Managing Projects with MS Project 2010

Session: 7

Costing

Objectives

- 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

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.

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.
- 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

Types of Costs

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

Costs per hour	Costs per use	Costs per unit	Fixed costs	Costs for specific assignments of cost resources

Understanding Cost Estimation 1-2

- 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

- 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

Understanding Cost Estimation 2-2

- 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

Cost Specifications of Work Resources 1-3

- 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.
- 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.

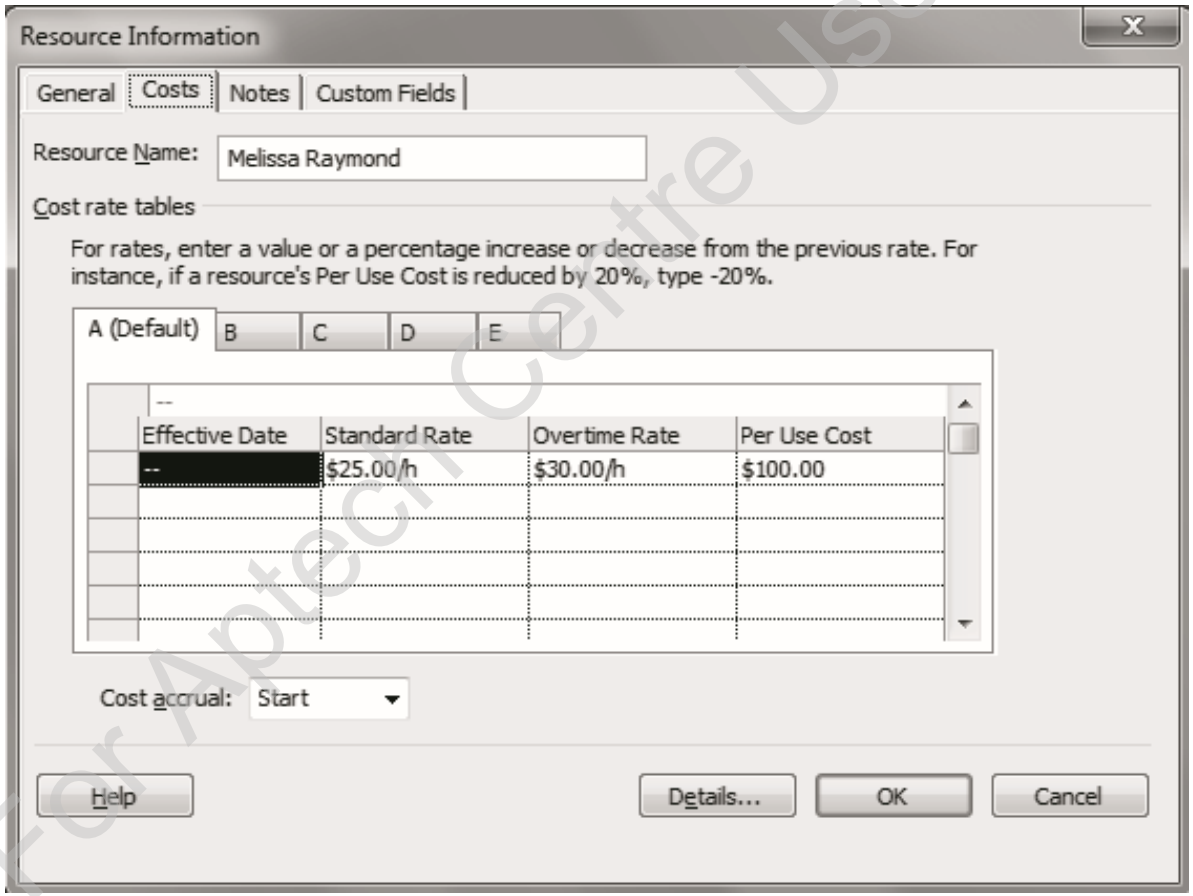
Cost Specifications of Work Resources 2-3

- 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.
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.

Cost Specifications of Work Resources 3-3

- 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 the following figure:



Project Cost Specifications 1-2

- Projects incur a combination of the following three cost types:

