

Project Management Planning

Budgeting

Initial Release	1.0
Date:	January 1997

Overview of Project Budgeting

Paralleling the development of the schedule is the development of a budget. At the initial stages of project planning, budgeting is the determination of costs associated with the defined activities. The steps associated with budgeting are highly dependent upon both the estimated length of tasks and the resources assigned to the project.

Initial budgetary estimates are often based on availability of funds. This parameter may or may not coincide with the actual funds needed to perform the project. For this reason, budget estimates are refined in the planning process until they are baselined at project start-up. Budgeting serves as a control mechanism where actual costs can be compared with and measured to the budget. The budget is often a fairly set parameter in the execution of the project. When a schedule begins to slip, cost is proportionally affected. When project costs begin to escalate, revisit the project plan to determine whether scope, budget, or schedule needs adjusting.

Identify Cost Factors

To develop the budget, the applicable cost factors associated with the project tasks are identified. The development of costs for each task should be simple and direct and consist of labor, material, and other direct costs. Cost of performing a task is directly related to the personnel assigned to the task, the duration of the task, and the cost of any non-labor items required by the task.

Budget estimates are obtained from the people responsible for managing the work efforts. This provides the expertise required to make the estimate and provides buy-in and accountability during the actual performance of the task.

These team members identify people or labor categories required to perform the work and multiply the cost of the labor by the number of hours required to complete the task, as discussed in scheduling. Determining how long the task performance takes is the single most difficult part of deriving a cost estimate. The Labor costs should factor in vacation time, sick leave, breaks, meetings, and other day-to-day activities. Not including these factors jeopardizes both scheduling and cost estimates.

In calculating the cost of labor, be certain to burden the costs appropriately for your organization. Burdened cost typically refers to the overhead and general expenses associated with an employee. These costs are beyond strict salary expenses (e.g., office space, benefits, etc.).

Non-labor charges include such items as material costs, reproduction, travel, cost of capital (if leasing equipment), computer center charges, and equipment costs.

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Create Cost Model

Labor and non-labor cost information is entered into a cost estimation system or spreadsheet, depending upon the complexity of the project. Spreadsheets work well for projects of small to medium scope. A sample of a budget using a spreadsheet is shown below.

Sample Estimated at Completion Summary

WBS	Activity Description	Analysis in Hours						Analysis in Dollars				
		Res #	Budget hours	Actual hours	Est to Complete	Est @ Complete	Variance (+/=More)	Budget hours	Actual hours	Est to Complete	Est @ Complete	Variance (+/=More)
2.0	DESIGN											
2.1	Prepare Preliminary Design	3	900	1,150	0	1,150	250	90,000	115,000	0	115,000	25,000
2.1.1	Develop Enterprise Architecture		400	500	0	500	100	40,000	50,000	0	50,000	10,000
2.1.2	Prepare Data Flow Diagrams		300	250	0	250	(50)	30,000	25,000	0	25,000	(5,000)
2.1.3	Prepare Logical Data Module		200	400	0	400	200	20,000	40,000	0	40,000	20,000
2.2	Prepare Detailed Design	5	1,000	640	408	1,048	48	100,000	64,000	40,800	104,800	4,800
2.2.1	Prepare Physical Data Model		600	600	8	608	8	60,000	60,000	800	60,800	800
2.2.2	Prepare Data Dictionary		400	40	400	440	40	40,000	4,000	40,000	44,000	4,000
2.3	Document Design	2	430	0	430	430	0	43,000	0	43,000	43,000	0
2.3.1	Develop Design Specification		430		430	430	0	43,000	0	43,000	43,000	0
2.4	Design Review	10	160									
	Total for the Project		4,820	3,620	1676	5,256	646	466,000	358,000	167,600	525,600	59,600

For large systems, a project management tool is typically preferred for cost estimation. A Project Estimate Summary worksheet, included at the end of this section, is another appropriate model for costing and can be useful if completed prior to entering information into a tool. Tasks included in this sample should be tailored to specific project cases.

Costs are assigned to the lowest level WBS work package task. These costs are then combined to determine a sub-task cost. In turn, these are combined to determine the overall task cost, which can be summed to find the total project cost.

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Perform Risk Analysis

Identifying and quantifying project risks is inherently involved with budgeting any project. Good budgeting practices make allowances for dealing with risks in one or more of the following ways:

- Where significant budgetary risks are identified, add another WBS task for risk management/risk reduction, where financial reserves can be set aside to deal with potential budget problems.
- Budget for those tasks where risks are inherent. There is no rule of thumb for this multiplier; it depends on the degree of risk and the overall importance of the task to the project.
- Add a percentage multiplier to the budget where there are risks, especially if new technology is being used or if the person providing the estimate is extremely optimistic. Also, technical staff frequently underestimate the effort required to do any particular task. This could result in serious budget problems during implementation.

Document Assumptions

As with developing a project schedule, documenting assumptions made while developing the project budget is critical to the success of the project. Without clear documentation of these assumptions, tracking to the budget is very difficult and risky.

If, for example, a budget assumed that the material would be acquired at one price rate and only substantially higher cost material was available to perform the task, there would be a budget problem. If the assumption is not documented, the project manager may inadvertently increase project cost unknowingly and may unwittingly jeopardize chances for the project's success.

Review the Cost Estimates

Development of project budgets typically require more than one person. Rarely does a single individual have the knowledge and understanding of all the factors affecting every aspect of a project. A good process is to have the same people that reviewed the activity list and schedule, review the budget.

Upon completion of a draft budget, interview the team and determine if the work descriptions, schedule and associated budgets are complete and accurate. Determine if there is a common understanding of what it costs to do the tasks. Get independent estimates. Where there are significant differences, determine the reasons and either redefine the work packages, schedule, and budgets or review and reiterate the estimates.

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Form:

A large component of the budget is labor costs. Carefully determine that the reviewer is providing an estimate of the calendar time required to perform the task based on the actual labor hours needed. The total labor days per phase can also be checked against the rule of thumb that suggests the following distribution of development project effort and cost:

- 40% for planning and design
- 20% for development
- 40% for component and system testing

It is extremely important to get buy-in on the budget from the people who will actually perform the work. Participation results in having a stake in the project's success and fosters accountability. Imposing budgets on staff without a buy-in may result in sabotage.

The project budget is included in the project management plan template as the Estimate to Complete. The initial project budget is shown in the budgeted columns and the actual expenditures are compared on a regular basis to the plan.

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Form: PM 04
Project Estimate Summary Worksheet - Sample

Customer: _____ Prepared by: _____

Project: _____ Date: _____

Time Units: _____

	Project Task	Labor Hour	Labor Cost	Material Cost	Travel Cost	Other Cost	Total per Task
1.	Project Design						
1.1	Develop Functional Specifications						
1.2	Develop System Architecture						
1.3	Develop Preliminary Design Specification						
1.4	Develop Detailed Design Specifications						
1.5	Develop Acceptance Test Plan						
2.	Project Development						
2.1	Develop Components						
2.2	Procure Hardware						
2.3	Development Acceptance test Package						
2.4	Perform Unit/Integration Test						
3.	Install System						
4.	Train Users						
5.	Perform Acceptance Test						
6.	Perform Post Project Review						

