

Managing Projects with MS Project 2010

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Managing Projects with MS Project 2010

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First Edition - 2014



Dear Learner,

We congratulate you on your decision to pursue an Aptech Worldwide course.

Aptech Ltd. designs its courses using a sound instructional design model – from conceptualization to execution, incorporating the following key aspects:

- Scanning the user system and needs assessment

Needs assessment is carried out to find the educational and training needs of the learner

Technology trends are regularly scanned and tracked by core teams at Aptech Ltd. TAG* analyzes these on a monthly basis to understand the emerging technology training needs for the Industry.

An annual Industry Recruitment Profile Survey# is conducted during August - October to understand the technologies that Industries would be adapting in the next 2 to 3 years. An analysis of these trends & recruitment needs is then carried out to understand the skill requirements for different roles & career opportunities.

The skill requirements are then mapped with the learner profile (user system) to derive the Learning objectives for the different roles.

- Needs analysis and design of curriculum

The Learning objectives are then analyzed and translated into learning tasks. Each learning task or activity is analyzed in terms of knowledge, skills and attitudes that are required to perform that task. Teachers and domain experts do this jointly. These are then grouped in clusters to form the subjects to be covered by the curriculum.

In addition, the society, the teachers, and the industry expect certain knowledge and skills that are related to abilities such as *learning-to-learn, thinking, adaptability, problem solving, positive attitude etc.* These competencies would cover both cognitive and affective domains.

A precedence diagram for the subjects is drawn where the prerequisites for each subject are graphically illustrated. The number of levels in this diagram is determined by the duration of the course in terms of number of semesters etc. Using the precedence diagram and the time duration for each subject, the curriculum is organized.

- Design & development of instructional materials

The content outlines are developed by including additional topics that are required for the completion of the domain and for the logical development of the competencies identified. Evaluation strategy and scheme is developed for the subject. The topics are arranged/organized in a meaningful sequence.

The detailed instructional material – Training aids, Learner material, reference material, project guidelines, etc.- are then developed. Rigorous quality checks are conducted at every stage.

➤ Strategies for delivery of instruction

Careful consideration is given for the integral development of abilities like thinking, problem solving, learning-to-learn etc. by selecting appropriate instructional strategies (training methodology), instructional activities and instructional materials.

The area of IT is fast changing and nebulous. Hence considerable flexibility is provided in the instructional process by specially including creative activities with group interaction between the students and the trainer. The positive aspects of web based learning –acquiring information, organizing information and acting on the basis of insufficient information are some of the aspects, which are incorporated, in the instructional process.

➤ Assessment of learning

The learning is assessed through different modes – tests, assignments & projects. The assessment system is designed to evaluate the level of knowledge & skills as defined by the learning objectives.

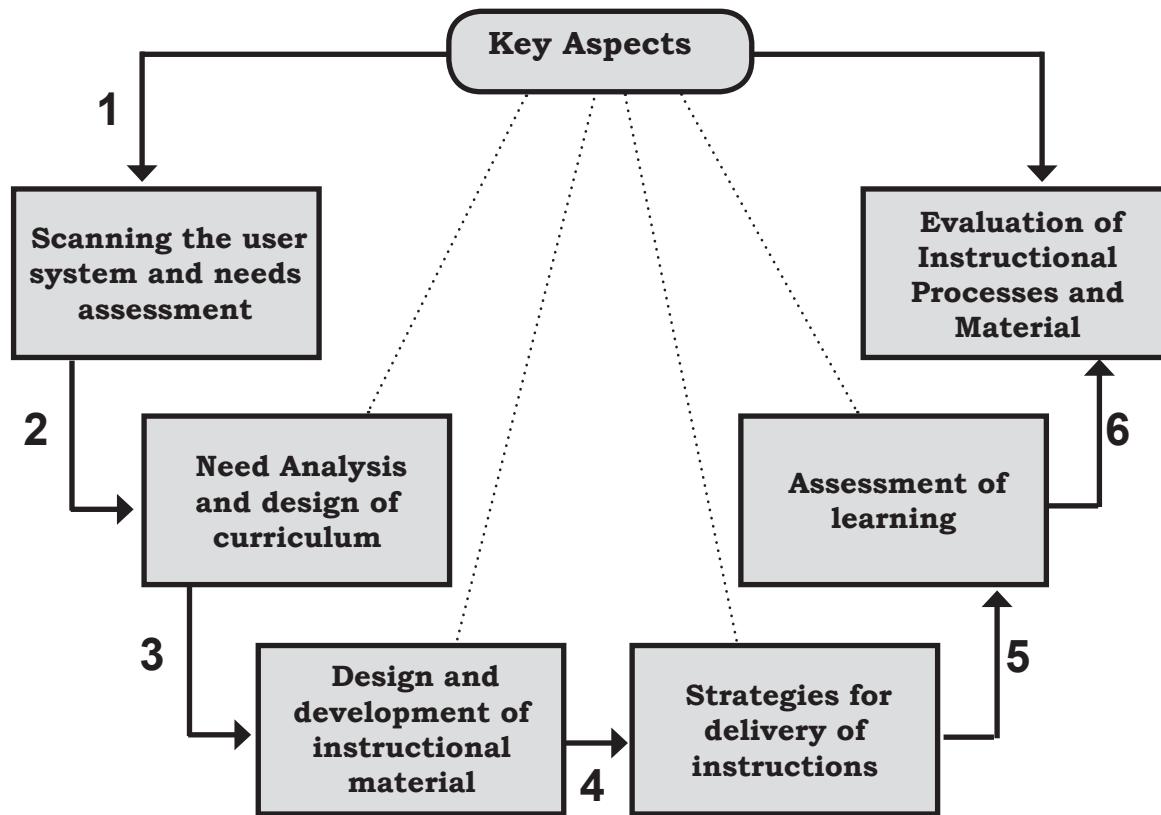
➤ Evaluation of instructional process and instructional materials

The instructional process is backed by an elaborate monitoring system to evaluate - on-time delivery, understanding of a subject module, ability of the instructor to impart learning. As an integral part of this process, we request you to kindly send us your feedback in the reply pre-paid form appended at the end of each module.

*TAG – Technology & Academics Group comprises of members from Aptech Ltd., professors from reputed Academic Institutions, Senior Managers from Industry, Technical gurus from Software Majors & representatives from regulatory organizations/forums.

Technology heads of Aptech Ltd. meet on a monthly basis to share and evaluate the technology trends. The group interfaces with the representatives of the TAG thrice a year to review and validate the technology and academic directions and endeavors of Aptech Ltd.

Aptech New Products Design Model



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Preface

A project involves planning and organizing people, material, and other assets effectively. Successful projects require skilled project management. Microsoft (MS) Project 2010 is a powerful tool for project management. It is a software product that helps you document project tasks, build a schedule, assign resources, track progress, and make changes until the project is complete.

This book begins with an introduction to Microsoft Project 2010. It then describes creation of project plans and explains controlling and managing tasks, schedules, resources, and costs. The book shows how to collaborate and share data with others in an organization using a variety of productivity and use resource pools, consolidated projects, to extend project management focus across multiple projects.

This book is the result of a concentrated effort of the Design Team, which is continuously striving to bring you the best and the latest in Information Technology. The process of design has been a part of the ISO 9001 certification for Aptech-IT Division, Education Support Services. As part of Aptech's quality drive, this team does intensive research and curriculum enrichment to keep it in line with industry trends.

We will be glad to receive your suggestions.

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Table of Contents

Sessions

1. Microsoft Project 2010 Interface
2. Creating a Project Plan
3. Scheduling.....
4. Tasks Allocation
5. Project Dependencies
6. Resource Management
7. Costing
8. Tasks, Resources, and Team Planner
9. Project Baseline
10. Fine Tuning Project Plans
11. Monitoring and Controlling Project Progress
12. Project Performance
13. Reports
14. Customizing Project Appearance
15. Connecting and Collaborating
16. Project Management Best Practices



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Objectives

At the end of this session, the student will be able to:

- *Identify project management elements*
- *Define a project manager's role*
- *Describe the system requirements for MS Project 2010*
- *Identify the various editions of MS Project 2010*
- *List the features of MS Project 2010*
- *Identify the various components of the MS Project 2010 interface*
- *Identify and describe the different views*

1.1 Introduction

Microsoft Project 2010 is a powerful and widely used project management and scheduling software. It provides several features and enhancements that assist a project manager throughout the life cycle of a project and in all phases of a project. It enables to perform the responsibilities and essential tasks that are required to manage a project. MS Project 2010 is available in several editions with features for meeting the project management needs of a variety of users. This session describes the life cycle of a project and the role of a project manager. It also introduces MS Project 2010 and discusses its installation process, the available editions, and its compatibility with other versions. Further, this session describes the features of MS Project 2010, the MS Project 2010 user interface, and types of views in MS Project 2010.

1.2 Introduction to Project Management

A project is an organized endeavor to achieve a specific output. It could be designing a new computer system, building a highway, building a hydroelectric power plant, or designing a new aircraft. Project management involves managing the time, cost, financial resources, human resources, and other related aspects of a project to achieve its objectives.

Session 1

Microsoft Project 2010 Interface

1.2.1 Nature and Limitations of a Project

A project is temporary in nature, which means that it has a specific start and end time as opposed to routine operations such as manufacturing or maintenance. These routine operations can be ongoing and may not be a one-time activity. For example, designing a new car can be considered as a project whereas manufacturing that car is a routine operation because it can be ongoing for long duration. Temporary, however, does not mean short duration. Some complex projects, such as designing a satellite or building a dam can take years.

Projects often have the constraints or limitations of time, scope, and budget. This means that the project must be completed within the given time, scope, and budget. Quality is sometimes considered the fourth limitation. The main challenge of project management is to achieve the project objectives within the project constraints.

Every project includes a project owner or client, for whom the project is being executed, and a project team that is responsible for implementing the project. The project owner typically funds the project and hence, is also called the project sponsor. The project team consists of one or more project managers who are professionals in the field of project management and one or more team members who actually perform the project tasks.

1.2.2 Project Management

Project management provides a set of tools and techniques that enable the project team to successfully meet the project objectives within the constraints. Project management evolved in the early 1950s in the fields of engineering, civil construction, and defense production. Today, it is an important tool, especially in the Information Technology (IT) and software industry.

1.3 Life Cycle of a Project

Every project has a definite start and end point. Every project follows a life cycle and produces defined deliverables at various stages. The stages in a project include:

- Identifying the need for a project
- Identifying the project phases
- Preparing the project schedule
- Assigning resources
- Tracking the project
- Closing the project

1.3.1 Identifying the Need for a Project

The first step in the life cycle of a project is to identify the need for a project. A need is a gap between what is available and what is required. A project is an effort to meet that specific gap. For instance, an organization may need to track the performance of its vendors who cater to their fast expanding supply chain. The primary objective of the project is to fulfill that need. In this case, a project is required to design and implement a vendor performance tracking system.

1.3.2 Identifying the Project Phases

Depending on the type of project, there are various development phases in a project. In general, projects go through the following phases:

- **Initiation:** This phase involves deciding and agreeing upon the nature and scope of the project. This is the most critical phase as it defines what will be done and what will not be done as part of the project. This scope clarity is very essential for the execution of the project within the time and cost constraints.
- **Planning:** The activities involved in this phase include, determining the schedule, estimating the resources required, drawing up the budget, and risk planning.
- **Execution:** In this phase, the work plan decided in the planning phase is put into action to execute the project. This is typically the longest phase of the project cycle.
- **Monitoring and Controlling:** To ensure that the project is executing as per the estimated time and cost, it is essential to monitor and control the project and take corrective actions if and when things are not proceeding as per plan.
- **Closing:** The activities in this phase involve formal acceptance of the deliverables, formally closing the project, archiving the files and documents, and documenting the lessons learnt for future use.

1.3.3 Preparing the Project Schedule and Project Plan

A project plan is a plan for the entire project that defines all tasks and schedules for execution in a disciplined manner. Following a project plan ensures timely delivery of project outcomes and targets within budget. A project plan ensures proper coordination between project team members and provides adequate visibility to management during project execution.

A project plan includes a project schedule, which is a list or a chart of activities, each with specific start and end dates. These activities are terminal, which means they cannot be broken down into further lower-level activities.

Session 1

Microsoft Project 2010 Interface

A project schedule also includes notable milestones. A milestone marks the completion of a major activity, such as the end of a stage. A milestone is represented as a task of zero duration showing an important achievement. A schedule also highlights interdependencies between the activities, if any.

Two activities in a project, Activity D and Activity F, are considered as interdependent if Activity F cannot start until Activity D is completed. The simplest and most popular way of drawing up a schedule is by using a **Gantt Chart**.

A **Gantt Chart** is a pictorial representation of project schedule represented as a type of Bar chart. **Gantt Chart** illustrates the start and finish dates of the tasks including sub tasks of a project. **Gantt Chart** also shows the dependency (also called as 'precedence') between tasks. **Gantt Charts** are used to show as-is current schedule status of the project.

1.3.4 Assigning Resources

Once the project manager decides the activities, phases, and schedule required to complete the project, the next step is to decide who will do the work. Assigning resources to tasks in project helps to:

- Track the amount of work done by the assigned people or equipment, or the amount of material used, in completing the tasks
- Ensure high accountability and understanding of the project. Clearly defining responsibilities minimizes the risk of tasks being overlooked
- Schedule more accurately as to how long the tasks will take and when they are likely to be completed
- Manage work allocation among resources to ensure effective use of resources
- Account for resource time and costs

1.3.5 Tracking the Project

Tracking activity in a project involves recording the actual tasks performed, the time that the resources have spent on those tasks, and the actual costs. Task information helps project managers to analyze and track the progress of a project.

The task information items that help project managers track tasks and their progress in projects includes:

- Duration
- Work

Session 1

Microsoft Project 2010 Interface

- Start date
- Finish date
- Cost

Task information helps project managers to compare and evaluate any variances during the project progress. Variances to verify during project tracking are as follows:

- Planned
- Scheduled
- Actual
- Remaining

Now, consider the task work. Project managers can track the task information about work under the fields of planned work, scheduled work, actual work, and remaining work. The contents of these fields might match one another, or they might all be different. Examining the variation between these fields provides tracking information regarding project progress.

1.3.6 Closing the Project

Project closure is a process and is more than just a project phase with deliverables to successfully conclude a project. A well-structured project closure phase must ensure that the project has completed with a controlled end. In this phase, the project manager compiles the end of project report, detailing the major findings and outcome of the project. The report evaluates the degree of the project's success.

The project manager then identifies the list of people who must attend the project closure meeting and schedules the meeting based on their availability. The purpose of a closure meeting is to review the project and the end of project report. The attendees of the meeting discuss and ensure that all the work products have been delivered as per the acceptance criteria.

Before formal closure of the project, the project owner studies the end of project report in detail and verifies that the project has successfully delivered its objectives, as detailed in the project initiation document. Further, the project owner schedules a review for the outcome of the project.

The project manager closes the project on receiving the formal acceptance of project deliverables from the customer, and/or sponsor, and senior management. Project closure further involves archiving the project files and documents, documenting the lessons learnt for future use, and freeing up resources for allocation to other projects.

Session 1

Microsoft Project 2010 Interface

Finally, a project evaluation review and post implementation review of the project are carried out. This involves an analysis of the effectiveness of the project deliverables. The post implementation review happens typically six months after project delivery. This process ensures that lessons are learned based on the project activities and milestones and can be applied to future projects.

1.4 The Role and Essential Tasks of a Project Manager

A project manager is a person responsible for managing one or more projects. The key responsibility of a project manager is to create the master plan for a project, complete all the activities within project life cycle, and ensure that it executes successfully. The detailed responsibilities of a project manager include initiation, planning, execution, monitoring and control, and closure of the project.

While managing a project, a project manager must track all activities of the project life cycle and maintain the limited project costs and strict deadlines. Variances in the project status if any, must be communicated to all project stakeholders.

The project manager is not always the highest power in a project. Often, this role belongs to the ones who manage the project including members of senior management. The project manager makes sure of the project deliverables and assumes hands-on responsibility for all successes as well as failures regarding the project.

1.5 Introduction to Microsoft Project 2010

Microsoft Project 2010 is a project management software that helps manage the resources and timelines of a project efficiently. It is an indispensable project management tool for project managers. It enables project managers to efficiently manage small to large projects with ease. MS Project not only helps project managers in developing and managing schedules but also allows them to work more productively, communicate more effectively, access required information, and track projects more efficiently.

MS Project 2010 provides user-friendly, powerful, and visually enhanced features to assist in planning, scheduling, collaborating, and managing project resources. It provides features, such as charts and graphs that enable project managers to communicate the project status with key stakeholders and monitoring and controlling project progress.

1.5.1 System Requirements for MS Project 2010

MS Project 2010 is available in two editions, MS Project Standard 2010 and MS Project Professional 2010. Both editions are offered in 32-bit and 64-bit versions.

Session 1

Microsoft Project 2010 Interface

Table 1.1 lists the various system requirements for MS Project 2010.

Feature	Specifications
Processor	700 Mega Hertz (MHz) or faster
Memory	512 Mega Bytes (MB) or more RAM
Hard Disk	1.5 Giga Bytes (GB)
Display	1024 × 768 or higher resolution monitor
Operating System	Windows 7, Windows Vista with Service Pack (SP) 1, Windows XP with SP3 (32-bit), Windows Server® 2008 with SP2 (32-bit or 64-bit), or Windows Server 2003 Release 2 (R2) with Microsoft eXtensible Markup Language (XML) Core Services (MSXML) 6.0

Table 1.1: System Requirements for Installing MS Project 2010

Concepts

1.5.2 Editions of MS Project 2010

The two editions of MS Project 2010 are available as entire suite of products, each offering a set of innovative features to meet the project management requirements of various types of users. The MS Project 2010 suite comprises:

- MS Project Standard 2010
- MS Project Professional 2010
- MS Project 2010 built-on SharePoint 2010
- MS Project Professional 2010 with MS Project Server 2010
- Microsoft Enterprise Project Management (EPM) Solution

MS Project Standard 2010 provides features that are more useful for part-time project managers while MS Project Professional 2010 provides features for professional project managers. Another version of MS Project 2010 is also available with built-in SharePoint 2010 (both Standard and Professional). MS Project 2010 built on SharePoint 2010 is recommended for integrated workflow management connecting individuals, teams, and enterprises.

Session 1

Microsoft Project 2010 Interface

Table 1.2 lists the various products in the MS Project 2010 suite and their respective target user profiles.

Product	User Profile
MS Project Standard 2010	Individual and Part-Time Project Managers
MS Project Professional 2010	Professional Project Managers
MS Project built-on SharePoint 2010	Integrated workflow management connecting individuals, teams, and the enterprise
MS Project Server 2010	IT, Project Management Office, Engineering, Research and Development, Product Development, Operations
Microsoft Enterprise Project Management (EPM) Solution	Teams in geographically different locations needing centralized resource management and team coordination between projects, project managers

Table 1.2: MS Project 2010 Suite

MS Project Professional 2010 combined with MS Project Server 2010 is best suited for managing complex multiple projects in large organizations.

EPM Solution is suitable for managing multiple projects and utilizing the shared resources across the organization in a centralized environment. It comprises a combination of several tools and software. Microsoft EPM includes MS Project Professional, MS Project Server, MS Project Web Access, and MS Project Portfolio Server. EPM facilitates project sponsors and top-level senior managers to view and analyze information on all the projects in their organization on a dashboard. EPM Solution is perfect for organizations having teams in geographically different locations. Such teams need coordination between projects, their project managers, and a centralized resource management pool, with top-level reporting and project analysis features.

1.5.3 Compatibility of MS Project 2010 with Earlier Versions

MS Project 2010 offers full compatibility with files created in earlier versions of MS Project Standard 2010 and MS Project Professional 2010. User can also save Project files in formats supported by earlier versions of Project. However, the new features of Ms Project 2010 will be available with reduced functionality.

Users can save MS Project 2010 files in other file formats, including XML, Comma-Separated Values (CSV), text (tab-delimited), and Excel workbooks. Users can also save MS Project files as Open Database Connectivity (ODBC) databases.

Session 1

Microsoft Project 2010 Interface

Figure 1.1 illustrates MS Project 2010 file type extensions.

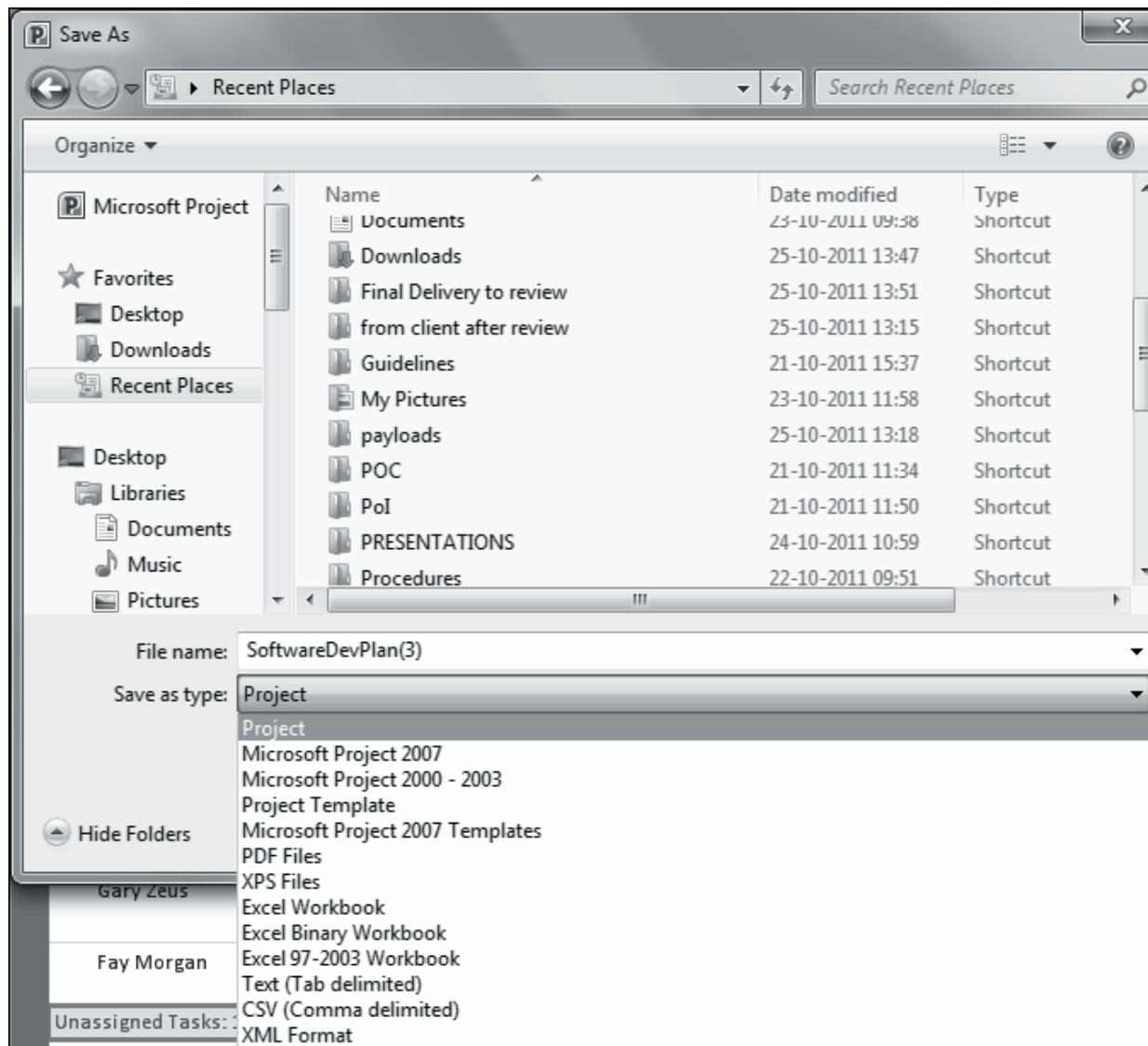


Figure 1.1: MS Project 2010 File Type Extensions

1.6 Installing MS Project 2010

To install MS Project 2010, users need to purchase the full licensed version of the software. Alternatively, they can try out a free 30-day trial from the link:

<http://technet.microsoft.com/en-us/evalcenter/ee404758.aspx>

To begin installation, insert the MS Project 2010 CD into the CD drive. This starts the MS Project 2010 installer. On the **Enter your Product Key** page, enter the product key for the software copy and click **Continue**.

Session 1

Microsoft Project 2010 Interface

Next, on the Read the Microsoft Software License Terms page, read the terms of agreement and select the **I accept the terms of this agreement** check box. Click **Continue**.

Figure 1.2 displays the MS Project 2010 installation screen to enter the software product key.

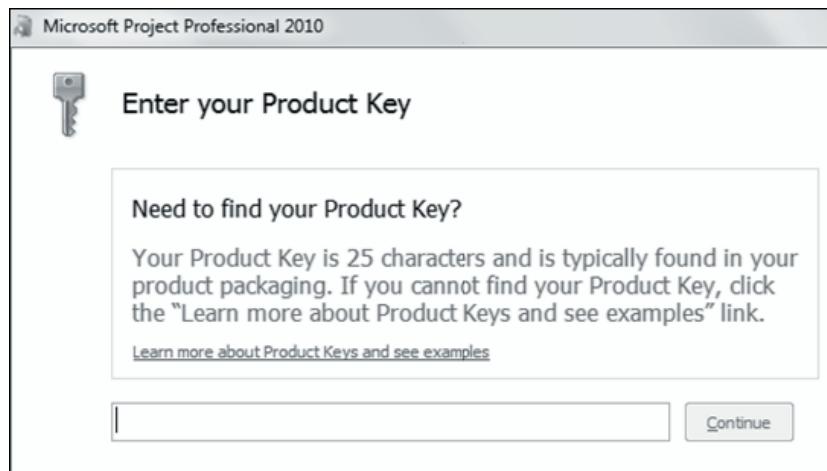


Figure 1.2: MS Project 2010 Installation and Entering Product Key

On the next page, specify the user name and organization name and click **Install Now** to begin typical installation of the software. To perform a custom installation of the software, click **Customize**. Click **Close** once the installation is complete.

Figure 1.3 illustrates typical installation of MS Project 2010.



Figure 1.3: Typical Installation of MS Project 2010

Session 1

Microsoft Project 2010 Interface

Concepts

Once Microsoft Project is installed successfully, it will appear in the Start menu along with other Office applications that might be installed on the computer. Now, the user can start managing projects using Microsoft Project 2010.

Figure 1.4 displays MS Project 2010 on the start menu of a computer after successful installation.

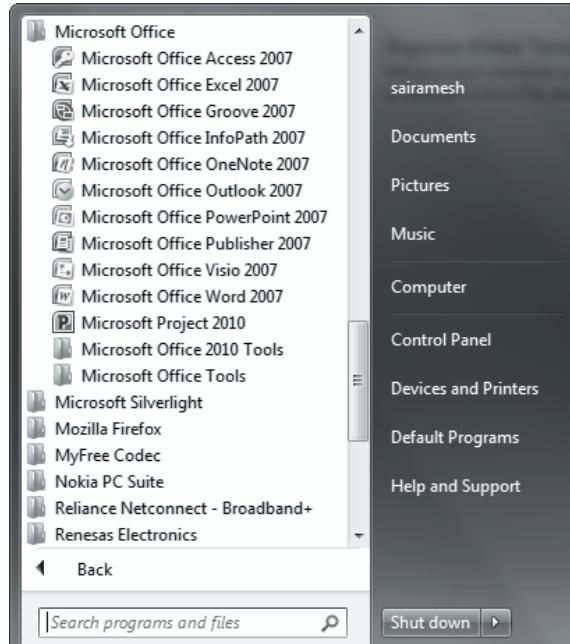


Figure 1.4: MS Project 2010 in the Start Menu

1.7 Features of MS Project 2010

MS Project 2010 delivers powerful, visually enhanced tools to effectively manage a wide range of project tasks and schedules. From meeting crucial deadlines, to selecting the resources and empowering the teams, MS Project 2010 facilitates increased productivity and provides great results through efficient project management solutions.

MS Project 2010 provides the following features:

- Efficient work planning
- Effective resource management
- Collaborative project management
- Quick access to project information

Session 1

Microsoft Project 2010 Interface

- Integration with other MS Office applications
- Building dynamic schedules
- New Interactive Team Planner
- Easy updates and management of projects and plans

1.7.1 Efficient Work Planning

MS Project 2010 helps in efficient planning for small, medium, and large-scale projects. MS Project 2010 helps project managers efficiently plan project schedules, allocate resources, manage budgets, and in the process, meet the expectations of customers. Project managers can constantly track the status of the project throughout its life cycle and be in full control of the project.

1.7.2 Effective Resource Management

MS Project 2010 helps managing project resources by offering visibility in workload, timesheets, and resource competence. MS Project 2010 helps assign resources to tasks and at the same time, check for any overallocated or interdependent tasks by building resource plans.

1.7.3 Collaborative Project Management

MS Project 2010 helps manage multiple teams spread across different geographic locations and work collectively towards a common goal. This helps in teamwork and achieves organization success. MS Project 2010 enables you to present project data in various forms, such as charts, reports, graphs, Portable Document Format (PDF) documents, and custom templates of an organization, for easy analysis and presentation for the team as well as the customers.

1.7.4 Quick Access to Project Information

MS Project 2010 helps generate information through grouping data by custom fields and by customizing the toolbar. It is possible to export MS Project 2010 data to other Office Applications, such as Word, Excel, and PowerPoint with a few clicks.

1.7.5 Integration with Other MS Office Applications

MS Project 2010 integrates seamlessly with all MS Office applications. Project plans made in Excel or Word can be copied directly into MS Project. The enhanced copy-paste property keeps all the formatting parameters of the source file intact, such as fonts, colors, and justification. In addition, you can pull tasks and resources directly from MS Outlook and push them into MS Project.

1.7.6 Building Dynamic Schedules

MS Project 2010 comes with a unique feature of Auto Scheduling wherein the start date and end date of tasks is calculated based on the Tasks predecessors, Start Date, and End Date. Manual scheduling allows users to enter values for Duration, Start Date, and End Date. Task Inspector is a feature in MS Project 2010 that raises a flag whenever there is a conflict in resource and/or schedule.

1.7.7 New Interactive Team Planner

The Team Planner tool in MS Project 2010 helps manage resources and move tasks between them with a simple drag-drop mechanism. Resource conflicts can be handled by enhanced resource leveling. Resource leveling is a project management technique used to check whether resources are allocated equally without any over time and conflicts.

1.7.8 Easy Updates and Management of Projects and Plans

MS Project enables users to update project plans using commands on the **Ribbon** and the interactive Team Planner functions. Compare projects is a unique feature of MS Project 2010 that derives ‘what-if’ analysis.

1.8 MS Project 2010 User Interface

The MS Project user interface comprises the following core components:

- Menu Ribbon
- Backstage View
- Status Bar
- Help

Session 1

Microsoft Project 2010 Interface

Figure 1.5 shows the typical MS Project 2010 user interface.

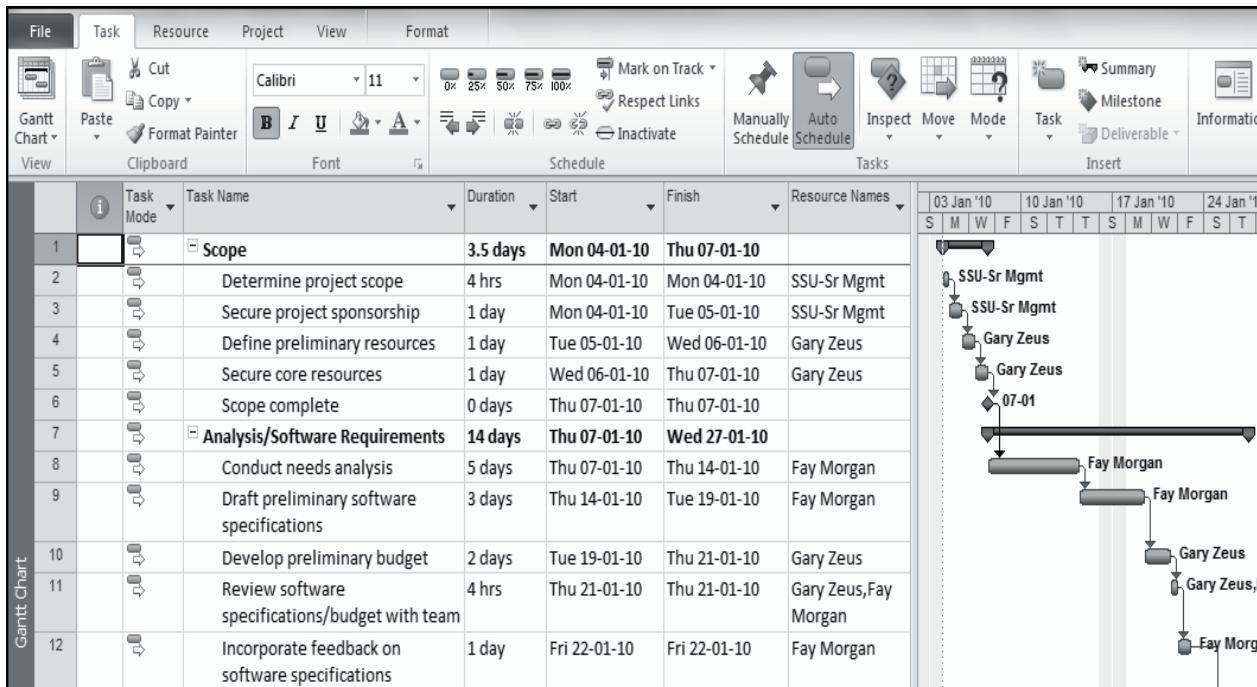


Figure 1.5: Microsoft Project 2010 User Interface

1.8.1 The Ribbon

At the top of the MS Project application window is a collection of menu commands called the **Ribbon**. The **Ribbon** provides access to various features and functions of MS Project at one place. The **Ribbon** contains several tabs. Each tab is a set of menu commands and functions organized into logical groups. The **Ribbon** can be minimized when not in use, to maximize the workspace. This can be done by clicking the **Ribbon** button placed next to the question mark icon on the top right corner or by pressing Ctrl+F1. The various menu tabs available on the **Ribbon** are as follows:

- **Task:** The **Task** tab contains several options to work with project tasks, such as **Gantt Chart** View, Insert Task, Indent and Outdent Task, Split Tasks, Link Tasks, and so forth.
- **Resource:** The **Resource** tab contains several options to work with project resources, such as Assign Resources, Resource Pool, Details, Level Resource, and Level All.
- **Project:** The **Project** tab contains options to perform project level operations, such as Insert Sub Project, Project Information, and Work Breakdown Structure, Change Working Time, Calculate Project, and so forth.
- **View:** The **View** tab provides options to track various types of project details and project progress, such as Team Planner, Resource Usage, and Resource Sheet.
- **Format:** The **Format** tab provides several commands to apply formatting to project details and charts, such as Gridlines, Column Settings, Text-wrapping, Auto-complete, and so forth.

Session 1

Microsoft Project 2010 Interface

Figure 1.6 illustrates the typical view of the **Ribbon**.

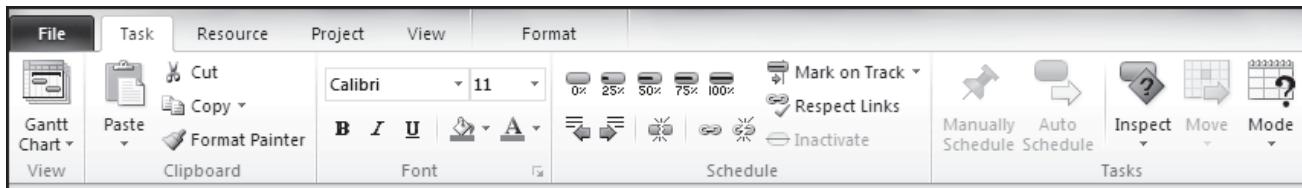


Figure 1.6: The Ribbon

1.8.2 The Backstage View

Starting with the Office 2007 suite, Microsoft removed the menu bar and replaced it with the **File** tab. The **File** tab is the green button at the left end of the **Ribbon**. Clicking it displays the Backstage view. The Backstage view provides several options to work with the entire file or project. It provides options to open, close, save, print, and share files. It also provides options to protect project files and set their properties. The Backstage view groups all document related commands and settings at one place making them easy to find and work with.

Figure 1.7 illustrates the Backstage view of MS Project.

A screenshot of the Microsoft Project 2010 Backstage view. The left sidebar shows options like Save, Open, Info, Recent, New, Print, Save & Send, Help, Options, and Exit. The "Print" option is selected. The main pane shows the "Print" dialog with "Copies: 1" and a "Printer" dropdown set to "doPDF v7 Ready". Below that is the "Settings" section with "Print Entire Project" and "Print the project from start to finish". It also shows date range "04-01-2010 to 01-06-2010", page range "1 to 18", and orientation "Landscape Orientation" with "A4" selected. To the right, a Gantt chart is visible, showing a list of tasks with columns for Task Name and Task Mode. The tasks include "Scope", "Determine project scope", "Secure project sponsorship", etc., up to task 20.

Figure 1.7: The Backstage View

Session 1

Microsoft Project 2010 Interface

1.8.3 Quick Access to Features and Functions

MS Project allows customizing the **Ribbon** and arranging the commands according to individual preferences. You can add the most commonly used commands on a Quick Access toolbar. To customize the **Ribbon**, click the **File** tab and click **Options** in the Backstage view. This displays the **Project Options** dialog box. In this dialog box, select the **Customize Ribbon** option from the list of options in the left column.

Figure 1.8 illustrates options for customizing the **Ribbon**.

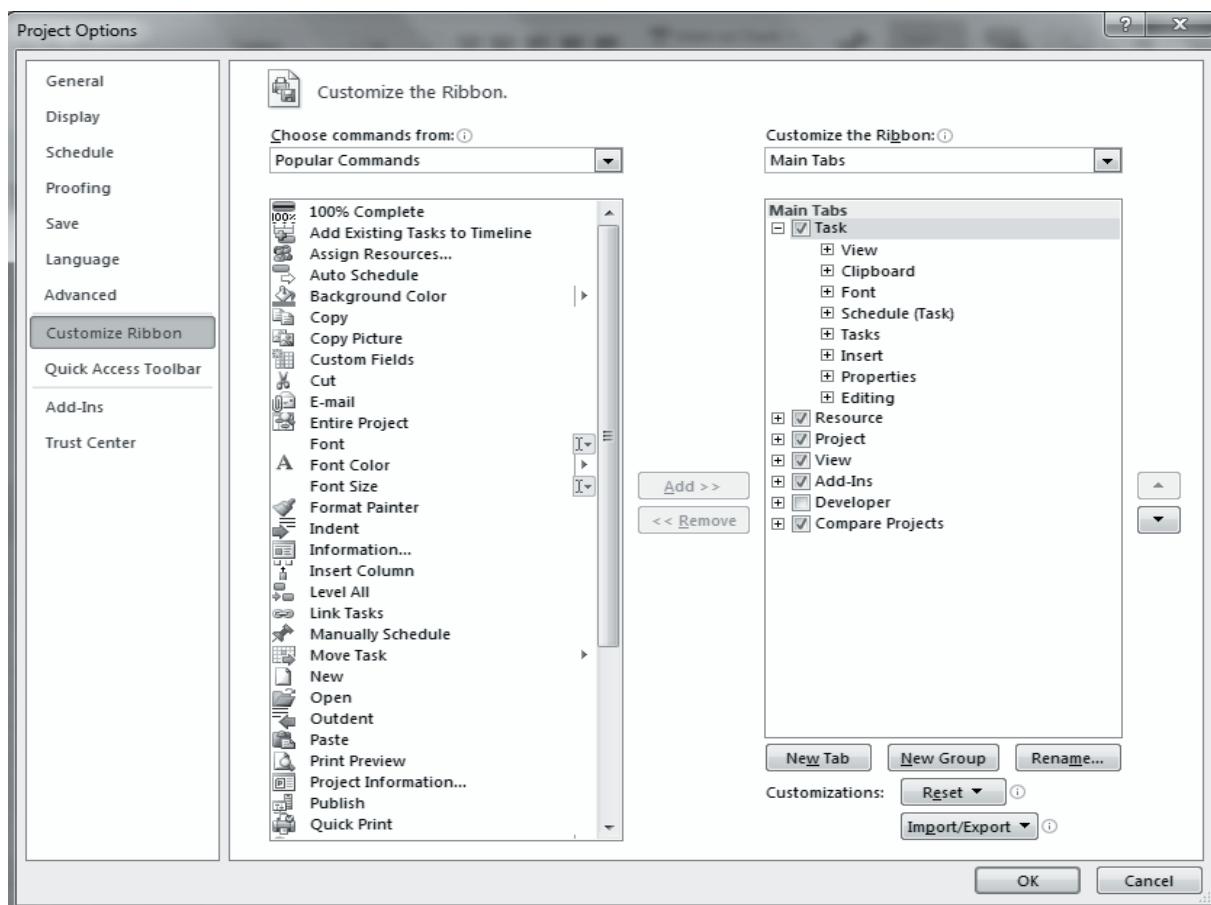


Figure 1.8: Options for Customizing the Ribbon

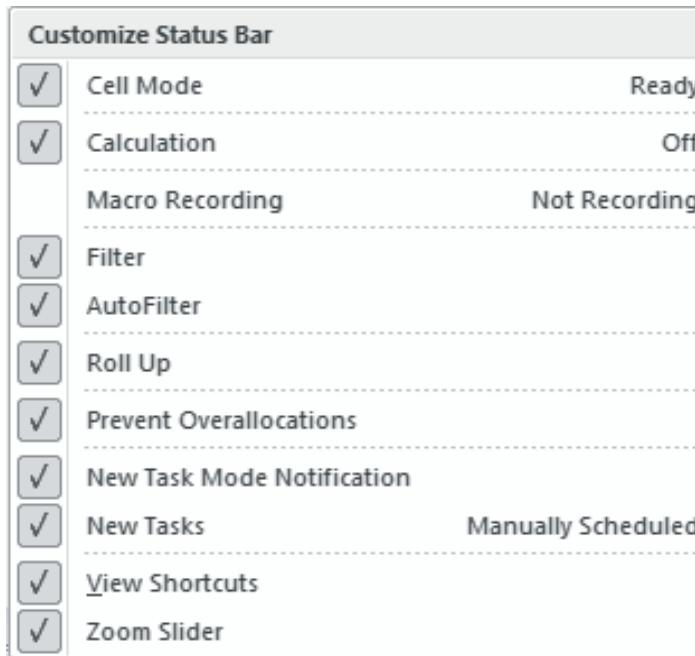
1.8.4 Status Bar

At the bottom of the application window is a status bar. The status bar displays key program settings that provide shortcuts to useful functions. It also contains the View and Zoom controls to change project view and timescale.

Session 1

Microsoft Project 2010 Interface

Figure 1.9 illustrates the status bar.



Concepts

Figure 1.9: Status Bar

1.8.5 Help

Like all MS Office applications, MS Project also provides a context-sensitive help. Click the question mark at the top right corner of the application window to display the help menu. MS Project Help option is also available on the **File** tab. Alternatively, press the F1 key .

Session 1

Microsoft Project 2010 Interface

Figure 1.10 illustrates the MS Project 2010 Help window.

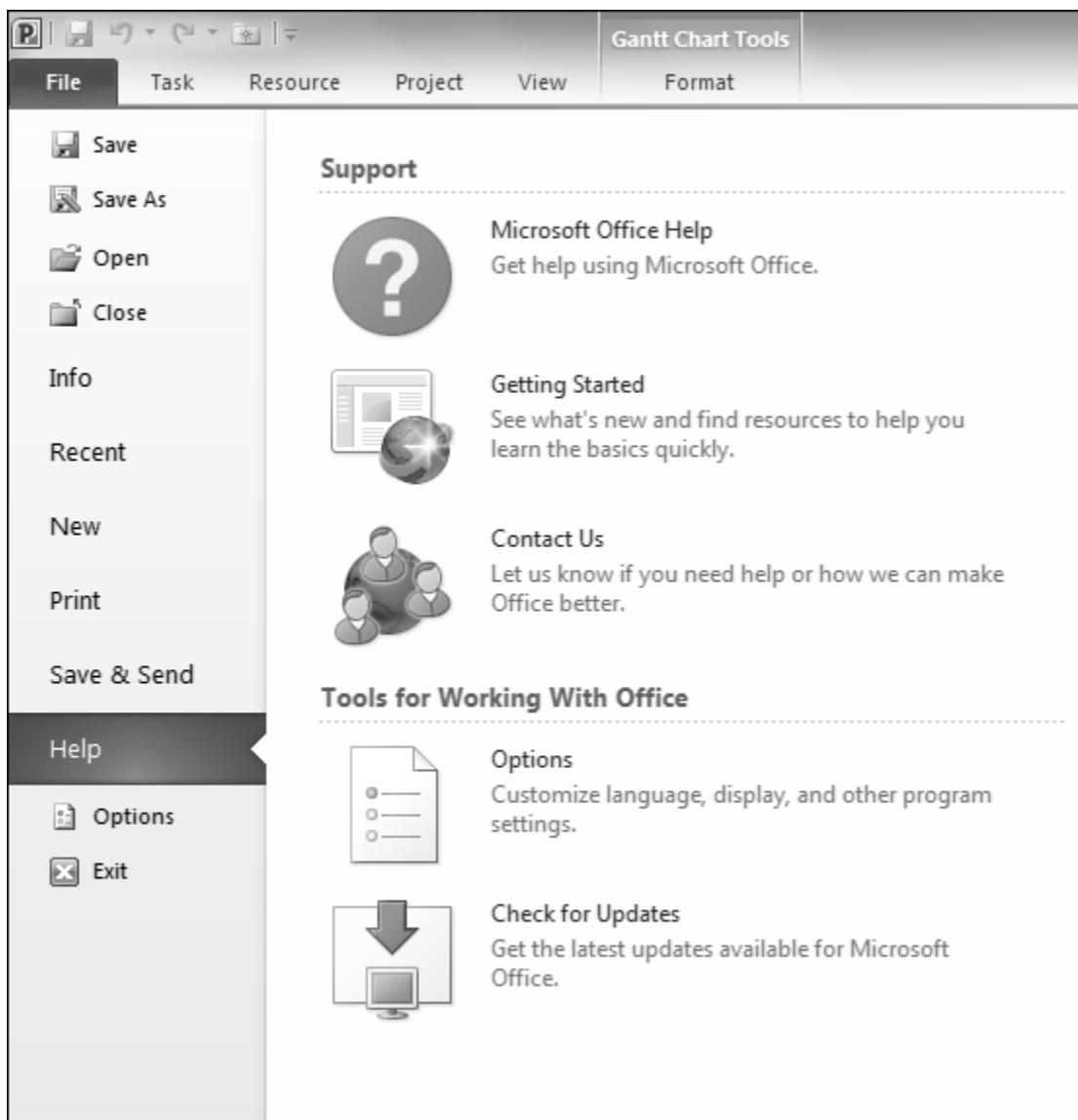


Figure 1.10: MS Project 2010 Help Window

1.9 Types of Views

Typically, project plans contain complex information. MS Project 2010 offers many views to simplify complex information and generate user-friendly views. These views help project managers to organize and display project and tasks details logically and analyze the information better. The various types of views are available on the **View** tab on the **Ribbon**. **Task Views** and **Resource Views** are two major groups of views available in MS Project.

Session 1

Microsoft Project 2010 Interface

Figure 1.11 illustrates the various choices of views on the View tab.

The screenshot shows the Microsoft Project 2010 interface with the 'View' tab selected in the ribbon. The main area displays the 'Task Usage' view, which is a grid of tasks. The columns include Task Name, Work, Duration, Start, Finish, and Details. The Details column shows a Gantt chart for each task. The ribbon under 'View' includes options for Network Diagram, Resource Usage, Resource Sheet, Sort, Outline Tables, Filter, Group by, Timescale (Days), Zoom (Entire Project, Selected Tasks), Timeline, Details, Split View, and various window management options like New Window, Hide, and Macros. A vertical 'Task Usage' label is on the left of the grid.

Concepts

Figure 1.11: Views Choices on the View Tab

1.9.1 Task Views

Task view is the default view that is displayed on opening an MS Project file. The Task view is split into two sections. On the left is a tabular list of tasks and their start and end dates. On the right is the **Gantt Chart** view of the same information. Click the down arrow on the **Gantt Chart** button on the **Ribbon** and select the **More Views...** option from the menu. This displays a list of various other available views as well as any custom views created by users. Click any view in the list to display it. Clicking the **Gantt Chart** button displays default task view once more.

Session 1

Microsoft Project 2010 Interface

Figure 1.12 illustrates the Task view for a project.

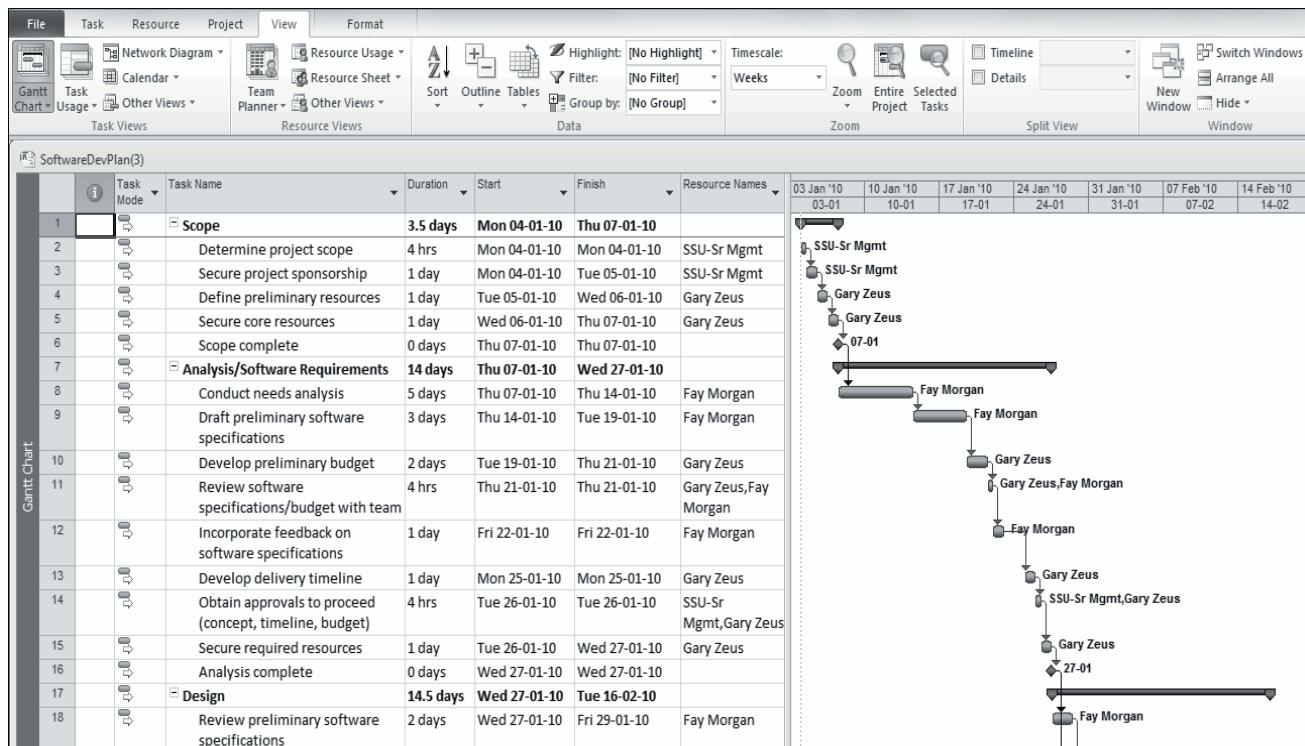


Figure 1.12: Task View

1.9.2 Resource Views

The **Resource Views** group enables you to select the Team Planner, Resource Usage, Resource Sheet, and other resource views. Resource Sheet view, shown in figure 1.13, enables project managers to view the resources assigned resources to the various tasks for a project. They can also assign new tasks to resources or add new resources to a project. Enter information in cells and use the Tab and arrow keys to navigate through the resources. Users can zoom into a view or sort the data on the view. Additionally, users can choose and adjust the view using the **View** Tab.

Session 1

Microsoft Project 2010 Interface

Figure 1.13 illustrates Resource Sheet view for a project.

The screenshot shows the Microsoft Project 2010 interface in Resource Sheet view. The ribbon at the top includes tabs for File, Task, Resource, Project, View, Format, and several icons for team management and resource assignment. The main area displays a grid of resources and their tasks. A context menu is open over a task assigned to 'Gary Zeus' on February 16, showing details like task mode, start date, finish date, duration, and work remaining. The grid columns include Resource Name, Unscheduled Tasks, and dates from Mon 15 Feb to Sat 23 Feb. Resources listed include Deployment Team, Gary Zeus, Fay Morgan, SSU-Sr Mgmt, Michelle Yeomans, Sharon Gail, Ryan Patrick, and Jeff Smith. The task details for Gary Zeus show 'Incorporate feedback into functional specifications'.

Concepts

Figure 1.13: Resource Sheet View

1.10 Chart Views

The various views in MS Project can also be displayed as charts, which are as follows:

- Gantt Chart
- Network Diagram

1.10.1 Gantt Chart View

The **Gantt Chart** view is the default chart view that is displayed on opening a new project. A **Gantt Chart** is like a horizontal bar chart showing the start and end of each activity. It helps users identify with a quick glance whether activities will be executed one after the other or in parallel, whether there are any overlaps or interdependencies between activities.

The **Gantt Chart** view has two major sections: the sheet pane on the left and the chart pane on the right. The view, shown in figure 1.14, is a grouping of MS Excel like sheet pane on the left and graphical representation of tasks on the right pane.

Users can change the information that is displayed in the sheet on the left using tables.

Session 1

Microsoft Project 2010 Interface

Tables are preset combinations of columns (fields) of data that can be easily displayed.

To change the type of information displayed, click the **View** tab and select **Tables**. Then, select a data table, such as **Entry** or **Cost**, from the menu that is displayed.

Figure 1.14 displays the **Gantt Chart** view.

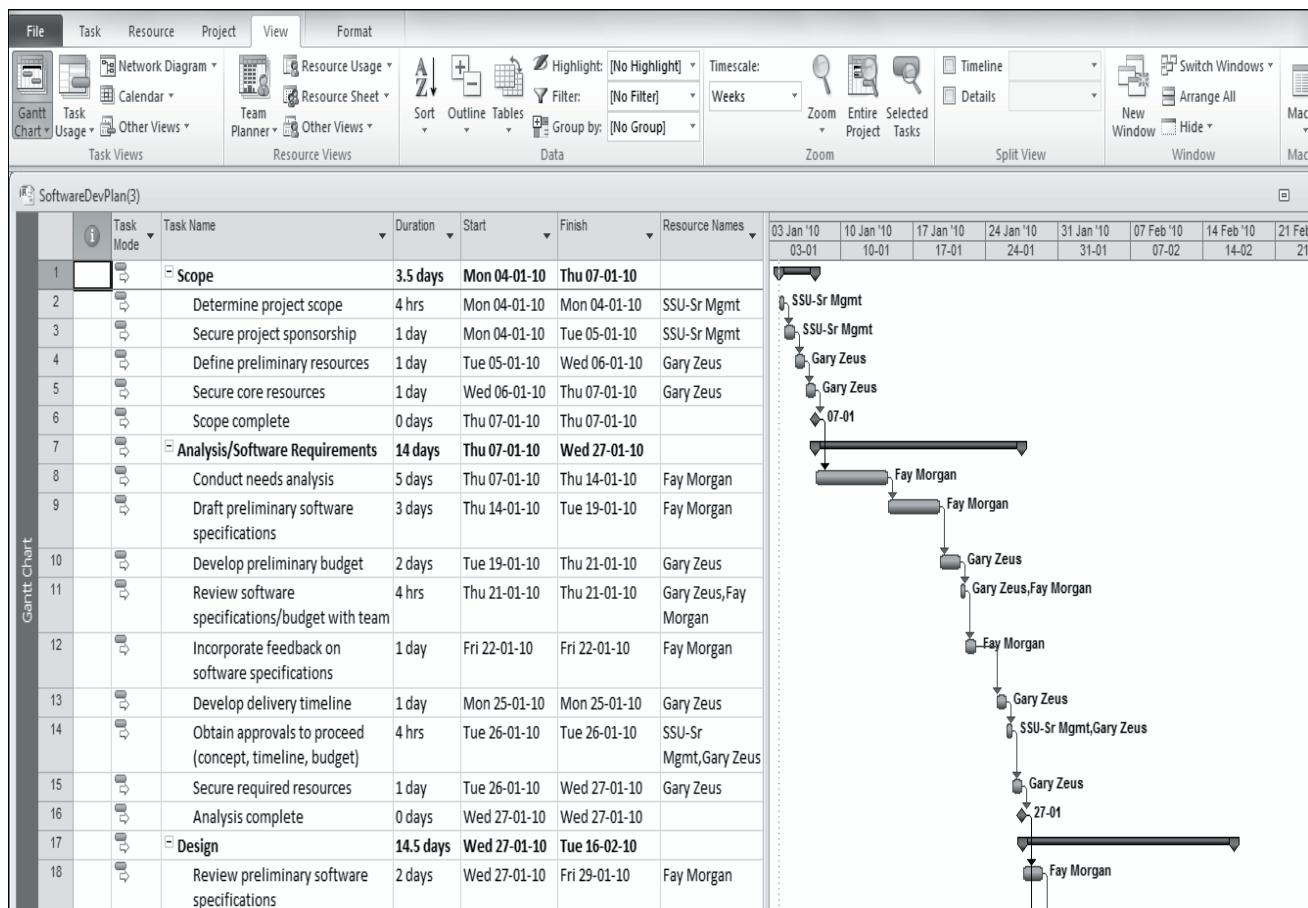


Figure 1.14: Gantt Chart View

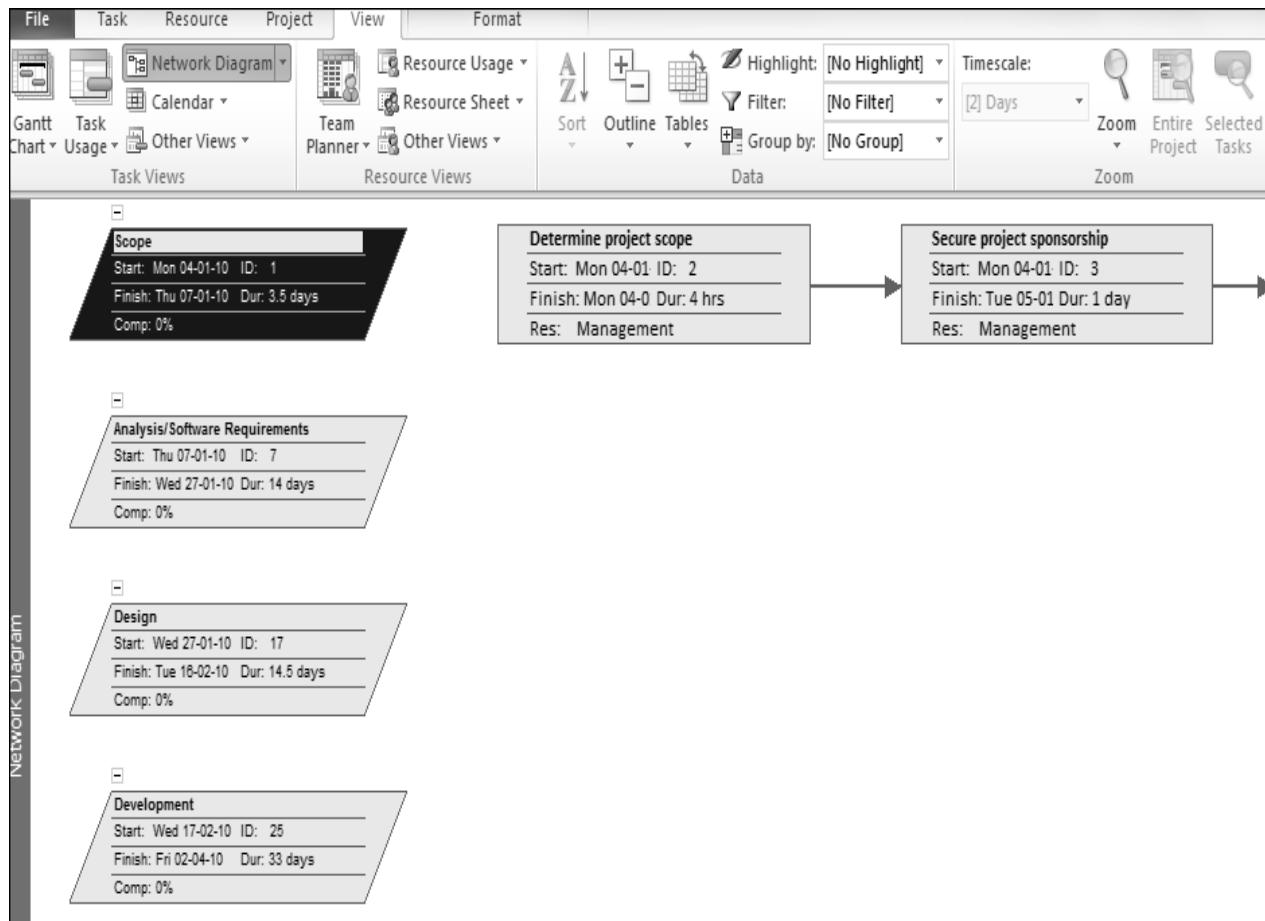
1.10.2 Network Diagram View

Another chart view that project managers often use for project related information is the Network Diagram view, shown in figure 1.15. This view displays a representation of the workflow in a project, as a series of work schedule boxes. The boxes consist of dependency lines between them to reflect the sequence of tasks. Tasks that happen in the same time frame are aligned vertically above each other. Tasks with an X through them are those that have been marked as complete.

Session 1

Microsoft Project 2010 Interface

Figure 1.15 illustrates the Network Diagram view.



Concepts

Figure 1.15: Network Diagram View



Summary

- A project is an activity carried out to meet a specific need and is temporary in nature.
- A project comprises a project manager, project sponsor, and a project team.
- All projects go through a life cycle, which includes stages, such as identifying the need, identifying the phases, preparing the schedule, assigning resources, tracking, and closing the project.
- Microsoft Project 2010 is a powerful project management software that helps efficiently manage project resources and timelines.
- MS Project 2010 allows viewing project related information in a variety of views, for slicing and dicing the information.
- The two key views in MS Project 2010 are the Task View and the Resources View.
- Project related data can be viewed in two graphical formats, Gantt Chart View and Network Diagram.



Check Your Progress

1. For which of the following queries would one find answers in order to understand the scope of project management?

A)	What are the business goals for the project?
B)	Is this project doable?
C)	What would be the communication protocol with the project stakeholders to move forward with the project?
D)	Should this project be executed?

2. For which of the following does engaging and involving key project stakeholders during the project requirements definition phase help?

A)	Identify documented procedures and specification for the project that one must adhere to
B)	Define the technical requirements for the project
C)	Capture well the business needs and stakeholder expectations
D)	Reduce costs of the project

3. Which of the following will add contingency to project plans?

A)	Adding extra resources or extra time in the project schedule
B)	Encouraging the client to allow for time delays in project delivery
C)	Allowing extra budget for increased project costs
D)	Encouraging the client to consider some contingency into the budget

4. Which of the following actions define a clear and measurable project mission at the start of the project?

A)	Assessing the stakeholders' readiness
B)	Calculate at each step, the impact of the system on the project goals
C)	Checking the availability of capable resources
D)	Diagnosing the business problem

Session 1

Microsoft Project 2010 Interface



Check Your Progress

5. Identify the following discussions should be on while discussing project's benefits with the team?

A)	Improved productivity
B)	Expanding business contacts
C)	Determining why are the defined goals essential to the project
D)	Determining why does the client want to execute this project

6. Which of the following is a manageable project phase approach?

A)	Plan the steps all the way to the end of the project
B)	Evaluate the steps for each phase at the start of the phase
C)	Keep each phase as manageable chunks that can be delivered in a stipulated timeframe before moving to the next phase
D)	Keep each phase as manageable chunks such that the final project can accommodate for any change that might arise during the project cycle

7. Identify the following project schedule, risks, and costs that needs to be managed by the project manager?

A)	Have a list of tasks with actual duration estimates and committed task owners
B)	Let the project team members put individual task buffers to their respective tasks
C)	Have a risk log to manage all key risks
D)	Track costs at the project level

Objectives

At the end of this session, the student will be able to:

- *Describe a project plan*
- *Describe how to create a new MS Project 2010 file*
- *Describe the use of MS Project templates*
- *Define and describe the Work Breakdown Structure (WBS)*
- *Describe the procedure to create tasks and sub tasks*
- *Explain setting and customizing WBS codes*
- *Explain the integration of MS Office applications with MS Project*

2.1 Introduction

A project plan is a formal and official document that guides through the development of the project as well as manages the project control. The key purposes of a project plan are to document the scope, cost, and schedule baselines and show the various resources, milestones, and activities that are part of the project. This session describes creation of a project plan using Microsoft Project 2010 and demonstrates the same through a case study.

2.2 Need for a Project Plan

Preparing a project plan is a crucial activity in a project. Consider a real-world scenario that shows the importance of a project plan.

Smart Signup Group is a world leader in developing Web applications. They are known internationally for design, development, consulting, and IT services on Microsoft platform. With the advent of mobile applications, there is pressure from their customers to support existing Web application on mobile devices too. Subsequently, Smart Signup Group has decided to reengineer the existing Internet-based applications to support mobile devices and also incorporate new enhancements to the software. This is a massive project and without a proper project plan, there can be various problems and conflicts. Some of these may include uneven resource allocation, schedule lags due to lack of planning and scheduling, and so forth. One of the staff, Gary Zeus, has been asked to take up this initiative as a project manager. He has worked in the organization for over a decade and recalls the project issues during the Web development.

Session 2

Creating a Project Plan

As a professional project manager, he decides to use the project management best practices combined with MS Project 2010.

As a first step, Gary creates a project scope document. Next, he has to create a project plan and works on the topics to arrive at the Work Breakdown Structure (WBS). A WBS involves breaking a project into smaller objectives and deliverables. To begin with, Gary or any person wishing to create the project plan can create a project file in MS Project by either starting a new project or searching and using a suitable MS Project template.

2.3 Creating a Project Plan

The following steps are involved in creating a project plan:

- Creating a new project file using MS Project 2010
- Defining a draft WBS for the project on paper or using a documenting software such as MS Word or Excel
- Creating WBS in MS Project 2010 by establishing project information and defining project tasks

In order to create a project plan, a user must first launch the MS Project 2010 application.

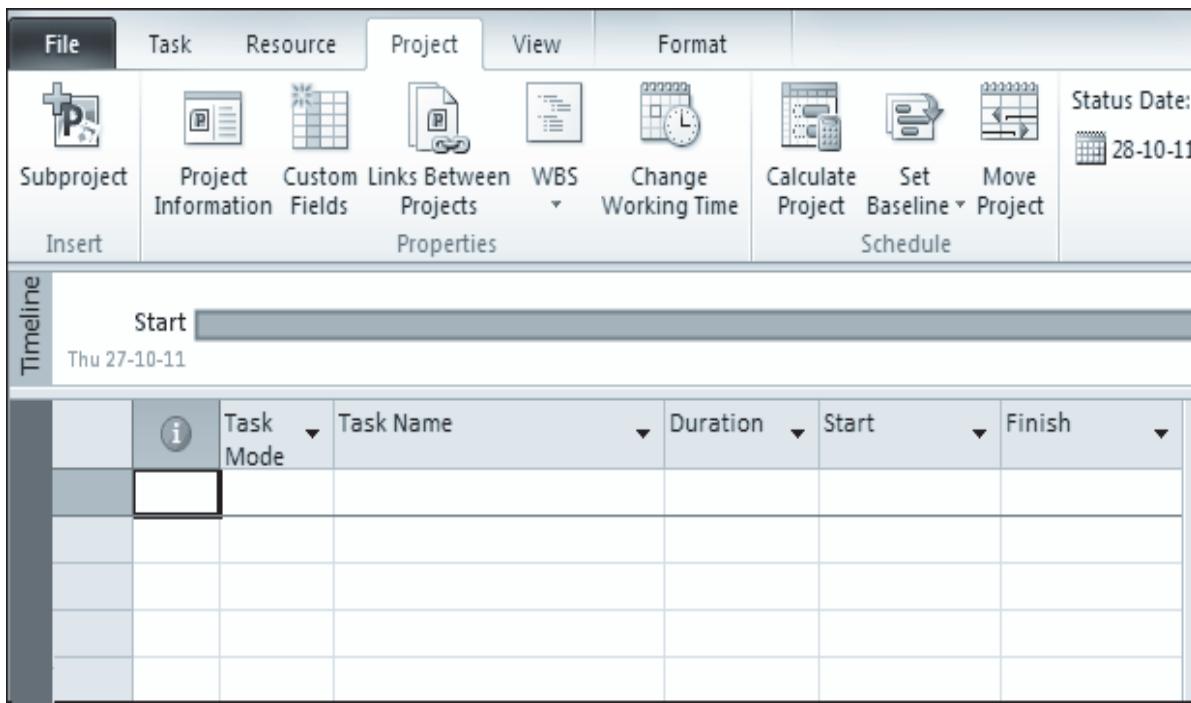
2.3.1 Launching MS Project 2010 and Creating a New Project

Users can launch MS Project 2010 by selecting it from the **Start** menu. This opens a blank MS Project file. Users can start entering the tasks and create a project plan from scratch. Alternatively, they can select a template suitable for the type of project that they want to manage and create the project file based on it. They can then edit the predefined list of tasks.

Session 2

Creating a Project Plan

Figure 2.1 illustrates a blank MS Project file.



Concepts

Figure 2.1: MS Project 2010 New Project Screen

After creating the project file, users can save it at the desired location, by selecting the **Save** option from the **File** tab.

2.3.2 MS Project Templates

Microsoft provides several convenient project templates through the Microsoft Office Online Web site, Office.com. The templates are available for various types of projects under several categories, such as engineering projects and marketing event execution. The templates contain sample tasks broken into logical phases, with durations and dependencies in place. The templates also include resources to create, edit, and delete project information.

To create a new project in MS Project 2010 using templates, the following steps must be performed:

1. Click the **File** tab.
2. From the **Backstage** view, select **New**. This displays the **Available Templates** screen, as shown in figure 2.2. Here, under the **Office.com Templates** section, a user can select a template category and then select the template that suits the project needs.

Session 2

Creating a Project Plan

Figure 2.2 depicts MS Project templates that are displayed while creating a new project.

Concepts

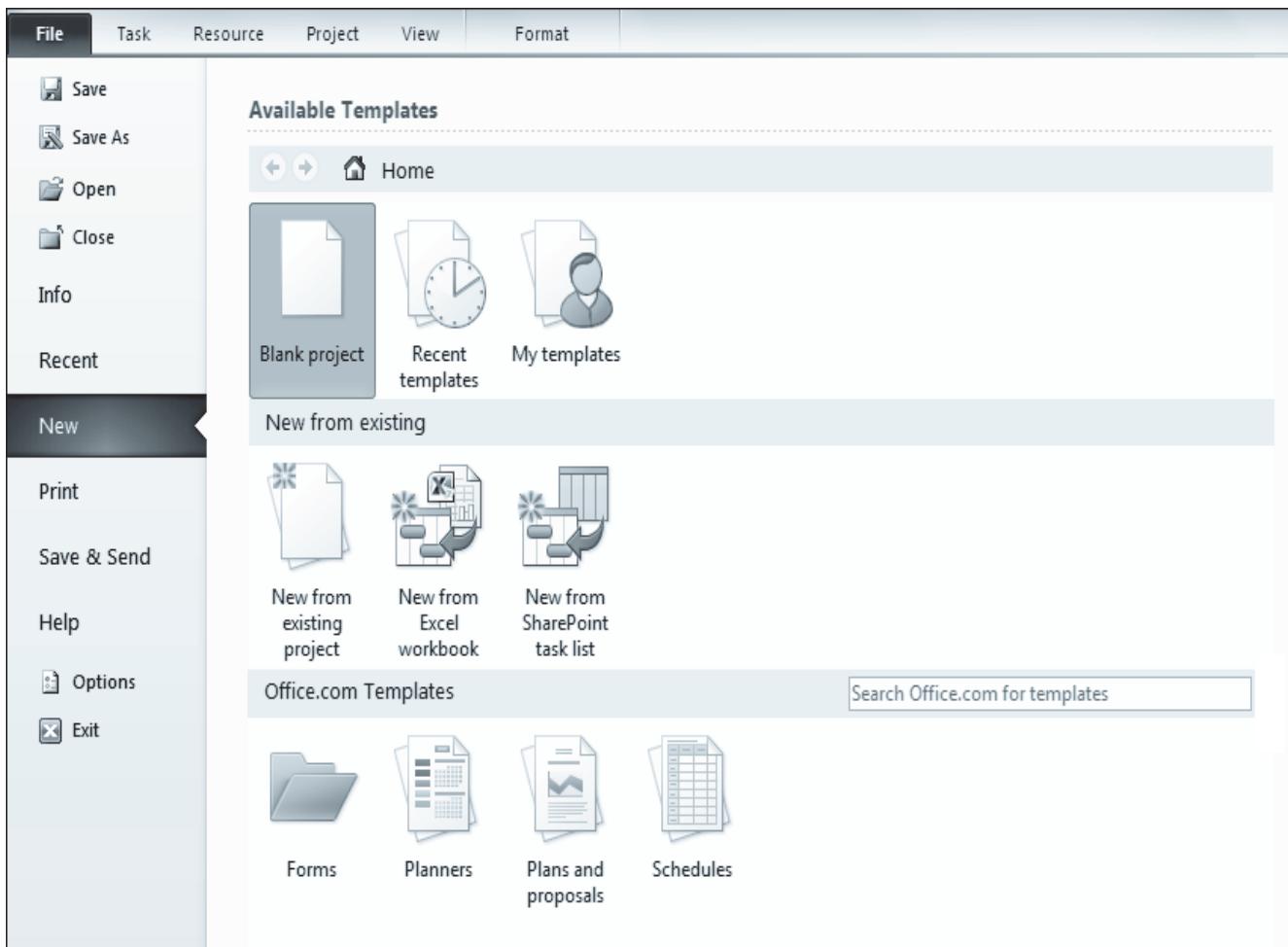


Figure 2.2: Creating Project Based on Available Templates

Consider an example for creating a project using an available template. The steps to do this are as follows:

1. Click the **File** tab and select **New**.
2. In the **Office.com Templates** section on the **Available Templates** screen, click **Schedules**. This displays two categories of schedule templates.
3. Double-click the **Business Schedules** folder.
4. From the list of business schedules templates, select the **Secondary market research schedule** template.
5. Click the **Download** button on the right panel, under the template preview image. MS Project starts downloading the template from the Office.com Web site. The selected template then opens in MS Project as an .MPT file.

Session 2

Creating a Project Plan

6. Select **Save As** from the **File** tab to save this template as SSU_Schedule.mpp project file.

7. Click **OK**.

The downloaded template is now ready to use for the project. Users can delete any predefined tasks, move them, or add new tasks to the project.

Figure 2.3 depicts the **Secondary market research schedule** template available from the **Office.com** Web site.

Concepts

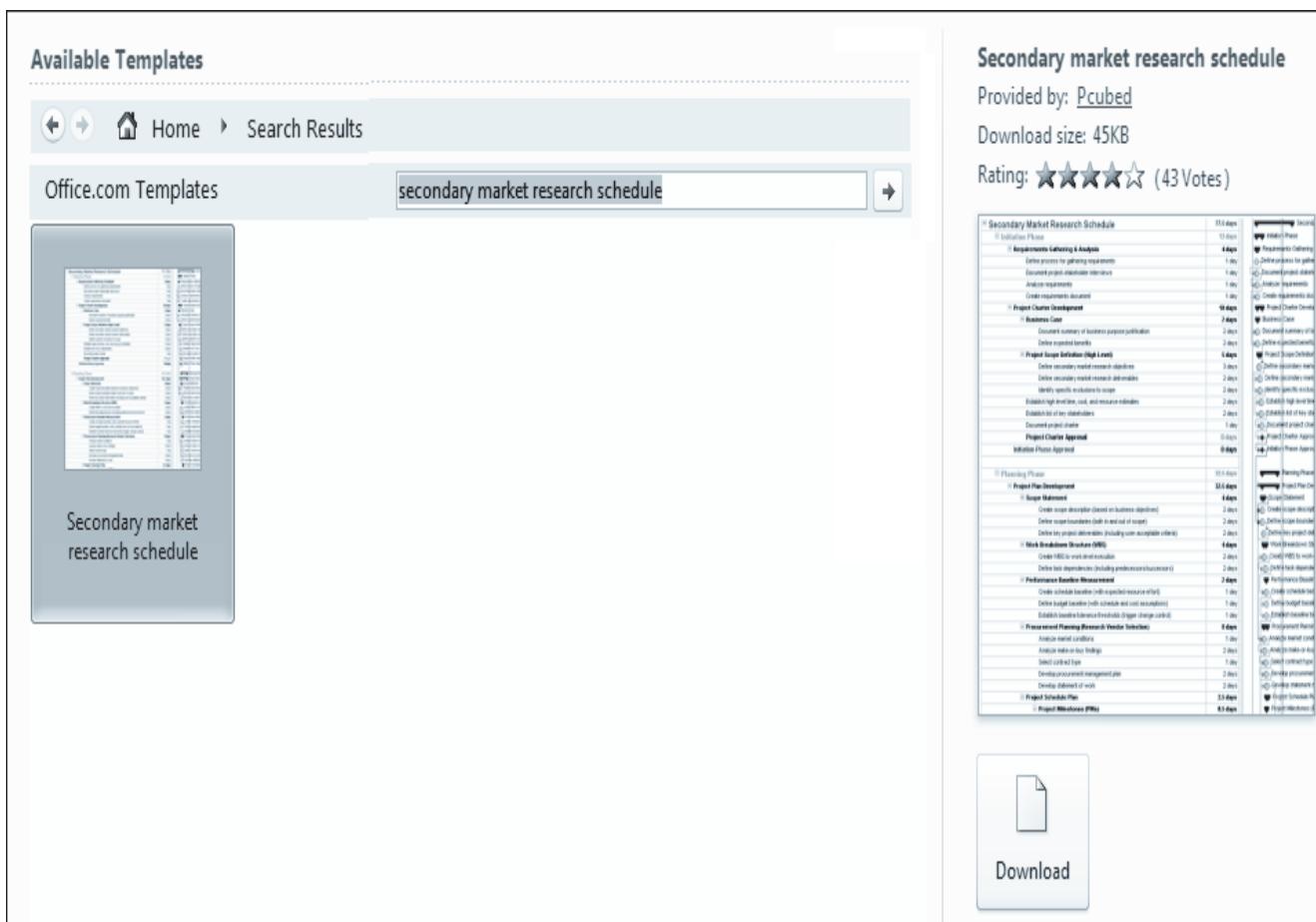


Figure 2.3: Downloaded Template from Office.com

Note: Once a template is downloaded, it can be selected next time without downloading it again. One can access the downloaded templates by clicking **My Templates** under **Available Templates** on the **Backstage view**.

Session 2

Creating a Project Plan

Figure 2.4 displays a few other downloaded templates available under **Personal Templates**.

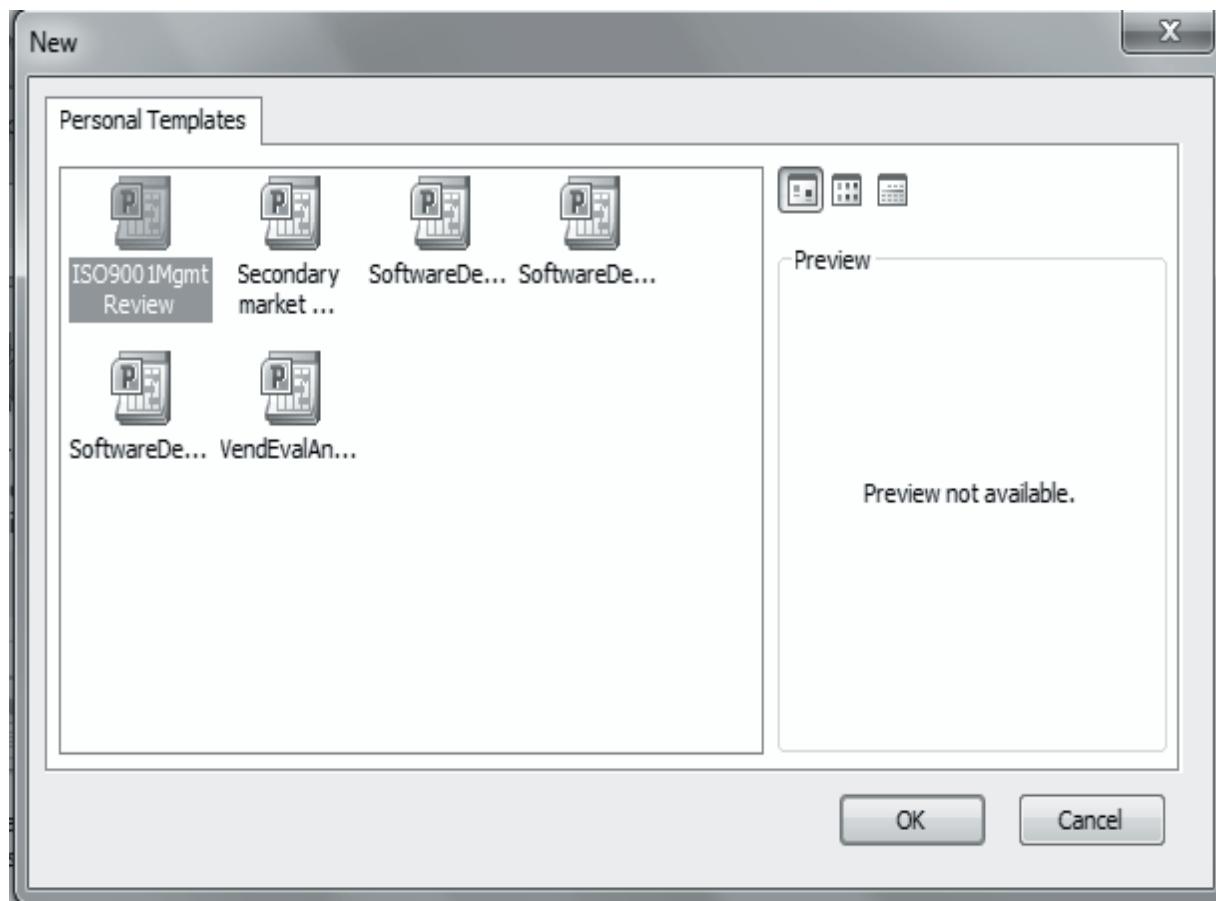


Figure 2.4: Opening a Template from Personal Templates

2.4 Work Breakdown Structure (WBS)

The first step after creating a project file is to define the WBS on paper or using documenting software such as MS Word. A WBS sets milestones for a project, where the project is broken down into detailed smaller tasks. It helps define and organize the scope of the total project more accurately and specifically. WBS in projects also helps in allocating responsibilities, assigning resources, and project monitoring and control. It helps in making realistic and detailed project deliverables so that the project team knows intermediate project goals. It is recommended to create the WBS before entering tasks into MS Project.

A WBS layout looks like a typical Windows Explorer file structure or an outline structure of a book index.

There are several ways of defining the WBS. The most popular way is by using a top-down tree structure. In this structure, each level divides the project deliverables into more specific and measurable units.

Session 2

Creating a Project Plan

Concepts

2.5 Creating a WBS

Consider the example of a WBS defined for the Smart Signup project that develops mobile applications. This WBS will be created in MS Word 2010 which will then serve as a base for creating the WBS in MS Project.

