

Running head: COST MANAGEMENT TECHNIQUES

Cost Management Techniques

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*Abstract*

This essay will explore when a project manager would use rough order of magnitude, budgetary and definitive cost estimates in managing the cost of a project. The essay will also explore how analogous, parametric and bottom-up techniques may be used in creating a cost estimate.

## COST MANAGEMENT TECHNIQUES

Cost management is an area of expertise that can differentiate the most experienced and successful project managers from those with less professional experience. To manage project costs effectively, a project manager must assemble an accurate estimate and complete the project within an approved budget. A project manager must make every effort to reduce and control costs while satisfying the project stakeholders with a well defined and delivered project.

To begin, a project manager will need to estimate the cost of the project. The cost estimating process results in activity cost estimates, a list of requested changes and updates to the cost management plan, which is part of the overall project management plan.

There are three types of estimates that may be create for most projects: a rough order of magnitude, a budgetary estimate and a definitive estimate. Each of these estimates have a different purpose and may represent a different phase in a project's cost management.

The rough order of magnitude estimate (or ballpark estimate) is prepared very early in a project's life cycle, perhaps even several years before the project completion. It may be prepared before a project has been started and all specifications are gathered. In this time when requirements have not been specified in great detail, an accurate budget can not yet be created. The point of the rough order of magnitude estimate is to provide enough detail that managers can use it as the basis for project selection. The accuracy of a ROM may range from -50 percent to +100 percent. In information technology, project managers frequently estimate the overall project cost and double it for the rough order of magnitude estimate.

A budgetary estimate (or top-down estimate) is developed one or two years before project completion. The goal of the budgetary estimate is to provide funding for the project in an

organization's budget plans. This estimate is based on the level of detail defined in the current project scope and often considers alternatives such as doing the work in-house in comparison to using outside consultants or vendors. The actual cost of a project may typically be -10% to +25% more than the budgetary estimate. This kind of estimate usually occurs after a project has been selected, and is designed to help ensure the organization is realistic about it.

A definitive estimate (or bottom-up estimate) is prepared approximately one year before the completion of the project. Its goal is to deliver an accurate estimate of the project's costs. It is used for evaluation of different suppliers and actual project costs and for supplying the funds to pay for the project's purchases. The accuracy of this estimate is normally -5% to +10%, in other words the actual project cost may be 5% less or 10% more than what the definitive estimate states.

There are several tools and techniques that may be used in creating a good cost estimate in project management. These techniques include analogous cost estimating, bottom-up estimating, and parametric modeling. Analogous estimates or top-down estimates create an estimate based upon the cost of a previous, similar project. This estimation technique is less costly and less accurate than other methods, and to be useful, it requires expert judgement. The past project used as a model must be very similar in its facts and details to help create a good estimate. The group preparing the cost estimate must have the expertise to know how the project they are planning may differ from the project they are modeling their estimate after.

In bottom-up estimating, the individual activities and work items are estimated and then added to reach a total estimated cost. This method is also called activity based costing. The activity estimate should ideally be based on the work breakdown structure, and the individual

work packages should be estimated by the team members responsible for performing the work. To improve accuracy, at a minimum, the responsible team members responsible should estimate the amount of resources required. Additional estimates for the cost of resources (such as labor or supplies) should be requested from the financial departments in an organization and calculated into the total estimate.

Project management software can frequently assist in the bottom-up estimating process, by working with the work items and work packages in a WBS and calculating the estimate line item by line item. Using project management software to develop the estimate may improve accuracy of a bottom-up estimate, and ensure no work items are overlooked. Accuracy of a bottom-up estimate also increases as details and smaller work items are added to the list of tasks. To break larger tasks in a project down into individual tasks and estimate the cost of those tasks effectively requires the input of the project team members familiar with and responsible for those tasks. The estimate becomes increasingly more accurate as each work item is accurately represented with an associated cost. The tradeoff in creating such an accurate estimate is that it takes much more time to develop, which may be costly to the project process. In addition, the project team members whose input is needed may be somewhat reluctant to participate and give the estimating process the time or attention it needs because of their current assignments and deadlines in ongoing projects.

Another technique that may be used in estimating is parametric modeling. Parametric modeling uses mathematical equations to estimate the project based on its characteristics. The equations used may be standard equations applied from a textbook, proprietary equations developed by consultants and vendors in the industry, or a combination of the two. The

parameters must be scalable, easily quantifiable and based on actual historic project data to be reliable. The effectiveness of a parametric modeling solution is determined by both the sophistication of the data analysis methods and the extensiveness of the project data. Frequently, parametric model equations are based on a wealth of historical, accurate project management experience. They are reliable because useful project management experience has validated the accuracy of the equation and because they are less biased than human thought processes. Complex parametric models are frequently computerized and developed as applications, with a more user-friendly graphical user interface.

Many project managers attempt to use a combination of methods when preparing estimates, in order to ensure the most accurate results. For example, they may provide both analogous and bottom-up estimates or bottom-up and parametric estimates.

Whichever approaches or combination of approaches are used, the project manager should err on the side of caution and estimate an amount to keep in reserve for the project. Reserves are estimated to ensure a budgeted amount is available that may be used to mitigate any cost risk should unpredictable situations arise over the course of a project. It is very difficult to calculate how much may be needed, but it is important to consider this issue.

When developing estimates for a project, project managers have several different types of estimates and techniques available to assist them. It is critical that a project manager approach each project as a unique estimating problem, and use the techniques that most appropriately fit the project. In the challenge to provide accurate cost estimates, taking time, gathering necessary input, being cautious not to underestimate, providing estimates at the most appropriate phase of project planning and using techniques most appropriate to the project will set a course for

effective cost management. While there may not be as much historical data available for estimating technology projects, using good project management techniques, maintaining records of accurate project estimates, and being willing to seek out new information on developments in cost estimation should assist every project manager in getting more accurate and thorough estimates on their projects.

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