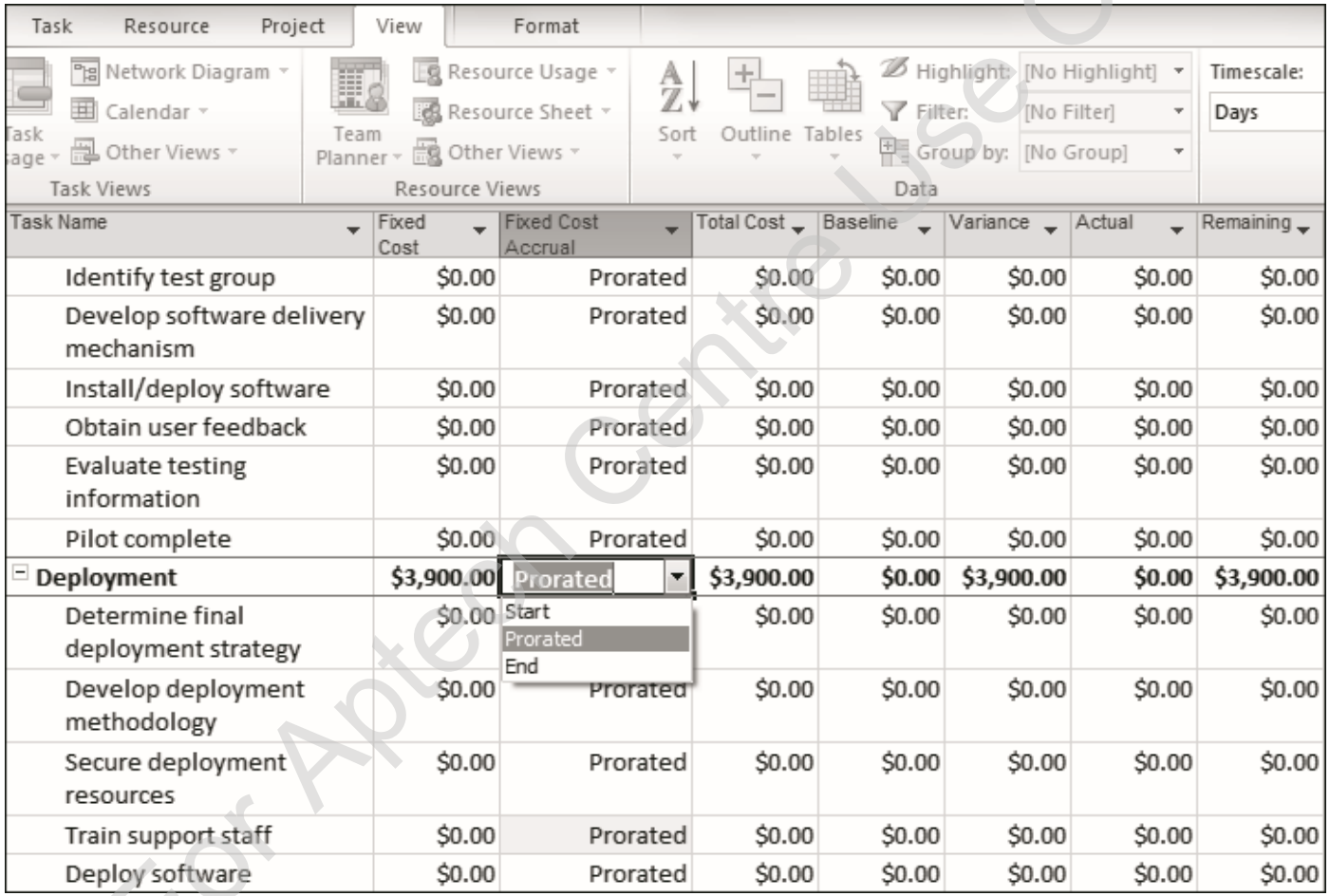
- Project managers need to analyze the fixed costs and the hourly or unit rates or project tasks and resources.
- MS Project provides the Cost table for entering and tracking all fixed costs.
- In MS Project, to enter fixed costs for a task in the Cost table:

On the **View** tab, click **Tables** in the **Data** group, and then select **Cost** from the drop-down menu. The Cost table is displayed.

Click in the **Fixed Cost** column for the task to assign its cost and enter the amount.

Project Cost Specifications 2-2

- Following figure illustrates Fixed Cost Accrual method settings:



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	Start / Prorated / End	$0.00	$0.00	$0.00	$0.00	$0.00
Develop deployment methodology	$0.00	Prorated	$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

