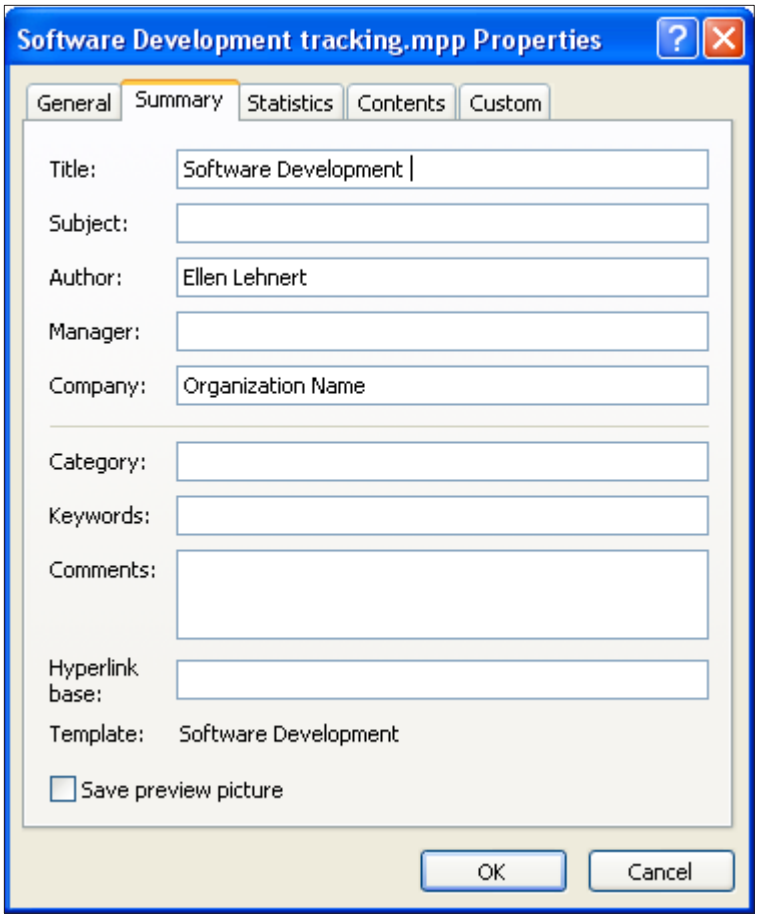


Figure 12-5 PLACEHOLDER

To display the Page Setup dialog box:

- File → Print → Page Setup

A dialog box will appear with the Page tab displayed. The options on this tab are similar to other Microsoft Office applications. The Margin tab contains the margin settings for the current report and an option to print borders around the data. Adjust these values as needed. The Header and Footer tabs allow for configuration of titles and footer information for reports. The view below shows the Header tab used for adding the project title values.

To add Header or Footer information to the title of a project:

- Click the **Header** or **Footer** tab.
- Click on the **Left**, **Center**, or **Right** tab in the lower section of the box.

- Click the down arrow to view the General drop-down menu.
- Select field value.
- Click **Add**.
- Repeat for additional data.

The Header and Footer settings are unique per report and should be checked using Print Preview before each reported is printed.

A current date is not preset to show in either the header or the footer title lines. Add the system's date using the center button above the General drop-down menu.

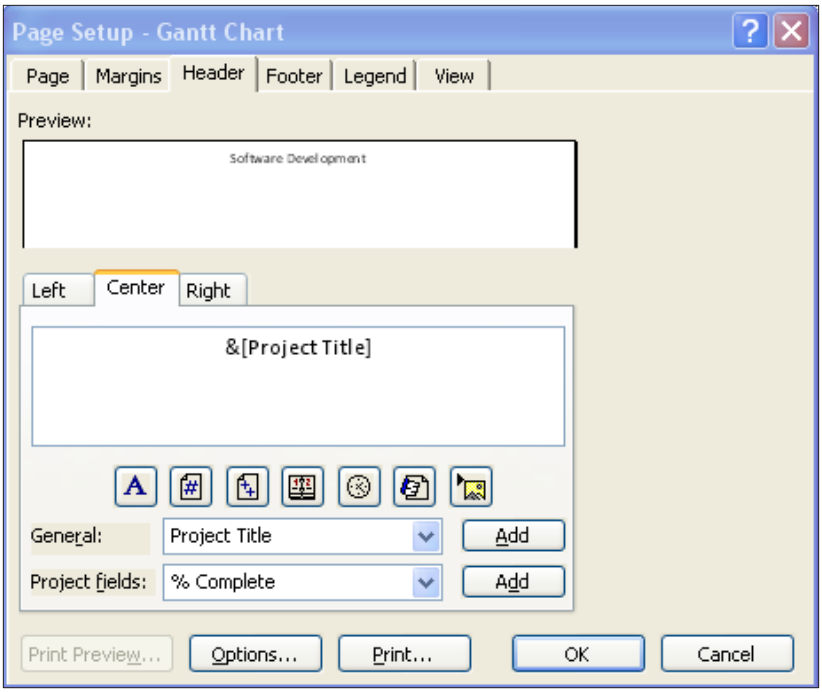


Figure 12-6 PLACEHOLDER

The Legend tab is used to customize or turn off the legend printed on Gantt charts. If unique Gantt chart formatting has been created, the alternate color coding will automatically appear in the legend when the Gantt

chart is printed. The Legend Labels button allows for font color and font selection changes. To disable the legend printed on Gantt charts, select None on the right side of the dialog box .

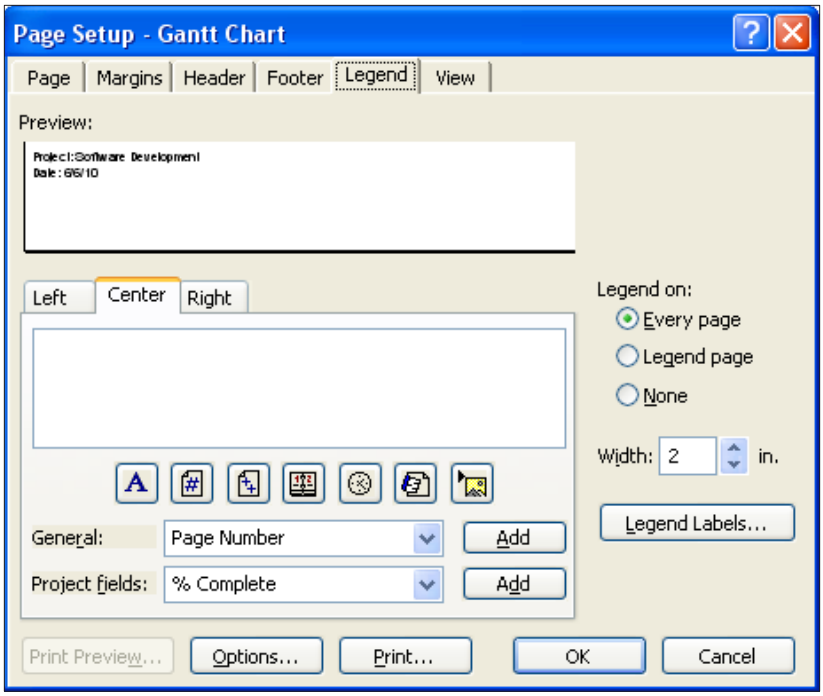


Figure 12-7 PLACEHOLDER

The View tab contains options for specific views, but not all options will be available for each report. The options on the View tab are:

Table 12.4 PLACEHOLDER

Option	Result of selecting option
Print all sheet columns	All columns in the table of the active view will be printed.

Table 12.4 PLACEHOLDER

Option	Result of selecting option
Print first (enter number) columns on all pages	Specify the number of columns to be printed on all pages of the report. When printing a Gantt chart, it is advantagous to add the task name to all pages.
Print notes	A separate notes page will be added to the report. Task ID numbers will be used to tie the note to the task.
Print blank pages	When printing Gantt charts, blank pages might result. Should these pages be printed?
Fit timescale to end of page	Adjusts the timescale for the report.
Print row totals for values within print date range	Adds totals to Resource Usage and Task Usage reports.
Print column totals	Adds totals to Resource Usage and Task Usage reports.

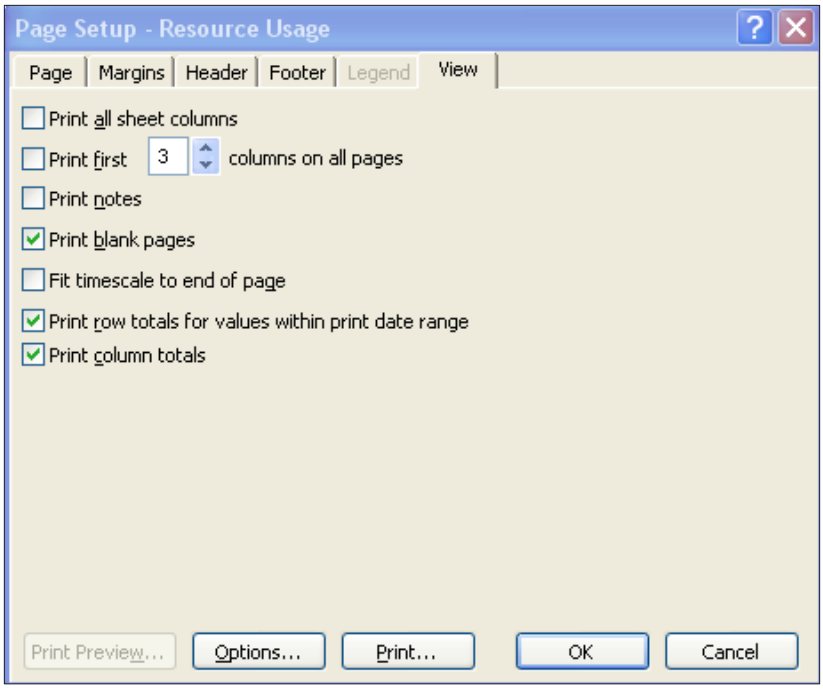


Figure 12-8 PLACEHOLDER

Copy Picture

Use the Copy Picture tool to take a picture of your active view and store it on the clipboard. After it is stored, it can be pasted into Powerpoint, Word, Excel or any other application. The Copy Picture button, by default, is not available on any of the ribbon bars, but it can easily be added to the Quick Access Toolbar.