Launch MS Word 2010 and type in the following:

1. Project Scope
 - a. Draft scope of work
 - b. Obtain sponsorship for the project/work order
 - c. Identify preliminary resources
 - d. Secure resources
2. Software Requirements Analysis
 - a. Identify project need analysis
 - b. Document high level software requirements
 - c. Identify budget/costing
 - d. Review software requirements with team
 - e. Update requirements with feedback
 - f. Calculate delivery timeline
 - g. Approvals to system design
3. System Design
 - a. Review final software requirements
 - b. Document project functional specifications
 - c. Develop pilot
 - d. Review final functional specifications
 - e. Update functional specifications with feedback
 - f. Approval for development
4. Software Development
 - a. Identify system modules/components
 - b. Identify development team
 - c. Build code programming

Session 2

Creating a Project Plan

Concepts

- d. Developer debugging
- 5. Testing
 - a. Document unit test plans
 - b. Document integration test plans
 - c. Unit Testing
 - i. Test components/modules code
 - ii. Identify variances
 - iii. Update code
 - iv. Re-test updated code
 - d. Integration Testing
 - i. Test integration of modules
 - ii. Identify variances
 - iii. Re-modify code
 - iv. Re-test updated code
- 6. Training
 - a. Identify training specifications for end users and support staff
 - b. Develop training methodology (PC based training, Webinar, and so forth)
 - c. Preparing training materials
 - d. Review and update training materials
 - e. Finalize training delivery methodology
- 7. Software Documentation
 - a. Identify Help specification
 - b. Document Help system
 - c. Review and update Help documentation with feedback
 - d. Identify user manuals specifications
 - e. Document user manuals
 - f. Review and update user documentation with feedback

Session 2

Creating a Project Plan

8. Pilot/prototype ready
 - a. Categorize testing resources
 - b. Identify software delivery methods
 - c. Install software with instructions
 - d. Get user feedback
 - e. Evaluate testing results
9. Implementation/Installation
 - a. Resolve final implementation strategy
 - b. Identify implementation methods
 - c. Commit implementation resources
 - d. Identify and train support team
 - e. Implement/install software
10. Post Implementation/Installation Review
 - a. Document project lessons learnt
 - b. Share with the team members
 - c. Identify support and maintenance team
 - d. Archive Project documents to the central repository

Save the file and exit.

Concepts

2.6 Establishing Project Information

After creating a project file and defining the WBS either on paper or in MS Word, users need to establish the project information and enter tasks in the project file, to map the WBS to MS Project 2010.

Project information for any project contains configuration about the project, such as start date, end date, the type of calendar used, and how tasks will be scheduled.

To establish the project information, perform the following steps:

1. Create a blank new Project file.
2. Open the **Project** tab on the Ribbon.
3. Click **Project Information**. This displays the **Project Information** dialog box where users can enter the following information:

Session 2

Creating a Project Plan

- **Start Date:** This is the date when the project will start. All project tasks will be set to begin on this day.
- **Schedule From:** Users can specify to create the project schedule forward from the start date or backward from the finish date. This setting is specified here.
- **Finish Date:** If the deadline for the project is known, that information is specified here. This can be used to work the schedule backwards from the finish date. This field is available only if the **Schedule From** field is set to **Finish Date**.
- **Current Date:** This field contains the computer's current date setting.

Figure 2.5 illustrates **Project Information** dialog box.

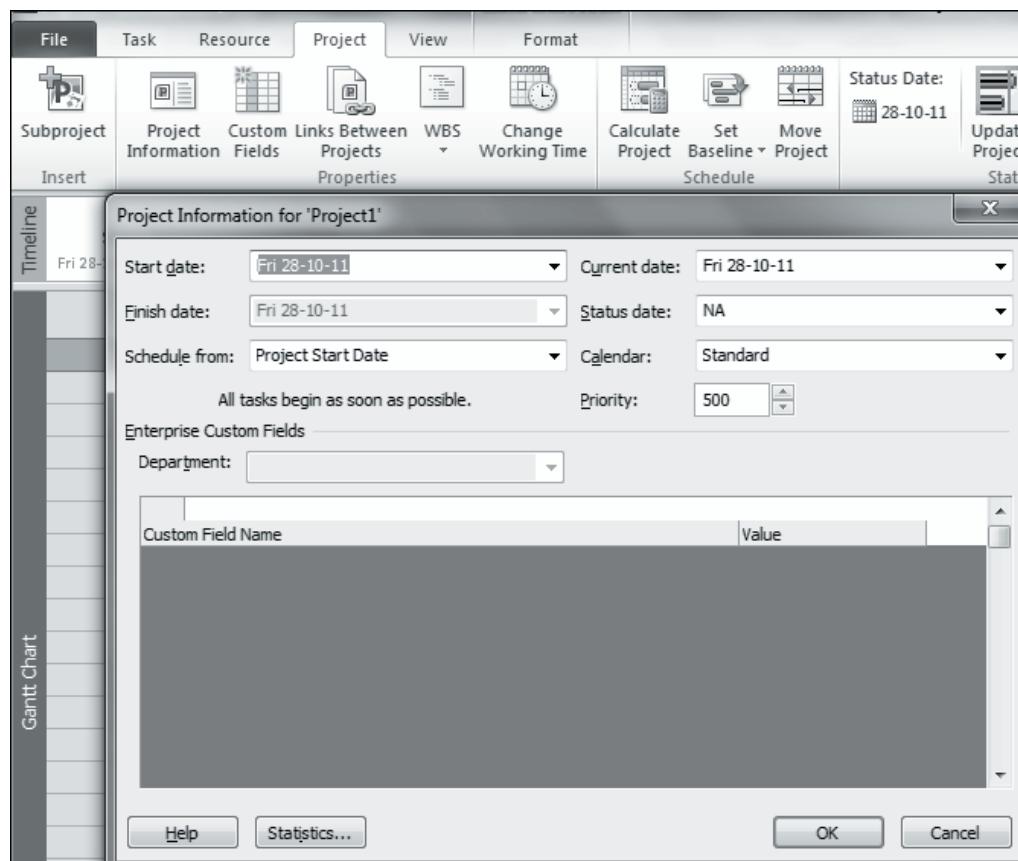


Figure 2.5: Project Information Dialog Box

4. Enter relevant information in the **Project Information** dialog box as shown in figure 2.5 and click **OK**.
5. Save the file as SSU_ProjectPlan.mpp.

Session 2

Creating a Project Plan

Concepts

2.7 Entering Tasks

The next step is to start entering the tasks and subtasks that will define the WBS in the **Gantt Chart** table. To create a task, perform the following steps:

1. In the **Gantt Chart** table, click inside the **Task Name** column and enter the task description.
2. Press **ENTER** or the Tab key or simply press the down arrow to enter the next task. An empty default duration appears in the **Duration** column along with a pin question mark icon in the **Task Mode** column. This icon indicates that the task is **Manually Scheduled**. Users can specify an option to schedule tasks manually or automatically.
3. To change the scheduling, click in the **Task Mode** column and select the desired option: **Manually Scheduled** or **Auto Scheduled** from the drop-down. Selecting the **Task Mode** to **Auto Scheduled** will change the icon to an **Auto Scheduled** icon with default duration of **1 day**. The default start and finish dates are also automatically added based on system date.

In case of **Manually Scheduled** tasks, the project manager needs to manually calculate and enter the task dates. In case of **Auto Scheduled** tasks, MS Project automatically calculates the task dates based on the WBS and task dependencies.

Figure 2.6 display an example of tasks in **Manually Scheduled** and **Auto Scheduled** modes.

Task Mode	Task Name	Duration	Start	Finish
?	Project Scope	10 days	Fri 10/28/11	Thu 11/10/11
?	Draft scope of work			
?	Obtain sponsorship for the project/work order			
?	Identify preliminary resources	1 day	Fri 10/28/11	Fri 10/28/11
?	Secure resources	1 day	Fri 10/28/11	Fri 10/28/11

Figure 2.6: Tasks in Manually Scheduled and Auto Scheduled Modes

By default, all new tasks are configured to be **Manually Scheduled**. Users can change this default setting to **Auto Scheduled** by clicking the **New Tasks** option on the status bar and selecting **Auto Scheduled**.

Session 2

Creating a Project Plan

Figure 2.7 depicts the two default scheduling options.

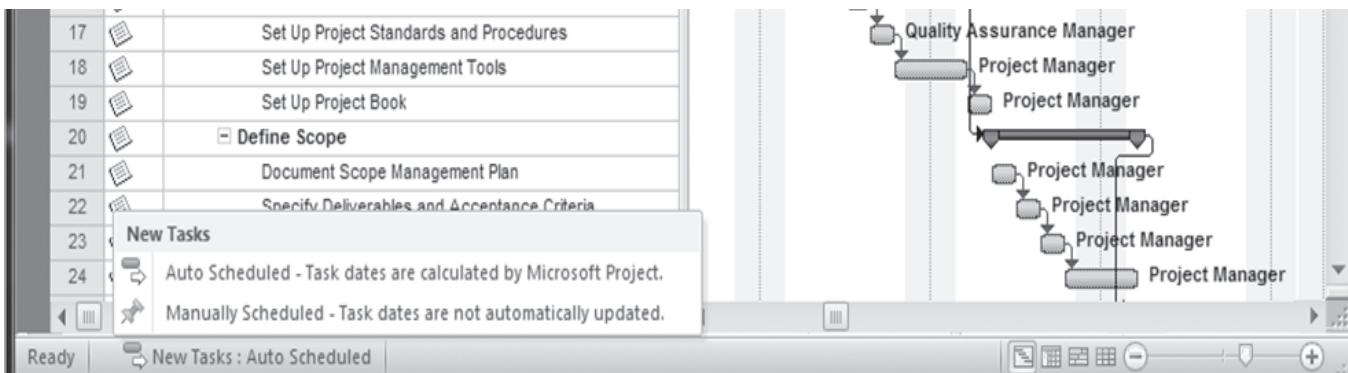


Figure 2.7: Default Task Scheduling Options

2.8 Creating Subtasks and Summary Tasks

After entering all major tasks, a project manager can detail out the subtasks. To enter a subtask for a major task, perform the following steps:

1. First, select the task and click the top part of the **Task** button (with a blue icon) in the **Insert** group on the **Task** tab. This adds a new task row.
2. Next, enter the subtask name in the **Task Name** column.
3. Click the **Indent Task** button in the **Schedule** group on the Task tab. The **task** at a level higher than the subtask now becomes a **Summary task**. Similarly, to modify a subtask to main task, click the **Outdent Task** button.

Figure 2.8 displays the **Indent Task** and **Outdent Task** options on the Ribbon.

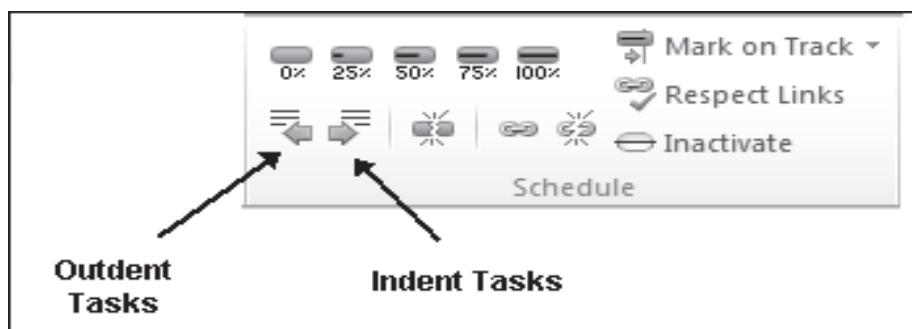


Figure 2.8: Outdent and Indent Tasks

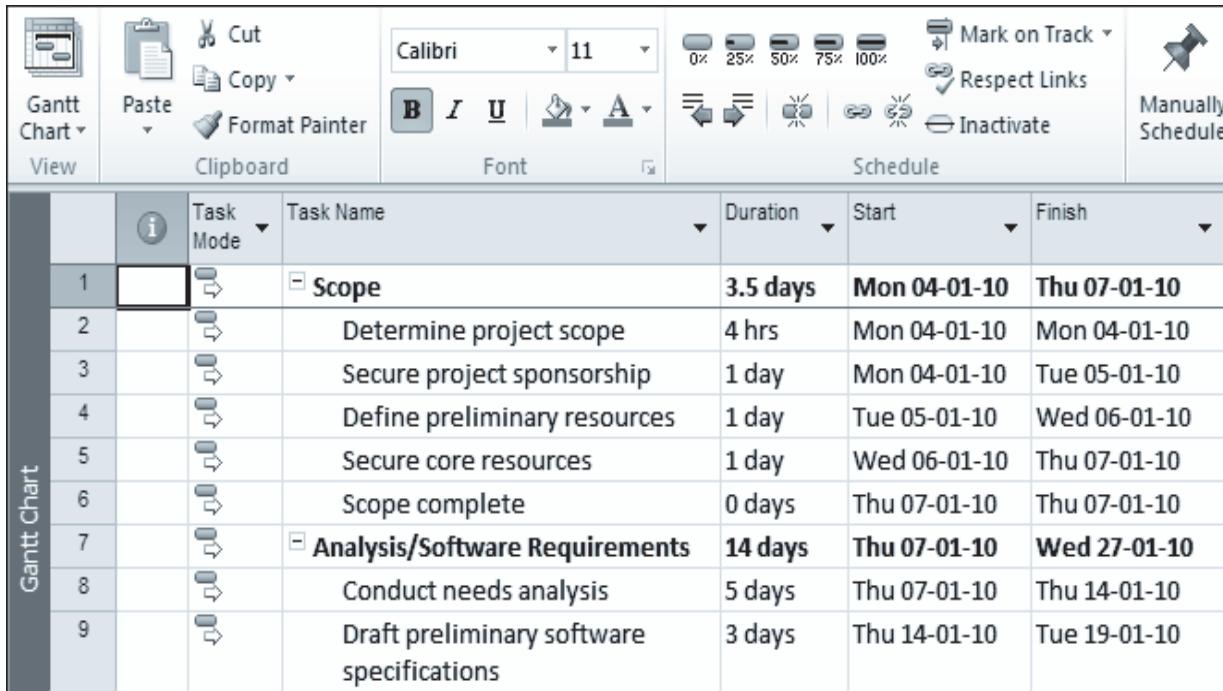
Pressing the Tab key is an easy way to navigate between fields in the table. To delete a task, select the task row and press the Delete key.

Session 2

Creating a Project Plan

Similar to other Office tools, one can use right-click in MS Project 2010 to view the related context menu options.

Figure 2.9 illustrates the list of tasks and subtasks for the Smart Signup project.



The screenshot shows the Microsoft Project 2010 interface in Gantt Chart view. The ribbon at the top has tabs for 'View' (selected), 'Clipboard', 'Font', and 'Schedule'. The 'Clipboard' tab contains icons for Cut, Copy, Paste, Format Painter, and various scheduling tools like Mark on Track, Respect Links, and Inactivate. The 'Font' tab shows Calibri 11pt selected. The 'Schedule' tab includes duration and date columns. The main area displays a hierarchical list of tasks:

		Task Mode	Task Name	Duration	Start	Finish
1		Scope	3.5 days	Mon 04-01-10	Thu 07-01-10	
2		Determine project scope	4 hrs	Mon 04-01-10	Mon 04-01-10	
3		Secure project sponsorship	1 day	Mon 04-01-10	Tue 05-01-10	
4		Define preliminary resources	1 day	Tue 05-01-10	Wed 06-01-10	
5		Secure core resources	1 day	Wed 06-01-10	Thu 07-01-10	
6		Scope complete	0 days	Thu 07-01-10	Thu 07-01-10	
7		Analysis/Software Requirements	14 days	Thu 07-01-10	Wed 27-01-10	
8		Conduct needs analysis	5 days	Thu 07-01-10	Thu 14-01-10	
9		Draft preliminary software specifications	3 days	Thu 14-01-10	Tue 19-01-10	

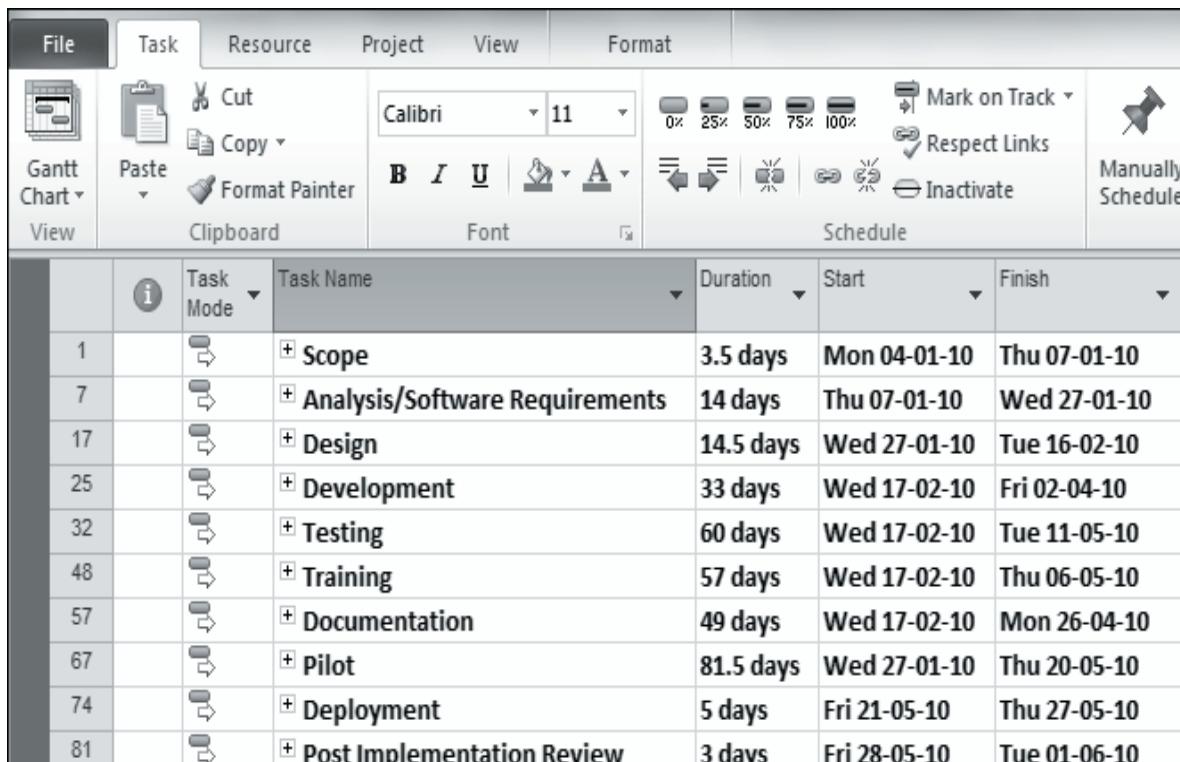
Figure 2.9: Tasks and Subtasks

After entering the WBS tasks, users can display the WBS as a list of Summary tasks. A Summary task is an activity having several subtasks in it. It can be collapsed or expanded as needed. Managers might want to hide certain tasks and display only a summarized view, before printing a report, if they are not relevant to a meeting.

Session 2

Creating a Project Plan

Figure 2.10 illustrates Summary tasks for the Smart Signup project.



The screenshot shows a Microsoft Project interface with a Gantt Chart view. The ribbon menu at the top includes File, Task, Resource, Project, View, and Format. The Task tab is selected. The ribbon also features a Gantt Chart view icon, Paste dropdown, Format Painter, and a clipboard section. The main area displays a table of tasks:

		Task Mode	Task Name	Duration	Start	Finish
1		+	Scope	3.5 days	Mon 04-01-10	Thu 07-01-10
7		+	Analysis/Software Requirements	14 days	Thu 07-01-10	Wed 27-01-10
17		+	Design	14.5 days	Wed 27-01-10	Tue 16-02-10
25		+	Development	33 days	Wed 17-02-10	Fri 02-04-10
32		+	Testing	60 days	Wed 17-02-10	Tue 11-05-10
48		+	Training	57 days	Wed 17-02-10	Thu 06-05-10
57		+	Documentation	49 days	Wed 17-02-10	Mon 26-04-10
67		+	Pilot	81.5 days	Wed 27-01-10	Thu 20-05-10
74		+	Deployment	5 days	Fri 21-05-10	Thu 27-05-10
81		+	Post Implementation Review	3 days	Fri 28-05-10	Tue 01-06-10

Figure 2.10: Summary Tasks

2.9 Defining Milestones

A milestone can be defined as a task with zero duration. In essence, it simply marks a moment in time that must be reflected in the project outline. Examples of milestones are ‘approval of a marketing campaign brochure design’ or ‘review and approval from customer for acceptance of a project’. Such tasks do not involve any real work or effort. They typically involve a series of tasks, which when completed result in achieving of the milestones. They must be completed for the project to move ahead.

2.10 WBS Levels

Project managers use WBS as an essential aspect of their project management methodology. Similar to the outline of project tasks list, WBS is a hierarchical chart of project deliverables. Each level represents details of the project deliverables. Levels in the hierarchy represent summary tasks, tasks, subtasks, and so forth. WBS levels are associated with a specific code set, such as 4.2, 4.2.1, 4.2.2, and so forth. A project manager can also define specific and customized WBS codes.

Session 2

Creating a Project Plan

Concepts

2.11 Defining WBS Codes

MS Project 2010 generates WBS codes for the list of tasks outlined in the **Gantt Chart** table. These codes are similar to the numbering in a table of contents of a document or a book. They are added to the project outline to provide a quick overview of the number of tasks and subtasks, the number of tasks completed, and the number of tasks that are pending in a project. In simple words, the WBS is a numbered list of tasks within a project.

MS Project 2010 allows project managers to generate a set of unique outline numbers as basic WBS codes for a project. The outline number for the first summary task is 1 and the outline number of the first subtask under the first summary task is 1.1. Also, the user can define custom dynamic WBS codes for the project tasks list.

2.12 Displaying the WBS Codes

To display auto-generated WBS codes for a project, perform the following steps:

1. Insert a new column for WBS codes by right-clicking the column heading before which to display the WBS codes and selecting the **Insert Column** option. This results in a list of data fields in a new column.
2. Scroll down the list and select **WBS**. The WBS codes for the entire task details will then be displayed in the column. The WBS codes are updated automatically whenever a task is added, moved, or deleted from the table.

Figure 2.11 illustrates the WBS option for displaying WBS codes.

The screenshot shows the Microsoft Project 2010 ribbon interface with the 'Project' tab selected. The 'Task Mode' dropdown is set to 'WBS'. The Gantt Chart table displays several tasks, with the second task, 'Analysis/Software Requirements', expanded to show its sub-tasks: Design, Development, Testing, Training, Documentation, Pilot, Deployment, and Post Implementation Review.

		Task Mode	WBS	Task Name
7		7	Warning	+ Analysis/Software Requirements
17		17	WBS	+ Design
25		25	WBS Predecessors	+ Development
32		32	WBS Successors	+ Testing
48		48	Work	+ Training
			Work Contour	+ Documentation
			Work Variance	+ Pilot
57		57		+ Deployment
67		67		+ Post Implementation Review
74		74		
81		81		

Figure 2.11: Creating Dynamic WBS Codes

Session 2

Creating a Project Plan

2.13 Creating a Custom WBS Code

MS Project 2010 allows creating custom WBS codes. Users can add a prefix to the WBS codes, such as the name of the project, client name, or department name.

For the Smart Signup project, the project manager can chose to create custom WBS codes with the project short name, SSU separated by an underscore for all the tasks. Tasks will now be identified with the WBS codes SSU_1, SSU_1.2 , and so forth.

To create custom WBS codes, perform the following steps:

1. Open the **Project** tab on the Ribbon.
2. On the tab, in the **Properties** group, click the **WBS** button and select the **Define Code** option. This displays the **WBS Code Definition** dialog box.
3. In this dialog box, enter the **Project Code Prefix** as **SSU_**.
4. Next, in the table, click the **Sequence** drop-down list and specify the desired type unique coding for the project. Users can specify to code the WBS as either **Numbers (ordered)**, **Uppercase Letters (ordered)**, **Lowercase Letters (ordered)**, or **Characters (unordered)**. A preview of the defined custom code is displayed in **Code preview** in the dialog box.
5. Finally, click **OK** to generate the custom WBS codes.

Figure 2.12 shows the creation of custom WBS codes in the WBS Code Definition dialog box.

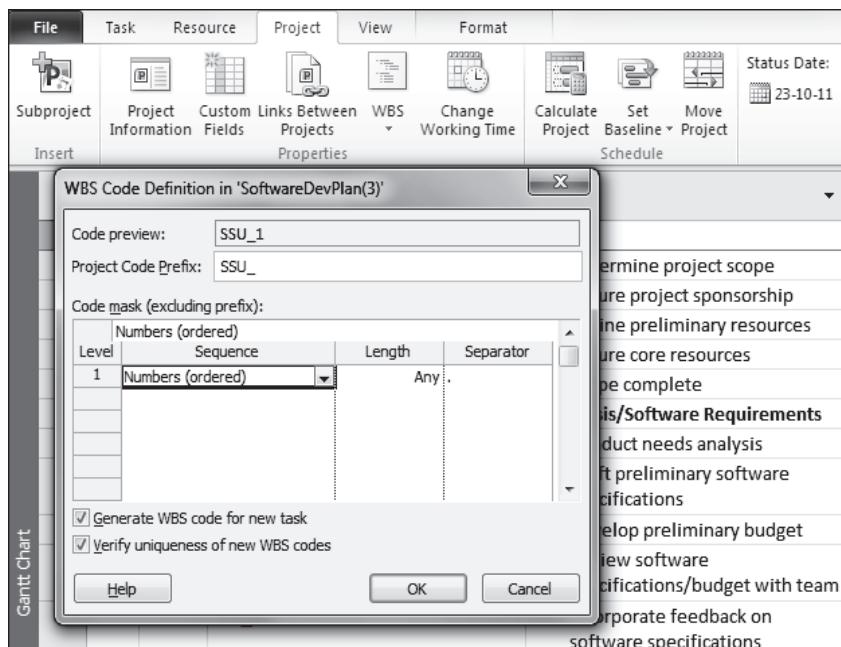
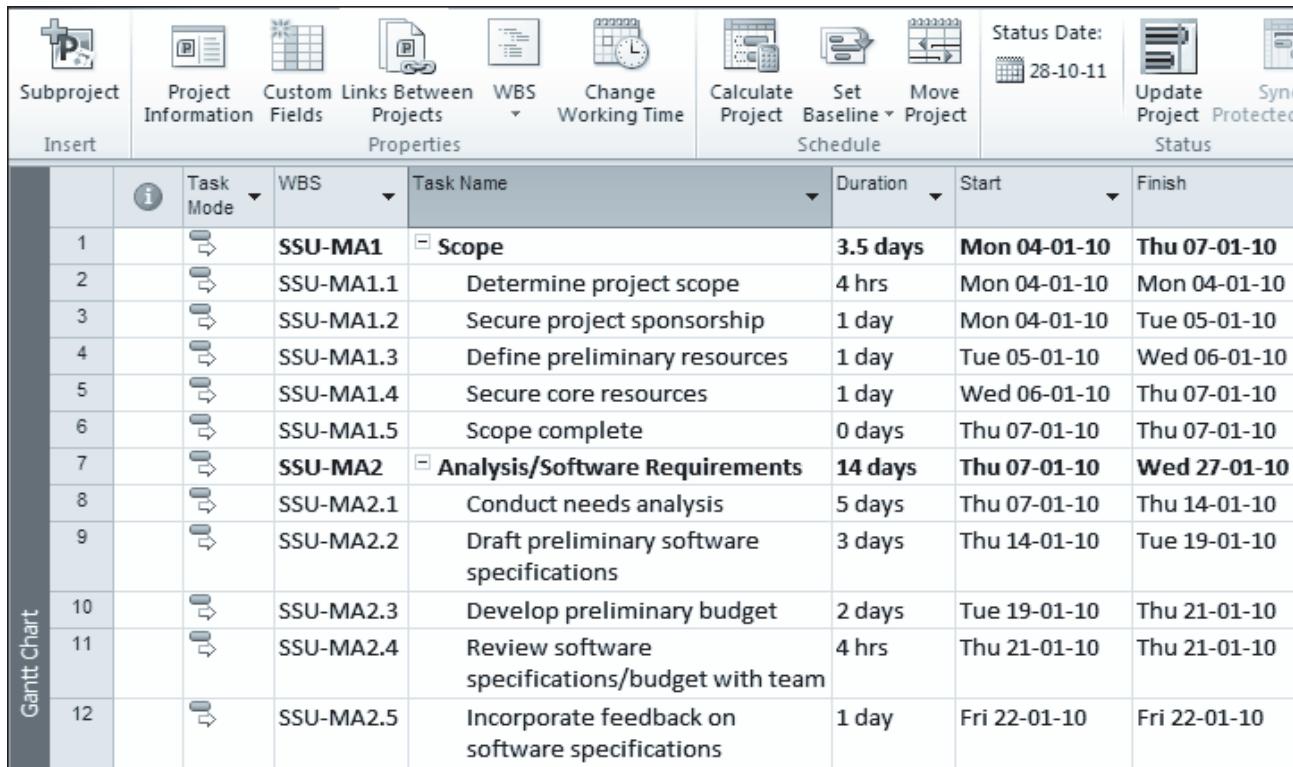


Figure 2.12: Creating Custom WBS Code

Session 2

Creating a Project Plan

Figure 2.13 illustrates the outcome of creating custom WBS codes.



The screenshot shows the Microsoft Project 2010 ribbon at the top with various tabs like Subproject, Insert, Project Information, Custom Fields, Links Between Projects, Properties, WBS, Change Working Time, Calculate Project, Set Baseline, Move Project, Status Date (set to 28-10-11), Update Project, and Sync Protected Status. The main area is the Gantt Chart view, which displays a hierarchical task list. The tasks are organized under two main categories: SSU-MA1 and SSU-MA2. SSU-MA1 contains tasks 1 through 6, and SSU-MA2 contains tasks 7 through 12. Each task is listed with its name, duration, start date, and finish date.

		Task Mode	WBS	Task Name	Duration	Start	Finish
1		→	SSU-MA1	Scope	3.5 days	Mon 04-01-10	Thu 07-01-10
2		→	SSU-MA1.1	Determine project scope	4 hrs	Mon 04-01-10	Mon 04-01-10
3		→	SSU-MA1.2	Secure project sponsorship	1 day	Mon 04-01-10	Tue 05-01-10
4		→	SSU-MA1.3	Define preliminary resources	1 day	Tue 05-01-10	Wed 06-01-10
5		→	SSU-MA1.4	Secure core resources	1 day	Wed 06-01-10	Thu 07-01-10
6		→	SSU-MA1.5	Scope complete	0 days	Thu 07-01-10	Thu 07-01-10
7		→	SSU-MA2	Analysis/Software Requirements	14 days	Thu 07-01-10	Wed 27-01-10
8		→	SSU-MA2.1	Conduct needs analysis	5 days	Thu 07-01-10	Thu 14-01-10
9		→	SSU-MA2.2	Draft preliminary software specifications	3 days	Thu 14-01-10	Tue 19-01-10
10		→	SSU-MA2.3	Develop preliminary budget	2 days	Tue 19-01-10	Thu 21-01-10
11		→	SSU-MA2.4	Review software specifications/budget with team	4 hrs	Thu 21-01-10	Thu 21-01-10
12		→	SSU-MA2.5	Incorporate feedback on software specifications	1 day	Fri 22-01-10	Fri 22-01-10

Figure 2.13: Custom WBS Codes

2.14 Integrating Project Plans with other MS Office Applications

Project plans created with MS Project 2010 integrate well with other MS Office applications, facilitating management of projects with less effort. Users can use simple copy-and-paste functions to copy task outlines and notes from other MS Office applications, such as Word and Excel and create a new project file.

In earlier versions of MS Project, after copying lists from other Office applications into MS Project, users required to spend time on formatting and indenting items to match their original design. MS Project 2010 keeps intact the project outline structure copied from other Office applications and automatically generates subtasks and summary tasks in the project schedule, based on the list items. Further, MS Project 2010 retains text formatting, fonts, text effects, date formats, and colors from the source Office file.



Summary

- MS Project 2010 enables users to create a project file from scratch or by using a template.
- A WBS breaks down the project into detailed smaller tasks and sets milestones for a project.
- Creating a project plan involves creating a new project file, defining a draft WBS, and creating WBS in MS Project 2010 by establishing project information and defining project tasks.
- Project information for any project specifies the project start date, end date, the type of calendar used, and how the tasks will be scheduled.
- Entering tasks and sub tasks mapping to WBS is done after configuring project information.
- The detailed list of major tasks and subtasks in a project file can be collapsed to display a list of Summary tasks to present them in reports.
- MS Project allows generating WBS codes for the list of tasks, which provide a quick glance at the number of tasks and subtasks in the project as well as the number of completed and pending tasks.
- Users can also generate custom WBS codes through the WBS Code Definition dialog box.

Session 2

Creating a Project Plan

Concepts



Check Your Progress

1. The first step after creating a project file using MS Project is _____.

A)	Establishing project information
B)	Creating a WBS
C)	Entering major tasks and subtasks
D)	Defining summary tasks

2. In the Project Information dialog box, users can specify to schedule project plan backwards in _____.

A)	Finish Date
B)	Start Date
C)	Schedule From
D)	Current Date

3. When creating a new task, which of the following statements are true?

A)	Tasks are by default Manually Scheduled
B)	Tasks are by default Auto Scheduled
C)	An empty default duration appears in the Duration column
D)	A default duration of 1 day appears

4. Which one of the following actions requires to be completed while creating a new task?

A)	Determine Summary tasks before entering any major tasks or subtasks
B)	Enter all major tasks before entering any tasks
C)	Create the WBS before entering any tasks
D)	Defining WBS code before entering any tasks

5. A Summary task is _____.

A)	An activity having several subtasks in it
B)	A task with zero duration
C)	A task for which MS Project automatically calculates the task dates based on the WBS and task dependencies
D)	The lowest level of task in the WBS

ASK to LEARN

Questions
in your
mind?



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Objectives

At the end of this session, the student will be able to:

- *Define a project calendar*
- *Describe how to set calendar options and working times*
- *Describe how to choose the right calendar*
- *Describe how to work with Task calendars*
- *Explain the use of Resource calendars*
- *Describe how to create custom calendar templates*
- *Explain copying calendars to other projects*

3.1 Introduction

Once project managers finish defining all the tasks and milestones for a project, they need to start scheduling the tasks and assigning them to resources. A project manager schedules and manages a project using calendars focusing on tasks of the day. Calendars help identify the resources working on tasks, whether there is any schedule or effort variance, and whether there are any pending tasks to be completed. Accordingly, project managers can schedule the tasks using resources for successful completion of a project.

This session describes how to choose and define a project calendar and configure the working times. It explains how to work with various types of calendars, including the task calendar and the resource calendars. This session will also describe how to create custom templates and copy calendars across projects.

3.2 Defining a Project Calendar

MS Project 2010 provides the following three types of calendars that assist in project management:

- Base calendar
- Resource calendar
- Task calendar

3.2.1 Base Calendar

The base calendar, also known as the standard calendar, is the basic calendar that is used for all scheduling calculations in MS Project. All other calendars are built on this calendar. The base calendar assumes that a workday has eight working hours from 8 A.M. to 5 P.M. with an hour for lunch and a five-day week, Monday–Friday, as workweek.

In addition to the standard calendar, there are two other templates based on working times namely, 24 Hours and Night Shift. The 24 Hours template is used for projects that demand work round the clock every day of the week. The Night Shift template is used in night shift projects from 11 P.M. to 8 A.M. with an hour for dinner and a six-night week, Monday to Saturday, as workweek.

To configure calendar settings for a project, on the **Project** tab, in the **Properties** group, click **Change Working Time**.

This displays the Change Working Time dialog box, as shown in figure 3.1

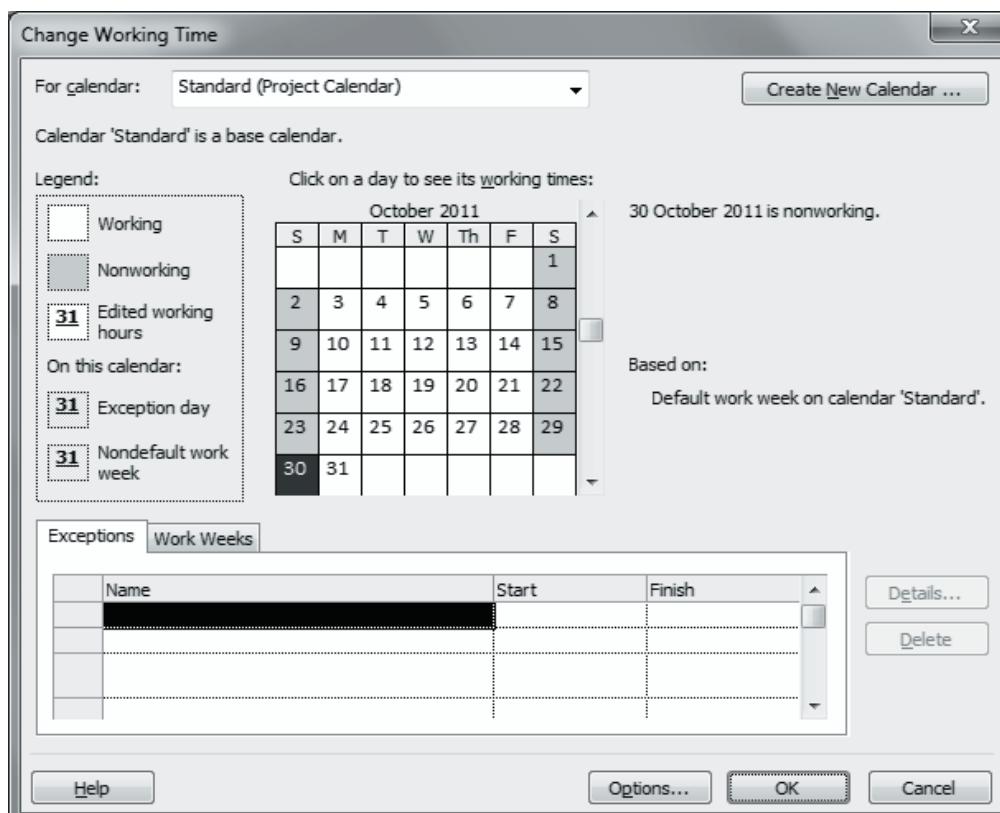


Figure 3.1: Change Working Time Dialog Box

The **Change Working Time** dialog box facilitates a user to select either a calendar or a resource from the **For calendar** drop-down list. The **Create New Calendar** button provides an option either to create a new base calendar or copy from any existing calendars.

Session 3

Scheduling

The **Click day to see its working times** section displays a calendar. Clicking on any day on the calendar displays the working times of that day, based on the calendar options entered for the project.

The **Legend** section on the left displays the color codes for working and nonworking times, exception day, and non-default workweek. A vacation or a day of celebration such as an anniversary, New Year, and so forth, is an example of an exception day.

To add exceptions in the calendar, perform the following steps:

1. In the table on the **Exceptions** tab, in the **Change Working Time** dialog box, enter the name of the exception setting in the **Name** box. For example, type 'SSU Anniversary'.
2. Enter the **Start** and **Finish** dates for which the exception day and work hours need to be configured. For example, enter 23 March 2011 as start and finish dates.
3. After entering the exception data select the row and click **Details**. This opens the **Details** dialog box, where one can specify the nonworking and working hours.

Selecting the **Working Times** radio button provides the option to enter from and to work time during the day interval. This would be useful for specifying half day working periods on special occasions.

4. Click **Nonworking** to specify the day as a full holiday. For example, for the anniversary day exception, the entire day would be nonworking.

The **Recurrence pattern** section has four radio buttons **Daily**, **Weekly**, **Monthly**, and **Yearly**. The **Daily** radio button allows entering frequency of recurrence for this exception. The **Weekly** radio button allows selecting a weekday and entering **Range of recurrence**, **Start**, **End after**, **End Date**, and so forth for other options of Recurrence pattern.

5. Select appropriate recurrence pattern, for example, **Yearly**, in the current scenario.

Session 3

Figure 3.2 shows the details set for the exception.

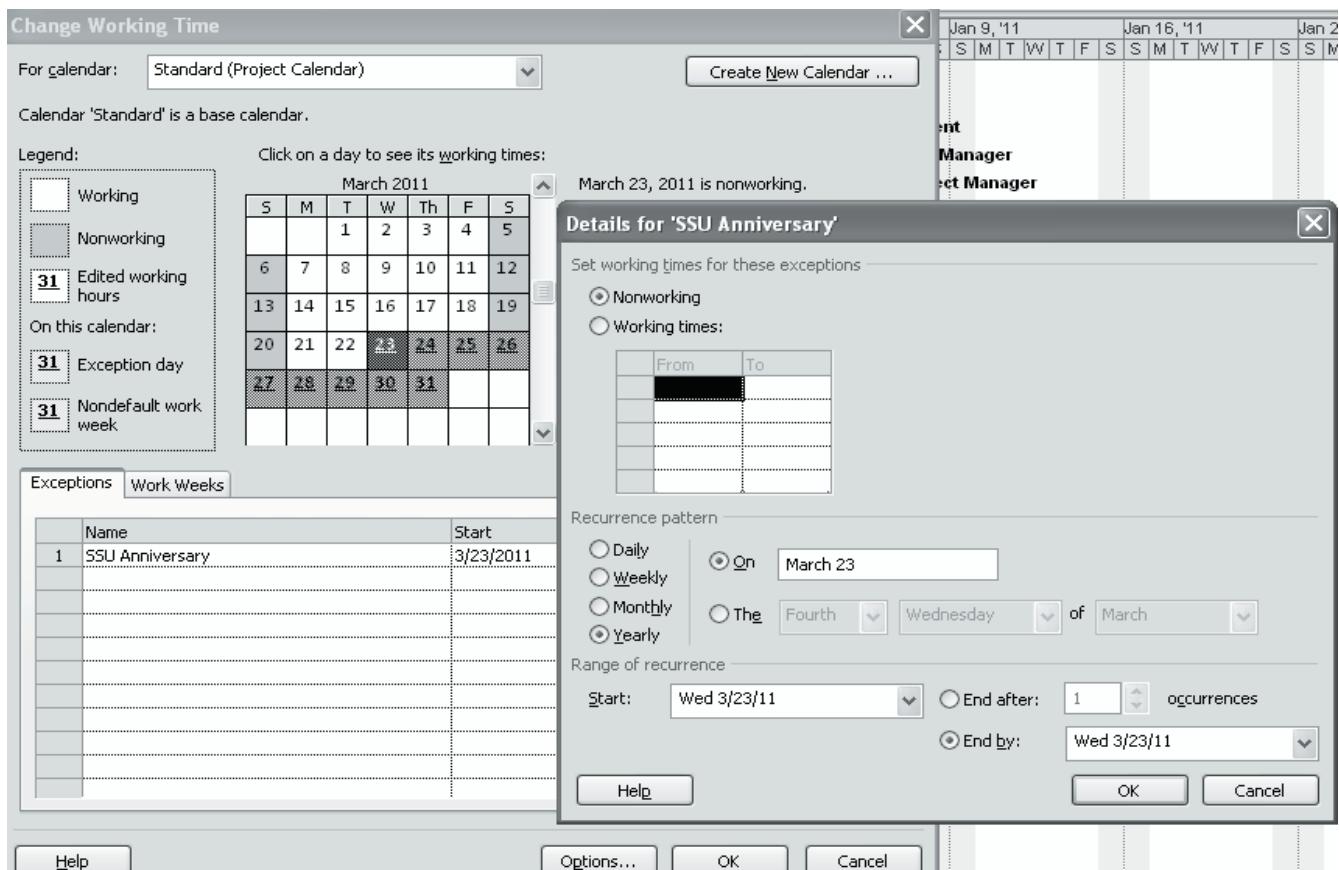


Figure 3.2: Setting Exceptions in the Change Working Time Dialog Box

6. Click **OK** to close the exception details dialog box.

In a similar manner, one can add further exceptions depending on the requirements.

After configuring the exceptions, the next step is to configure the work weeks on the calendar. This means that one can specify additional work weeks for a range of days that differ from the default work days. For example, for a week comprising a crucial audit, all resources may be required on weekends too. Hence, that week may be configured under Work Weeks with the name Audit Week and details of working times will include weekends too.

To do so, perform the following steps:

1. On the **Work Weeks** tab in the **Change Working Time** dialog box, enter a name for this setting in the **Name** box. For example, type **Audit Week** in the **Name** box.
2. Enter **Start** and **Finish** dates.
3. Click **Details** to select a day to configure its work hours, its **From** and **To** hours, and options to select either **Use Project default times for these days** or **Set days to nonworking time** or **Set day(s) to these specific times**.

Session 3

Scheduling

- Click **OK** to close the details dialog box.

Figure 3.3 depicts the details for **Work Weeks** in the **Change Working Time** dialog box.

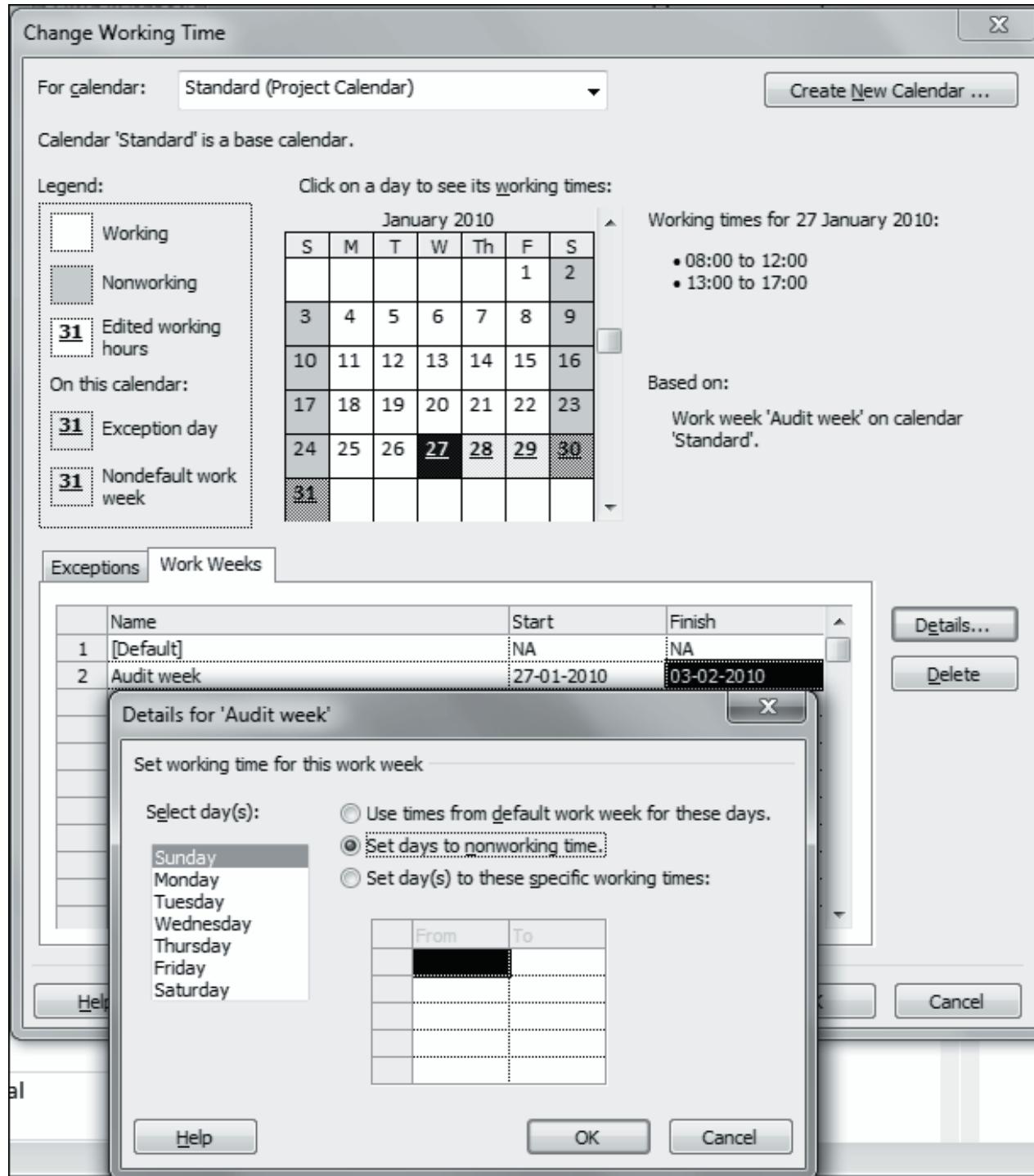


Figure 3.3: Change Working Time Dialog Box with the Work Weeks Tab Active

Session 3

Scheduling

The **Options** button in the **Change Working Time** dialog box opens the **Project Options** dialog box. This dialog box provides options related to scheduling, calendars, calculations, and so forth.

3.2.2 Resource Calendar

The previous section showed how to configure specific work times and workdays at project level in a calendar. Similarly, users can specify work hours and workdays for a specific project resource. Resource calendars are calendars customized for specific scheduling requirements for individual resource groups. Suppose at the project initiation stage, the application architect needs to interact with the client's Subject Matter Expert three days a week for three weeks. The client works in a different time zone which requires the application architect to work extra hours after office. In such a case, a resource calendar can be set up for the resource, defining these specific work hours and workdays.

Users can modify this setting in the **Resource Information** dialog box for an individual resource or for a resource group. Creating and adding resources to a project will be covered in a later session. For now, assume that a few resources have been added to the project.

To modify settings in a resource calendar, perform the following steps:

1. Select the **Resource** tab present on the **Ribbon** and click the top part of the **Team Planner** option. This will display the **Team Planner** table with a list of resources and resource groups assigned to the project.
2. Select the resource or resource group for which workdays or work times need to be configured and click the **Details** option in the **Properties** section on the **Resource** tab. This displays the **Resource Information** dialog box for the selected resource.

Session 3

Scheduling

3. Click **Change Work Time...** in the **Resource Information** dialog box to display options for configuring work times and workdays for the selected resource as shown in figure 3.4.

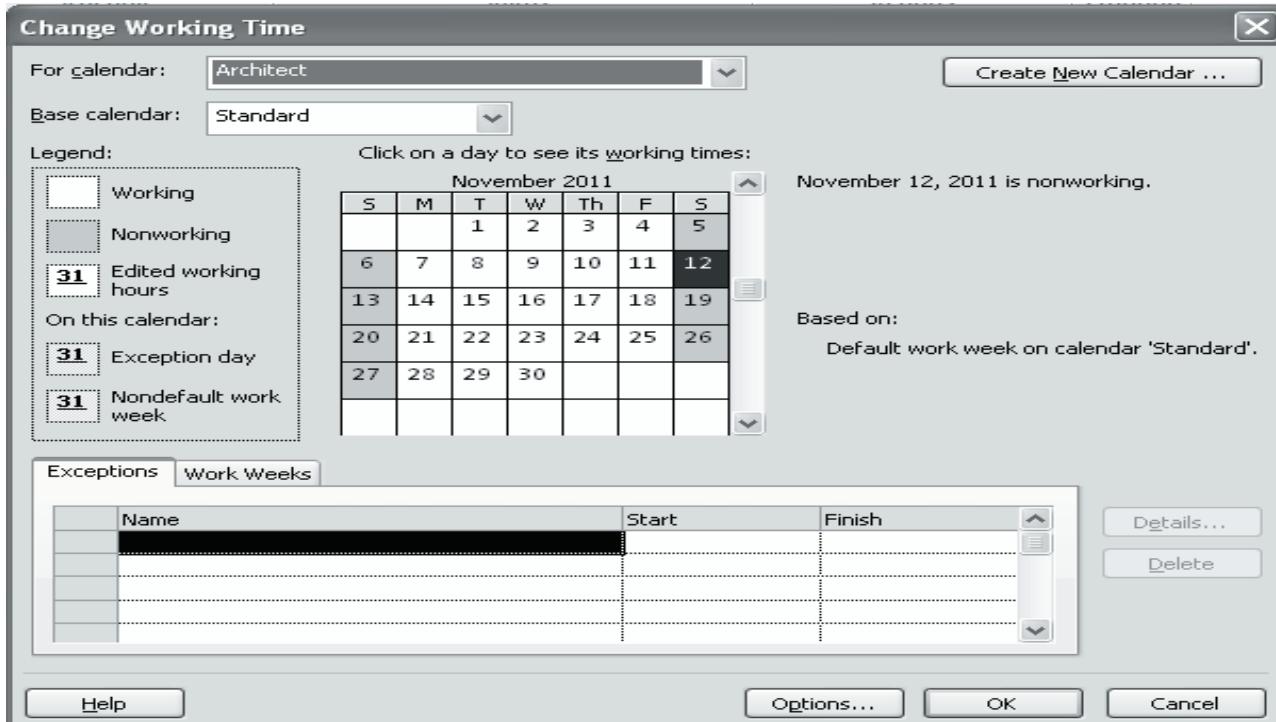


Figure 3.4: Resource Information Dialog Box for the Resource, Architect

3.2.3 Task Calendar

By default, project tasks are scheduled and resources are allocated based on the project calendar settings. Similar to resource calendar, a task calendar can be used to create calendars with specific scheduling requirements for a particular task. Consider a task such as weekly meetings with an overseas client, after office hours. Such tasks can be scheduled in the task calendar.

Assigning a task to a calendar is a two-step process. The first step is to create a new calendar for the task schedule and second is to assign the task calendar to the specific task. Steps to create a new calendar for the task schedule are as follows:

1. On the **Project** tab, click the **Change Working Time** dialog box to display the **Change Working Time** dialog box.
2. Click the **Create New Calendar...** button to create a new calendar, **Weekly Client Meetings**. The new calendar can be a copy of an existing calendar or a new base calendar.
3. Click **OK** to create the new calendar and return to the **Change Working Time** dialog box.
4. Then, click the **Work Weeks** tab on this dialog box and select the row in the table with the default schedule for the calendar.

Session 3

Scheduling

5. Click the **Details...** button to specify the work days and time for tasks in this calendar.
6. From the **Select day(s):** list box, select **Thursday** as the day on which the weekly meetings will be scheduled. Select the **Set day(s) to these specific working times:** radio button and specify the meeting hours as 19:00 P.M. to 21:00 P.M.

Figure 3.5 shows the calendar settings.

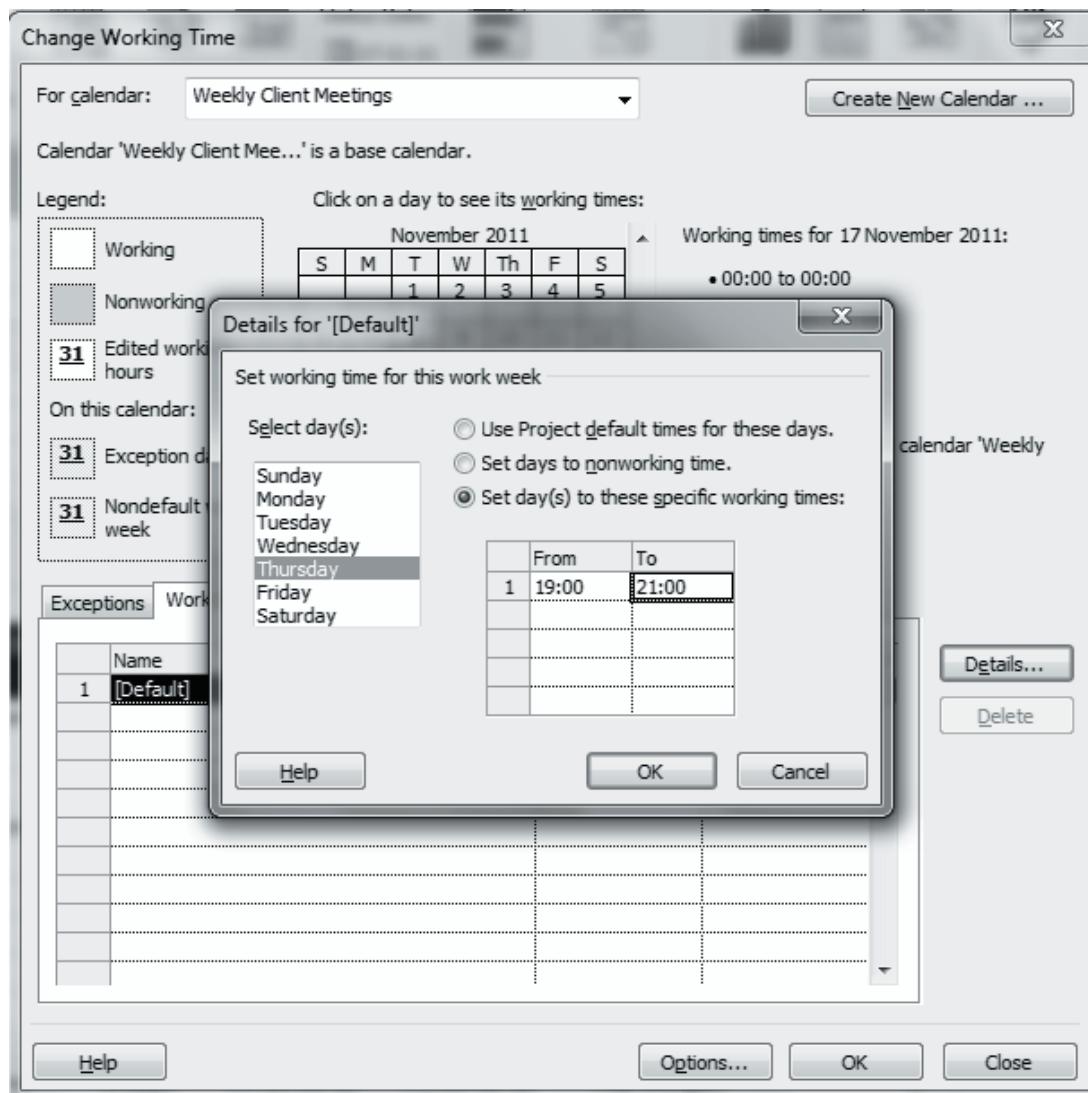


Figure 3.5: Workday and Work time Specifications for Weekly Client Meetings

7. Click **OK** on all open dialog boxes to save the calendar settings.

Session 3

Scheduling

Concepts

Now, the new task calendar needs to be assigned to the task. This can be done using following steps:

1. From the **Gantt Chart** table, select the task from the **Task Name** column.
2. In the **Properties** group on the **Task** tab, click the **Information** option to display the **Task Information** dialog box for the selected task.
3. In this dialog box, click the **Advanced** tab and from the **Calendar** drop-down list, select the new calendar **Weekly Client Meetings** as shown in figure 3.6.

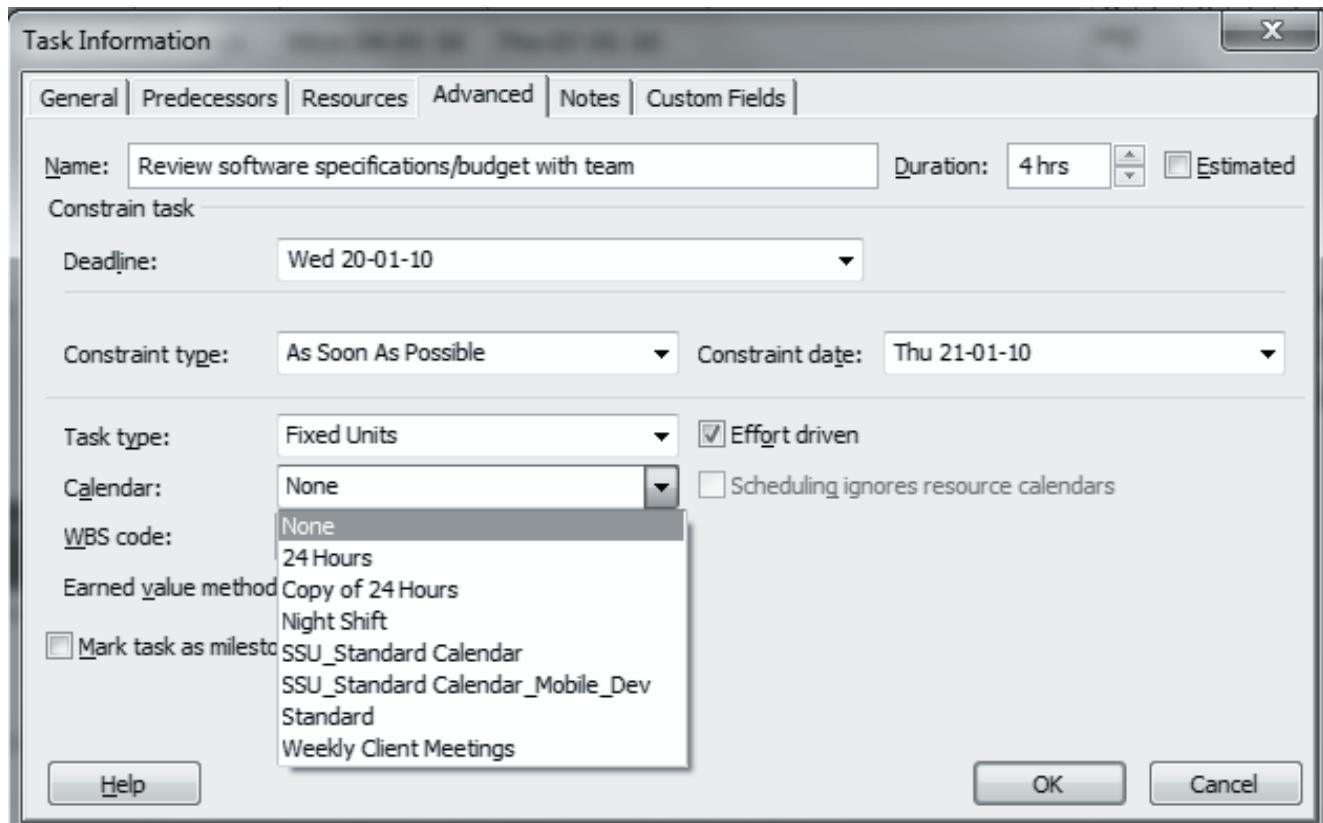


Figure 3.6: Advanced Tab in the Task Information Dialog Box

4. Click **OK** to assign the calendar to the selected task.

3.3 Project Calendar Options

A project manager when scheduling tasks should set the working times depending on the complexity of the project, timelines, resources, and budget. MS Project provides calendars and work hours for scheduling tasks by setting calendar options and customizing work hours.

When creating tasks and assigning resources, MS Project 2010 schedule tasks based on the standard calendar. By default, according to MS Project, one workday has eight work hours. A project manager can customize the work hours to be 12 hours or any specific number of hours and also modify the start and end times for the workdays in the Project calendar.

Session 3

Scheduling

A project manager should also check working time and make sure that any specific nonworking days are updated for the project.

For every new project in MS Project, it is recommended to change the calendar options and the work hours and times, if required, before adding any tasks. This ensures that the project is scheduled accurately from the project start date.

3.3.1 Adjusting Project Calendar Options

To modify the calendar options, click the **File** tab and select **Options** from the **Backstage** view. This displays the **Project Options** dialog box. Here, from the options in the left pane, select **Schedule**.

The same settings are displayed on clicking **Options...** in the **Change Working Time** dialog box.

Figure 3.7 depicts an example of adjusting calendar options.

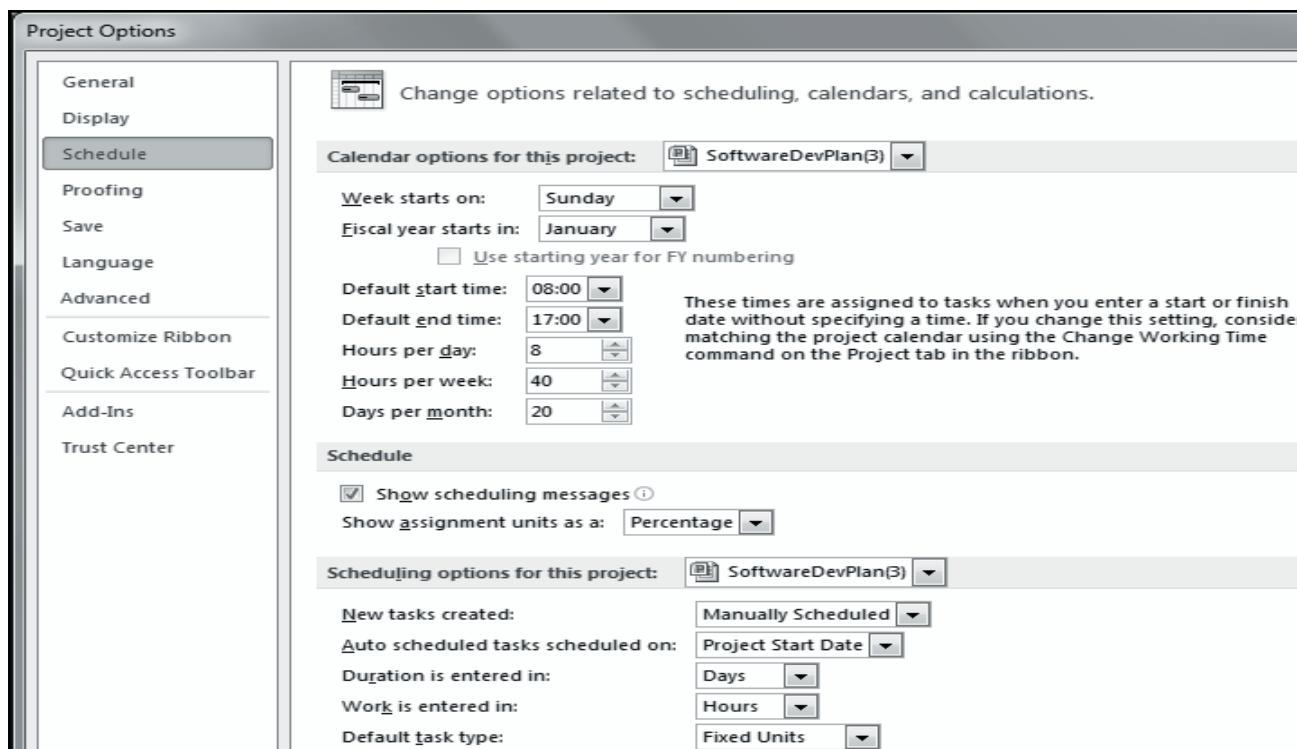


Figure 3.7: Adjusting Project Calendar Settings

A manager can configure or adjust the project calendar options using the following steps:

1. Start by specifying whether the settings will apply to the current project or to all projects.
2. Specify settings to indicate the beginning and ending day of a workweek, the start and end time of a workday, the number of work hours per day and per week, and the number of working days per month.
3. Click **OK** to save the calendar settings.

Session 3

Scheduling

Concepts

3.3.2 Setting Schedule Options

All projects need not follow the default auto scheduled durations or enter manually scheduled durations for the tasks in a project. Managers can specify custom scheduling options depending on the project needs. After configuring the project calendar to the project requirements, the next step is to specify scheduling options.

Scheduling options can be specified as follows:

1. Click the **Project Information** option from the **Project** tab and set the project calendar.
2. Enter the **Start date** if the project is scheduled from a specific date to start or enter the **End date** if the project has to be completed on a specific end date.
3. Select the **Current date**, which by default, displays computer clock settings that can be modified by the user.
4. Optionally, specify a **Status date**. The **Status date** helps the project manager to track the progress of the project on that specific status date. However, MS Project also facilitates tracking the project on an as-of-now state.
5. Specify a value for **Priority** box. Priority is useful if multiple projects that are linked among each other exist in an organization. This helps in options such as resource planning and resource leveling to resolve conflicts.

Figure 3.8 shows an example of configuring project schedules in the **Project Information** dialog box.

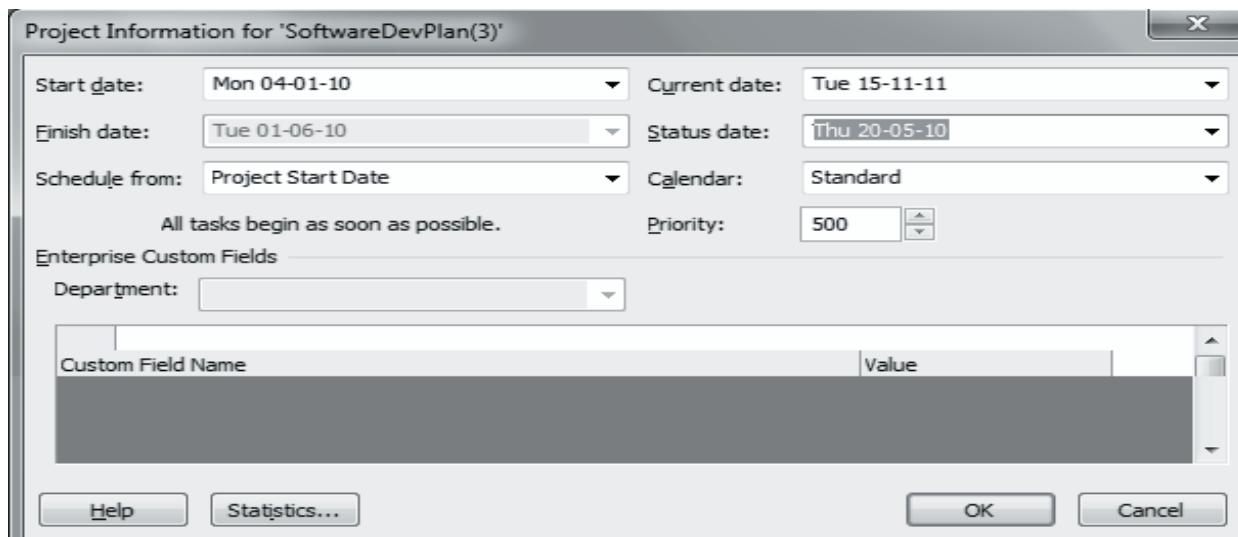


Figure 3.8: Setting Schedule Options

MS Project 2010 includes a user-controlled scheduling feature that helps schedule projects in less time and to control all the phases of project life cycle.

Session 3

User - controlled scheduling is done in two modes:

- Manually Scheduled
- Auto Scheduled

Using Manually Scheduled tasks, a project manager can skip the duration and dates and indicate them at a later stage. When the duration and dates are entered for any task in MS Project, the schedule will be fixed and will not move unless the project manager schedules the task manually.

Note that manually scheduled tasks will move if the entire project is rescheduled and **Gantt Chart** bars of Manually Scheduled tasks appear in a different way than that of automatically scheduled ones.

Using Auto Scheduled tasks, MS Project 2010 calculates task schedules based on project start date and task dependencies. A project can have all manually scheduled tasks, all auto scheduled tasks, or a combination of the two. By default, all tasks will be manually scheduled. Scheduling mode can be changed either by clicking **Manually Scheduled** or **Auto Scheduled** in the **Task Mode** drop-down.

3.4 Creating a Custom Calendar

Apart from the three calendar templates available in MS Project, project managers can create custom calendar templates for a project. The MS Project base calendars do not have any holidays marked up. For accurate scheduling tasks including details such as organization specific holidays, it is suggested to create custom calendars for projects.

To create a custom calendar:

1. On the **Project** tab on the Ribbon, click **Change Working Time** to display the **Change Working Time** dialog box.
2. In this dialog box, click the **Create New Calendar...** button in the top-right corner. This displays the **Create New Base Calendar** dialog box.
3. Here, enter **SSU_Standard_Calendar** as name of the custom calendar in the **Name** box. Project managers can choose to either create a new base calendar from scratch or create one from a copy of a base calendar.
4. Click **OK** to create the custom calendar. This will close the **Create New Base Calendar** dialog box and revert to the **Change Working Time** dialog box. Managers can now configure the custom calendar and specify the working times and working days for the custom calendar in the **Exceptions** and **Work Week** tabs, respectively.
5. Finally, click **OK** in the **Change Working Time** dialog box to save the configuration to the custom calendar.

Session 3

Scheduling

Concepts

Figure 3.9 illustrates creating a custom calendar based on the 24 Hours calendar.

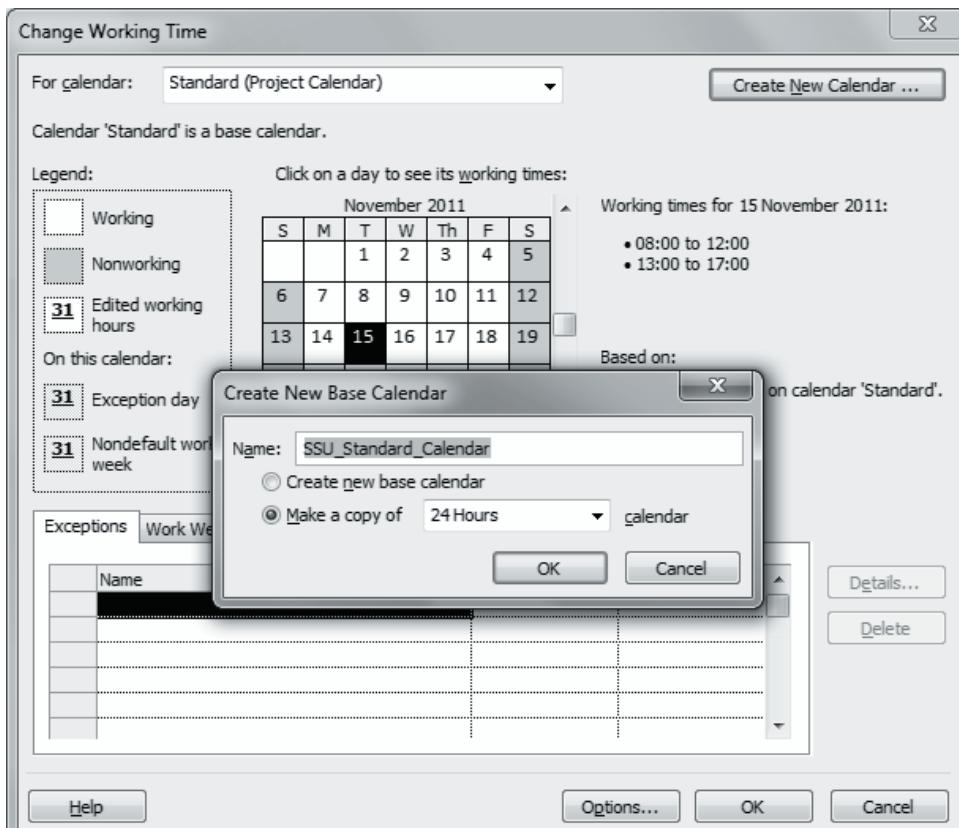


Figure 3.9: Creating Custom Calendar

3.5 Sharing Calendars

After creating a custom calendar or customizing a base calendar with organization specific workdays, work hours, and organization specific holidays, the project manager might want to make this calendar available across all the projects that he or she is managing. Calendars can be shared across all projects using the Organizer feature in MS Project 2010. Organizer is the control center for custom calendars in project files. Managers can copy custom calendars into a global template file, Global.MPT. The settings and customizations available in this template will be available across all projects. This method is especially useful when all the project managers in a company use a consistent calendar across all projects.

To make a calendar available across all projects:

1. Open the project that contains the custom calendar.
2. On the **File** tab, select the **Info** option.
3. Next, click the **Organizer** button in the **Backstage** view. This displays the **Organizer** dialog box.

Session 3

4. In this dialog box, click the **Calendars** tab. The list box on the left displays calendars available in the global template, Global.MPT, which are available across all projects. The list box on the right displays the calendars available in the current project, including the custom calendars.
5. From the list box on the left, select the custom calendar that is required across all projects and click **Copy** to copy between the two list boxes. Managers can rename the calendars in the global template or the current project by clicking the **Rename...** button. They can also delete any calendar that they might have copied to the global template by mistake.
6. Finally, close the **Organizer** dialog box to apply the changes.

Figure 3.10 illustrates an example of sharing calendars across all projects.

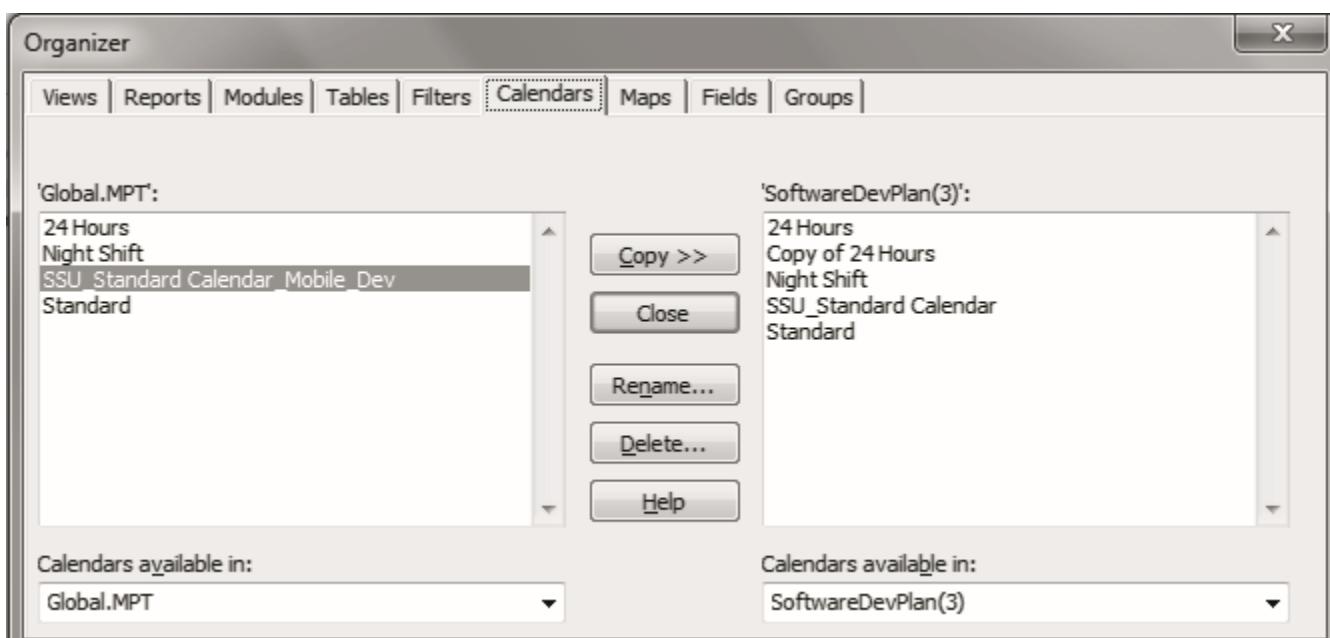


Figure 3.10: Sharing Calendars Across All Projects



Summary

- Calendars help schedule tasks and resources efficiently and track their progress.
- MS Project 2010 provides three types of calendars, namely base calendar, resource calendar, and task calendar.
- The base calendar or the standard calendar is the basic calendar template with a five-day week from Monday to Friday and eight working hours from 8 A.M. to 5 P.M.
- Two additional templates available for scheduling based on the organization or project work times are 24 Hours and Night Shift.
- Project managers can select any of the calendar templates and configure the work weeks and hours according to the project and organization requirements.
- Project managers can configure scheduling requirements for a specific project resource or task in the resource calendar and task calendar respectively.
- Project managers can create as well as share custom calendars across multiple projects.

Session 3

Scheduling



Check Your Progress

1. Which one of the following calendar templates provides the default scheduling with workweek from Monday to Saturday and eight working hours?

A)	Standard
B)	Night Shift
C)	24 Hours
D)	Resource

2. A project requires doing 3-D model animation for a 3-week project. The organization does not have one. They decide to hire a freelance animation specialist, who is available only for six hours a day. The tasks for the freelancer can be scheduled in _____.

A)	Standard calendar
B)	Task calendar
C)	Resource calendar
D)	Project information

3. The default auto scheduled duration for tasks can be modified in the _____.

A)	Changing Working Time dialog box
B)	Project Information dialog box
C)	Task Information dialog box
D)	Custom calendar

4. Project level calendar options in the Project Option dialog box can set by clicking the _____.

A)	Options... button on the Change Working Time dialog box
B)	Details button on the Work Weeks tab in the Change Working Time dialog box
C)	Calendar drop-down in the Task Information dialog box
D)	File tab and selecting Options from the Backstage view

Objectives

At the end of this session, the student will be able to:

- *Define project outlining requirements*
- *Compare project estimates to actual details*
- *Understand how to build agile project plans*
- *Describe how to work with scheduling tasks*
- *Describe project constraints*
- *Describe how to control timing with constraints*

4.1 Introduction

A project is a consolidation of phases and tasks. A project manager while allocating tasks to resources must consider all the four Ws: what the tasks are, when to assign tasks, who are the resources to work on tasks, and where in the project the resources should start work on tasks. Resources start working on a project, after they are assigned to their specific tasks by the project manager. The relationships between the tasks form the schedule of the project.

This session discusses project outlining requirements, project estimates to actual details, building agile project plans, scheduling tasks and establishing constraints, and controlling project timing with project constraints.

4.2 Defining Phases and Outlining Requirements

A project outline is a collection of subtasks grouped within summary tasks. In MS Project, each group of tasks within a summary task represents a project phase. The tasks in MS Project have a tree-like hierarchical structure. Any summary task or a task with subtasks under it, gets its duration and cost information as a sum of its subtasks in the hierarchy. A summary task does not have its own timing or cost information.

Note: Moving a summary task also moves all its subtasks.

Session 4

Tasks Allocation

Concepts

4.2.1 Representation of Project Outline on Gantt Chart

The tasks in the project outline, including summary tasks, are represented as a **Gantt Chart** on the left of the **Gantt Chart** table. If a summary task is manually scheduled, MS Project warns by displaying a red Gantt bar indicating that the calculated duration for the subtasks do not match the summary task duration. The summary task's Finish date field will also have a red underline to indicate a scheduling problem.

To resolve such cases, changing the task mode to auto scheduling (by using the **Auto Scheduled** option) is the best option, in which case MS Project automatically calculates the roll-up data correctly. Project managers can edit the finish date if desired, to manually schedule the summary task.

4.3 Creating Manually Scheduled Tasks

When using the **Auto Scheduled** mode, the final project duration is auto calculated by grouping all the summary tasks and their durations. This may show a variance in the dates of originally planned schedule to that of MS Project's auto schedule.

A project manager can start creating the schedules for summary tasks/phases based on the WBS and subsequently add sub tasks. MS Project 2010 provides a new scheduling mode for manual scheduling, **Manually Scheduled**, which allows project managers to draw the project plan from the top down by creating the timelines of each summary task. Manual scheduling prevents automatic movement of scheduled dates of a summary task when subtasks are added to it.

The steps for creating manually scheduled summary tasks are as follows:

1. Open an existing project file in MS Project 2010.
2. Create a summary task and set its **Task Mode** to **Manually Scheduled**.
3. Enter the duration for the summary task and start date of the summary task. Start date can also be set by dragging the bar to the right on the **Gantt Chart** to any desired time frame.
4. Create other summary tasks based on the WBS. Subtasks to these summary tasks can be added now or later.
5. Complete the plan by setting tasks below the summary task, with scheduling method and duration of the task as desired.
6. Indent the subtasks. The **Gantt Chart** displays a summary bar for manually scheduled summary tasks and displays a rollup bar for subtasks.
7. Click the location to insert a task and press **Insert** key .

Session 4

Tasks Allocation

Figure 4.1 illustrates creating manually scheduled summary tasks.

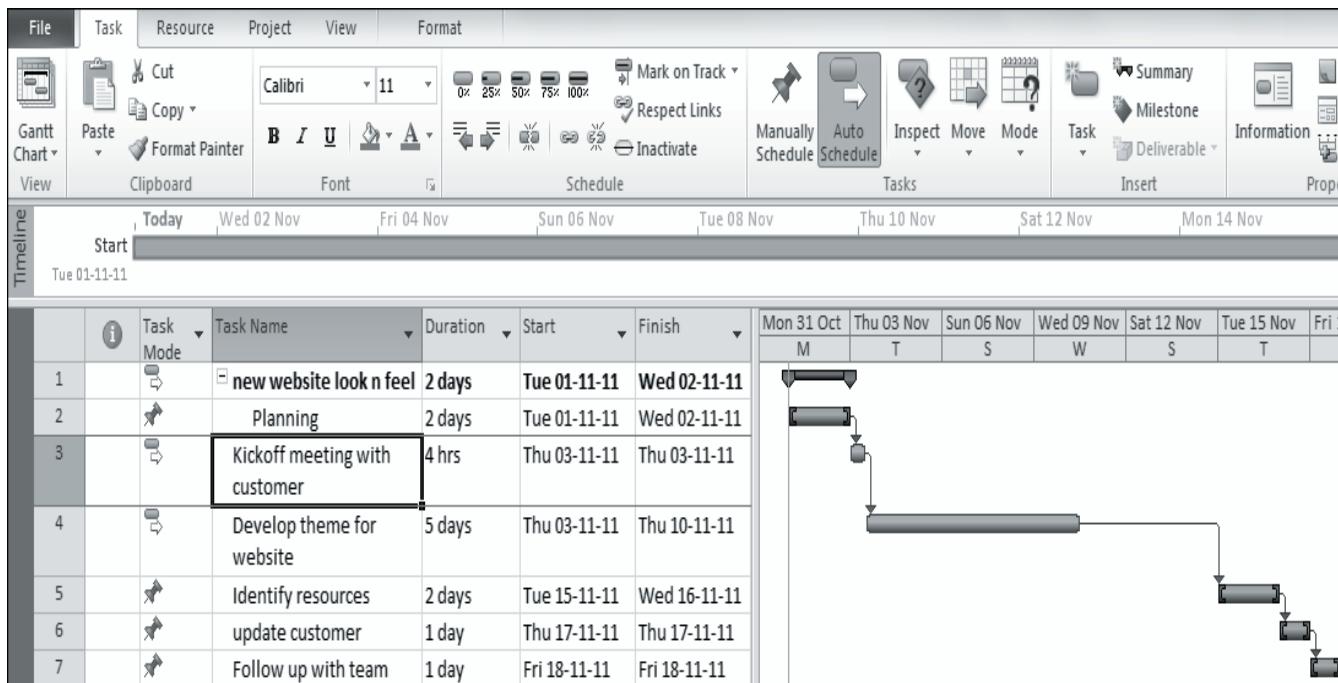


Figure 4.1: Creating Manually Scheduled Summary Tasks

Tasks, such as 'Weekly meeting with Customer' that cannot be scheduled through auto scheduling mode, can be defined outside the overall schedule for the summary task. For such tasks that are outside the summary task, the **Gantt Chart** displays an expanded lower rollup bar to the left of the black summary bar.