Cost Specifications of Material Resources

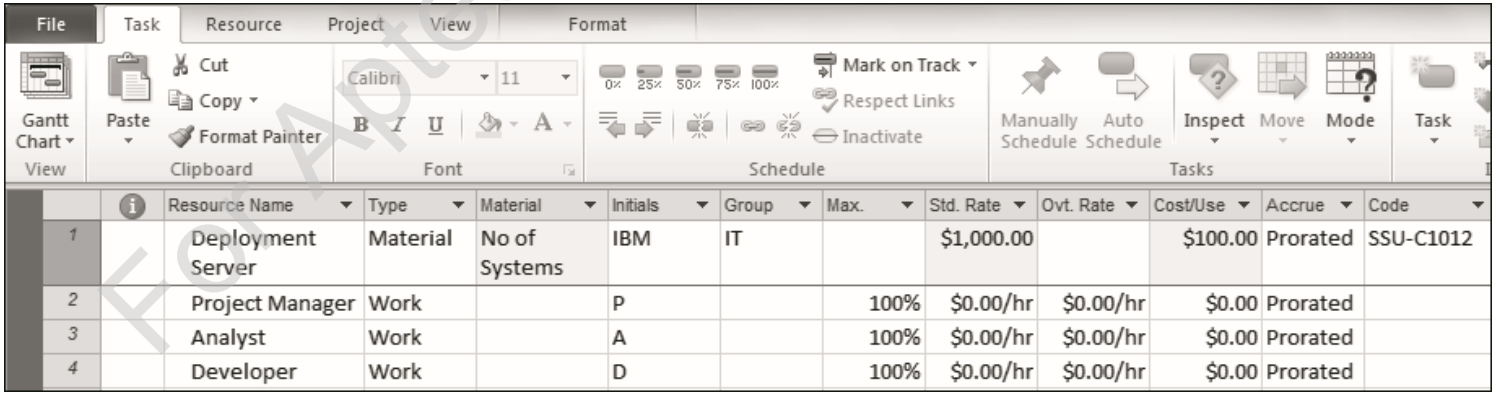
- Cost for material resources is calculated by multiplying its standard unit rate with the number of units.
- The steps to assign a standard unit rate for a material resource are as follows:

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.

In the **Material** column, enter the unit of measurement of the resource.

In the **Std. Rate** column, enter the cost per unit of the resource.

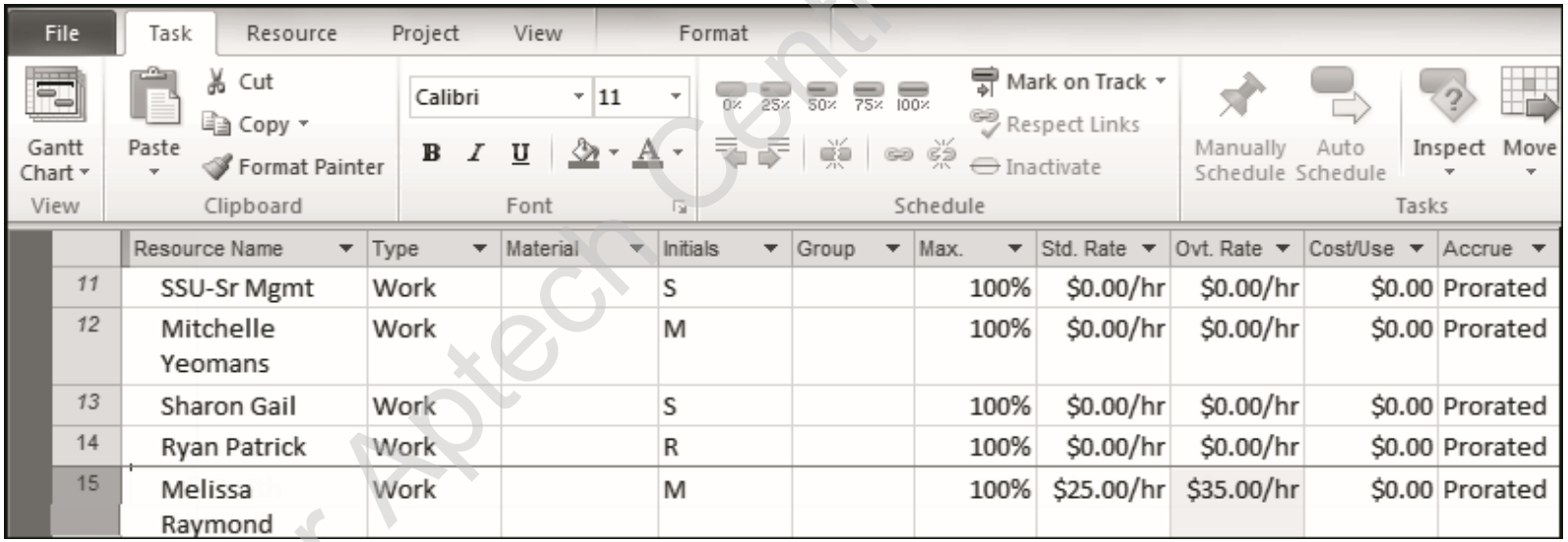
- Following figure illustrates assigning standard unit rate for a material resource:



	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	

Cost Specifications of Overtime Allowances

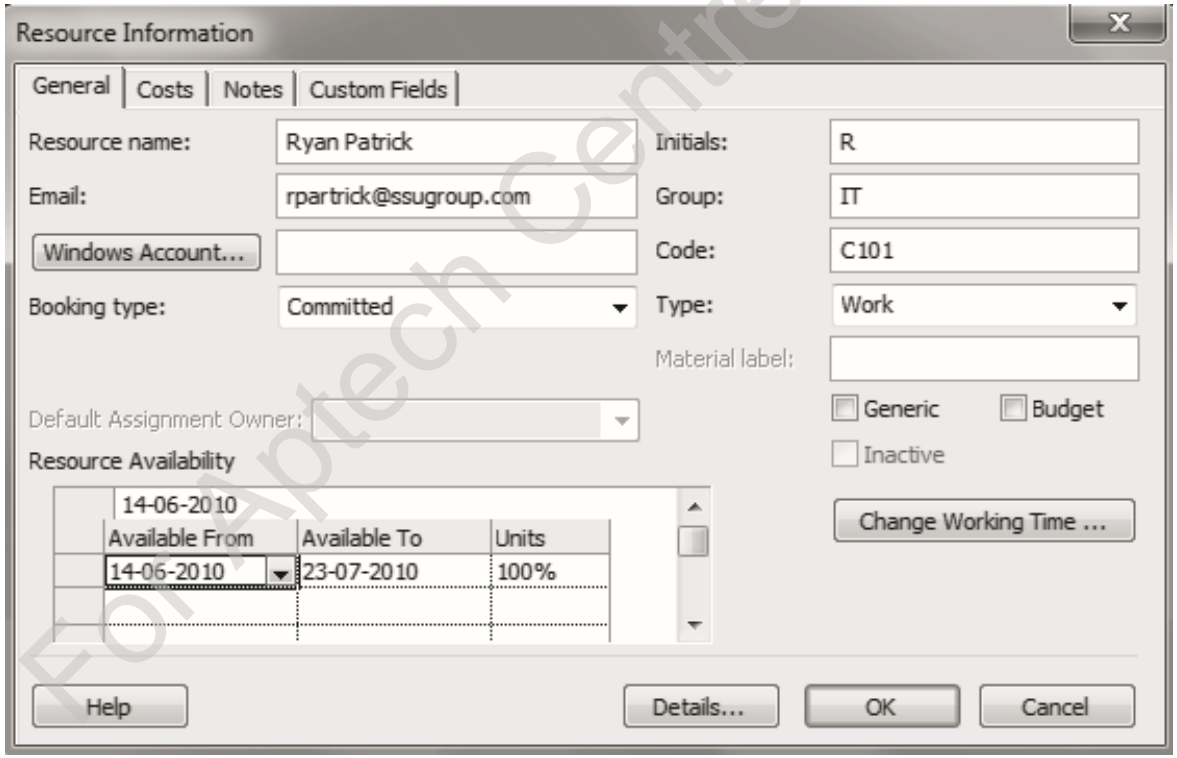
- To complete critical tasks in meeting deadlines, project managers sometimes need to drive resources to work overtime, though it has an impact on the project budget.
- To enter overtime rate for a resource, in the Resource Sheet view, click in the **Ovt. Rate** column and enter the overtime rate as shown in the following figure:



	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

Cost Specifications of Limited Time Resources 1-2

- 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.
- Following figure shows the **Resource Information** dialog box, to specify varying availability:



Cost Specifications of Limited Time Resources 2-2

- 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.

Assigning Cost Resources 1-2

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

Open the project in the **Gantt Chart** view and click the task that contains the resource to be replaced.

On the **Resource** tab, in the **Assignments** group of the **Ribbon**, click **Assign Resources** to display the **Assign Resources** dialog box.

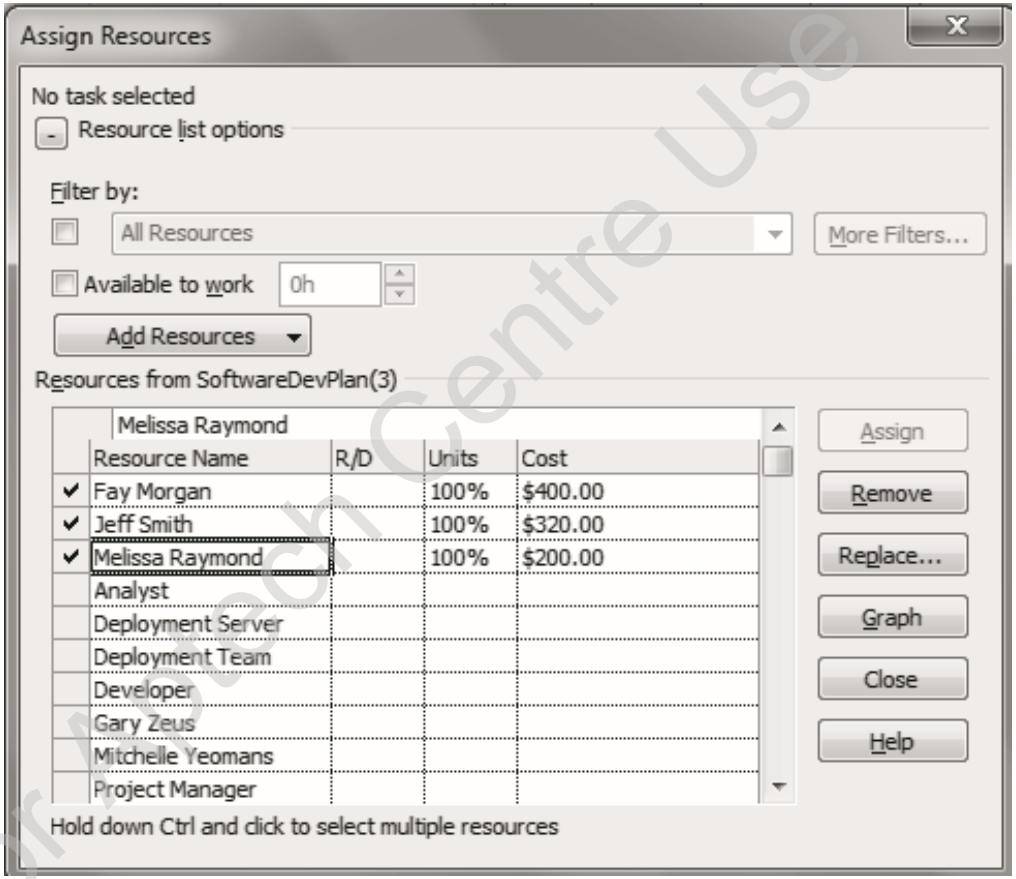
Click the name of the resource to be replaced, and then click **Replace**. Resources currently assigned to the selected task will have a **check mark** to the left of the **Resource Name** column.