To add the Copy Picture tool to the Quick Access Toolbar:

- Click the down arrow to the right of the Quick Access Toolbar.
- Select **More Commands**.
- Under Choose commands from Popular commands in the left box select, **Copy Picture**.

- Click **Add**.
- Click **OK** to close.

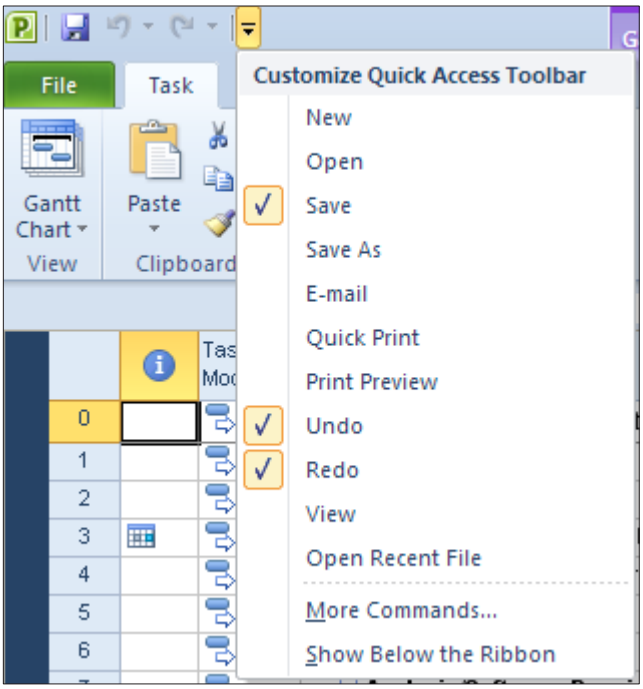


Figure 12-9 PLACEHOLDER

The copy picture icon looks like this:

Figure 12-10 PLACEHOLDER

To use the Copy Picture tool, the view must be displayed and refined for the picture. Navigate to the view to be copied. Some adjustments to a view might include:

- Expand or collapse the work breakdown structure.
- Adjust timescale.
- Adjust titles in the timescale.
- Change formatting.
- Highlight tasks.
- Add drawing elements.

If printing a Gantt chart, adjust the vertical bar in the middle to show the columns to be included and click **Copy Picture** to open the Copy Picture dialog box shown below.

- **Render image** - select image to render For Screen, For Printer or To GIF image file.
- **Copy** - rows on screen or Selected rows.
- **Timescale** - as shown on the screen or date range.
- Click **OK** to copy to the clipboard.

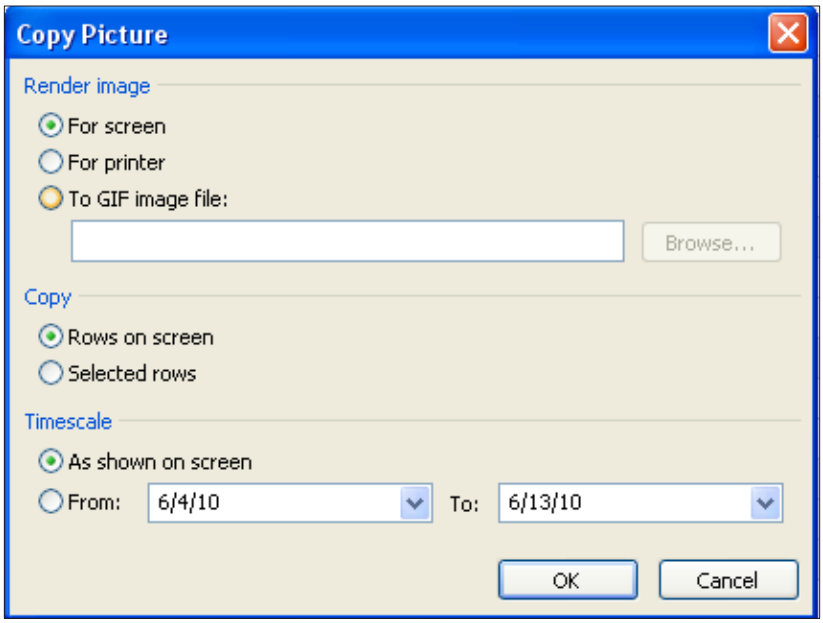


Figure 12-11 PLACEHOLDER

Use the image to paste into a Powerpoint presentation, a Word document, an email or other application. After pasting, resize the image as necessary.

Save as PDF

In Project 2013, we now have the option to save files as PDF's. This can be accomplished in a few different ways. Both ways are accessed via the "backstage" (File Menu).

To save as PDF:

1. In the **File** tab, click **Save & Send**.
2. Select **Create PDF/XPS Document** under the **Save & Send** menu to the right.
3. Select **Create PDF/XPS** under the **Create a PDF/XPS Document** menu to the far right.
4. A browser window will appear asking you to name the file and designate where to store the file. The filetype defaults to "PDF."
5. Once you've named the file and provided the destination location for the file, click **OK**.
6. Project will now ask you to determine what the **Publish Range** is (all dates or a set range of dates) as well as a few items pertaining to the information provided in the PDF file. Select the options desired and click **OK**.

The file will be created and saved. Adobe will not launch the file once it's been created. You can open the PDF from its saved location.

Alternate method to save as PDF:

1. In the **File** tab, click **Save As**.
2. Provide a filename and select **Save as Type** to be **PDF Files (*.pdf)**
3. Project will now ask you to determine what the **Publish Range** is (all dates or a set range of dates) as well as a few items pertaining to the information provided in the PDF file. Select the options desired and click **OK**.

The file will be created and saved. Adobe will not launch the file once it's been created.

The **Save As PDF** function is limited to a single-pane view (i.e. without a split). If you have Gantt Chart with Timeline view displayed, the PDF will generate based on the currently selected (active) pane. This will be either Gantt Chart or Timeline, not both.

Send as an Attachment

Gantt Charts: Timescale, Turn Off Legend, Show the Format Ribbon

Using the Format Tab

The Format tab buttons help you customize the text, columns, colors, and other elements of each type of view. The groups and buttons in the Format tab are different for each type of view. The Format tab is a contextual tab and the content of the tab changes automatically when you change the view.

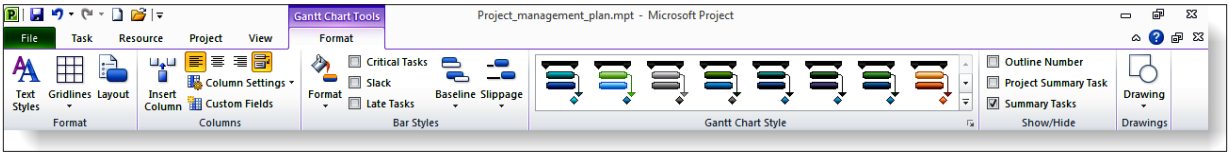


Figure 12-12 Project Ribbon – Gantt Chart Format Tab

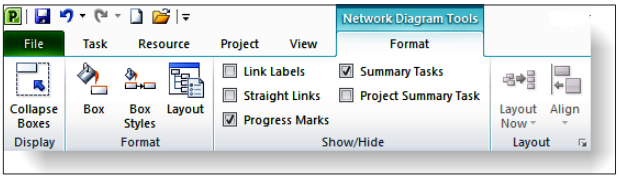


Figure 12-13 Project Ribbon – Network Diagram Format Tab

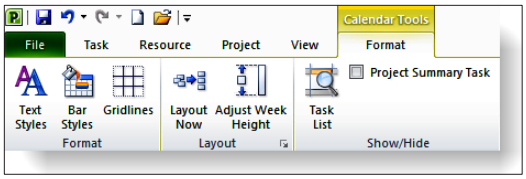


Figure 12-14 Project Ribbon – Calendar Tools Format Tab

You can customize the chart part of these views in Project to better suit your needs. For example, you can change how non-working time is displayed, or you may want to format a Gantt Chart view to quickly identify specific tasks, or perhaps you want to add text to specific bars to help you identify them.

Any changes you make to one Gantt Chart view does not change the look of another Gantt Chart view. For example, if you apply formatting to the Gantt Chart view, this will not carry over to the Detail Gantt view.

Formatting Text Styles

You can use text styles to change the format of text for one cell in a table or apply a unique format to an entire category of information, such as all critical tasks. You may also want to change text to be more readable or to look distinct to garner attention for certain tasks.

You can format the text the same way for any view.

You can't format fonts in the Calendar view, but you can format categories of text, so text will have distinct formatting for items such as all critical tasks or all summary tasks.