4.4 Deleting Tasks

While refining the project plan, the project manager may decide to delete tasks. To delete a task, select the entire task row in the **Gantt Chart** table including the Task ID, and press the Delete key. One must be careful when deleting a task. MS Project does not display any alert or warning to confirm the deletion of a task. Users can undo the actions by pressing **Ctrl+Z** keys to restore certain number of deleted tasks. After deleting a task, the project manager needs to make sure that any task dependencies are adjusted as needed.

MS Project 2010 comes with a unique feature of inactivating a task, which is equivalent to deleting a task. Making a task inactive, keeps the task in the project plan and strikes it out in the **Gantt Chart** table and on the **Gantt Chart**.

If any auto scheduled tasks are dependent on the inactive task, MS Project overlooks that inactive task while calculating the schedules for other tasks. Leaving an inactive task in the project plan also gives an opportunity to the project manager to track and document changes in the project schedule.

Session 4

Tasks Allocation

Steps to mark a task as inactive are as follows:

1. Select the task in **Gantt Chart View** to make inactive.
2. Click the **Inactivate** button placed in the **Schedule** group on the **Task** tab of the **Ribbon** to make the task as inactive.

Figure 4.2 illustrates inactivating a task.

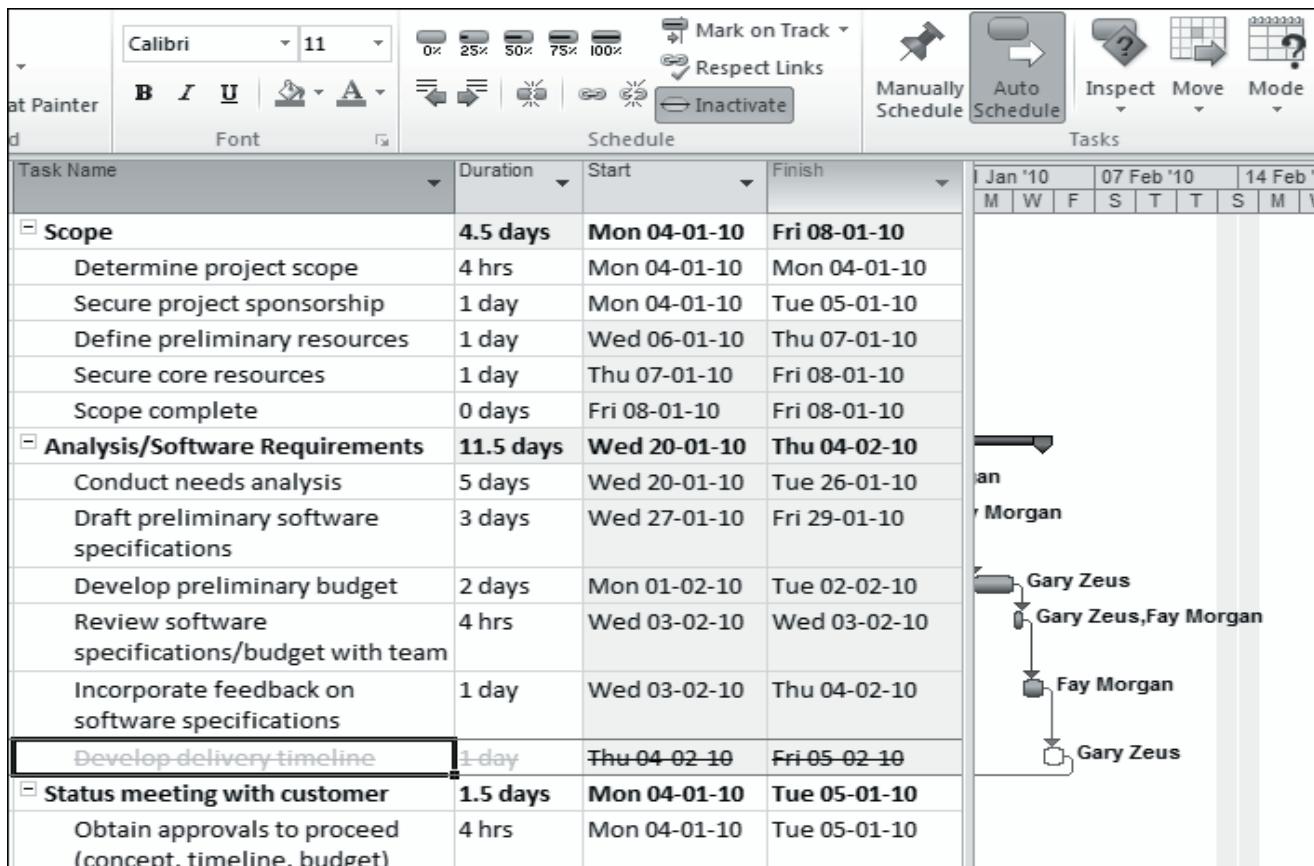


Figure 4.2: Inactivating a Task

4.5 Building Agile Project Plans

Most projects work on strict deadlines. Agile project planning, also referred as ‘release planning’, is about planning multiple sprints (levels) that culminate in a release of the final deliverable. Having agile project plans help the project manager deal with any uncertainty in project schedules.

Session 4

Tasks Allocation

Concepts

The benefits of agile project planning are as follows:

- Early realization of business value
- Early visibility when tasks go off track
- Collaboration and regular feedback to ensure quality and provide the right solution

Agile project plans also depend on product backlog, which is a list of features that the project needs to deliver. It is a user-oriented feature list in a language that business people and users can easily understand. Product backlog is neither technical nor a list of tasks. Product backlog does not contain all the tasks and the dependencies for the project. Product backlog can be defined as a high level list maintained throughout the project life cycle.

It combines backlog items along with Priority features sorted by importance. Product backlog contains rough estimates of business value and effort and help the project manager to estimate the timelines.

For example, if two tasks have the same business value, the one with the smallest development effort will probably have higher priority, because the Return on Investment is higher.

Agile project plans help the project manager to calculate productivity of a resource by finding the average delivery timelines per level and calculate how many levels it will take to wipe off the number of points on the project's product backlog.

An agile project plan works on several parameters, such as applying multiple levels of planning, combining the planning levels, relating the planning levels to a release, conditions of user satisfaction, and so forth.

4.6 Scheduling Tasks

The list of tasks and subtasks in a project form its to-do list. The timings for executing the tasks and their relationship with each other define project schedule.

Project managers can make changes and set preferences for the tasks and their schedules while creating them. For instance, they can specify settings for task timing, priority, and certain constraints during the life cycle of the project. A project manager, using MS Project, can control scheduling using either **Manually Scheduled** or **Auto Scheduled** modes.

In **Auto Scheduled** mode, MS Project uses the old method of calculating task schedules based on the project start date and its dependencies. When there is a change in project start date or in a task's schedule or several dependent sub tasks, the task schedules are automatically recalculated. This saves the project manager's time and effort in reentering dates for the tasks throughout the project.

In **Manually Scheduled** mode, project managers can enter the task duration and dates anytime during the project life cycle. Once the duration (start date and end date) is entered, MS Project fixes the schedule for the task and does not move the dates unless they are manually changed.

Session 4

Tasks Allocation

4.7 Working with Tasks

The first step while creating tasks is identifying the individual action items. These individual action items can be considered as individual tasks.

The parameters needed for creating a task are as follows:

- Task name
- Task duration
- Task type
- Task priority
- Task constraints

4.8 Entering Tasks

Creating a task in MS Project is as simple as entering a name for it. Details of the task such as its duration and type, can be entered at the same time or later.

Users can enter task information in the following three ways:

- By using the **Gantt Chart** table
- By using the **Task Information** dialog box via the **Gantt Chart** view
- By importing tasks from Excel or Outlook

4.8.1 Entering Tasks in the Gantt Chart Table

The quickest and easiest way to enter all task names is through the **Gantt Chart** table. The user can simply enter the name in the Task Name column, press the ENTER key or down arrow to move to the next blank row, enter another task, and so forth. An automatic Task ID is created by MS Project for each task name.

To enter a task in the **Gantt Chart** table, place the cursor in a blank cell in the **Task Name** column and enter a task name. Press Delete or Backspace key to delete/edit task names. To move to the next cell, press the down arrow key and then type the next task name, and so forth for all task names.

Session 4

Tasks Allocation

Concepts

Figure 4.3 illustrates entering tasks in **Gantt Chart** table.

	Task Mode	Task Name	Duration	31 Oct '11
				M T W T F S S
1	?	Website look and feel change SSU	2 wks	
2	?	system study	3 days	
3	?	requirements gatherir	4 days	
4	?	prototype	3 days	
5	?	review meeting with customer	1 day	
6	?	Design Templates	8 days	
7	?	identify designers	1 day	
8	?	delphi mode	4 days	
9	?	review templates	2 days	
10	?	finalize	1 day	
11	?	review meeting with customer	1 day	
12	?	Development	1 wk	
13	?	database design		

Figure 4.3: Creating Tasks in Gantt Chart Table

4.8.2 Entering Tasks in the Task Information Dialog box

Project managers can also enter tasks in the **Gantt Chart** table using the Task Information dialog box, by performing the following steps:

1. Double-click a blank cell. This displays the **Task Information** dialog box

The **General** and **Advanced** tabs in the **Task Information** dialog box contain various timing and scheduling settings for the task

2. Enter the task name in the **Name** text box
3. Click **OK** to save the task

Session 4

Tasks Allocation

Figure 4.4 shows the **Task Information** dialog box.

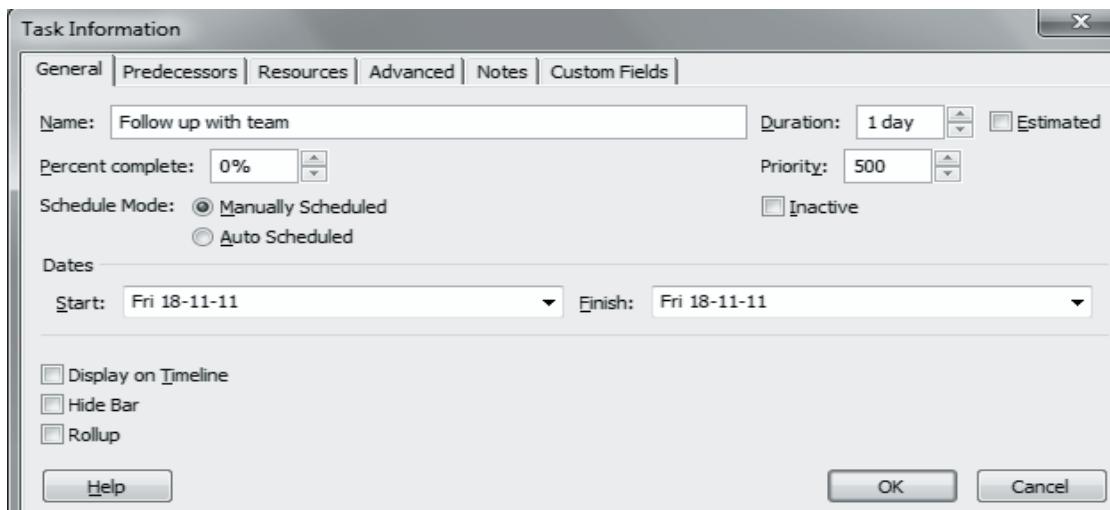


Figure 4.4: Task Information Dialog Box

The **Gantt Chart**'s default sheet displays the most common task information columns. Users can add any additional columns that they need. To do so, perform the following steps:

1. Scroll to the last column on the **Gantt Chart** table and click the drop-down arrow on the header of the Add New column to display a list of task related parameters.
2. Select the required parameter to display it as a new column.

To insert a task within the list of tasks, users can select the task row above which they want to add the new task and click the top part of the **Task** button in the **Insert** group on the **Task** tab.

4.8.3 Importing Tasks from Outlook

MS Project 2010 provides an easy way to import tasks created in Outlook 2010 into a project. A project manager can import Outlook tasks into MS Project by performing the following steps:

1. Open MS Project 2010 and create a new project file.
2. In the Insert group on the **Task** tab, click the down arrow on the Task button and select **Import Outlook Tasks...**
The **Import Outlook Tasks** dialog box appears.
3. From the list of tasks, select the check boxes adjacent to each task to import them into project.
4. Click **OK** to view the tasks imported in MS Project.

Session 4

Tasks Allocation

The imported tasks are added at the bottom of the task list in the **Gantt Chart** table.

Figure 4.5 illustrates the **Import Outlook Tasks** dialog box.

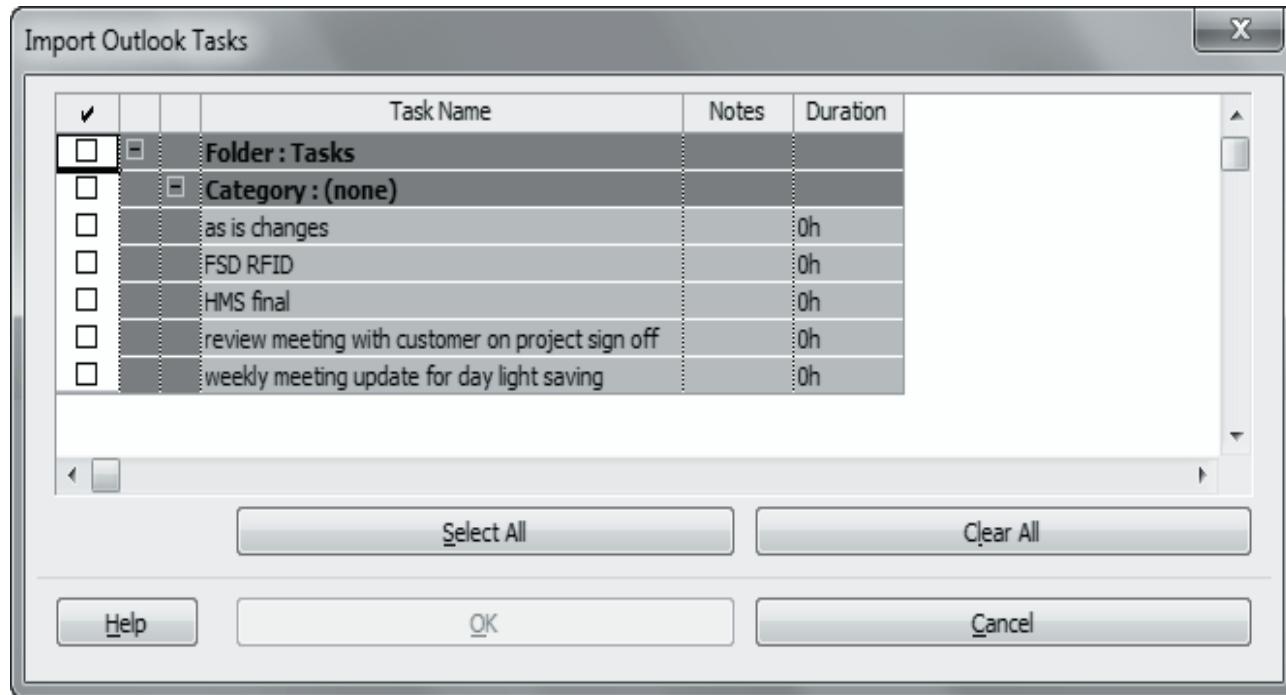


Figure 4.5: Import Outlook Tasks Dialog Box

4.8.4 Importing Tasks from Excel

Project managers can also import tasks from Excel to MS Project. At the project initiation stage, when defining the WBS and project tasks, a project manager often makes several edits and changes to the list. Project managers can create and edit this list in Excel, and once finalized, they can import the tasks into MS Project.

MS Project 2010 provides two templates for importing Excel data. These templates are located in the **Installed Templates** section in the Backstage view in Excel 2010. The two templates are as follows:

- **Microsoft Project Task List Import Template:** Contains two Excel worksheets; users can enter tasks and resources in the first sheet, while the second sheet provides information on that template.
- **Microsoft Project Plan Import Export Template:** Contains four worksheets; first worksheet is for entering tasks, second is for resources, and the third is for assignments. The fourth worksheet provides information about the template.

After entering the tasks in the template, users can import the data from Excel into MS Project.

Session 4

Tasks Allocation

The steps to use the **Microsoft Project Task List Import Template** are as follows:

1. Open MS Excel 2010 and open the **File** tab. Click **New** in the Backstage view and select the **Installed Templates** option to display **Microsoft Project Plan Import Export Template** and **Microsoft Project Task List Import Templates** as shown in figure 4.6.

Figure 4.6 illustrates display of MS Project Import Templates in Excel 2010.

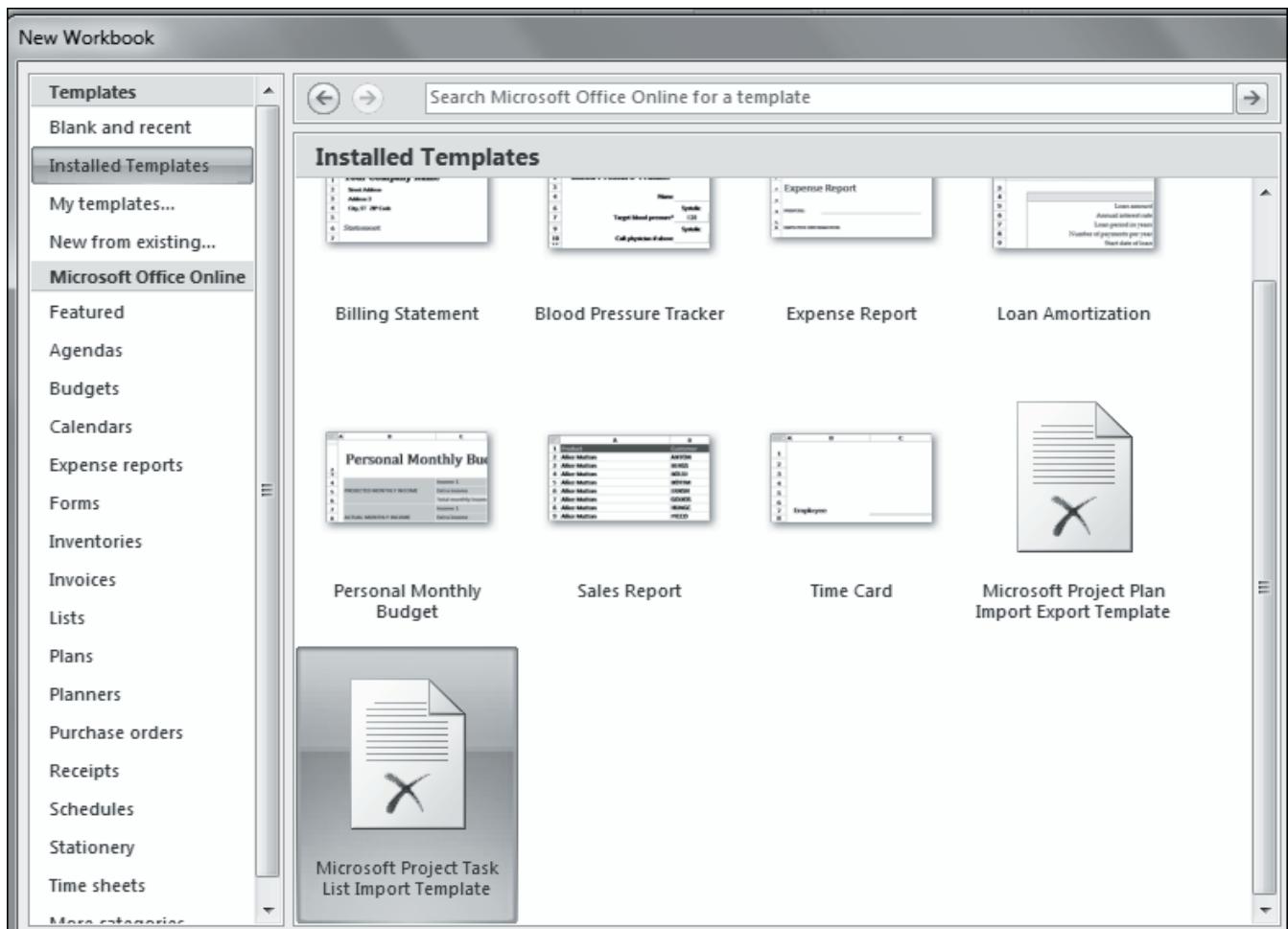


Figure 4.6: MS Project Import Templates in Excel 2010

2. Select the **Microsoft Project Task List Import Template** and click the appropriate button to open the template in Excel 2010.
3. Enter the Task Information, Resources, and Dates in the respective columns of the template, and save the file as an Excel workbook.

Session 4

Tasks Allocation

4. Now, open MS Project 2010 and click **Open** from **File** tab to display the **Open** dialog box. From the file types drop-down list adjacent to the **File name** text box, choose **Excel Workbook**.
5. Locate the Excel workbook containing the project details and click the **Open** button to start the **Import Wizard**. The first screen of the wizard displays the information about the Import Wizard.
6. Click **Next** to continue with the wizard.
7. If a predefined map already exists, where the Excel data columns are mapped to the MS Project data columns, select the **Use existing map** radio button and specify the template. Else, select the **New Map** radio button and click **Next**.
8. Specify method of importing the file and click **Next**. There are three methods to import the workbook: **As a new project**, **Append the Data to the active project**, or to **Merge the data into the active project**. Merging data with the active project allows the user to create a merge key that defines the data to merge with existing tasks.
9. Click **Next**. Three check boxes are displayed. Users can select to import tasks, resources, and assignments from the Excel workbook using these check boxes.
10. Select **Import Includes Headers** to import the column headings from the task list and click **Next**.
11. From the **Source Worksheet Name** list box, select the name of the worksheet from which data needs to be imported. For example, the worksheet **Task_Table**, may hold the task data.
12. In the **From** and **To** columns in table below, specify which columns in the Excel worksheet map to which fields in the MS Project file.
13. Once the mapping is done for all fields, click **Finish**. The project file opens with the following fields imported from Excel to MS Project format:
 - Tasks
 - Resources
 - Assignment information

Concepts

4.9 Setting Task Duration, Units, and Work

The duration assigned to individual tasks sum up to define the timing of the entire project. MS Project 2010 cannot determine the duration of a task, but it helps a project manager identify the effect of timing of tasks on the total duration of the project. Estimating the duration must be done using the project manager's experience and knowledge.

4.9.1 Identifying Task Types

Every project contains one or all three types of tasks. These task types have an effect on the schedule of a task, when scheduled using the auto schedule mode. The three types of tasks are as follows:

- **Fixed Duration:** This task type has a fixed amount of time to complete with any number of additional resources. For example, flight travel time from New York to Chicago should be a fixed duration. The duration will not increase if less number of pilots are deployed and will not decrease if additional pilots are used.
- **Fixed Units:** This task type is the default task type in MS Project 2010. This task type is used when resources are assigned to a task with a certain number of units. A unit is expressed as the percentage of work hours of a resource. For example, if a resource works for 8 hours a day, the unit is 100% and if the resource works for 4 hours a day, the unit is 50%. In case of fixed units task type, the resource assignments will not change, even if the duration of the task and the work amount is changed. For example, if a task has to be completed by 1 resource in 2 days, the same can be completed in 1 day with 2 resources and in 4 days if 1 resource works for 4 hours a day.
- **Fixed Work:** The number of resource hours assigned to a task determines its length. Fixed work is always an effort driven task type. For a fixed-work task, adding resources to the task decreases the task duration. For example, if the duration of a fixed work task is set at 40 hours, and assigned two resources to work 20 hours each at units of 100 percent, the task will be completed in 20 hours. If one of these resources is taken away, the active resource must put in 40 hours at units of 100 percent to complete the task as scheduled.

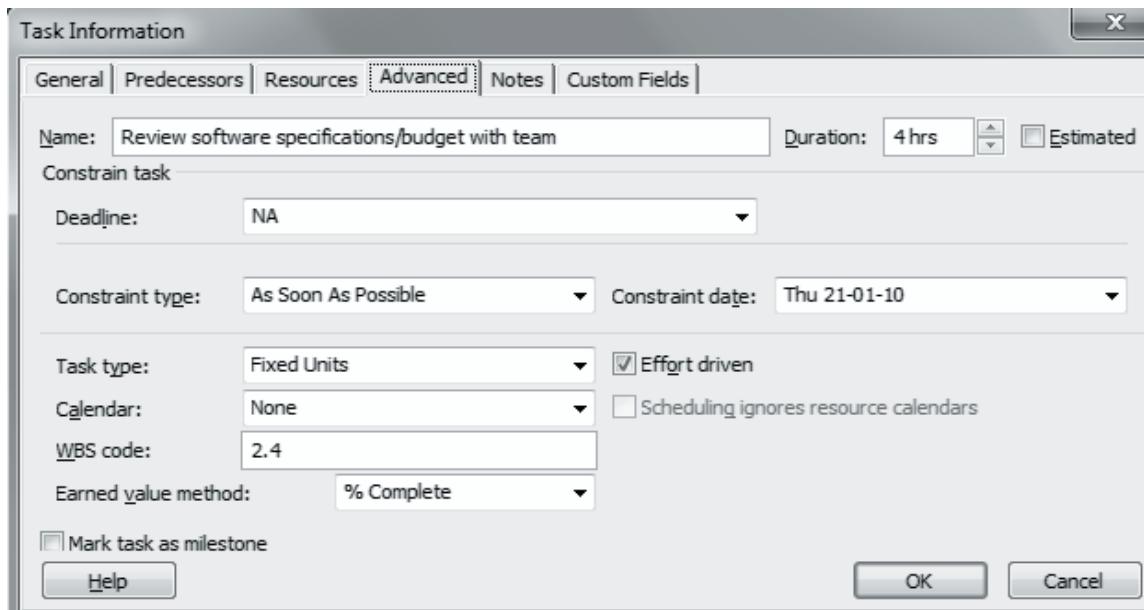
The steps to define the task types are as follows:

1. Select a task name in the **Gantt Chart** table and click **Information** in the **Properties** group, on the **Task** tab to display **Task Information** dialog box.
2. Click the **Advanced** tab and select the appropriate task type for the selected task, from the **Task Type** drop-down list.
3. Click **OK** to save the task type.

Session 4

Tasks Allocation

Figure 4.7 illustrates types of tasks in the Task Information dialog box.



Concepts

Figure 4.7: Task Information Dialog box

An alternative method of defining task types for tasks is to add the **Type** parameter to a new column on the **Gantt Chart** table. Users can then specify in the column, the task type for each task.

4.9.2 Setting Task Duration

Most tasks in a project have a duration. Tasks without any duration are called milestones. MS Project allows users to set various units of task durations such as Hours, Days, Weeks, and so forth. Steps to specify the duration type for a task are as follows:

1. Select a task name from the **Gantt Chart** table and click **Information** in the **Properties** group, on the **Task** tab to display the **Task Information** dialog box.
2. In the **Duration** text box on the **General** tab, enter the duration or click the up and down scroll buttons to increase or decrease the duration and specify the **duration units** such as days, weeks and so forth in the same **Duration** box. By default, MS Project estimates duration of a new task to be one day (1d).
3. Specify time unit. User can use the abbreviations of various time units as follows:
 - a. m: Minutes
 - b. h: Hours
 - c. d: Days
 - d. w: Weeks
 - e. mo: Months
4. Click **OK** to save the changes.

Session 4

Tasks Allocation

If users are not sure about the timing of a task and want to enter an approximate timing, they can select the **Estimated** check box on the **General** tab.

4.9.3 Setting Milestones

As mentioned earlier, tasks without any duration are called milestones. To create a milestone, simply indicate the task duration as zero in the **Duration** column in **Gantt Chart** table. If the user wants to mark a task with some duration as a milestone, click the **Advanced** tab of the **Task Information** dialog box and select the **Mark task as milestone** check box. A milestone is represented in the **Gantt Chart** view with a black diamond shape than a taskbar.

4.10 Recurring Tasks and Effort Driven Tasks

Recurring tasks are those tasks that are repeated regularly during the execution of the project. It becomes a tedious task for the user to create all the tasks for each occurrence. MS Project automatically creates the recurring task if once designated with a period of recurrence.

Though MS Project facilitates to change the type of a task either as **Manually Scheduled** or **Auto Scheduled**, the user can make **Auto Scheduled** tasks as effort driven tasks. That means, if resource assignments are adjusted, the task duration might also change but the number of hours of effort that resources need to complete the task remains the same.

4.10.1 Recurring Tasks

Tasks that occur repeatedly in projects are called recurring tasks. Tasks such as, conducting weekly status meeting every Friday or generating a monthly project report can be considered as recurring tasks. Using MS Project, users can set up such tasks to recur.

The steps to create a recurring task are as follows:

1. In the **Insert** group on the **Task** tab, click the down arrow on the Task option and select **Recurring Task...**
This displays the **Recurring Task Information** dialog box
2. In the **Task Name** text box, enter a name for the recurring task
3. In the **Duration** text box, enter the duration for the task, such as **5d** to set the task duration to 5 days
4. Choose a recurrence pattern by selecting the **Daily**, **Weekly**, **Monthly**, or **Yearly** radio buttons. Depending on the selections, make choices for the rest of the recurrence pattern. For example, on selecting the **Weekly** radio button, users must specify the interval in weeks when the task should recur and the day in the week when the task should recur. For example, the **Weekly Project Status Meeting** should recur every single week on a **Friday**

Session 4

Tasks Allocation

5. Specify the **Range of recurrence**, which is the start and end period between which the tasks should recur. For example, the user may start a task on March 1st and end after 12 occurrences to create a task that occurs every month for a year
6. Click **OK** to save the recurring task

Concepts

Figure 4.8 illustrates the creation of a recurring task in the **Recurring Task Information** dialog box.

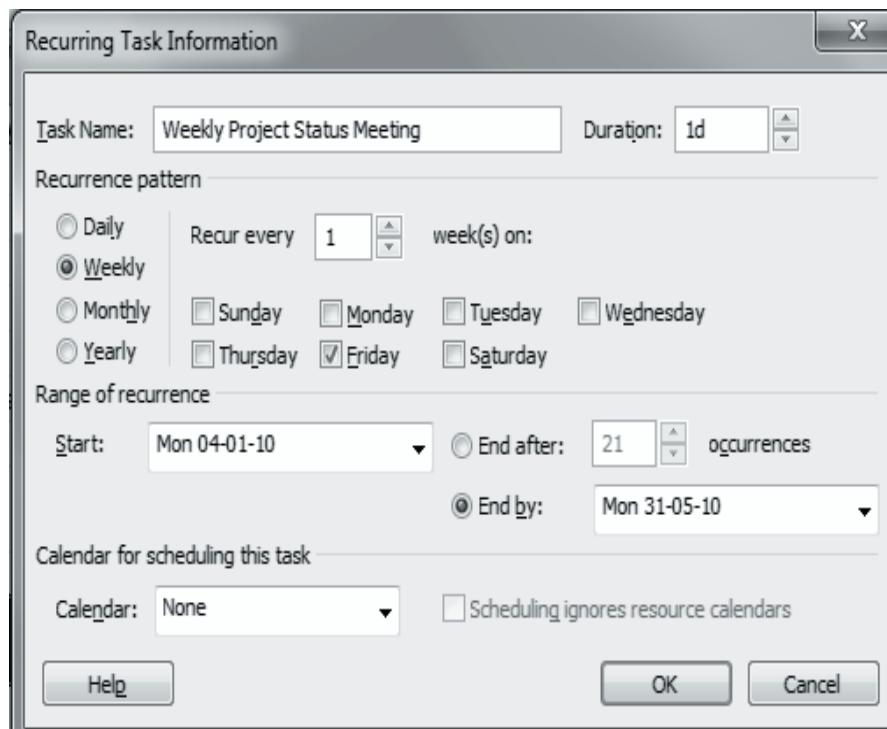


Figure 4.8: Creating a Recurrence Task Using Recurring Task Information

When assigning resources to a recurring task, make sure to assign resources to individual recurrences and not to the summary level recurring task. MS Project will not calculate the work hours correctly, if resources are assigned to the summary recurring task.

4.10.2 Effort-driven Tasks

Effort is the number of work hours put in by a resource to complete a task. Effort-driven tasks are those tasks for which the work hours per resource reduces with the increase in the resources assigned to the task.

In MS Project, manually scheduled tasks cannot be set up as effort driven tasks. Only auto scheduled tasks can be effort-driven. If resource assignments are adjusted, the duration might change but the number of hours of effort and the resources needed to complete the task remain the same. While adding or deleting a resource assignment on an effort-driven task, the amount of work is distributed equally among all the resources.

Session 4

Tasks Allocation

Consider a scenario. There is a need to set up four computers. 16 work hours are required to set up each computer. In all, one person can complete this task in 64 hrs. If another resource is added to this task, the total work hours required for the project is halved.

Effort-driven schedule uses the formula $D=W/U$ (Duration is equal to Work divided by Units). MS Project recalculates the duration of a task accordingly if resources (Units) are added or removed from a task assignment.

4.11 Arranging and Splitting Tasks

Project managers estimate the start date of tasks but quite often put them on hold before they actually start. For example, if the project start date has a precedent of customer signoff on the project work order and if the work order from customer gets delayed, there can be a delay in the task start date.

In such cases, project managers can use a feature in MS Project to split a task so that the second or the third portion of the task starts at a later date, with no activity between. The project manager can perform as many splits as required.

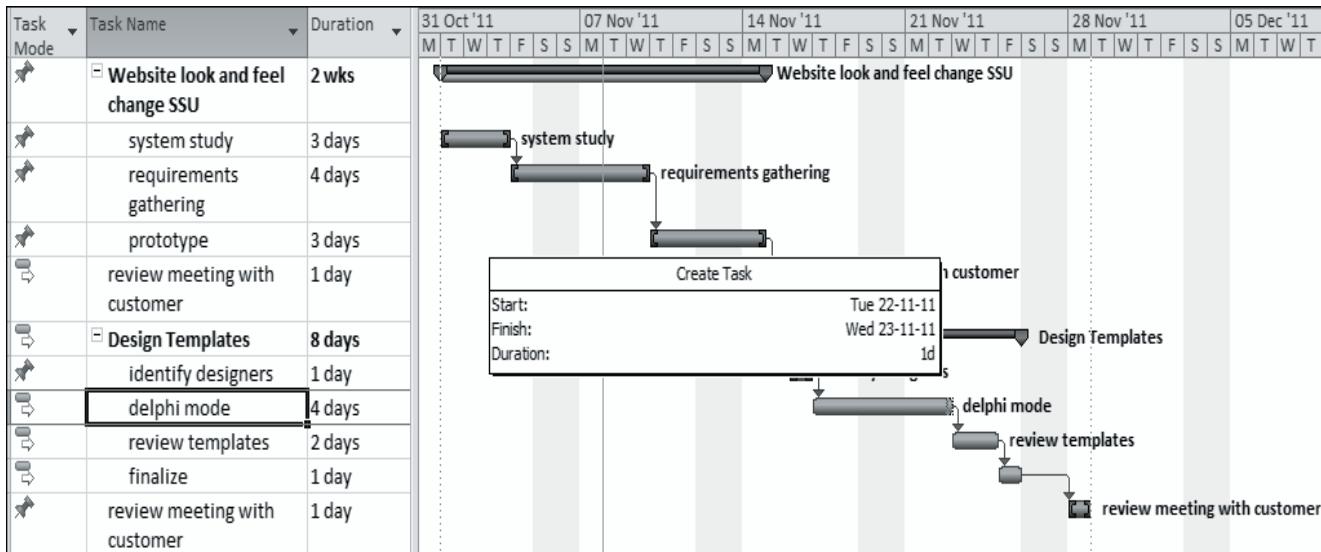
A task can be split by performing the following steps:

1. Click the **Split Task** button under the **Schedule** group on the **Task** tab. This displays the **Split Task Information** box. The box guides the user to set the start date for the continuation of the task.
2. Move the mouse pointer on the **Gantt Chart** taskbar to adjust the pointer's position till it displays the date where the user wants to start the split, and then drag it to right till the box contains the date on which the user wants the task to begin again and release the mouse. The task is now split.
3. To rejoin the split task, place the mouse over the taskbar until the cursor appears and dragging the split taskbar to join with the split portion of the taskbar.

Session 4

Tasks Allocation

Figure 4.9 illustrates the process of splitting a task.



Concepts

Figure 4.9: Splitting a Task

4.12 Controlling Timing with Constraints

In MS Project 2010, constraints are the timing conditions that organize an auto scheduled task. Manually scheduled tasks follow defined start and end dates, hence they are already constrained with their respective start and end dates.

4.12.1 Understanding Constraints

When a task is created in MS Project and set to Auto Scheduled, by default, the **As Soon As Possible** constraint is selected. In simple words, the task starts as soon as the project starts, assuming that no dependencies exist and that would delay the start of the project.

Timing of a task depends upon its start date, finish date, dependencies, task type, and any effort-driven setting and constraints.

For example, if a constraint for a task is set to finish on a specific date, MS Project works around all the dependent tasks to recalculate the timing and suggests that the task might complete on another date. Note that in MS Project 2010, constraints must be used only when there is a strong need for a task's timing.

Session 4

Tasks Allocation

Table 4.1 lists all the constraints and explains their effects on a task's timing.

Concepts

Constraint	Effect
As Soon As Possible	The default setting in MS Project; the task starts as early in the schedule as possible, based on project dependencies and project start date.
As Late As Possible	The task occurs as late as possible in the project schedule, based on project dependencies and project finish date.
Finish No Earlier Than	The end of the task cannot occur any earlier than the date specified.
Finish No Later Than	The end of the task cannot occur any later than the date specified.
Must Finish On	The task must finish on that date.
Must Start On	The task must start on that date.
Start No Earlier Than	The task cannot start any earlier than the date specified.
Start No Later Than	The task cannot start any later than the date specified.

Table 4.1: List of Constraints and their Effects

4.12.2 Setting Constraints

A task will have only one constraint. Setting a constraint involves selecting the type of constraint in the **Task Information** dialog box. Some constraints work together with a chosen date. For example, if the user wants a task to start no later than a specific date, the user needs to specify a date before which the task must start.

The steps to set a task constraint are as follows:

1. Select a task name from the **Gantt Chart** table and click the **Information** option on the **Task** tab to display the **Task Information dialog** box.
2. Click the **Advanced** tab and select the appropriate constraint from the **Constraint type** drop-down list.
3. If the constraint requires a date, select one from the **Constraint date** drop-down list.
4. Click **OK** to save the settings.

Session 4

Tasks Allocation

Figure 4.10 illustrates specifying constraint types in the **Task Information** dialog box.

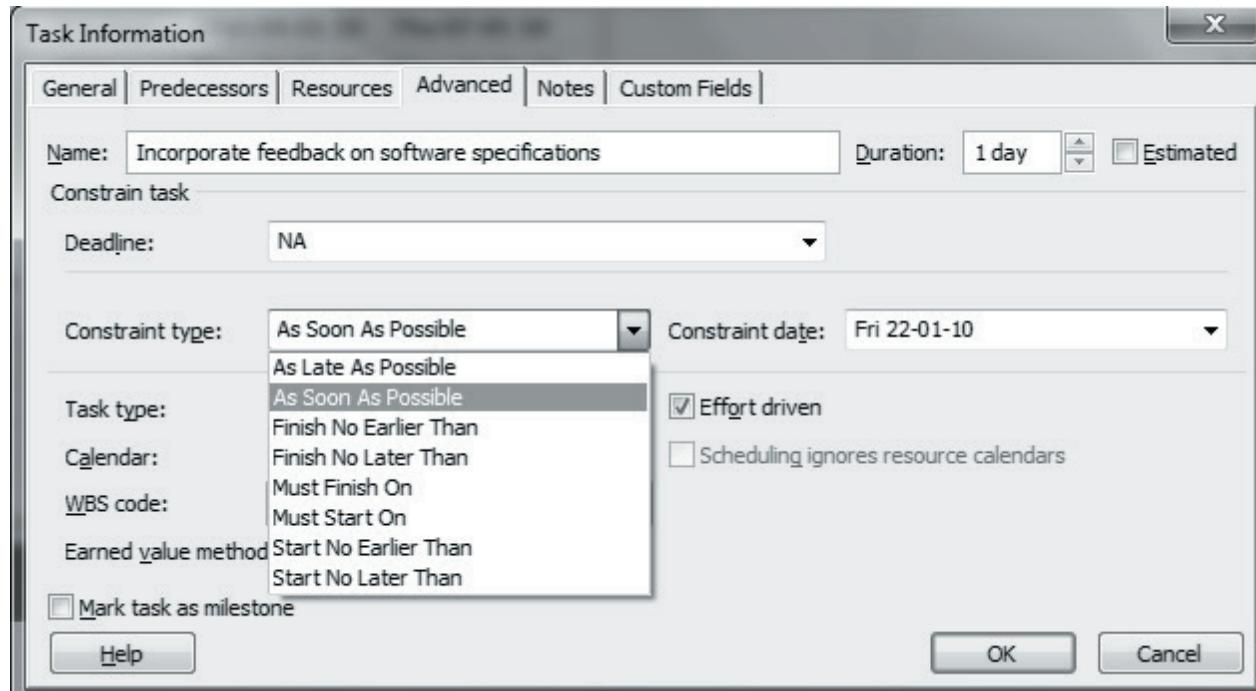


Figure 4.10: List of Constraint Types

4.12.3 Setting a Deadline

Deadlines do not force project managers to change the timing of task schedules. Deadlines are not considered to be constraints; though in MS Project, the deadlines are set in the **Constraint Task** section of the **Task Information** dialog box. In MS Project, setting a deadline displays a symbol in the **Indicator** column of the **Gantt Chart** view if the task has run past the deadline that alerts the project manager to take corrective actions.

Steps to set a deadline are as follows:

1. Select a task name and click the **Information** option on the **Task** tab to display the **Task Information** dialog box.
2. Under the **Constrain task** section on the **Advanced tab**, select a date in the **Deadline** field.
3. Click **OK** to save the deadline setting.

Session 4

Tasks Allocation

Concepts

Figure 4.11 illustrates setting deadlines.

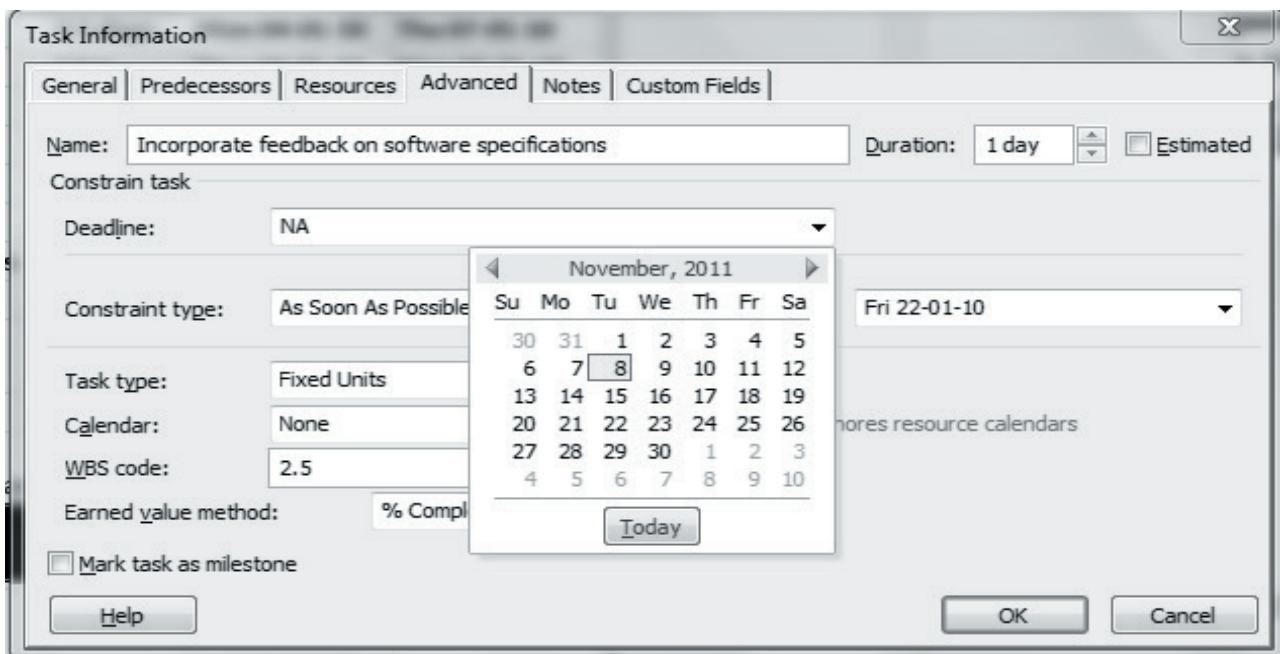
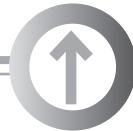


Figure 4.11: Deadline Settings



Summary

- Project managers must build agile project plans to help deal with uncertainties in the project.
- In case of auto scheduling, any changes in task scheduling are automatically recalculated and updated.
- In case of manual scheduling, any change in task scheduling does not affect the project schedule unless changed manually.
- Users can create new tasks by entering information in the Tracking Gantt table or in the Task Information dialog box, or by importing tasks and project information from Excel or Outlook.
- MS Project identifies three types of tasks; fixed duration, fixed units, and fixed work.
- Tasks that occur repeatedly in a project life cycle can be set up as recurring tasks.
- Certain tasks for which the work hours required per resource to complete the task is affected by the resources assigned are called effort-driven tasks.

Session 4

Tasks Allocation



Check Your Progress

1. If a summary task is manually scheduled and the calculated duration for the task does not match the actual summary task duration, MS Project warns by _____.

A)	Displaying the finish field in red
B)	Displaying a red Gantt bar
C)	Changing the scheduling mode to auto schedule
D)	Displaying a warning message that calculated duration for the task does not match the actual summary task duration

2. Which one of the following statements is true for a task deleted from the task list?

A)	The action cannot be undone
B)	MS Project displays a warning before deleting the task
C)	MS Project marks the task as inactive
D)	Pressing the Ctrl+Z key will undo the action

3. If a project manager chooses to control scheduling using manually scheduled mode and there is a change in project start date, which of the following will take place?

A)	Task schedules in the entire project are recalculated automatically
B)	MS project fixes the schedule for all tasks and makes no changes
C)	The task schedules cannot be changed
D)	Project managers can enter the task dates and schedules anytime during the project life cycle

4. Project managers can create tasks by _____.

A)	Exporting project information from excel templates
B)	Entering tasks in the Task Information dialog box
C)	Entering information in under Add New Column
D)	Importing tasks from Outlook

Session 4

Tasks Allocation

Concepts



Check Your Progress

5. Identify the task type in which the number of resource hours assigned to a task determines its length.

A)	Fixed duration
B)	Fixed units
C)	Fixed work
D)	Effort-driven

6. By default, when a task is created in MS Project and set to the auto schedule mode, which one of the following constraints is assigned to it?

A)	As Soon As Possible
B)	As Late As Possible
C)	Finish No Later Than
D)	Must Finish On

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Objectives

At the end of this session, the student will be able to:

- *Define dependent and co-dependent tasks*
- *Describe how to compare types of dependencies*
- *Explain how to create, modify, view, and delete dependency links*
- *Explain how to work with lag time and lead time*

5.1 Introduction

MS Project assumes by default that all tasks start on the project start date simultaneously. Tasks are created with their default constraint ‘as soon as possible’ and with no dependencies. Practically, all the tasks in a project cannot start at the same time. Tasks will have dependency links between them in a project plan. Dependencies can be considered as timing relationships between tasks. For example, a task, such as testing a software application to start, depends on the completion of the software programming task.

This session defines dependent and co-dependent tasks in a project. It explains how to identify and compare these dependencies and also how to create, modify, view and delete dependency links between tasks. Finally, it explains how to deal with lag time and lead time for project tasks.

5.2 Dependent Tasks

Dependency tasks are tasks that are dependent on other tasks, as either a predecessor or a successor. Any two tasks can become a predecessor-successor pair if they have a timing relationship between them. A task can have multiple dependency links.

Project managers should not establish a dependency link between two tasks just to prevent resources working on the tasks simultaneously. Such dependency becomes a resource dependency rather than a task dependency and may affect the project schedule, causing resource over-allocation.

In case of **Auto Scheduled** tasks in MS Project, the predecessor task’s schedule automatically impacts the successor tasks’ schedule.

Session 5

Project Dependencies

Figure 5.1 illustrates a graphical representation of taskbars in **Gantt Chart** view with predecessors and successors between tasks. The lines between tasks represent dependency links.

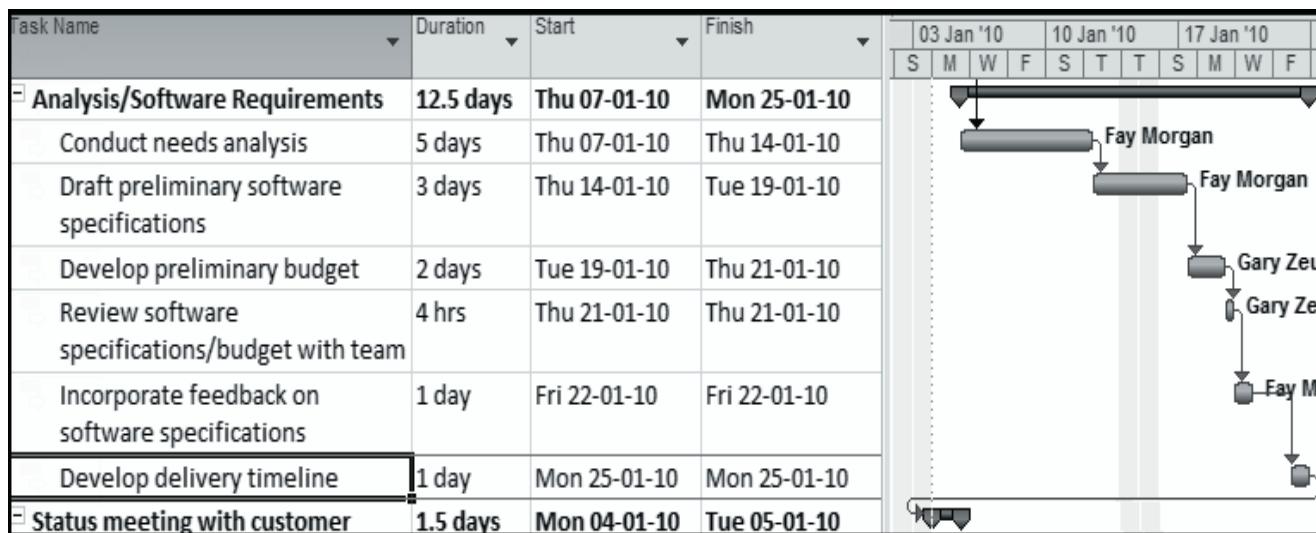


Figure 5.1: Gantt Chart Displaying Dependency Links Between Tasks

5.3 Co-dependent Tasks

Project managers should not set start dates of tasks close apart, as changes in projects are bound to happen. One of the best practices is to build time logic between tasks than assigning specific dates to them. MS Project auto calculates and adjusts dates based on the time logic.

For example, if the predecessor's task is delayed by a week, the dependent task (successor) start date moves out a week automatically. MS Project adjusts dates accordingly while tracking such activities in the project plan.

5.4 Types of Dependencies

MS Project identifies the following four types of dependency links:

- Finish-to-Start
- Start-to-Finish
- Start-to-Start
- Finish-to-Finish

Using these dependency types, project managers can efficiently manage a project to finish on time.

Session 5

Project Dependencies

Steps to set a dependency type in MS Project are as follows:

1. Open the project and select a task to create a dependency.
2. Double-click the **task** to display **Task Information** dialog box.
3. Click the **Predecessor** tab to display **Finish-to-Start** as the default value for the task.
4. Change the **Type** value to the desired Dependency Type such as **Start-to-Start (SS)** or **Finish-to-Finish (FF)** or **Start-to-Finish (SF)** or **None**.
5. Click **OK** to save the information.

Concepts

5.4.1 Finish-to-Start

Finish-to-Start is the most common dependency type. In this, the predecessor task must complete before the successor task starts. It is the default dependency type for any two dependent tasks in MS Project. In case of Finish-to-Start dependency, project managers can have the same team working on one task to move on to its successor task.

An example of a Finish-to-Start dependency is a case where the quality check of a product can happen only after the completion of the manufacturing of the product. Figure 5.2 illustrates a Finish-to-Start dependency indicated in the **Gantt Chart**, by the successor taskbar starting where the predecessor taskbar ends.

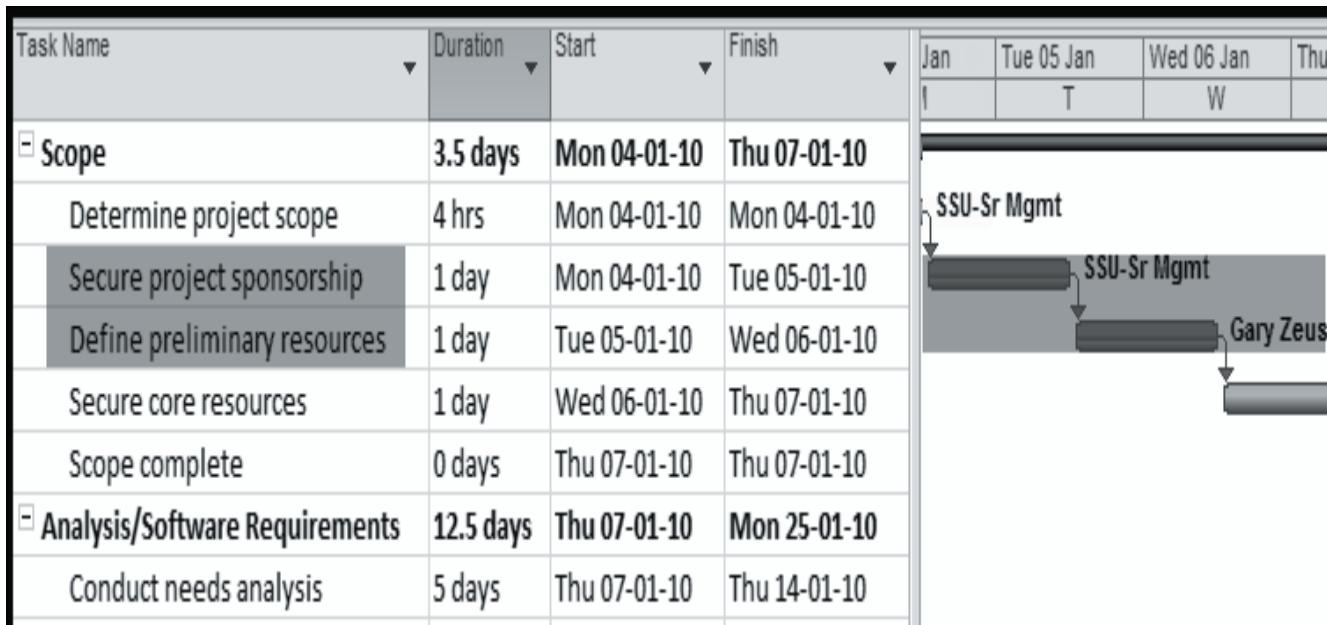


Figure 5.2: Finish-to-Start Dependency Links Between Tasks in Gantt Chart View

Session 5

Project Dependencies

5.4.2 Start-to-Finish

In Start-to-Finish dependency, the successor task must finish only after the predecessor task starts. If the predecessor is delayed, the successor task will not finish. This type of dependency is a bit tricky, as the second task cannot finish until the first task starts. However, the second task can finish any time after the first task starts.

For example, a customer requesting an order can begin once the order is ready for delivery. That is, a Start-to-Finish dependency link can be established between the 'delivery of the goods' and 'customer billing' tasks, so that when the delivery task starts, the billing task can finish.

Figure 5.3 shows Start-to-Finish dependency link in **Gantt Chart** view.



Figure 5.3: Start-to-Finish Dependency Link in Gantt Chart

5.4.3 Start-to-Start

Start-to-Start dependency type exists when either two tasks start simultaneously or the second task begins immediately after the first task.

For example, writing of a business proposal by the author on the first session to submit on a specific deadline must begin in order to start the editing of that session by the editor. Project managers use Start-to-Start dependency links to minimize the downtime between tasks or projects and to coordinate resources to utilize the organization's time and assets. With this technique, it is possible to simultaneously utilize the necessary resources, without waiting for one task to complete to begin another.

Session 5

Project Dependencies

Concepts

Figure 5.4 illustrates Start-to-Start dependency link between the tasks review functional specifications and develop training specifications for end users.

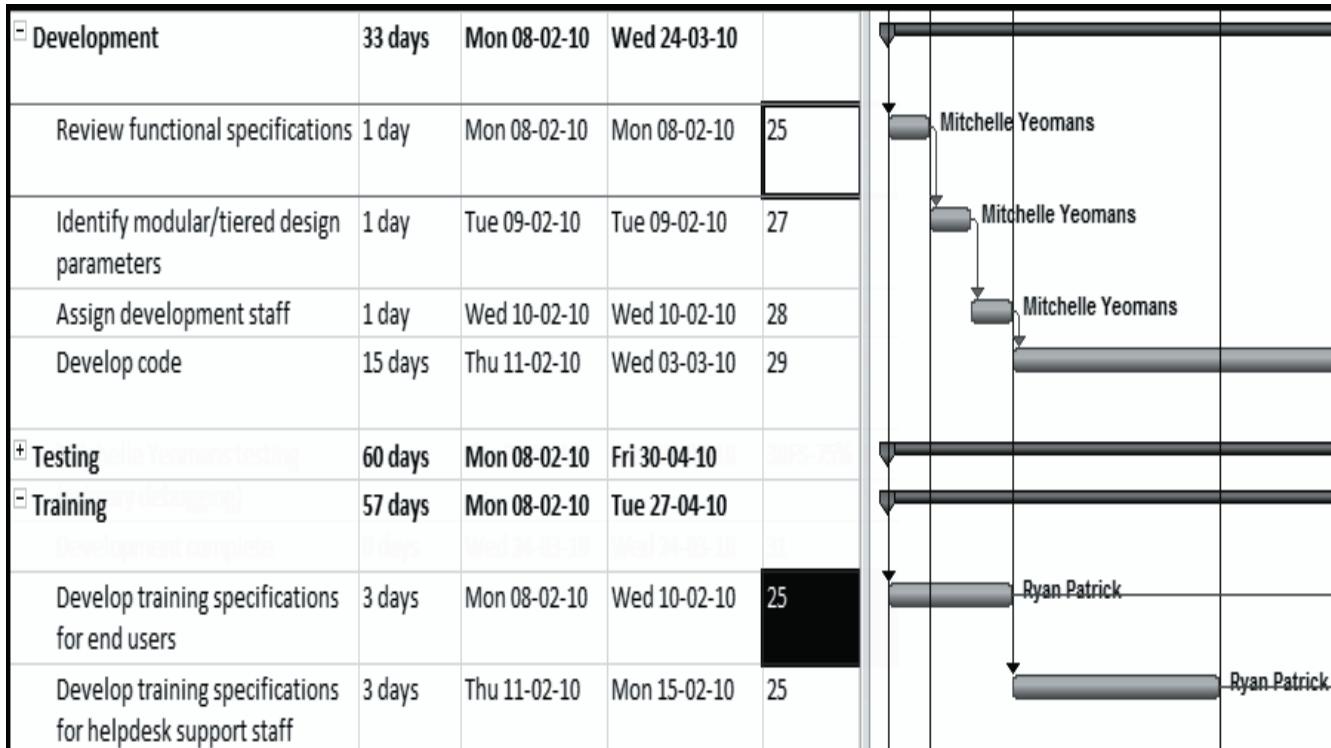


Figure 5.4: Start-to-Start Dependency Link Between Tasks in Gantt Chart View

5.4.4 Finish-to-Finish

A Finish-to-Finish dependency type exists when two tasks must finish at the same time. Project managers apply this dependency type by adjusting the expected start date of the successor task or modifying the finish date of the predecessor task.

For example, in some cases, the estimation of Finish-to-Finish dependency links will take place at the start of the project. The project manager shall perform a detailed analysis of all of the estimated end dates of key deliverables throughout the life of the project. The Finish-to-Finish dependency can be decided by subtracting the start date of one task from the end date of the preceding task.

Session 5

Project Dependencies

Figure 5.5 illustrates Finish-to-Finish dependency link in **Gantt Chart** view.

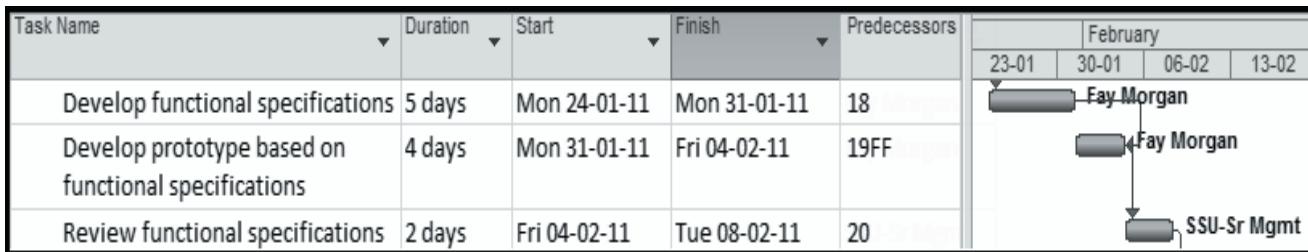


Figure 5.5: Finish-to-Finish Dependency Link Between Tasks in Gantt Chart View

5.5 Lag Time and Lead Time

Tasks in a project plan must have well-defined start and end dates, along with relationships and links between tasks in the project schedule. A project manager should also assume delays and overflows in the schedule. Therefore, it is a good practice to include lead time and lag time in the project schedule for tasks with dependencies.

Lead time refers to the time overlap between tasks. For example, if two tasks have a Finish-to-Start dependency link, the successor task can start only when the predecessor task is 75% completed. In this case, the lead time for the successor is 25%.

Lag time is the delay between tasks. For example, a successor task can start only five days after the predecessor task is completed. In such case, the two tasks have a Finish-to-Start dependency and the lag time is five days.

In MS Project, lead time or lag time is specified on the **Predecessors** tab of the **Task Information** dialog box. Lead time/lag time values can be defined in terms of either duration or percentages. **Lead time** is created by entering a negative value for duration in the **Lag** field. **Lag time** is created by entering a positive value in duration in the **Lag** field.

Session 5

Project Dependencies

Figure 5.6 displays Predecessors tab with Lag time in Task Information dialog box.

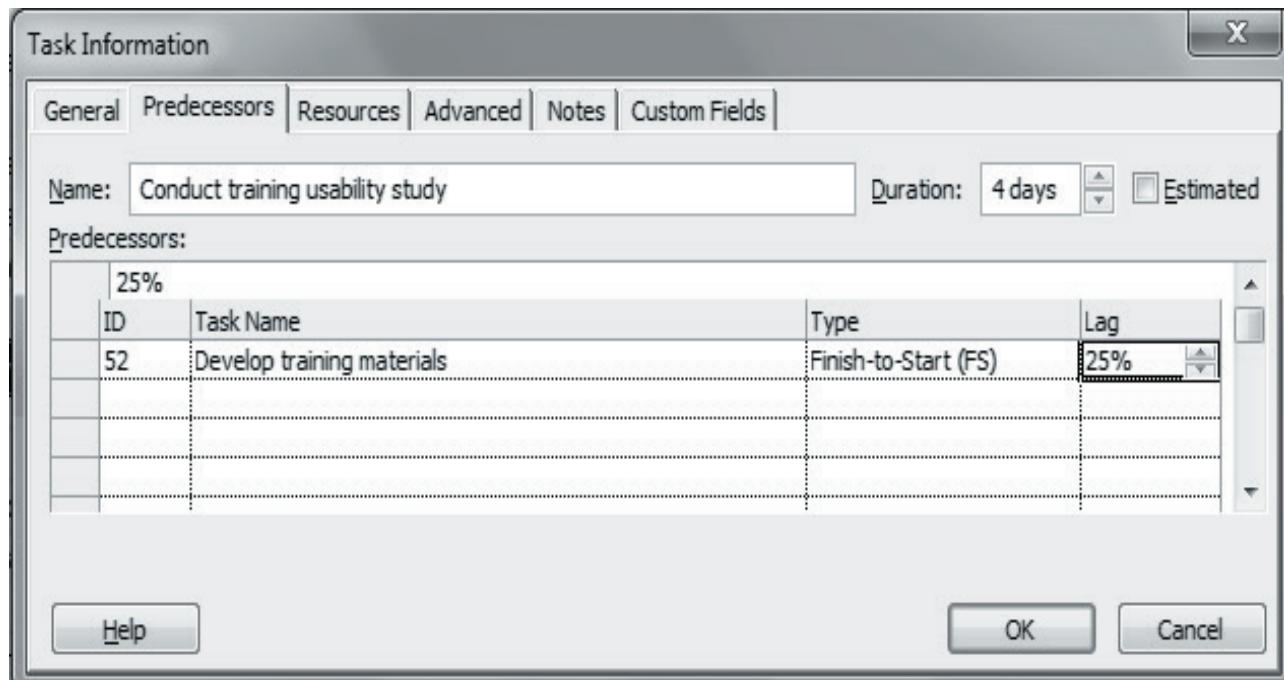


Figure 5.6: Setting Lag Time in Predecessors Tab of Task Information Dialog Box

5.6 Creating and Modifying Dependency Links

Creating dependency links between tasks in MS Project involves the following three steps:

1. Create a dependency link.
2. Specify the dependency type.
3. Build in any lag or lead time.

5.6.1 Creating a Dependency Link

By default, MS Project sets a Finish-to-Start relationship when a dependency is established between two tasks. If users wish to change the dependency type, they can edit the dependency type or build a lag or lead time.

Users need to perform the following steps to establish a Finish-to-Start dependency link:

1. Open the **Gantt Chart** to display the tasks.
2. Click the predecessor taskbar and drag the mouse pointer over to the successor taskbar. A box appears while dragging the mouse and the pointer changes to a little chain link.

Session 5

Project Dependencies

3. When the tool tip indicates the task number to link to, release the mouse button. This establishes a Finish-to-Start dependency between the two tasks.

Figure 5.7 illustrates creating dependency link between two tasks.

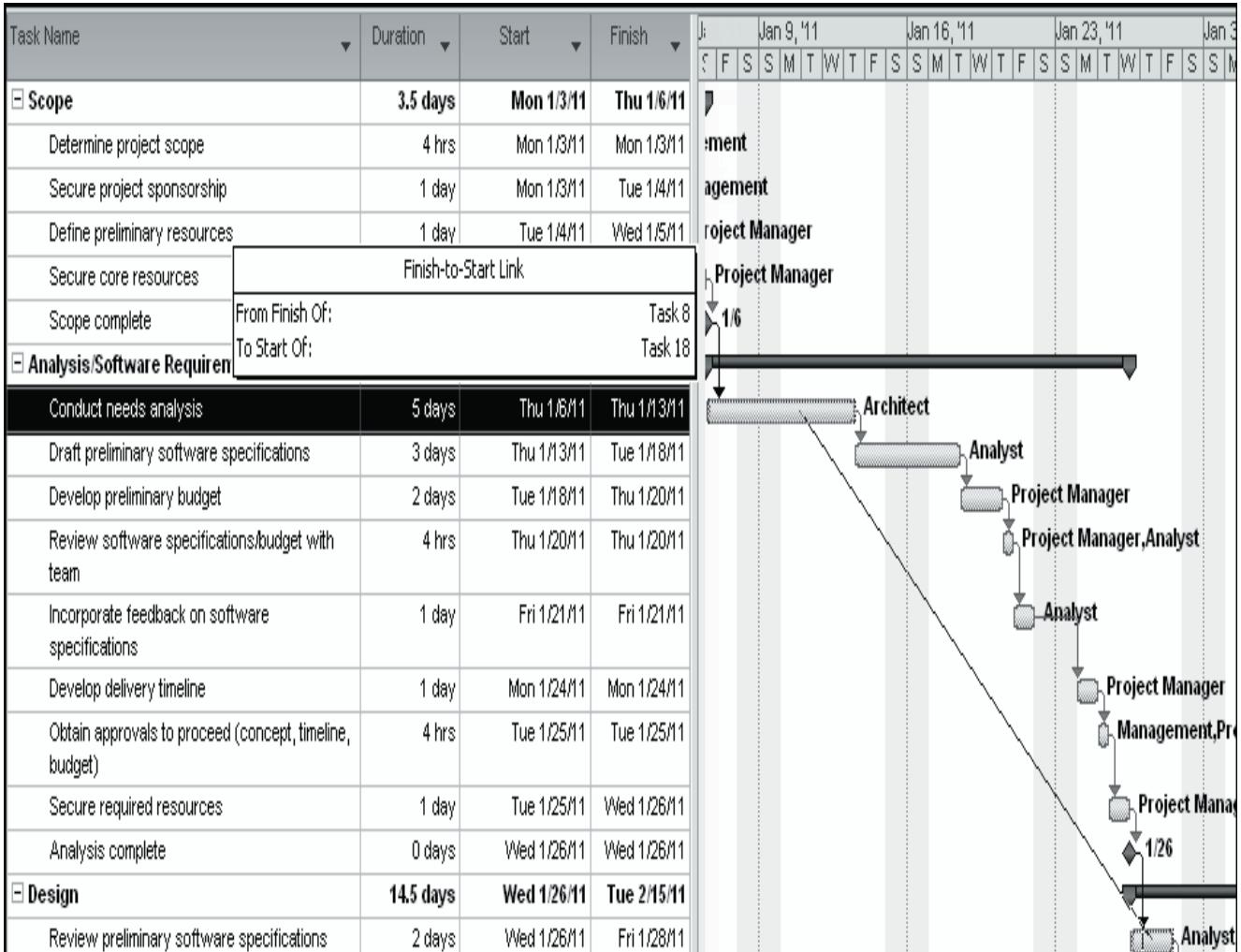


Figure 5.7: Creating Dependency Link Between Two Tasks in Gantt Chart View

Alternatively, the user can establish a Finish-to-Start dependency link by clicking the predecessor task in the **Tracking Gantt** table, holding the Ctrl key and clicking the successor task, and then clicking the **Link Tasks** button in the **Schedule** group of the **Task** tab.

Note: A best practice when defining dependencies is to link only the subtasks that correspond to the actual work to be done and not the summary tasks. The Ctrl+Click method is helpful for skipping over summary tasks and selecting tasks for linking. Remember, whether dependencies are created using the mouse to drag between tasks or the Link Tasks button, the task selected first always becomes the predecessor.

Session 5

Project Dependencies

Concepts

5.6.2 Modifying a Dependency Link

The process of modifying an existing dependency relationship involves the following steps:

1. Note the Task ID for which the dependency link needs to be modified.
2. Select its successor task in the **Tracking Gantt** table and click the **Information** button on the **Task** tab to display **Task Information** dialog box.
3. Click the **Predecessors** tab to establish dependency links.
4. Select the Predecessor **Task Name** and select the **Type** from the drop-down list as shown in figure 5.8.

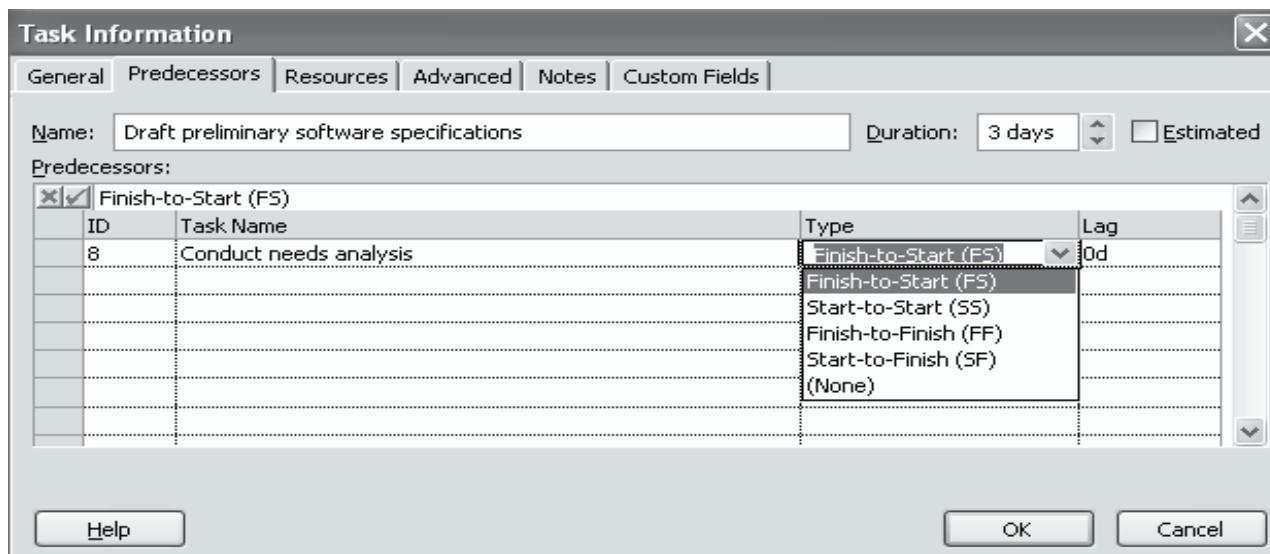


Figure 5.8: Modifying Dependency Relationships

5. If the need is to change to the existing dependency, in the **ID** column, replace the task ID of the existing predecessor task with the task ID of the new predecessor task.
6. If the need is to add a new dependency link, click in the blank **ID** column and enter the task ID number for the predecessor task. The **Task Name** column changes automatically to reflect the predecessor task name. Default values for lag time as **0d** (Zero Days) and Finish-to-Start as dependency type are displayed automatically.
7. Click the **Type** field and select the appropriate dependency type from the drop-down list.
8. To add lag or lead time, click the **Lag** field and use the arrows to set the amount of time.
9. Enter a positive number for lag time and a negative number to specify lead time.
10. Click **OK** to save the information.

5.6.3 Deleting a Dependency Link

Project schedules might undergo edits during the life cycle of a project to accommodate uncertainties. In the process, project managers might want to delete certain task dependencies. They can delete dependency links either from the **Gantt Chart** view or using the Task Information dialog box.

The following are the steps to delete a dependency link from the **Gantt Chart** view:

1. Select the two tasks whose dependency needs to be deleted.
2. In the **Tracking Gantt** table, select adjacent tasks by dragging and selecting their task IDs. To select nonadjacent tasks, click one task ID, press and hold the Ctrl key and then click the nonadjacent task ID.
3. Click the **Unlink Tasks** button in the **Schedule** group of the **Task** tab. Make sure to select only one dependent task and then click the **Unlink Tasks** button to avoid a drastic result like removing all dependency relationships for that task. This deletes the dependency link between the selected tasks.

The steps to delete a dependency link using the **Task Information** dialog box are as follows:

1. Select the successor task name in a dependency link in the Gantt Tracking table.
2. Click the Information button on the Task tab to display **Task Information** dialog box.
3. On the **Predecessors** tab, from the drop-down list in the **Type** column for the dependency, choose **None**, as shown in figure 5.9.
4. Click **OK** to save the changes and delete the dependency.

Session 5

Project Dependencies

Concepts

Figure 5.9 illustrates deletion of dependency links using the Task Information dialog box.

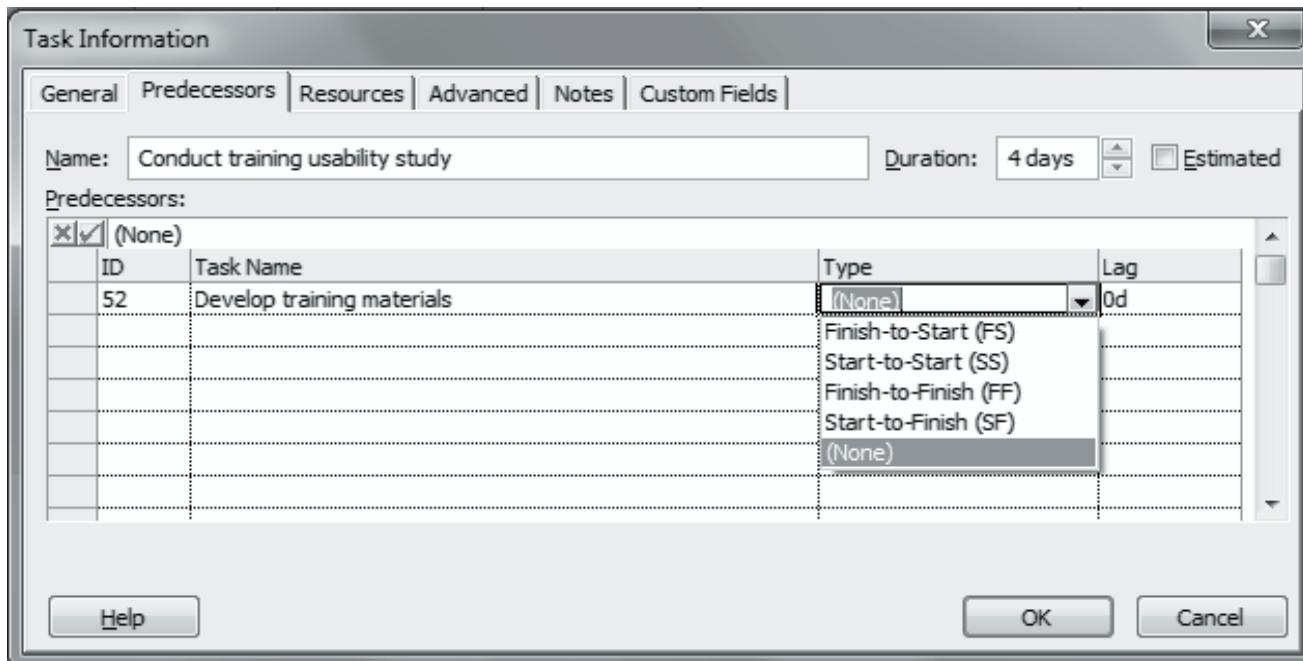


Figure 5.9: Deleting Dependency Links Between Tasks Using Task Information Dialog Box

5.7 Viewing Dependency Links

Project managers can choose ways to visualize data as needed. MS Project 2010 provides the following ways to view dependencies in a project:

- **Gantt Chart view:** The easiest way to view dependencies between tasks is through the dependency link lines that appear in the **Gantt Chart**.
- **Network Diagram view:** Another way to view the flow of dependencies is through the Network Diagram view. The Network Diagram view displays similar lines and arrows to display dependency links.

In the Network Diagram view, each task node displays critical task information. Between the nodes are lines that reveal task dependency links. By default, the critical dependency links are displayed in red, and all noncritical tasks are displayed in blue. On the Network Diagram view, right-click outside any task node, select **Layout** from the menu, and then select the **Show Link Labels** check box. This displays the dependency code for dependency types between tasks, such as FS for Finish-to-Start.

Session 5

Project Dependencies

Figure 5.10 displays dependency links in the Network Diagram view.

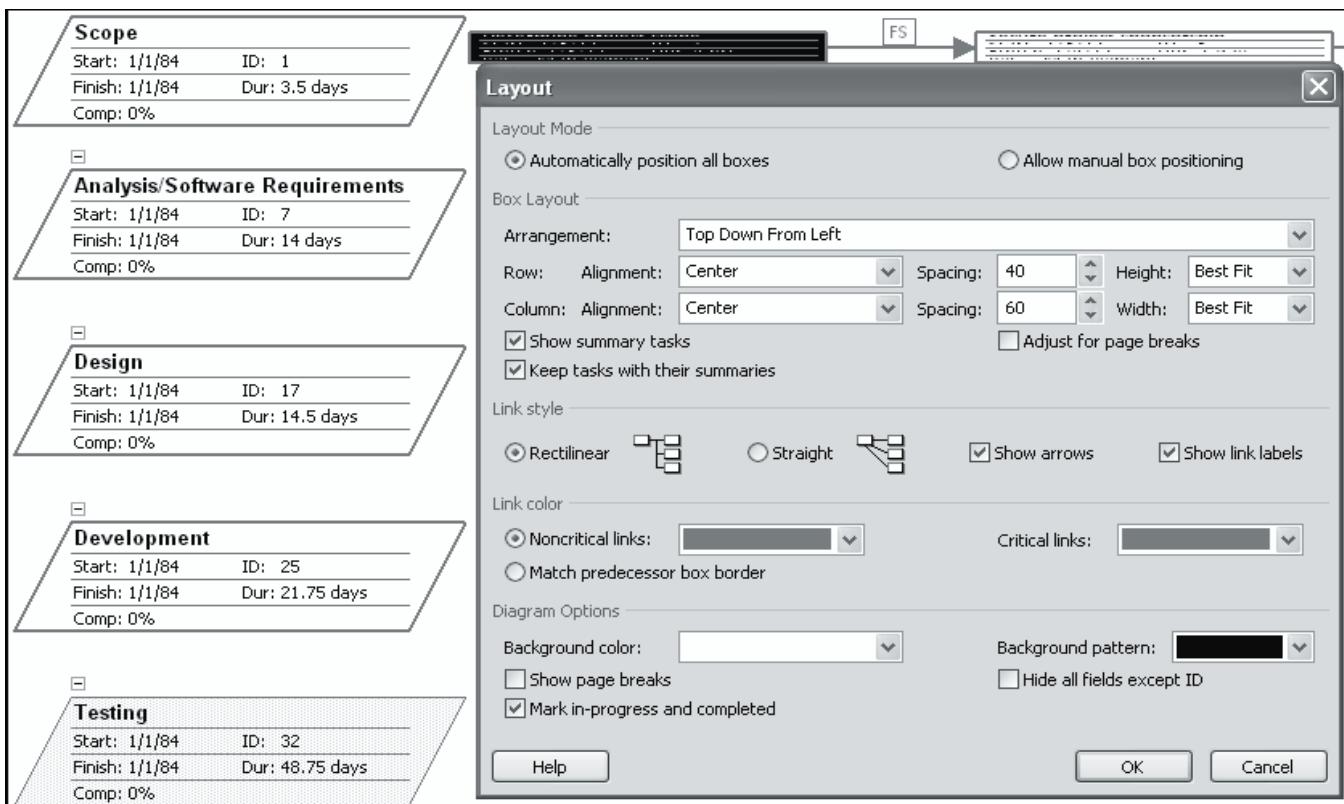


Figure 5.10: Dependency Links in Network View Diagram

- **Task Inspector:** To view dependencies by task, users can select the task in the **Tracking Gantt** table and click the **Inspect** button in the **Tasks** group of the **Task** tab. This displays the complete schedule of the task including its predecessor tasks in the **Task Inspector** on the left on the **Tracking Gantt** table.

Session 5

Project Dependencies

Figure 5.11 illustrates the display of Task Inspector.

Concepts

Task ID	Task Mode	Task Name	Duration
43	→	Test module integration	5 days
44	→	Identify anomalies to specifications	2 days
45	→	Modify code	3 days
46	→	Re-test modified code	2 days
47	→	Integration testing complete	0 days
48	→	[-] Training	57 days
49	↓	Develop training specifications for end users	3 days
50	↓	Develop training specifications for helpdesk support staff	3 days
51	↓	Identify training delivery methodology (computer based training, classroom, etc.)	2 days
52	↓	Develop training materials	3 wks
53	↓	Conduct training usability study	4 days
54	↓	Finalize training materials	3 days
55	↓	Develop training delivery mechanism	2 days

Figure 5.11: Task Inspector on the Gantt Chart Table

Displaying task ID, successors, and predecessors columns for each task in any view such as **Gantt Chart** view, shows type of dependency with any lead time or lag time in percentages or lengths of time.