In the **Replace Resource** dialog box, click the name of the resource to assign work.

Click **OK** to save the information and click **Close** on the **Assign Resources** dialog box.

Assigning Cost Resources 2-2

- Following figure displays assigning cost resources using **Assign Resources** dialog box:



Fixed Cost versus Cost Resource 1-2

- Users, who are new to MS Project, generally get into a usability problem while filling the cost column manually.
- Right-clicking 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.
- To solve the problem, perform the following steps:

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.

Generally, the cost column is calculated based on the rate multiplied by the number of hours.

- Cost of the resource will be $800 as displayed in the following figure:

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

Fixed Cost versus Cost Resource 2-2

Manually enter a number in the cost column, to replace the calculated cost with a new cost say $1200 as shown in the following figure:

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

Verify this by inserting the **Fixed Cost** column, to find the value as shown in the following figure:

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

To fix the problem, the simplest way is to set the fixed cost as $0.00 manually as shown in the following figure:

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

Viewing Total Project Cost in Project Statistics

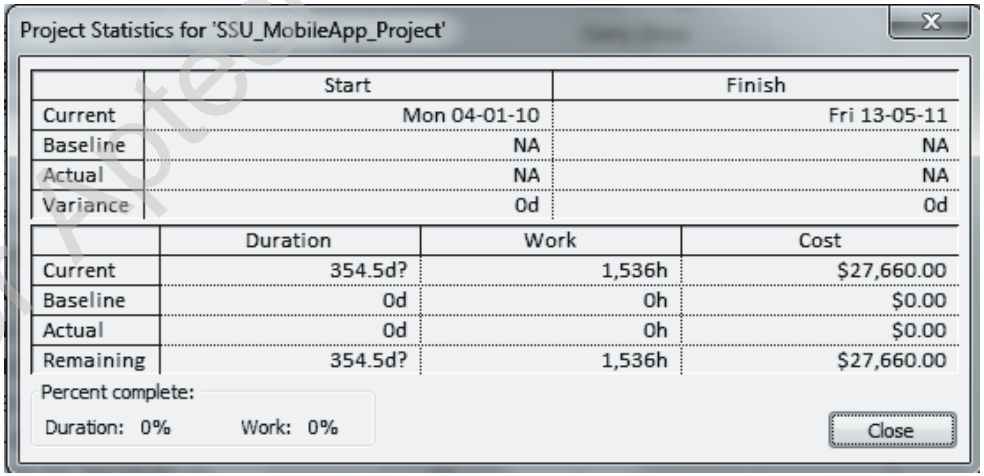
- Assigning a cost to a resource is not the only way to assign a cost to the project.
- Projects will also have other costs.
- To view total project cost, follow these steps:

Click the **Project** tab and in the Properties group of the **Ribbon**, click **Project Information** to display the **Project Information** dialog box.

Click the **Statistics** button to open the **Project Statistics** dialog box.

Check the total cost of the project in **Project Statistics** dialog box.