Formatting Selected Text

To format selected text:

4. Select the cell containing text that you want to format.
5. In the Ribbon, **Format** tab, **Format** group, click on **Text Styles**.

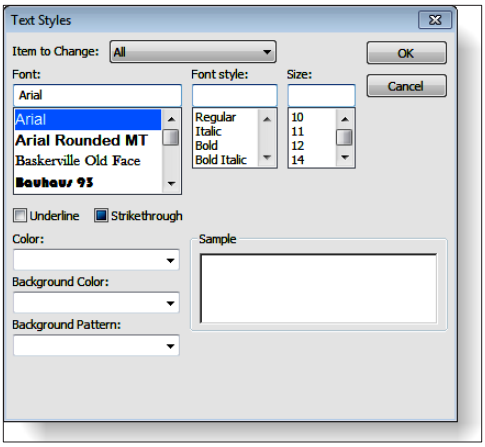


Figure 12-15 Text Styles Dialog

6. From the three lists across the top of the dialog box you can select Font type, Font style and/or the Font Size. You can also select an Underline or Strikethrough check box and set the Font color, Background color and/or choose a Background pattern. A preview of your selection will appear in the sample area.
7. Click **OK** to save changes.

Formatting Categories of Text

To format categories of text:

1. Select the cell containing text that you want to format.
2. In the Ribbon, **Format** tab, **Format** group click on **Text Styles**.
3. Click the dropdown arrow next to **Item to Change:** select a category of text.

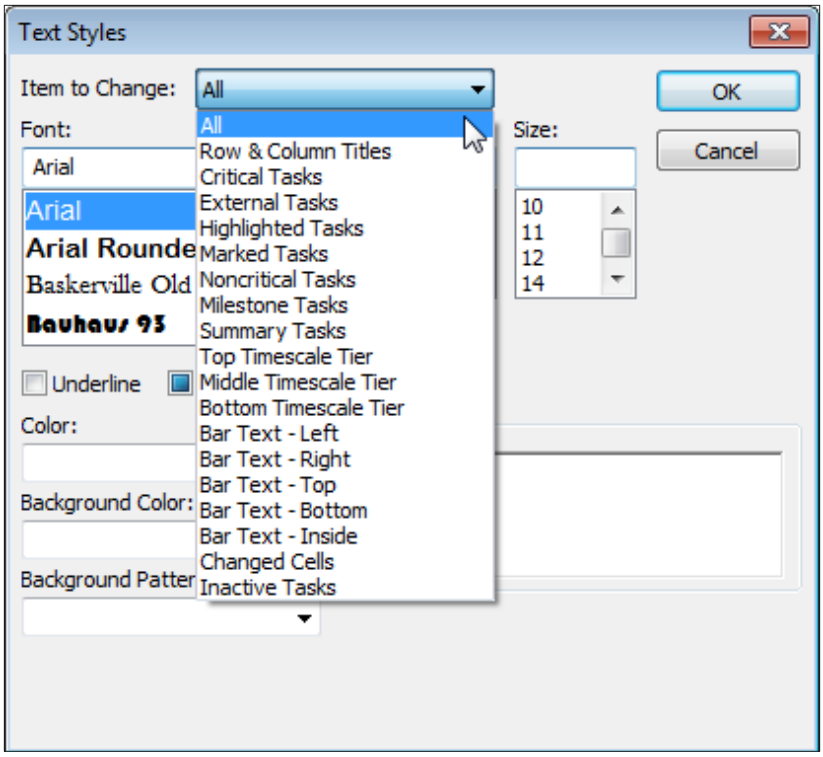


Figure 12-16 Text Styles Dialog with Items to Change Menu

4. Select the settings that you want for the text, including font, font style, font size, color and script.
5. Click **OK** to apply the formatting.

Formatting the Gantt Chart

In addition to text styles you can format the task bars. You can make changes to the shape, color, and pattern, as well as style of the bar.

Changing the Gantt Bars Quickly Using a Style

With a single click, you can apply a pre-defined style to all bars in a Gantt Chart view.

To apply pre-defined styles to Gantt bars:

1. Apply a Gantt Chart view.
2. In the **Format** tab, **Gantt Chart Style** group, click a style in the **Gantt Chart Style** group.

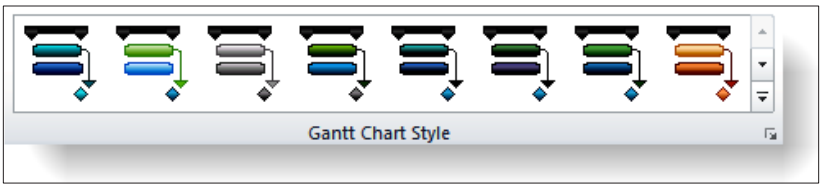


Figure 12-17 Gantt Chart Styles Group

3. The style is instantly applied to all the bars in the view.

Changing the Color, Shape, or Pattern of Gantt Bars

To call attention to task bars on a Gantt Chart view, such as a milestone or summary task, you can change their color, shape, or pattern to separate them from other bars of a particular type.

To format the task bar:

1. Apply a Gantt Chart view.
2. In the **Format** tab **Bar Styles** group, click the **Format** dropdown arrow, and click **Bar Styles**.

You can also double click within the chart portion of a Gantt Chart view, but not on individual bars, to open the Bar Styles dialog box.

3. In the **Name** field, click the type of bar (such as Task or Progress) that you want to format.
4. Click the **Bars** tab.

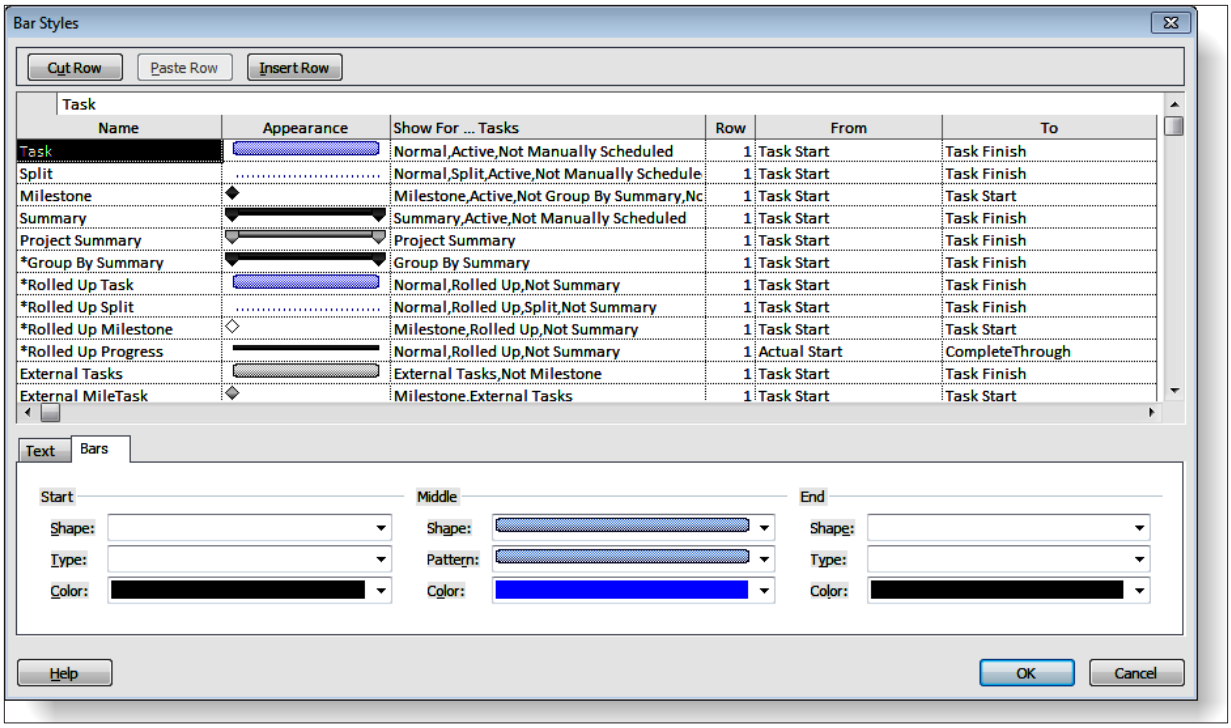


Figure 12-18 Bar Styles Dialog

5. Under Start, Middle, and End, click the shapes, types or patterns, and colors for the bar.

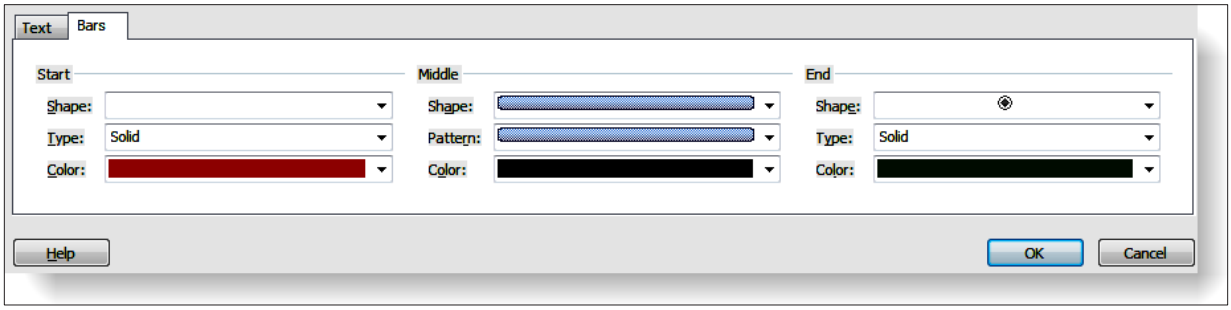


Figure 12-19 Bottom Pane of Bar Styles Dialog – Bars Tab Selected

To highlight a single Gantt bar by changing its formatting, right click on the individual bar and select a fill color.