For example, 5FS+6 days is a Finish-to-Start link to task 5, with lag time set so that the successor task begins 6 days after the predecessor task completes. In MS Project, if no lead or lag time is displayed; no notations will be added to successors and predecessors.



Summary

- Dependency tasks are tasks that are dependent on other tasks, as either a predecessor or a successor.
- MS Project identifies four types of dependency links namely, Finish-to-Start, Start-to-Finish, Start-to-Start, and Finish-to-Finish.
- Finish-to-Start is the default dependency type for any two dependent tasks in MS Project.
- To accommodate for delays and overflows in the schedule, it is a good practice for project managers to lead time and lag time for tasks.
- Dependencies can be created between tasks by either a drag and drop action in the Gantt Chart or by holding the Ctrl key and clicking the Link Tasks button in the Schedule group of the Task tab.
- Project managers can edit existing dependencies or add new dependencies any time during the life cycle of a project.
- Managers can delete dependencies from either the Gantt Chart view or using the Task Information dialog box.
- Managers can view task dependencies in a project in three ways: Gantt Chart view, Network Diagram view, or the Task Inspector.

Session 5

Project Dependencies

Concepts



Check Your Progress

1. Any two tasks can become a predecessor-successor pair if _____.

A)	They have a timing relationship between them
B)	They share resources between them
C)	They are both auto scheduled
D)	One cannot start before another finishes
2. In which of the following dependency types must a task finish only after the predecessor task starts?

A)	Finish-to-Start
B)	Start-to-Finish
C)	Start-to-Start
D)	Finish-to-Finish
3. If a successor task can start only one week after the predecessor task is completed, it is a case of _____.

A)	Lag time between the tasks
B)	Lead time between the tasks
C)	Finish-to-Start dependency
D)	Start-to-Finish dependency
4. Project managers can create a dependency link using the _____.

A)	Task Information dialog box
B)	By drag-drop action in the Gantt Chart
C)	Network Diagram view
D)	Task Inspector



Check Your Progress

5. To delete a dependency, project managers can use the _____.

A)	Task Information dialog box
B)	Gantt Chart view
C)	Network Diagram view
D)	Task Inspector

6. When viewing task dependencies, project managers can display the dependency code for dependency types between tasks in the _____.

A)	Gantt Chart view
B)	Network Diagram view
C)	Task Inspector
D)	Task Information dialog box

Objectives

At the end of this session, the student will be able to:

- *Explain types of resources*
- *Explain how to make flexible choices for resource planning*
- *Describe how to estimate resources*
- *Describe how to work with resource pool*
- *Describe how to manage workload*
- *Explain how to simplify resource workload analysis*

6.1 Introduction

A project involves planning and organizing people, equipment, material, and other assets for a project while ensuring effective utilization. These people, equipments, and materials employed in a project are the project's resources. The project manager should drive resources to optimize project costs. MS Project provides several tools that enable project managers to make optimum resource assignments.

This session describes how to manage resources using the Team Planner. It also explains how to compare resources, make flexible choices for resources planning and how to estimate resources. Further, this session describes how to work with resources calendar to make resource assignments, manage workload, and simplify resource workload analysis.

6.2 People, Product, and Processes

Successful project management is the art of planning, organizing, securing, and managing right resources with right skills to achieve specific goals. Project managers need to manage the project without overallocating any resource at any point during the project schedule.

As resources affect time and costs in a project, using software products like MS Project, helps project managers to execute the process of creating resources, assigning resources to tasks, managing costs, and manipulating resource workload to successfully deliver the end product.

Session 6

Resource Management

Resources in a project are not just the people but also include materials, assets, and equipment. Resources can be anything that is used to complete the project. When considering resources, project managers should also consider facilities such as meeting space, rent for infrastructure, and any other costs such as airfare, stay, rental car charges, and so forth.

6.3 Analyzing Resources

Analyzing resources is the next step after creating and organizing the project tasks. Resources in an organization should be optimally used by sharing them across the projects. The following two factors must be considered when analyzing the resources required for a project.

- Cost of resources
- Time availability of resources

6.3.1 Cost of Resources

Resources in a project equal costs. Project costs, such as number of working hours of a resource on a task, computers to buy, charges for services, and so forth add to the total cost of the project. When analyzing the resources and their costs to a project, adding fixed cost to the project is a good practice. A fixed cost is a set of costs applied directly to an individual task, such as monthly charges to rent computers. They are not directly assigned through resources, as they are not calculated collectively by the hours of work or units used.

6.3.2 Time Availability of Resources

When analyzing project resources, it is important to identify resources that have limited time availability to manage the workflow in a project. For example, a resource may be available for 50 percent of the time, that means 20 hours in a 40-hour work week. While another resource might be available for full time that is 40 hours. Identification of such resources is useful to the project manager in generating reports and verifying if any resource is overallocated at any point during the project schedule. Project managers can also view ideal resources, the resources working on multiple projects across the organization, and use them efficiently.

Session 6

Resource Management

Figure 6.1 illustrates the **Resource Usage** view that helps project managers visualize resource working times in a project.

Concepts

		Resource Name	Work	Details	30 Oct '11	13 Nov '11		
					30-10	06-11	13-11	20-11
9		+ Gary Zeus	96 hrs	Work	24h			4h
10		+ Fay Morgan	164 hrs	Work	24h	40h	24h	
11		+ SSU-Sr Mgmt	44 hrs	Work	4h		16h	12h
12		+ Mitchelle Yeomans	264 hrs	Work				28h
13		+ Sharon Gail	280 hrs	Work				32h
14		+ Ryan Patrick	256 hrs	Work				28h
15		- Jeff Smith	336 hrs	Work				24h
		Develop Help specification	8 hrs	Work				8h

Figure 6.1: Resource Usage View

Typically, the number of resources assigned to a task has an effect on the duration of that task. That is, if a certain amount of work takes x hours to perform with y number of resources, y+2 resources working on the same task will take lesser time to complete the task. However, the task type determines whether a task's duration changes based on the number of resources assigned to it.

6.4 Types of Resources

The resources required for a project can be classified in the following three types:

- Work resources
- Material resources
- Cost resources

6.4.1 Work Resources

In general, work resources are considered as people resources. People costs are normally associated with the amount of work hours put in. These costs are usually an hourly rate. Also, a work resource can have a cost per usage and this cost is to be added every time the resource is assigned with some work.

Work resources are assigned with tasks based on the project and resource calendars, where their working and nonworking hours are entered. Project managers can modify the base calendar for a resource to schedule specific working hours. An example of a typical work resource is a person working 8 hours a day at a standard rate of \$25 per hour and an overtime rate of \$35 per hour.

Another example for a work resource can be a meeting room available only 8 hours a day at an hourly rate. Though it is not a person, the meeting room is treated and tracked as a working resource as it contains a value for working hours.

6.4.2 Material Resources

Material resources have a unit cost and do not need working hours. Hence, these resources do not have any calendar configuration or any settings for working and nonworking times. A typical material resource is any equipment or material such as paper, rubber, steel, or stationary items and so forth assigned to a task with a unit cost associated to it.

For example, a resource called Paper with a unit price of \$15, assigned to a task called User Manual Preparation at 10 units, accrues a cost of \$150 to the task.

6.4.3 Cost Resources

Cost resources do not have any cost associated to them initially. These resources offer flexibility to specify the applicable cost each time as per the resource usage. Calendars, units of work, or unit costs of these resources will have no effect on the project. Project managers decide which resource type to use while adding an external resource or material resource to the project.

Session 6

Resource Management

Examples of cost resources include air travel, hotel costs, or car rental fare. Cost resource can be anything that is independent of working hours or any person performing a service for a fee irrespective of the number of working hours. Another example of a cost resource is an external consultant with a unit cost of \$1,000, whose working calendar and time are not concerned with the project.

Concepts

6.5 Resource Effort Estimation

In most cases, the project manager calculates the number of resources needed to complete a task. While estimating the effort required in completing the tasks in a project, project managers use experience with similar tasks and resources by considering the following guidelines:

- **Skill Set:** A less skilled or experienced resource is likely to take more time to finish a task.
- **Projects History:** Considering the previous projects and tasks and by tracking people's time, a project manager can estimate the required effort by comparing types of tasks handled by a resource on other projects.
- **Individual Assessment:** At times, project managers are able to manage projects better by allocating tasks to the resources to estimate approximate time from the resources themselves and adding a factor of safety percentage to the schedule.

6.6 Committed and Proposed Resources

In order to identify resources for allocating tasks, project managers can designate a resource either as a committed resource or as a proposed resource.

The following are the steps to assign resources to a project:

- On the **Task** tab, click the bottom part of the **Gantt Chart** button and select the **Resource Sheet** option. This displays the **Resource Sheet** view.
- From the **Resource Sheet**, select the resource to assign to the project.
- On the **Resources** tab, click the **Information** button in the **Properties** group to display the **Resource Information** dialog box.
- On the **General** tab, from the **Booking type** drop-down list, select **Committed** or **Proposed**, depending on whether the resource is officially assigned to the project or is proposed to be used in the project.

Session 6

Resource Management

Figure 6.2 illustrates assigning resources to a project, in the **Resource Information** dialog box.

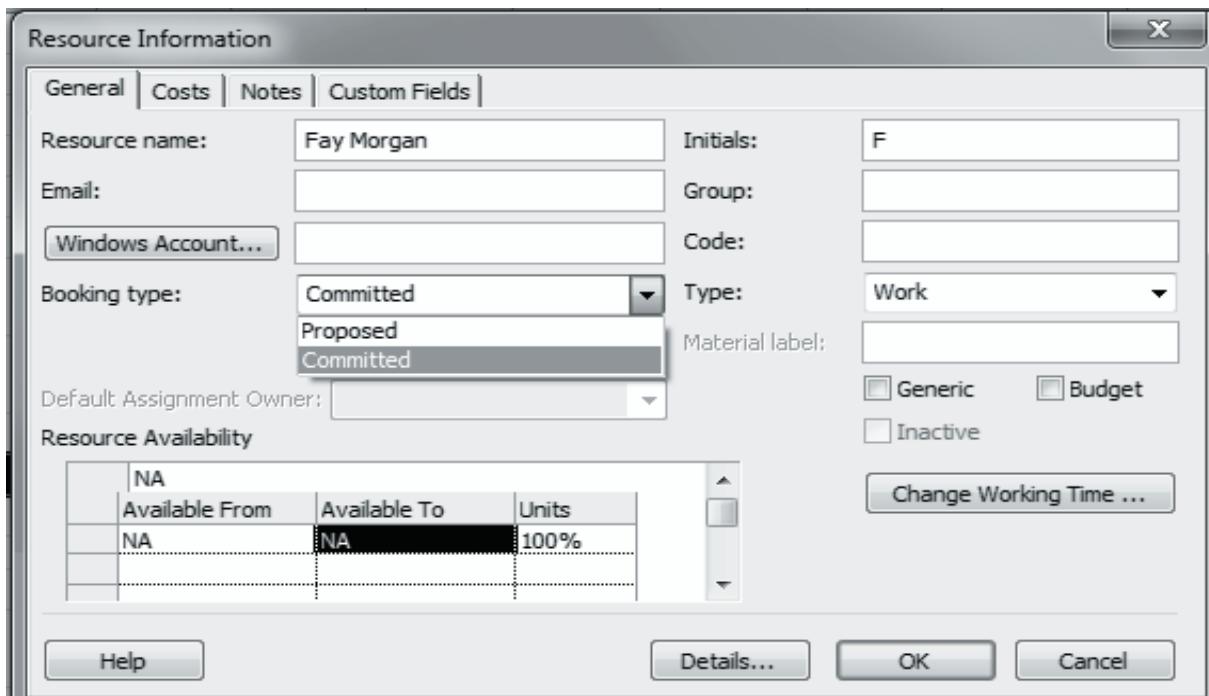


Figure 6.2: Resource Setting Types in Resource Information Dialog box

6.7 Creating Resources

Listing resources in MS Project, involves gathering information such as the resource name, per hour rate or cost per usage, and availability. Optional information, such as the group in the organization, e-mail addresses, and so forth can also be listed.

There are three ways of creating resource list in MS Project as follows:

- Resource Information dialog box
- Resource Sheet view
- Importing resources from MS Outlook

Session 6

Resource Management

Concepts

6.7.1 Creating Resources Using the Resource Information Dialog Box

The steps to create resources in the **Resource Information** dialog box are as follows:

1. On the **Task** tab of the **Ribbon**, click the bottom part of **Gantt Chart** button and select **Resource Sheet**. This displays the **Resource Sheet** view.
2. On the **Resource** tab of the **Ribbon**, click the **Information** button in the **Properties** group to display **Resource Information** dialog box.
3. In the **Resource Name** text box, enter a name for the resource.
4. Enter an abbreviation or initials by which for the resource will be referred, in the **Initials** text box. For example, PM for Project Manager.
5. From the **Type** drop-down list, select **Work**, **Material**, or **Cost**, depending on the type of resource being created. Depending on the type of resource being created, other resource information fields get enabled. For a Material resource, enter the units of measure by which the material will be accounted, in the **Material Label** text box. For example for a material resource vehicle, miles can be entered as the units of measure in the **Material Label** text box.
6. In the **Code** text box, enter a code that identifies the resource with a specific project group code, or a skill code, or a job code. This is an optional field.
7. Further information, such as e-mail address and the name of the project group to which the resource belongs, can be specified. These fields are also optional.
8. From the **Booking Type** drop-down list, select **Committed** or **Proposed**, depending on whether the resource is officially assigned to the project or is proposed to be used in the project.
9. Click **OK** to save the changes.

Session 6

Resource Management

Figure 6.3 display creating resources in the **Resource Information** dialog box.

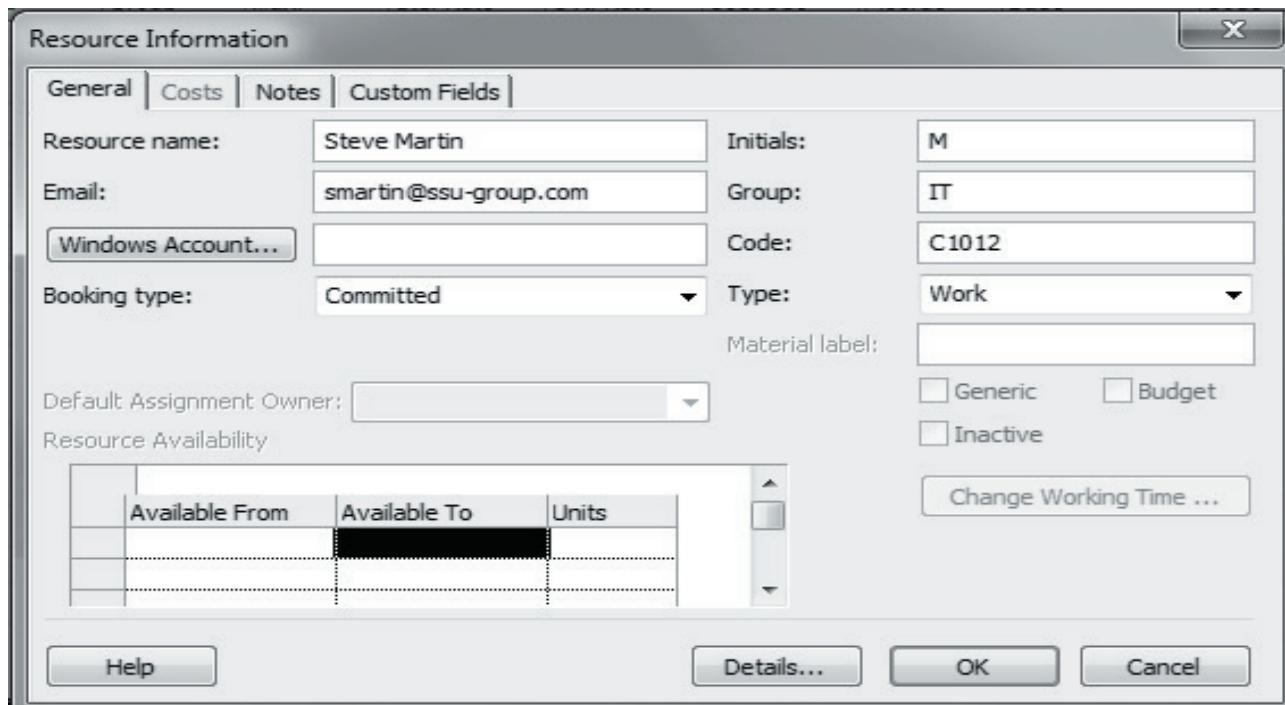


Figure 6.3: Creating Resource in Resource Information Dialog Box

6.7.2 Creating Resources from the Resource Sheet View

One can also use the **Resource Sheet** view to create resources. The **Resource Sheet** view contains fields for entering all the information as in the **Resource Information** dialog box, and more. Additional resource information that can be specified in the **Resource Sheet** view includes:

- **Max:** The maximum percentage of time for which the resource is available for the project
- **Std. Rate:** The standard cost rate that the resource costs per unit of time. The unit of time is by default hours, but other units of time, such as days, weeks, months, or year can be specified
- **Ovt. Rate:** The cost rate for employing the resource for overtime work on the project
- **Cost/Use:** The cost of a resource added on each time a task is assigned. For example, the cost of procuring new software for project development, or the cost of conducting training programs for the project team on new software

Session 6

Resource Management

Concepts

- **Accrue:** Projects record the cost that the resource is accruing as it is used for various project tasks. This field specified when the cost accrued is charge against the resource. By default, it is **Prorated**, which means the amount divided proportionally based on part of a time period. For example, a monthly charge of \$50 will be prorated to \$25 if used for only half a month. Other options are **Start** and **End**, to charge it at the beginning or the end of the resource usage
- **Base:** Here, the calendar that is used to schedule tasks for the resource is specified. Whether the resource will use a Standard, 24 Hours, Night Shift, or a custom calendar

Note: Resources can also be created in the Resource Sheet view by copy-pasting resources from other applications, such as an MS Excel spreadsheet.

6.7.3 Importing Resources from MS Outlook

MS Project allows project managers to pull resources from MS Outlook. Project managers should have Outlook as the default e-mail program for this to work.

The steps to insert resources from the MS Outlook Address Book are as follows:

1. Open the **Resource Sheet** view.
2. In the Insert group on the **Resources** tab, click the **Add Resources** button and select the **Address Book** option. This displays the **Select Resources** dialog box.
3. Select the resource required in the project, from the **Name** list box.
4. Click the **Add** button to move the selected resource name to the **Resources** list box.
5. Repeat the steps to import all the resources into the project.
6. Click **OK** to import the resources to the project file.

6.8 Sharing Resources

Most organizations have multiple projects executing simultaneously. In such cases, it is common to have a set of core resources or a pool of resources that are required to work on all or most of the projects. To handle such resources, the best practice is to create centralized resources and share them across projects. This saves time as the resources need not be created in every project and helps to track the shared resources across projects.

Session 6

Resource Management

6.8.1 Creating a Resource Pool

To create a resource pool, project managers need to create a list of core resources. This resources list will be shared across projects and can be saved as a resource pool. These resources include both individual resources and generic resources. Project managers can then save this resources list as a resource pool file which can be accessed on the company network. They can then use the resource-sharing tools in MS Project, to assign these resources to their respective project plan.

A resource pool file can be an existing project file whose resources are shared across projects. Typically, a resource pool file is a separate file without any tasks. It lists only the set of shared resources and is used to track their availability, and to manage their costs and assignments across projects.

The following are the steps to create a resource pool:

1. Open a new blank project file.
2. On the **Task** tab, click the bottom part of **Gantt Chart** button and select **Resource Sheet** to display the **Resource Sheet** view.
3. Enter the information for all resources to be included in the resource pool including work, material, and cost resources.
4. Save the file at a location such as a central server or a shared folder on the network. This will enable project managers of various projects to access it.

6.8.2 Linking a Project to a Resource Pool

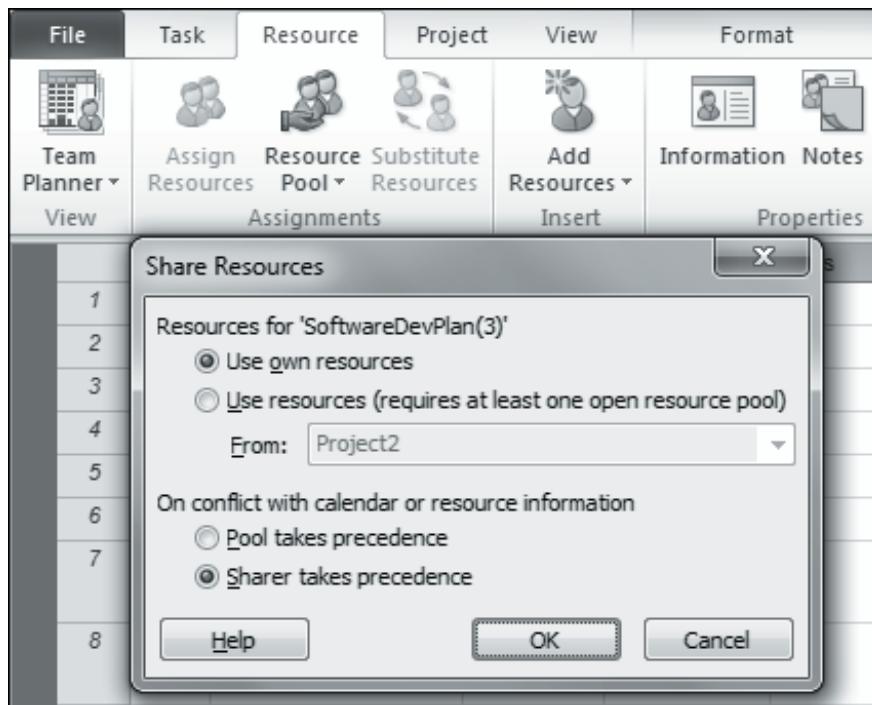
To use the resource pool in a project, project managers need to link the project file to the resource pool file. The following are the steps to link a project to a resource pool:

1. On the **Task** tab in the project file, click the bottom part of the **Gantt Chart** button and select **Resource Sheet** to display the **Resource Sheet** view.
2. On the **File** tab, click **Open** and select the resource pool file.
3. From the Taskbar, select and display the project file.
4. In the **Assignments** group on the **Resource** tab, click the **Resource Pool** button and select the **Share Resources...** option.

Session 6

Resource Management

Figure 6.4 shows the **Share Resources** dialog box.



Concepts

Figure 6.4: Share Resources Dialog Box

5. In the **Share Resources** dialog box, select the **Use resources** radio button. This enables the **From** drop-down list from which the project managers can select the open resource pool file. By default, the **Use own resources** option is selected, considering that the project uses its own resources.

There might be a case where a calendar scheduling conflict exists for a specific shared resource. That is, a resource is assigned work hours or workdays that do not match those specified in its resource pool calendar. Such conflicts can be avoided by specifying whether the calendar for the resource pool takes precedence or the project calendar takes precedence. The project sharing the resources of the resource pool is called the sharer.

6. Click **OK** to link the selected resource pool file to the project file.

6.9 Working with Resource Calendar

By default, the project calendar applies for scheduling and assigning all resources to a project. If the resource has specific scheduling constraints that are different from that of the project calendar, project managers can create a different calendar specific to the resources. Such calendars are called resource calendars. A resource calendar can be a Standard, Night Shift, 24 Hours, or Custom calendar.

- **Standard Calendar:** This is a base calendar with a typical 9.00 A.M. to 5.00 P.M. workday and a five-day work week with an hour off for lunch.
- **Night Shift:** This is another base calendar with an 8 hour work day, scheduled from 11.00 P.M. and 8.00 A.M. with an hour off and five-day work week.
- **24 Hours:** This is yet another base calendar that is scheduled 24 hours per day and 7 days per week.
- **Custom Calendar:** This calendar uses one of the above three base calendars as a template and includes any custom settings, such as work hours, work days, and holidays, that are different from the base calendars.

The project manager can change the schedule of a resource calendar by specifying working hours such as 9.30 A.M. to 1.00 P.M. and 2.00 P.M. to 6.30 P.M. in a standard 8-hour day. Similarly, specific days can be specified as nonworking for a resource.

The steps to make changes to a resource's calendar are as follows:

1. In the **Resource Sheet**, select the resource name and click the **Information** button on the **Resource** tab, to display the **Resource Information** dialog box.
2. On the **General** tab, click the **Change Working Time** button to display **Change Working Time** dialog box.
3. To change the base calendar, select a different base calendar from the **Base calendar:** drop-down list.
4. To specify an exception to the default base calendar hours, open on the **Work Weeks** tab and select the default entry in the table.
5. Then, click **Details...** button to display **Details** dialog box.
6. From the **Select day(s)** list box, select the days for which specific work hours need to be defined.
7. Select the **Set Day(s) to These Specific Working Times** radio button and edit the **From** and **To** working times in the table, as needed.

Session 6

Resource Management

8. Specify as many different work times for various days as required, with each work time in a separate row.

Figure 6.5 displays the **Details** dialog box for a resource calendar.

Concepts

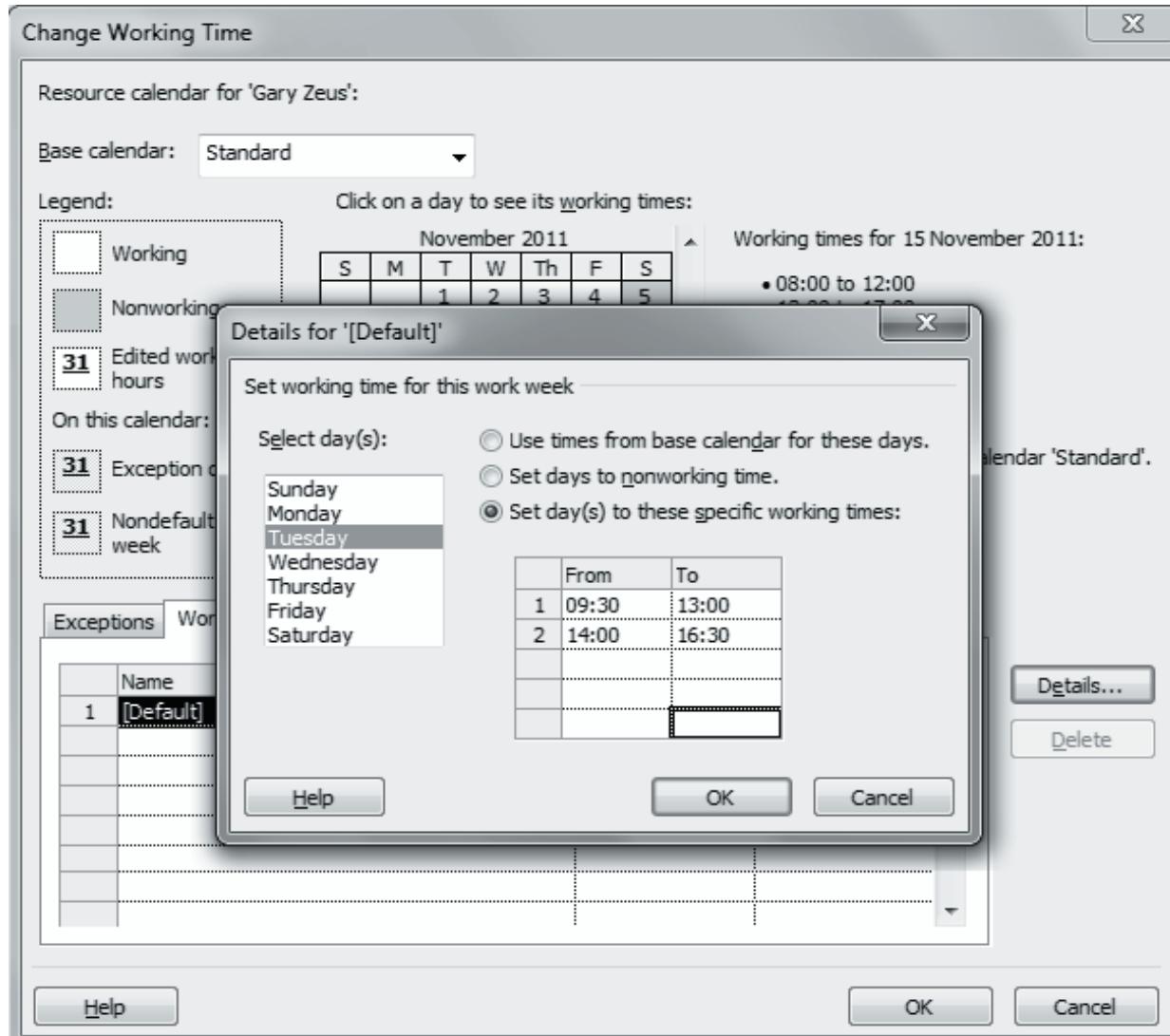


Figure 6.5: Settings in Details Dialog box in Resource Sheet View

9. Click **OK** to save the work time and workdays specifications.
10. To create an exception such as a holiday or vacation day, on the **Exceptions** tab, select the date or period on the calendar for which a holiday or vacation needs to be specified.
11. In the table, enter the exception name and press the Tab key. Specify the start and finish dates for the holiday or vacation period.

Session 6

Resource Management

12. Click the **Details** button to display the **Details for Exception** dialog box.
13. Specify the required details for the selected period, such as any specific working times, recurrence pattern of the exception period, and the duration of the exception.
14. Click **OK** thrice to save the resource calendar settings and close all the open dialog boxes.

6.10 Finding the Right Resource

Once the resources and the resource pool for a project have been identified, next the project manager needs to identify which resources to assign to which task. For efficient execution of the project tasks, it is very important to find the right resource for the right task. The following are the four parameters for finding the right resource for a task:

- Right skills of the resource required for the task to complete
- Time available for the resource to complete the task according to the project schedule
- Commitment of the resource to the project
- Cost of the resource that fits in the project budget

MS Project provides the following ways for identifying resources based on their skill and other criteria:

- Enter information about resources' skills and abilities using the **Resource Notes** tab in the **Resource Information** dialog box. Managers can later use the **Find** feature to search with words, such as highly skilled, dependable, and trainable, to search for the right kind of resource.
- Rank resources by skill set, cost, or ability to work well with team using the **Code** field in the **Resource Information** form.
- Create custom fields for resources to note specific skills and search resources for those skills.

6.11 Managing Workload

Managing workload of a resource is another important aspect of resource management. Managing the assignment of resources without overallocating anyone is the key of project management. Though occasional overallocation is predictable for most resources, frequent overtime of resources result in poor work quality.

Project managers can perform the following three main actions to manage resource workload in a project:

- **Track the project plan:** MS Project provides various features, such as the **Resource Graph** and the **Resource Form**, which provide an at-a-glance view of overbooking on tasks.

Session 6

Resource Management

Concepts

- **Track the workload of individual resources:** It is important to track the activities of the resources on the assigned tasks and accounting the actual time spent on tasks. This helps identify those, who constantly put in overtime to complete their tasks.
- **Communicate with resources:** It is essential for managers to keep communicating with resources to check whether tasks are completing within their stipulated time or the resource is at a risk. Helping those who are overworked by modifying the project schedule or adding other resources will help the project manager to get project schedule on track.

Figure 6.6 illustrates the **Resource Graph** view and **Resource Form**.

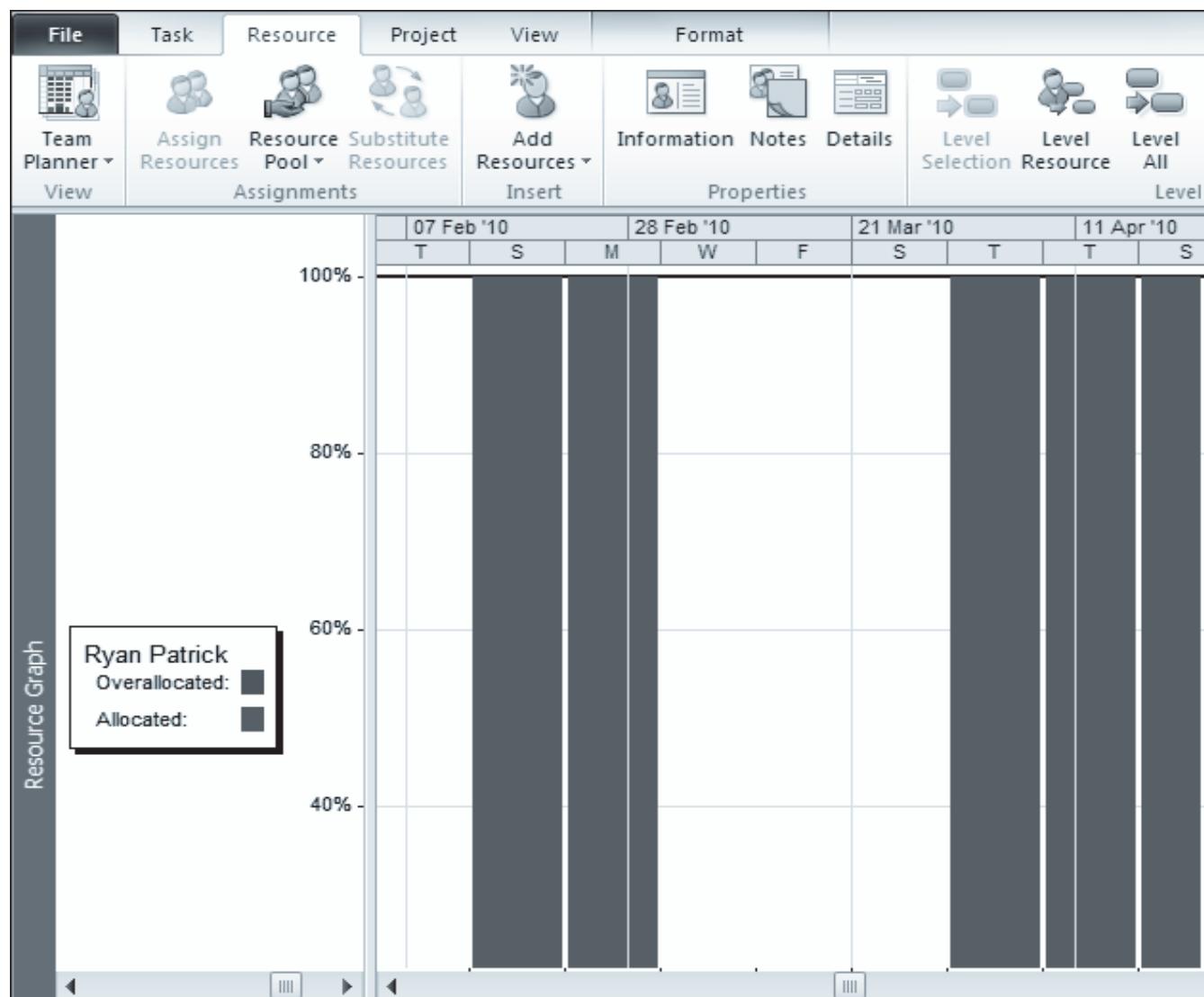


Figure 6.6: Resource Graph View Indicating Allocated and Overallocated Resources

Session 6

Resource Management

Figure 6.7 illustrates the **Resource Form**.

Concepts

The screenshot shows the Microsoft Project Resource Form view. At the top, there's a ribbon with tabs like Home, Insert, Page Layout, etc., and a toolbar with various icons for cutting, pasting, copying, and formatting. Below the toolbar, the main area is divided into sections: 'Name' (Fay Morgan), 'Initials' (F), 'Max units' (100%), and a 'Previous' button. Under 'Costs', there are fields for 'Std rate' (\$0.00/h) and 'Per use' (\$0.00). There are also fields for 'Ovt rate' (\$0.00/h) and 'Accrue at' (Prorated). To the right of these cost fields are dropdowns for 'Base cal:' (Standard) and 'Group:' (empty). Below these are fields for 'Code:' (empty) and 'Category:' (empty). The bottom half of the screen displays a table of tasks assigned to the resource. The columns are: Project, ID, Task Name, Units, Work, Ovt. Work, Baseline Work, and A. The data in the table is as follows:

Project	ID	Task Name	Units	Work	Ovt. Work	Baseline Work	A
SoftwareDevPl	8	Conduct needs analysis	100%	40h	0h	0h	0h
SoftwareDevPl	9	Draft preliminary software specification	100%	24h	0h	0h	0h
SoftwareDevPl	11	Review software specifications/budget	100%	4h	0h	0h	0h
SoftwareDevPl	12	Incorporate feedback on software spec	100%	8h	0h	0h	0h

Figure 6.7: Resource Form View

6.11.1 Managing Resource Conflicts

Conflict resolution is considered to be a pre-requisite skill of a project manager. In order to achieve project success, the project manager must create an environment of cooperation, respect, team consensus, and honest communication. A project manager must establish effective communication methods such as regular status meetings with several graphical reports to get people connected with the project goal.

Overallocation of a resource occurs when more work is assigned than what the resource can complete in the allotted time for the work. Overallocation can cause project schedule delays as there is a risk of the assigned resources not completing the tasks on time. As resources are assigned with tasks, MS Project checks the resource's calendar to make sure that the resource is available.

For example, if a resource is assigned to work full-time on two tasks that start on the same day. This results in an allocation of 16 hours of work in an 8 hour day, which shows overallocation to the resource. MS Project verifies dependencies and constraints of a task to calculate the scheduled start date for a task. It also checks the resource's calendar, finds the next regular workday and assigns that date as the task start date. If resources are not assigned to the task, MS Project sets the next regular workday using the project's calendar.

Session 6

Resource Management

MS Project provides views and filters to identify overallocated resources.

Figure 6.8 displays overallocated resources in **Gantt Chart** view.

Concepts

	Task Mode	Task Name	Duration	Start	Finish	Resource Names
1	→	- Scope	3.5 days	Mon 04-01-10	Thu 07-01-10	
1	→	Determine project scope	4 hrs	Mon 04-01-10	Mon 04-01-10	SSU-Sr Mgmt
1	→	Secure project sponsorship	1 day	Mon 04-01-10	Tue 05-01-10	SSU-Sr Mgmt
1	→	Define preliminary resources	1 day	Tue 05-01-10	Wed 06-01-10	Gary Zeus
1	→	Secure core resources	1 day	Wed 06-01-10	Thu 07-01-10	Gary Zeus
1	→	Scope complete	0 days	Thu 07-01-10	Thu 07-01-10	
1	→	- Analysis/Software Requirements	3 days	Thu 07-01-10	Tue 12-01-10	
1	→	Conduct needs analysis	2 days	Thu 07-01-10	Mon 11-01-10	Fay Morgan,Jeff
1	→	Draft preliminary software specifications	3 days	Mon 11-01-10	Thu 14-01-10	Fay Morgan
1	→	Develop preliminary budget	2 days	Thu 14-01-10	Mon 18-01-10	Gary Zeus
1	→	Review software specifications/budget with team	4 hrs	Mon 18-01-10	Mon 18-01-10	Gary Zeus,Fay Morgan
	→	Incorporate feedback on software specifications	1 day	Tue 19-01-10	Tue 19-01-10	Fay Morgan
	→	Develop delivery timeline	1 day	Wed 20-01-10	Wed 20-01-10	Gary Zeus
	→	Obtain approvals to proceed (concept, timeline, budget)	4 hrs	Thu 21-01-10	Thu 21-01-10	SSU-Sr Mgmt,Gary Zeus
	→	Secure required resources	1 day	Thu 21-01-10	Fri 22-01-10	Gary Zeus

Figure 6.8: Overallocated Resources in Gantt Chart

Session 6

Resource Management

A red person icon in the Indicator column of **Gantt Chart** indicates overallocated resources. Also, in **Resource Usage** view and the Resource Sheet, an alert sign displays beside overallocated resources in the Indicator column. The resource's name and hours appears in bold red as shown in figure 6.9.

	Resource Name	Work	Add New Column	Details	14 Nov '11	
					M	T
	+ Unassigned	0 hrs		Work		
1	gary zeus	168 hrs		Work		
	Determine project scope	16 hrs		Work		
	Secure project site	48 hrs		Work		
	Define preliminary requirements	16 hrs		Work		
	Develop preliminary design	16 hrs		Work		
	Review software requirements	8 hrs		Work		
	Develop delivery plan	8 hrs		Work		
	Obtain approvals from stakeholders	8 hrs		Work		
	Secure required resources	8 hrs		Work		
	Obtain approvals from clients	8 hrs		Work		

Figure 6.9: Resource Usage View Per Resource

Session 6

Resource Management

Alternatively, the **Resource Graph** view shows graphical representation of a resource's allocation, as shown in figure 6.10.

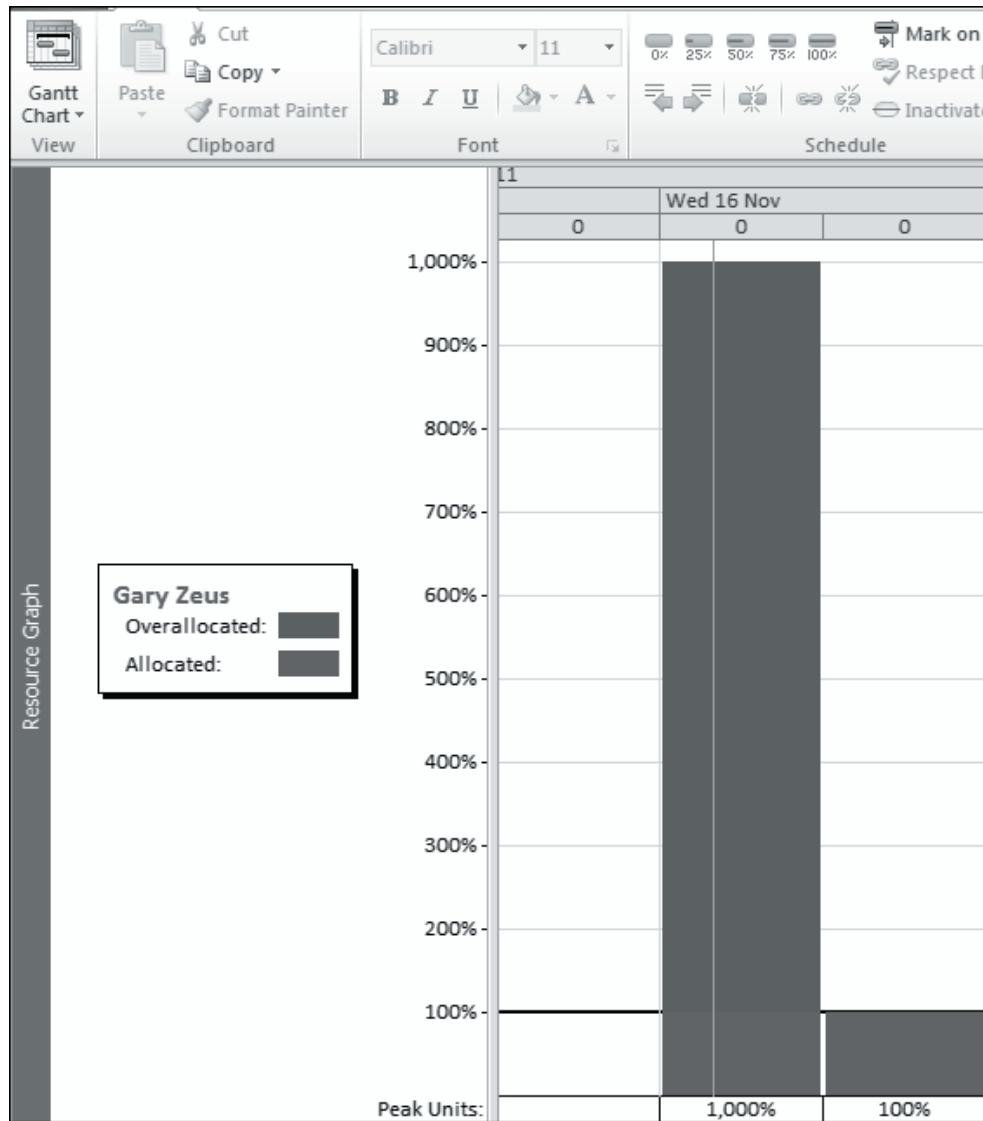


Figure 6.10: Resource Graph View Showing Overallocated and Allocated Units Per Resource

Session 6

Resource Management

The following are the various ways of displaying the **Resource Graph** view:

- Click the down arrow on **Gantt Chart** button on the Task tab and select **Resource Graph**.
- Click the down arrow on **Team Planner** button on Resources tab and select **Resource Graph**.
- Click the **Other Views** button on the **Task Views** tab and select **Resource Graph**.

MS Project 2010 has come up with a new feature, the **Team Planner** view, to spot resource overallocation as shown in figure 6.10. Overallocated resource names appear in red, and a red bar highlights overallocated tasks and timeframes.

Steps to open **Team Planner** in MS Project 2010 are as follows:

1. On the **View** tab, under **Resource Views** group of the **Ribbon**, click **Team Planner**.
2. Alternately, on the **Resource** tab, under **View** group, click **Team Planner**.

Figure 6.11 illustrates the **Team Planner** view displaying overallocated resources.

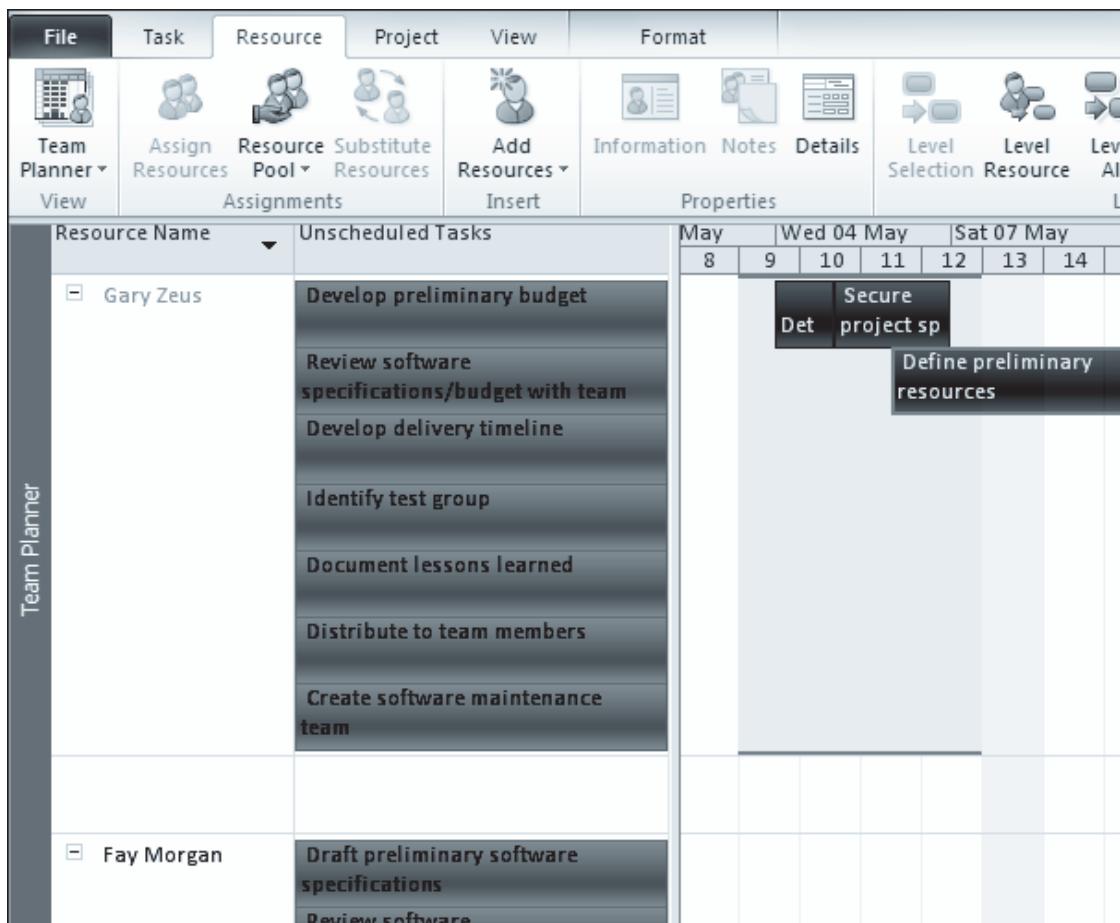
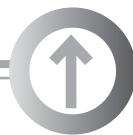


Figure 6.11: Team Planner View of Overallocated Resources



Summary

- Project management involves assigning the right resources to the right tasks at the right time without any overallocation.
- While analyzing the resource requirement, the project resources such as work, material, and cost need to be considered.
- Project managers need to estimate the effort and the number of resources required considering the three guidelines, skill set, projects history, and individual assessment.
- Project managers start by listing the available resources for a project by using the Resource Information dialog box, the Resource Sheet view, or by importing resources from MS Outlook.
- Multiple projects running simultaneously can create a resource pool of the core resources and share them according to the project requirement and the resource availability.
- Project managers can create a separate resource calendar for resources with specific scheduling constraints different from that of the project.
- To avoid work overload or over allocation and for successful project execution, project managers need to manage the workload by constantly tracking the project plan, and tracking the workload of resources and communicate with them.

Session 6

Resource Management



Check Your Progress

1. Which of the following statements are true about the various types of resources?

A)	Material resources do not have any unit cost associated to them.
B)	Units of work, unit cost, and calendar schedules of cost resources have no effect on the project.
C)	Material resources require calendar settings and working and non-working times.
D)	Work resources have a cost per usage associate to them, which needs to be accrued to the project every time they are assigned a project task.

2. Which of the following information fields for a material resource are not optional in the Resource Information dialog box?

A)	Material Label
B)	Code
C)	Type
D)	Group

3. Which of the following statements are true about the various fields in the Resource Sheet view?

A)	Max is the maximum cost rate of the resource per unit of time.
B)	By default, the Accrue field is set to accrue resource cost at the start of the resource usage.
C)	Cost/Use field specifies the initial costs for starting to use the resource in the project.
D)	Base field specifies the calendar that is used to schedule tasks for the resource.

4. Project managers can share resources from a resource pool in multiple projects by _____.

A)	Importing resources from the resource pool file into each project file
B)	Copy-pasting resources from the resource pool into each project file
C)	Linking the project file with the resource pool file
D)	Marking specific project resources as shared in the project file

Session 6

Resource Management



Check Your Progress

5. Project managers can view resource conflicts in a project by tracking them in the _____.

- | | |
|----|---------------------------------|
| A) | Gantt Chart View |
| B) | Resource Form |
| C) | Resource Information Dialog Box |
| D) | Resource Usage View |



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Objectives

At the end of this session, the student will be able to:

- *Identify various types of costs*
- *Explain how to perform costing calculations*
- *Describe how to specify overtime allowances*
- *Describe how to set availability of time and resources*
- *Explain working with budget and budget settings*
- *Describe how to compare cost to budget*
- *Describe how to reduce project costs*

7.1 Introduction

Every project incurs certain costs. Project managers need to consider the projected budget and estimate the project costs in advance. They need to constantly track the project costs and take actions to ensure the expenditure does not go over the project budget.

This session identifies the various types of costs. It explains how to perform costing calculations, estimate costs, specify overtime allowances, and set availability of time and resources. Further, it explains setting budgets for a project using project cost information and comparing cost to budget estimates. It also explains how to reduce project costs to keep it within the budget limit.

7.2 Project Costing

Project resources account for majority of the costs to a project. When a resource is set up, depending on the type of resource, the project manager specifies a work resource rate (usually per hour) or a material resource per usage cost. Cost resources are assessed at a variable cost that is not calculated at per usage or per hour rate.

One must also consider other factors, such as number of hours per day for which a resource is available to work and any overtime costs. The sum of all these costs make either an over budget, under budget, or an on-projected budget of the project.

Session 7

Costing

Concepts

The key tasks of a project manager while calculating costing of a project are as follows:

- Exploring the relationship between resources and costs
- Setting standard and overtime rates for resources
- Creating fixed costs
- Setting availability of resources on individual tasks

7.3 Types of Costs

Projects might incur various types of costs in a variety of combinations, such as:

- Costs per hour: These are essentially Rate-based costs, and are calculated based on the pay rates that is resource cost per hour. MS Project includes two types of pay rates for a resource. They are standard rates and overtime rates for a resource.
- Costs per use: These incur either each time that a resource is used, or once for each complete task from beginning to end.
- Costs per unit: These are applied to a project as a whole.
- Fixed costs: These remain constant regardless of the task duration or the work performed by a resource.
- Costs for specific assignments of cost resources: These depend on the resource amount of work on a task or the duration of a task, such as airfare or lodging.

7.4 Understanding Cost Estimation

Before entering cost information of resources, project managers must estimate the costs of resources based on the project budget.

Following are the two aspects of budgeting in a project:

- Budget based on freezing a baseline plan
- Budget based on ongoing actual costs of activity and material usage

Session 7

Costing

Consider an example where Gary Zeus, a project manager, anticipates the following costs for the installation/deployment of software application. The tasks under this activity are as follows:

- Determine final deployment strategy
- Develop deployment methodology
- Secure deployment resources
- Train support staff
- Deploy software

For these tasks, Gary estimates the following costs:

- About eight person-hours effort of Melissa Raymond, who is a software installation expert and trainer to do the installation, at the rate of \$25 per hour
- A cost per use of \$500 paid to set up the server, oversee the installation, and train the support staff by Melissa Raymond on the server
- \$200 for the server shipment
- A fixed cost of \$3,000 for the server

Melissa is a work resource accruing costs per hour. At the resource rate of \$25 per hour, for eight hours of her effort, she costs \$200. If another resource is added to work on this task, at the rate of \$35 per hour, then it adds sixteen hours of effort and the resulting cost is $(25 * 8 + 35 * 8) = \$480$.

Server is treated as a work resource accruing cost per use. The costs per use of \$500 to set up the server will not change based on the number of resources or the time involved.

The \$200 charge for the shipment of the server is a cost resource accruing cost per unit, while \$3,000 for the purchase of the server is a fixed cost.

In all, costing for the task of deploying software application sums up to $(\$200 + \$500 + \$200 + \$3000) = \$3900$.

In MS Project, users can choose the time when the project costs are accrued. Resource costs can be estimated and added either at the start or at the end of the task or as prorated throughout the life of the task.

Session 7

Costing

For example, if a month long task begins September 1, a \$30 cost resource can be added to the actual costs either at the start of the project that is on day 1 (start date) or on day 30 (end date), or at a dollar per day until the end of the task.

Note: By default, MS Project 2010 accrues resource costs on a prorated basis. Users can select any of the options **Start, Prorated, or End.**

7.4.1 Cost Specifications of Work Resources

Cost for work resources is calculated by multiplying its standard hourly rate with the hours of effort. Project managers create work resources and charge these resources at an hourly rate. Some resources also charge an additional flat fee for each use. For example, an architect may charge a flat fee of \$100 and then add the cost per hour. That flat fee is a cost per use, added each time a task is assigned, whatever may be the number of hours involved in completing the task. When tracking the actual effort spent on such tasks, actual effort times the hourly rate plus any cost per use equals actual cost of the resource.

Comparing estimated costs to actual costs, gives a clear picture of whether or not the project is on track with respect to budget.

The steps to enter resource rates per hour and cost per use for a work resource are as follows:

1. On the **Task** tab, click the down arrow on the **Gantt Chart** button and select **Resource Sheet** from the drop-down menu.
2. Click in the **Std. Rate** column against the required resource, to assign a cost.
3. Enter the hourly or unit rate for the selected work resource. By default, MS Project assumes the rate to be per hour. For anything other than hours, enter a slash (/) and then the **unit** (for example, year or month).
4. Optionally, enter the overtime rate in the **Ovt.Rate** column.
5. If the resource has any flat fee for the resource for every use, click in the **Cost/Use** column and enter the amount.

Session 7

Costing

Users can also enter cost rate information for work resources, in the **Costs** tab of the **Resource Information** dialog box. The **Costs** tab of the **Resource Information** dialog box allows users to enter resource cost information, such as **Standard Rate**, **Overtime Rate**, and **Per Use Cost**, as shown in figure 7.1.

Concepts

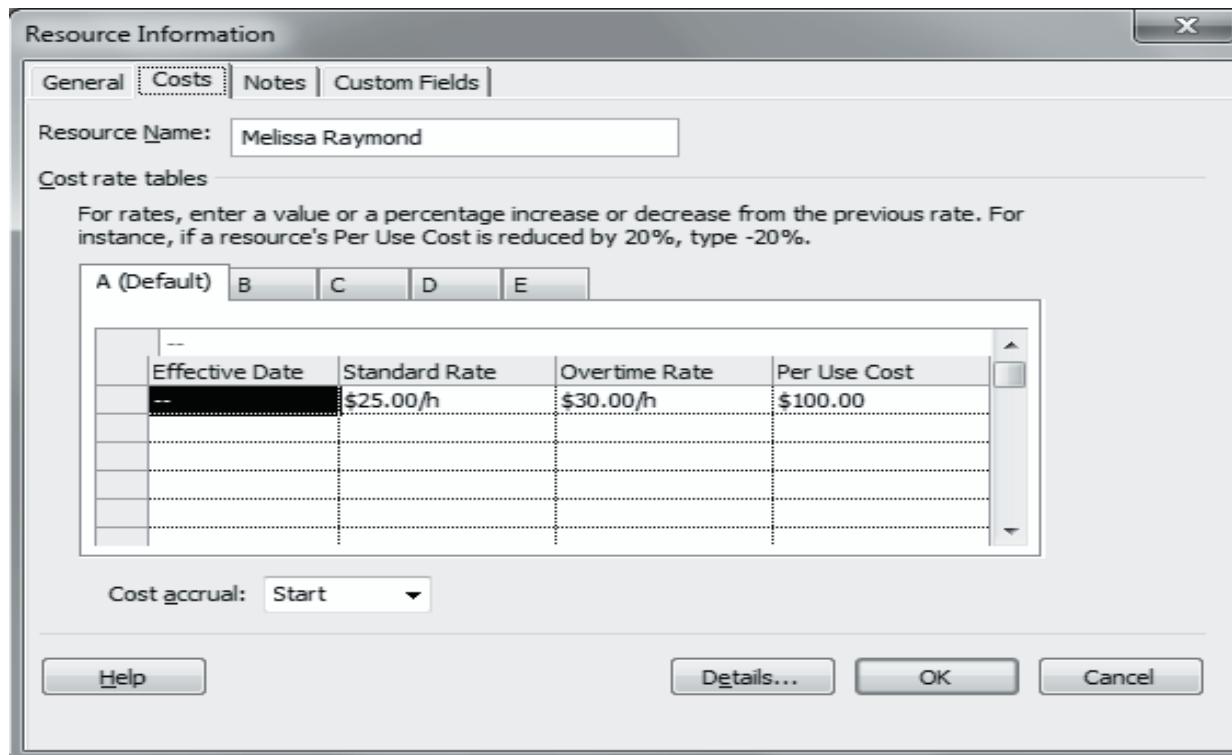


Figure 7.1: Cost-Rate Entries for a Work Resource in Resource Information Dialog Box

The **Effective Date** column is used for a resource who works for several months at one rate and then at a different rate on a preset date. This helps account periodic raises or shifts in rates. The **Costs** tab also contains five tabs labeled **A (Default)** to **E** for entering rates for the resource.

7.5 Project Cost Specifications

Projects incur a combination of the following three cost types:

- Cost
- Work
- Material

Project managers need to analyze the fixed costs and the hourly or unit rates for project tasks and resources. MS Project provides the Cost table for entering and tracking all fixed costs.

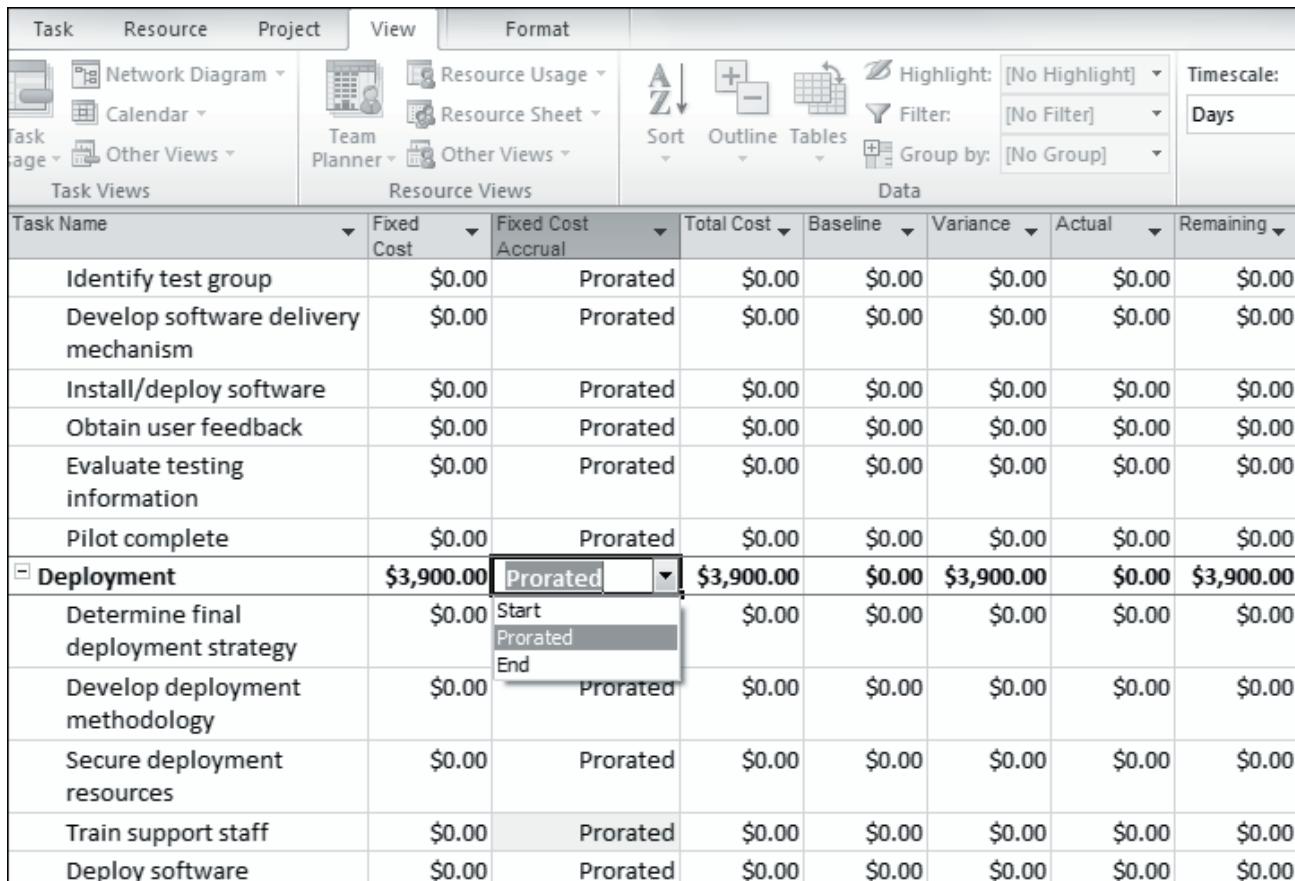
Session 7

Costing

In MS Project, to enter fixed costs for a task in the Cost table:

1. On the **View** tab, click **Tables** in the **Data** group, and then select **Cost** from the drop-down menu. The Cost table is displayed.
2. Click in the **Fixed Cost** column for the task to assign its cost and enter the amount.

Figure 7.2 illustrates Fixed Cost Accrual method settings.



The screenshot shows the Microsoft Project 2010 interface with the 'Cost' table selected. The 'Fixed Cost' column for the task 'Deployment' has a dropdown menu open, showing options: 'Start', 'Prorated' (which is highlighted), and 'End'. The table includes columns for Task Name, Fixed Cost, Fixed Cost Accrual, Total Cost, Baseline, Variance, Actual, and Remaining.

Task Name	Fixed Cost	Fixed Cost Accrual	Total Cost	Baseline	Variance	Actual	Remaining
Identify test group	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Develop software delivery mechanism	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Install/deploy software	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Obtain user feedback	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Evaluate testing information	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Pilot complete	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Deployment	\$3,900.00	Prorated	\$3,900.00	\$0.00	\$3,900.00	\$0.00	\$3,900.00
Determine final deployment strategy	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Develop deployment methodology	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Secure deployment resources	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Train support staff	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Deploy software	\$0.00	Prorated	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Figure 7.2: Setting Fixed Cost Accrual Methods

In MS Project 2010, project managers can use the '**Code**' field in the **Resource Sheet** to designate resources with estimated rates or costs that update with the actual rates as the project progresses. Managers can also enter fixed costs associated with a task without having to create and assign a cost resource to it.

Session 7

Costing

Concepts

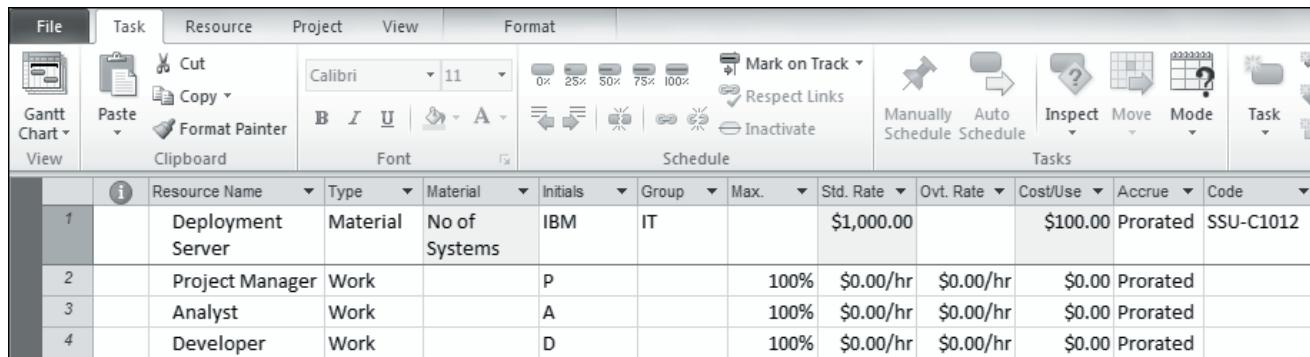
7.5.1 Cost Specifications of Material Resources

Cost for material resources is calculated by multiplying its standard unit rate with the number of units.

The steps to assign a standard unit rate for a material resource are as follows:

1. On the **Task** tab, click the down arrow on the **Gantt Chart** button and select **Resource Sheet** from the drop-down menu to display **Resource Sheet** view.
2. In the **Material** column, enter the unit of measurement of the resource, such as gallons.
3. In the **Std. Rate** column, enter the cost per unit of the resource, such as cost per gallon.

Figure 7.3 illustrates assigning standard unit rate for a material resource.



	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Code
1	Deployment Server	Material	No of Systems	IBM	IT		\$1,000.00		\$100.00	Prorated	SSU-C1012
2	Project Manager	Work		P		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	
3	Analyst	Work		A		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	
4	Developer	Work		D		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	

Figure 7.3: Assigning Costing for a Material Resource

Alternatively, users can assign material resource cost in the **Resource Information** dialog box. The **Resource Information** dialog box allows users to enter up to five standard unit rates for a material resource, with effective dates to account for variations in unit cost during the life of the project.

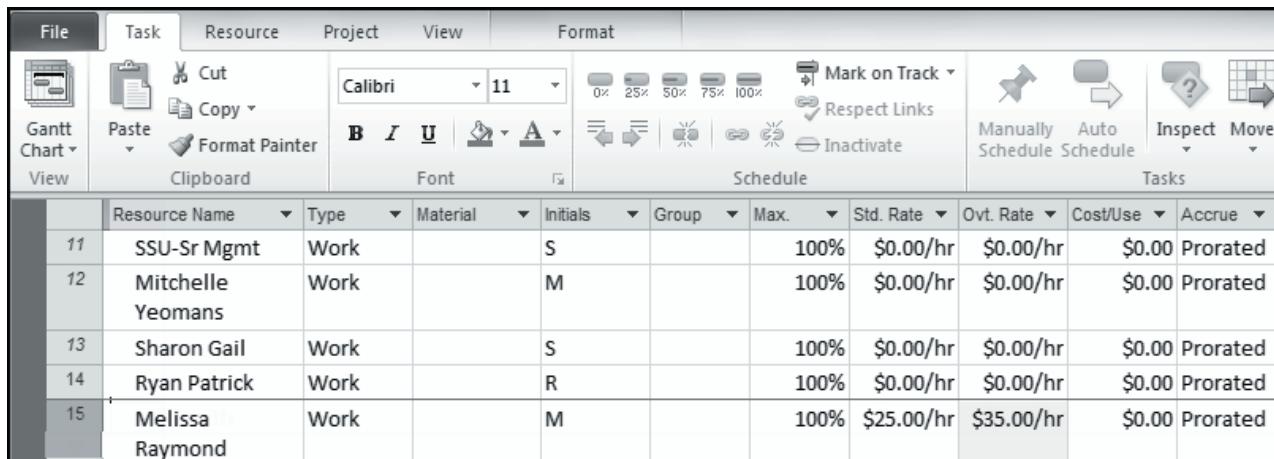
7.5.2 Cost Specifications of Overtime Allowances

To complete critical tasks in meeting deadlines, project managers sometimes need to drive resources to work overtime, though it has an impact on the project budget.

Session 7

Costing

To enter overtime rate for a resource, in the Resource Sheet view, click in the **Ovt. Rate** column and enter the overtime rate as shown in figure 7.4.



The screenshot shows the Microsoft Project application window with the 'Resource' tab selected in the ribbon. The 'Resource Sheet' view is displayed, showing a list of resources with columns for Resource Name, Type, Material, Initials, Group, Max., Std. Rate, Ovt. Rate, Cost/Use, and Accrue. Row 15, 'Melissa Raymond', has the 'Ovt. Rate' cell highlighted in yellow, indicating it is being edited. The value '\$25.00/hr' is visible in the cell.

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue
11	SSU-Sr Mgmt	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
12	Mitchelle Yeomans	Work		M		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
13	Sharon Gail	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
14	Ryan Patrick	Work		R		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
15	Melissa Raymond	Work		M		100%	\$25.00/hr	\$35.00/hr	\$0.00	Prorated

Figure 7.4: Specifications for Overtime Allowances to Resources

7.5.3 Cost Specifications of Limited Time Resources

A resource may be required for only a certain period during the project life cycle. For example, a software architect may be hired to work part-time during the initial phases and then full time during the final release of the software. In such cases, managers first need to define the time availability of the resource. They can do so by entering a date range in the **Available From** and **Available To** columns in the **Resource Availability** section of the **Resource Information** dialog box, to specify varying availability.

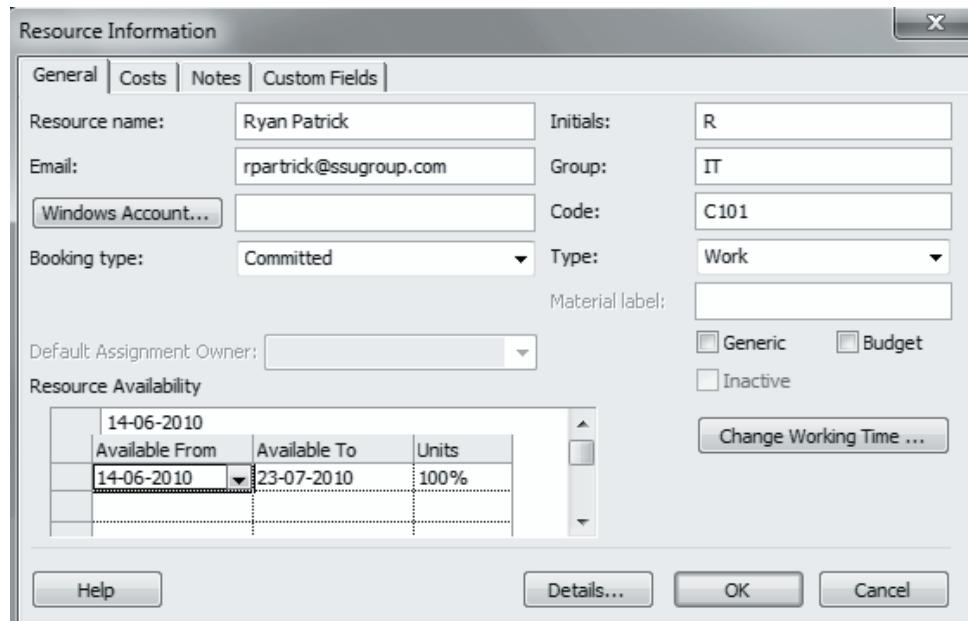


Figure 7.5: Specifications for a Resource Working on Limited Time

Session 7

Costing

The steps to specify a resource with limited availability period are as follows:

1. In the Resource Sheet view, select a resource and click **Information** on the **Resource** tab, to display the **Resource Information** dialog box.
2. In the **Resource Availability** table on the **General** tab, enter the availability period of the resource in the **Available From** and **Available To** columns.
3. In the **Units** column, either click the arrows to raise or lower the availability of the resource in percent increments or type in a specific availability percentage.
4. Repeat steps 2 and 3 to enter any additional periods of availability in the subsequent rows in the **Resource Availability** table.
5. Click **OK** to save the settings.

Concepts

7.5.4 Assigning Cost Resources

To pull out a resource working on a task from the project and to assign the remaining work to another resource, follow these steps:

1. Open the project in the **Gantt Chart** view and click the task that contains the resource to be replaced.
2. On the **Resource** tab, in the **Assignments** group of the **Ribbon**, click **Assign Resources** to display the **Assign Resources** dialog box.
3. Click the name of the resource to be replaced, and then click **Replace**. Resources currently assigned to the selected task will have a **check mark** to the left of the **Resource Name** column.
4. In the **Replace Resource** dialog box, click the name of the resource to assign work.
5. Click **OK** to save the information and click **Close** on the **Assign Resources** dialog box.

Session 7

Costing

Figure 7.6 displays assigning cost resources using **Assign Resources** dialog box.

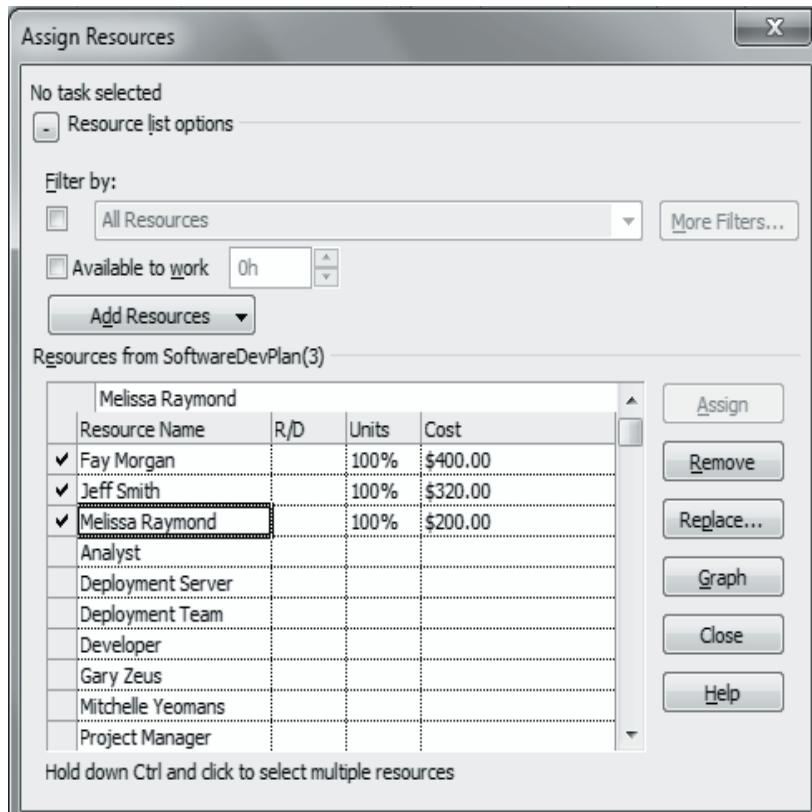


Figure 7.6: Assigning Cost Resource Using Assign Resources Dialog Box

Note: For adding additional resource information to a resource such as cost of the resource, one must double-click the resource in **Assign Resource** dialog box. This displays the **Resource Information** dialog box where one can enter cost of the resource under **Costs** tab of the **Resource Information** dialog box.

7.5.5 Fixed Cost versus Cost Resource

Users, who are new to MS Project, generally get into a usability problem while filling the cost column manually. Right-clicking on a cell in the cost column and selecting 'fill down' will not work as in MS Excel. Unlike MS Excel, MS Project copies the values but overrides the calculations. Hence that approach will not work. To solve the problem, perform the following steps:

1. On the **Gantt Chart** sheet, click the **Add New Column** heading and select **Cost** from the drop-down to display Cost column in the **Gantt Chart** Sheet.

Session 7

Costing

2. Generally, the cost column is calculated based on the rate multiplied by the number of hours. Consider \$100 per hour as the cost and duration of eight hours and calculate the cost. Cost of the resource will be \$800 as displayed in figure 7.7.

Task Name	Duration	Resource Names	Cost
software testing	1 day	Jeff Smith	\$800.00

Figure 7.7: General Cost Calculation of Rate and Hours in Gantt Chart

3. Manually enter a number in the cost column, to replace the calculated cost with a new cost say \$1200 as shown in figure 7.8.

Task Name	Duration	Resource Names	Cost
software testing	1 day	Jeff Smith	\$1,200.00

Figure 7.8: Replacing Calculated Cost with Manual Entry

MS Project calculates the difference between the original calculated cost and the manually entered cost as a 'fixed cost', that is \$400 in this example.

4. Verify this by inserting the **Fixed Cost** column, to find the value as shown in figure 7.9.

Task Name	Duration	Resource Names	Cost	Fixed Cost
software testing	1 day	Jeff Smith	\$1,200.00	\$400.00

Figure 7.9: Fixed Cost Column in Gantt Chart

Changing the duration or hours will not change the cost. For example, changing the duration to two days will not recalculate the cost to \$1600 but keeps the \$400 as fixed cost only; making the total cost as \$2000 as shown in figure 7.10.

Task Name	Duration	Resource Names	Cost	Fixed Cost
software testing	2 days	Jeff Smith	\$2,000.00	\$400.00

Figure 7.10: Changing Duration in Gantt Chart

Session 7

Costing

5. To fix the problem, the simplest way is to set the fixed cost as \$0.00 manually. For example, changing the fixed cost to \$0 will change the duration. The cost is calculated as shown in figure 7.11.

Task Name	Duration	Resource Names	Cost	Fixed Cost
software testing	2 days	Jeff Smith	\$1,600.00	\$0.00

Figure 7.11: Manually Entering Fixed Cost in Gantt Chart

7.5.6 Viewing Total Project Cost in Project Statistics

Assigning a cost to a resource is not the only way to assign a cost to the project. Projects will also have other costs such as fixed costs, material costs and so forth associated to it.

To view total project cost, follow these steps:

1. Click the **Project** tab and in the **Properties** group of the **Ribbon**, click **Project Information** to display the **Project Information** dialog box.
2. Click the **Statistics** button to open the **Project Statistics** dialog box as shown in figure 7.12.
3. Check the total cost of the project in **Project Statistics** dialog box.

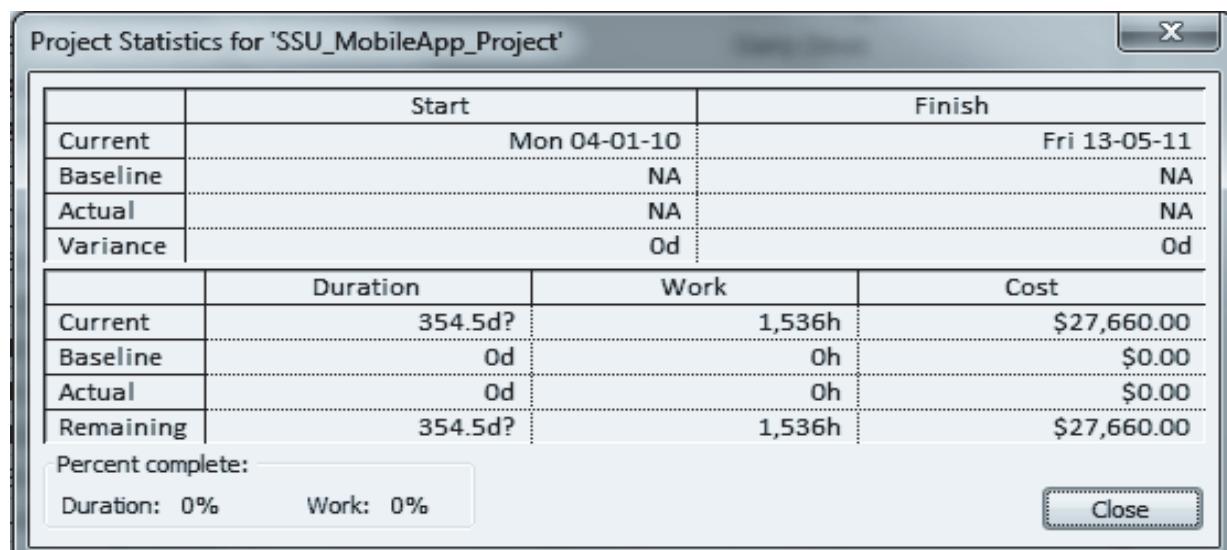


Figure 7.12: Project Statistics Dialog Box

Session 7

Costing

Concepts

7.5.7 Viewing Total Project Cost in Project Summary Report

Apart from project statistics, the total project cost can also be viewed in project summary report.

Steps to view total project cost in project summary report are as follows:

1. On the **Project** tab, click **Reports** on the **Ribbon** to display **Report** dialog box as shown in figure 7.13.

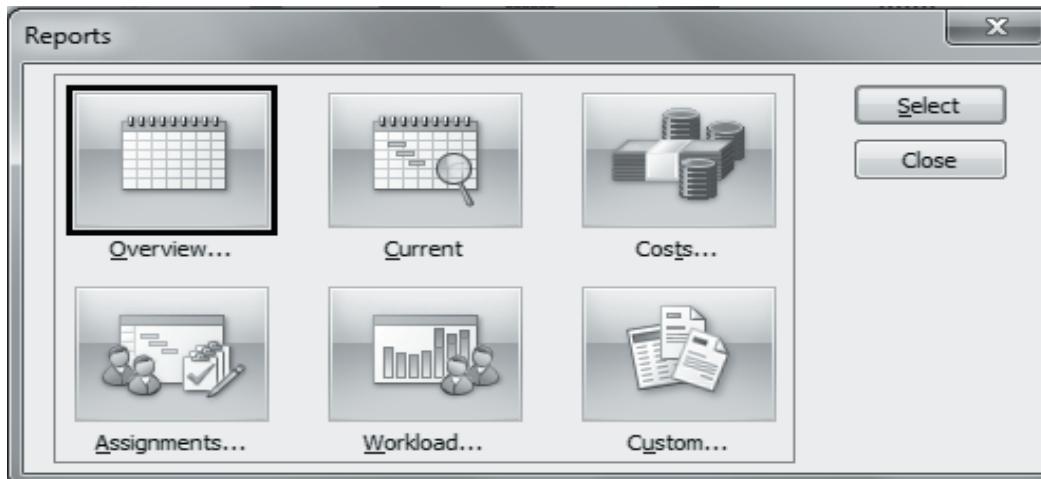


Figure 7.13: Reports Dialog Box

2. Select **Overview** and click **Select** button to open **Overview Reports** dialog box.

Session 7

Costing

3. Select Project Summary and click Select button to generate Project Summary Report as shown in figure 7.14.

Software Development			
as of Wed 30-11-11			
Dates			
Start:	Mon 04-01-10	Finish:	Fri 13-05-11
Baseline Start:	NA	Baseline Finish:	NA
Actual Start:	NA	Actual Finish:	NA
Start Variance:	0 days	Finish Variance:	0 days
Duration			
Scheduled:	354.5 days?	Remaining:	354.5 days?
Baseline:	0 days	Actual:	0 days
Variance:	354.5 days?	Percent Complete:	0%
Work			
Scheduled:	1,536 hrs	Remaining:	1,536 hrs
Baseline:	0 hrs	Actual:	0 hrs
Variance:	1,536 hrs	Percent Complete:	0%
Costs			
Scheduled:	\$27,660.00	Remaining:	\$27,660.00
Baseline:	\$0.00	Actual:	\$0.00
Variance:	\$27,660.00		
Task Status		Resource Status	
Tasks not yet started:	87	Work Resources:	12
Tasks in progress:	0	Overallocated Work Resources	2
Tasks completed:	0	Material Resources:	2
Total Tasks:	87	Total Resources:	16

Figure 7.14: Project Summary Report

7.6 Setting Availability

By default, a resource is assigned to a task at 100 percent availability, and project managers can modify the availability of a resource entirely to a single task or part-time to several tasks. The availability units setting in MS Project helps project managers spot any over-allocated resources working on multiple tasks in a project schedule.