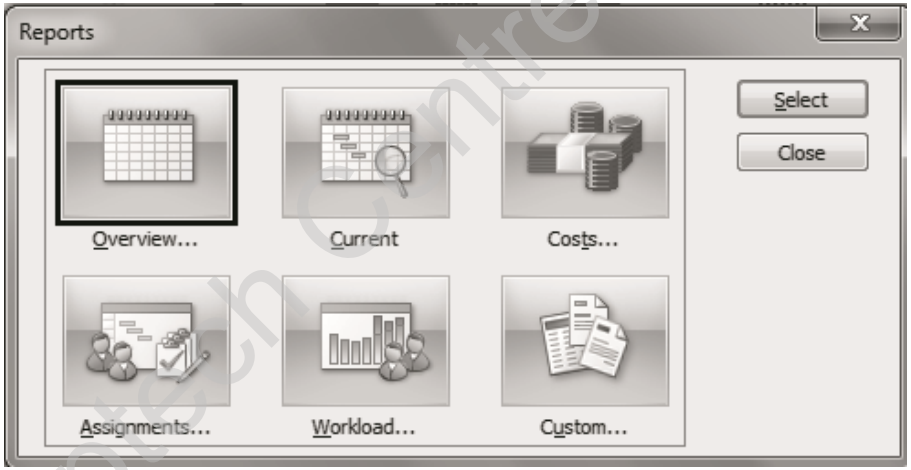
- The **Project Statistics** dialog box as shown in the following figure:



Viewing Total Project Cost in Project Summary Report 1-2

- 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:

On the **Project** tab, click **Reports** on the **Ribbon** to display **Report** dialog box as shown in the following figure:



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

Select **Project Summary** and click **Select** button to generate **Project Summary Report.**

Viewing Total Project Cost in Project Summary Report 2-2

- The **Project Summary Report** is shown in the following figure:

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		

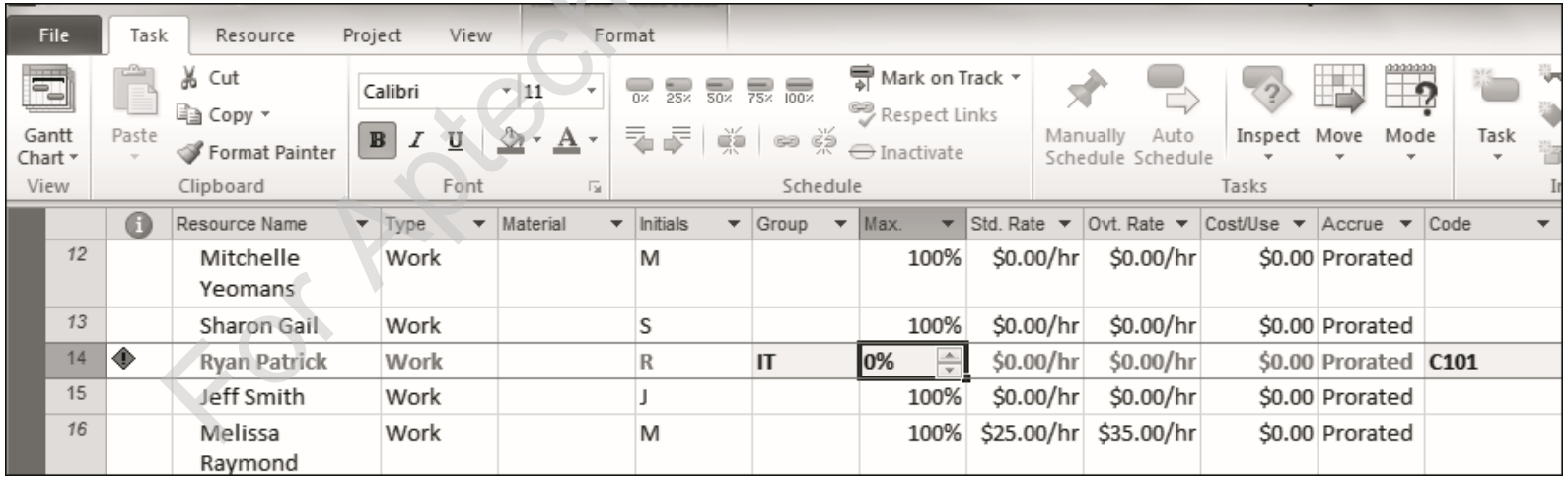
Task Status		Resource Status	
Tasks not yet started:	87	Work Resources:	12
Tasks in progress:	0	Overallocated Work Resources	2
Tasks completed:	0	Material Resources:	2
Total Tasks:	87	Total Resources:	16

Setting Availability

- By default, a resource is assigned to a task at 100 percent availability.
- 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.
- The steps to specify availability and set default resource units are as follows:

In the **Resource Sheet** view, click in the **Max**. column for the resource.