Creating a New Type of Gantt Bar

If you want to spotlight a particular task category that is not represented by its own Gantt bar, you can create a new Gantt bar style. For example, you can create a type of Gantt bar to show available slack or to call attention to delayed tasks.

To create a new task bar style:

1. Apply a Gantt Chart view.
2. In the **Format** tab, **Bar Styles** group, click the **Format** dropdown arrow, and click **Bar Styles**.

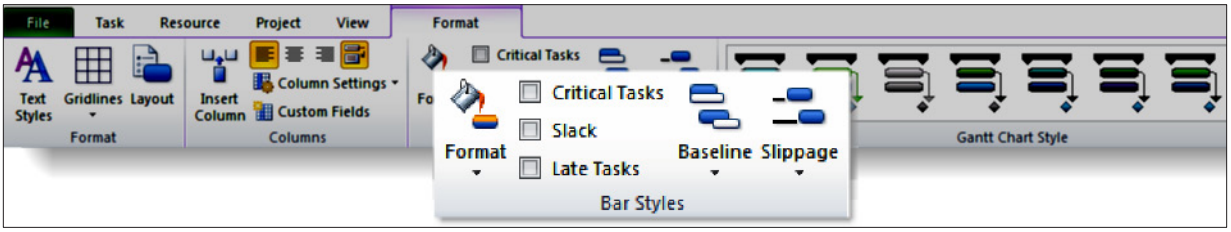


Figure 12-20 Project Ribbon – Format Tab, Bar Styles Group

3. In the **Gantt bar** list, select the row below where you want to insert a new Gantt bar style, and click **Insert Row**.
4. In the **Name** column of the new row, type a name for the new bar style.
5. In the **Show For Tasks** column of the new row, type or select the task type you want the bar to represent.

To display a Gantt bar for tasks of multiple types (such as tasks that are milestones and critical), type a comma (,) after the task category in the text entry box, and type or select a second task category in the **Show For Tasks** field.

6. In the **From** and **To** columns, type or select the fields you want to use to position the start and finish points of the new Gantt bar.

To create a symbol that represents a single date, type or select the same field in the **From** and **To** columns.

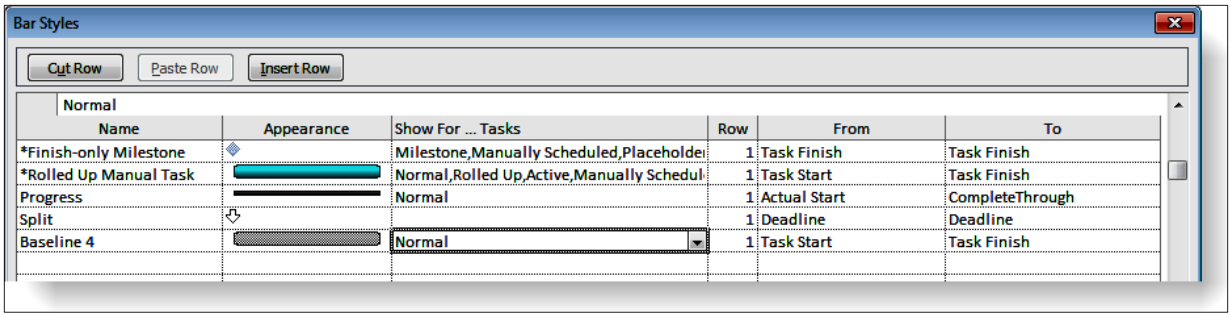


Figure 12-21 Bar Styles Dialog for Create New Gantt Bar

7. Click the **Bars** tab, and under **Start, Middle, and End**, select shapes, patterns or types, and colors for the bar.

To quickly highlight the critical path on the Gantt Chart, in the **Format** tab, **Bar Styles** group, click the check box for **Critical Tasks**. The critical task bars will become red. You can also apply a visual cue showing **Slack** or **Late Tasks** by clicking the appropriate checkbox.

Adding Text to Gantt Bars

Specific project information, such as task names, resource names, completion percentages, and start dates, can be added to bars on a Gantt Chart view.

To add text to task bars:

1. Apply a Gantt Chart view.
2. In the **Format** tab, **Bar Styles** group, click the **Format** dropdown arrow, and click **Bar Styles**.
3. In the table, click the type of Gantt bar (such as Task or Progress) that you want to add text.
4. Click the **Text** tab.
5. In the **Left, Right, Top, Bottom, and Inside** boxes, type or select the field that contains the data you want to display on the Gantt bar.

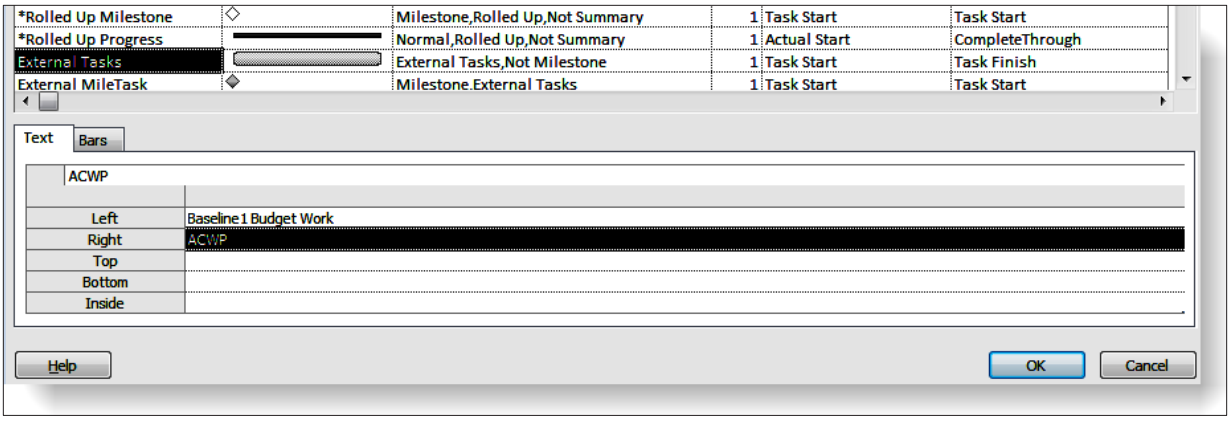


Figure 12-22 Dialog for Adding Text to Gantt Bars

6. To add text that is unique to each task, type or select a custom text field, such as Text1, Text2, or Text3 from the available dropdown list. Text that you enter into these fields from other views is automatically added to the Gantt bars.

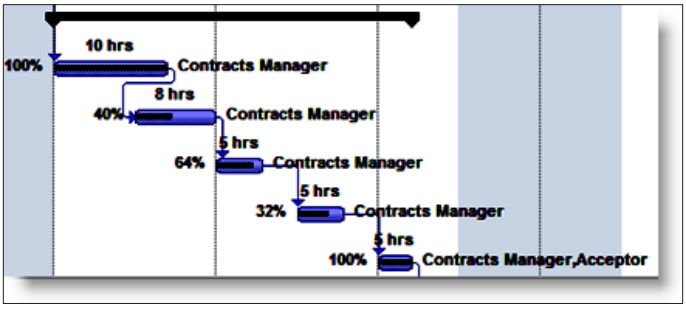


Figure 12-23 Link Lines with Descriptions

Changing the Appearance of Link Lines Between Gantt Bars

When you link tasks, Project displays link lines on a Gantt Chart view that show the dependency of the linked tasks.

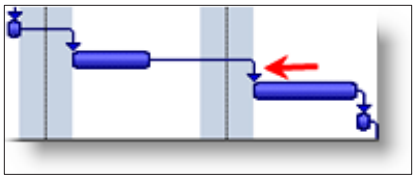


Figure 12-24 Link Line

You can change the way link lines appear or hide the link lines.

To change the appearance of links between Gantt bars:

1. Apply a Gantt Chart view.
2. In the **Format** tab, **Format** group, click **Layout**.

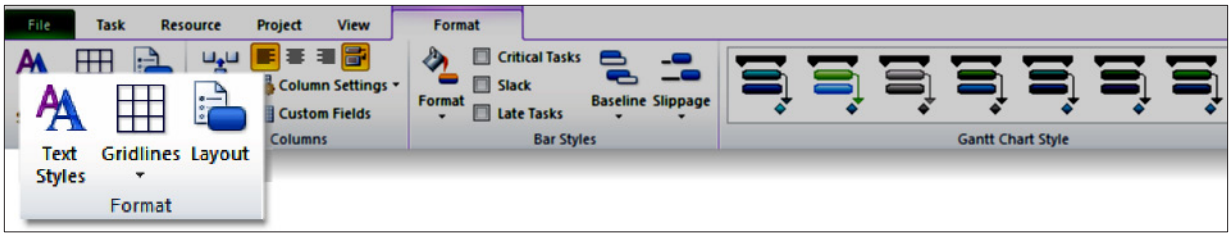


Figure 12-25 Project Ribbon – Format Tab

3. Under **Links**, click the type of link line that you want to use. If you choose the first type of link, then the link lines will not appear.