Session 7

Costing

The steps to specify availability and set default resource units are as follows:

1. In the Resource Sheet view, click in the **Max.** column for the resource.
2. Enter a number in percentage of the total work hours for which the resource is available to work on the project, as shown in figure 7.15.

The screenshot shows the Microsoft Project application window with the 'Resource' tab selected in the ribbon. The 'Resource Sheet' view is displayed, showing a list of resources with columns for Resource Name, Type, Material, Initials, Group, Max., Std. Rate, Ovt. Rate, Cost/Use, Accrue, and Code. Row 14, which contains the resource 'Ryan Patrick', has its 'Max.' value set to 0% and is highlighted with a red border. The 'Format' tab is selected in the ribbon, and the 'Schedule' group is visible, showing various scheduling and availability options.

		Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue	Code
12		Mitchelle Yeomans	Work		M		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	
13		Sharon Gail	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	
14	◆	Ryan Patrick	Work		R	IT	0%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	C101
15		Jeff Smith	Work		J		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated	
16		Melissa Raymond	Work		M		100%	\$25.00/hr	\$35.00/hr	\$0.00	Prorated	

Figure 7.15: Setting Availability to Set Default Units

For example, type 50 for a resource who is available half of the time or 33 for a resource who is available for one-third of the time for the project. Entering 300 in the **Max.** Column indicates a firm or a resource such as a contractor who can provide 3 workers for full time. Entries greater than 100% represent a group of resources to handle assignments.

7.7 Budget Settings

In addition to resource cost per hour, resource base calendar, and resource availability, project managers assign resources to tasks at certain units (percentages for work resources and quantity consumed for material resources). All these factors work together while estimating the cost of the resources and projecting a budget for the project.

Consider an example where a resource, Melissa Raymond, is assigned a task to train a Help Desk Executive, with the following specifications:

Base calendar: Night Shift (eight hours work time, six days per week, between 11 P.M. to 8 A.M.)

Cost per hour: \$30

Overtime cost: \$40

Availability: 100%

Assigned to a two day task: 50 percent

Session 7

Costing

Now, from cost estimation perspective, the task involves two days at half time resource availability based on an eight hour calendar, which equals to four hours per day, totaling eight hours. There is no overtime incurred. The cost of the resource for the task comes to $8 \times \$30 = \240 .

Consider the same resource having the following specifications:

Base calendar: Night Shift (eight hours work time, six days per week, between 11 P.M. to 8 A.M.)

Cost per hour: \$30

Overtime cost: \$40

Availability: 100%

Assigned to a two day task: 150 percent

Overtime authorized: eight hours

Costing of the resource is calculated as follows:

The resource will now work twelve hours per day (150 percent of eight hours) for two days. With 24 total hours and sixteen hours at a standard rate of \$30 and eight hours of overtime rate of \$40, the resource will cost $(16 * \$30 + 8 * \$40) = \$800$.

MS Project computes total costs based on the resource settings and displays in views such as the Cost table, as shown in figure 7.16. To view the Cost table of a resource, click the **Tables** button in the **View** tab and select **Cost** from the drop-down menu.

Figure 7.16 displays Cost table under Resource Usage view.

	Resource Name	Cost	Baseline Cost	Variance	Actual Cost	Remaining
16	Melissa Raymond	\$2,400.00	\$0.00	\$2,400.00	\$0.00	\$2,400.00
	Install/deploy	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Obtain user fi	\$1,000.00	\$0.00	\$1,000.00	\$0.00	\$1,000.00
	Evaluate test.	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Determine fin	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Develop depli	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Secure deploy	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Train support	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00
	Deploy softw	\$200.00	\$0.00	\$200.00	\$0.00	\$200.00

Figure 7.16: Cost Table Under Resource Usage View

Session 7

Costing

Concepts

7.7.1 Working with Budgets

Using budget resources, project managers can compare budgeted work with planned work. Budget resources are assigned to project's summary tasks. Managers can specify a resource as a budget resource by just selecting the **Budget** check box in the **Resource Information** dialog box for the resource, as shown in figure 7.17.

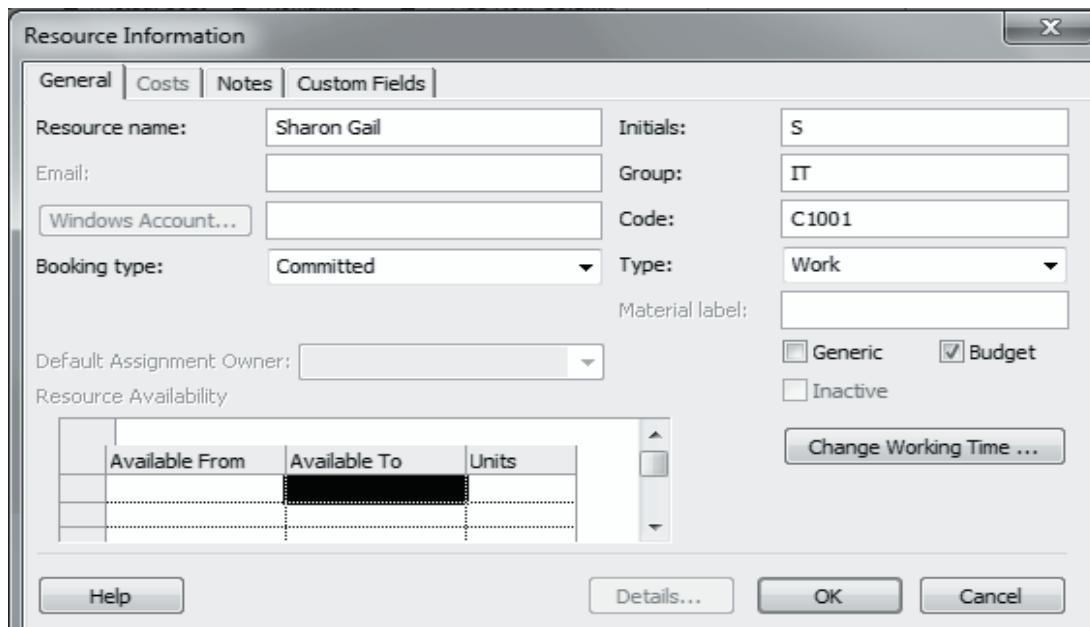


Figure 7.17: Specifying a Budget Resource

Project managers use the **Task Usage** and **Resource Usage** views to enter the work amount for a budget resource. One can view budgeted tasks in a project by displaying the **Budget Work** column in these views.

Note: The **Budget Work** column reflects only material and work resource type costs.

7.8 Defining Budget Resource Types

To facilitate comparing the costs of various budget resources, project managers can categorize them, by displaying additional information fields, such as **Group** and **Code**. Alternatively, they can create a custom text field, in which they can specify the category for each resource. Examples of budget resource categories can be Employee, Vendor, Supplier, Customer, and so forth.

Session 7

Costing

MS Project provides a number of custom placeholder field types, such as:

- Text
- Cost
- Number
- Flag
- Other types of fields

To create a custom field, perform the following steps:

1. On the **Project** tab, click the **Custom Fields** button to display the **Custom Fields** dialog box, as shown in figure 7.18.
2. Select a field type and enter a name for the custom field.
3. In the **Resource Sheet**, click the column header **Add New Column** and select the custom field name from the drop-down menu. This displays the new custom field in the **Resource Sheet**.

Project managers can then enter in the custom field, resource categories against each resource.

7.8.1 Creating Lookup Tables

To simplify entering resource categories and make the process faster and error free, managers can use the lookup table feature of MS Project. A lookup table allows creating a drop-down list of values to select for a custom field. For example, to add a field to indicate the status of ‘resource training’, creating a custom field in the lookup table with three possible entries such as Yes, No, and Partial.

The steps to create and use a custom text field with a lookup table are as follows:

1. On the **Project** tab, click the **Custom Fields** button to display the **Custom Fields** dialog box.
2. Select a field from the field list box and click the **Lookup...** button in the **Custom attributes** section, to display the **Edit Lookup Table** dialog box for the selected custom field.
3. Enter the custom field values in the **Values** column, such as Yes, No, and Partial. Enter a description for each value in the **Description** column.
4. Use the **Move** top and bottom arrows to arrange the values in the rows in the preferred order.

Session 7

Costing

Figure 7.18 display creating custom field in lookup tables.

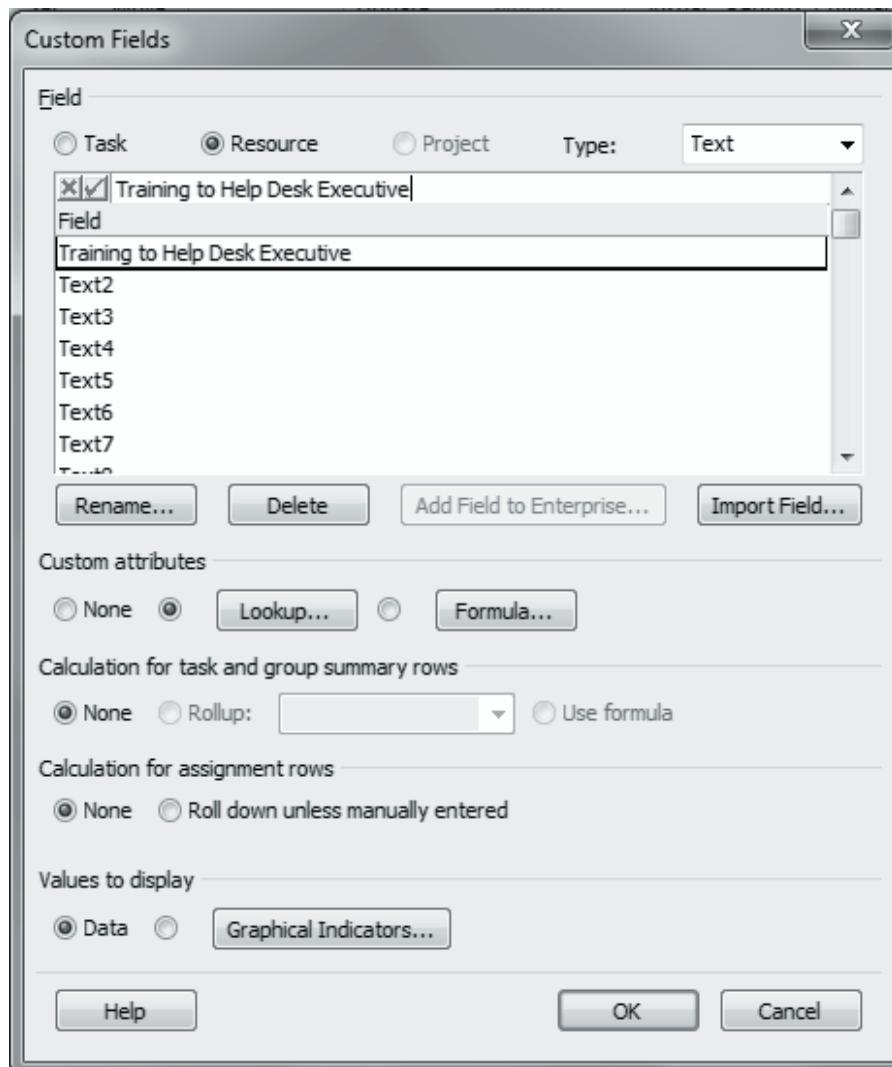


Figure 7.18: Creating Custom Fields Using Lookup Table

5. Click **Close** in the **Edit Lookup Table** dialog box and **OK** in the **Custom Fields** dialog box to save the lookup list values.

Now, users can enter the budget resource categories by clicking in the custom category field and selecting the appropriate category value from the lookup list.

Session 7

Costing

Figure 7.19 shows the lookup list in the custom field on the **Resource Sheet** name.

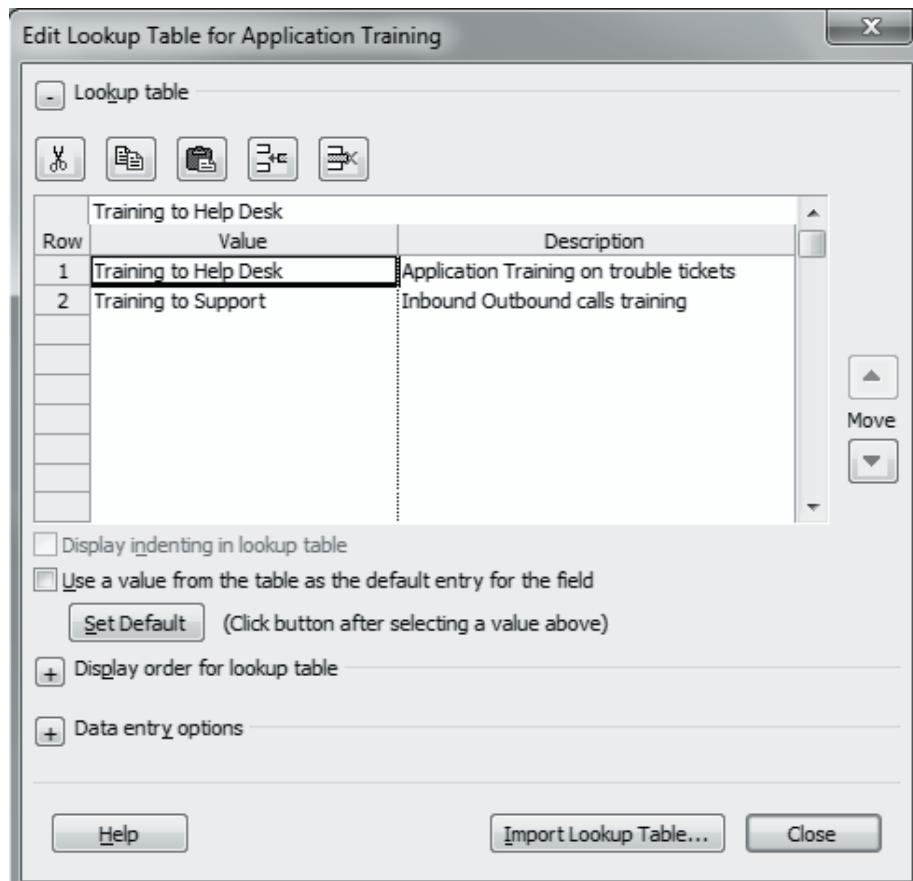


Figure 7.19: Lookup List in Custom Fields

7.9 Reducing Project Costs

Managing a project requires balancing time, money, and scope. The project manager has to prioritize among the schedule or budget or the project scope. To reduce project costs, the other two must be flexible to adjust in the project plan.

After reviewing the budget details against the current project costs and the value is over-budget, a project manager has to move towards a different total project cost.

The following are the corrective actions in the project plan to reduce project costs:

- Reverify all the basic cost assumptions such as resource rates, resource per-use costs, amounts for cost resources assigned to tasks, and other fixed costs for tasks.
- Adjust the project schedule to reduce costs. Task durations and adjusting task dependencies can help in reduce costs.

Session 7

Costing

- Adjust assignments to reduce costs. That is, add, remove, or replace resources on assignments as appropriate to cut costs.
- Cut scope to reduce costs after getting approval from the project stakeholder.

Note: When a project plan is adjusted to achieve the budget, make sure to check the finish date, resource allocation, and scope of the project does not affect the quality of the final deliverables.



Summary

- Resources contribute to majority of project costs.
- Based on the types of resources, project costs are of three types, work resources cost, material resources cost, and cost resource.
- Costs for work resources is calculated by multiplying its standard hourly rate with the hours of effort, while cost for material resources is calculated by multiplying its standard unit rate with the number of units.
- In case a project requires resources to work overtime, the overtime rates must be included in project cost estimation.
- For resources who are not available full time or for the entire project life cycle, project managers can specify specific work hours and work period for the resources, and accordingly estimate their effort for cost calculation.
- Project managers can set the availability of resources for a project as a percentage of the total work hours.
- Depending on the project cost information and estimates, managers need to calculate the project budgets.



Check Your Progress

1. By default, MS Project accrues resource costs _____.

A)	At the end of the project task
B)	At the beginning of the project
C)	On a prorated basis throughout the life cycle of the project
D)	As soon as the specific task starts in the project

2. Cost per use of work resources are calculated by _____.

A)	Multiplying its standard hourly rate with the hours of effort
B)	Multiplying its standard unit rate with the number of units
C)	Multiplying its standard hourly rate with the hours of effort along with the cost per use
D)	Simply entering the cost per use of the work resource for every task that uses the resource

3. The availability dates of a resource required for only a certain period during the project life cycle are specified in the _____.

A)	Resource Sheet view
B)	Resource Information dialog box
C)	Resource Usage view
D)	Task Usage view

4. Budget resources are assigned to a project's _____.

A)	Cost resources
B)	Summary tasks
C)	Subtasks
D)	Work resources



Check Your Progress

5. The key tasks of a project manager while calculating costing of a project include _____.

A)	Setting standard and overtime rates for resources
B)	Exploring the relationship between resources and costs
C)	Determining the tasks and subtasks required to complete the project
D)	Determining the effort required to complete project tasks

Objectives

At the end of this session, the student will be able to:

- *Describe assignments and task timings*
- *Define types of tasks*
- *Explain how to make effort-driven settings*
- *Describe how to find and select resources*
- *Describe work contours*
- *Explain how to work with Team Planner*
- *Explain how to assign work to resources using the Team Planner*

8.1 Introduction

Assigning resources is an ongoing activity for project managers throughout the project life cycle. Communicating tasks to resources and their commitment towards the completion of the tasks are key factors for the success of any project.

Project managers need to finalize project plans avoiding any resource over-allocation owing to resources working on several concurrent tasks in a project. A resource having either a cost per hour or cost per use in a project will impact the project budget once a task is assigned to it. While making assignments, the project manager must anticipate change in duration of some tasks and the result of a change in duration may impact resource timing and cost of the project.

MS Project provides necessary tools and techniques to manage the entire process of identifying appropriate resources and allocating tasks to resources. This session describes how to allocate resource assignments and task timings for various types of tasks. It also explains how to make effort-driven task settings, define work contours, and find and select appropriate resources for the tasks. Further, this session explains how to work with the Team Planner tool and use it to assign work to resources and define their work contours.

Session 8

Tasks, Resources, and Team Planner

Concepts

8.2 Assignments and Timing

Auto-scheduled tasks in MS Project can be of the following three types:

- Fixed units
- Fixed work
- Fixed duration

Each task type defines the relationship between a task's duration and the amount of work required to complete that task along with resource assignment units. The combination of these task types in a project and the effort-driven settings to the tasks automatically affects the duration of the tasks in the project schedule.

In case of manually scheduled tasks, the duration of the tasks is not affected unless a project manager makes an effort-driven setting for the task.

Figure 8.1 illustrates the display of Fixed Units, Fixed Work, and Fixed Duration in Task Form.

The screenshot shows the Microsoft Project Task Form. At the top, there are fields for 'Name' (Draft preliminary software specification), 'Duration' (3 days), and checkboxes for 'Effort driven' (checked) and 'Manually Scheduled' (unchecked). Below these are fields for 'Start' (Mon 18-01-10) and 'Finish' (Thu 21-01-10), and a dropdown for 'Task type'. The 'Task type' dropdown menu is open, showing four options: 'Fixed Units' (selected), 'Fixed Duration', 'Fixed Units', and 'Fixed Work'. Below the dropdown is a table with columns: ID, Resource Name, Units, Work, Ovt. Work, Baseline Work, and Act. Work. One row is visible, showing ID 10, Resource Name Fay Morgan, Units 100%, Work 24h, Ovt. Work 0h, Baseline Work 0h, and Act. Work 0h.

Figure 8.1: Fixed Units, Fixed Work, and Fixed Duration Task Types in Task Form

Note: In MS Project, by default if **Task Form** is not seen, it can be shown by using **More Views...** in the **Gantt Chart** drop-down and selecting **Task Form**.

8.3 Types of Tasks

To accurately determine task durations assigned to resources, project managers need to understand the various task types. The key to a perfect project plan is to understand which task type remains fixed, even when work resources are added or removed from the task during task execution, and which tasks get affected by the slightest change to the allocations made before initiating the task.

Session 8

Tasks, Resources, and Team Planner

Concepts

8.3.1 Fixed Units Tasks

By default, all tasks in MS Project are fixed units tasks. In case of fixed units tasks, the task duration and the resource effort, together determine the assignment units. The assignment units of resources will not change even if the number of hours required to complete the task increases or decreases.

For example, using fixed units task type, if the duration of Task A is increased from three to four days, the resources will continue to work at the assigned units for the specified duration of four days; MS Project increases the amount of work accordingly keeping the level-of-effort of resources as fixed.

Note: When the resources are increased or decreased, if the effort-driven setting for the task is enabled, MS Project changes the task duration accordingly, based on the assignment units specified.

8.3.2 Fixed Work Tasks

In case of fixed work tasks, project managers need to determine the units of work to be completed. For instance, a two day task requires sixteen hours to complete (using a standard calendar). By default, fixed work tasks are effort-driven. The task duration changes based on the number of resource units assigned to the task. If the amount of work changes, resource assignments may also change;

For example, a resource assigned to Task A, a fixed work task, takes four days to complete it. The same task takes only two days to complete if two people work on it.

MS Project does not modify the total hours of work required to complete the task. Instead, it modifies the hours of work scheduled for each resource, based on assignment units within the specified timeframe. If the duration of a task is reduced, resource assignment units increased to maintain the same total number of hours. For example, if the time to complete Task A is reduced to one day, number of resources assigned to the task increase, to complete the work in less time.

8.3.3 Fixed Duration Tasks

A fixed duration task does not vary the duration of the task, even if the resource assignments change. That is, Task A will take four days, irrespective of whether additional resources are assigned or removed for the task.

8.4 Effort-driven Scheduling

Most project tasks are effort-driven tasks. If effort-driven scheduling is enabled for a task, it will be affected by the total number of resources, adding their effort towards the completion of the task. Increasing the number of resources of a task will decrease the duration and decreasing the resources will increase the duration of the task. Hence, the hours assigned to each resource will change with the change in assignment units.

Session 8

Tasks, Resources, and Team Planner

Figure 8.2 illustrates auto-scheduled tasks of three different task types with effort-driven scheduling enabled for two of them. The task 'Determine project scope' was created with two day duration and two resources, SSU-Sr Mgmt and Gary Zeus, were allocated to the task at 100 percent. The scheduling of each task type and the number of hours of work are shown.

Task Mode	Task Name	Work	Duration	Details						
				In '10			10 Jan '10			
		M	W	F	S	T	T			
	Scope	88 hrs	7 days							
	Determine project scope - Fixed Duration not effort driven	32 hrs	2 days							
	Gary Zeus	16 hrs								
	SSU-Sr Mgmt	16 hrs								
	Secure project sponsorship - Fixed duration effort driven	16 hrs	2 days							
	SSU-Sr Mgmt	8 hrs								
	Gary Zeus	8 hrs								
	Define preliminary resources - Fixed Units not effort driven	32 hrs	2 days							
	Gary Zeus	16 hrs								
	Fay Morgan	16 hrs								
	Secure core resources - Fixed Units effort driven	8 hrs	1 day							
	Gary Zeus	8 hrs								
	Analysis/Software Requirements	112 hrs	11 days							
	Conduct needs analysis -Fixed Work	32 hrs	2 days							
	Fay Morgan	16 hrs								
	Gary Zeus	16 hrs								

Figure 8.2: Gantt Chart View with all Three Task Types

MS Project calculates work, task duration, and assignment units based not only on task types but also on the effort-driven setting. For an effort-driven task, if more resources are added, MS Project distributes the work equally among the resources and may change the task duration based on the total resource effort and task type.

For the fixed duration and fixed units task types, MS Project by default assumes that the tasks are not effort-driven.

In case of fixed work task type, the effort-driven setting is automatically turned on and cannot be turned off.

Session 8

Tasks, Resources, and Team Planner

Concepts

The steps to change the settings for an effort-driven task are as follows:

1. Select a task in the **Gantt Chart** table and click **Information** on the **Task** tab to display the **Task Information** dialog box. On the **Advanced** tab, the **Effort-driven** check box is checked and enabled by default.
2. Deselect the **Effort-driven** check box to turn off the effort-driven setting.
3. Click **OK** to save the new setting.

Figure 8.3 illustrates effort-driven setting in **Task Information** dialog box.

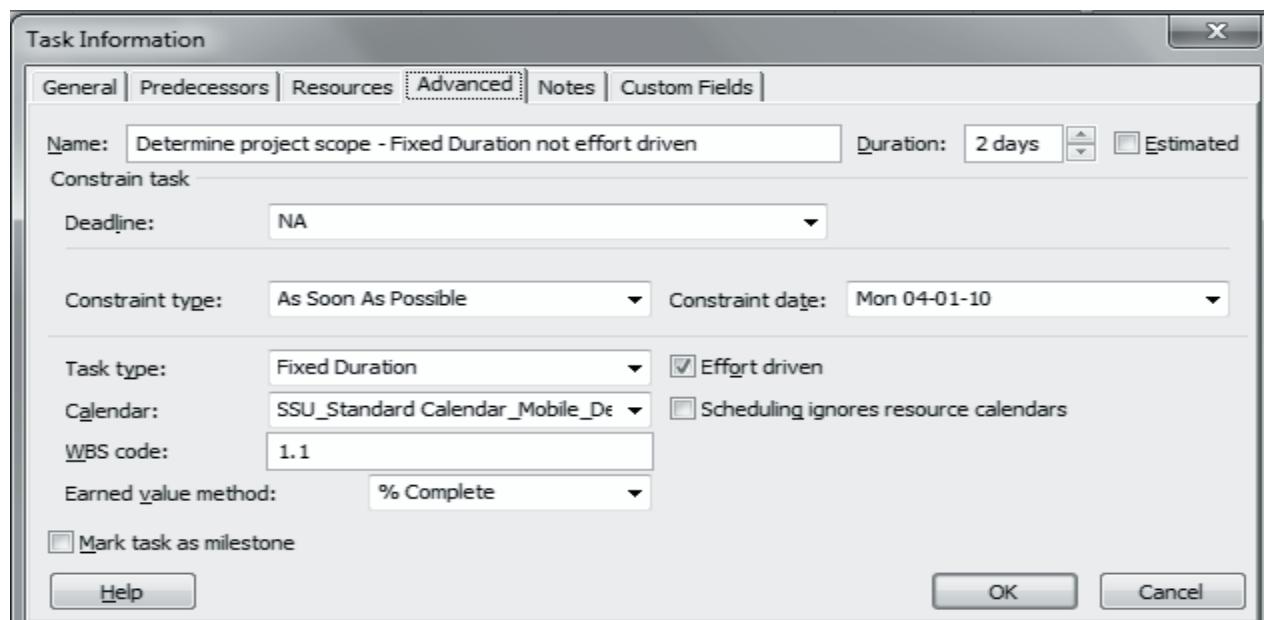


Figure 8.3: Effort-driven Task Setting

Another setting on the **Advanced** tab, **Scheduling Ignores Resource Calendars**, impacts the project schedule while performing task assignments. It lets the Task calendar override any Resource calendar setting for the resources assigned to that task. For example, if a task is set to use the Standard calendar and a resource assigned to it uses a Night Shift calendar, then MS Project schedules the resource to work on standard hours on that task. This setting is used to provide flexibility to the task. For example, to attend a company audit during the standard working hours, a night shift employee can be scheduled to work during the day hours.

8.5 Finding Resources

MS Project's 'Find' feature helps search for the right resource and also checks if a specific resource has enough time to handle another task. This feature finds resources by using various parameters, such as:

- Specific rates
- Initials
- Maximum assignment units
- Standard or overtime rate

For example, users can use this feature to search for a resource with a standard rate less than \$40 per hour, a resource to put in extra work on a task, any resource whose maximum units are greater than 100 percent, or the name of the cable material resource that is measured in feet, and so forth.

The steps to find resource information are as follows:

1. Click the down arrow on the **Gantt Chart** button on the **Task** tab and select the **Resource Usage** option.
2. On the **Task** tab, click the **Find** button in the **Editing** group to display the Find dialog box, as shown in figure 8.4.
3. In the **Find what** text box, enter the text to find, such as **200**, to search for a resource with standard rate of \$200 or less, or enter '**cable**' to search for a material resource whose material label contains the word '**cable**'.

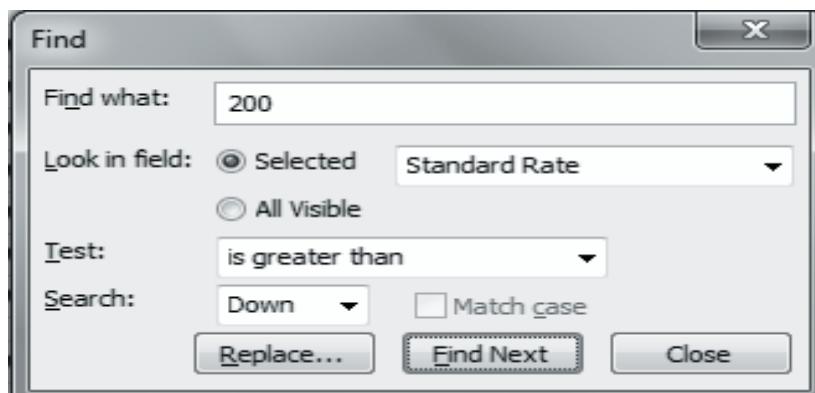


Figure 8.4: Finding a Resource Based on Certain Values

Session 8

Tasks, Resources, and Team Planner

4. From the **Look in field** drop-down list, select the name of the field in which to search, such as **Standard Rate**.
5. Select a search criterion from the **Test** drop-down list.
6. To search backward from the current cell position, select **Up** from the **Search** drop-down list and **Down** to search forward from the current cell position.
7. Select the **Match case** check box to match the case of the search text.
8. Click **Find Next** to start the search. Continue to click **Find Next** until the right resource is found.

The **Find** feature can also be used to find and replace any entry. Enter the text in the **Find what** text box in the **Find** dialog box, click **Replace**, and type the new text in the **Replace with** text box. Then, click **Replace** to replace each instance one by one or click **Replace All** to replace in all instances of the text in the specified entry field, as shown in figure 8.5.

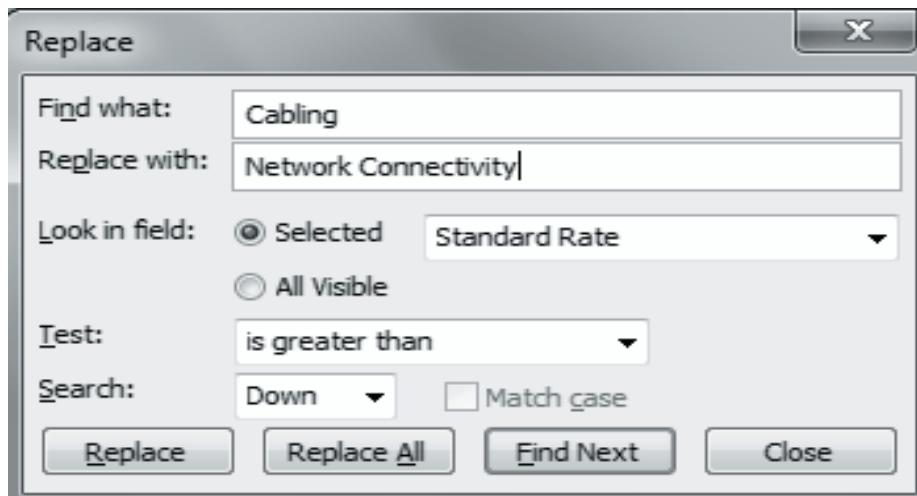


Figure 8.5: Find and Replace Settings

8.6 Work, Material, and Cost Resources

Work resources are usually people assigned to a task and in percentage of units such as 100%, 50%, or 150%, and so forth. Resources are assigned at a percentage, based on the Resource calendar. That is, a resource with a Standard calendar will put eight hours per day when assigned at 100% units.

Material resources are assigned in units, such as gallons, feet, or tons, and so forth. When assigning a material resource, determine the number of units of the material resource required for that task.

Session 8

Tasks, Resources, and Team Planner

Cost resources incur a variable cost every time they are assigned. For example, creating a cost resource, such as a computer maintenance fee of \$25, will incur cost every time a computer is assigned for a maintenance task.

Note: Cost and material resource units do not affect the work and task duration calculations or change work resource assignments.

8.7 Selecting Resources

Depending on the kind of assignments, project managers can use one of the following three main methods for selecting resources in MS Project:

- Entering resource information in the **Resource Sheet** view
- Selecting resources on the **Resources** tab in the **Task Information** dialog box
- Selecting resources from the **Assign Resources** dialog box

When assigning resources, the **Resource** field by default gets 100% assignment. When selecting resources using the **Task Information** dialog box, users can enter task details, such as task type and other task constraints.

When selecting resources using the **Assign Resources** dialog box, users can replace one resource with another or filter the list of available resources by any criteria. This method is also useful for making multiple resource assignments.

8.7.1 Entering Resources in the Resource Sheet View

The following are the steps to assign resources in the **Resource Sheet** view:

1. Click the down arrow on the **Gantt Chart** button on the **Task** tab and select **Resource Sheet** from the drop-down menu.

Session 8

Tasks, Resources, and Team Planner

2. Click the **Resource** column to enter the resource name and assignment as shown in figure 8.6.

Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue
Gary Zeus	Work		G		100%	\$50.00/hr	\$60.00/hr	\$0.00	Prorated
Fay Morgan	Work		F		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
SSU-Sr Mgmt	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
Mitchelle Yeomans	Work		M		50%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
Sharon Gail	Work		S		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
Ryan Patrick	Work		R	IT	0%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
Jeff Smith	Work		J		100%	\$0.00/hr	\$0.00/hr	\$0.00	Prorated
Melissa Raymond	Work		M		100%	\$25.00/hr	\$35.00/hr	\$0.00	Prorated

Figure 8.6: Selecting Resources in the Resource Sheet View

3. On entering the resource name, by default, the **Max** field is updated with 100% units.
4. Click the up or down arrow in the **Max** field to increase or decrease the assignment units for the resource at a 50% increment or decrement.

Alternatively, click **Information** on the **Resource** tab to display the **Resource Information** dialog box. In the table in the **Resource Availability** section, click the up or down arrow buttons in the **Units** column to adjust the assignment units.

8.7.2 Selecting Resources from Task Information Dialog Box

Users can also select resources to assign to tasks by using the **Task Information** dialog box. The steps to assign resources in the **Task Information** dialog box are as follows:

- Select a task in the **Gantt Chart** table and click the **Information** button on the **Task** tab, to display the **Task Information** dialog box.
- On the **Resources** tab, click in a blank cell in the **Resource Name** column and select a resource from the drop-down list. For a **work** or **material** resource, click in the **Units** column and specify in percentage, the units of resources assigned to the task, as shown in figure 8.7.
For a cost resource, specify the units cost for the resource in the **Cost** column. For a material resource, the default unit value is 1. Users can either enter the required value in the **Units** field or use the up and down arrows to assign additional material units.

Session 8

Tasks, Resources, and Team Planner

Figure 8.7 illustrates selection of resources from the **Task Information** dialog box.

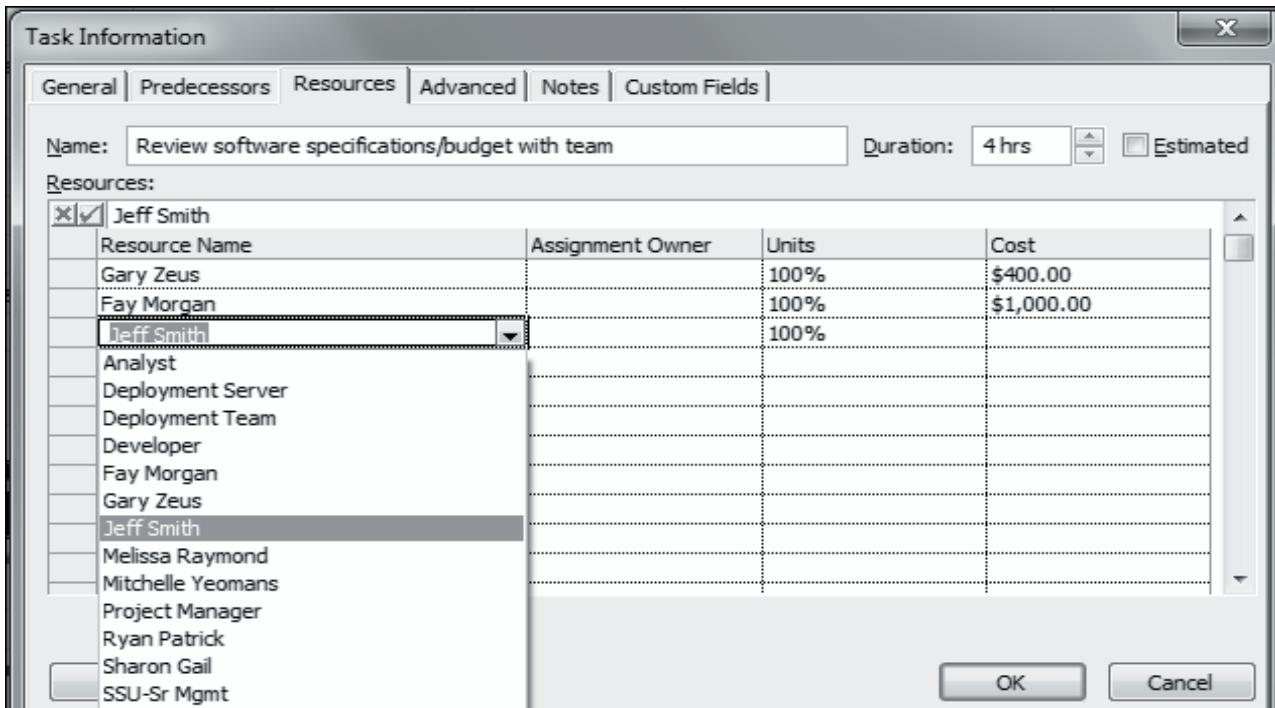


Figure 8.7: Selection of Resources from Task Information Dialog Box

3. Repeat Step 2 to assign any additional resources.
4. Click **OK** to save the information and close the dialog box.

8.7.3 Selecting Resources from the Assign Resources Dialog Box

Project managers can select and assign a work or material resource to a task using the **Assign Resources** dialog box. The steps to assign resources using the **Assign Resources** dialog box are as follows:

1. In the **Gantt Chart** table, select a task to assign resources, and click the **Assign Resources** button in **Assignments** group on the **Resource** tab. This displays the **Assign Resources** dialog box.
2. While keeping the **Assign Resources** dialog box open, users can select multiple tasks for assigning, from the **Gantt Chart** table.

Session 8

Tasks, Resources, and Team Planner

Figure 8.8 displays the **Assign Resources** dialog box.

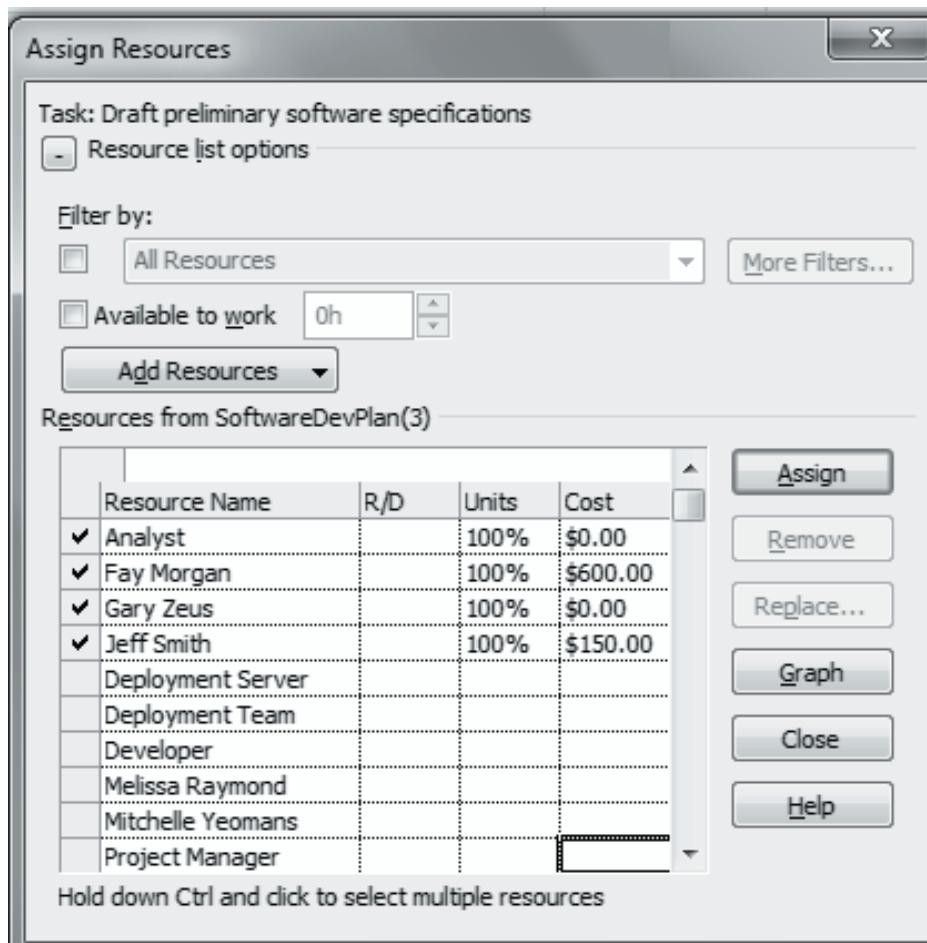


Figure 8.8: Selecting Resources from Assign Resources Dialog Box

3. In the **Resources** table in the **Assign Resources** dialog box, against each resource to be assigned to the selected task(s), click in the **Units** column and enter the units of work or material resource to assign.
For a work resource, change the **percentage** units in 50-percent increments by clicking the up and down arrows or enter a percentage. For a material resource, use the arrows in the **Units** column to increase or decrease the unit assignment, or enter the number of units.
4. In case of cost resources, click the **Cost** column to specify the unit cost for the cost resource to assign.
5. Select all resources to be assigned to the task (while holding down the **Ctrl** key) and for which information has been specified, and then click the **Assign** button.

Session 8

Tasks, Resources, and Team Planner

All the assigned resources will now appear with a check mark in the grey column, to the left of the dialog box.

6. To replace one resource with another, click an assigned resource (indicated with a check mark) and click the **Replace** button. Then, select another name on the list, set its units, and click **OK**. Click **Close** to save the resource assignment.

8.8 Working with Work Contours

The level of work during the life of an auto-scheduled task is known as a work contour. While making work resource assignments, by default, MS Project distributes the work evenly over the task. But in reality, the actual pace of work may be different. Hence, project managers can modify the level of work during the life of an auto-scheduled task such that more work can happen at the start, in the middle, or at the end of the task.

For example, a manager can allocate resources to spend some time at the beginning of the task for studying the user manuals before beginning to install new software on a mobile device. Project managers can use a late peaking work contour for these resources on this task.

To resolve a resource conflict, managers can use a different contour on a particular resource's task assignment to free that resource and to work on another task that may occur during the life of the first task. The selected contour may affect the schedule depending on the task type. Trying a different contour may solve the conflict and change the task duration or other resource assignments.

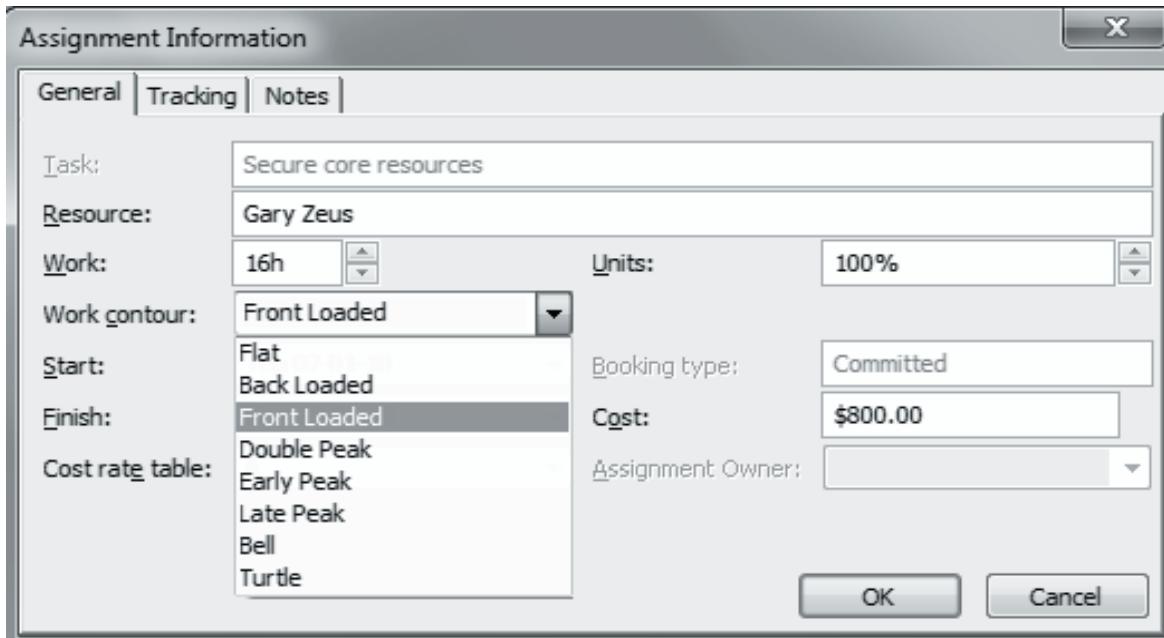
The steps to define the work contour for a resource are as follows:

1. Click the down arrow on the **Gantt Chart** button on the **Task** tab and select **Task Usage** from the drop-down menu to display the **Task Usage** view. The **Task Usage** view displays resource assignments by task.
2. Select a resource under a task from the **Task Name** column.
3. Click the **Task Usage Tools** tab and click the **Information** button in the **Assignment** group to display the **Assignment Information** dialog box.
4. From the **Work Contour** drop-down list, select the required preset pattern, as shown in figure 8.9.

Session 8

Tasks, Resources, and Team Planner

Figure 8.9 illustrates the display of various Work contour preset patterns.



Concepts

Figure 8.9: Work Contour Preset Patterns

Table 8.1 lists various preset work contour patterns and their purpose.

Preset Pattern	Purpose
Flat	MS Project 2010 by default assigns Flat contour pattern to new tasks.
Back Loaded	This contour starts slow at the beginning of the task and gradually increases till the completion of the task.
Front Loaded	This contour starts at full effort at the beginning of the task and gradually decreases during the life of the task.
Double Peak	This contour looks like a suspension bridge with a peak near each end and lower hours at the beginning, middle, and end.
Early Peak	This contour starts slowly but quickly peaks and then drops off. This gives you some time to get oriented to a task before really digging in.
Late Peak	This contour peaks ramp up but drops off at the end of loose ends.
Bell	The contour represents a bell with a back loaded contour followed by a front Loaded contour. The work continually increases to a peak and then gradually drops off.
Turtle	This contour has low levels at the beginning and the end with fully scheduled resources in the middle.

Table 8.1: Preset Work Contour Patterns

Session 8

Tasks, Resources, and Team Planner

5. Click **OK** to save the setting.
6. If none of the present patterns fit the situation, managers can manually modify the resource's work by changing the number of hours the resource puts in day by day on a task, in the **Task Usage** view.

After specifying work contours for the resources, one can use the **Resource Usage** view or **Task Usage** view to find the preset patterns of the tasks. A contour pattern symbol representing the selected work contour is displayed in the Indicator column for the resource.

Figure 8.10 illustrates the result of work contour preset pattern in **Task Usage** view.

		SSU-Sr Mgmt
		Secure project sponsorship
		SSU-Sr Mgmt
✓		Define preliminary resources
		Gary Zeus
✓		Secure core resources
		Gary Zeus
		This assignment dynamically schedules work using a front loaded pattern.
		Requirements
		Conduct needs analysis
		Fay Morgan

Figure 8.10: Task Usage View with Work Contour Preset Patterns

8.9 Team Planner View

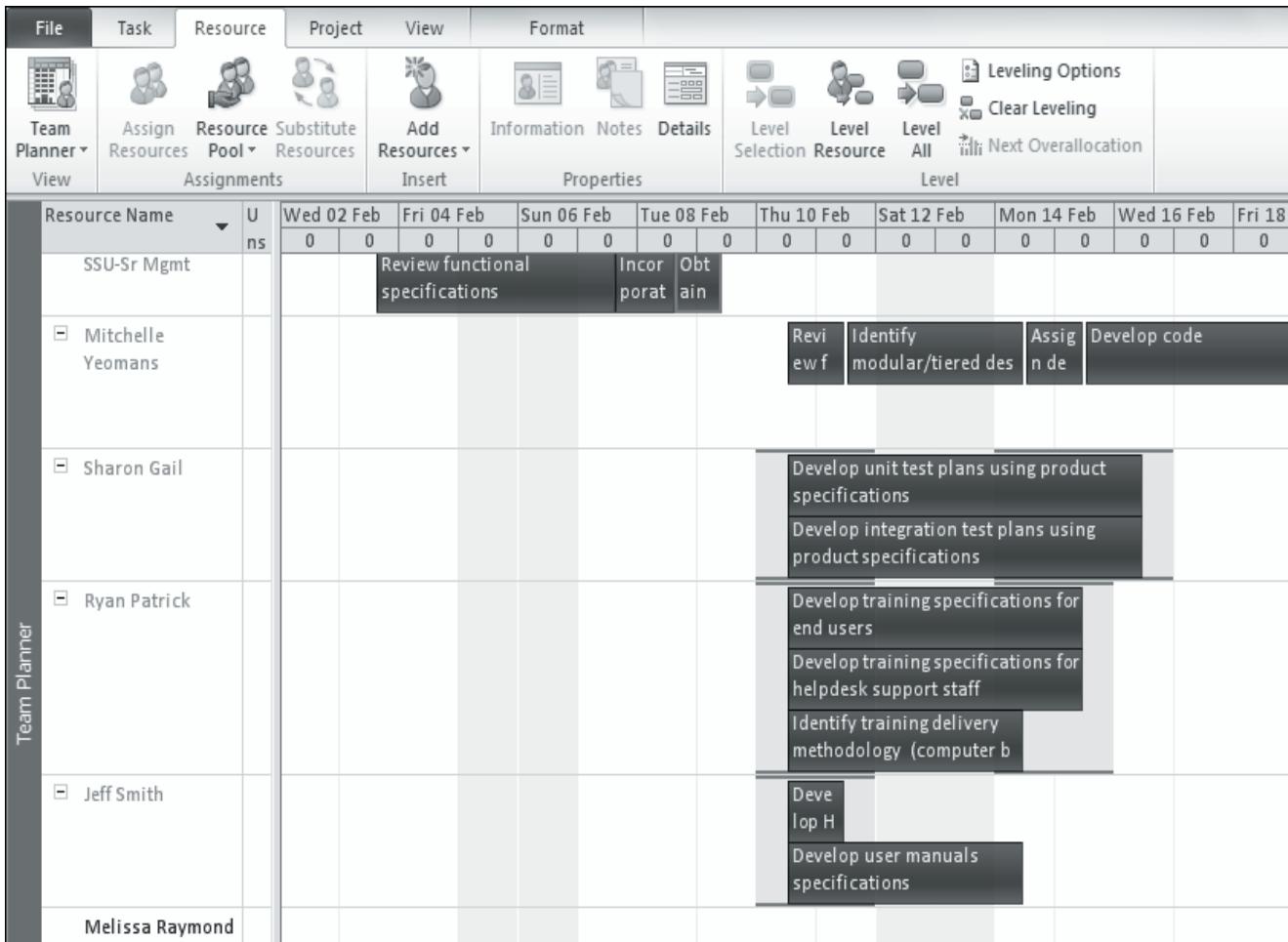
In various resource views, MS Project alerts project managers of overbooked resources, by displaying them in red.

MS Project 2010 provides a new view called the '**Team Planner**', which is used to fix workload issues. It helps project managers ensure that the work is distributed among all the resources in a manageable way. This view enables managers to move assignments among resources, assign tasks that have not been assigned, and schedule tasks that have not been scheduled.

Session 8

Tasks, Resources, and Team Planner

Figure 8.11 displays the Team Planner view.



Concepts

Figure 8.11: Team Planner View

When two tasks assigned to a resource overlap, the resource is marked as over-allocated and thin red bars appear above and below the overbooked period. The **Team Planner** view also shows any unassigned tasks or tasks not having enough schedule information to be scheduled.

Perform the following steps to display and configure the **Team Planner** view:

1. Click the down arrow at the bottom of the **Gantt Chart** button on the **Task** tab and select **Team Planner** option. Alternatively, the **Team Planner** view can be displayed by clicking the **Team Planner** button located at the far left on the **Resource** tab. The bottom half of the Team Planner sheet displays the list of unassigned tasks. Users can drag the **Unassigned Tasks** split bar up to view more unassigned tasks at the same time.

Session 8

Tasks, Resources, and Team Planner

2. Once the unassigned tasks are identified, drag and drop to correct any scheduling issues, by using a combination of the following techniques:

- **Fixing Resource Over-allocation:** On the **Team Planner** view, drag one of the overlapping tasks either to the left or to the right to change the schedule of the task. To reassign the task to another resource, drag the task up or down to that resource.
- **Assigning an Unassigned Task:** Drag the unassigned tasks up to the row for the resource to assign the task.
- **To Schedule an Unscheduled Task:** Drag the task to the right onto the timescale portion of the view, and drop the task at the desired schedule position. The unscheduled task can then be dragged over to a resource to assign it.

Dragging a task vertically from one resource to other changes the task assignment, while dragging horizontally changes the task schedule in **Team Planner** view.

Placing the mouse over on any task displays basic information about a task in **Team Planner** view. To change the details of either a task or a resource, select it and click the **Information** button to display the **Task Information** dialog box or the **Resource Information** dialog box, respectively. In the dialog box, specify the information to be modified and click **OK**.

To insert new tasks and resources into the project, use the **Insert Task** and **Add Resources** buttons in the **Insert** group on the **Task** tab and the **Resource** tab, respectively.



Summary

- MS Project classifies three types of tasks, fixed units, fixed work, and fixed duration. By default, all tasks in MS Project are fixed units tasks.
- If effort-driven scheduling is enabled for a task, the task duration will be affected by the total number of resources adding their effort towards the completion of the task.
- MS Project calculates work, task duration, and assignment units based not only on task types but also on the effort-driven setting.
- MS Project provides a Find feature that enables managers to search for the right resources using various parameters, such as specific rates, standard or overtime rate, and so forth.
- When assigning resources to a task, project managers need to determine the units of hours, quantity, or rate for which the resource is assigned to the task.
- Managers can select resources for a task in the Gantt Chart table, Task Information dialog box, or the Assign Resources dialog box.
- A new feature in MS Project 2010 is the Team Planner that provides managers an at-a-glance view of resource assignments and helps identify any unassigned resources or unscheduled tasks.

Session 8

Tasks, Resources, and Team Planner



Check Your Progress

1. By default, all tasks in MS Project are classified as _____.

A)	Fixed units tasks
B)	Fixed work tasks
C)	Fixed duration tasks
D)	Effort-driven tasks

2. Which of the following statements are true about fixed work tasks?

A)	They are by default, effort-driven tasks
B)	The units of resources assigned will not change even if the number of hours required to complete the task increases or decreases
C)	The task duration changes based on the number of resource units assigned to the task
D)	The duration of task does not change even if resource assignments

3. Which of the following items can managers search using the Find feature?

A)	Tasks by type
B)	Effort-driven tasks
C)	Resources by rates
D)	Resources by maximum assignment units

4. When selecting resources using the Assign Resources dialog box, which of the following can managers do?

A)	Cannot assign a task to multiple resources
B)	Can replace one resource with another or filter the list of available resources by any criteria
C)	Can specify the task type
D)	Can specify the percentage of work hours for which the resource is assigned to the task

Session 8

Tasks, Resources, and Team Planner



Check Your Progress

5. Managers can define the work contour for a specific resource in the _____.

- | | |
|----|-----------------------------------|
| A) | Assign resources dialog box |
| B) | Task information dialog box |
| C) | Task Usage view |
| D) | Assignment Information dialog box |



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Objectives

At the end of this session, the student will be able to:

- *Explain baselines and interim plans*
- *Explain how to create a baseline schedule*
- *Describe how to work with multiple baselines*
- *Explain how to create and clear interim plans*
- *Describe organizing project details*
- *Describe sorting and filtering project details*

9.1 Introduction

Every project has a method of benchmarking project data to compare the actual activity against the original project plan. The saved version of the project plan is called a ‘baseline’ that includes the entire information of a project, such as task timing, resource assignments, costs, and so on.

MS Project provides a feature called as ‘interim plan’ that is essentially used as a timing checklist. It includes the actual start and end dates of tasks and also the estimated start and end dates for tasks that are yet to start. This session describes baselines, interim plans and explores when, why, and how to save a baseline and interim plan for a project.

9.2 Baseline Scheduling

Saving a baseline is like storing a permanent record of project estimates of time, cost, and resource workload. Baselines are saved comparing the current values before starting any activity with the final project plan.

A project manager can use project baselines to describe about the project status at any point of time in a project. Project baselines are useful especially at the end of a project, when comparing the actual timelines to the estimated timelines. Thus, a project baseline helps the project manager to make more accurate estimates upfront.

Session 9

Project Baseline

Project baselines are also used to explain and track the actual activity against any time delays or cost overruns to project owners by using a variety of reports and views.

MS Project facilitates to save and clear baselines for any selected tasks. Therefore, if one task is removed from the project plan due to any change, the user can modify the project estimates and keep the rest of the baseline without making any changes.

9.2.1 Look and Feel of a Baseline

A project baseline captures baseline start, finish, duration, work, and cost information of every task in the project plan.

MS Project displays visual indications to track an actual activity against the estimated timelines of a task.

Figure 9.1 shows the **Gantt Chart** view of a project displaying a check mark in the indicators column for every task that is marked as complete. All Completed works on the **Gantt Chart** View display a black progress bar to illustrate the percentage of completion of the task. **Gantt Chart** sheet area displays the Variance tables for Start and Finish, with columns of data comparing baseline estimates to the actual activity. For example, Start Variance for Design summary task is 5 days and Finish Variance is 1.5 days.



Figure 9.1: Gantt Chart with Status as Complete

In figure 9.1, the **Gantt Chart** view presents data as a pair of taskbars for each task, as follows:

- **Thin Gray Bar:** shows the baseline schedule for a task.
- **Upper Solid Bar:** shows the actual schedule for completed tasks.
- **Upper Shaded Bar:** indicates the current schedule for a task either partially complete or not yet started.

Session 9

Project Baseline

- **Completion Percentage:** marked completion percentage displays beside each task and also on summary taskbars.

Concepts

9.2.2 Saving a Baseline Schedule

To save a baseline schedule, click the **Set Baseline** button on the **Ribbon**. Saving a project baseline for the first time, saves the summary task information. However, the user can save or modify baselines either for a selection of tasks or the entire project.

A manager can save a project baseline using the following steps:

1. Open the project and select the tasks with the cursor over their **Task ID** numbers.
2. On the **Project** tab of the **Ribbon**, click **Set Baseline** and select **Set Baseline** to display the **Set Baseline** dialog box.
3. In the **Set Baseline** dialog box, select **Set Baseline** and choose the Baseline number from the drop-down.
4. In the **Set Baseline** dialog box, select either the **Entire project** or the **Selected task** radio button based on the requirement of the project.
If **Selected task** is chosen, make selections on how the baseline rolls up, or summarize based on the changes to task data.
5. Click **OK** to save the information.

Session 9

Project Baseline

Figure 9.2 shows an example of saving a baseline schedule.

Concepts

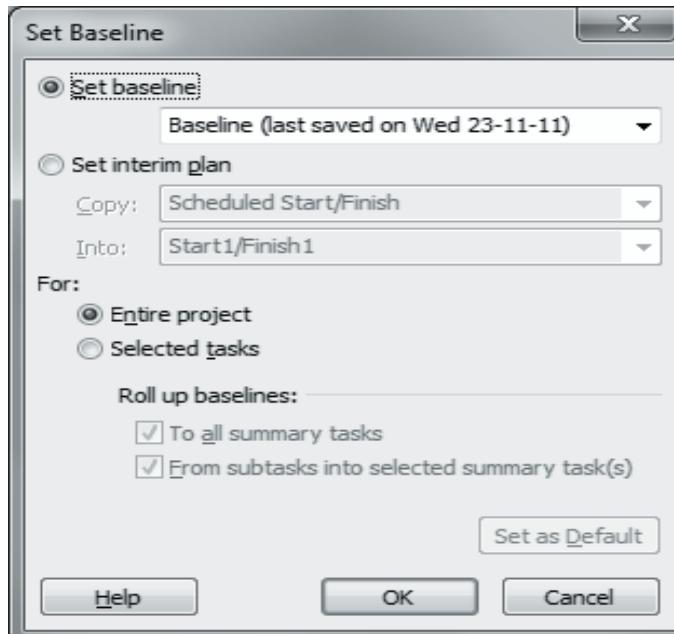


Figure 9.2: Saving Baseline Schedule in Set Baseline Dialog Box

9.3 Multiple Baselines

MS Project 2010 comes with a unique feature of saving a project baseline data up to 11 times during the project life cycle. The ability to save multiple project baselines can help the project manager to check the progress of the project plan over the life of longer duration project. Multiple baselines also help in anticipating the budget overrun, though not included in the original saved plan.

Session 9

Project Baseline

Concepts

Figure 9.3 shows an example of setting list of baselines, with the last date being saved.

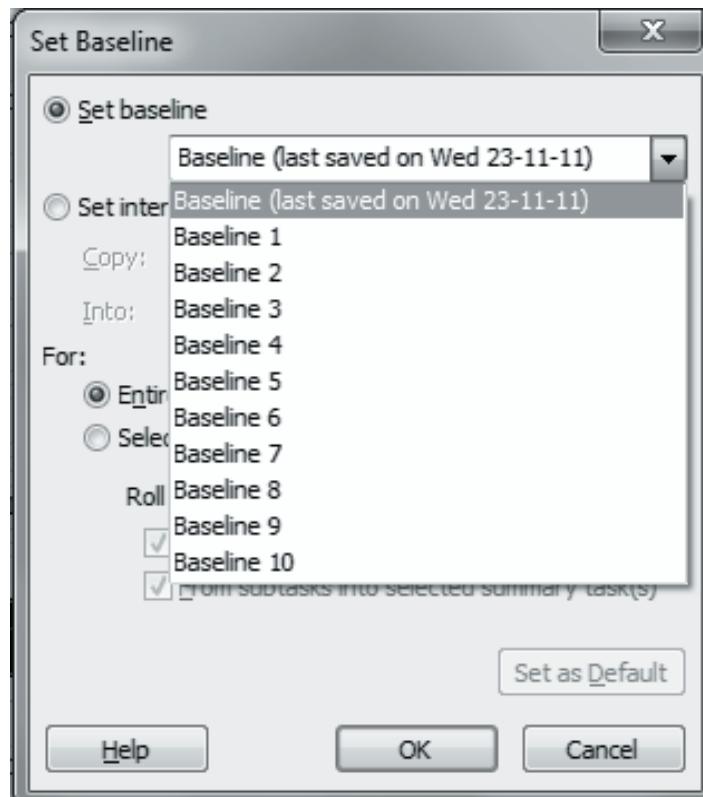


Figure 9.3: Setting Multiple Baselines of a Project

When a baseline is saved, it saves without overwriting any of the existing baselines. A manager can view multiple baselines or interim plans, by displaying columns in any sheet view of MS Project 2010.

For example, to display cost information for a baseline that is saved with the name Baseline 2, insert the column named Baseline Cost2 in the **Gantt Chart** view sheet. Also, the user can view multiple baselines at a time in **Gantt Chart** view. MS Project uses the first saved baseline as the benchmark and builds other baselines on top of it.

A project manager can save project baseline up to 11 times during the life of the project.

9.4 Clearing a Baseline

To accommodate frequent changes in a project and to get more valid variance data, the user must clear or reset the baselines.

To delete a baseline from the project plan, the manager has to clear the baseline.

Session 9

Project Baseline

Consider for example, a long duration project that may take several years to complete. The project manager may want to save a new baseline every year or for every six months due to change in costs or resources. There will be incremental versions of the project estimates and multiple baselines that may exceed the maximum number of 11 project baselines provided by MS Project. Hence, the manager must clear some baselines.

Steps to clear an existing baseline are as follows:

1. Open the project and click the **Project** tab of the **Ribbon**.
2. To clear the baseline of selected tasks, select the tasks by clicking on their **Task ID** numbers.
3. Click **Set Baseline** and select **Clear Baseline** to display **Clear Baseline** dialog box with **Clear baseline plan** radio button selected by default.
4. From the **Clear Baseline** Plan drop-down list, choose the baseline to clear as shown in figure 9.4.

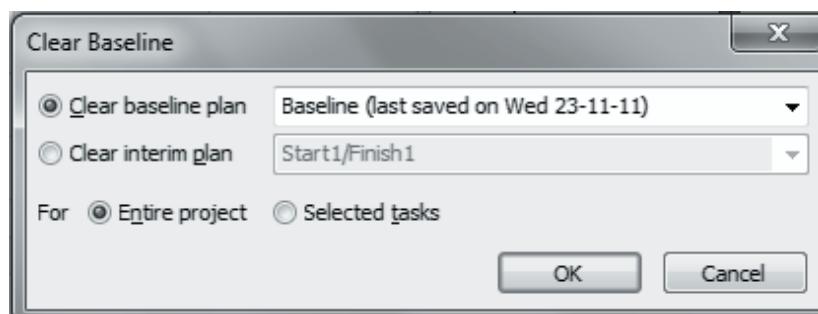


Figure 9.4: Clear Baseline Settings

5. Select **Entire project** radio button to clear the baseline for the entire project or **Selected task** radio button to clear baseline for selected tasks.
6. Click **OK** to clear either the entire project baseline or selected tasks.

9.5 Interim Plans

An interim plan is a timing checklist that includes the actual start and end dates of tasks as well as the estimated start and end dates for those tasks that are yet to start.

An interim plan saves only timing information and will not save any information related to resource assignments, costs and so forth. An interim plan records date changes and does not overwrite the original baseline cost data.

9.5.1 Saving Interim Plans

Interim plans and baselines are saved using the same **Set Baseline** dialog box. For an interim plan, a project manager has to specify the location of the baseline to save the interim plan.

For example, to save the start and finish dates from Baseline 3 plan to an interim plan, copy Start and Finish from Baseline 3.

To change currently scheduled start and end dates in a baseline without changing all the other data saved in a baseline, copy from Start/Finish to the baseline plan to change.

Steps to save an interim plan are as follows:

1. Open project and select tasks by dragging the **Task ID** numbers to save an interim plan for those selected tasks.
2. On **Project** tab of the **Ribbon**, click **Set Baseline** and select **Set Baseline** to display the **Set Baseline** dialog box.
3. Select **Set interim plan** as shown in figure 9.5.

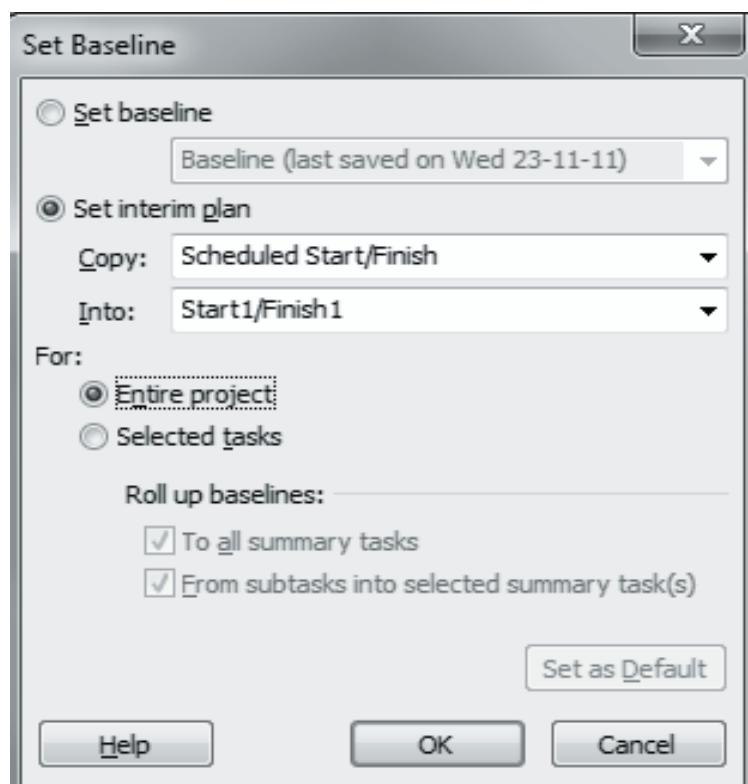


Figure 9.5: Saving Interim Plans Using Set Baseline Dialog Box

Session 9

Project Baseline

Concepts

4. From the **Copy** drop-down list, select the set of data to copy to the interim plan.
5. From the **Into** drop-down list, select those fields to save the interim plan data.
6. Select **Entire project or Selected tasks** to save the plan.
7. Use option **To all summary tasks** check box under **Roll up baselines** to roll up the baseline data up to the summary task level for all the tasks.
8. Use option **From subtasks into selected summary task(s)** to roll up baseline data to summary tasks for the tasks selected in the **Gantt Chart** view.
9. Click **OK** to save the plan.

Note: Maximum of 10 interim plans can be saved based on baseline or actual data.

9.5.2 Clearing Interim Plans

As MS Project supports saving for only 10 interim plans, the project manager may find the need to clear some interim plans.

Steps to clear an interim plan are as follows:

1. Open project and select tasks by dragging the task **ID** numbers to clear an interim plan for those selected tasks.
2. On **Project** tab of the **Ribbon**, click **Set Baseline** and select **Clear baseline** to display the **Clear Baseline** dialog box, as shown in figure 9.6.

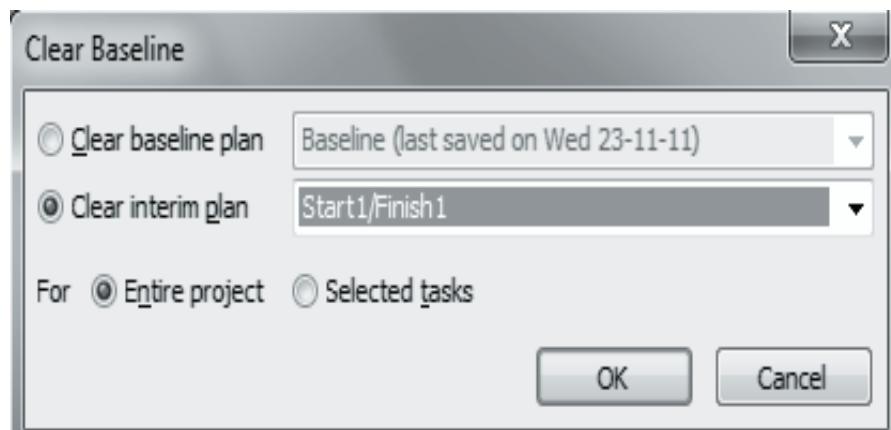


Figure 9.6: Clearing Interim Plans Using Clear Baseline Dialog Box

Session 9

Project Baseline

3. Select the **Clear interim plan** radio button, and then choose the plan from the drop-down list to clear from the list.
4. Select **Entire project** radio button to clear the specified interim plan for the entire project or **Selected tasks** radio button to clear the specified interim plan for certain tasks.
5. Click **OK** to clear the plan.

Concepts

9.6 Customizing Baseline and Interim Plans

A baseline saves relevant project data including start date and finish date, duration, work, cost and so forth, whereas an interim plan saves only the start date and finish date of tasks in the project.

A project having interim plans and multiple baselines demonstrates adjustments made for major changes or problems occurred during the project life cycle.

A project manager gets a holistic view of the project by generating views and reports of interim and baseline plans. Such views and reports help project managers to submit detailed project information to the senior management and other stakeholders of the project.

Steps to view or print information from various baselines or interim plans are as follows:

1. Open the project in **Task Sheet** view.
2. On the sheet, click the **Add New Column** heading to display the menu.

Session 9

Project Baseline

Concepts

The menu with the available fields appears, as shown in figure 9.7.

Task Name	Duration	Start	Finish		
Analysis/Software Requirements	14 days	Thu 01-12-11	Tue 20-12-11	% Complete	
Conduct needs analysis	5 days	Thu 01-12-11	Wed 07-12-11	% Work Complete	
Draft preliminary software specification	3 days	Thu 08-12-11	Mon 12-12-11	Active	
Develop preliminary budget	2 days	Tue 13-12-11	Wed 14-12-11	Actual Cost	
Review software specifications/budget	4 hrs	Thu 15-12-11	Thu 15-12-11	Actual Duration	
Incorporate feedback on software speci	1 day	Thu 15-12-11	Fri 16-12-11	Actual Finish	
Develop delivery timeline	1 day	Fri 16-12-11	Mon 19-12-11	Actual Overtime Cost	
Obtain approvals to proceed (concept, t	4 hrs	Mon 19-12-11	Mon 19-12-11	Actual Overtime Work	
Secure required resources	1 day	Tue 20-12-11	Tue 20-12-11	Actual Start	
Analysis complete	0 days	Tue 20-12-11	Tue 20-12-11	Actual Work	
Design	14.5 days	Wed 21-12-11	Tue 10-01-12	ACWP	
Review preliminary software specificati	2 days	Wed 21-12-11	Thu 22-12-11	Assignment	
Develop functional specifications	5 days	Fri 23-12-11	Thu 29-12-11	Assignment Delay	
Develop prototype based on functional	4 days	Fri 30-12-11	Wed 04-01-12	Assignment Owner	
Review functional specifications	2 days	Thu 05-01-12	Fri 06-01-12	Assignment Units	
Incorporate feedback into functional sp	1 day	Mon 09-01-12	Mon 09-01-12	Baseline Budget Cost	
Obtain approval to proceed	4 hrs	Tue 10-01-12	Tue 10-01-12	Baseline Budget Work	
Design complete	0 days	Tue 10-01-12	Tue 10-01-12	Baseline Cost	
				Baseline Deliverable Finish	
				Baseline Deliverable Start	
				Baseline Duration	
				Baseline Estimated Duration	
				Baseline Estimated Finish	
				Baseline Estimated Start	
				Baseline Finish	
				Baseline Fixed Cost	
				Baseline Fixed Cost Accrual	
				Baseline Start	
				Baseline Work	

Figure 9.7: Customizing Baselines and Interim Plans View on Task Sheet View

3. Select the field to insert.
4. Repeat Steps 2 to 3 to insert additional columns.
5. Click **OK** to display the column(s).

In addition to interim plans and baselines, task notes include resource performance on a task, vendor problems or late deliveries, if any.

Steps to display the first three baselines in the view are as follows:

1. On the **Task** tab, click the bottom portion of the **Gantt Chart** button, and then click **More Views...** on the menu.

Session 9

Project Baseline

2. Click **Multiple Baselines Gantt** in the views list of the **More Views** dialog box, and then click the **Apply** button as shown in figure 9.8.

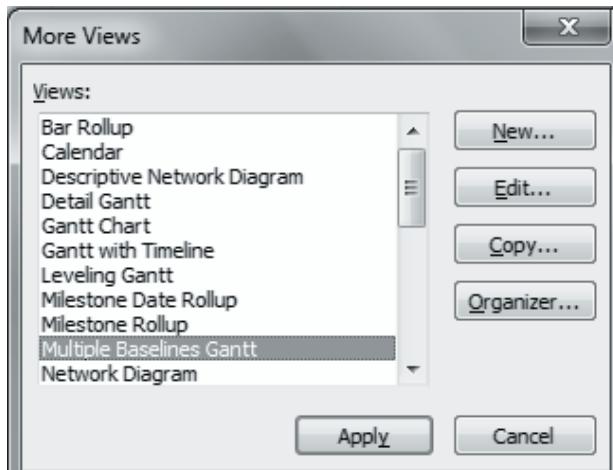


Figure 9.8: Multiple Baselines Gantt Option in the More Views Dialog Box

3. To display task notes, add the **Notes** column in the task sheet.
4. Click **OK** to save and display the column(s).

9.7 Organizing Project Details

MS Project provides a feature called **Organizer** to help project managers to share views, tables, forms, reports, and so forth among projects.

Session 9

Project Baseline

Steps to display the Organizer are as follows:

1. On the **File** tab, click **Info**, and then click the **Organizer** button to display the **Organizer** window as shown in figure 9.9.

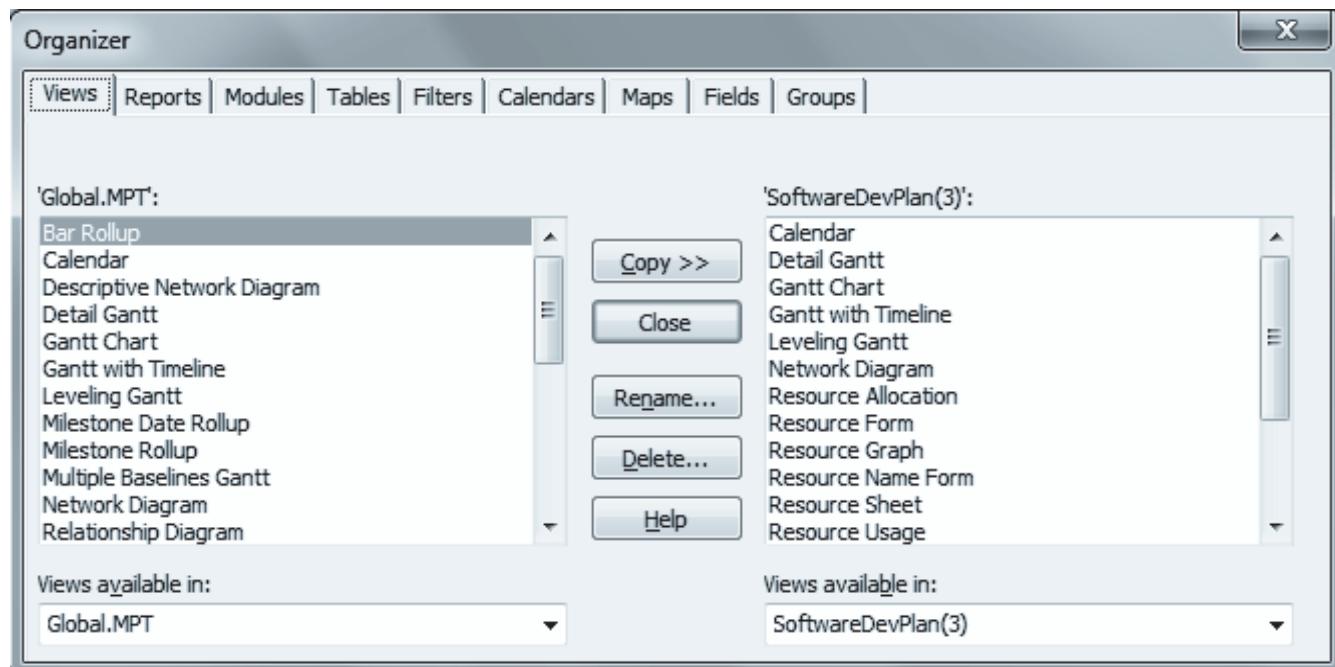


Figure 9.9: Organizing Project Details Using the Organizer

2. Use tabs in the **Organizer** dialog box to copy various elements from the Global template (**Global.mpt**) to the current project. Also, the user can copy elements from the current project to the Global template or between projects.
3. Click **OK** to save the information and organize project details.

9.8 Sorting Project Details

The Sort by cost feature helps the project manager to focus on the most expensive tasks first; sort by priority saves time by deleting tasks with least priority and sort by duration helps in identifying the longest task first.

MS Project allows project managers to sort tasks by a number of criteria, including start date, finish date, priority, cost, and so forth.

Session 9

Project Baseline

Concepts

Steps to apply a preset sorting order are as follows:

1. On the **View** tab of the **Ribbon**, click **Sort** and then choose an option from the submenu, such as **by Start Date** or **by Cost** as shown in figure 9.10.

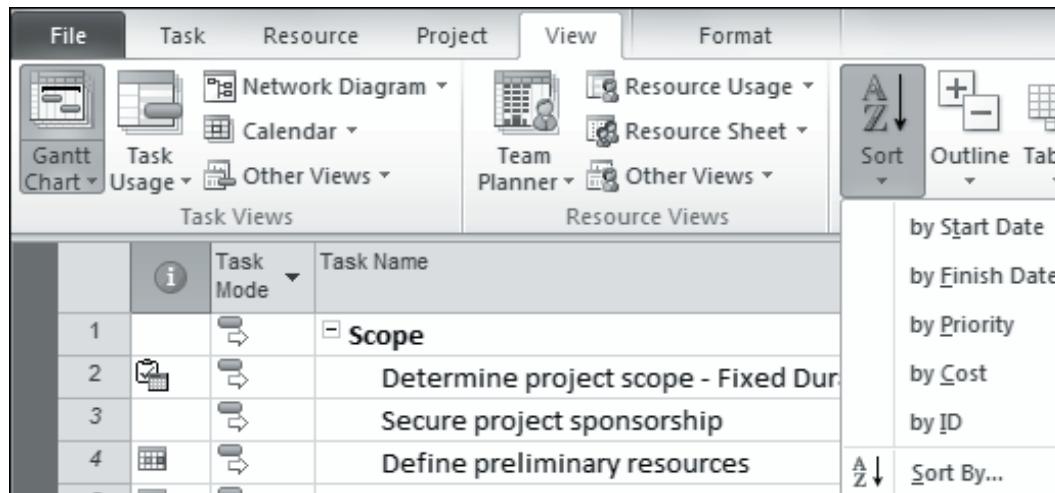


Figure 9.10: Sorting by Preset Project Details

For additional sort criteria or sorting by more than one criterion, follow these steps:

2. Click **Sort by** option in the drop-down list to display the **Sort** dialog box as shown in figure 9.11.
3. In the **Sort by** list, select criteria.

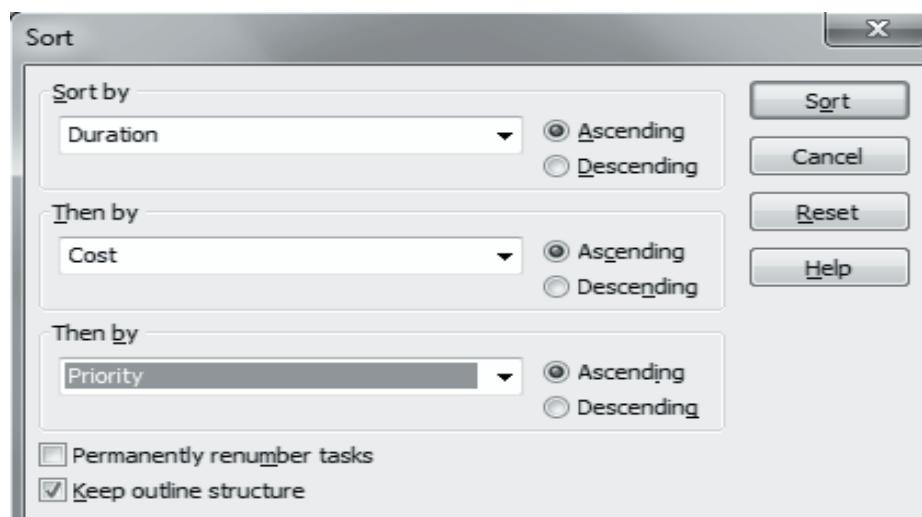


Figure 9.11: Sorting Project Details Using Sort by Option

Session 9

Project Baseline

Concepts

4. Select either **Ascending** (to sort from lowest to highest) or **Descending** (to sort from highest to lowest).
5. To choose a second criterion, click the first **Then by** box and make a selection.

To choose the Third criterion, click the second **Then by** box and make a selection.

4. Click **Sort**.
5. To return to original task order, select **Sort by** and choose ID, that is MS Project's standard sorting order.

9.9 Filtering Project Details

Filters in MS Project are handy tools for a project manager to track important task information such as delayed tasks or over budget tasks and so forth.

To filter tasks, on the **View** tab of the **Ribbon**, click **Filter** drop-down box and select a filter from the list as shown in figure 9.12.