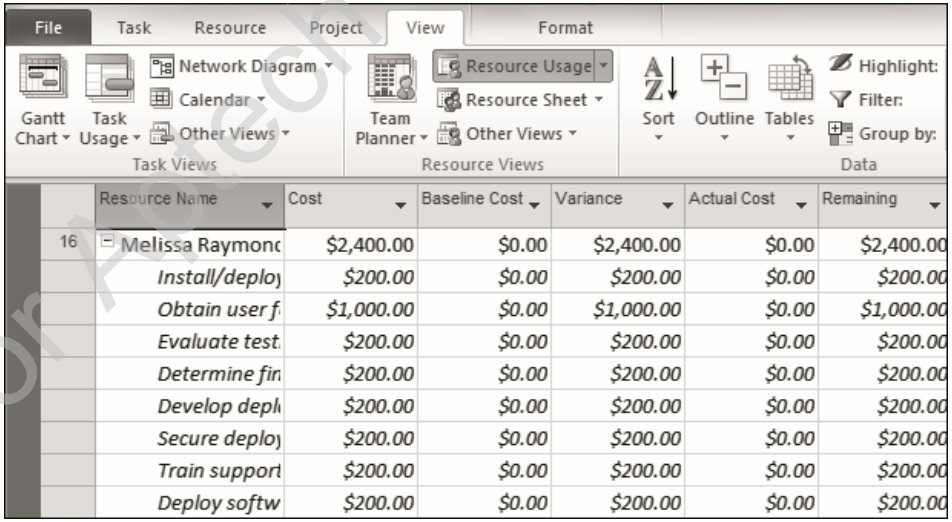
Enter a number in percentage of the total work hours for which the resource is available to work on the project as shown in the following figure:



	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	

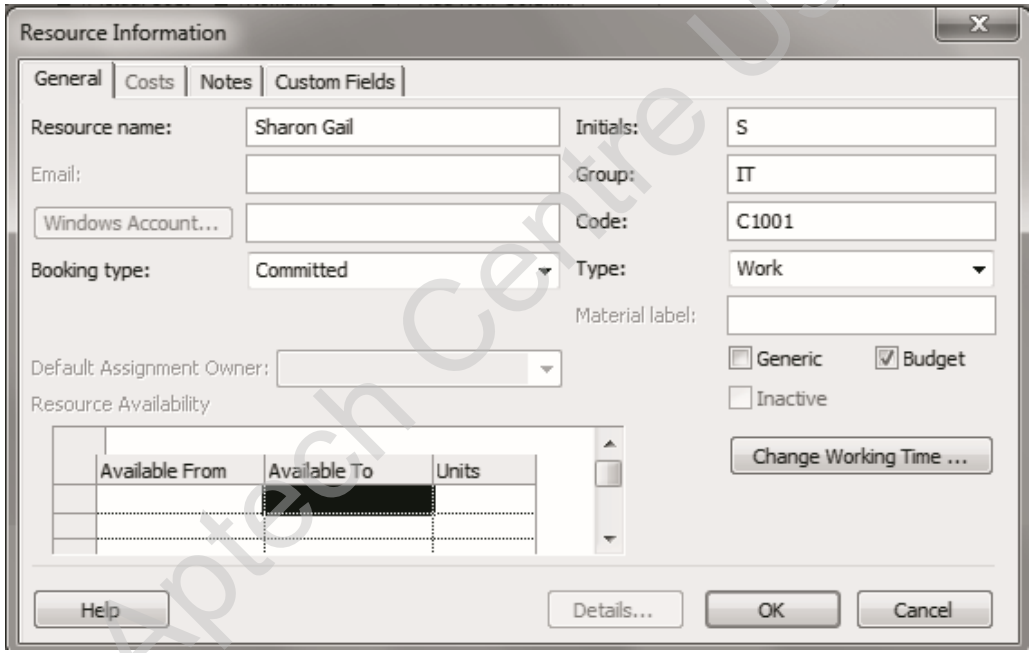
Budget Settings

- In addition to resource cost per hour, resource base calendar, and resource availability, project managers assign resources to tasks at certain units.
- All these factors work together while estimating the cost of the resources and projecting a budget for the project.
- MS Project computes total costs based on the resource settings and displays in views such as the Cost table.
- To view the Cost table of a resource, click the **Tables** button in the **View** tab and select **Cost** from the drop-down menu.
- Following figure displays Cost table under **Resource Usage** view:



Working with Budgets

- 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 following figure:



- 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.

Defining Budget Resource Types

- To facilitate comparing the costs of various budget resources, project managers can categorize them, by displaying additional information fields.
- Alternatively, they can create a custom text field, in which they can specify the category for each resource.
- 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.
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**.