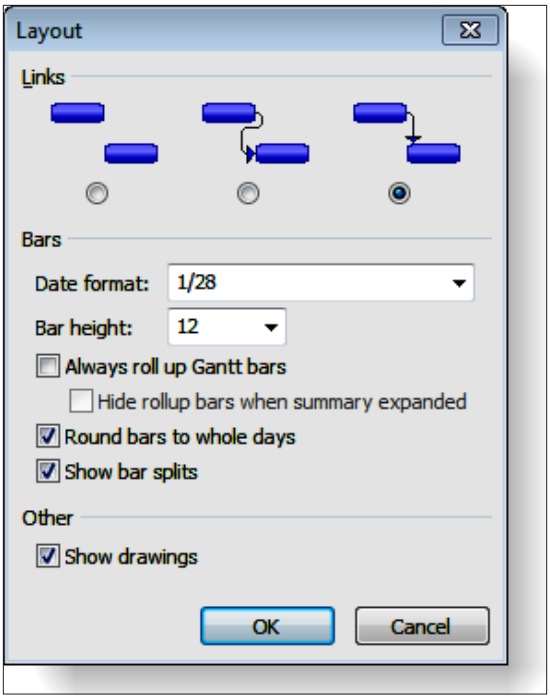


Figure 12-26 Layout Dialog Box

Reporting

Visual Reports

Visual reports are graphical type reports that are available in Project 2013. These reports are defined using a template in Project 2013 and use either a Visio PivotDiagram or Excel PivotTable technology to generate the final report. Once a report is generated, changes and fine-tuning of the report can be performed through Visio or Excel.

Since Visual Reports use Pivot table technology, knowledge of Pivot tables is helpful for the project manager to gain the greatest benefit from these reports.

In this lesson we will discuss:

- Overview of Visual Reports
- The Anatomy of Pivot Tables
- Viewing a Visual Report
- Creating a Visual Report template

Overview of Visual Reports

Visual Reports are reports based on dimensions and measures that produce graphs using Pivot Tables. Pivot Tables will be discussed in the next lesson. When a Visual Report is run, an On-line Analytical Processing (OLAP) cube of data is built based on the metrics stated in the specifications for the Visual Report. After the cube is built, Project 2013 connects to either Visio or Excel to display the report. If an Excel-based report is selected, the report will be based on Pivot Tables. If a Visio-based report is selected, a Visio Pivot Diagram will be produced.

Once a report is generated, it can be manipulated as a Pivot Table and tailored to fit your needs. Types of manipulations include expanding and

contracting outline levels, changing field values, selecting options, adding totals and changing the appearance of graphs. After the Visual Reports are generated, they can be saved or published to a reporting website.

Project 2013 provides multiple Visual Report definition templates found in the Visual Reports - Create Report dialog box. Options are available to filter the Excel templates from the Visio templates. All templates are contained in the All tab within the dialog box.

Sub tabs are provided for various report categories, and contain the following report options:

Table 12.5 Task Summary **Tab**

Report	Content	Excel or Visio
Critical Tasks status report (Metric)	Work and Work remaining for critical and non-critical tasks.	Visio
Critical Tasks status report (US)	Work and Work remaining for critical and non-critical tasks.	Visio

Table 12.6 Resource Summary **Tab**

Report	Content	Excel or Visio
Resource remaining work report	Work, Remaining Work, total Work for work resources.	Excel

Table 12.7 Assignment Summary **Tab**

Report	Content	Excel or Visio
Resource status report (Metric)	Work and Cost values per resource.	Visio

Table 12.7 Assignment Summary **Tab**

Report	Content	Excel or Visio
Resource status report (US)	Work and Cost values per resource.	Visio
Task status report (Metric)	Work and percent of work completed by WBS level.	Visio
Task status report (US)	Work and percent of work completed by WBS level.	Visio

Table 12.8 Task Usage **Tab**

Report	Content	Excel or Visio
Cash flow report	Timephased task cost data.	Excel

Table 12.9 Resource Usage **Tab**

Report	Content	Excel or Visio
Cash flow report (Metric)	Baseline Cost vs Actual Cost over time by resource type.	Visio
Cash flow report (US)	Baseline Cost vs Actual Cost over time by resource type.	Visio
Resource Availability report (Metric)	Total capacity, Work and remaining availability per. resource	Visio

Table 12.9 Resource Usage **Tab**

Report	Content	Excel or Visio
Resource Availability report (US)	Total capacity, Work and remaining availability per resource.	Visio
Resource cost summary report	Resource costs per resource type.	Excel
Resource work availability report	Work and remaining availability over time.	Excel
Resource work summary report	Work, Actual Work and Remaining Availability per resource.	Excel

Table 12.10 Assignment Usage **Tab**

Report	Content	Excel or Visio
Baseline Cost Report	Compares Baseline Cost, Actual Cost and Cost.	Excel
Baseline Report (Metric)	Baseline, Actual Work and Cost over time.	Visio
Baseline Report (US)	Baseline, Actual Work and Cost over time.	Visio
Baseline Work Report	Baseline Work, Baseline Cost, and Actual Work.	Excel

Table 12.10 Assignment Usage **Tab**

Report	Content	Excel or Visio
Budget Cost Report	Budget Cost, Baseline Cost, Cost and Actual Cost.	Excel
Budget Work Report	Budget Work, Baseline Work, Work, Actual Work.	Excel
Earned Value Over Time Report	Timephased – Actual Cost of Work performed, baseline values and Earned Value.	Excel

Anatomy of a Pivot Table

To understand Visual Reports, some understanding of Pivot Tables is helpful. Pivot Tables are flexible tables based on measures and dimensions. The information below is an overview of a Pivot Table based report. Additional information regarding Pivot Tables can be found in any Excel reference book, through software Help, or online.

In the table below, sales data from The Chocolate Company shows that sales of different products have occurred in multiple locations. The Chocolate Company also keeps track of the customer type and products sold. We might want to know total sales by customer type, product or location. Pivot Tables have the flexibility to process any of these report requests quickly.

The data below is the source data that will be used to generate the Pivot Table:

Table 12.11 Chocolate Company Sales

Customer	Customer type	Location	Product	Quantity in bars	Price
Customer A	Retail	Chicago	Dark	48	120
Customer B	School	Rome	Milk	24	60
Customer C	Vending	Sydney	White	12	30
Customer D	Retail	Chicago	Dark almonds	36	45
Customer E	School	Rome	Milk almonds	48	120
Customer F	Vending	Sydney	White peanuts	24	60
Customer G	Retail	Chicago	Dark	12	30
Customer H	School	Rome	Milk	36	45
Customer I	Vending	Sydney	White	48	120
Customer J	Retail	Chicago	Dark almonds	24	60
Customer K	School	Rome	Milk almonds	12	30
Customer L	Vending	Sydney	White peanuts	36	45
Customer M	Retail	Chicago	Dark	48	120

In the view below, a Pivot Table has been created using the above data. The data below is consolidated to show sales by Customer type:

Table 12.12 PLACEHOLDER

Customer Type	Sum of Price
Retail	480
School	180
Vending	90
Wholesale	135
Grand Total	885

In the next example, the table was changed to show sales by Location:

Table 12.13 PLACEHOLDER

Location	Sum of Price
Chicago	375
Rome	255
Sydney	255
Grand Total	885

In the next example, sales by Product:

Table 12.14 PLACEHOLDER

Product	Sum of Price
Dark	270

Table 12.14 PLACEHOLDER

Product	Sum of Price
Dark almonds	105
Milk	105
Milk almonds	150
White	150
White peanuts	105
Grand Total	885

Pivot Tables are easily changed to create the type of report necessary for your reporting needs, based on the values contained in the Pivot Table data. Visual Reports will be used to create the Pivot Diagram or Pivot Table but the project manager will need to customize the generated report.

Viewing Visual Reports

Project 2013 comes with built in Visual Report templates to report on cost, work and resource data. Having a specific goal in mind for the type of report you want will help generate more meaningful report data.

To open the Visual Reports – Create Report dialog box:

- Project → Visual Reports

To create a report:

- Select any report.
- Change timeframe for assignment (usage) data.
- Click **View**.