Task Name	Duration	Start	Finish	Filter
Scope	498 days	Mon 04-01-10	Wed 26-01-11	Built-In
Determine project scope - Fixed Duration	8505 hrs	Mon 04-01-10	Fri 29-11-11	Active Tasks
Secure project sponsorship	1 day	Mon 27-12-10	Mon 28-12-10	Completed Tasks
Define preliminary resources	1 day	Tue 29-11-11	Wed 30-11-11	Critical
Secure core resources	1 day	Wed 30-11-11	Thu 01-12-11	Date Range...
Scope complete	0 days	Wed 30-11-11	Thu 01-12-11	Incomplete Tasks
Analysis/Software Requirements	14 days	Thu 01-12-11	Tu 15-12-11	Late Tasks
Conduct needs analysis	5 days	Thu 01-12-11	Mon 05-12-11	Milestones
Draft preliminary software specification	3 days	Thu 08-12-11	Mon 12-12-11	Summary Tasks
Develop preliminary budget	2 days	Tue 13-12-11	Thu 15-12-11	Task Range...
Review software specifications/budget	4 hrs	Thu 15-12-11	Fri 16-12-11	Tasks With Estimated Durations
Incorporate feedback on software speci	1 day	Thu 15-12-11	Fri 16-12-11	Using Resource...
Develop delivery timeline	1 day	Fri 16-12-11	Mon 19-12-11	Filter
Obtain approvals to proceed / consent +	4 hrs	Mon 19-12-11	Mon 19-12-11	Clear Filter

Figure 9.12: Filtering Project Details

Session 9

Project Baseline

Concepts

Figure 9.13 shows the outcome of selecting the filter milestones.

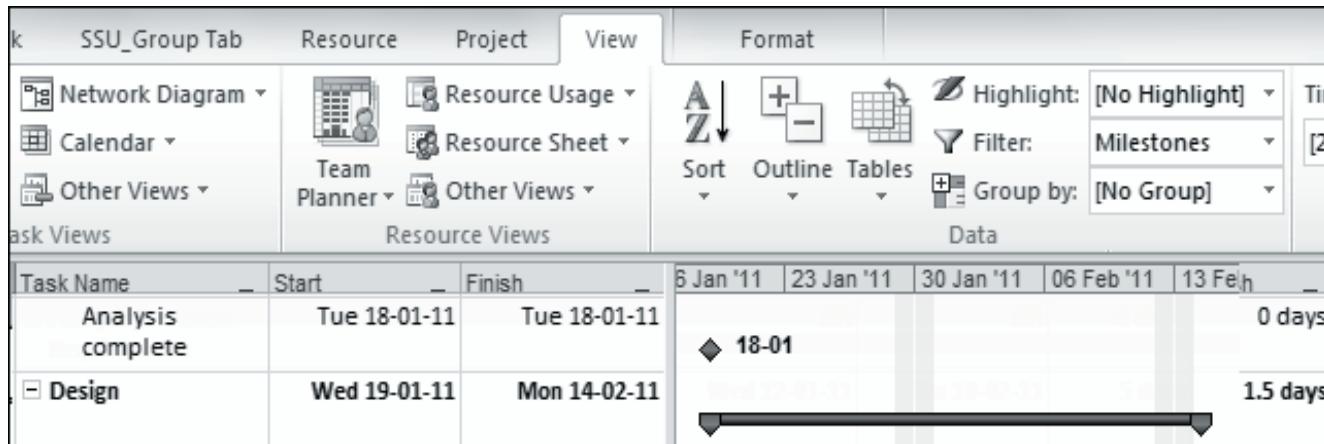


Figure 9.13: Outcome of Milestones as Filter

Table 9.1 lists some filters that are useful to identify and solve problems during the project schedule. The first six filters are task filters and the rest are resource filters.

Filter Name	Display Information
Critical	Tasks that must be completed according to schedule to meet final deadline (also known as 'critical path')
Cost Overbudget	Tasks that exceed budgeted expenditure
Incomplete Tasks	Tasks that have not been marked as complete
Late/Overbudget Tasks Assigned To	Tasks assigned to a resource that are running late than their baseline estimate and are over budget
Should Start By	Tasks that should have started as on a specified date
Slipped/Late Progress	Tasks that are running late and have no progress recorded
Overallocated Resources	Tasks with resources assigned that are overbooked during the task
Slipping Assignments	Tasks that involve resource work that should have begun by now
Work Incomplete	Tasks that should have had all their work recorded by now
Work Overbudget	More work hours have been put in on the task than the estimated

Table 9.1: List of Various Filters and their Display Information



Summary

- Baselines help to record actual activity to the original project plan efficiently to track their progress.
- MS Project 2010 provides the option to save multiple baselines and interim baseline plans.
- A maximum of 11 project baselines can be saved and a maximum of 10 interim plans can be saved in MS Project 2010.
- Baseline plans and interim plans can be deleted by clearing them.
- Interim plans and baseline plans use the same set baseline dialog box in MS Project.
- The Organizer feature helps the project manager to save and share project information among projects and in the global project template.
- Customizing baseline and interim plans help project managers to generate views and reports with detailed information of a project.
- Using Sort and filter feature in MS Project 2010 helps project managers to focus on critical aspects of a project during the project life cycle.

Session 9

Project Baseline

Concepts



Check Your Progress

1. By default, multiple baselines in Gantt Chart view shows-the first three saved baselines as _____.

A)	Baseline, Baseline 1, and Baseline 2
B)	Baseline 1, Baseline 2, and Baseline 3
C)	Baseline, Start/Finish Baseline 2, and Baseline 3
D)	Baseline 1, Start/Finish Baseline 2, and Baseline 3

2. Which of the following statements are true about baselines?

A)	Saving a baseline saves project estimates of time, cost, and resource workload
B)	Project baselines are used to track the actual activity against any time delays or cost overruns.
C)	A project baseline once saved, cannot be cleared before making it to an interim plan.
D)	If one task is removed from the project plan, the user cannot modify the project estimates and keep the rest of the baseline without making any changes.

3. The maximum number of baseline plans and interim plans respectively that are supported in MS Project 2010 are _____.

A)	10, 11
B)	30, 10
C)	11, 10
D)	30, 11

4. Which of the following are Preset Sorting values in MS Project 2010?

A)	Start date
B)	Duration
C)	ID
D)	Cost



Check Your Progress

5. Which of these do filters in MS Project 2010 help to find?

A)	Delayed tasks
B)	Assign material resources
C)	Over budget tasks
D)	Resource skill set

Objectives

At the end of this session, the student will be able to:

- *Explain built-in filters, auto filters, and custom filters*
- *Describe how to highlight matching items*
- *Explain predefined and customized groups*
- *Explain how to use Task Inspector*
- *Explain how to make use of suggestions and warnings*
- *Explain how to use multiple Undo feature*
- *Explain how to fine tune resource tasks and level the overallocated resources*

10.1 Introduction

After laying out the project plan, creating all project tasks, and assigning tasks to every resource, project managers need to view and fine tune the project plan to find any issues that may occur and resolve them wherever possible.

Fine tuning of a project plan may include changes to the project schedule or to the human resources, or the project budget. Also, fine tuning makes the project plan as practical as possible.

This session teaches how to apply built-in filters and auto filters. The session then explores how to define and use custom filters. This session also explains suggestions and warnings using filters and groups, highlight matching items and use multiple undo feature to fine tune a project plan. Finally, it explains how to fine tune resource tasks and level the overallocated resources.

10.2 Applying Built-in Filters

The first step in fine tuning a project plan is to view the plan from different angles. Filters in MS Project 2010 help project managers to view a project plan with such perspectives.

Session 10

Fine Tuning Project Plans

Two major problem areas that filters can help the project managers to examine are:

- **Overallocated Resources:** Resources working more than the number of hours assigned.
- **Tasks on a Critical Path:** A critical path consists of a series of tasks in a project that must happen on time to meet the deadlines.

Filters highlight tasks and resources meeting certain criteria of the project plan such as overallocated resources, over budgeted resources and so forth.

Built-in filters can be set for tasks or resources based on the following criteria:

- Tasks having a cost greater than the specified amount
- Tasks on the critical path
- Tasks occurring within a specific date range
- Milestone tasks
- Tasks using **Resources** from a resource group
- Tasks having overallocated resources

Based on the view selected, the list of built-in filters changes. If a filter is applied on any **Task** views such as **Task Usage** view, the **Filter** drop-down displays a built-in list for tasks.

Steps to open built-in filters in a **Task** view are as follows:

1. Open the project in any **Task** views such as **Task Sheet** view.
2. Click the **Filter** drop-down list located under **Data** group of the **Ribbon** to display built-in filters.
3. Select the respective built-in filter from the list to display relevant information on the sheet.

Session 10

Fine Tuning Project Plans

Figure 10.1 displays list of built-in filters in **Task Sheet** view.

The screenshot shows the Microsoft Project ribbon with the 'Project' tab selected. In the 'Data' group, the 'Filter' button is highlighted. A dropdown menu is open, showing a list of built-in filters. The list includes: [No Highlight], Timescale: [32] Weeks, Active Tasks, Custom [No Filter], Built-In, Active Tasks, Completed Tasks, Critical, Date Range..., Incomplete Tasks, Late Tasks, Milestones, Summary Tasks, Task Range..., Tasks With Estimated Durations, Using Resource..., Clear Filter, New Filter, More Filters..., and Display AutoFilter. The 'Active Tasks' filter is currently selected.

Task Name	Work	Duration	Start	Finish
Define project scope - fixed Duration not effort driven	32 hrs	258 days	Mon 04-01-10	
SSU-Sr Mgmt	8 hrs		Mon 04-01-10	
Secure project sponsorship	8 hrs	1 day	Mon 27-12-10	
SSU-Sr Mgmt	8 hrs		Mon 27-12-10	
Define preliminary sources	8 hrs	1 day	Tue 28-12-10	
Gary Zeus	8 hrs		Tue 28-12-10	
Secure core resources	8 hrs	1 day	Wed 29-12-10	
Gary Zeus	8 hrs		Wed 29-12-10	

Figure 10.1: List of Built-In Filters in Task Sheet View

If a filter is applied on any **Resource** views such as **Resource Sheet** view, the Filter drop-down displays built-in list for resources.

Steps to open built-in filters in **Resource** views are as follows:

1. Open the project in any **Resource** views such as **Resource Sheet** view.
2. Click the **Filter** drop-down list under **Data** group of the **Ribbon** to display built-in filters.
3. Select the respective built-in filter from the list to display relevant information on the sheet.

Session 10

Fine Tuning Project Plans

Figure 10.2 displays list of built-in filters in **Resource Sheet** view.

The screenshot shows the Microsoft Project 2010 interface. The ribbon at the top has tabs for Resource, Project, View, and Format. The View tab is selected. On the far right of the ribbon, there is a 'Built-In' filter section. This section includes a dropdown menu set to '[No Filter]' under 'Times'. Below this are several filter options: 'Budget Resources', 'Cost Overbudget', 'Group...', 'Non-budget Resources', 'Overallocated Resources', 'Resource Range...', 'Resources - Cost', 'Resources - Material', 'Resources - Work', 'Work Overbudget', and three buttons for 'Clear Filter', 'New Filter', and 'More Filters...'. A 'Display AutoFilter' button is also present. The main area shows a resource sheet with columns for Name, Type, Material, Initials, Group, Max., and Std. Rate. Data rows include Deployment Server (Material, No of Systems), Project Manager (Work, P), Analyst (Work, A), Developer (Work, D), Testers (Work, T), Trainers (Work, T), Technical Communicators (Work, T), and Deployment Team (Material, D). The 'Group' column for the last two rows is empty.

Name	Type	Material	Initials	Group	Max.	Std. Rate
Deployment Server	Material	No of Systems	IBM	IT		\$1,000
Project Manager	Work		P		100%	\$0.00
Analyst	Work		A		100%	\$0.00
Developer	Work		D		100%	\$0.00
Testers	Work		T		100%	\$0.00
Trainers	Work		T		100%	\$0.00
Technical Communicators	Work		T		100%	\$0.00
Deployment Team	Material		D			\$0

Figure 10.2: List of Built-In Filters in Resource Sheet View

10.3 Auto Filtering

MS Project 2010 provides the **AutoFilter** feature that is turned on by default for all the columns and in any project view.

Steps to create an **AutoFilter** are as follows:

1. Open the project in any table view that contains the columns to filter. Arrows appear for each column.
2. Click the arrow of the column to filter. Use either the list or the **Filters** submenu to select a filter.
3. To use the list, first deselect the **Select All** check box and then click to reselect individual items to show.

Session 10

Fine Tuning Project Plans

For example, to filter a specific task in the **Task Sheet** view, click the arrow that appears in the **Task Name** column. Then, deselect the **Select All** check box and select a specific task in the list, to filter and display the task in the **Task Sheet** view as shown in figure 10.3.

Task Name	Duration	Start	Finish	Resource Name
Analysis/Software Requirements	246 days	Tue 11-01-11	Tue 20-12-11	
Conduct needs analysis	5 days	Fri 09-12-11	Thu 15-12-11	Fay Morgan

Filters

- (Select All)
- Analysis/Software Requirements
 - Analysis complete
 - Conduct needs analysis
 - Develop delivery timeline
- Deployment
 - Deploy software
 - Deployment complete

OK Cancel

Figure 10.3: AutoFilter in Task Sheet View

4. To use **Filters** submenu, click a predefined filter. For example, to filter task durations in the **Duration** column having 1 day, choose **Equals** in the listed filters to display only those tasks having 1 day duration including respective summary tasks. Click **Group by Duration** to display all the tasks having 1 day duration.

Figure 10.4 shows the outcome of applying the AutoFilter.

Task Name	Duration	Start	Finish	Resource Names
Duration: 1 day	1d	Wed 26-05-10	Thu 08-12-11	
Secure project sponsorship	1 day	Mon 27-12-10	Mon 27-12-10	SSU-Sr Mgmt
Define preliminary resources	1 day	Tue 28-12-10	Tue 28-12-10	Gary Zeus
Secure core resources	1 day	Thu 08-12-11	Thu 08-12-11	Gary Zeus
Incorporate feedback on software	1 day	Thu 13-01-11	Fri 14-01-11	Fay Morgan
Develop delivery timeline	1 day	Fri 14-01-11	Mon 17-01-11	Gary Zeus
Secure required resources	1 day	Tue 18-01-11	Tue 18-01-11	Gary Zeus
Incorporate feedback into functio	1 day	Fri 11-02-11	Fri 11-02-11	SSU-Sr Mgmt

Figure 10.4: AutoFilter List and Options

10.4 Defining and Using Custom Filters

Filters often need customization to generate project information based on specific criteria. Custom filters help project managers to derive specific details of a project. Tasks or resources not meeting the filter criteria will not appear on the sheet.

For example, to create a custom filter to show cost of tasks having 1 day duration, open the sheet view that has the filter set for tasks having 1 day duration. Then, click the arrow in the **Add New Column** and select **Cost** to display the cost column for all those tasks. Figure 10.5 displays the cost column of tasks.

Task Name	Duration	Resource Names	Cost
<input checked="" type="checkbox"/> Pilot	135.13 days		\$1,400.00
Identify test group	1 day	Gary Zeus	\$0.00
Develop software delivery mechanism	1 day		\$0.00
Install/deploy software	1 day	Melissa Raymond	\$200.00
Obtain user feedback	1 wk	Melissa Raymond	\$1,000.00
Evaluate testing information	1 day	Melissa Raymond	\$200.00
Pilot complete	0 days		\$0.00
<input checked="" type="checkbox"/> Deployment	55 days?		\$4,900.00
Determine final deployment strategy	1 day	Melissa Raymond	\$200.00
Develop deployment methodology	1 day	Melissa Raymond	\$200.00
Secure deployment resources	1 day	Melissa Raymond	\$200.00
server setup	1 day?	Deployment Team	\$0.00
Train support staff	1 day	Melissa Raymond	\$200.00
Deploy software	1 day	Melissa Raymond	\$200.00

Figure 10.5: Gantt Chart Displaying Cost Column of Tasks

To find the tasks having costs greater than \$100, click the arrow located on the cost column and select **Filters** from the drop-down. This shows a list of filter conditions that can be applied. Click **is greater than** to display the **Custom AutoFilter** dialog box filter.

Session 10

Fine Tuning Project Plans

This displays cost related fields greater than \$100 as shown figure 10.6.

The screenshot shows a Microsoft Project Gantt chart with a 'Custom AutoFilter' dialog box overlaid. The dialog box has the following settings:

- Show rows where:
- Cost
- is greater than \$100.00
- And (radio button selected)

The Gantt chart lists several tasks with their details:

Task Name	Duration	Resource Names	Cost
Pilot	135.13 days		\$1,400.00
Install/deploy software	1 day	Melissa Raymond	\$200.00
Obtain user feedback	1 wk	Melissa Raymond	\$1,000.00
Evaluate testing information	1 day	Melissa Raymond	\$200.00
Deployment	54 days	Gary Zeus	\$4,900.00

Concepts

Figure 10.6: Custom AutoFilter for Displaying Filtered Cost Field

10.4.1 Highlighting Matching Items

To highlight items meeting filter criteria and without removing the non-matching items from the view, use the **Highlight** list in the **Data** group of the **View** tab on the **Ribbon**. Figure 10.7 illustrates the display of highlighted matching items having cost more than \$100.

The screenshot shows a Microsoft Project Gantt chart with several tasks highlighted in grey, indicating they have a cost greater than \$100. The highlighted tasks include:

- Pilot
- Identify test group
- Develop software delivery mechanism
- Install/deploy software
- Obtain user feedback
- Evaluate testing information
- Pilot complete
- Deployment
- Determine final deployment
- Develop deployment infrastructure
- Secure deployment resources
- server setup
- Train support staff
- Deploy software
- Deployment complete

The Gantt chart also shows other tasks like 'Obtain user feedback' and 'Evaluate testing information' which do not have a cost value displayed.

Figure 10.7: Highlighted Matching Items Having Cost More than \$100 in Gantt Chart

10.5 Predefined Groups

Grouping items help project managers to organize information by certain criteria. Like filters, MS Project provides predefined groups and custom groups. Groups can collapse and expand based on tasks or resources. Predefined groups in MS Project 2010 are quick and easy to apply.

Figure 10.8 depicts the predefined groups.

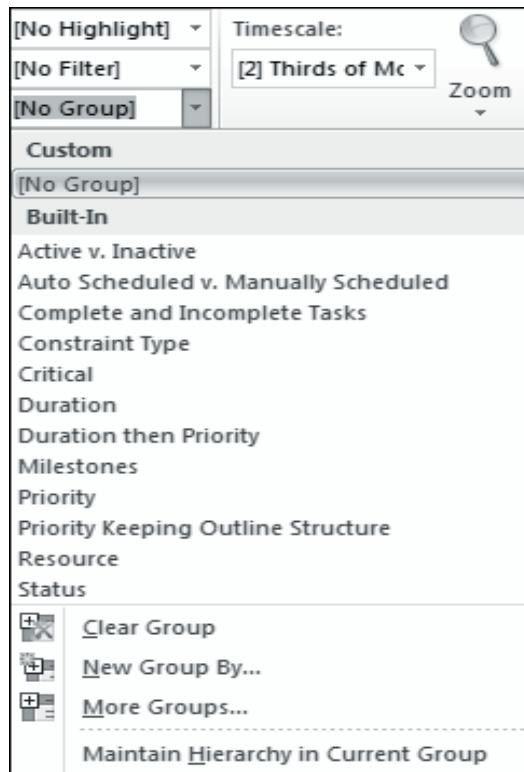


Figure 10.8: Predefined Groups

Steps to apply a predefined group to a project are as follows:

1. Open a project in any resource view such as **Resource Sheet** view to group resources or any task view such as **Gantt Chart** view to group tasks.

Session 10

Fine Tuning Project Plans

Concepts

2. On the **View** menu, click the **Group by** list in the **Data** group of the **Ribbon** and then choose the criteria in the list.

For example, project information is grouped and organized based on the duration of tasks as shown in figure 10.9.

The screenshot shows a Microsoft Project interface. The ribbon at the top has tabs like 'Task Diagram', 'Resource Usage', 'Resource Sheet', 'Team Planner', and 'Other Views'. The 'Resource Views' tab is selected. In the 'Data' group of the ribbon, the 'Group by' dropdown is set to 'Duration'. The main area is a Gantt chart with tasks listed. The first three tasks are collapsed under a group header 'Duration: 1 day' (1d). The fourth task, 'Duration: 3 days', is expanded, showing its details: 'Draft preliminary software specifications' (3 days, Start: Fri 15-01-10, Finish: Fri 23-07-10, Predecessor: none, Resource: Fay Morgan). The fifth task, 'Identify anomalies to product specifications', is also visible.

Task Name	Duration	Start	Finish	Predecessor	Resource Names
Duration: 1 day	1d	Tue 05-01-10	Tue 10-08-10		
Duration: 2 days	2d	Wed 20-01-10	Tue 27-07-10		
Duration: 3 days	3d	Fri 15-01-10	Fri 23-07-10		
Draft preliminary software specifications	3 days	Fri 15-01-10	Wed 20-01-10	8	Fay Morgan
Identify anomalies to product specifications	3 days	Thu 15-04-10	Tue 20-04-10	37	Sharon Gail

Figure 10.9: Grouping Tasks Using Predefined Groups by Duration in Gantt Chart

The **Gantt Chart** displays tasks groups by duration that can collapse and expand.

3. To redisplay in the original order, click the arrow on **Group by** drop-down and select **No Group** in the Group list on the **View** menu.

10.6 Customizing Groups

Like filters, groups often need customization to organize project information by certain criteria. Custom groups consist of three elements namely field name, field type, and order.

For example, to create a group to show field name such as baseline duration and a field type such as Tasks in a certain order such as descending order, project managers need to customize to create such group. Other customizing settings for groups are the formatting settings to a group appearance, such as the font or a font color.

Session 10

Fine Tuning Project Plans

Steps to create a custom group are as follows:

1. Open a project in any view, on the **View** tab under **Data** area on the **Ribbon**, click **Group by** drop-down list and click **More Groups...** to display the **More Groups** dialog box as shown in figure 10.10.

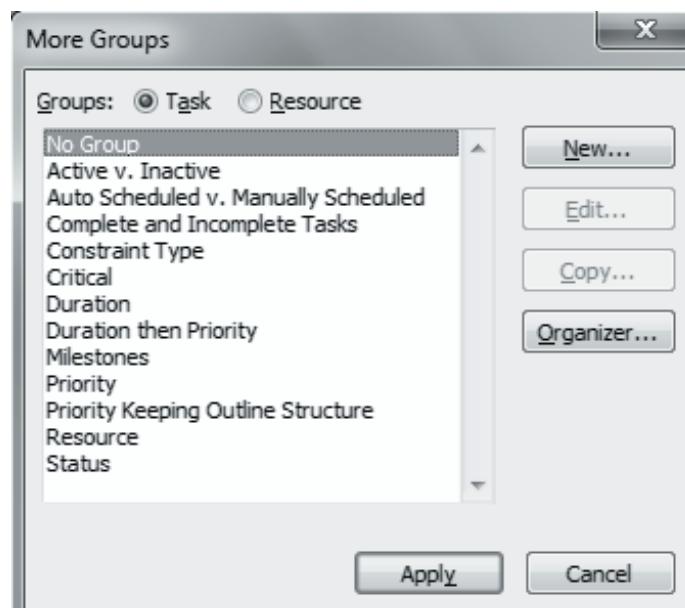


Figure 10.10: Creating Custom Group Using More Groups Dialog Box

2. Select either **Task** or **Resource** radio buttons to include the new group to that list.

Session 10

Fine Tuning Project Plans

- Click the **New** button to display the **Group Definition** dialog box as shown in figure 10.11.

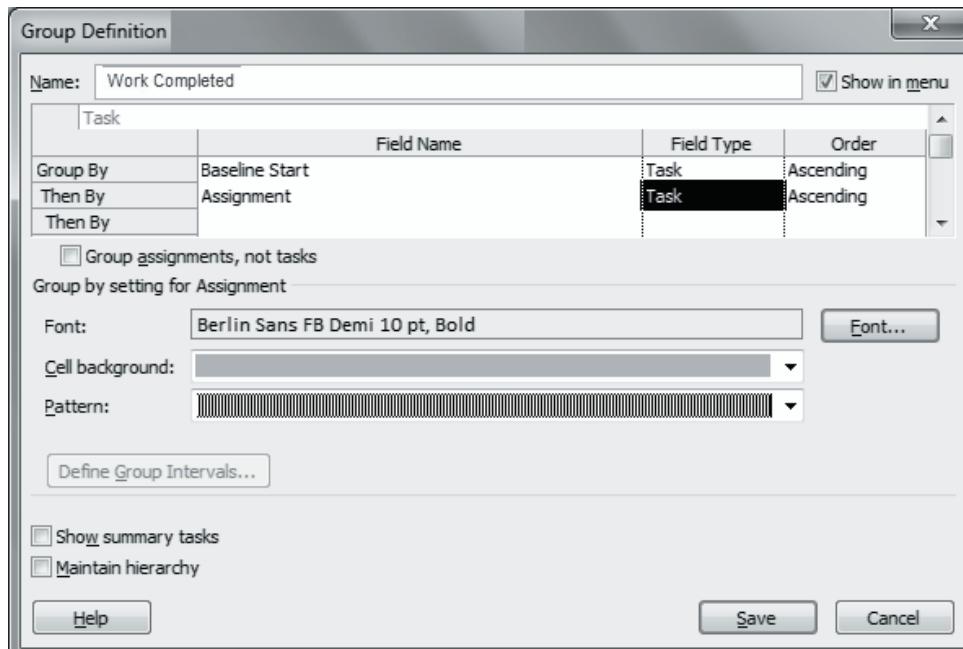


Figure 10.11: Customizing Group in Group Definition Dialog Box

- Type a name for the group in the **Name** field.
- On the first line of the **Field Name** column, click the down arrow to display the list, then select a field name, and click it.
- Perform actions similar to Step 5 for **Field Type** and **Order** columns.
- To add other sorting criteria, click **Then By** and make choices for the **Field Name**, **Field Type**, and **Order** columns.
- To show the new group in the list on the **Group** box, select the **Show in menu** check box on the formatting toolbar.
- Depending on the field name chosen, make settings for the **Font**, **Cell background**, and **Pattern** to format the group.
- To define intervals for the groups to be organized, click the **Define Group Intervals...** button to display the **Define Group Intervals** dialog box
- Use settings in the box to set starting time and an interval.
- Click **Save** to save the new group and then click **Apply** so that it appears in the plan.

10.7 Inspecting Tasks

In a project comprising number of tasks, dependencies, calendars, and so forth, it is tough to manually inspect each and every task.

MS Project 2010 supports four key features that help the project manager to fine tune the project before finalizing the project plan:

- **Task Inspector:** Is a unique feature that identifies the project manager to verify the timing of tasks in a project and also problems with suggestive solutions.
- **Task Warnings and Suggestions:** Helps the project manager to identify possible schedule issues on manually scheduled tasks.
- **Multiple Undo:** Allows trying different approaches and then undo several changes in a row.
- **Change Highlighting:** Helps in seeing the results of any change made to the project plan.

10.7.1 Task Inspector

The timing of a task in the project is affected by certain conditions called task drivers. The **Task Inspector** is a task driver that helps to recognize such conditions, which include the following:

- **Actual Start Date or Assignments:** Entering actual start date or making a resource assignment to a task and find that the resource is not available.
- **Calendars:** Assigning a different calendar to the task, resource, or both, and the difference in calendars causing a scheduling issue.
- **Leveling Delay:** Turning on leveling to deal with resource overallocation that may cause a delay on a task.
- **Constraints:** Applying a constraint to a task, such as pushing the task to finish on a specific date.
- **Summary Tasks:** Timings of summary tasks are driven by the timing of their respective sub tasks.
- **Dependency Relationships:** A predecessor task changing a task's timing.

Use the **Task Inspector** to ensure that the task schedule is in concurrence with other tasks, though start and finish dates are mentioned for manually scheduled tasks. MS Project calculates each manually scheduled task's start date based on its predecessors and the duration. If MS Project detects a delay in the task to start, it warns about the potential problem and also suggests a fix.

Steps to display the **Task Inspector** are as follows:

1. Open project in any task oriented view such as **Gantt Chart** view and on the **Task** menu, click the **Inspect** button on the **Tasks** group of the **Ribbon** and then **Inspect Task** to display the **Task Inspector**.

Session 10

Fine Tuning Project Plans

2. Click the task to inspect, and the **Task Inspector** pane explains the driving conditions of the selected task's timing as shown in figure 10.12.

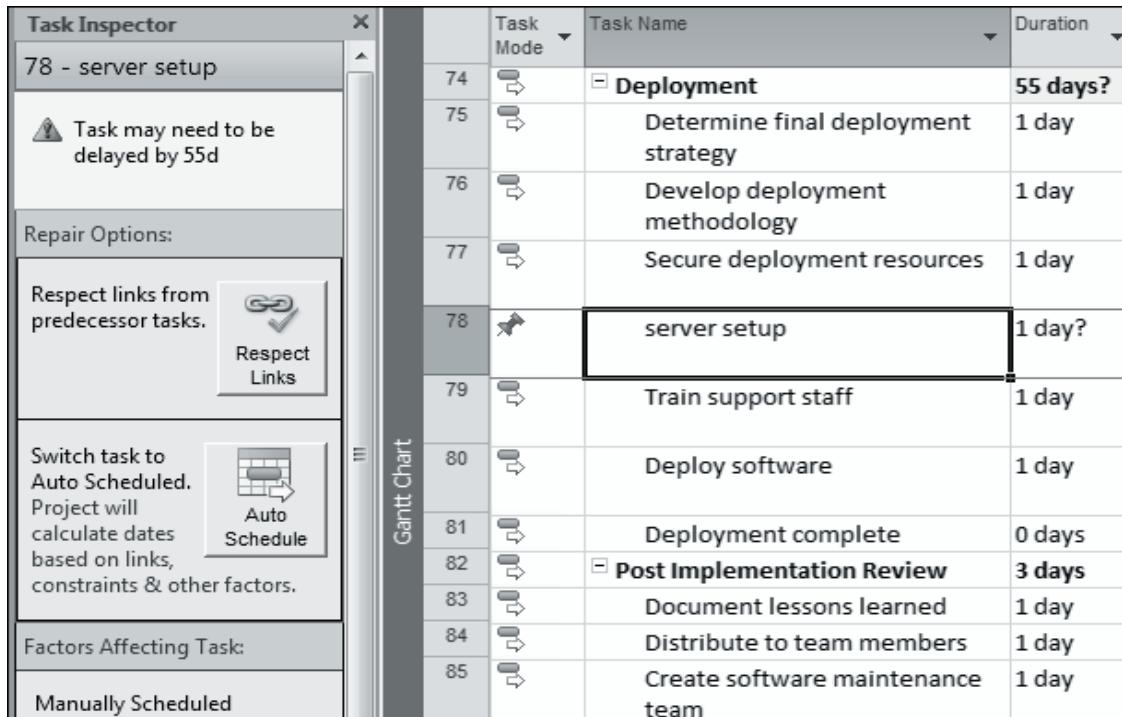


Figure 10.12: Task Inspector Pane Displaying Repair Options

3. Click another task to display its respective drivers and details. **Task Inspector** warns and suggests various **Repair Options** such as **Respect Links** and **AutoScheduled** for a fix to apply it to the task.

10.7.2 Task Warnings and Suggestions

MS Project reschedules auto scheduled tasks, while establishing task dependencies. Though MS Project cannot automatically move manually scheduled tasks, it calculates the occurrence of the task based on its links and conditions. In MS Project 2010, schedule warnings appear by default.

As the start and end dates for manually scheduled tasks are manually entered, any schedule changes to the predecessor task lets MS Project to move them to the best possible dates.

Whenever a potential scheduling problem occurs with a manually scheduled task, MS Project alerts in the form of warnings and suggestions as follows:

- Warnings appear as **red curly underlines**, generally under the task end date in the **Finish** column of the task sheet.
- Suggestions appear as **green curly underlines**, generally under the task start date in the **Start** column of the task sheet.

Session 10

Fine Tuning Project Plans

Warnings represent problems that are likely to cause the project schedule; suggestions provide ideas for optimizing the schedule, possibly improving the projected finish date.

To fix a warning that appears with a curly underline for a cell, right-click it to display a shortcut menu with options to fix the potential schedule problem as shown in figure 10.13.

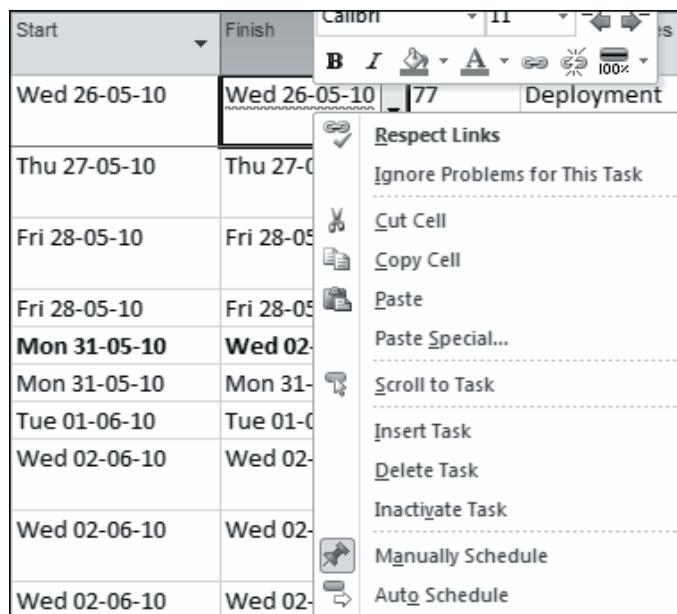


Figure 10.13: Shortcut Menu Options for Fixing Warnings

To apply a schedule change option provided in the list, click on it to reflect changes in the project schedule.

Note: The available schedule change options for warnings are different from that for suggestions, and they also vary depending on other conditions such as overallocated resources assigned to the task.

Steps to view suggestions are as follows:

1. Click the drop-down arrow on the **Inspect** button in the **Tasks** group of the **Task** tab and select **Show Suggestions** as shown in figure 10.14.

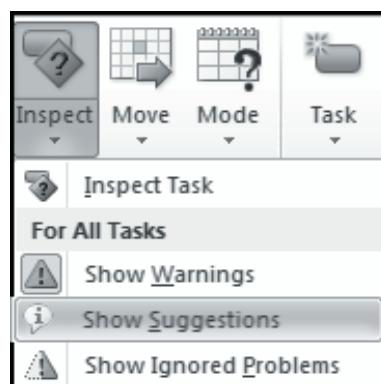


Figure 10.14: List Items in Inspect Button of the Ribbon

Session 10

Fine Tuning Project Plans

The warning curly underlines look similar to MS Word and to fix them, right-click the cell containing the curly underline to display a shortcut menu with options.

To apply a schedule change option, select and click the shortcut option.

Concepts

Note: The available schedule change options for warnings are different to those of suggestions, and also vary depending on whether any overallocated resources are assigned to the task.

Following are the details of options in the shortcut menu:

- **Reschedule to Available Date:** If an overallocated resource is assigned to a task, this choice reschedules all or part of the task, to a time frame when the resource is available to work on the task.
- **Respect Links:** Moves the task based on the timing of the predecessor task. This fix moves the task to a later date based on the predecessor task's schedule.
- **Switch to Auto Schedule:** Appears for manually scheduled summary tasks and suggests a fix to subtasks. This choice recalculates the summary task based on the rollup values of its subtasks. For subtasks, the choice moves the task earlier in the schedule.
- **Fix in Task Inspector:** Opens the **Task Inspector** pane to review the task drivers and other factors before selecting a schedule change. Task schedule warnings and suggestions will not appear unless task list is outlined with summary tasks. Hence, it is suggested to organize and schedule a project by the use of outlining.

10.8 Using Multiple Ctrl+Z

Project managers often try different scenarios that involve several changes to the project and undoing several actions in a row is a major technology challenge.

Project managers often try different scenarios that involve several changes to the project, by performing an action and undo it, then do another action and undo it, and so forth.

MS Project 2010 offers the multiple undo (Ctrl+Z) feature so that the manager can try several changes when finalizing or making adjustments to a project and then undo the whole list of changes or a portion of them at once.

For example, to change the timing of several tasks or the hourly rates of resources, the multiple undo feature helps as a handy tool for project managers.

Steps to undo multiple changes are as follows:

1. Click the down arrow of the **Undo** button on the **Quick Access** toolbar and then select the change to undo.
2. Alternatively, the user can use Ctrl+Z to undo the latest change.

Session 10

Fine Tuning Project Plans

3. To perform multi level undo and to roll back to a specific action, hold the Ctrl key and tap Z every time to display the sequence of recent actions or select a specific activity from the Undo actions list.

Figure 10.15 illustrates the display of undo actions.

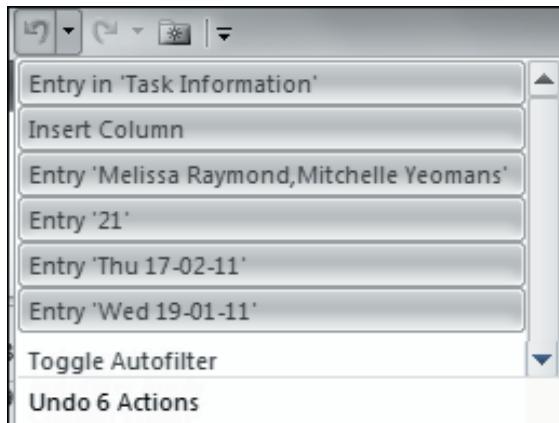


Figure 10.15: Sequential List of Actions for Multi Level Undo

10.9 Highlighting Changes

Another useful tool to see the changes made while fine tuning the project schedule is change highlighting. This feature can be turned on and off by adding the **Change Highlighting** button to the custom **Ribbon** tab.

Steps to customize the **Ribbon** are as follows:

1. Open the project and click **File** and select **Options**.
2. Click **Customize Ribbon** in the list located on the left of the **Project Options** dialog box.
3. Click the **New** button below the list, then click **Add**, and use the **Rename** button to rename the **New Tab (Custom)** and **New Group (Custom)** items in the list as preferred.
4. Click the **Choose commands from** drop-down and select **All Commands** in the list displayed.

Session 10

Fine Tuning Project Plans

Concepts

5. Drag **Change Highlighting** from the list of **All Commands** onto the new custom group on the created custom tab in the list on the right as shown in figure 10.16.

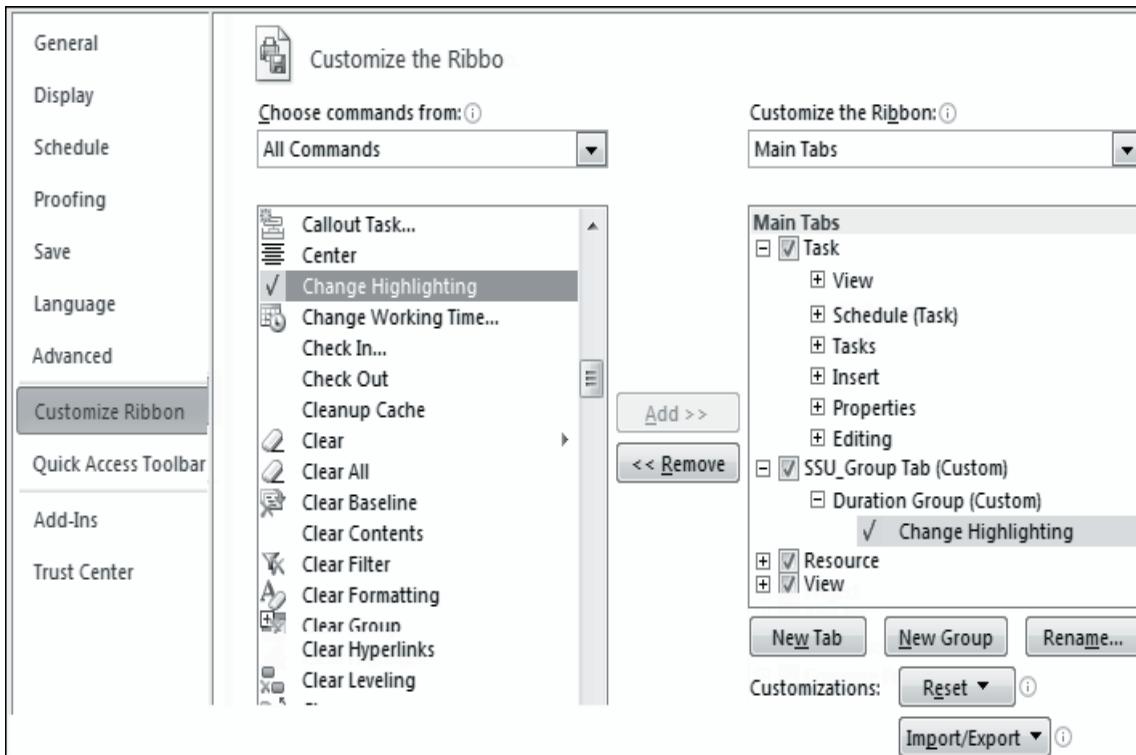


Figure 10.16: Customizing Ribbon with Change Highlighting Feature

6. Click **OK** to save changes.

Figure 10.17 illustrates the display of the newly added tab on the **Ribbon**.

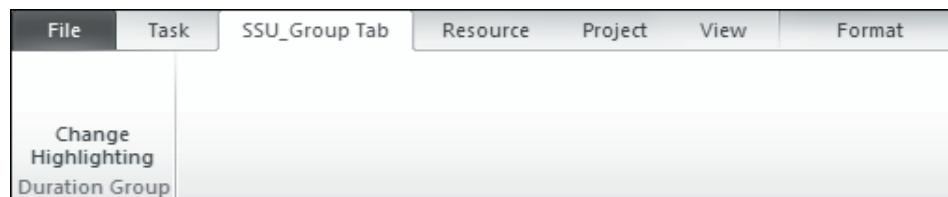


Figure 10.17: Customized Ribbon with Newly Added Tab

To delete the custom group and its contents from the list, right-click the custom group in the right section of the Project Options dialog box and click **Remove**.

Note: The Change Highlighting displays only the results of the last change made and works only on scheduling changes.

10.10 Fine Tuning Resource Tasks

Before finalizing the project plan, the project manager must make sure of two things:

- Total time to complete the project
- The critical path (the longest series of tasks that must be completed on project finish date)

Considering human errors, project manager can use filters and groups to identify the critical path and see that not too many tasks are on the critical path. The project manager can add some slack time to the plan to allow any inevitable delays.

Ideally, every task in a project should have slack time as things can come up unexpectedly. Also, slack cannot be added to every task as it probably pushes the timing of the project to a large extent.

Another factor that affects project timing is the availability of resources. Sometimes, setting a dependency relationship where one task cannot start before another task for the only reason of the same resources to work on the predecessor task.

Following are the few things to look for while modifying resource tasks:

- If the start date of a task is delayed because of a resource's unavailability, switch resources to let the task start sooner.
- MS Project calculates the duration of some auto scheduled tasks (Fixed Work and Fixed Units with effort-driven scheduling) based on the number of resources available to do the work. Adding more resources to such tasks shortens the project duration.
- Assigning more skilled resources to some tasks, reduce the hours of work to complete the task.
- Assigning more resources to tasks on the critical path makes the duration shorter that makes the overall project schedule shorter.
- Hiring an outside vendor sometimes is a viable option though it can impact the project cost.

10.11 Leveling Overallocated Resources

Gantt Chart view displays overbooked resources with an overallocation icon in the indicator column. To fix the overallocation, right-click the icon and choose **Reschedule to Available Date**. This method reschedules all or part of the task to a period when the resource has availability to fix the overallocation, if possible.

Even after choosing **Reschedule to Available Date**, if the icon still remains on the indicator column, the manager need to look at other methods to resolve the problem.

Session 10

Fine Tuning Project Plans

Right-clicking the icon again and choosing **Fix in Task Inspector** enables the **Task Inspector** to provide ideas for fixing the overallocation.

Adding resources to some tasks will shorten the task duration. MS Project by default keeps all the resources working on a task at the same level. Changing the work contour for the resource may free the resource work load during the life of a task.

Resource leveling is a MS Project feature in which it tries to resolve resource overallocation in a project.

The feature works in two ways:

- By delaying a task until the overbooked resource is available
- By splitting tasks

MS Project delays tasks that involve overallocated resources to use up any available slack. When no more slack on these tasks is available, MS Project makes changes based on any priorities entered for tasks, any dependency links, and task constraints (such as a **Start No Later Than** constraint).

Steps to level the resources in a project are as follows:

1. Open a project and click the **Resource** tab.
2. In the **Resource** tab, click **Leveling Options** on the Ribbon to display **Resource Leveling** dialog box as shown in figure 10.18.

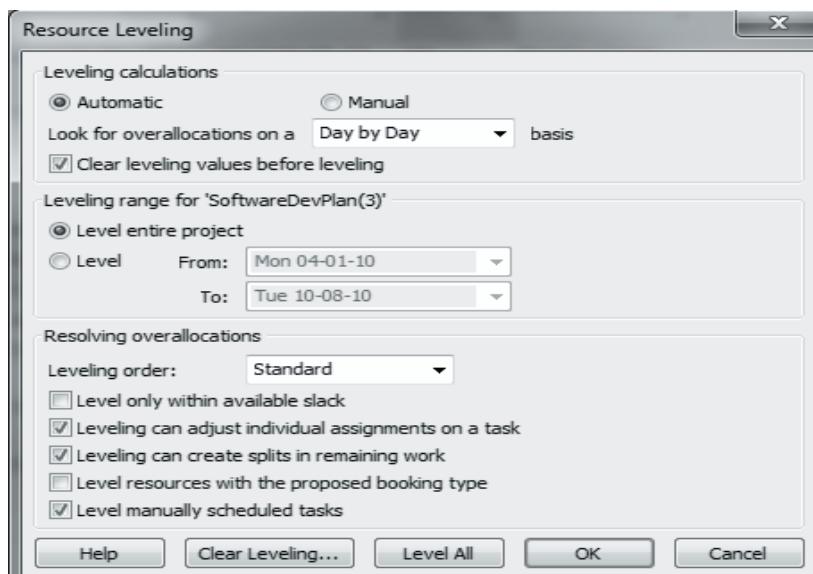


Figure 10.18: Leveling Overallocated Resources Using Resource Leveling Dialog Box

Session 10

Fine Tuning Project Plans

3. Make a choice between **Automatic** or **Manual**. These options work as follows:
 - Automatic option will level the resources whenever there is a change in the project plan. Make sure to select the **Clear leveling values before leveling** check box, to reverse previous leveling actions before leveling the next time.
 - Manual requires the user to click the **Level All** button in the **Resource Leveling** dialog box and or click the **Level All** button on the **Resource** menu under **Level** group of the **Ribbon**.
4. Set the **Leveling range** to one of the following:
 - Level Entire Project
 - Level between a date <range> by selecting **From** and **To** dates
5. Select a choice from the **Leveling Order** drop-down list that shows **Standard**, **ID Only**, and **Priority**, **Standard**. These options work as follows:
 - Standard considers slack, dependencies, priorities, and constraints.
 - ID Only delays or splits the task with the highest ID number in the project.
 - Priority, Standard uses task priority as the first criterion in choosing delay or split.
6. Select any of the five check boxes to control the level located at the bottom:
 - **Level only within available slack:** The current finish date for the project is retained without delaying any critical tasks
 - **Leveling can adjust individual assignments on a task:** Allows MS Project to remove or change assignments
 - **Leveling can create splits in the remaining work:** Allows some of the tasks on hold for a time period until resources are available for work
 - **Level resources with the proposed booking type:** Allows booking type (proposed or committed) to relate to a particular resource usage
 - **Level manually scheduled tasks:** Allows MS Project to move the task though the task is scheduled manually
7. Finally, click the **Level All** button to perform the leveling operation.
8. To reverse leveling, click **Clear Leveling** on the **Resource** menu under **Level** tab of the **Ribbon**.

10.12 Project Rescheduling

Project rescheduling happens when a project is put on hold for various reasons such as lack of budget, changing priorities, resources being pulled on to another project and so forth.

Scope and resources are the essential aspects of a project. If they are unchanged, rescheduling the entire project to start from a later date than rebuilding from the scratch helps project managers to a larger extent.

Steps to reschedule a project are as follows:

1. Open the project and on the **Project** tab, click **Move Project** under **Schedule** group of the **Ribbon**. This displays the **Move Project** dialog box as shown in figure 10.19.

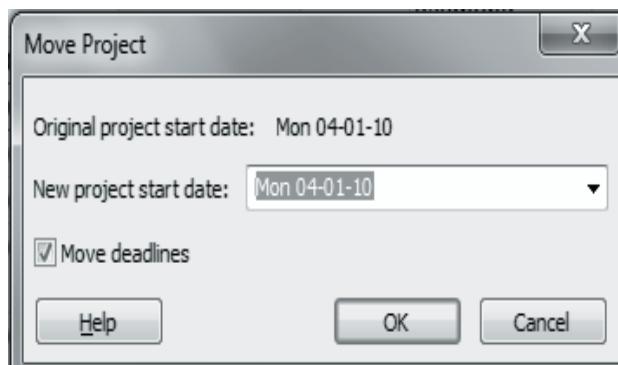


Figure 10.19: Move Project Dialog Box

2. Enter the new project start date in the **New project start date** box, or choose a date from the drop-down calendar.
3. Deselect the **Move deadlines** check box to skip moving any deadlines that are assigned to tasks. However, take care to see that the deadlines are not before the new start date before deselecting this check box.
4. Click **OK** to reschedule the project.



Summary

- The first step in fine tuning a project plan is to filter and view the plan from different perspectives.
- By default, MS Project 2010 turns on AutoFilter for all the columns and in any view.
- MS Project 2010 facilitates to highlight items meeting filter criteria and without removing the non-matching items from a view.
- MS Project provides predefined groups and custom groups that are quick and easy to apply
- MS Project 2010 provides three elements in custom groups namely field name, field type and order.
- The Task Inspector helps to organize tasks, their dependencies and calendars.
- Whenever there is a potential scheduling problem with a manually scheduled task, MS Project alerts in the form of warnings and suggestions.
- Warnings appear as red curly underlines and suggestions appear as green curly underlines in MS Project 2010.



Check Your Progress

1. By default, levels of resources in MS Project are indicated _____.

A)	At the same level
B)	Based on skills and experience of the resource
C)	Based on priority of tasks and dependencies
D)	At zero level

2. Which of the following statements are true about criteria for built-in filters?

A)	Tasks having a cost greater than the specified amount
B)	Tasks not on the critical path
C)	Tasks not occurring within a specific date range
D)	Milestone tasks

3. Which one of the leveling order is used for slack, dependencies, priorities, and constraints?

A)	Standard
B)	ID Only
C)	Priority
D)	Priority, Standard

4. When fine tuning a project, key features that help the project manager are _____.

A)	Task Inspector
B)	Change highlighting
C)	Grouping projects
D)	Task warnings and suggestions

5. Changing the work contour for a resource may result in _____.

A)	Assigning more tasks to the resource
B)	Removing the task information
C)	Leveling cost of the resource
D)	Removing the resource work load

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Objectives

At the end of this session, the student will be able to:

- *Describe how to track projects*
- *Describe tracking tools*
- *Explain project updates*
- *Describe setting progress lines*
- *Explain types of tables*
- *Explain how to identify slipping tasks*
- *Explain project budget analysis*

11.1 Introduction

Project managers need to be aware of the project status and track its progress closely. They need to identify any deviations or scheduling conflicts in the project plan and fix them at the earliest. In resolving these issues, project managers might need to make changes to the task schedule or resource assignments. This session explains using various methods of getting project updates. It also explains how to identify and resolve scheduling conflicts and identify potential effects of changes on overall scheduling and budget. Finally, this session teaches how to monitor and control the project progress.

11.2 Tracking Projects

Once the project plan is devised, project managers need to track the project progress and each activity, record the actual start and finish dates of each task, and determine whether each activity is executing as planned. Managers need to gather this data and update the project status as it progresses. They can then compare the gathered data with the baseline plan to check whether the project is progressing as planned or it is deviating from the planned timelines and goals.

The data gathered for tracking a project can be as basic as the start and finish time and dates of each task or it can be as detailed as to include actual timelines, costs, work hours, and resources assigned.

Session 11

Monitoring and Controlling Project Progress

Depending on what information managers want to gather for tracking the project status, managers can select one of the following four tracking methods or tools:

- Task-total method
- Task-timephased method
- Assignment-total method
- Assignment-timephased method

11.2.1 Task-total Method

The Task-total Method is used to track the total task durations, actual start and finish dates, work hours, or costs up to the current date. This data can be tracked in the **Task Sheet** view with the Tracking table displayed.

The following are the steps to display this view and use the **task-total** Method:

1. Open the project.
2. On the **File** tab, in the **View** group, click **Gantt Chart** and select **Task Sheet** view.
3. On the **View** tab of the **Ribbon**, click **Tables** and then click **Tracking**.

This displays the Tracking table with list of project tasks, along with the actual start and finish dates of each task. It also displays for each task, the percent of task completed, actual task duration, remaining task duration, actual cost, and actual work hours. Project managers can record and track project information in this view.

Figure 11.1 shows the Tracking table.

	Task Name	Act. Start	Act. Finish	% Comp.	Act. Dur.	Rem. Dur.	Act. Cost
20	Review prelim	Thu 20-01-11	Mon 24-01-11	100%	2 days	0 days	\$4,000.00
21	Review functio	Fri 04-02-11	Tue 08-02-11	100%	2 days	0 days	\$0.00
22	Incorporate fe	Tue 08-02-11	Wed 09-02-11	100%	1 day	0 days	\$0.00

Figure 11.1: Tracking Table

Session 11

Monitoring and Controlling Project Progress

Concepts

11.2.2 Task-timephased Method

The task-timephased Method is used to track work hours or costs in time phases, on a day-by-day basis. This method is useful if managers want to present in their weekly status meeting, the work hours and costs put in during that week.

Steps to track project data using the time-phased method are as follows:

1. Click the down arrow on the **Gantt Chart** button on the **Task** tab.
2. Select **Task Usage** from the drop-down list to display the **Task Usage** view with work hours, duration, and start and finish dates for all tasks in the left panel.

In the right panel is the timephased data, where the work hours assigned for each task can be tracked on a planner-like sheet, by month, week, and weekdays.

Figure 11.2 displays the **Task Usage** view with timephased data in the panel on the right.

	Task Name	Act. Start	Act. Finish	% Comp.	Act. Work
1	Scope	Mon 04-01-10	NA	25%	13.95 hrs
2	Determine project scope - Fixed	Mon 04-01-10	Mon 04-01-10	100%	13.95 hrs
	SSU-Sr Mg	Mon 04-01-10	Mon 04-01-10		13.95 hrs

Figure 11.2: Tracking Project Using Task-Timephased Method

Steps to track the actual timephased work hours put in for each task in contrast with the assigned work hours are as follows:

1. Click the **Task Usage Tools** tab on the **Ribbon**.
2. In the **Details** group on the **Task Usage Tools** tab, select the **Actual Work** check box.

Users can also select to display and track other timephased data, such as **Cumulative Work**, **Baseline Work**, and **Actual Cost**.

Session 11

Monitoring and Controlling Project Progress

11.2.3 Assignment-total Method

The assignment-total Method is used to track the total work or costs per resource assignment up to the current date.

Steps to track data using Assignment-total method are as follows:

1. Open the **Task Usage** view.
2. Next, on the **View** tab, click the **Tables** button and select the **Tracking** option from the drop-down menu.

On the right panel in this view, users can track by tasks as well as each resource assigned for tasks, the actual start and finish dates of each task, percentage of task completed, actual task duration, task duration remaining, and the actual cost.

Figure 11.3 displays the **Task Usage** view with the Tracking table using Assignment-total method.

The screenshot shows the Microsoft Project application window with the 'Task Usage' view selected. The ribbon at the top has tabs for Task, Resource, Project, View, and Format. Under the View tab, the 'Tables' button is highlighted, indicating the Tracking table is selected. The main area displays a table with the following data:

Task Name	Act. Start	Act. Finish	% Comp.	Act. Dur.	Rem. Dur.	Act. Cost
Scope	Mon 04-01-10	NA	65%	3.48 days	1.9 days	\$200.00
Determine project scope - Fixed Duration not effort driven	Mon 04-01-10	Mon 04-01-10	100%	1 day	0 days	\$200.00
SSU-Sr Mgmt	Mon 04-01-10	Mon 04-01-10				\$0.00
Secure project sponsorship	Mon 04-01-10	NA	44%	2 days	2.5 days	\$0.00

Figure 11.3: Tracking Project Using Assignment-total Method

11.2.4 Assignment-timephased Method

The assignment-timephased Method is used to track each resource assignment's work hours and costs in time phases.

Steps to track data using Assignment-timephased method are as follows:

1. Open the **Task Usage** view with the Tracking table displayed.
2. Next, in the **Details** group on the **Task Usage Tools** tab, select the **Actual Work** check box.

Session 11

Monitoring and Controlling Project Progress

Figure 11.4 displays the **Task Usage** view with timephased Actual Work data, for each resource assignment.

Task Name	Act. Start	Act. Finish	% Comp.	Act. Dur.	Rem. Dur.	Act. Cost	Act. Work
<input checked="" type="checkbox"/> Scope	Mon 04-01-10	NA	80%	7.57 days	1.93 days	\$200.00	62.4 hrs
<input checked="" type="checkbox"/> Determine project scope - Fixed Duration not effort driven	Mon 04-01-10	Mon 04-01-10	100%	1 day	0 days	\$200.00	13.95 hrs
<i>SSU-Sr Mgmt</i>	<i>Mon 04-01-10</i>	<i>Mon 04-01-10</i>				<i>\$0.00</i>	<i>13.95 hrs</i>
<input checked="" type="checkbox"/> Secure project sponsorship	Mon 04-01-10	Wed 06-01-10	100%	2.13 days	0 days	\$0.00	1.7 hrs
<i>SSU-Sr Mgmt</i>	<i>Mon 04-01-10</i>	<i>Wed 06-01-10</i>				<i>\$0.00</i>	<i>1.7 hrs</i>
<input checked="" type="checkbox"/> Define preliminary resources	Tue 05-01-10	NA	75%	5.34 days	1.78 days	\$0.00	42.75 hrs
<i>Gary Zeus</i>	<i>Tue 05-01-10</i>	<i>NA</i>				<i>\$0.00</i>	<i>42.75 hrs</i>
<input checked="" type="checkbox"/> Secure core resources	Thu 07-01-10	NA	50%	0.5 days	0.5 days	\$0.00	4 hrs

Figure 11.4: Tracking Project Using Assignment-timephased Method

11.3 Tracking Tools

MS Project provides handy tracking tools located at the top of the **Schedule** group on the **Task** tab of the **Ribbon** to perform updates on selected tasks in any sheet view.

Table 11.1 describes various tracking tools and their purpose.

Tracking Tool	Purpose
0%	Mark the selected tasks as 0% complete
25%	Mark the selected tasks as 25% complete
50%	Mark the selected tasks as 50% complete
100%	Mark the selected tasks as 100% complete
Mark on Track	Mark the selected tasks so that they are on schedule
Update Tasks	Update information for the selected tasks such as mark percent complete, set actual or remaining duration, and modify actual start and finish dates
Respect Links	Move the selected tasks so that their dates are determined by any task dependencies they have
Inactivate	Make the selected tasks inactive so that the tasks no longer affect the schedule and the resource availability

Table 11.1: Various Tracking Tools

Session 11

Monitoring and Controlling Project Progress

Figure 11.5 shows the tracking tools in the **Schedule** group.

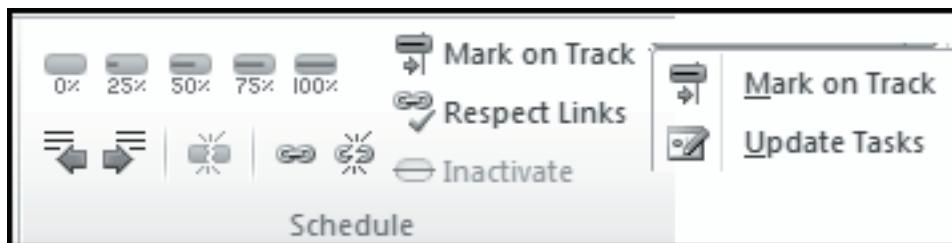


Figure 11.5: Tracking Tools in the Schedule Group of the Ribbon

11.3.1 Updating the Project

Project managers use the tracking tools in MS Project 2010 for specific updates of the selected tasks which are as follows:

- Marking a task's progress using a calculation of the percentage of hours of work completed is quickly done by clicking the Percentage Complete tool (**0% to 100%**). This tool is present in the **Schedule** group on the **Ribbon**.
- Selecting a task and clicking on the **Mark on Track** tool automatically updates activity to the status date as scheduled in the baseline.
- **Update Tasks** tool that appears on clicking the down arrow beside **Mark on Track** displays the Update Tasks dialog box. This dialog box contains tracking fields from the Task Information dialog box as well as some other fields for updating the project as shown in figure 11.6.

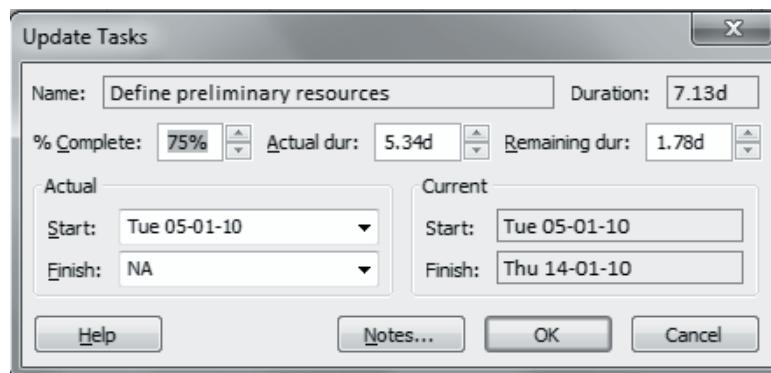


Figure 11.6: Update Tasks Dialog Box

The **Update Project** tool enables project managers to mark all the tasks in a project as complete on a status date. Project managers can write additional notes about the task progress by clicking **Notes** and entering information in the **Notes** dialog box.

Session 11

Monitoring and Controlling Project Progress

Steps to update all the tasks in a project are as follows:

1. On the **Project** tab, click **Update Project** on the **Ribbon** to display **Update Project** dialog box as shown in figure 11.7.
2. Choose any of the options: Set 0% – 100% complete or Set 0% or 100% complete only.
 - The Set 0% – 100% complete setting lets MS project to assume that tasks started and moved on time.
 - The Set 0% or 100% complete only setting lets MS Project to record 100% complete based on the baseline and leave all other tasks at 0% complete.
3. Choose either **Entire project** or **Selected tasks** for the changes to apply.
4. Click **OK** to save the settings and make project updates.

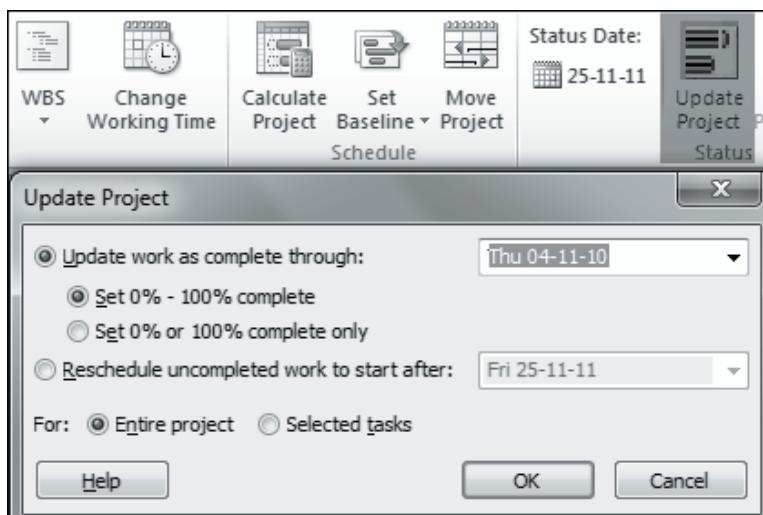


Figure 11.7: Update Project Dialog Box

To reschedule any uncompleted work to a future time, select the **Reschedule uncompleted work to start after** option and then select a date from the list.

11.3.2 Moving a Task

The **Move Task** tool in MS Project 2010 helps project managers to reschedule an entire task or part of a task. **Move Task** tool is located in the **Tasks** group of the **Task** tab on the **Ribbon**, it enables to move a task either forward or backward, or reschedule parts of a task as on the selected status date.

Session 11

Monitoring and Controlling Project Progress

Steps to move a task are as follows:

1. Open the project to display in **Gantt Chart** view.
2. Select the task and set a status date to the task that is partially complete and to move its uncompleted part to a future date.
3. Click the **Move Task** button in the **Tasks** group on the **Task** tab of the **Ribbon**.

The options of moving the task appear as shown in figure 11.8.

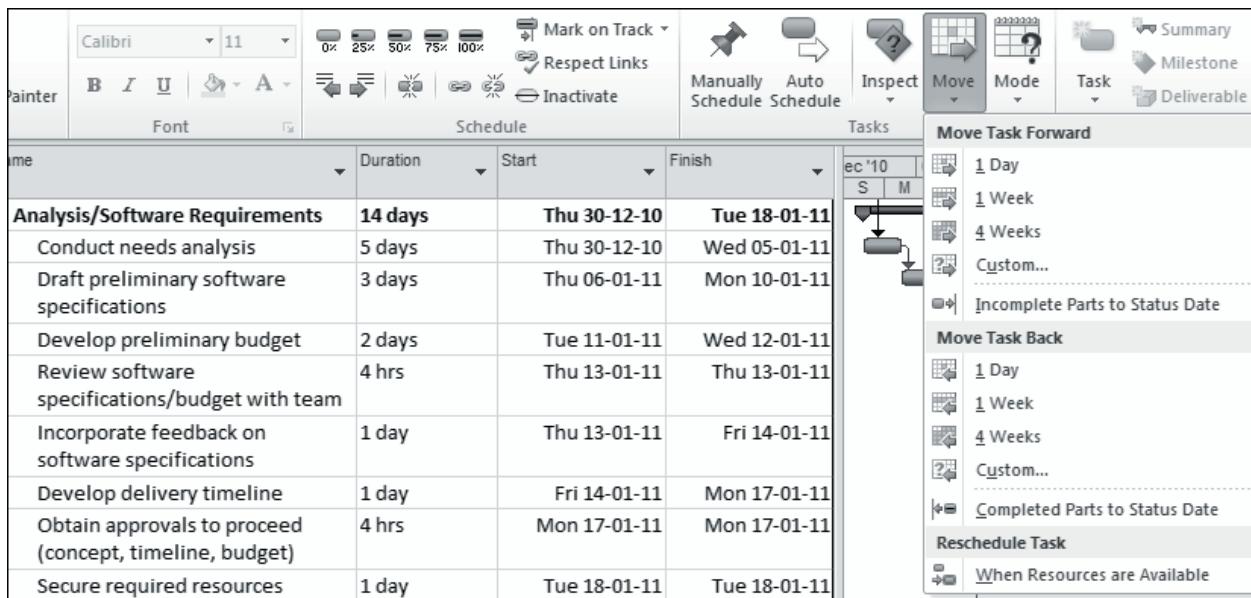


Figure 11.8: Moving Tasks

4. To move a task forward or backward by certain amount, click **1 Day**, **1 Week**, or **4 Weeks** on **Move Task Forward** or **Move Task Back** respectively.
5. To move the task to a custom time frame, click **Custom** and specify the number of working days to move the task and click **OK** to move the task.
6. To reschedule parts of a task, click **Incomplete Parts to Status Date** and move the uncompleted section to restart later, starting on the status date.
7. Click **Completed Parts to Status Date** to move the completed portion earlier, before the status date.
8. To reschedule the task based on the availability of the assigned resources, click **When Resources are Available** and specify the number of working days to move the task.

Session 11

Monitoring and Controlling Project Progress

Concepts

11.3.3 Progress Links

The **Add Progress Line** tool in MS Project 2010 is a drawing tool that indicates a progress line for the tasks that are ahead of the project schedule and also the tasks behind schedule. By default, MS Project does not display any progress lines. They are displayed once they are turned on.

Steps to create and display progress lines are as follows:

1. Open the project in the **Gantt Chart** view and right-click the chart in **Gantt Chart** view and select **Progress Lines** to display the **Progress Lines** dialog box to set up progress lines at particular dates as shown in figure 11.9.

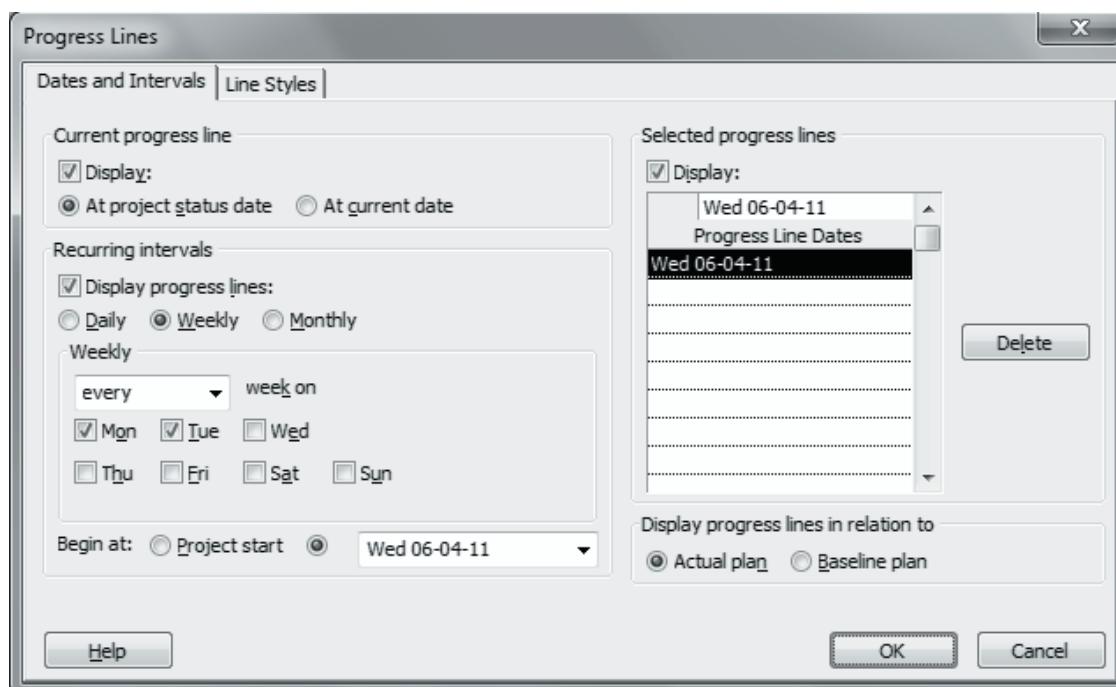


Figure 11.9: Progress Lines Dialog Box

2. Select the **Display** check box under **Current Progress Line** and select **At project status date** or **At current date** to always show a progress line for the current or status date.

To display progress lines at specific intervals, perform the following:

- Select the **Display Progress Lines** check box under **Recurring Intervals**, and select **Daily**, **Weekly**, or **Monthly**.
- Specify the interval settings to display the progress line on the selected days of the week.

Session 11

Monitoring and Controlling Project Progress

3. Select whether to display progress lines at the **Project start** or on any selected date from the calendar.
4. On the right pane of the dialog box, select the **Display** check box under **Selected Progress Lines**.
5. Select a date from the **Progress Line Dates** drop-down calendar to display a progress line on a specific date as shown in figure 11.10.
6. Make this setting for multiple dates by clicking subsequent lines in the list by selecting additional dates.

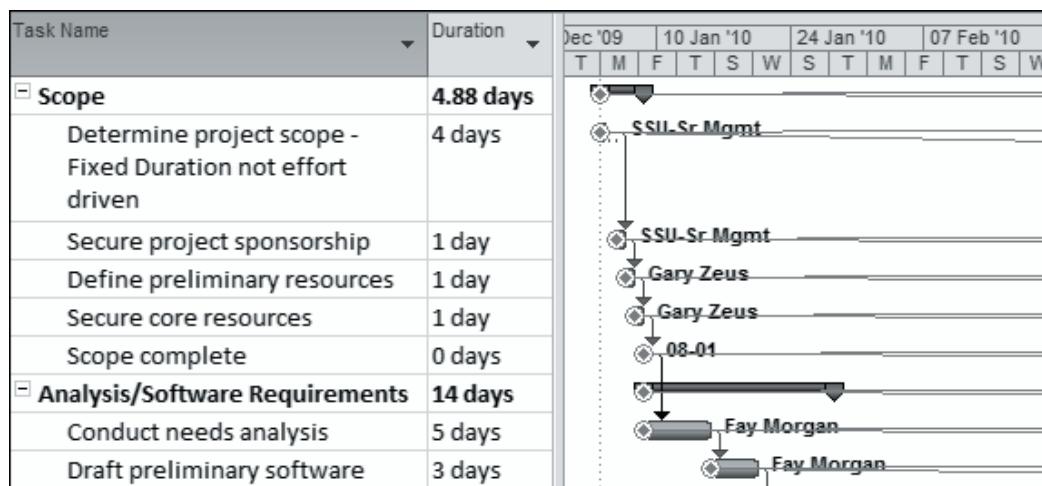


Figure 11.10: Progress Lines of Tasks Set at Project Status Date

7. Select **Actual plan** or **Baseline plan** radio buttons to display progress lines with respect to actual or baseline information. To track and show a task with 50 percent complete and by selecting actual plan option, MS Project display progress lines relative to the 50 percent of the actual line but not the complete baseline taskbar.
8. Click **OK** to save settings.

Progress lines are displayed as zigzag lines among tasks and forms, displaying peaks pointing left or right. These peaks indicate late or early tasks calculated based on the set status date or based on specific date.

A progress line pointing to the left of a task indicates the task running late and the one to the right shows the task ahead of the schedule.

Session 11

Monitoring and Controlling Project Progress

To apply formatting changes to progress lines, follow these steps:

1. Right-click the chart portion of the **Gantt Chart** view and select **Progress Lines**. This displays the **Progress Lines** dialog box.
2. Click the **Line Styles** tab, to display the formatting options as shown in figure 11.11.

Concepts

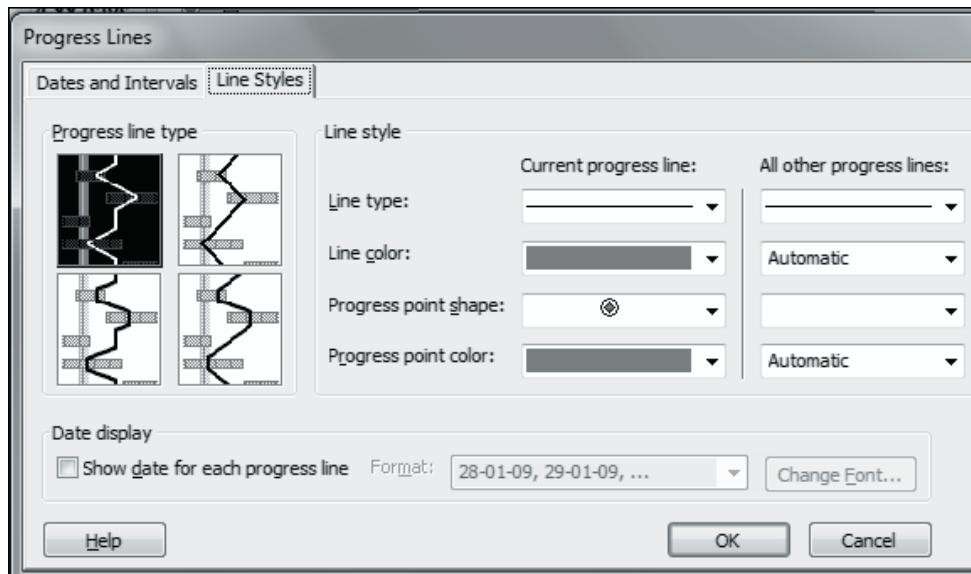


Figure 11.11: Line Styles Tab of Progress Lines Dialog Box

3. Click a line style sample under the **Progress line type**.
4. Click a style from the samples drop-down in the **Line type** fields by making two settings; one for the current progress line and the other for all other progress lines.
5. Change the **Line color**, **Progress point shape**, and **Progress point color** by opting different choices in these boxes.
6. To display a date adjacent to each progress line, select **Show date for each progress line** and select a date from the **Format** date.
7. Click **Change Font...** to change the display font for the displayed date.
8. Click **OK** to save the settings.

11.4 Monitoring with Tables

In MS Project, two tables in **Gantt Chart** view, the Cost table and the Variance table, provide information about the expenditure and variations in timing between baseline estimate and actual activity.

Session 11

Monitoring and Controlling Project Progress

Concepts

11.4.1 Cost Table

The Cost table displays data to compare and review baseline estimates of fixed costs and the actual costs by placing them in side by side columns.

Figure 11.12 displays the current total cost based on tracked information is \$16,900 and the baseline estimate was \$5,000, giving a variance of \$11,900 over the budget.

Task Name	Fixed Cost	Total Cost	Baseline	Variance	Actual	Remaining
SSU_Group Project	\$0.00	\$16,900.00	\$5,000.00	\$11,900.00	\$1,600.00	\$15,300.00
Scope	\$0.00	\$1,600.00	\$0.00	\$1,600.00	\$1,600.00	\$0.00
Determine project scope - Fixed Duration	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Figure 11.12: Gantt Chart View Displaying the Cost Table

Steps to display a Cost table are as follows:

1. Open the project in **Gantt Chart** view.
2. Click the **View** tab and select **Cost** under **Tables** tab of the **Ribbon** to display **Cost Table** on the **Gantt Chart**.

11.4.2 Variance Table

The Variance table displays data to compare and view scheduling whether on track or having any schedule variances. It shows the variance between baseline start and finish dates, task durations, and also the actual timing occurred on tasks during the project life cycle as shown in figure 11.13.

Task Name	Start	Finish	Baseline Start	Baseline Finish	Start Var.	Finish Var.
Determine project scope -	Wed 06-01-10	Thu 07-01-10	Mon 04-01-10	Wed 06-01-10	6 days	2.88 days
Secure project	Thu 07-01-10	Fri 08-01-10	Wed 06-01-10	Fri 08-01-10	1.88 days	-0.13 days
Define preliminary	Wed 06-01-10	Fri 08-01-10	Tue 05-01-10	Thu 07-01-10	1.88 days	0.88 days
Secure core	Thu 07-01-10	Mon 11-01-10	Tue 05-01-10	Thu 07-01-10	2.88 days	1.88 days

Figure 11.13: Gantt Chart View Displaying the Variance Table

Session 11

Monitoring and Controlling Project Progress

Steps to display a Variance table are as follows:

1. Open the project in **Gantt Chart** view.
2. Click the **View** tab and select **Variance** under **Tables** tab of the **Ribbon** to display **Cost Table** on the **Gantt Chart**.

Concepts

11.5 Analyzing Project Budget

While entering resource hours and fixed costs in a project, MS Project calculates task timing and resource workload in the project plan. These calculations determine task updates, critical path, and earned value.

Inserting certain columns of data in any view in MS Project 2010, generate views on some calculated analyses on the project budget. Earned Value reports also provide this information. Project managers should become familiar with the most common calculations as follows:

- The Earned Value (EV), formerly known as Budgeted Cost of Work Performed (BCWP) is a calculation of the value of the work completed expressed in dollars. For example, if a task has \$1,000 of costs associated with it and recording that task as 50 percent complete, the earned value for that task is \$500, which is 50 percent of the baseline estimated costs.
- The Actual Cost of Work Performed (ACWP) is a calculation of actual costs that include tracked resource hours or units expended and any fixed costs on the task. Earned value calculates cost at the baseline value whereas ACWP calculates the actual tracked costs.
- The Estimate At Completion (EAC) is a calculation of totaling all costs on a task. EAC calculates for a task in progress, the actual costs recorded to date including the remaining baseline estimated costs.
- The Cost Variance (CV) is a calculation representing the difference between planned costs and actual costs recorded as of date plus any remaining estimated costs. This number is expressed as a negative number if it is under budget and as a positive number if it is over budget.

11.6 Earned Value Options

MS Project provides two settings to calculate the earned value to a project as follows:

- % Complete: This setting calculates earned value using the percent complete on each task. This option assumes a task that is halfway complete when half the work hours are used.
- Physical % Complete: This setting is used to enter a percent of completion that is not based on direct percent complete calculation.

Session 11

Monitoring and Controlling Project Progress

Steps to set Earned Value options are as follows:

Open the project and on the **File** tab, select **Options** and click **Advanced** to open **Project Options** dialog box as shown in figure 11.14.

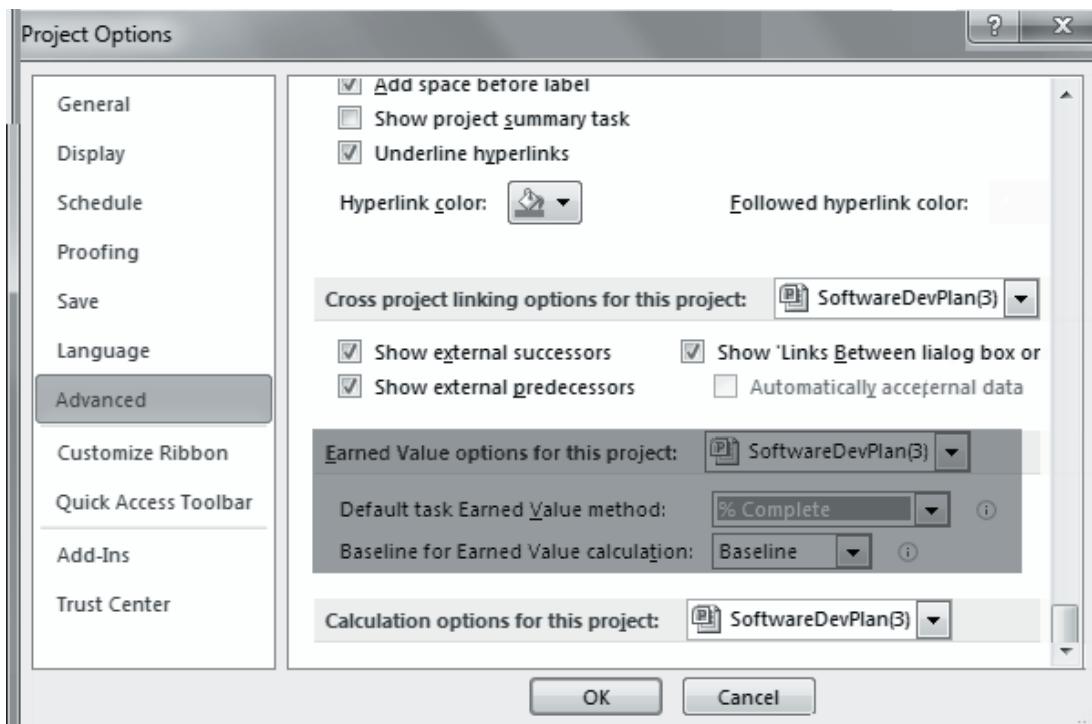


Figure 11.14: Earned Value Settings in Project Options Dialog Box

For example, to complete a four week task ‘online user feedback survey’, 50 percent of the effort will happen in the first 25 percent of the duration of the project for activities such as designing the feedback forms, printing the forms, mailing the survey forms and so forth. No other activity happens for one week to wait for responses. The activity of responses from users and analyzing the survey results start after one week waiting period.

In such cases, a straight calculation of 50 percent of the task completed for the 50 percent of the work done may not yield accurate results.

This setting is generally used when the project consists of a number of such tasks to display in the Physical % complete column in the **Gantt Chart** sheet and to enter more accurate percent complete information for each task.

11.7 Checking for Slipping Assignments

Project managers can also view whether the start and finish dates for task assignments are slipping, using the Slipping Assignments filter.

Session 11

Monitoring and Controlling Project Progress

Managers can apply this filter to view resource assignments to tasks that are not yet complete and whose finish date is delayed as per the baseline. Perform the following steps to view delayed resource assignments:

1. On the **View** tab, click the **Resource Usage** button to display the list of resources and the tasks that they have been assigned, along with the work hours for each resource.
2. In the **Data** group on the **View** tab, click the **Filter** drop-down list and select **More Filters...** to display the **More Filters** dialog box as shown in figure 11.15.
3. In the **Filters** option, select the **Resources** radio button to display resource-related filters.
4. Scroll down the list box and select **Slipping Assignments**.
5. To display only slipping assignments click the **Apply** button and close the dialog box. To display all resource assignments and highlight the slipping assignments, click the **Highlight** button and close the dialog box.