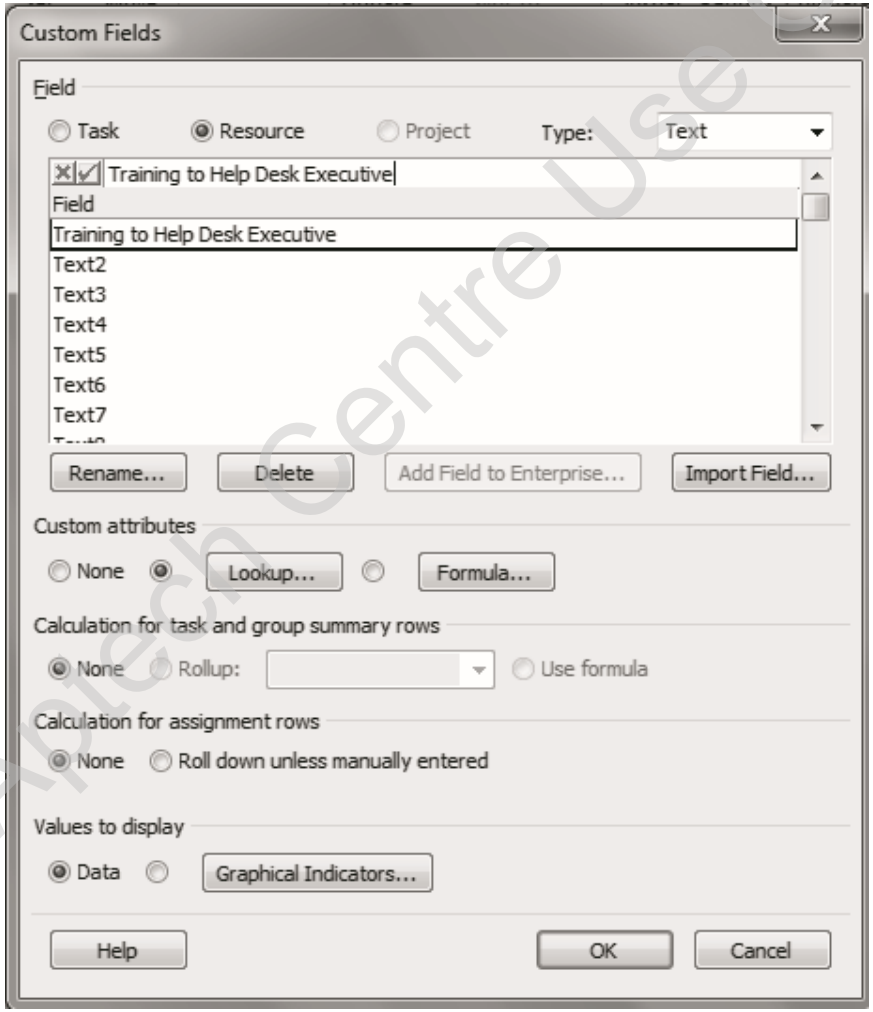
Creating Lookup Tables 1-3

- 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.
- 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.

Creating Lookup Tables 2-3

- Following figure displays about creating custom field in lookup tables:

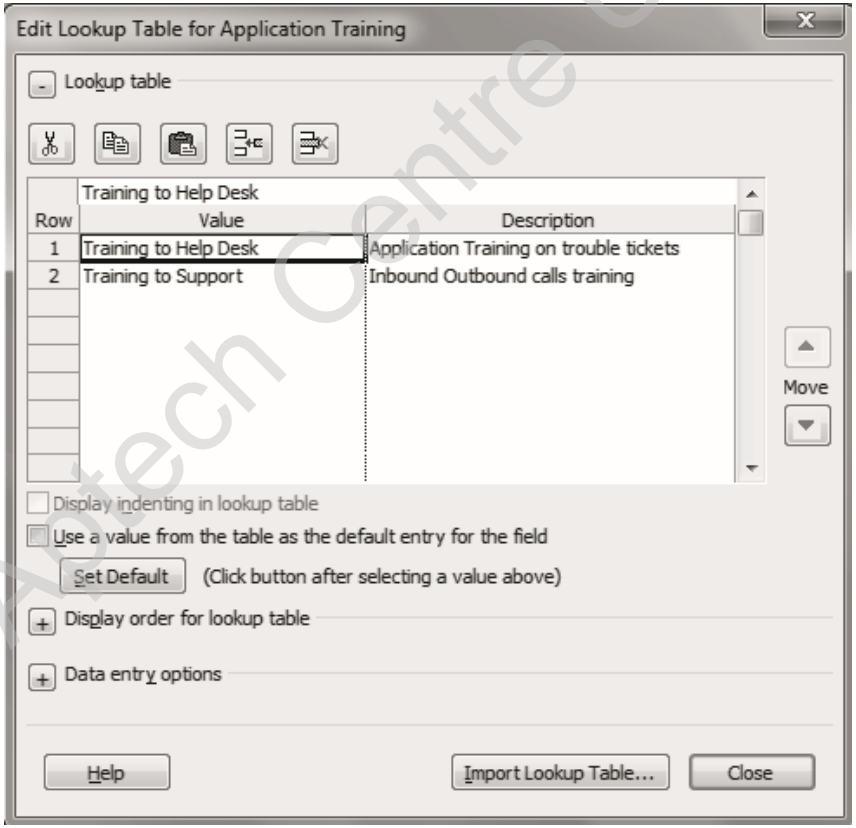


Creating Lookup Tables 3-3

5

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

- Following figure shows the lookup list in the custom field on the **Resource Sheet** name:



Reducing Project Costs

- 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.
- 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.

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.

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.