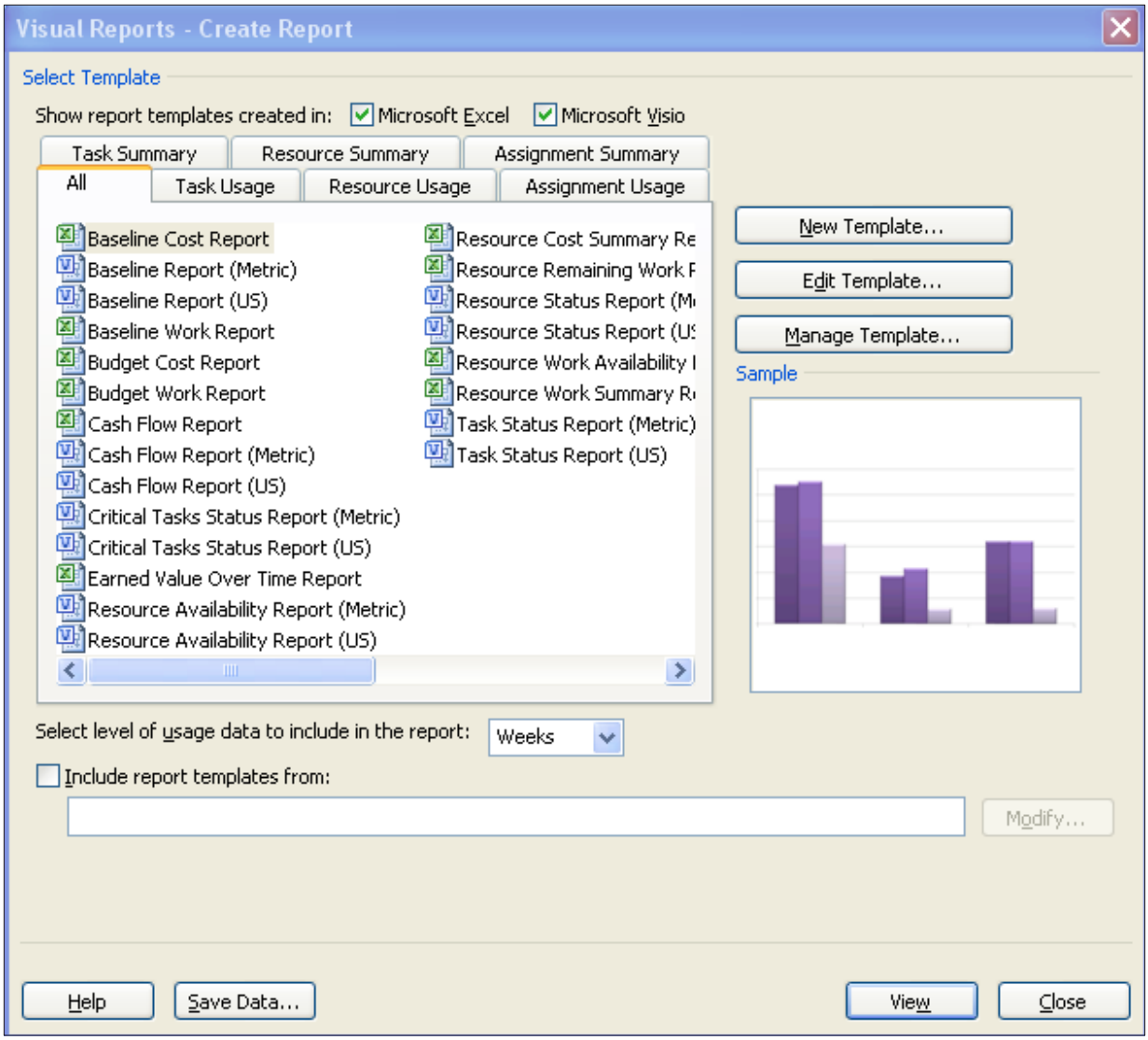


Figure 12-27 PLACEHOLDER

The report will generate by creating an OLAP cube and will open either Visio or Excel. In the generated Pivot Table select the data to be viewed on the report. Notice that the data viewed on the table can also be viewed in chart format.

Options are available for saving the generated OLAP cube or creating an Access database from the data by clicking the Save Data… button.

Dashboard Reports

What are Dashboard Reports?

Dashboard reports are reports that display project data is tabular and graphic form. Each report displays different data and can be customized to tailor the reports for each users needs.

Below is a view of the Overallocated Resources Dashboard Report. Note that there are two charts each representing different resource data. The chart on the left represents Actual Work v Remaining Work. The chart on the right is displaying resources that are Overallocated at the day level. Each of these reports may be altered to adjust the chart type, chart elements and details of the display data.

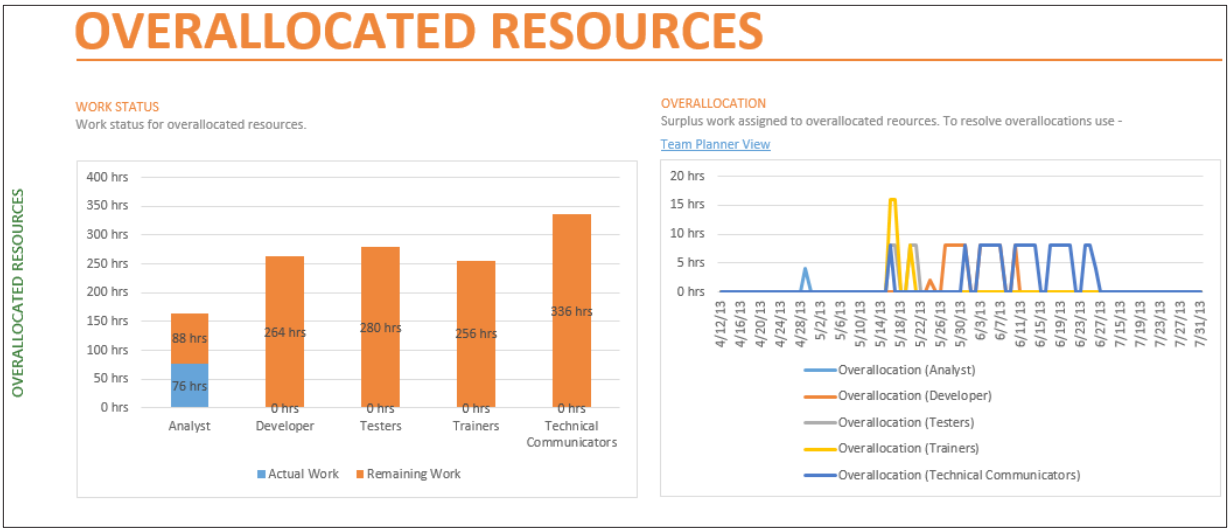


Figure 12-28 PLACEHOLDER

Data included in the Dashboard Reports

Dashboard Reports contain data relating to project progress, variance calculations, and critical path. Below are listed some of the data which are included in the reports. If you are not using the data needed to populate the reports, the reports will not display properly.

Some of the data needed for the reports includes the following project data values:

- Task Duration, Cost and Work.
- Resource Cost and Work.
- Baseline comparison.
- Status date.
- Status field: Late, On Time, Future

To Display a Dashboard Report:

1. Click on the **Reports** tab
2. Click on a Report Category: **Dashboards**, **Resources**, **Costs**, **In Progress**
3. Click on a Report to display

To change parameter values displayed on a Dashboard Report:

1. Click on the **Reports** tab
2. Click on a Report Category: **Dashboards**, **Resources**, **Costs**, **In Progress**
3. Click on a Report to display
4. Click inside of a graph. Options will appear on the right side of the view.
5. Change options as necessary. Close by options by clicking on the X in the upper left corner of the options box.
6. Other changes may be made by clicking on formatting changes on the Design ribbon which will appear when a Report is selected.

Changes to Dashboard Reports will be remembered within the file and will appear the next time the report is viewed.

Clicking on the **Page Breaks** button will display the page breaks as for printing the report. The separate report graphics and tables may be dragged to different pages for printing purposes.

Timeline View Report

Customizing Timeline Views

The Timeline view is new view to Project 2013. The purpose of the Timeline view is to display project tasks using a timeline format and export the view to other applications such as Word, Excel, Outlook and Powerpoint.

Gantt Chart with Timeline is the default view in Project 2013. This view is a split screen with the Timeline view on the top and the Gantt Chart View on the bottom.

To turn Timeline view off/on:

- **Task → Gantt Chart**
- **View → Timeline**

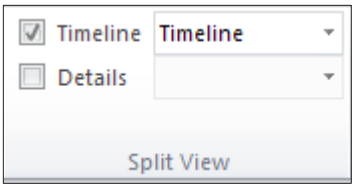


Figure 12-29 PLACEHOLDER

Below is a view of the default Timeline view. The Timeline view is showing the information for the project summary task. The length of the timeline represents the duration of the project. There is a timeframe window open in the middle to highlight a specific timeframe:

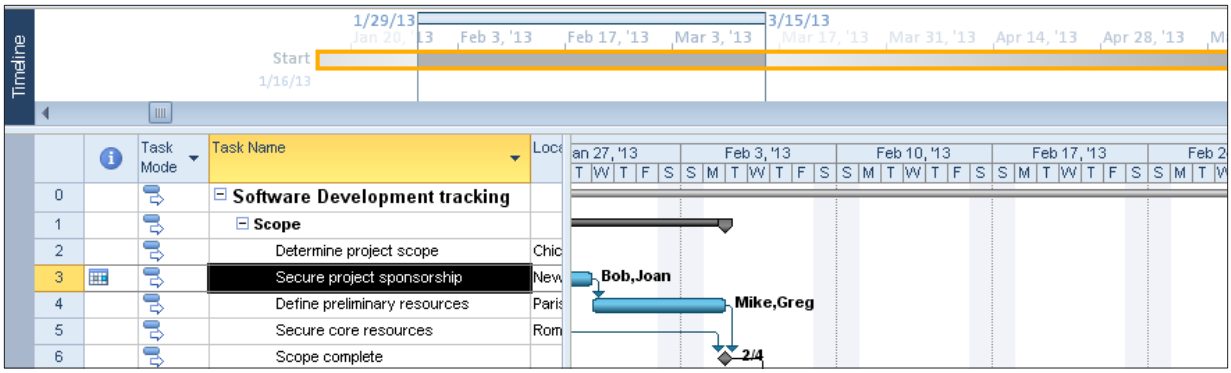
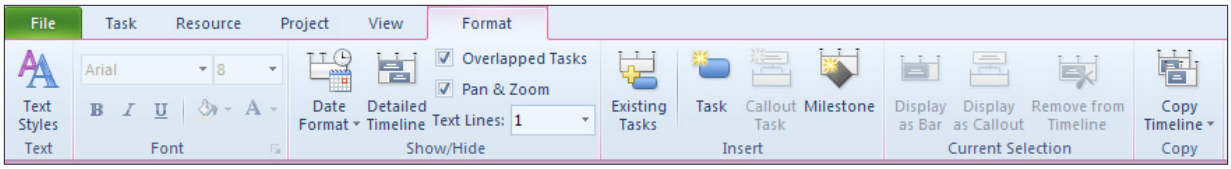


Figure 12-30 PLACEHOLDER

To format or add more data to the Timeline view:

- Click inside the Timeline view window
- Click on the Format tab

Below is a view of the Timeline format bar. Use the buttons on this bar to add additional tasks and format the Timeline view.