Figure 11.15 displays the **More Filters** dialog box.

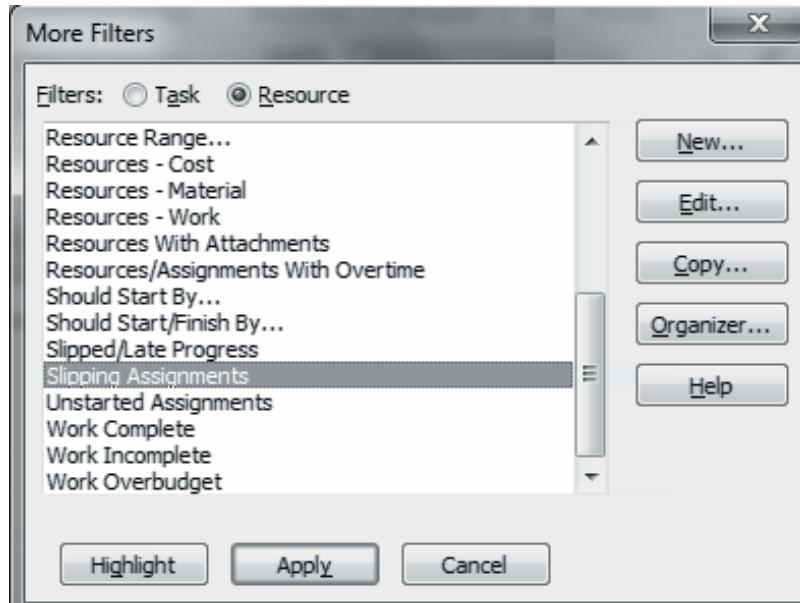


Figure 11.15: More Filters Dialog Box

Session 11

Monitoring and Controlling Project Progress

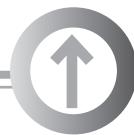


Summary

- Project managers constantly track project details to monitor and control the actual values to the planned estimated values.
- The amount of data collected and the type of information required determines the method of project tracking.
- MS Project provides four types of tracking methods namely, Task-total method, Task-timephased method, Assignment-total method, and Assignment-timephased method.
- MS Project provides handy tracking tools to perform updates on selected tasks.
- Progress Lines in MS Project 2010 indicates the progress of tasks that are ahead or behind the project schedule.
- Cost table provides information about the expenditure and Variance table provides information about variations in timing between baseline estimate and actual activity.
- Project budget analysis determines task updates, critical path, and earned value.
- MS Project provides two settings to calculate the earned value to a project namely percent complete and physical percent complete.

Session 11

Monitoring and Controlling Project Progress



Check Your Progress

Concepts

1. By default, MS Project 2010 _____.

A)	Does not display any progress lines
B)	Display progress lines starting from actual start date
C)	Display progress lines starting from baseline start date
D)	Display progress lines from variance

2. Which of the following are tracking methods in MS Project 2010?

A)	Task-total method
B)	Total-timephased method
C)	Assignment-total method
D)	Assignment-taskphased method

3. To mark all the tasks in a project as complete on a status date, managers use _____.

A)	Move task tool
B)	Progress lines tool
C)	Update project tool
D)	Earned value settings

4. Which of the following statements is true?

A)	Earned value calculates cost at the baseline value where as Actual Cost of Work Performed calculates the actual tracked costs
B)	Estimate At Completion is a calculation of sum of all pending costs of a task
C)	Cost Variance is a calculation of the difference between planned costs and actual costs
D)	Actual Cost of Work Performed is a calculation of actual costs



Check Your Progress

5. The set of tasks in a project whose scheduling greatly affects the duration of the project form the _____.

A)	Critical Path
B)	Delayed Tasks
C)	Slipping Assignments
D)	Slack in Schedule

Objectives

At the end of this session, the student will be able to:

- *Identify various stoplight indicators*
- *Explain how to calculate schedule variance*
- *Describe how to review critical path*
- *Describe how to create critical task report*
- *Explain how to evaluate performance using earned value measures*

12.1 Introduction

Using flexible choices and built-in earned value metrics in MS Project 2010, project managers can easily monitor the performance of a project against their project plan.

Evaluating project performance using views, reports, and filters help project managers to see high level and task-by-task progress, as well as potential problems. It also helps in finding and comparing overallocated resources and tasks that exceed their work budgets.

12.2 Inserting Stoplight Indicator Icons

As seen in earlier sessions, by setting baselines and interim baselines, project manager can verify the project progress through project statistics. Project managers can also design formula based visual indicators to show the status of the project and its performance.

For example, a project manager can set an option to trigger an indicator in the **Gantt Chart** view when there is a variance in the project plan with colors red, yellow, and green for schedule, cost, or work statistics.

The senior management should decide on the allowable variance of schedule and cost for tasks in a project. Most of the organizations keep 10% schedule variance as the threshold (allowable) limit and a cost threshold of a specific dollar amount.

Evaluating project duration is the first step in evaluating performance of a project. Project schedule can be evaluated at the project level, or day-to-day task management, or to calculate schedule performance metrics.

Session 12

Project schedule can be evaluated using visual indicators at several levels such as at the project finish date, task management at regular intervals and overall schedule performance.

For example, to set visual indicators for schedule variance of tasks in the project plan, consider table 12.1 that illustrate schedule variance assumptions in a project:

Schedule Variance	Condition
0-10%	Green
10%-20%	Yellow
More than 20%	Red

Table 12.1: Schedule Variance Assumptions

Schedule variance is calculated by subtracting the expected schedule and the actual values. It is also possible to use Start/Finish or Duration variances.

The preferred calculation is to subtract Estimated Baseline Finish from the Actual Finish dates as shown in Equation 1.

Equation 1: Calculating Schedule Variance Index

$$\text{Schedule Variance} = (\text{Estimated Baseline Finish Date} - \text{Actual Finish Date})$$

Project managers use stoplight indicators on the **Gantt Chart** to see the status of the schedule of project tasks. Project managers assume a condition for schedule variance and map them to a color indicator.

Table 12.2 maps a schedule variance condition to its respective indicator.

Schedule Variance	Indicator Icon
≤ 10 days	Green
> 10 days < 20 days	Yellow
> 20 days	Red

Table 12.2: Assumptions of Indicator Icons for Schedule Variance

Session 12

Project Performance

Concepts

Steps to enable stoplight indicators in MS Project are as follows:

1. Open the project and on the **Format** tab, click **Custom Fields** on the **Columns** group of the **Ribbon**.

This displays **Custom Fields** dialog box as shown in figure 12.1.

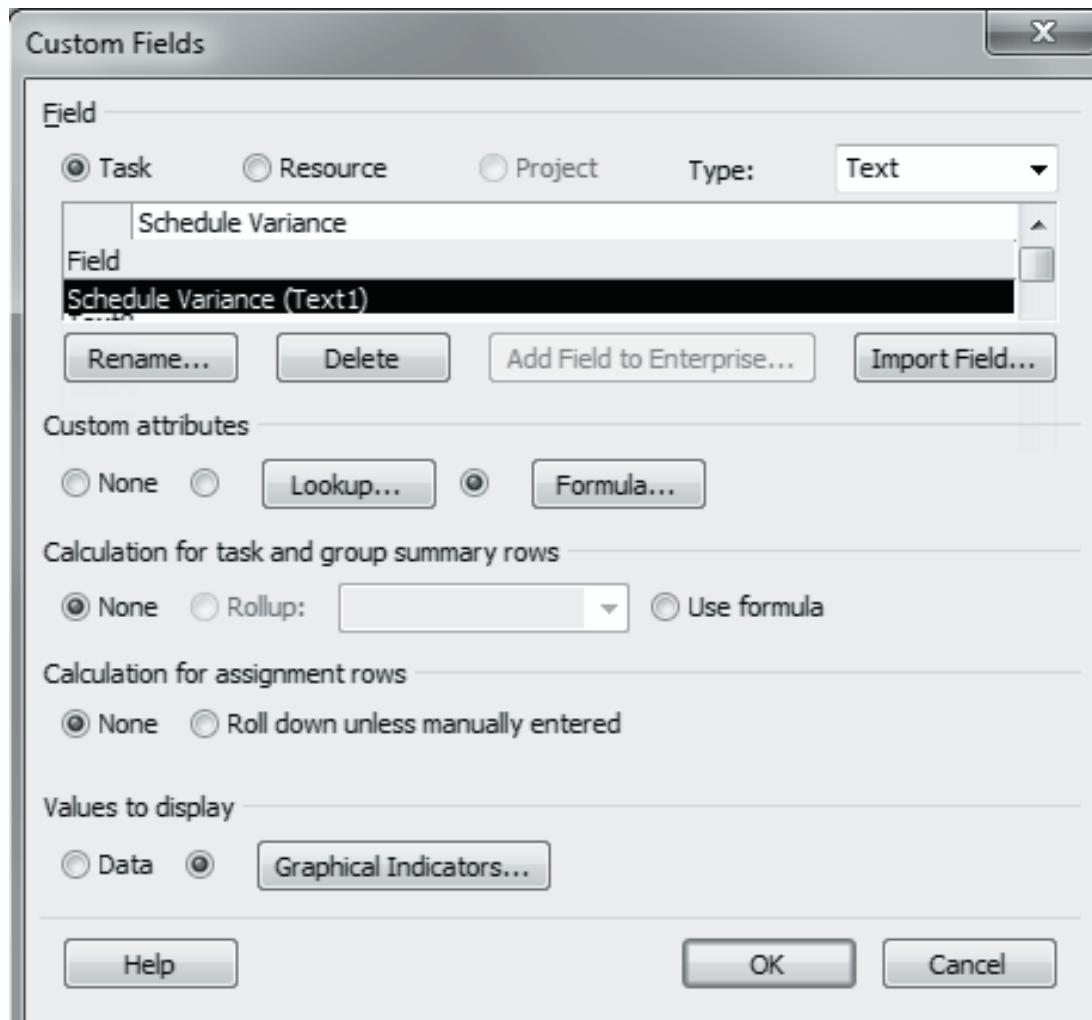


Figure 12.1: Creating Schedule Variance in Custom Fields Dialog Box

2. Select the **Text 1** row and click **Rename...** button to enter a name such as '**Schedule Variance**' for the custom field.
3. Select **Formula...** option under **Custom attributes** to display **Formula for Schedule Variance** dialog box.

Session 12

Project Performance

4. Insert the fields in the formula by selecting the columns from the **Field** drop-down list and applying mathematical calculations as shown in figure12.2.

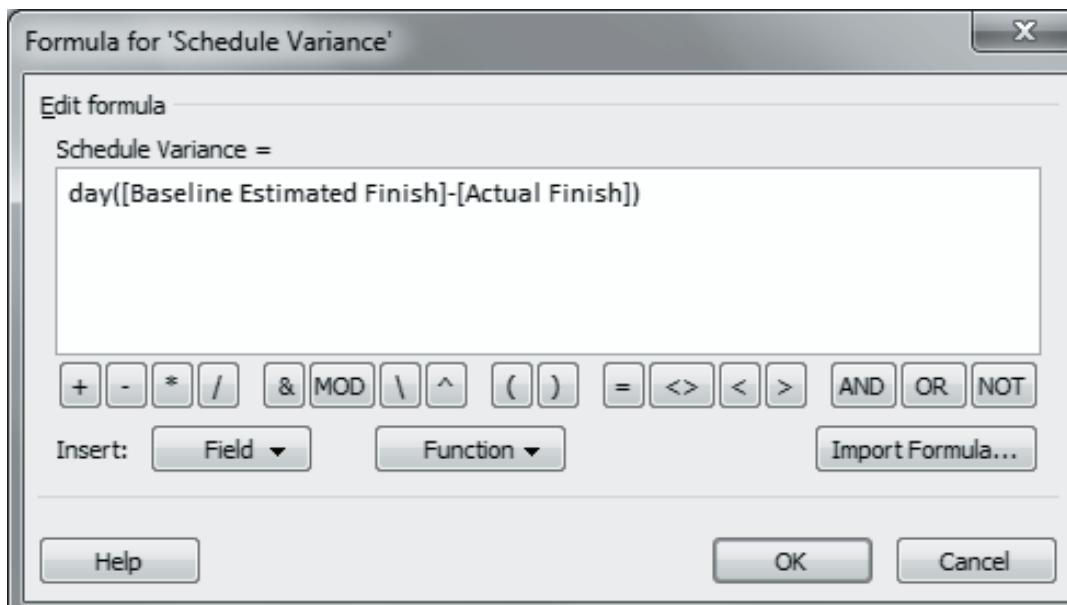


Figure 12.2: Formula Field Dialog Box

Organizations having global MS Project templates, build generic formula for schedule variance. Users can import such formulae from any Organizational MS Project Template.

The **Function** drop-down list provides various functions such as general, mathematical, and so forth for users to apply necessary functions to the fields.

A function is displayed with the name of the function followed by an open parenthesis and a corresponding parenthesis at the end. In between the parenthesis, a function will have a number of arguments separated by a comma.

5. Click **OK** to return to the **Custom Fields** dialog box.
6. Click **Graphical Indicators...** to open the **Graphical Indicators** dialog box.
7. Select **Indicator criteria** either for **Nonsummary rows** or **Summary rows** or select **Project summary** radio button to display graphic indicators for the entire project.
8. Click **Test for Schedule Variance** cell and click the drop-down list to select a condition and enter its value in the **Value(s)** field.

Session 12

Project Performance

Concepts

9. Click **Image** cell to select an image from the drop-down list for the condition and value(s) selected as shown in figure 12.3.

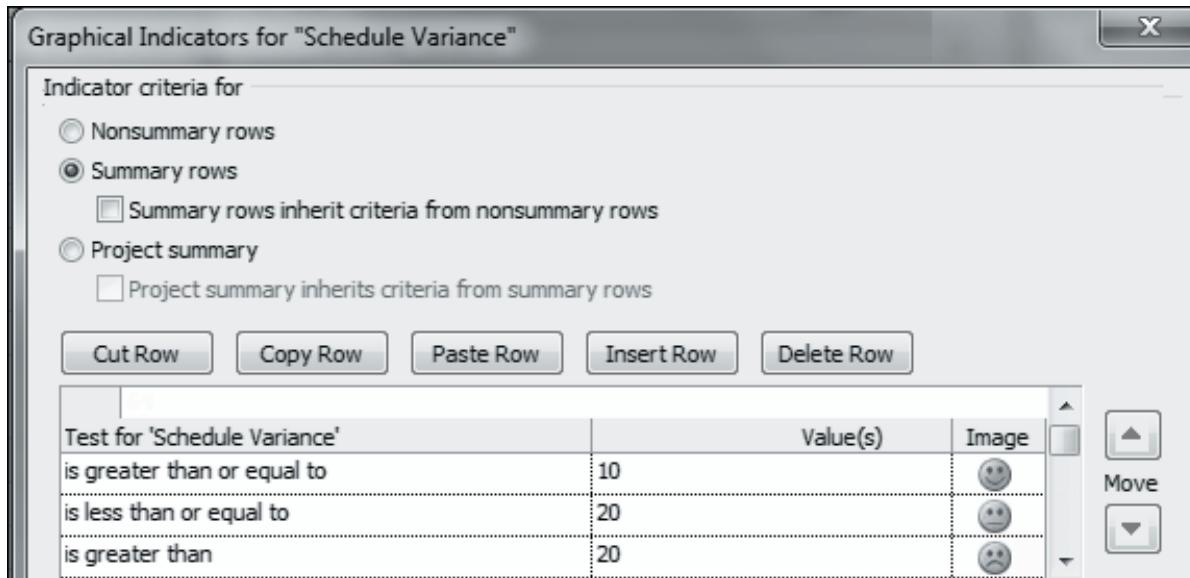


Figure 12.3: Graphical Indicator Settings for Schedule Variance

10. Click **OK** to save the information. This displays indicators on the **Gantt Chart** sheet as shown in figure 12.4.

Task Name	Start	Finish	Late Start	Late Finish	Schedule Variance
Scope	Mon 04-01-10	Wed 29-12-10	Fri 25-12-09	Fri 22-12-10	
Determine project scope - Fixed	Mon 04-01-10	Fri 24-12-10	Fri 25-12-09	Fri 17-12-10	●
Secure project	Mon 27-12-10	Mon 27-12-10	Fri 17-12-10	Fri 17-12-10	●
Define preliminary requirements	Tue 28-12-10	Tue 28-12-10	on 20-12-10	on 20-12-10	●
Secure core requirements	Wed 29-12-10	Wed 29-12-10	ue 21-12-10	ue 21-12-10	●
Scope completion	Wed 29-12-10	Wed 29-12-10	ed 22-12-10	ed 22-12-10	●

Figure 12.4: Stoplight Indicators for Schedule Variance in Gantt Chart

12.3 Reviewing the Critical Path

While evaluating project performance, critical path tasks are the key tasks to examine. Most project managers check tasks each week to see the progress of tasks because any delays on the critical path turns immediately into a late finish date.

Session 12

Project Performance

For example, if a two week non critical task runs into difficult problems that make it a five weeks task, the delay could place the task on the critical path. The tasks on the critical path impact the duration of the project.

MS Project 2010 provides easy ways to view the critical path, baseline, and other schedule information as shown in figure 12.5.

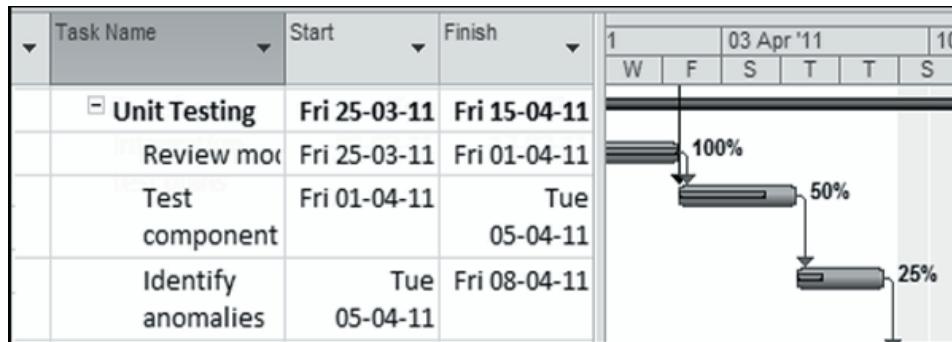


Figure 12.5: Critical Path Tasks on Gantt Chart View

Steps to display critical path tasks are as follows:

1. Open the project in any task oriented view such as the **Gantt Chart**.
2. On the **Format** tab, select the **Critical Tasks** check box on the **Bar Styles** tab of the **Ribbon** to show critical tasks in red on the **Gantt Chart** view.
3. Select the **Late Tasks** check box to display late tasks with black taskbars.
4. Select the **Slack** check box to display slack of each task on the **Gantt Chart** view.
5. Select the **Baseline** down arrow and choose a baseline.
6. Select the **Slippage** down arrow and choose a baseline to draw narrow black lines from the baseline start dates to the current scheduled start date.

12.4 Creating Critical Tasks List

The Critical Tasks text based report works well as a hard copy checklist of critical tasks. The columns in critical task checklist include Duration, Start, Finish, Predecessors, and Resources. Check the predecessor and successor columns to see tasks delaying a critical task.

Session 12

Project Performance

Concepts

Steps to create a critical tasks report are as follows:

1. Open project in **Gantt Chart** view and under **Project** tab, select **Reports** and double-click **Overview...** button.
2. Click **Critical Tasks** on the **Overview Reports** dialog box and click **Select**. This generates the **Critical Task Report** and readies it for printing.
3. Click **Print** under the **Print** options of the **File** tab. The report is printed as shown in figure 12.6.

Critical Tasks as of Fri 16-12-11 Software Development				
Indicators	Task Mode	Task Name	Duration	
	Auto Schedu	Scope	258 days	
1	Auto Schedu	Determine project scope - Fixed Duration	8505 hrs	
	ID Successor Name	Type	Lag	
3	Secure project sponsorship	FS	0 days	
	Auto Schedu	Secure project sponsorship	1 day	
4	ID Successor Name	Type	Lag	
	Define preliminary resources	FS	0 days	
	Auto Schedu	Define preliminary resources	1 day	
5	ID Successor Name	Type	Lag	
	Secure core resources	FS	0 days	
	Auto Schedu	Secure core resources	1 day	
6	ID Successor Name	Type	Lag	
	Scope complete	FS	0 days	
Page 1				

Figure 12.6: Critical Tasks Report

12.5 Checking Delayed Tasks

Finding tasks with delayed start dates help project managers to prevent further delays. MS Project 2010 provides several filters and reports that highlight delayed tasks. The most common instance with delayed starts is not entering actual values in the project plan. Once the project plan is filled with actual values, it is time to find out any delay in the remaining tasks to start.

The **Should Start By** filter lists tasks that should have started by the most recent status date. This filter helps in identifying tasks whose start dates are earlier than Should Start By date, but whose Actual Start values are empty. The **Should Start By** filter allows the user to switch tables in the view to see different task values.

Session 12

Project Performance

Concepts

Steps to create filter to check delayed tasks are as follows:

1. Open the project and on the **View** tab, click **More Filters** under **Filter** drop-down on the **Data** tab of the Ribbon to display **More Filters** dialog box as shown in figure 12.7.

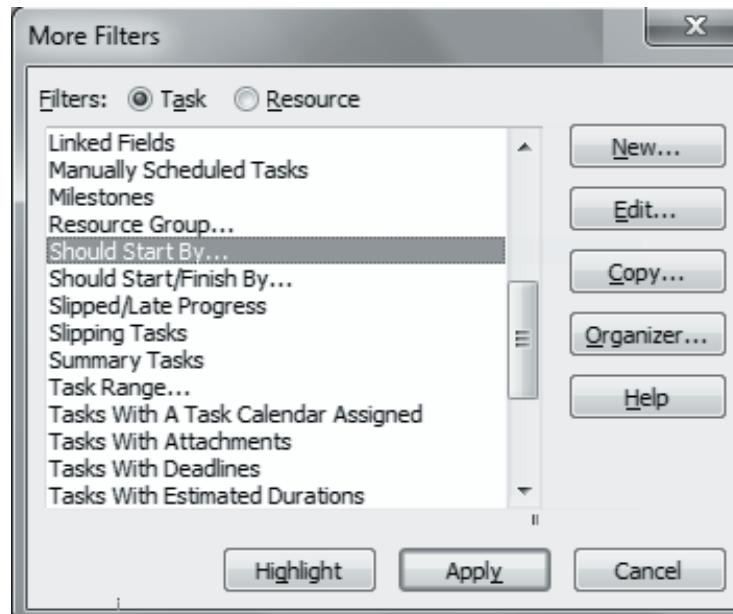


Figure 12.7: More Filters Dialog Box

2. Select **Should Start By** in the list and click **Apply** to display the **Should Start By** dialog box.
3. Select **Start by** date from the date calendar and click **OK**. This shows changes in the view with only the tasks that should have started but have not started as of Start by date.

12.6 Evaluating Performance with Earned Value Measures

Earned value analysis requires a baseline in the project to compare to the current values. If no project baseline is set, all the earned value fields display zero. To measure schedule and cost status, MS Project uses several calculations.

For example, performance of a project can be evaluated by creating an earned value over time visual report that indicates earned value, planned value, and actual cost in a graphical representation.

Session 12

Project Performance

Concepts

Steps to create earned value overtime visual report are as follows:

1. Open the project and on the **Project** tab, click **Visual Reports** on the **Reports** group. This displays **Visual Reports - Create Report** dialog box as shown in figure 12.8.

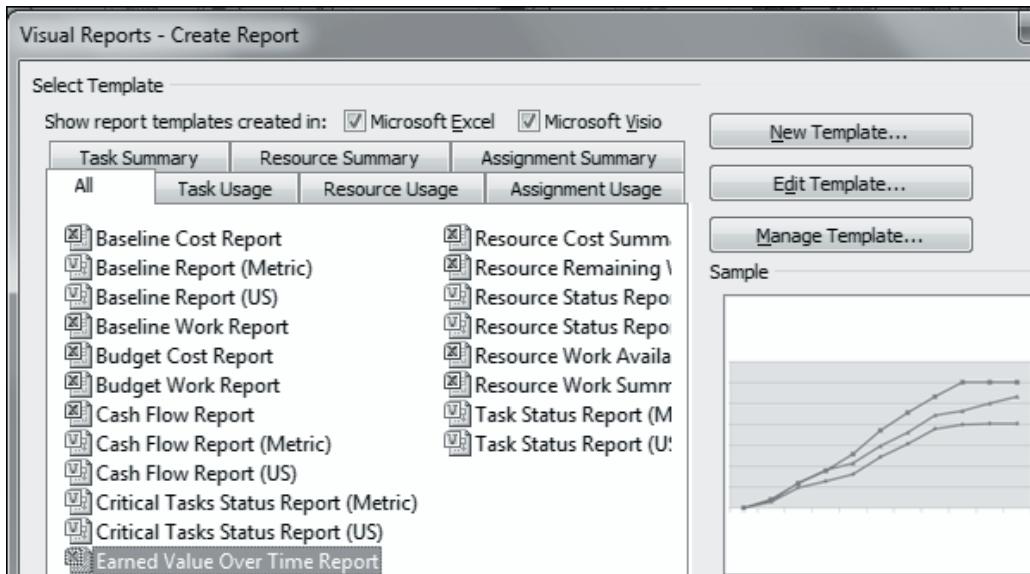


Figure 12.8: Visual Reports - Create Report Dialog Box

2. Select **Earned Value Over Time Report** under **All** templates tab and click **View** to generate the graph in MS Excel showing lines of three measures Actual cost greater than earned value means over budget, earned value greater than planned value means ahead of schedule and planned value as shown in figure 12.9.



Figure 12.9: Earned Value Over Time Report Graph

Session 12

Project Performance

Project performance with respect to schedule and cost can be evaluated by simple calculations as follows:

- Schedule performance is measured considering planned value and earned value. Planned value is the baseline cost for the work expected to complete, while earned value is the baseline cost of the work actually completed.
 - If earned value is less than planned value, less work is completed than the expected and hence the project will be behind schedule.
 - If earned value is greater than planned value, more work is completed than the expected, and hence the project will be ahead of schedule.
- Cost performance is the difference between earned value and actual cost.
 - If the earned value is greater than the actual cost, then the cost of work performed is less than the planned and hence the project is under budget.
 - If earned value is less than the actual cost, then the project is over budget.

12.7 Additional Earned Value Measures

Additional earned value measures are calculated as follows:

- Schedule Performance Index (SPI) is a measure to find the health of a project in terms of the project schedule. SPI is a comparison of the project tasks that were planned to be completed to that of actually accomplished. SPI is calculated by dividing the earned value by planned value, and based on the value, performance can be measured as:
 - When earned value and planned value are equal, the project is on schedule.
 - A value of SPI less than 1.0 means earned value is less than the planned value; hence the project is behind schedule.
- Cost Performance Index (CPI) is a measure to find the health of a project in terms of the project budget. CPI is a comparison of the actual expenditures of the work that was accomplished to that of planned. CPI is calculated by dividing the earned value by actual cost (BCWP/ACWP) and based on the value, performance can be measured as:
 - If the value is greater than 1.0, means earned value is greater than actual cost and hence amount spent is less to complete the work performed than the planned resulting the project as under budget.

Session 12

Project Performance

- Budget At Completion (BAC) is the sum of the budget for each phase of the project. This is the estimated grand total of the project. Budget at completion and Baseline Costs are the same.
- Estimate At Completion (EAC) is an estimate of how much a task will cost when it is completed, based on the performance so far. EAC is calculated by the following formula:

$$EAC = ACWP + ((BAC - BCWP) / CPI)$$

where, EAC has two components:

- The first component is the actual cost (ACWP) of the task as on date.
 - The second component $(BAC - BCWP) / CPI$, is a forecast based on the cost performance.
- Variance At Completion (VAC) is the estimated variance when the task is done. It is calculated as the Baseline Cost At Completion minus the EAC.

Steps to create Earned Value table are as follows:

1. Open the project in any task oriented view such as Task Usage view.
2. On the **View** tab select **Tables** and click **More tables...** to open **More Tables** dialog box.
3. Select **Earned Value** in the list as shown in figure 12.10.

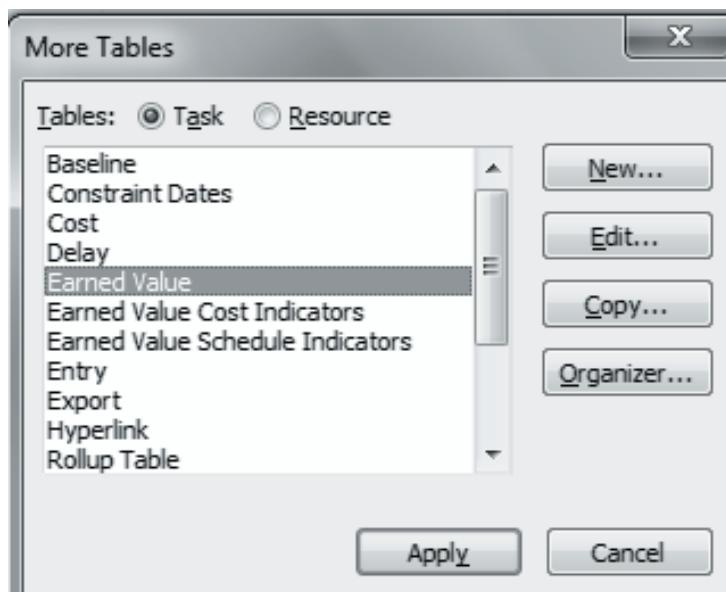


Figure 12.10: More Tables Dialog Box

Session 12

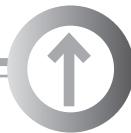
Project Performance

4. Click **Apply** to display Earned Value table in the Task Usage sheet as shown in figure 12.11.

Task Name	PV	EV	AC (ACWP)	SV	CV	EAC	BAC	VAC
Deployment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$5,900.00	\$0.00	\$5,900.00)
Determine final deployment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$200.00	\$500.00	\$300.00

Figure 12.11: Earned Value Table

The Earned Value table includes all the basic earned value fields such as planned value (BCWS), earned value (BCWP), actual cost (ACWP), SV, CV, EAC, BAC, and VAC.



Summary

- MS Project 2010 provides several ways to monitor the performance of a project against the project plan.
- Project schedule can be evaluated using visual indicators at several levels such as at the project finish date, task management at regular intervals and overall schedule performance.
- Earned value analysis requires a project baseline to compare to the current status and if no project baseline is set, all the earned value fields display zero.
- The critical tasks text based report works well as a hard copy checklist of critical tasks.
- MS Project 2010 provides several ways to analyze project performance through the critical path, baseline, and other schedule information.
- Delayed tasks are filtered by the Should Start By filter in MS Project 2010.
- Earned Value graphs help in measuring performance by comparing planned value, earned value, and actual costs.

Session 12

Project Performance



Check Your Progress

1. Which of the following is the first step in evaluating performance of a project?

A)	Evaluating project duration
B)	Evaluating overallocated resources
C)	Evaluating under budget tasks
D)	Evaluating over budget tasks

2. Which of the following calculates schedule variance?

A)	Sum of duration of tasks and baseline duration
B)	Multiplying its standard schedule with the number of units
C)	Multiplying number of units with the resource effort per use
D)	Subtracting the expected schedule from the calculated value

3. Which of these filters identifies tasks whose start dates are earlier than the status date?

A)	Should Start By date filter
B)	Delayed tasks filter
C)	Critical tasks filter
D)	Task Usage filter

4. Which of the following is also known as earned value?

A)	Actual cost of work performed (ACWP)
B)	Budgeted cost of work performed (BCWP)
C)	Budget at completion (BAC)
D)	Estimate at completion (EAC)

5. Which of the following earned value measures are used to evaluate project performance?

A)	Planned cost for scheduled work
B)	Planned cost for completed work
C)	Actual cost of completed work
D)	Schedule variance

Objectives

At the end of this session, the student will be able to:

- *Describe standard reports*
- *Describe custom reports*
- *Explain modifications to standard and custom reports*
- *Describe crosstab reports*
- *Explain how to print a view*
- *Describe visual reports*
- *Explain how to apply graphics to reports*
- *Describe formatting of reports*

13.1 Introduction

Reports help in communicating project information details such as schedule, resource assignments, costs, and so forth.

MS Project 2010 facilitates project managers with built-in and customizable reports to include the data relevant to their projects. It also includes visual reports that offer graphic representation of the project progress by applying certain formatting settings to reports.

13.2 Standard Reports

Standard reports are built-in reports that offer choices for the information to include in the reports. With simple clicks on few buttons, project managers can generate standard reports that can be modified for look and feel using several ways.

Standard reports are generated with simple clicks such as selecting a report category, choosing a specific report, and printing the report.

Session 13

13.2.1 Standard Report Categories

MS Project provides five categories of standard reports as follows:

- Overview
- Current
- Costs
- Assignments
- Workload

Each category contains several predefined reports.

13.2.2 Creating Standard Reports

To create standard reports, follow these steps:

1. Open the project and on the **Project** tab, click **Reports** on the **Reports** group of the **Ribbon** to display **Reports** dialog box as shown in figure 13.1.

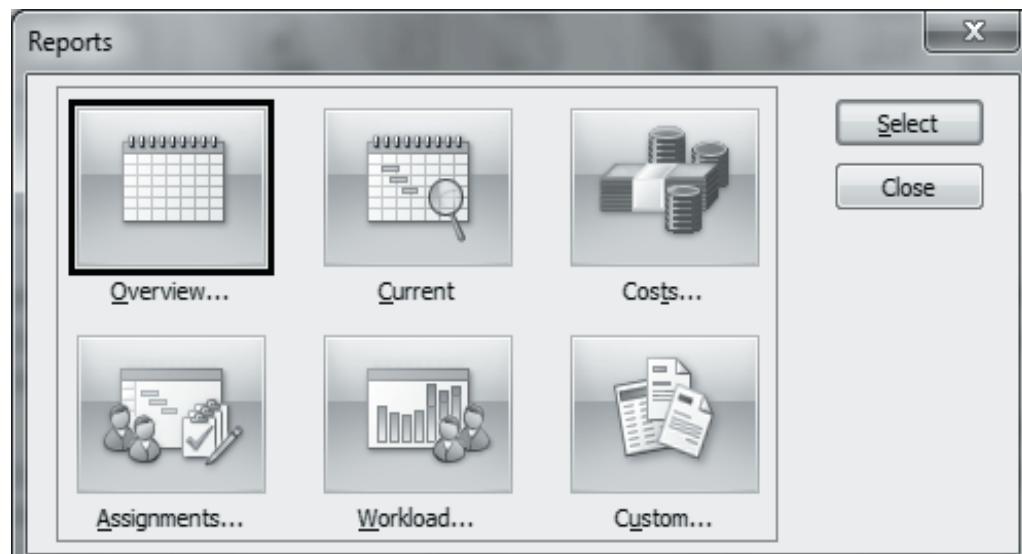


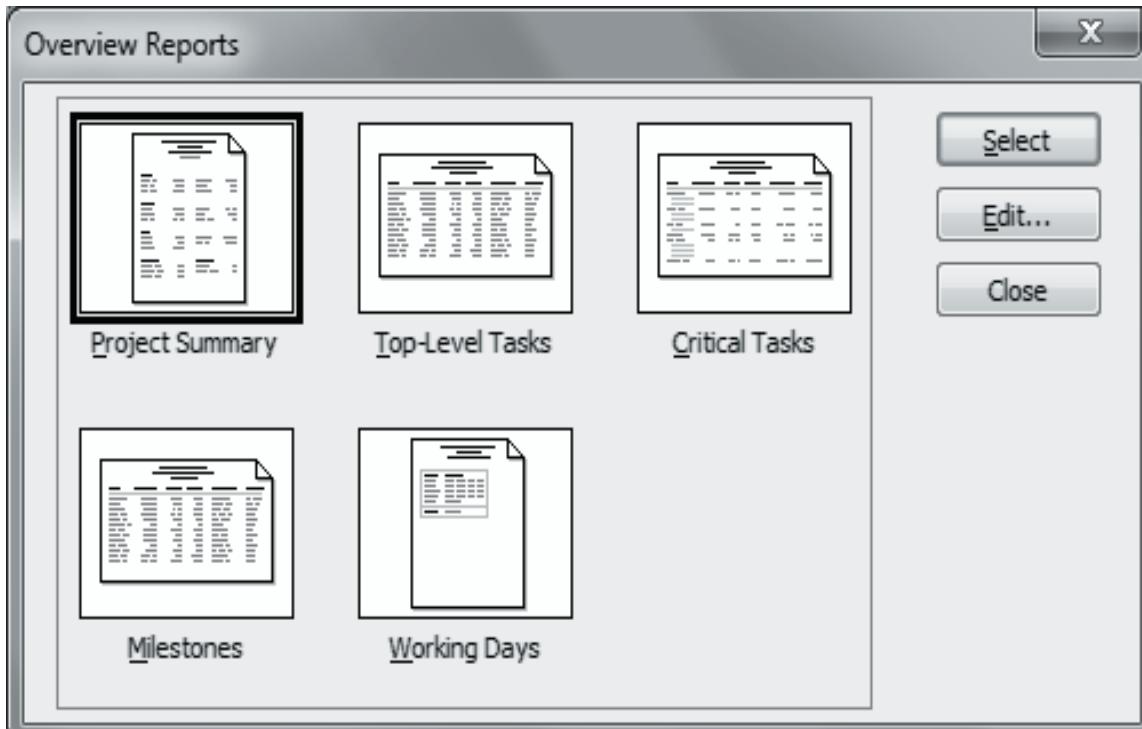
Figure 13.1: Report Categories in Reports Dialog Box

Note: The Reports dialog box displays all five categories of reports and also a custom report category.

Session 13

Reports

2. Selecting any of the six categories will open the respective reports under the category. For example, selecting **Overview** report category displays **Overview Reports** dialog box as shown in figure 13.2.



Concepts

Figure 13.2: Overview Reports Dialog Box

Users can edit a report by changing the report name, time period the report covers, the table of information, and filters applied to the report. Also, users can sort information to generate the report and add formatting changes such as applying borders or gridlines to the report.

Session 13

Reports

3. Select a report to display a preview of the report, like the **Should Have Started Tasks** as on a status date as shown in figure 13.3.

The screenshot shows the Microsoft Project 'Print' dialog box. On the left, there's a preview area titled 'Should Have Started Tasks as of Tue 12/6/11' for 'Software Development'. It displays a table of tasks with columns for Task Mode, Task Name, Start, and Finish. On the right, the 'Print' dialog box has sections for 'Printer' (set to 'HP Officejet 4300 Series' which is 'Offline'), 'Copies' (set to 1), and 'Settings' (which includes 'Print Specific Dates' from 1/4/2010 to 3/11/2010, 'Pages' 1-1, and 'Landscape Orientation').

Task Mode	Task Name	Start	Finish
Auto Schedul	Scope	Mon 1/4/10	Wed 12/29/10
Auto Schedul	Determine project scope - Fi	Mon 1/4/10	Fri 12/24/10
ID	Successor Name	Type	Lag
3	Secure project sponsorship	FS	0 days
Auto Schedul	Deployment		
Manually Sch	server setup		
ID	Successor Name	Type	Lag
79	Train support staff	FS	0 days
Auto Schedul	Train support staff		
ID	Successor Name	Type	Lag
80	Deploy software	FS	0 days
Auto Schedul	Deploy software		
ID	Successor Name	Type	Lag
81	Deployment complete	FS	0 days
Auto Schedul	Deployment complete		
ID	Successor Name	Type	Lag
83	Document lessons learned	FS	0 days
Auto Schedul	Post Implementation Review	Mon 5/31/10	Wed 6/2/10
Auto Schedul	Document lessons learned	Mon 5/31/10	Mon 5/31/10

Figure 13.3: Should Have Started Tasks Report Print Preview

4. Click the large **Print** button to print. Click **Page Setup** to change page settings or use the choices under **Settings** to suit the report.

Note: For some reports, clicking on **Print** displays an additional dialog box, to enter specific data such as date range for that report.

13.3 Custom Reports

A custom report begins with a report type that can be a task, a resource, a monthly calendar, or a crosstab. After choosing the basic type, users can work with the same Reports dialog box that is used to edit a standard report.

Session 13

Reports

Steps to create a custom report are as follows:

1. Open the project and on the **Project** tab, click **Reports** on the **Reports** group of the **Ribbon** to display **Reports** dialog box.
2. Click the **Custom** category and then click **Select** to display the **Custom Reports** dialog box.
3. User can edit an existing report or can create a new custom report.
4. Select either to base the custom report on an existing report or create a new report:
 - To base custom report on an existing report: Choose the report in the list and click the **Copy...** button.
 - To create a report that is not based on any report: Click the **New** button and click one of the categories in the **Define New Report** dialog box as shown in figure 13.4.

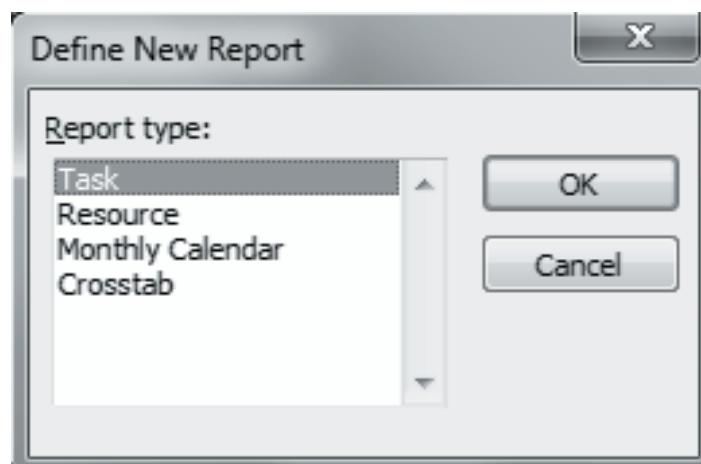


Figure 13.4: Define New Report Dialog Box

5. Click **OK** to save the information and return to the **Custom Reports** dialog box.

Session 13

Reports

6. Click **Select** to display the report print preview in the Backstage view of the project as shown in figure 13.5.

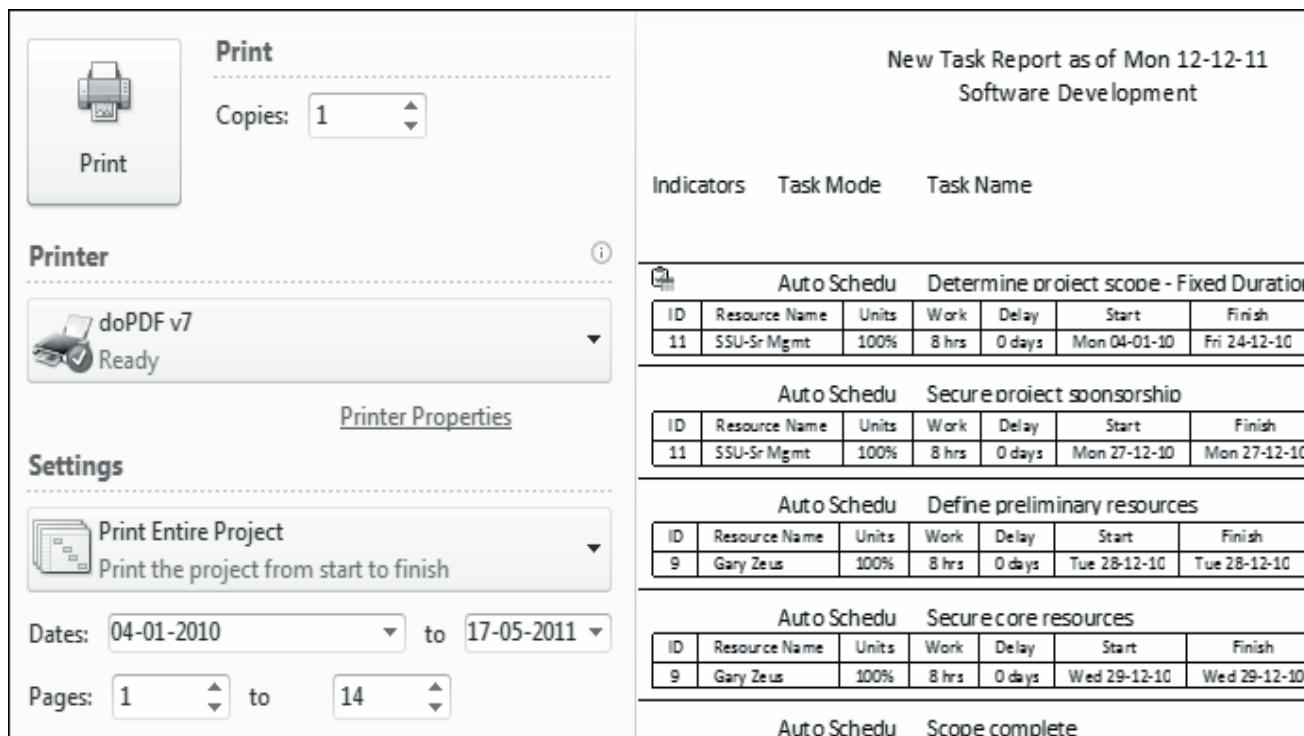


Figure 13.5: Displaying a Sample Custom Report in Backstage View

13.4 Modifications to Standard and Custom Reports

Users can modify three elements in a standard report:

- **Definition:** This includes report name, time period, table of information, any filters applied, and summary tasks display in a report.
- **Details:** This includes task details such as notes or predecessors and resource details such as notes or cost. Users can also choose to show totals, add a border for the report or gridlines between details, and so forth.
- **Sort:** This includes sorting up to three criteria in ascending or descending order.

Session 13

Reports

Steps to modify standard reports to create a custom report are as follows:

1. Open the project and on the **Project** tab, click **Reports** on the **Reports** group of the **Ribbon** to display the **Reports** dialog box.
2. Click **Custom** and then click **Select**.
3. Click a specific report and then click **Copy...**

Depending on the type of report such as Resource Report, Task Report, or Crosstab, the appropriate Report dialog box appears.

Figure 13.6 shows the **Resource Report** dialog box.

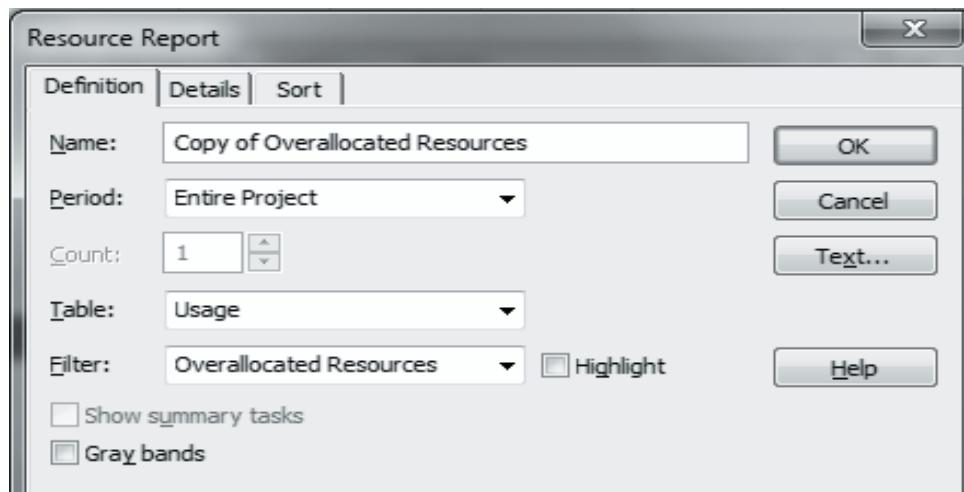


Figure 13.6: Resource Report Dialog Box

4. On the **Definition** tab, the following selections can be made:
 - Type a **Name** for the new report.
 - Choose the **Period** of the project from the **Period** drop-down list.
 - Choose the **Table** to be used for the project from the **Table** drop-down list.
 - Choose the **Filter** to be used for the project from the **Filter** drop-down list.
 - Select the **Highlight** check box to highlight tasks that match the filter's criteria.
5. Set the **Count** counter to reflect the number of increments of time from the **Period** field.

Session 13

6. On the **Details** tab, the following selections can be made:

- Select various check boxes to include different types of information, such as **Assignment Notes** or **Resource Cost Rates** and so forth.
- To apply a border around the report, select the **Border around Details** check box.
- To apply gridlines in the report, select the **Gridlines between details** check box.
- To include totals, select **Show Totals** check box.

Figure 13.7 shows the selections made in the **Details** tab.

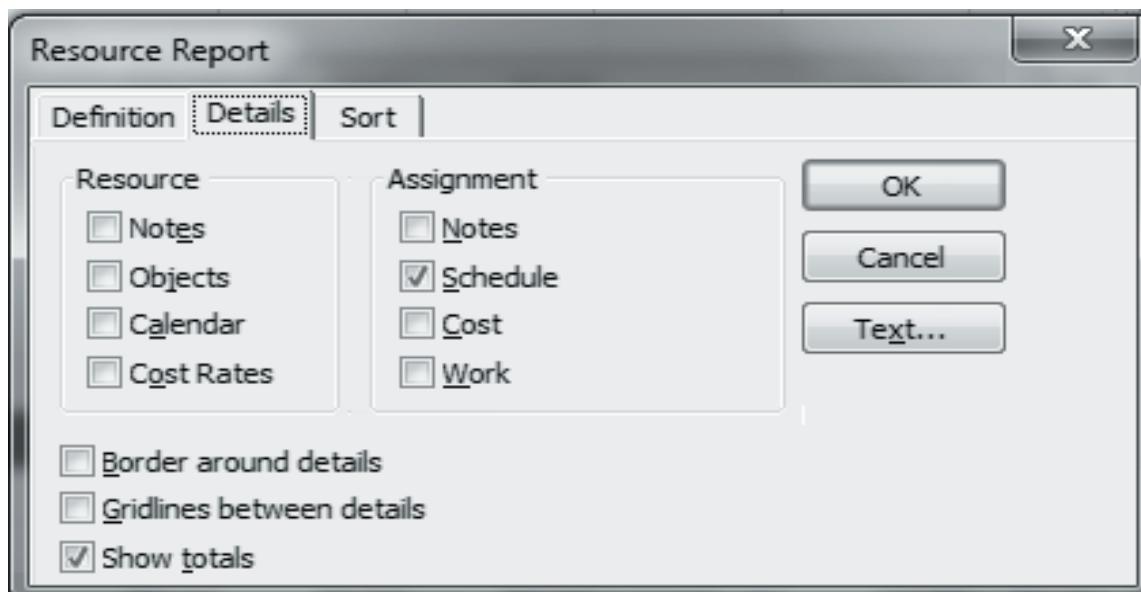


Figure 13.7: Details Tab in Resource Report Dialog Box

7. On the **Sort** tab, the following selections can be made:

- Click a sort criterion, and then select either **Ascending** or **Descending** to choose a sort order in the **Sort By** field.
- To sort by additional criteria, repeat the step 7 with the **Then by** boxes.

Session 13

Reports

Concepts

Figure 13.8 demonstrates the selection.

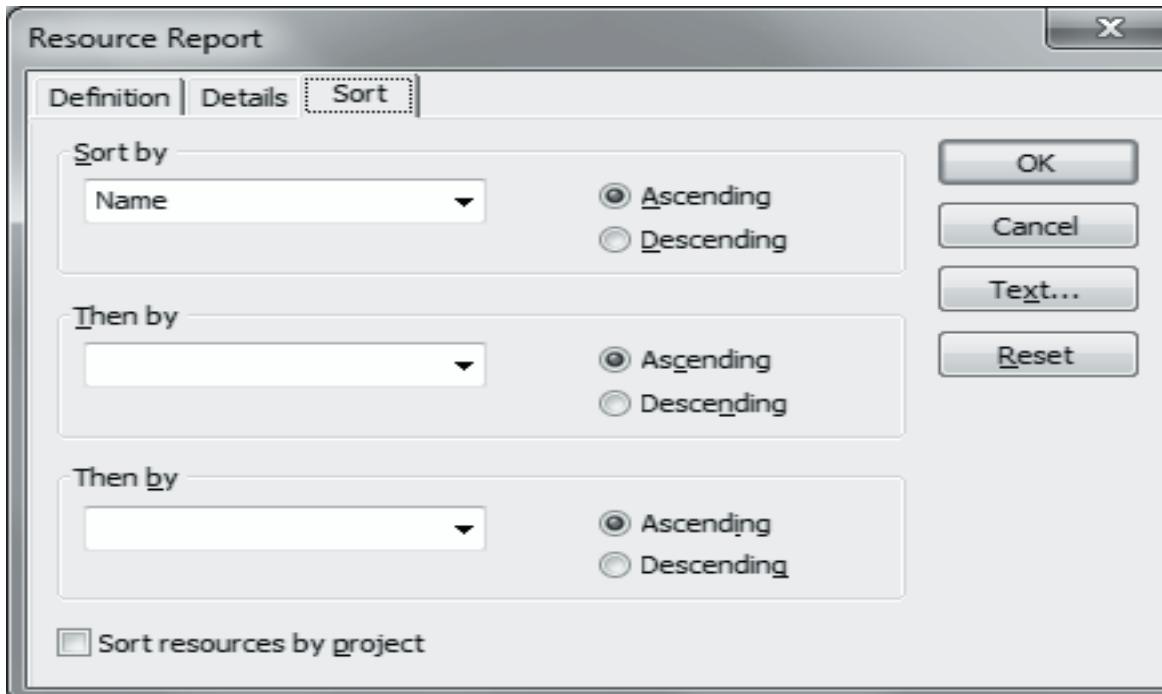


Figure 13.8: Sort Tab in Resource Report Dialog Box

8. Click **OK** to save the settings.
9. Click **Select** in the **Reports** dialog box, to generate the report preview.

13.5 Crosstab Reports

A crosstab report represents a unique data relative to column and row definitions. Effectively, the cell formed by the column and row intersection represents the unique data.

For example, to generate a report with days in columns resources as rows, the intersection between the column and row is resource work on a particular day. The report shows the daily hours of work by each resource.

Steps to create a crosstab report are as follows:

1. Open the project and on the **Project** tab, click **Reports** on the **Reports** group of the **Ribbon** to display **Reports** dialog box.
2. Click **Custom** and then click **Select** to display **Custom Reports** dialog box.

Session 13

Reports

3. Then, select **Crosstab** as shown in figure 13.9.

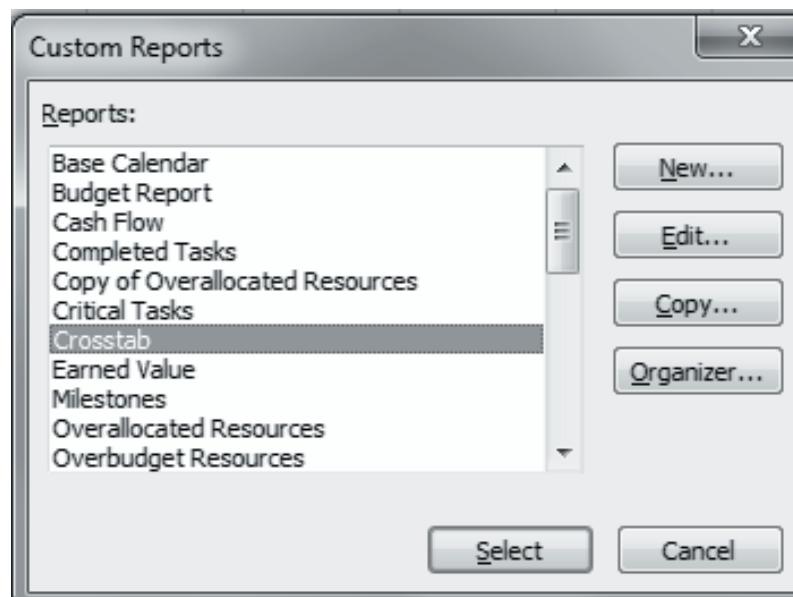


Figure 13.9: Selecting Crosstab Report in Custom Reports Dialog Box

4. Click **Edit...** to display **Crosstab Report** dialog box as shown in figure 13.10.

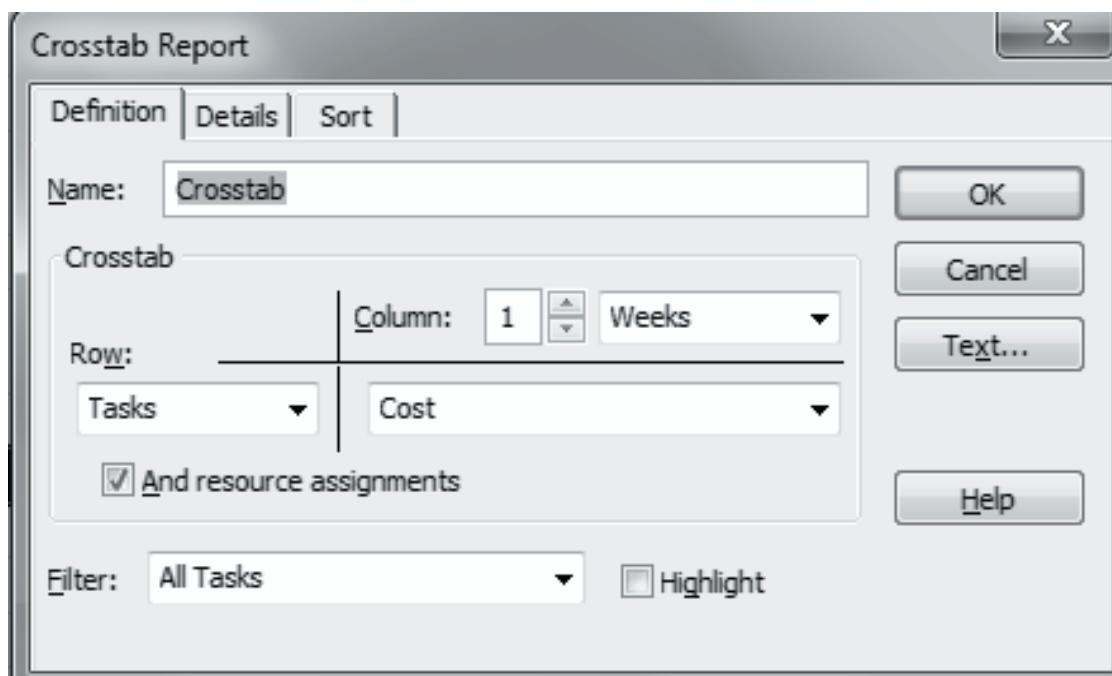


Figure 13.10: Crosstab Report Dialog Box

Session 13

Reports

5. Define the column, the row, and data to be compared on the **Definition** tab.
6. On the **Details** tab, make settings such as include row or column totals, inserting gridlines, and displaying any zero values.
7. Click **OK** to return to the **Custom Reports** dialog box.
8. Click **Select** to display the print preview in the Backstage view of the project.

Concepts

13.6 Printing a View

MS Project 2010 facilitates users to print any view in a project by clicking the **Print** button of any view.

To print any view, follow these steps:

1. Open the project in any view, and choose **Print** from the Backstage view after clicking **File** tab. This displays the various **Print** options as shown in figure 13.11.

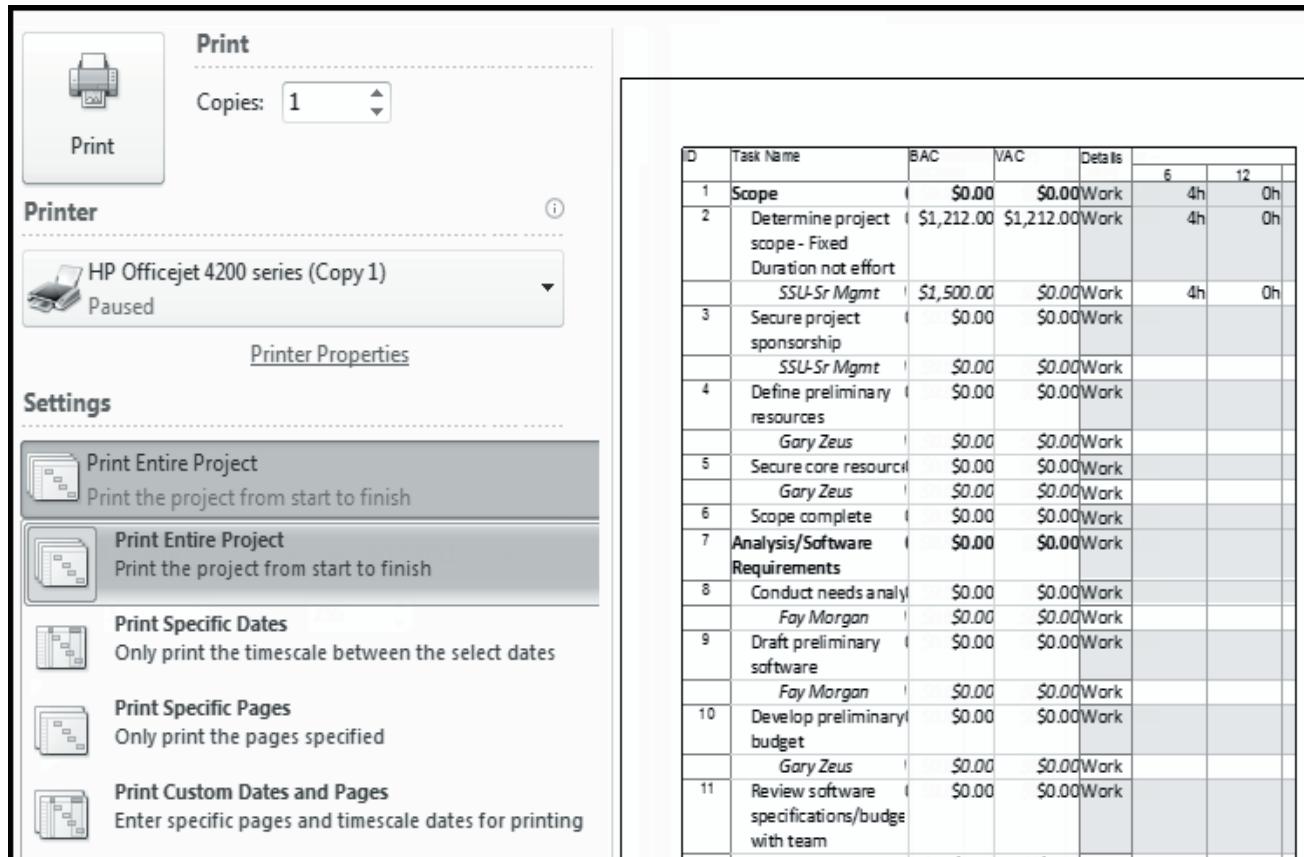


Figure 13.11: Print Options in Backstage View

Session 13

2. Select **Print Entire Project** drop-down to list various print options such as **Print Specific Dates**, **Print Specific Pages** and so on.
3. Selecting any option on the drop-down displays the corresponding print preview on the right view pane.
4. Users can choose to print only certain pages of the project or only a specific date range from the timescale.

Any filters or groups applied in the project get displayed in the printed document.

13.7 Visual Reports

Pivot tables in Excel and Visio allow viewing data from different perspectives beyond the standard report capabilities that are especially useful for data analysis. MS Project 2010 provides the capabilities of Pivot tables in the form of visual reports. Visual reports allow users to select the fields to view and modify the reports at any instance in the project plan.

MS Project 2010 offers six categories of visual reports to customize and build. Some of the visual reports are based on timephased data such as allocations of resource time or costs.

The report categories include:

- **Task Usage:** Based on timephased data for tasks, this category of reports gives peek information such as cash flow and earned value over time.
- **Resource Usage:** Based on timephased resource data, these reports include cash flow, resource availability, resource costs, and resource work data.
- **Assignment Usage:** Based on timephased data, this category of reports provide information in areas such as baseline versus actual costs and baseline versus actual work.
- **Task Summary, Resource Summary, and Assignment Summary:** These three categories of reports provide diagram views of a variety of work and cost data. These three categories are not based on timephased data.

13.7.1 Creating a Visual Report

To create a visual report, choose a report and decide whether to generate it in Excel or Visio, and view or print the report.

Session 13

Reports

Steps to generate a standard visual report are as follows:

1. Open the project and on the **Project** tab, click **Visual Reports** on the **Reports** group of the **Ribbon** to display **Visual Reports** dialog box as shown in figure 13.12.

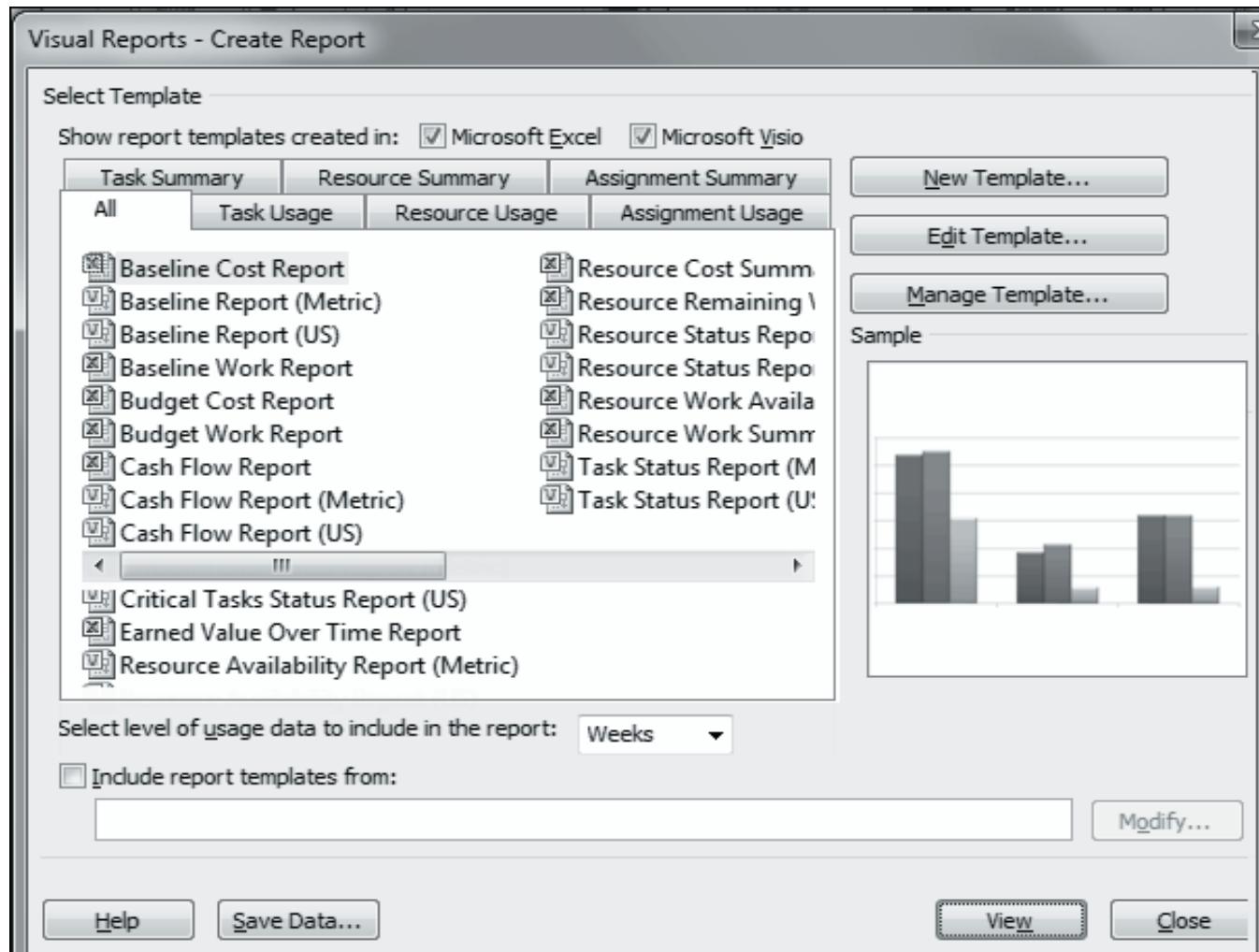


Figure 13.12: Visual Reports Dialog Box

2. Select **Excel** and/or **Visio** check boxes in the **Show Report Templates Created in** area to display the reports available in Excel or Visio.
3. Select a report (in this example, the Baseline Cost Report) on the **All** tab and then click the **View** button.

Session 13

Reports

Concepts

The report is generated in the selected application Excel or Visio as shown in figure 13.13.

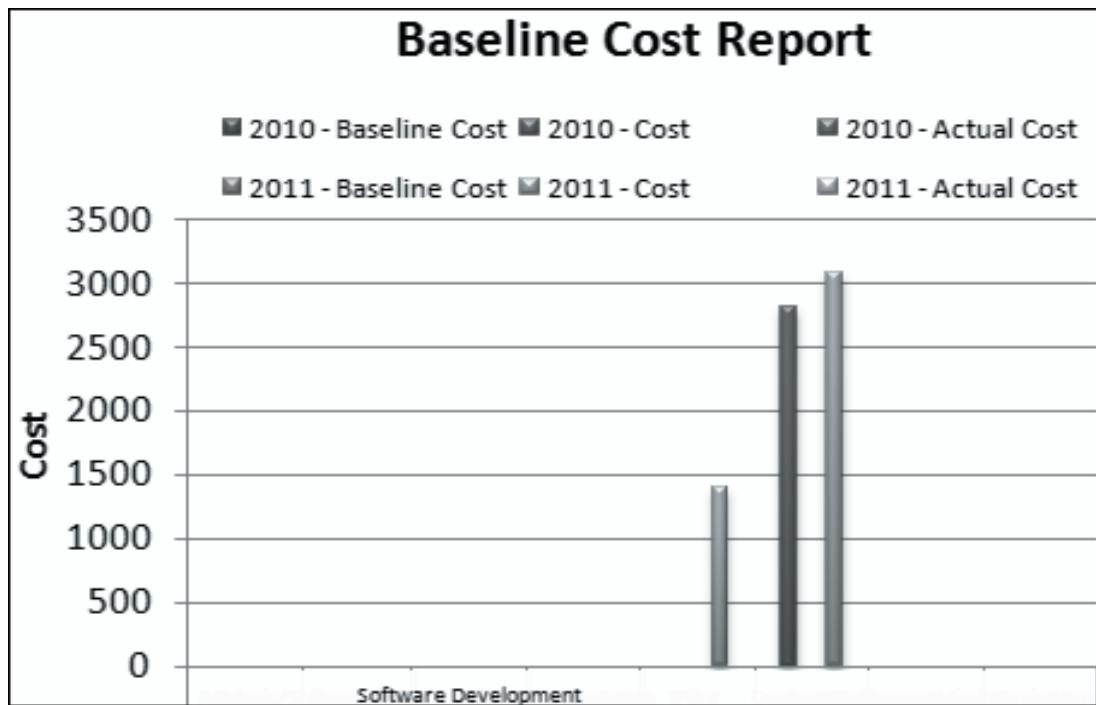


Figure 13.13: Displaying a Visual Report in MS Excel

Modifying Visual Report templates or creating own templates can be done by using the New Template and Edit Template buttons in the Visual Reports dialog box.

Editing a template allows to add or remove fields from the template whereas creating a new template involves specifying the format (Excel or Visio) and selecting the fields on the report.

13.8 Graphics in MS Project Reports

Project managers often find the necessity to add graphics in reports such as the company logo on the header of the report or the picture of the new product, and so forth.

MS Project 2010 offers three methods to insert graphics in a project which can then generate a report:

- Cut and paste a graphic from another file: A graphic once pasted from another file cannot be edited in the project.
- Insert a link to an existing graphics file: Inserting links in the project reduces the project file size.
- Embed a graphic: Embedding a graphic lets the user to edit the graphic content using the tools such as MS Paint for an image program.

Session 13

Reports

Concepts

Steps to insert an existing graphics file in a notes box are as follows:

1. Open the project in any task oriented view or resource oriented view.
2. Open the **Notes** tab of the **Task Information** or **Resource Information** dialog box.
3. Click **Insert Object** icon and select the **Object Type** from the list as shown in figure 13.14.

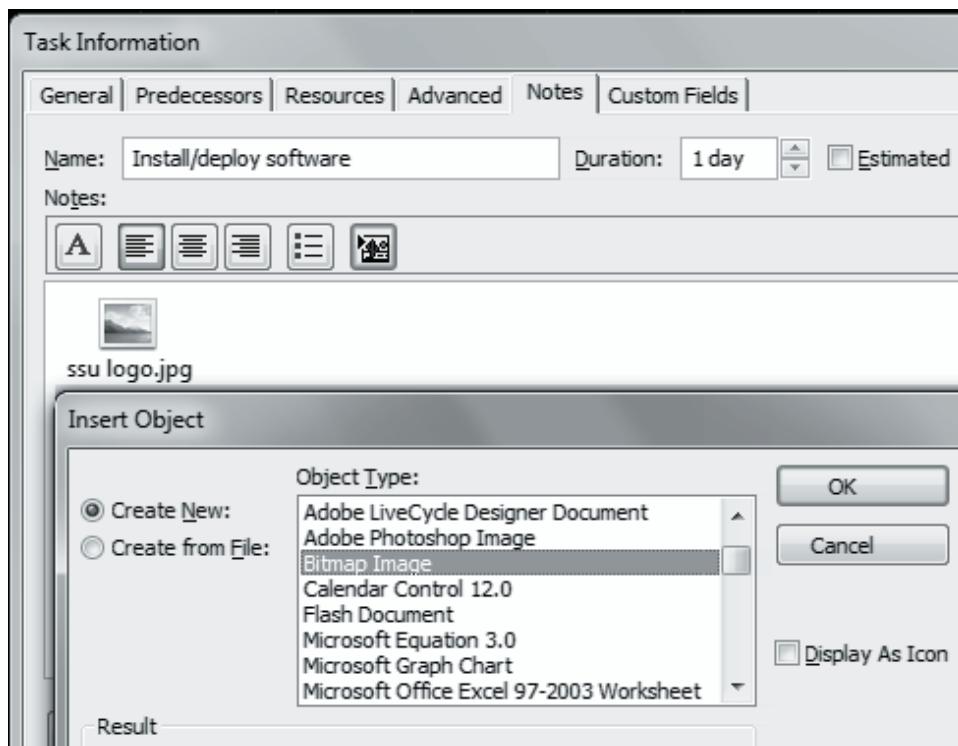


Figure 13.14: Inserting Graphics

4. Choose the **Create New** option or click the **Browse** button to locate the file.
5. To link to a file, select the **Link** check box and then click **OK**.
If this option is not selected, the object is embedded in the file.
6. To insert the object as an icon, select the **Display as Icon** check box.
When the object as an icon is displayed, viewers on a computer can click the icon to view the picture.
7. Click **OK** to display the image.

Session 13

Steps to insert an existing graphic file in a header or footer are as follows:

1. Open the header or footer tab of **Page Setup** and click the **Insert Picture** button to display the **Insert Picture** dialog box.
2. Navigate to the folder that holds the file to insert and click the file and then click **Open**. The image appears in the header or footer.

To insert a new graphic that is created on the fly into a note, follow these steps:

1. In the **Insert Object** dialog box, select the **Create New** option.
2. From the **Object Type** list, choose the type of object that you want to insert.
3. To insert the object as an icon, select the **Display as Icon** check box.
4. Click **OK** to see a blank object box, along with tools, similar to the one in MS Paint. Create an object as shown in figure 13.15.

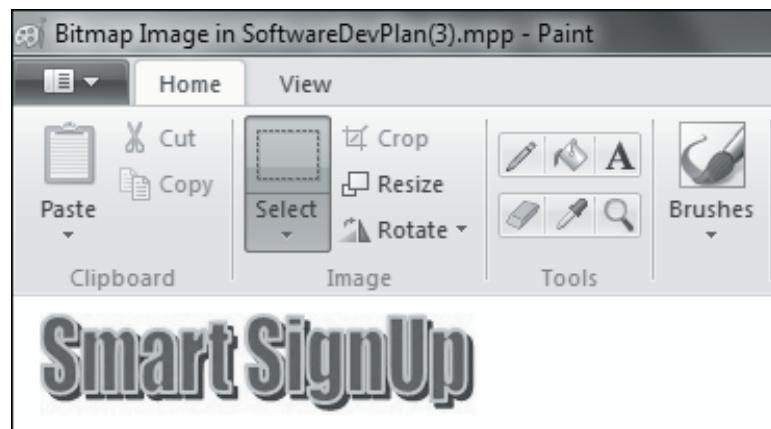


Figure 13.15: Creating a New Graphic

5. Use the tools of the application to the inserted object to draw, edit, insert, or format the new graphic object.
6. Close the window to return to the project file.

13.9 Formatting Reports

MS Project 2010 provides all the usual formatting options available in MS Office suite to format a report.

Session 13

Reports

Points to keep in mind while formatting reports:

- Font: Choose simple system fonts like Arial or Verdana.
- Color: Using too many colors may confuse the reader.
- Font size: Use a font size that is readable, without overlapping the labels.
- Effects: Avoid text effects that make text difficult to read such as bold, italic, or underlining.

Steps to edit report are as follows:

1. Open project and on **Project** tab, click **Reports** to display the **Reports** dialog box.
2. Click a report category and then click the **Select** button to display the Reports category dialog box.
3. Click the specific report to generate and click the **Edit...** button to display **Report** dialog box.
For some reports, the **Text Styles** dialog box opens to change other settings in those reports.
4. If the **Text Styles** dialog box has not opened, click the **Text...** button to display the **Text Styles** dialog box as shown in figure 13.16.

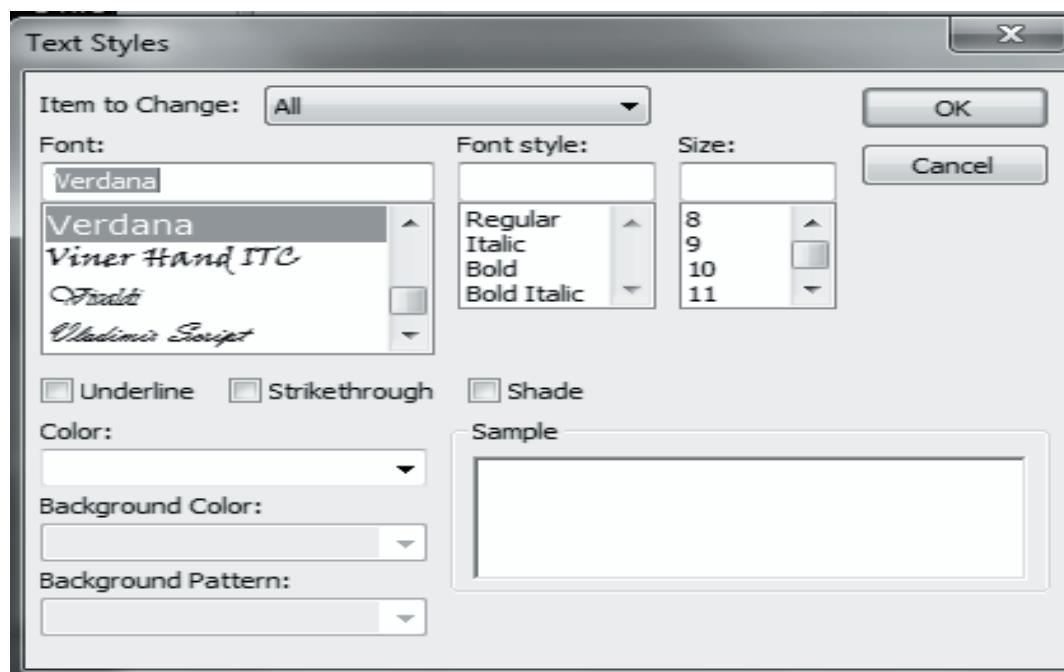


Figure 13.16: Text Styles Dialog Box

Session 13

5. In the **Item to Change** box, select the item to format from the drop-down.
6. Make selections in the **Font**, **Font style**, **Size**, and **Color** fields.
7. Make any other text-related selections such as **Underline** and so forth.
8. Click **OK** twice to return to the Reports dialog box.
9. Click **Select** to view the report preview.



Summary

- MS Project 2010 facilitates project managers with built-in and customizable reports to include the data relevant to their projects.
- Standard reports are built-in reports that offer choices for the information to include in the reports.
- MS Project provides five categories of reports with each category containing a total of 22 standard reports.
- A crosstab report represents a unique data relative to column and row definitions. Effectively, the cell formed by the column and row intersection represents the unique data.
- A custom report begins with a report type that can be a task, a resource, a monthly calendar, or a crosstab.
- MS Project 2010 provides the capabilities of Pivot tables in the form of Visual reports.
- MS Project 2010 enables project managers to add graphics to their reports.
- MS Project 2010 provides the usual formatting options available in MS Office suite to format project reports.

Session 13



Check Your Progress

1. Three elements that can be modified in a standard report are _____.

A)	Definition, Details, and Sort
B)	Documentation, Details, and Sort
C)	Details, Sort, and Manage
D)	Procedure, Documentation, and Details

2. Report generated by unique data relative to column and row definitions is _____.

A)	Standard report
B)	Custom report
C)	Formatted report
D)	Crosstab report

3. Which of the following MS Office applications use templates to generate visual reports?

A)	Visio
B)	Word
C)	Access
D)	Excel

4. Which of the following is not a method to insert graphics in a report?

A)	Cut and paste a graphic from another file
B)	Paste graphic links in Windows system directory
C)	Insert a link to an existing graphics file
D)	Embed a graphic



Check Your Progress

5. Which one of the following tab is used to insert an existing graphics file to a report in the Task information dialog box?

A)	General tab
B)	Predecessor tab
C)	Notes tab
D)	Custom fields tab

GROWTH
RESEARCH
OBSERVATION
UPDATES
PARTICIPATION



Objectives

At the end of this session, the student will be able to:

- *Explain how to change the look of taskbars*
- *Explain how to apply a new style to Gantt charts*
- *Explain formatting of Network Diagram task boxes*
- *Describe how to format the layout of various views*
- *Explain how to make changes to the gridlines in a view*
- *Explain how to add graphics to a project*

14.1 Introduction

The various views and **Gantt Charts** in MS Project provide all the information that project managers need to track and monitor a project. Project managers can apply formatting to the taskbars, **Gantt Charts**, as well as views to present information in a more structured and attractive layout. Such structured formatting is useful for presenting status reports to clients or in status meetings.

This session describes how to format taskbars, apply style to **Gantt Charts**, and format task boxes in network diagrams. This session also explains how to modify the layout and change gridlines of various views in a project. Finally, it explains how to add graphics to a project to enhance its presentation.

14.2 Formatting the Gantt Chart

The default view on opening a project displays the list of tasks, its schedule, and work assignments in a table in the left panel. Graphic representation of the project schedule is illustrated on the right panel in a **Gantt Chart**. By default, all taskbars in the **Gantt Chart** are displayed in blue. Project managers can format various elements of the **Gantt Chart** to bring better emphasis on certain statistics and for visual appeal.

MS Project 2010 has replaced the **Gantt Chart** wizard available in the previous versions with a Format tab that contains all the formatting options related to the **Gantt Chart**. Project managers can format the various types of taskbars, and specify their color and display style.

Session 14

Customizing Project Appearance

14.2.1 Formatting Taskbars

The **Gantt Chart** in MS Project depicts the project status through a variety of taskbars, such as Summary, Milestone, Split, Critical, Slack, and so forth. Project managers can specify formatting for each of these taskbars by performing the following steps:

1. In the **Bar Styles** group on the **Format** tab, click the **Format** button and select **Bar Styles** from the drop-down menu. This displays the **Bar Styles** dialog box as shown in figure 14.1.