Within the Timeline view there is a timeframe window highlighted in the diagram below.

- The Timeframe window may be dragged left and right to emphasize different timeframes of the project schedule. The Gantt bars will adjust as the timeframe window is moved.
- Change the timeframe window by clicking in the timeline view and clicking the zoom slider in the lower right corner of the screen.
- The time density of the Timeline view does not have to match the time density of the Gantt Chart View.
- To turn on and off the Timeframe window, click the Pan & Zoom button on the Format bar.
- Use the Date format button on the Format bar to format the dates in the Timeline view.
- Use the Detailed Timeline button to show task names and dates in the view.

The view below shows the standard Timeline view with the Gantt chart

view below. The Timeframe window is highlighted:

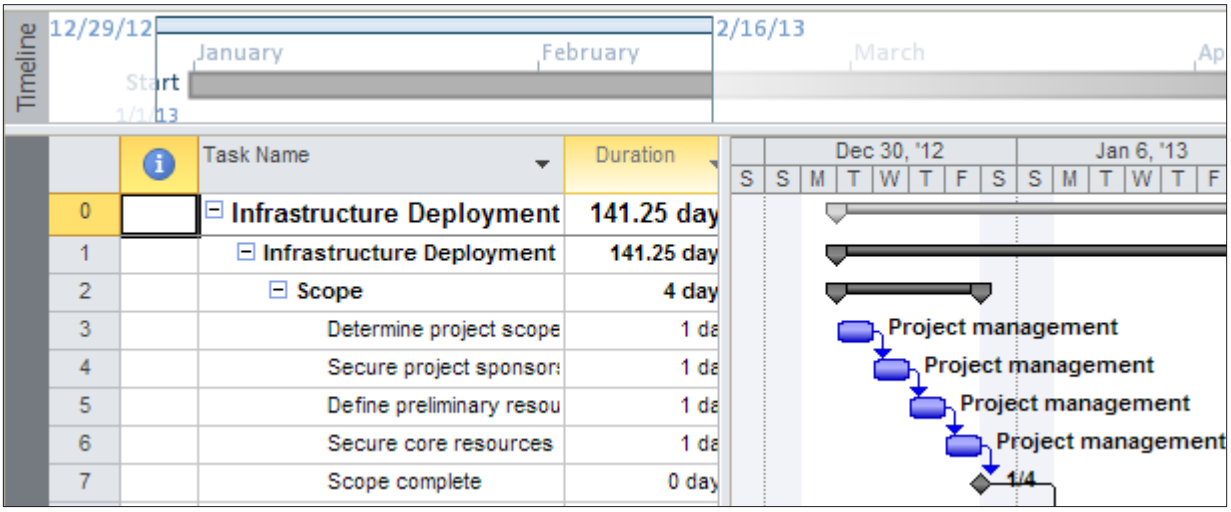


Figure 12-31 PLACEHOLDER

Adding additional tasks to the Timeline view will help build a better picture of your project. Tasks can be individually included to the Timeline view via the Task Information dialog box under the General tab. Double click a task to display the Task Information dialog box.

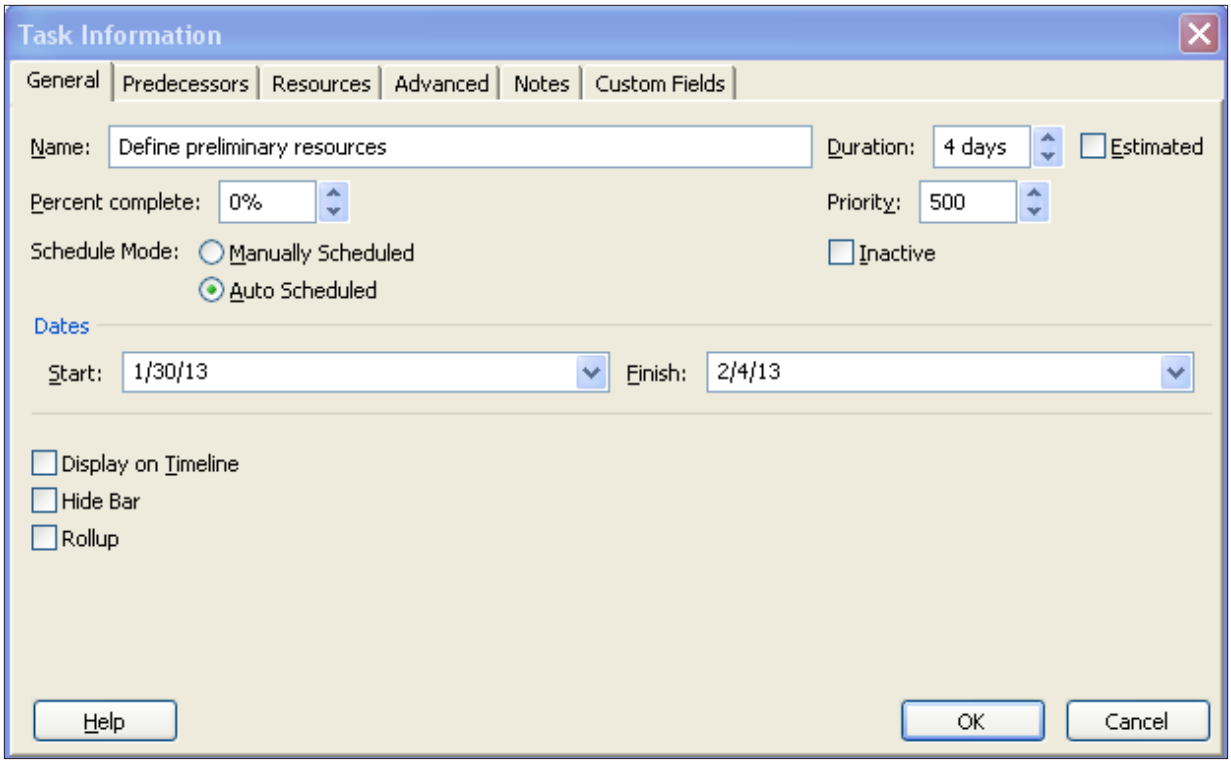


Figure 12-32 PLACEHOLDER

The timeline format bar has several command buttons that will help flag tasks for inclusion into the Timeline view. Clicking the Existing Tasks button will display a list of all tasks for a project where you can scroll through and select the tasks you want displayed in the Timeline view.

To add tasks to the timeline view using the Existing Tasks button:

- Click **Existing Tasks**
- Using the check boxes, select the tasks to add
- Click **OK** to close.

See below for an example of the Existing Tasks choice list. It is easy to tell the difference between summary and detail tasks:

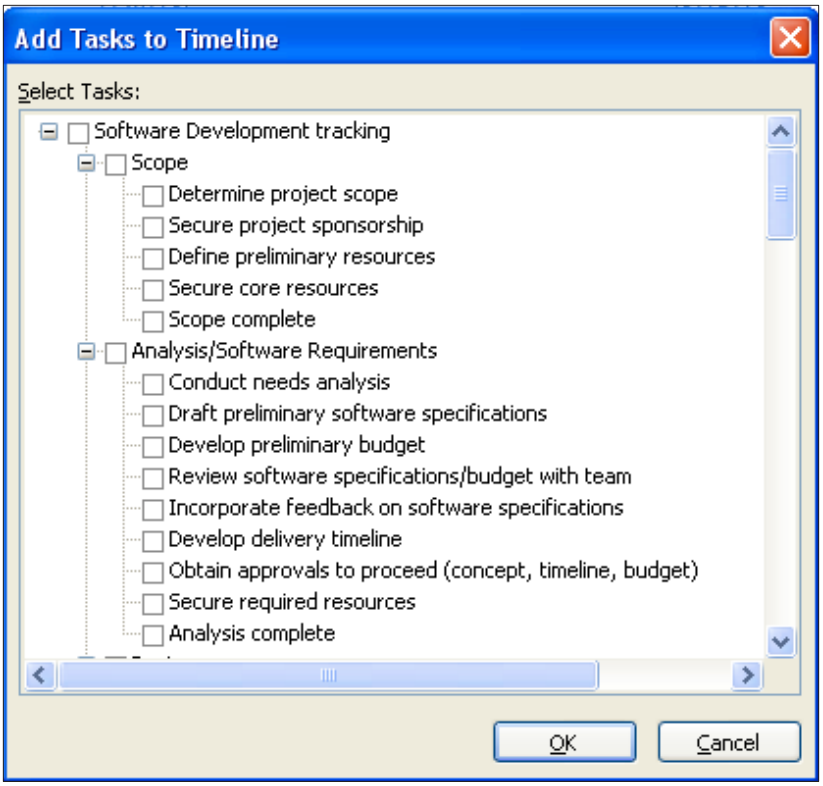


Figure 12-33 PLACEHOLDER

The timeline view should be planned carefully to create a meaningful report. Too much information can confuse the reader. Consider creating a high level tasks report that shows sections of work planned to be completed within timeframes. Below is a view where outline Level 1 tasks have been added to the Timeline view.