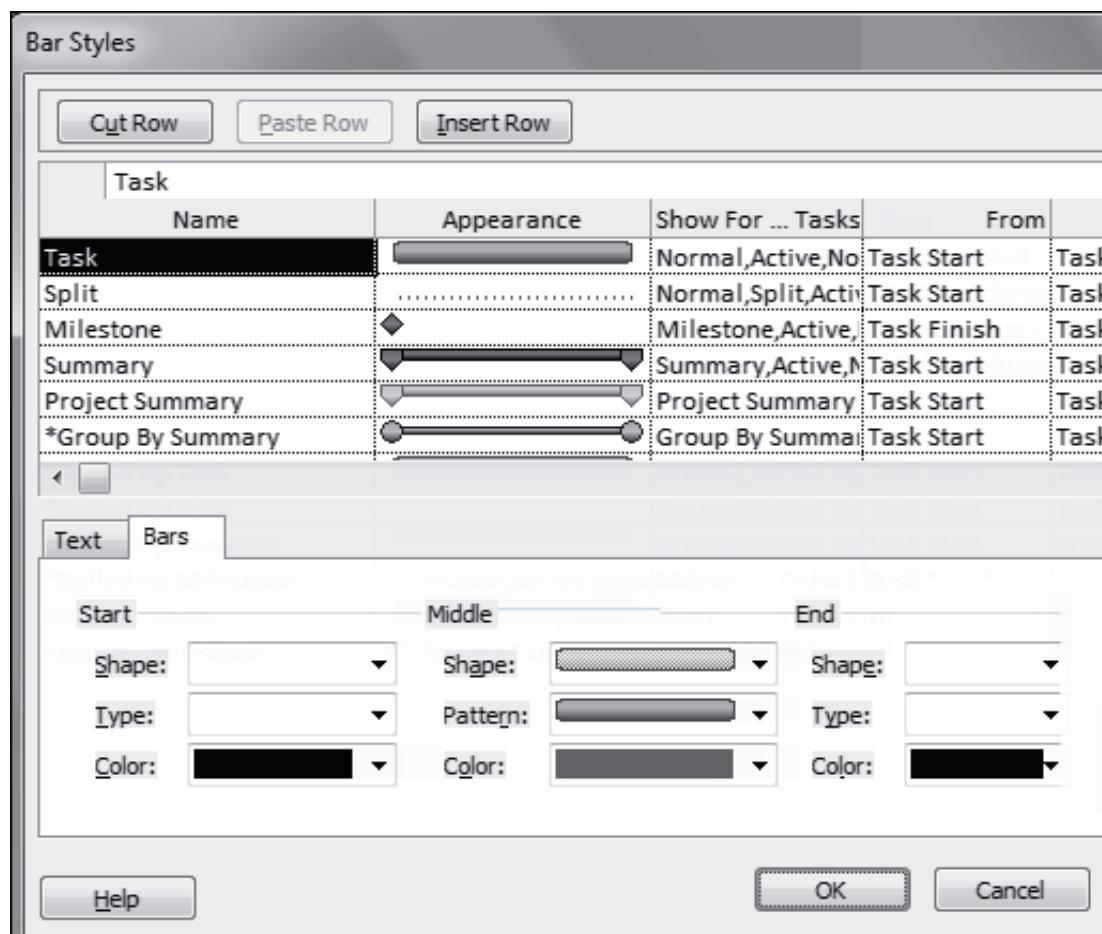


Figure 14.1: Bar Styles Dialog Box

2. In the **Name** column, select the type of taskbar to format.
3. In the **Show For ... Tasks** column for the selected task, select criteria for the task, such as **Critical** or **Finished**.
4. On the **Bars** tab in the dialog box, select a shape for the start, middle, and end parts of the taskbar from the **Shape** drop-down lists for each part.

Session 14

Customizing Project Appearance

5. From the **Type** drop-down lists, select the pattern for the starting and ending of the taskbar.
6. In the **Pattern** drop-down list, select the fill pattern for the middle part of the taskbar.
7. Click the **Color** drop-down lists and select a color for the start, middle, and end parts respectively of the taskbar from the color palette.
8. Click the **Text** tab and select an alignment position for the text against taskbars, in the **Gantt Charts**. Users can select to display the text to the left, right, top, bottom, or inside the taskbar in the chart.
9. Repeat the steps from 2 to 8 for all types of taskbars to format.
10. Click **OK** to apply the formatting changes for the taskbars as shown in figure 14.2.

Concepts

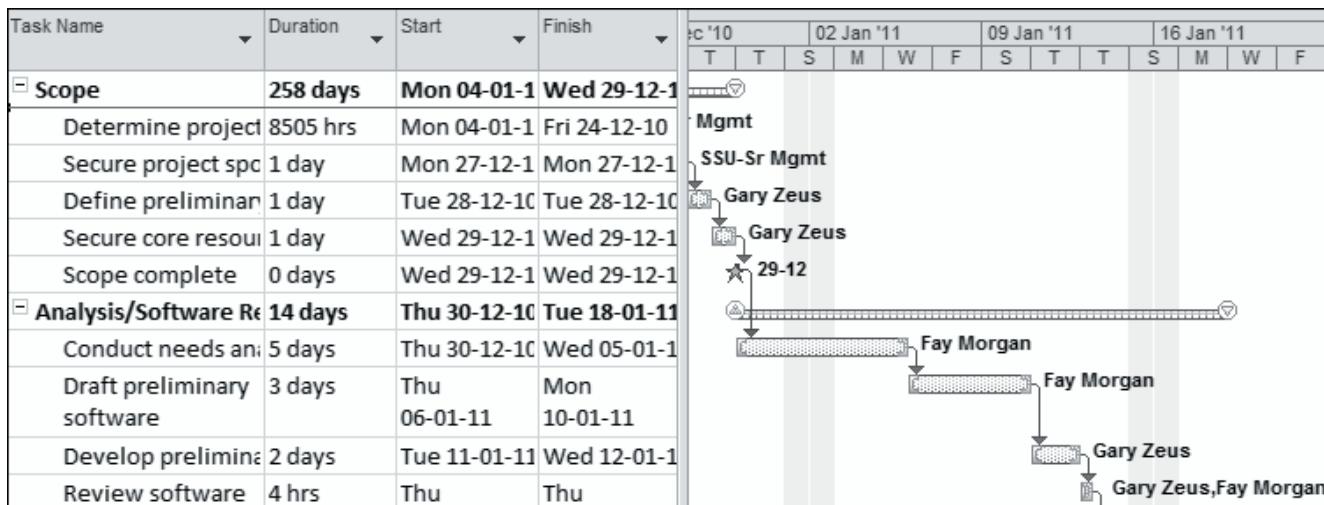


Figure 14.2: Outcome of Gantt Chart with Customized Bar Styles

14.2.2 Changing the Gantt Chart Style

By default, **Gantt Charts** in MS Project follow a blue and red color scheme for the taskbars. It depicts all taskbars in shades of blue and red. To change the color scheme for the **Gantt Chart**, on the **Format** tab of the Ribbon, in the **Gantt Chart Style** group, click the **Gantt Chart Style** list box. This displays two sets of color schemes, **Scheduling Styles** and **Presentation Styles**.

Figure 14.3 displays the **Scheduling Styles** and **Presentation Styles** color schemes in the **Gantt Chart Style** list box.



Figure 14.3: Scheduling Style and Presentation Styles

Select the desired color scheme to apply it to the entire **Gantt Chart**.

14.3 Formatting Views

Apart from the **Gantt Chart**, users can specify formatting for the various views. Users can specify formatting for the following elements of any view:

- Text
- Gridlines
- Layout

14.3.1 Formatting Text in Project Views

Users can specify the font style, font size, color, background, and other such formatting for the text in the views. Perform the following steps to format the text in a view in MS Project:

1. In the **Format** group on the **Format** tab for **Gantt Chart Tools**, click the **Text Styles** button to display the **Text Styles** dialog box. Here, one can specify various settings for text styles as shown in figure 14.4.

Session 14

Customizing Project Appearance

Concepts

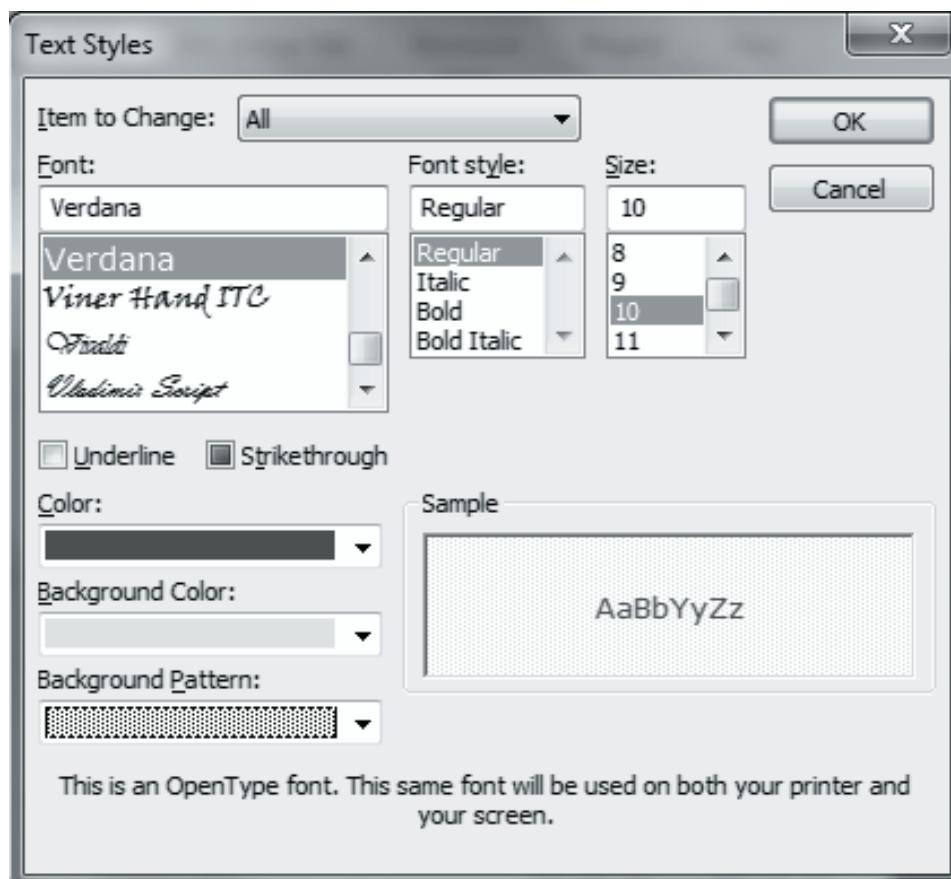


Figure 14.4: Text Styles Dialog Box

2. From the **Item to Change** drop-down list, users can select the task type for which they want to change the text formatting. Selecting **All** applies the formatting to all text available in the views, both in the views table as well as the **Gantt Chart**.
3. In the **Font** list box, select the required font style.
4. Specify the required font style and font size from the respective list boxes.
5. Specify additional formatting such as underline or strikethrough for the selected task type, if required.
6. Select the required text color, background color, and background pattern from the respective drop-down lists.
7. Click **OK** to apply the text formatting to the current view as shown in figure 14.5.

Session 14

Customizing Project Appearance

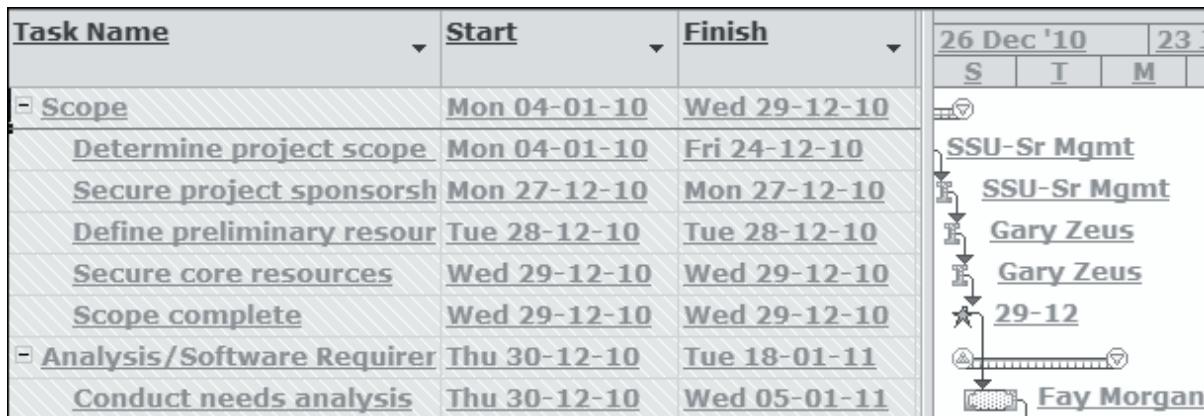


Figure 14.5: Outcome of Gantt Chart View with Customized Text Styles

14.3.2 Applying Gridlines

Project managers can display gridlines on the **Gantt Chart** to break up the scheduling display into chunks. The gridlines help identify at a glance, the time intervals in which the task occur; map the task list on the left to the taskbars on the right; identify the start, middle, and finish of interval for the tasks; identify the current or the status date on the **Gantt Chart**; and so forth. Users can also specify the color and style for the gridlines.

Perform the following steps to apply gridlines to **Gantt Charts** in MS Project:

1. In the **Format** group on the **Format** tab for **Gantt Chart Tools**, click the **Gridlines** button to display the **Gridlines** dialog box. This dialog box enables to specify various options for gridlines as shown in figure 14.6.

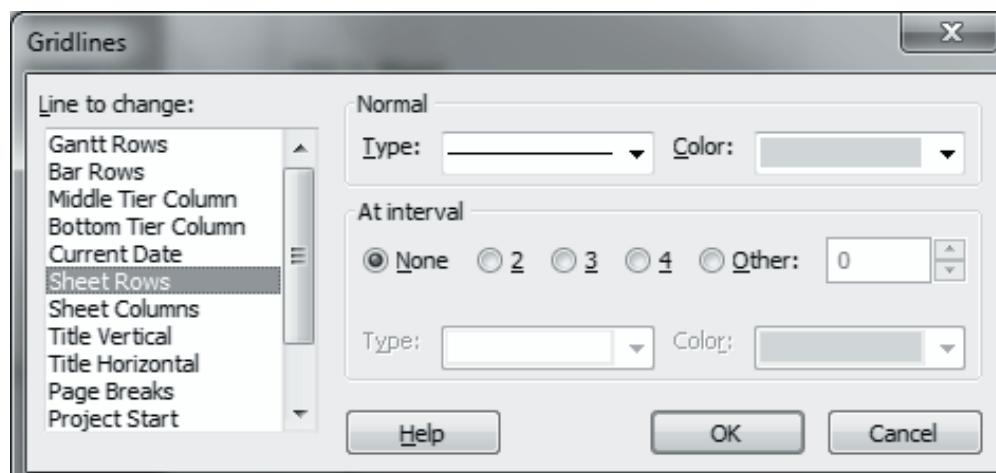


Figure 14.6: Gridlines Dialog Box

Session 14

Customizing Project Appearance

2. From the **Line to change** list box, select the type of gridline to display and format in the **Gantt Chart**.
3. From the **Type** drop-down list, select the line style to use when displaying the selected gridline.
4. Click the **Color** drop-down list to display a color palette and select the desired color for the selected gridline.
5. For certain types of gridlines such as **Sheet Rows**, **Sheet Columns**, and **Gantt Rows**, users can choose to display the gridlines at specific intervals, in contrasting colors. To do so, in the **At interval** section, select the interval at which contrasting colors should be displayed.
6. Specify the line style and contrasting color for the interval lines in the **Type** and **Color** drop-down lists, respectively.
7. Click **OK** to apply the gridlines with the specified formatting to the **Gantt Chart** as shown in figure 14.7.



Figure 14.7: Outcome of Gantt Chart View with Customized Gridlines

14.3.3 Formatting Layout

In addition to formatting the text and gridlines in the views in MS Project, users can also format the layout of the views. To format the layout of views in MS Project, in the **Format** group on the **Format** tab for **Gantt Chart Tools**, click the **Layout** button, to display the **Layout** dialog box. The contents of the Layout dialog box vary depending on the type of view for which the layout is being modified.

Options for formatting the layout of a **Gantt Chart** view are as follows:

- **Links:** Specifies the line style for the lines depicting dependency links between tasks.
- **Date Format:** Specifies the date format displayed in taskbar labels.
- **Bar Height:** Specifies the height of taskbars in points.

Session 14

Customizing Project Appearance

- **Always Roll Up Gantt Bars:** Selected to roll up taskbars to the highest-level summary task, by default.
- **Round Bars to Whole Days:** If selected, taskbars with durations including a portion of a day are represented in the **Gantt Chart** as rounded off to the nearest whole day. For instance, a task with duration of $\frac{3}{4}$ of a day is rounded off and represented with a taskbar spanning four days.
- **Show Bar Splits:** If selected, MS Project displays the tasks including a period of inactivity as split into different time lines.
- **Show Drawings:** If selected, drawings inserted in the **Gantt Chart** are displayed both on screen and in printouts.

Figure 14.8 displays the **Layout** dialog box for a **Gantt Chart** view.

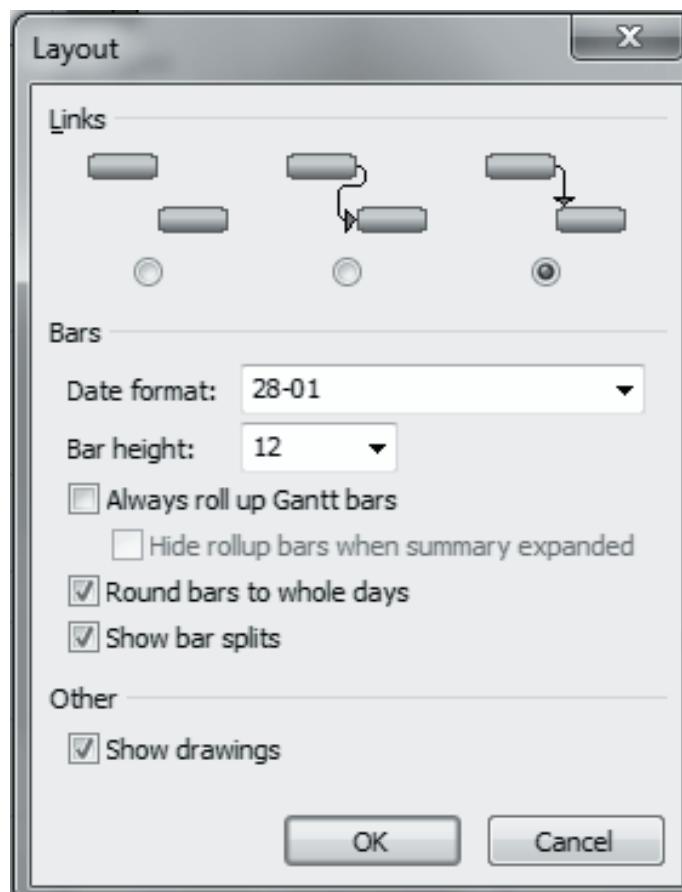


Figure 14.8: Layout Dialog Box for a Gantt Chart View

14.4 Formatting Network Diagram View

Project managers often use network diagrams to present the project plan and its status in status meetings and client reports. Formatting network diagrams to illustrate the project plan in a neat, clear, and aesthetic layout is quite important for better communication and understanding of the plan.

The Network Diagram view represents various types of tasks in different shapes such as:

- **Summary tasks** are displayed in boxes with two slanted sides with a plus or minus symbol, depending on whether the summary task's subtasks are hidden or displayed. Clicking the symbol hides or displays the subtasks.
- **Subtasks** are displayed in simple rectangular boxes.
- **Milestones** are displayed in diamond-shaped boxes with blue shading.

For each task type, the critical tasks have a red background while noncritical tasks have a blue background.

Users can apply the following types of formatting to the Network Diagram view:

- Task box
- Task box style
- Layout

14.4.1 Formatting Task Boxes

Users can format and modify a selected task box by performing the following steps:

1. Display the Network Diagram view by selecting it from the **Gantt Chart** drop-down menu in the **View** group on the **Task** tab.
2. Select the task box to modify and click the **Box** button in the **Format** group on the **Format** tab for **Network Diagram Tools**, to display the **Format Box** dialog box.
3. From the **Data** template drop-down list, select the desired box design template. Users can click the **More Templates...** button adjacent to the drop-down list for additional box designs.
4. In the **Border** section, specify a shape, border color, and a line style for the task box.
5. In the **Background** section, select the box background color and a background fill pattern for the

Session 14

Customizing Project Appearance

selected task box.

6. Click **OK** to apply the formatting changes to the task box.

Figure 14.9 displays the **Format** dialog box for the Network Diagram view.

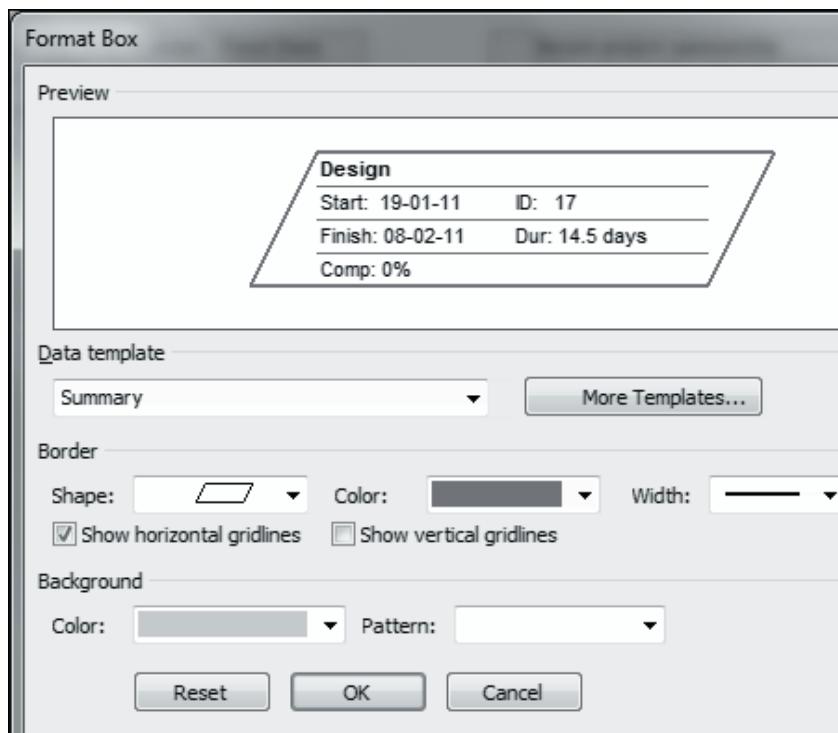


Figure 14.9 : Format Box Dialog Box for the Network Diagram View

14.4.2 Formatting Task Box Styles

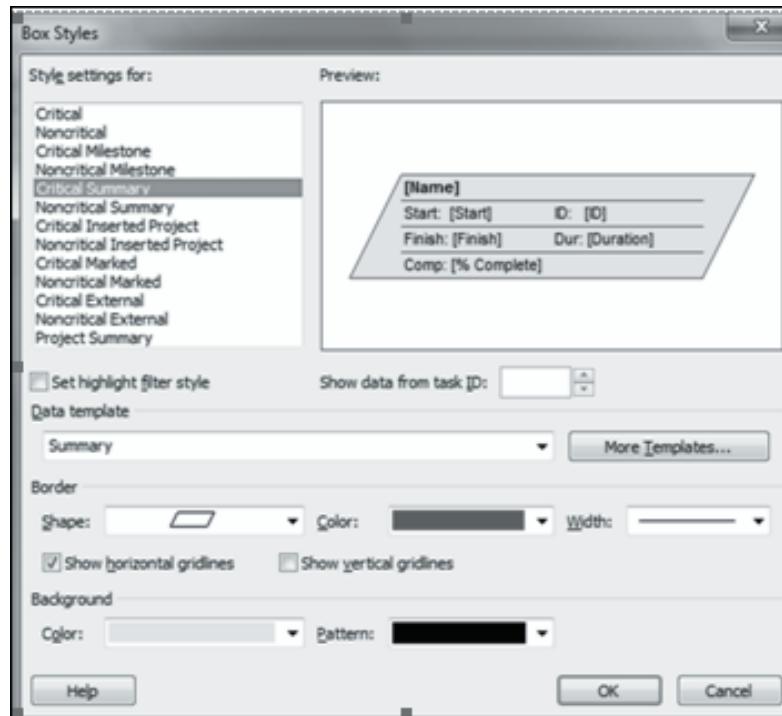
Users can format the box style of all task boxes of a specify type of task by performing the following steps:

1. With the Network Diagram view displayed, click the **Box Styles** button in the **Format** group on the **Format** tab for **Network Diagram Tools**, to display the **Box Styles** dialog box, as shown in figure 14.10.

Session 14

Customizing Project Appearance

Figure 14.10 displays the **Box Styles** dialog box for the Network Diagram view.



Concepts

Figure 14.10: Box Styles Dialog Box for the Network Diagram View

2. From the **Style settings for** list, select the task type to specify its formatting. The adjacent **Preview** box displays a preview of the existing task box formatting for the selected task type. As the users make changes to the formatting settings, the changes are reflected in the **Preview** box.
3. In the **Border** section, specify a shape, border color, and a line style for the task box. Users can also specify to add horizontal and vertical gridlines to the task boxes to separate the display of various task related parameters in the task box.
4. In the **Background** section, select the box background color and a background fill pattern for the selected task box.
5. Click **OK** to apply the formatting changes to all task boxes of the selected task type, in the network diagram.

14.4.3 Formatting the Network Diagram Layout

In addition to formatting task boxes, users can also specify formatting for the layout of the Network Diagram view in the Layout dialog box. Click the **Layout** button in the **Format** group on the **Format** tab for **Network Diagram Tools**, to display the **Layout** dialog box.

Session 14

Customizing Project Appearance

Figure 14.11 displays the **Layout** dialog box for the Network Diagram view.

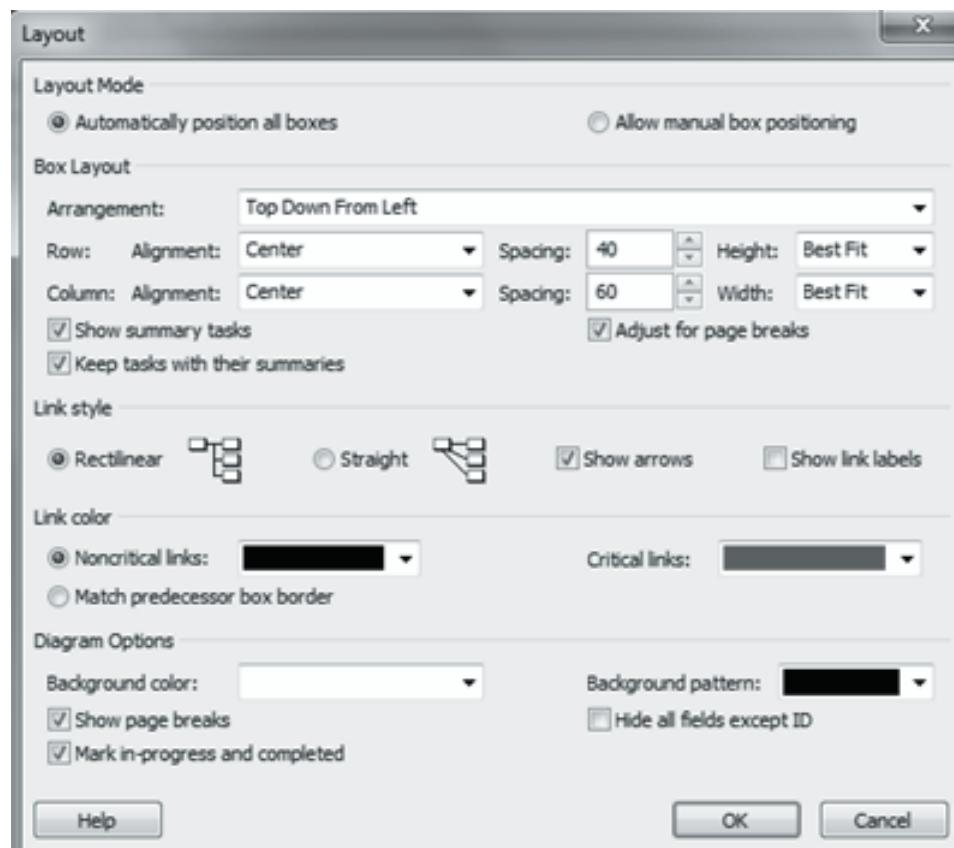


Figure 14.11: Layout Dialog Box for the Network Diagram View

Users can specify the following layout settings for the Network Diagram view:

- **Layout Mode:** Specify whether MS Project will automatically arrange the task boxes in the Network Diagram view or users can manually arrange them.
- **Box Layout:** In this section, specify the order for arranging the task boxes. Further, specify the alignment of task details in the rows and columns within the task boxes, the spacing between the rows and columns in the task boxes, and the height and width of the rows and columns in the task boxes. Users can also specify whether to display Summary tasks in the task boxes and how to display them.
- **Link Style:** Specifies how to display the dependency links between the tasks in the network diagram. Select the **Show link labels** check box to specify whether to display the dependency type alongside the link lines.
- **Link Color:** Specify the color for the dependency link lines for critical and noncritical links in the network diagram.

- **Diagram Options:** Specify the background color and the background fill pattern for the task boxes in the diagram. Also, specify whether to display page breaks and mark the tasks as in-progress or completed as the case may be. If required, users can specify to hide all task details except for the task ID, in the network diagram.

14.5 Formatting the Calendar View

The Calendar view in MS Project is similar to the Calendar view in Outlook, displaying weekly and monthly views of the project tasks. Just as in all other views, users can format the text and display styles in the Calendar view.

To display the Calendar view, perform the following steps:

1. In the **View** group, click **Gantt Chart** and then **More Views...**
2. Select **Calendar** in the **More Views** dialog box

MS Project allows users to format the following elements of the Calendar view:

- Text styles
- Bar styles
- Layout

14.5.1 Formatting Text Styles in Calendar View

Users can format the text in the calendar view to display it in a specific font, font style, font size, and font color. Users can also specify a background color and background fill pattern for the view. They can select to apply the specified text formatting to all task types in the calendar or a specific type of task in the calendar. Users can specify the text formatting for Calendar view in the **Text Styles** dialog box, which is displayed by clicking the **Text Styles** button on the **Format** tab for **Calendar Tools**. The **Text Styles** dialog box for Calendar view is exactly similar to the **Text Styles** dialog box for **Gantt Chart** view.

14.5.2 Formatting Bar Styles in Calendar View

The Calendar view displays taskbars along with task description depicting the task schedules. By default, all types of tasks in the Calendar view are displayed in blue. Users can specify formatting to display different types of taskbars in different colors for better emphasis.

To format taskbars in the **Calendar** view, click the **Bar Styles** button on the **Format** tab for **Calendar Tools** to display the **Bar Styles** dialog box.

Session 14

Customizing Project Appearance

Here, users can specify the following categories of formatting options for the taskbars:

- **Task type:** Specify to apply formatting to all tasks types or a specific task type.
- **Bar shape:** Specify to display the taskbars as bars, lines, or not displayed them at all. Also, specify the fill pattern for the taskbar, the fill color for the taskbar, and the pattern for displaying split tasks.
- **Bar rounding:** Specify to round off taskbars with durations including a portion of a day to the nearest whole day.
- **Text:** Click this drop-down list to display a list of project related information fields. From the list, select all the information fields to display in the taskbar. Also, specify alignment of text in the taskbars and whether or not to wrap the text in the taskbars.

Figure 14.12 displays the Bar Styles dialog box for formatting the taskbars in the Calendar view.

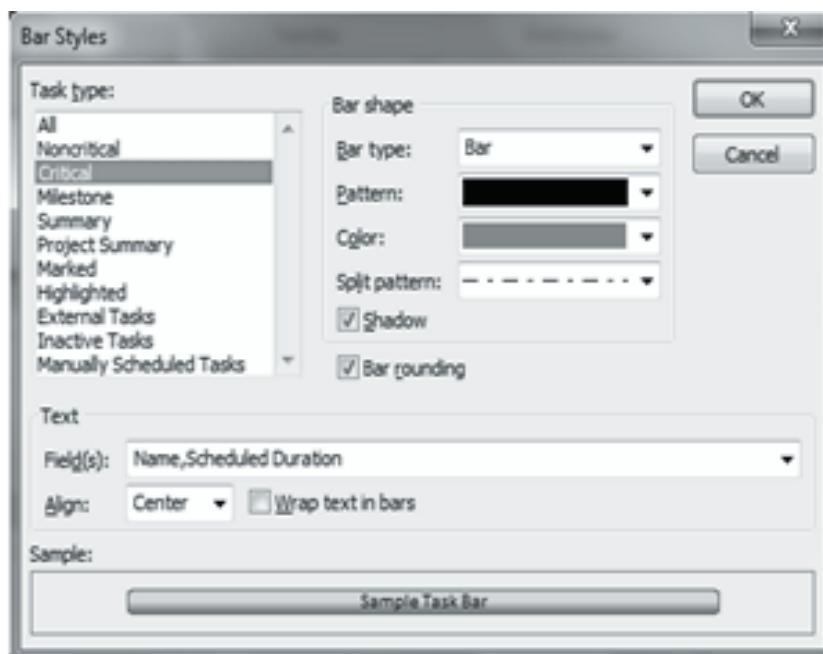


Figure 14.12: Bar Styles Dialog Box for Formatting the Taskbars in the Calendar View

14.5.3 Specifying Calendar View Layouts

Project managers can display the Calendar view in three different types of layouts, Month, Week, and Custom. Clicking the **Month** and **Week** buttons just above the Calendar view displays the project tasks in monthly and weekly time intervals, respectively. Click the forward and back buttons just below the layout buttons to navigate forward and backward through the selected intervals.

Session 14

Customizing Project Appearance

Figure 14.13 displays the three layout buttons in the Calendar view.

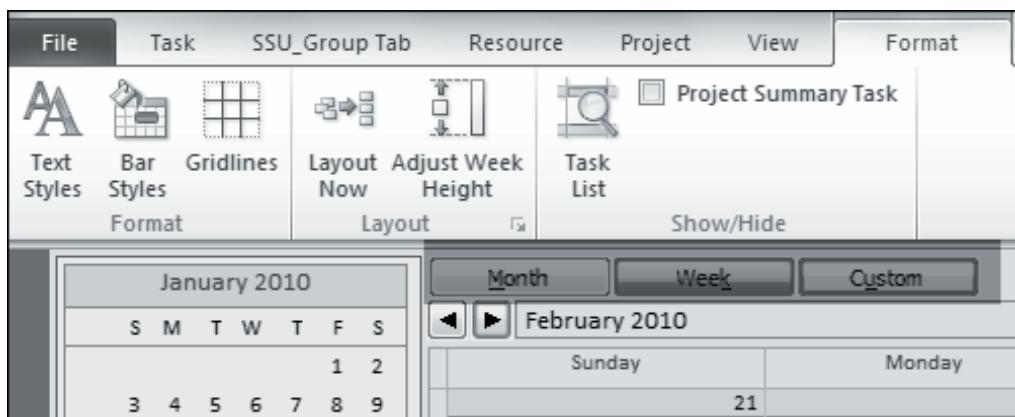


Figure 14.13: Three Layout Button in the Calendar View

Clicking the **Custom** button in the Calendar view displays the **Zoom** dialog box. Here, users can specify a custom interval for displaying project information. Select the **Number of weeks** radio button and specify the time interval in number of weeks for which the Calendar view should be displayed. Alternatively, specify the start and finish dates for the interval for which the Calendar view should be displayed.

Figure 14.14 displays the **Zoom** dialog box for specifying a custom interval layout.

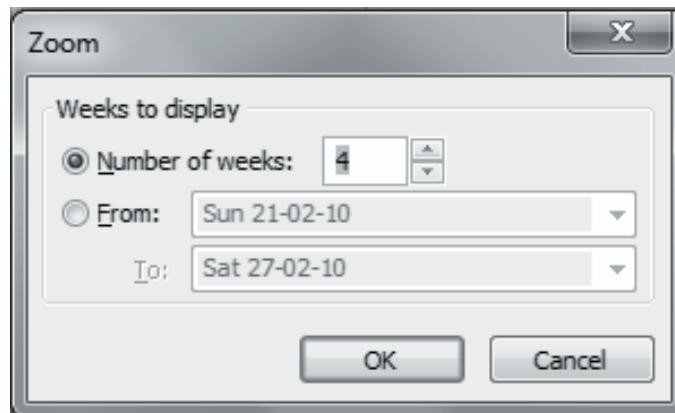


Figure 14.14: Zoom Dialog Box

14.6 Graphics in Project Views

Graphics help enhance the look of any document and can be used to emphasize or draw attention to specific information. Project managers can use the drawing tool on the **Format** tab for **Gantt Chart Tools** to draw images on the **Gantt Chart** in MS Project. Consider that a project manager wants to draw attention to a part of a project plan with some scheduling problem, during the project status meeting.

Session 14

Customizing Project Appearance

The project manager can solve this as follows by drawing a circle around the problem area in the project plan in the **Gantt Chart**:

1. Click the **Drawing** button in the **Drawings** group on the **Format** tab.
2. Select the oval shape from the drop-down menu and drag the mouse over the problem area to draw the shape.
3. The shape is displayed in solid white, hiding the text on the project plan. To display the text through the shape and format the object as an outline around the text, click the **Drawing** button on the **Format** tab again.
4. Select the **Send to Back** option from the drop-down menu.

By default, all shapes are drawn with a black outline. To emphasize the shape, users can format it, for instance to display it as a thicker red outline. Perform the following steps to format the shape:

1. Select the shape, click the **Drawing** button on the **Format** tab, and select **Properties** from the drop-down menu to display the **Format Drawing** dialog box.
2. In the **Line** section, select the desired line color from the **Color** drop-down list.
3. In the **Line** section, select the desired line width to give the shape a thicker outline.
4. Click **OK** to apply the formatting changes.

Figure 14.15 displays a red oval highlighting a part of the project schedule in the **Gantt Chart**.

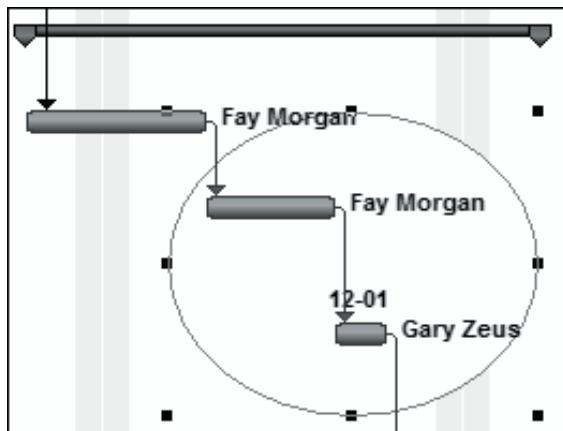
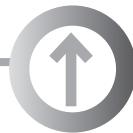


Figure 14.15: Highlighting a Part of Project Schedule in Gantt Chart



Summary

- MS Project allows project managers to format and enhance the appearance of the Gantt Chart views and Network Diagram views.
- Project managers can format various types of taskbars in the Gantt Chart view and specify their color and display style.
- Managers can change the color schemes for the taskbars in the Gantt Chart view.
- Managers can format text in views, apply gridlines, and format the layout for the Gantt Chart view in MS Project.
- Managers can format the task boxes, task boxes style, and layout of the tasks in the Network Diagram view.
- Managers can also format the text styles, bar styles, and layouts in the Calendar view.
- Project managers can present attractive Gantt Charts by enhancing them with graphics to highlight specific sections of the chart.



Check Your Progress

1. Project managers can format all taskbars of a specific task type in the Gantt Chart view in the _____.

A)	Bar Styles dialog box
B)	Layout dialog box
C)	Format Bar dialog box
D)	Gantt Chart Styles list

2. The Bar Styles dialog box in the Gantt Chart view allows users to specify _____.

A)	The color scheme for all taskbars
B)	The text alignment for all taskbars
C)	Gridlines for the Gantt Chart
D)	The shape for the start, middle, and end parts of the taskbars

3. In a Network Diagram view, milestones are displayed in _____.

A)	Regular blue rectangle task boxes
B)	Blue diamond task boxes
C)	Task boxes with two slanted sides
D)	Regular clear rectangle task boxes

4. Project managers can specify the formatting for a selected task box in the Network Diagram view using the _____.

A)	Format Box dialog box
B)	Box Styles dialog box
C)	Layout dialog box
D)	Text styles dialog box



Check Your Progress

5. When formatting Calendar view, the Zoom dialog box is displayed on clicking the _____.

A)	Week button above the Calendar view
B)	Custom button above the Calendar view
C)	Bar Styles button on the Format tab
D)	Text Styles button on the Format tab



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Objectives

At the end of this session, the student will be able to:

- *Describe the tools for collaborating and sharing project schedules*
- *Explain how to share project information using SharePoint 2010*
- *Explain how to set up and synchronize task lists*
- *Describe MS Project Server 2010 and its components*
- *Explain how to integrate MS Project Server with MS Project Professional*
- *Explain how to set up resource assignment using MS Project Server*

15.1 Introduction

MS Project 2010 is a project management tool that helps to manage and develop project schedules. It provides several tools for managing resources, tracking the project progress, and generating project reports. Microsoft also provides another very powerful tool called SharePoint 2010 that offers a business collaboration platform for teams to work at an enterprise level or on the Web. A new feature of MS Project 2010 is that it integrates seamlessly with SharePoint 2010 and can be used for collaborative project management.

This session introduces collaboration tools, such as SharePoint 2010 and Project Server 2010. These tools help project teams share project schedules, project related information, and set up and synchronize tasks lists. This session also explains how to integrate MS Project 2010 with Project Server and set up resource assignments.

15.2 SharePoint 2010

SharePoint 2010 is a collaboration tool from Microsoft that is used to quickly create Web sites that provide a common location for teams to collaborate on Web pages, documents, lists, calendars, and data. Project managers and team members can use SharePoint to create and share project related information, such as task and resources lists, project plans, calendars, and so forth.

Session 15

Connecting and Collaborating

15.3 Installing SharePoint 2010

To make use of the collaborative features of SharePoint 2010 with Project 2010, SharePoint 2010 must be installed on a server with a database, such as SQL Server.

The following are the system requirements for installing SharePoint:

- **Hardware Requirement:** SharePoint is a 64-bit application and hence can run only on hardware that supports a 64-bit operating system and 64-bit database server
- **Operating System Requirement:** 64-bit edition of Windows Server 2008 with Service Pack 2 or Window Server 2008 R2
- **Database Requirement:** 64-bit versions of Microsoft SQL Server 2005 or Microsoft SQL Server 2008 with appropriate service packs and updates

15.4 Connecting Projects to SharePoint

After installing SharePoint on the server, a SharePoint site needs to be configured. Each department or project can create its own SharePoint site where the project team can connect and share project information and work collaboratively. This site will serve as a repository for projects and will hold all the project related information to be shared among the project team members. The project team and stakeholders will have controlled access to the components of the SharePoint site.

Figure 15.1 displays a SharePoint site template that will hold and manage project related information.

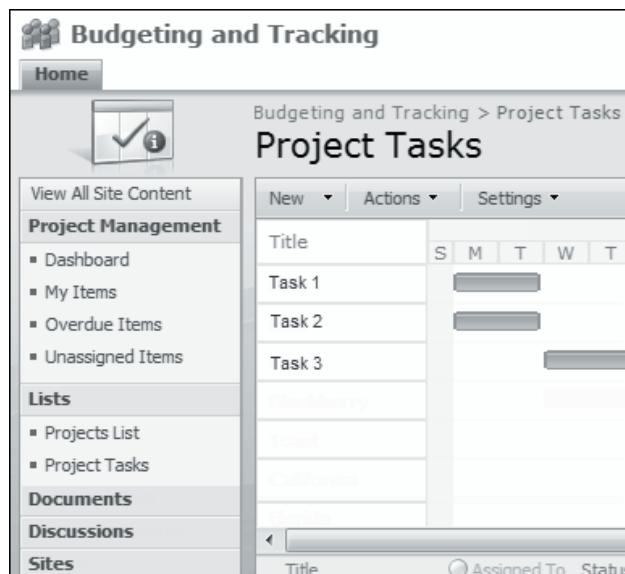


Figure 15.1: SharePoint Site Template with MS Project Information

15.5 Components of a SharePoint Site

Before beginning to use SharePoint with MS Project, it is useful to familiarize oneself with the following components of a SharePoint site:

- **Lists:** A list is a Web site component used to store, share, and manage information. Project managers can use lists to share information, such as project task list, resources assignments, or project milestones.
- **Libraries:** A library is a special type of list used to store files as well as information about files. Project managers can store project documentation, manuals, and other such documents that team members might require to access and update.
- **Views:** Views are used to browse through specific items in a list or library that are most accessed or critical to a project. For example, the software documentation of the project, a set of checklists that team members need to refer to before submitting the assigned work, or the project status report.
- **Web Parts:** A Web Part is a modular unit of information that forms a basic building block of most pages on a site. Web Parts can be used to display custom information on Web pages, such as the company logo, calendar with tasks lined up for the day, the status report as on the current date, or the **Gantt Chart** with status update as on the current date.

15.6 Connecting Teams with SharePoint

To make effective use of the collaborative features of SharePoint, project managers need to identify the members who will be part of the collaborative exercise and the roles that they will take on with respect to SharePoint. SharePoint identifies the following three roles for its participants:

- **Managers:** These are the team leaders, assistant managers, and project managers who oversee the day-to-day execution of the project tasks.
- **Team members:** These are the core members responsible for executing the project tasks.
- **Executives:** These include all stakeholders in the project, such as clients, senior management, and any other stakeholders who track and update the project tasks and monitor the project progress.

15.7 Creating Tasks List on SharePoint

Once SharePoint is installed on a server and a site is configured, project managers can start creating and sharing project information on the site. They can create a list with project information, such as a task list in the SharePoint site. The tasks list will outline the various tasks and their start and finish dates in the site. There are several templates available in SharePoint that project managers can use to create lists.

Session 15

Connecting and Collaborating

The following are the steps to create a tasks list using a template in a SharePoint site:

1. In the SharePoint site for the project, click the **Lists** link on the Quick Launch pane on the left of the window. This displays the **All Site Content** window.
2. Click the **Create** button on the top of the window to display the **Create** window.
3. Click the **Tracking** link in the **All Categories** group in the left pane of the window. This displays various types of lists that serve as tracking tools in SharePoint.
4. Select the **Project Tasks** list.
5. Enter a name for the list in the **Name** text box to the right of the screen and click **Create** to create a new tasks list.
6. To add a task to the tasks list, click **Add new item**. This displays the Tasks - New Item window as shown in figure 15.2.

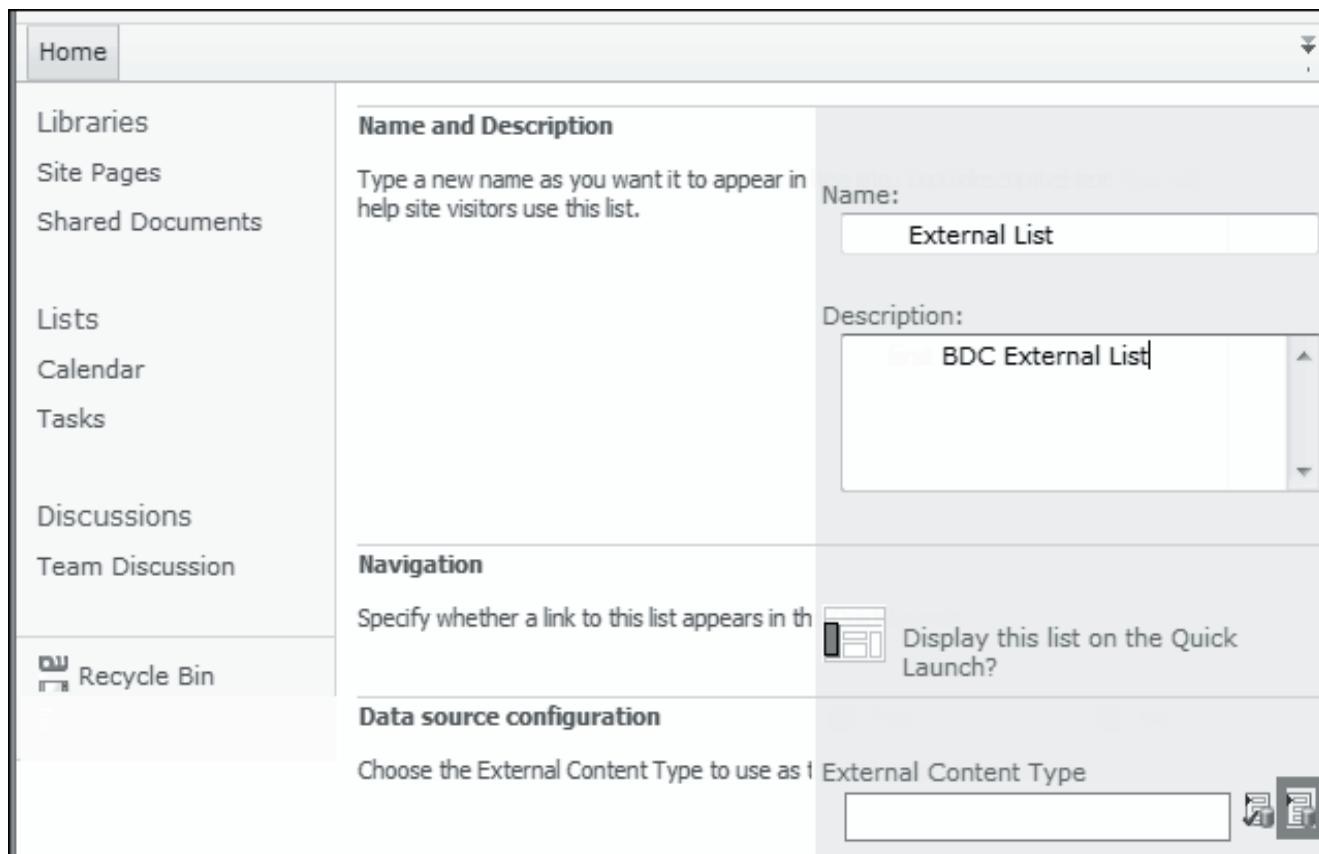


Figure 15.2: New Tasks Item Window in SharePoint Site

Session 15

Connecting and Collaborating

Users can start entering tasks information, such as name of the task in **Title** column, **% Complete**, **Status**, **Priority**, **Predecessors**, and resource name in the **Assigned To** column.

Concepts

Note: On entering the start and end dates for a task, a Gantt Bar is displayed.

15.8 Saving Project Schedules to SharePoint

Apart from creating tasks list on SharePoint site, project managers also can save a project plan to the site. Perform the following steps to save a project file to SharePoint site:

1. Click the **File** tab to display the Backstage view. Select the **Save & Send** option to display the **Save & Send** screen.

Figure 15.3 displays the **Save & Send** screen in the Backstage view.

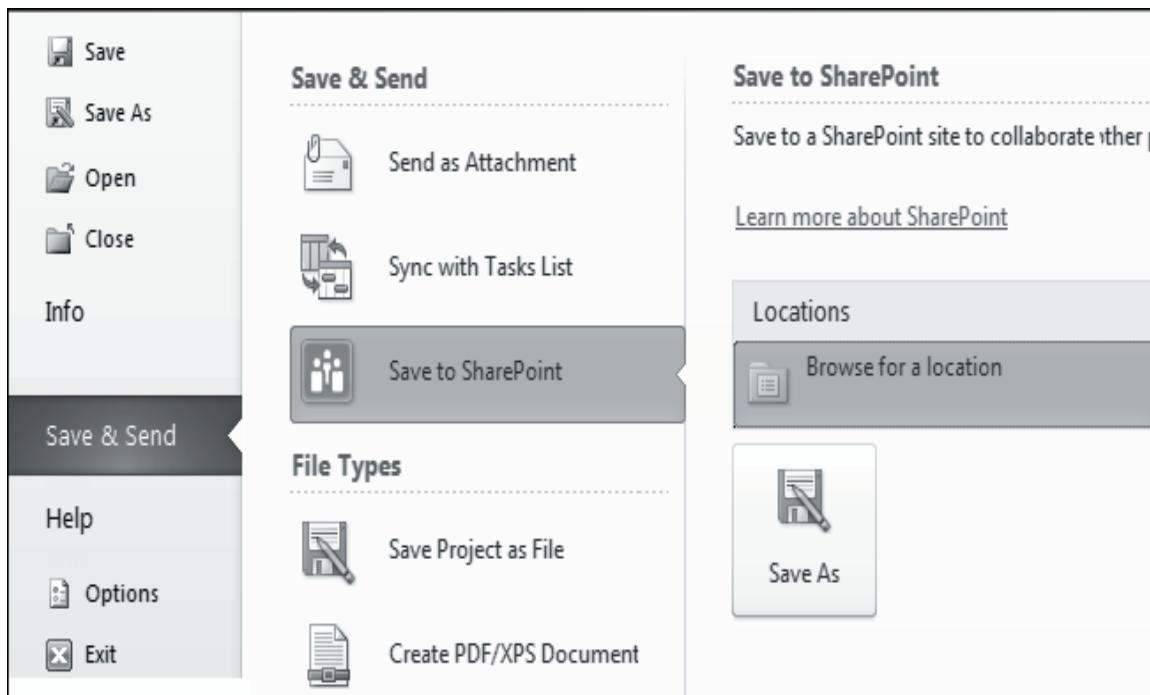


Figure 15.3: Save & Send Screen in the Backstage View

Session 15

Connecting and Collaborating

Concepts

2. Click **Browse for a location** button and choose the SharePoint site where the projects file needs to be saved.
3. Click **Save As** to display the **Save As** dialog box.
4. Ensure that the SharePoint location where the file is being saved is correct and click the **Save** button to save the file to the selected SharePoint site.

The following is an alternative method of saving an MS Project file to SharePoint site:

1. Click the **File** tab and select the **Save As** option to display the **Save As** dialog box.
2. In the folder location box, enter the URL of the SharePoint site and click the adjoining **Go to** button.
3. Click the **Save** button to save the file to the SharePoint site.

Note: Instead of saving a project file from within MS Project, users can upload the project file directly into the SharePoint site. Users can open the Library on the SharePoint site and click the **Add new document** option to browse and save the project file.

15.9 Synchronizing Tasks List in SharePoint with MS Project

SharePoint does not provide scheduling capability. It can only be used to gather, store, and share data. Project managers can just create a skeleton tasks list on SharePoint and pull it into their project file in MS Project, for detail scheduling and designing a complete project plan.

The following are the steps for synchronizing a SharePoint tasks list with MS Project:

1. Click the **File** tab and select the **Save & Send** option. This displays the **Save & Send** screen to the right, in the Backstage view .
2. Select the **Sync with Tasks List** option with the **Sync with Tasks List** screen displayed on its right.
3. In the **Site URL** drop-down list, select or enter the URL of the Task List site on the SharePoint server for the project.
4. Click the **Validate URL** button. This pulls the names of the existing SharePoint tasks lists into the **Select an existing tasks list, or enter a new name** drop-down list.
5. Select the tasks list to pull into MS Project, from the **Select an existing tasks list, or enter a new name** drop-down list.

Session 15

Connecting and Collaborating

6. Click the **Sync** button to start the synchronization process. A **SharePoint Synchronization** message box with a progress bar is displayed.

Figure 15.4 displays the **Sync with Tasks List** screen in the Backstage view.

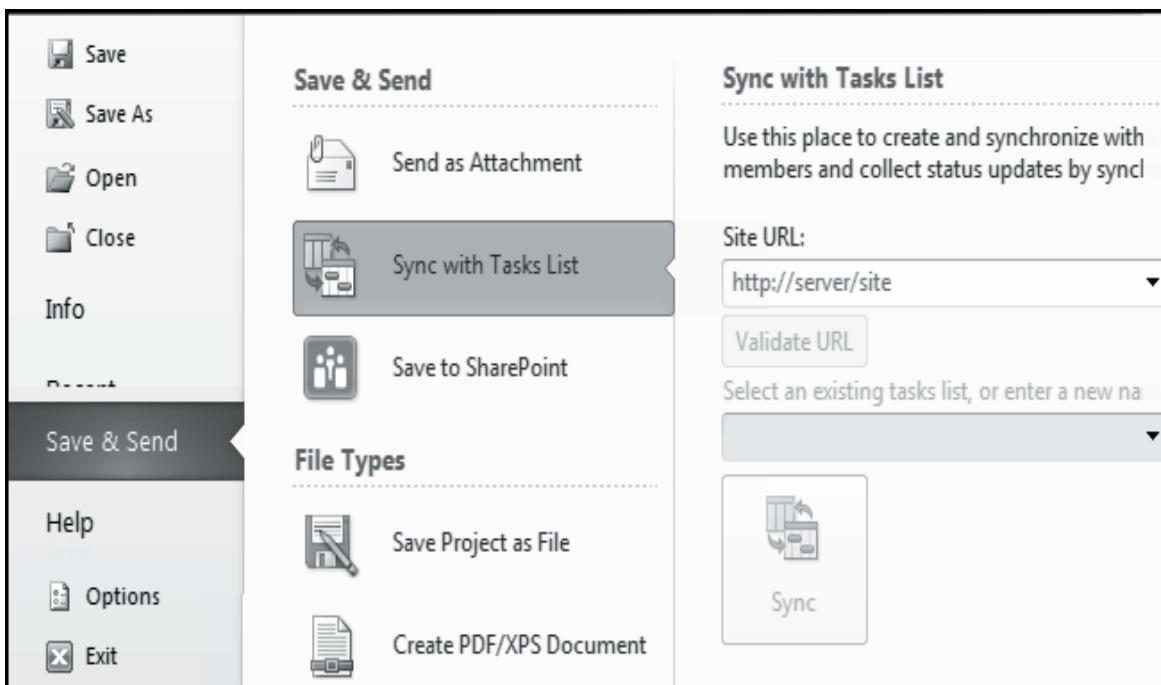


Figure 15.4: Sync with Tasks List in the Backstage View of MS Project 2010

Once the synchronization is complete, MS Project displays the list of tasks in the **Gantt Chart** view. All tasks are defined as manually scheduled.

15.10 Sharing Project Task Lists on SharePoint

A key utility of SharePoint in project management is sharing project tasks list and schedule and gather status updates from the team members. Project managers can publish task list from MS Project to the server. Team members can then update the tasks status regularly on SharePoint. Project managers can pull the updated tasks list from SharePoint into MS Project to update the project status in their project file.

Project managers need to follow the same steps as for pulling a tasks list from SharePoint into MS Project. Only, in the **Select an existing tasks list, or enter a new name** drop-down list, they must select the name of the tasks list if it already exists on SharePoint and is only being synchronized. Suppose they have a new tasks list in MS Project that does not exist on SharePoint and they want to upload it to SharePoint.

In that case, they can enter a name for the tasks list to share in the **Select an existing tasks list, or enter a new name** drop-down list.

Session 15

Connecting and Collaborating

Click **OK** to complete the synchronization process. Clicking **Cancel** will keep the tasks as auto-scheduled tasks and stop the synchronization process. Also, if any resources assigned to tasks in the list do not exist on the SharePoint site, those resources will not be published to the site. However, the resource will continue to be available in the project file.

Note: If the tasks list being synchronized contains auto-scheduled tasks, MS Project displays a warning message informing that those tasks will be converted to manually scheduled tasks.

Every time project managers modify the tasks list in the project file or team members update the status in the tasks list, project managers can perform synchronization and update the tasks list on both the SharePoint site and their project file.

Following are the steps to perform subsequent synchronization of a tasks list:

1. Click the **File** tab and select the **Info** option. The **Sync to Tasks List** section on the right displays the timestamp when the tasks list was last synchronized and the URL of the SharePoint site with which it was synchronized.
2. Click **Sync** to synchronize updates to the list.

The latest changes in the tasks list will be reflected at both locations. If the tasks list is updated at both locations at the same time, a **Conflict Resolution** dialog box will appear displaying task details as appearing in both SharePoint and MS Project, and highlight the conflicting entry. Users can select whether they want to retain the SharePoint version of the Project version.

15.11 Project Server 2010

Projects in an organization do not run in isolation. They affect each other in some way or the other to a certain extent. They require sharing resources, calendars, schedules, and so forth. With the increase in the size of projects and the number of projects that an organization handles, this interdependence increases, and so does the need to manage the management of these projects.

Storing all the shared resource information at a central location and monitoring their requirement and in the large number projects across the organization will assist in managing all projects smoothly. Project Server 2010 does just that. It enables storing all projects and their resource information in a central database on the company's network.

15.11.1 Project Server 2010 Components

Project Server 2010 comprises two main components: Project Server and Project Web App. The Project Server is the back-end of the system that comprises a database and is responsible for managing and maintaining all data of projects in the organization. The Project Web App is the front-end of the system, which provides the user interface in a browser for team members to interact and work with project data.

Project Server 2010 requires Microsoft SharePoint Server 2010 Enterprise version to be installed on the server running Project Server and on all Project Web App servers within a network. The project managers, resource managers, and system managers install and use MS Project 2010. The rest of the team connects and collaborates using the Project Web App.

15.11.2 Project Server Functions

Project Server acts as a complete collaborative enterprise wide project management platform. Using Project Server and Project Web App with MS Project, it is possible to:

- Schedule tasks
- Enter and view timesheet information
- Assign, accept, and reject task assignments
- Update assignments and tasks status with progress information
- Receive notices about task status
- View a project's **Gantt Charts** and reports
- Send status reports to managers and stakeholders

15.12 Connecting to Project Web App

Users can launch Project Web App by opening the browser and entering the URL for the Project Server. Users can log in according to their role to display the Project Web App homepage. On logging in as an administrator, the homepage for the administrator is displayed.

Users can connect to Project Web App in one of the following three roles, each of which has its own set of permissions to perform project management activities:

- Administrator
- Project manager
- Team member

Session 15

Connecting and Collaborating

Depending on the role under which they connect, the contents of the homepage will change.

15.12.1 Connecting to Project Web App as an Administrator

The homepage for an administrator contains several links for managing and customizing the Project Server environment and the Project Web App.

The following are the various activities that administrators can perform:

- **Managing Users:** To enable users to use Project Web App, administrators need to add them and create their accounts. Administrators can add, modify, and deactivate user accounts as required.
- **Managing Security Settings:** The Project Server environment contains some default security templates, which are sets of permissions that administrators can use to assign a set of permissions to users.
- **Managing Groups:** Administrators can put resources that access Project Web App under groups and assign them access permissions to perform various activities.
- **Assigning Categories:** Project Server provides several tools that users can use to manage projects, such as My Direct Reports, My Organization, My Projects, My Resources, and My Tasks. Administrators can add groups to these categories to give them access to work with the tools in these categories.
- **Managing Views:** Project Server database provides several types of views. Views display select project related information in different ways that helps users review and analyze their projects. Administrators can control which users can access which views. They can also create new views, or modify or delete existing views.
- **Managing Enterprise Templates, Calendars, and Timesheet Settings:** Administrators can define enterprise level templates, calendars, and timesheet settings that will be used commonly for all projects in the organization.
- **Customizing Project Web App Appearance:** Administrators can customize the formatting of the Quick Launch pane and Gantt Bar styles in Project Web App. They can also define the layout of views, timesheets, Project Center, and Resource Center in Project Web App.
- **Managing Project Database:** Administrators are responsible for managing the information in the project database. They need to periodically delete obsolete information, archive information that is not currently used but might be referred to in future, and manage database space.

Session 15

Connecting and Collaborating

Concepts

15.12.2 Connecting to Project Web App as a Project Manager

Project managers are responsible for creating and maintaining the project schedule and making task assignments. Project managers can either use MS Project 2010 or Project Web App to perform these activities. Following are the activities that project managers can perform:

- Updating project schedule
- Assigning resources to a project
- Monitor resource availability
- Monitor task progress

15.12.3 Connecting to Project Web App as a Team Member

Team members can contribute to efficient project management without using MS Project 2010. They can connect to Project Web App directly through the Web browser and perform the following activities:

- Enter actual work in timesheets
- View their task assignments
- Send task updates
- Send status reports

15.13 Connecting to Project Server

Project managers can perform most activities from Project Web App. However, certain project management activities, and activities creating new project schedules and fixing resource allocation problems require the use of the MS Project 2010 application. Project managers can connect to Project Server from within MS Project 2010 and manage projects.

To connect to Project Server from within MS Project 2010, managers need to create a Project Server account. The following are the steps to create a Project Server account in MS Project 2010:

1. Click the **File** tab and select the **Info** option from the Backstage view to display the **Information About <project name>** screen.
2. Click the **Manage Accounts** button to display the **Project Server Accounts** dialog box.

Session 15

Connecting and Collaborating

3. Click the **Add...** button to display the **Account Properties** dialog box.
4. Enter the account name and the URL to the Project Server details in the **Account Name...** and **Project Server URL** text boxes, respectively.
5. Click **OK** in the **Account Properties** and the **Project Server Accounts** dialog boxes to create the account.
6. Exit the MS Project 2010 application and restart it to connect to Project Server using the configured account.

Once connected, project managers can create a project file, save it, and publish it to the Project Server. Perform the following steps to publish a project file to the Project Server:

1. Click the **File** tab and select **Info** from the Backstage view.
2. Click **Publish** to publish the project file to the Project Server.

Once published, the project will be available on the Project Server and can be viewed in the Project Center via the Project Web App. To view the published project, in the Project Web App, click **Project Center** under **Projects** in the Quick Launch pane, on the left of the window.

15.14 Setting up Resource Assignment

The key function of Project Web App is to enable project interaction between the project team and project manager through resource assignment and delegating tasks to resources.

In an organization implementing Project Server, all resource information is stored in an enterprise resource pool on the server. Project managers need to add resources from the resource pool to the project to make them available for task assignment.

Using resources from the resource pool also allows managers to monitor the availability of resources and check any overallocation of resources on multiple projects in the organization.

The following are the steps to add resources to a project:

1. Open the project file in MS Project 2010.
2. Click the down arrow on the **Gantt Chart** button and select the **Team Planner** option to display the Team Planner view.
3. On the **Resources** tab, click the **Add Resources** button and select the **Build Team from Enterprise...** option to display the **Build Team** dialog box.

Session 15

Connecting and Collaborating

4. In the **Build team** section, select the resources from the list of enterprise resources pool on the left and add them to the project resources on the right.
5. Click **OK** to save the resource assignments.
6. Publish the file to Project Server to reflect the changes on Project Web App.

Once resources are added to the project, managers can view them, both in the project file in MS Project 2010 and in the Resource Center in Project Web App. They can monitor their availability and assign tasks to them. The resources added to the project can view their assignments when then log into Web App. They can update timesheets, review and update their tasks status, and send reports to the team managers.



Summary

- SharePoint 2010 is a collaboration tool for project teams and team members to create and share project related information.
- After installing SharePoint on a server, one can configure a SharePoint site where the project team can connect and share project information and work collaboratively.
- Project managers can create and share project information, such as tasks lists and resource list, on a SharePoint site.
- Project managers can create a skeleton tasks list on SharePoint and pull it into their project file in MS Project, for detail scheduling and designing a complete project plan.
- Project managers can publish task list from MS Project to the SharePoint site, in which team members can update the tasks status regularly.
- Project Server 2010 provides a central repository for storing large amount of project information and shared resource information and monitoring their requirement.
- Project Server is the back-end of Project Server 2010 system that comprises a database and is responsible for managing and maintaining the all data of projects in the organization.
- Project Web App is the front-end of the Project Server 2010 system, which provides the user interface in a browser for team members to interact and work with project data.



Check Your Progress

1. Which of the following statements are true about various components of a SharePoint site?

A)	Views are used to store project documentation, manuals, and other such documents that team members might require to access and update.
B)	Lists are used to browse through specific items in a list or library that are most accessed or critical to a project.
C)	Web parts are modular unit of information that forms a basic building block of most pages on a site.
D)	Documents containing information about resources assignments and project milestones are part of lists.

2. Which of the following features of SharePoint is true?

A)	SharePoint Foundation enables scheduling for projects.
B)	SharePoint enables team members to update tasks status.
C)	SharePoint enables monitoring the availability of resources and checking overallocation of resources.
D)	When synchronizing tasks list, all tasks are converted to auto-scheduled tasks.

3. Which one of the following statements is true with respect to various activities that a Project Server administrator can perform?

A)	Assigning categories involves putting resources that access Project Web App under groups and assign them access permissions.
B)	Managing views involves providing tools that users can use to manage projects, such as My Projects, My Resources, and My Tasks.
C)	Managing enterprise templates, calendars, and timesheet settings involves providing access to default security templates to users for managing projects.
D)	Customizing Project Web App appearance involves formatting Gantt Bar styles in Project Web App.



Check Your Progress

4. Which of the following statements are true about connecting to Project Server and Project Web App?

A)	Team members can connect to Project Web App only by entering the URL of the Project Server in a Web browser.
B)	Project managers and administrators can connect to Project Web App by entering the Project Server URL in a browser or in MS Project.
C)	Only administrators can connect to Project Web App through MS Project.
D)	Users can connect to Project Server from within MS Project Standard.

Objectives

At the end of this session, the student will be able to:

- *Describe best practices for project management*
- *Explain the techniques to create and track project schedules efficiently*
- *Describe the golden rules to manage risks, costs, and project issues*
- *Identify tips to manage stakeholders*
- *State the best practices to measure project results against stated goals*
- *Describe the process to capture and review the lessons learned by the end of project*

16.1 Introduction

Every project starts with a real business need. A business need is essentially the gap between what is required or possible and what is currently available. On identifying the gaps, a project is created to close them. Efficient management of a project is essential to ensure that its objectives are achieved. Project management is the art of balancing project goals against the constraints of scope, time, budget, and quality.

Project management offers a group of tools and techniques for efficiently managing a project. There are 10 best practices, also called golden rules, of project management, which lead to successful projects. This session describes the 10 golden rules.

16.2 Understanding the Scope of a Project

The golden rule for starting a project is to understand the scope of the project. The scope of a project essentially defines its boundaries. It specifies what will be done, and more importantly, what will not be done as part of the project. The first step in project management is to create a scope statement. A scope statement answers the following questions about the project:

- What are the objectives of the project?
- What does the project intend to achieve (also called the project outcome)?

Session 16

Project Management Best Practices

Concepts

- What are the business goals for the project?
- What are the client's expectations? Have they done anything similar before and what was the result of that project? What was good and what could have been done better?
- Are there any documented procedures and specifications that must be adhered to?
- What would be the communication protocol with the project stakeholders to move forward with the project?
- What are the technical requirements for the project?

Before moving to the next step, it is essential that there is agreement on the project scope statement among all those who are involved in the project.

16.3 Identifying the Project Stakeholders and Engaging them Early

Once there is clarity on the project scope, the next step is to identify the project stakeholders. Project stakeholders are those entities within or outside an organization who:

- Have a stake in the project
- Play an active role in the project
- Have interests that are affected by the outcome of the project

It is essential to identify stakeholders even before the project commences. A golden rule in project management is to engage and involve key project stakeholders early during the project requirements definition phase. This helps capture the business needs and stakeholder expectations in an efficient manner. Some of the methods that can be applied for stakeholder analysis are as follows:

- **Interviews:** Conduct one-on-one interviews with the stakeholders to ascertain their needs and expectations.
- **Focus Group Discussions:** Engage in project-related discussions with specific homogenous groups of stakeholders.
- **Surveys:** Use survey questionnaires to ascertain the stakeholder expectations.
- **Prototyping:** Create a prototype, which is a sample or a model solution drafted to identify the best possible approach to solving the problem at hand. Prototypes help identify which approaches will work or which ones will not work.

Session 16

Project Management Best Practices

- **Management Walkthrough:** Provide a visual model of the phases through which the project will develop and a showcase of its deliverables.
- **Project Discussion Forums (Blogs):** In today's socially networked world, these are an excellent tool to obtain feedback.
- **Project Boot Camp:** Organize boot camps for new project managers and team leaders to teach techniques of successful project management, best practices, and provide hands-on practical sessions with live-world case studies and examples.

One or more of the above-mentioned methods may be used depending on the requirements. Typically, the stakeholders for a project would be:

- **Business Sponsor:** The organization/person who is financing the project. They expect on-time quality delivery within the agreed project budget.
- **Client Project Manager:** The person in the client organization who will act as a bridge between the organization and the client during the project.
- **Client Expert:** A client expert provides deeper insights about the project needs and expectations. The client expert gives inputs on the project during the design and expects the output in a specific form.
- **Other Vendors:** When working on a project involving vendors of the client organization, the project might need inputs from these vendors or they might require inputs from the project. In such cases, it is important to work closely with these vendors, generally through the client's project manager, to make the project a success.

Apart from these stakeholders, there could be many other internal and external stakeholders based on the type of project. It is important to understand the needs and expectations of each stakeholder and address the same to ensure that the project is a success.

16.4 Conducting Feasibility Study

A best practice before executing a project is to conduct a feasibility study, which helps in assessing whether the project will execute successfully. When selecting projects to address the organization's business needs, it is very important to measure both its achievability and its benefits. A feasibility study answers the following two key questions:

1. Is this project doable?
2. What will be achieved by doing this project?

Session 16

Project Management Best Practices

Concepts

The process of measuring the achievability and benefits of a project is called project feasibility study. The benefits of a project can be measured in a number of ways. The most common methods include:

- Return On Investment (ROI)
- Benefit/Cost Ratio (BCR)
- Internal Rate of Return (IRR)
- Financial indicators like Net Present Value (NPV)
- Pay Back Period

The achievability of a project can be measured by performing an overall project risk analysis. In performing a risk analysis, the following critical project parameters need to be assessed:

- **Financial Commitments:** Ensure financial commitment from project sponsor/customer for delivering payment, procuring resources, and commitment for the time for the agreed project delivery.
- **Stakeholder's Readiness:** Stakeholders (be it customer, senior management, project managers, or support staff) should be ready to take up the project. Project manager needs to check the availability and readiness of the internal stakeholders. Every stakeholder should be ready and eager for the project to make it a successful one.
- **Project Complexity:** Complexity of the project can be defined only during the feasibility study on assessing the need for the project and the availability of resources for executing the project.
- **Availability of Capable Resources:** It is very important that the project manager identify capable resources for the project as project estimations made based on approximate productivity of resources. If capability of internal resources is an issue, the project manager has to work with the human resource department to solve the problem. This can be done by identifying suitable resources, negotiating, and if required, reworking on project costing to get them on board.

16.5 Defining Clear and Measurable Project Mission

Every project has a purpose, be it to address problems or take hold of opportunities within a specific timeline. To attain clarity on the purpose of the project, it is critical to have a clearly defined project mission at the start of the project.

The project mission answers two questions - what is the outcome of the project and why this project?

Session 16

Project Management Best Practices

The project stakeholders must foresee the final outcome or mission of the project and find the answer to the question, 'Why is the project being done?' Further, the mission should be measurable. That is, there should be quantitative parameters that measure whether or not the project mission has been achieved. For example, a good project mission could be 'Launching a mobile software application for flight reservations that runs on all mobile platforms.'

For defining a clear and measurable project mission, it is important to:

- Diagnose the business problem
- Define a set of solutions to address the business problem
- Define a set of clear and measurable business goals for the solutions
- Propose a set of system requirements that meet the set of business goals
- Conduct an impact analysis to select the system requirements that will have the best possible impact on the set of business goals
- Develop system requirements in small iterative steps
- Calculate at each step, the impact of the system on the project goals
- Adjust the business goals and future enhancements based on the feedback from the measures
- Repeat the 'build and calculate' cycle until the goals are met
- Achieve project success and reassign resources to other tasks

In planning for a project, project managers need to find answers to the following questions:

- What is the scope of the project?
- Who is the client and why do they want to execute this project?
- What is its title?
- What is the project goal; what needs to be achieved?
- When do the project goals need to be achieved?
- What are the specific aims?
- Why are these goals essential to the project?

Session 16

Project Management Best Practices

16.6 Communicating Project Goals to the Project Team

Concepts

All planning is useless unless there is a dedicated project team to carry out the project. The project team must involve qualified, capable, and committed team members. Project team members with common goals and commitments are necessary to ensure successful execution of the project. Another requirement is that the project team should have all the necessary resources, time, and sufficient budget to plan and execute the project. A project team charter should be developed to ensure clarity of project purpose, clearly delineate roles and responsibilities, establish lines of accountability, and fix ownership.

When managing a project, the team should be committed to it until the end. A project management best practice is to discuss and communicate to the project team, the benefits of the project to the client as well as the project team members. If the team recognizes and appreciates the project's benefits, it will likely be more seriously committed to the project.

While discussing the benefits of the project with the team, communicate the benefits that are most vital to the organization, its stakeholders, employees, and its clients. Some of those benefits might be as follows:

- Superior products and services
- Enhanced organizational processes and procedures
- Better sales
- Qualitative deliverables
- Improved work environment

In addition, communicate the achievable benefits to each team member, such as:

- Acquiring hands on new skills and knowledge
- Working in an enjoyable environment
- Expanding business contacts
- Enhancing career potential

When the team members realize personal benefits from the project, their commitment to the project automatically increases, thereby increasing the chances that the project will succeed.

Session 16

Project Management Best Practices

Concepts

16.7 Planning Projects Using the Manageable Project Phase Approach

To plan a project, start by defining a list of tasks and the resources required for executing those tasks. Identify if there are any tasks with interdependencies; that is, the tasks that cannot start before another task starts or completes.

Tools like MS Project are specifically designed to assist in project planning. Besides organizing the required people and resources, it is useful to plan for an early prototype along with Quality Assurance to tackle issues before they become unmanageable. The entire project team should be involved in planning the project.

Project planning involves the following activities:

- Defining measurable project objectives
- Chalking out strategies to achieve the objectives
- Preparing a list of deliverables and tasks
- Estimating the resources required
- Assigning responsibility for completion of tasks
- Calculating approximate project duration and project cost
- Preparing a project schedule clearly showing the inter-dependencies among various tasks
- Preparing a risk mitigation plan which lists the major risks and the plan to mitigate them
- Preparing a workable communication plan which involves senior management

For large complex projects, one golden rule is to break the project into smaller manageable phases with clearly defined timelines and deliverables for each phase. For new projects, which have never been executed, breaking them into phases minimizes the risks and allows mid-course corrections to be carried out easily. Often, in large projects, the project stakeholders' needs may change in the middle of the project cycle. That might make it difficult to achieve the planned project objectives. Phasing a project gives the team the flexibility to accommodate new demands and requirements of the project sponsor.

Session 16

Project Management Best Practices

Concepts

16.8 Monitoring Project Schedule and Costs

One major challenge faced by project managers is to maintain the project on schedule and keep the project under the estimated budget. If the project is delayed, the project costs may also increase. The golden rule is to prepare realistic project schedules and reliable cost estimates. Realistic schedules and timelines are easier to maintain. The interdependencies between tasks should be clearly spelt out and critical tasks should be monitored closely. If any critical task is delayed, then it might badly impact the project schedule.

Take into account all hidden or associated costs. A safe practice is to build in a small contingency budget to take care of unforeseen expenses. The more the unknown or uncertain factors in projects the higher the need for a contingency budget. For any project, based upon the size, type, and complexity, the contingency costing may vary from 5% to 20%. New and innovative projects might require a higher contingency budget since there are too many unknowns and there is no previous experience to rely upon.

16.9 Managing Risks and Change

All projects are faced with certain risks and a project manager must anticipate the risks that a project may be subject to. A golden rule is to design project plans with contingency for risks and flexibility to meet sudden changes and challenges. The project plan must include a risk mitigation plan, which classifies all the risks (as high, medium, and low impact) that the project team can identify and specifies the mitigation measures for each of the risks identified. The project team constantly needs to monitor every risk and proactively identify and manage the risks with high impact and high probability. For high impact and high probability risks the mitigation plan should be sound and without any chance of failure otherwise it can seriously derail the project. Contingency plans in a project can be extra resources or extra time in the project schedule. During the initiation of the project, encourage clients to consider 10% of the budget as contingency budget. This will allow them some room to exercise within the project scope and will be easier to get the project to completion without having to go back to costing for every little change.

During the course of a project, it is common for the project team to be faced with multiple requests for changes. These changes may be minor and can easily be accommodated or they could be such major changes that may require re-working the project plan. One must not immediately begin to make the requested changes. It is important to first assess whether the changes requested will have a positive or negative impact on the project objectives. The project manager should accept only those changes that are within the scope and benefits of the project. Having a well-defined change control process in place makes it easier to keep the project on time and within budget. It ensures that last-minute changes do not have a negative impact on the time or cost.

Session 16

Project Management Best Practices

Concepts

16.10 Continuously Managing Project Stakeholders

A project may involve multiple stakeholders with differing and often conflicting interests, personalities, and motivations. It is the foremost duty of a project manager to continuously engage and manage the key project stakeholders. A common mistake is to assume that stakeholder needs and expectations are unchanging. The reality is exactly the opposite. As the project progresses, new stakeholders with new expectations may appear. Another factor that varies is the interest and control level of stakeholders.

The project team needs to engage and communicate with all the stakeholders on a continuous basis throughout the duration of the project. The team should proactively identify the needs and expectations of project stakeholders and address their issues and concerns promptly.

A few tips to effectively manage stakeholders are as follows:

- Identify all the stakeholders and their roles at the beginning of the project
- Ensure that all the stakeholders commit on the project's deliverables
- Get consensus on how to handle changes in the project
- Practice good communication
- Keep the project vision visible
- Engage stakeholders throughout the process
- Agree on what is done
- Empathize with other stakeholders

16.11 Measuring Results and Capturing Lessons Learned

After having practiced the nine golden rules described so far, the project team would be successful in delivering a quality project on time and within budget. However, how do project managers ascertain whether they have achieved their project objectives? They can do so by measuring project results against the project goals or objectives. Continuous monitoring is the last key to successful project execution. Monitoring will detect if the project is going off-track and enable the team to make the necessary corrections in time. Once the project is closed, project managers must plan to hold a review meeting. This meeting will give them the opportunity to solicit client feedback. This is important not only as learning tool but is also a testimonial for the efforts the project team has put in. Before conducting the project review meeting with the client, the project manager should hold an internal team meeting. During internal project reviews, gather details from the project team. The project manager should give praise where it is due and give constructive feedback where there is scope for improvement the next time. The project manager should document the findings of all review meetings.

Session 16

Project Management Best Practices

Concepts

Finally, the project results should be evaluated to capture the lessons learned for continually improving one's project management capabilities.

At the end of this process, three types of lessons should be captured:

- **The Good:** Things that were done well and should become a standard practice in future projects.
- **The Bad:** Things that could have been improved upon and will be done in a different way in future projects.
- **The Ugly:** Things that will never ever be repeated in future projects.

These lessons need to be documented and shared with all so that future project performance is improved. As part of institutionalization of the project, appropriate training, learning, ownership, and expression of interest on improvements are important steps.



Summary

- There are 10 golden rules that can be applied to project management for successful execution of projects.
- Understanding the scope or project management and defining boundaries for a project is an important golden rule.
- The second golden rule is to identify the stakeholders in the project before starting the project and engage them early in the project.
- The third golden rule is to conduct a feasibility study of a project and assess whether the project is doable and will execute successfully.
- The fourth golden rule is to define a clear and measurable project mission at the start of the project.
- The fifth golden rule is to communicate the project goals to a capable and committed team with common goals and commitments to successfully attain the project mission.
- The sixth golden rule is to follow the manageable project phase approach by structuring the project into more controllable phases to minimize risk.
- The seventh golden rule is to monitor the project schedule and costs and ensure timely delivery of project outcomes while keeping the project under estimated budget.
- The eighth golden rule is to manage risk and change in a project and having a risk mitigation plan along with a change control process.
- The ninth golden rule is to continuously engage and manage the key project stakeholders.
- The tenth golden rule is to measure project results against stated goals, capture lessons learned, and institutionalize them.

Session 16

Project Management Best Practices



Check Your Progress

1. For which of the following queries would one find answers in order to understand the scope of project management?

A)	What are the business goals for the project?
B)	Is this project doable?
C)	What would be the communication protocol with the project stakeholders to move forward with the project?
D)	Should this project be executed?

2. For which of the following does engaging and involving key project stakeholders during the project requirements definition phase help?

A)	Identify documented procedures and specification for the project that one must adhere to
B)	Define the technical requirements for the project
C)	Capture well the business needs and stakeholder expectations
D)	Reduce costs of the project

3. Which of the following will add contingency to project plans?

A)	Adding extra resources or extra time in the project schedule
B)	Encouraging the client to allow for time delays in project delivery
C)	Allowing extra budget for increased project costs
D)	Encouraging the client to consider some contingency into the budget

4. Which of the following actions define a clear and measurable project mission at the start of the project?

A)	Assessing the stakeholders' readiness
B)	Calculate at each step, the impact of the system on the project goals
C)	Checking the availability of capable resources
D)	Diagnosing the business problem

Session 16

Project Management Best Practices

Concepts



Check Your Progress

5. Identify the discussions that should take place while discussing project benefits with the team.

A)	Improved productivity
B)	Expanding business contacts
C)	Determining why are the defined goals essential to the project
D)	Determining why does the client want to execute this project

6. Which of the following is a manageable project phase approach?

A)	Plan the steps all the way to the end of the project
B)	Evaluate the steps for each phase at the start of the phase
C)	Keep each phase as manageable chunks that can be delivered in a stipulated timeframe before moving to the next phase
D)	Keep each phase as manageable chunks such that the final project can accommodate for any change that might arise during the project cycle

7. Identify the project schedule, risks, and costs that need to be managed by the project manager.

A)	Have a list of tasks with actual duration estimates and committed task owners
B)	Let the project team members put individual task buffers to their respective tasks
C)	Have a risk log to manage all key risks
D)	Track costs at the project level

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