To add Outline Level 1 tasks (Summaries) to the Timeline view:

- **Tasks → Gantt Chart**
- **View → Outline → Outline level 1**
- For each summary task to be added to the Timeline view, Select and Right click. Multiple selections maybe made.
- Click **Add to timeline**

The Timeline view below, displays Outline Level 1 Summary tasks only and the Gantt chart displays the same Outline Level 1 Summary tasks.

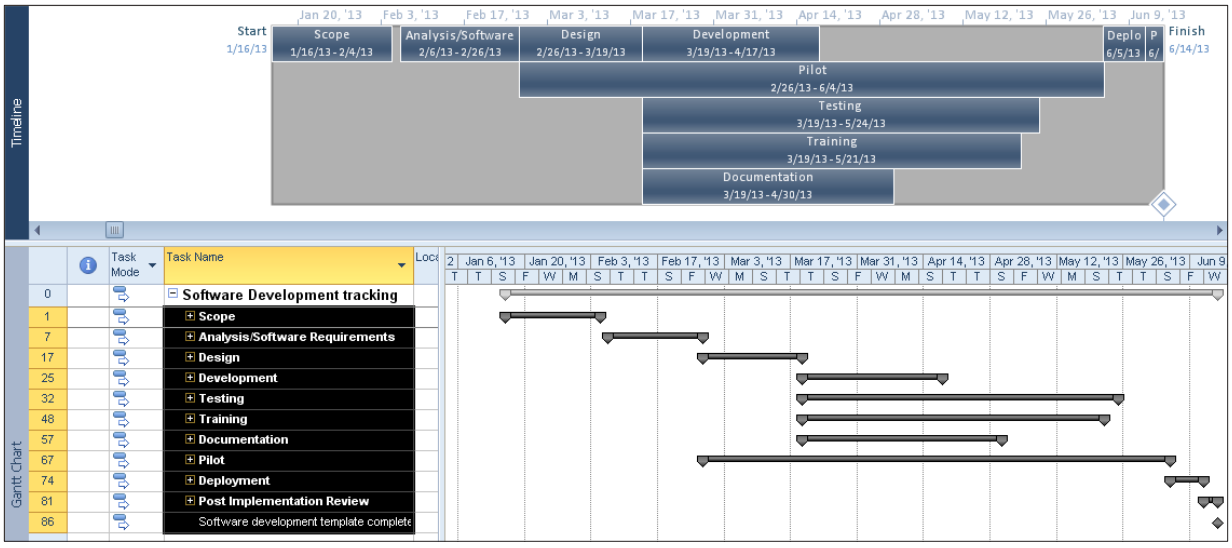


Figure 12-34 PLACEHOLDER

Milestone can also be added to the Timeline view.

To add a milestone to the Timeline view:

- **Tasks → Gantt Chart**
- **View → Filter → Milestone**
- Select the milestone tasks and Right click
- Click **Add to timeline**

The diagram below displays Outline Level 1 tasks with milestones added:

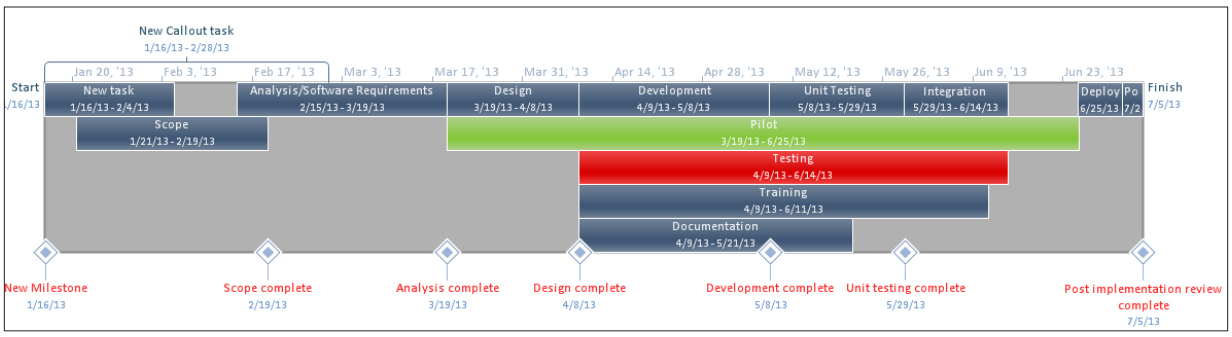


Figure 12-35 PLACEHOLDER

Tasks may be added to the project using the Timeline view format bar. When adding tasks using these buttons, the tasks will be added to the end

of the project schedule and will start on the first day of the project or the current date depending on the scheduling option. The choices are:

- Adding a new task to the timeline
- Adding a new callout task to the timeline
- Adding a new milestone to the timeline

Below is a view showing a new task, a new callout task and a new milestone added to the timeline and the project schedule. The lower half of the view shows the tasks added to the Gantt Chart view. Callout tasks are originally placed above the timeline spanning the timeframe of the task. After they are created, they may be dragged to alternate locations within the Timeline View.

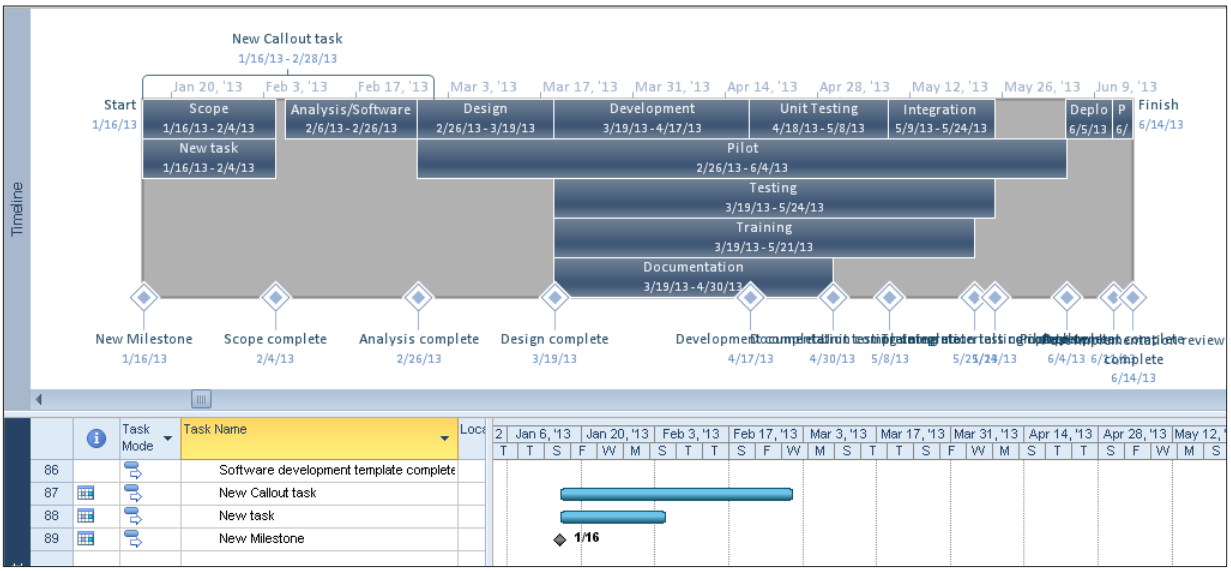


Figure 12-36 PLACEHOLDER

To display an existing task as a callout task:

- Click on a task in the Timeline view
- Click **Display as a Callout**

To display a Callout task as a bar:

- Click on the Callout task
- Click **Display as Bar**

To remove tasks from the Timeline view using the Timeline format bar:

- Click the task in the Timeline view
- Click **Remove from Timeline**

Tasks may be formatted and highlighted as necessary. Text styles and

format buttons are available on the Timeline format bar. Tasks may Changing the colors of the timeline bars is helpful when highlighting information.

To export a Timeline view to Outlook, Excel, Word, or Powerpoint to the clipboard:

- Click in the **Timeline** view
- Click **Copy timeline**
- Select copy choice:
  - For email
  - For presentation
  - Full size
- Navigate to destination
- Click **Copy**

Too much information results in a hard to read Timeline view. Select what is important and what will convey your message. The view will become more meaningful and will result in a useful reporting tool.

Exporting Timeline View

As a reminder, Timeline view is great for visual executive summaries. To facilitate sharing information with executives, the Timeline may need to be exported to another application.

To add items to the Timeline, refer to *Customizing Timeline Views* on page 339.

Timeline view must be displayed before you can export it to another application. The simplest method is to click the Timeline checkbox on the View tab. If this option is unavailable, you may need to uncheck the Details checkbox on the same tab.

To copy a timeline:

1. Click inside the Timeline.

2. In the **Timeline Tools**, **Format** tab, click on **Copy Timeline** and choose the desired option.
   - **For e-mail** – Timeline size is reduced to fit into an Outlook message. Small size.
   - **For presentation** – Optimized for a PowerPoint presentation. Medium size.
   - **Full Size** – Uses the full size of the timeline as displayed in Project. Large size.

   You can paste in Outlook to email it to peers or in PowerPoint to format it further.

You can also save the Timeline as an Adobe Acrobat file (see *Save as PDF* on page 315).