



Project Cost Management

Study Notes

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Points To Note

- Please read Chapter 7 from Project Management Institute, A Guide to the Project Management Body of Knowledge, (*PMBOK® Guide*) – Fourth Edition, Project Management Institute, Inc., 2008 (pages 165-188)
- The study notes explain topics that are important for PMP® exam preparation, and you can expect several questions from these topics.
- It is very important to understand all the concepts discussed in this chapter; so, please pay close attention to all the terms used.
- Try to relate the concepts to real life examples.
- After reading the study notes, please answer the chapter test questions in this knowledge area. The chapter questions improve your understanding of the concepts discussed in the study notes.



What is Project Cost Management?

- Processes that help to estimate, budget, and control cost so as to ensure that the project is completed within the approved budget.
- Processes primarily concerned with the cost of resources required to complete the project activities.
- Processes associated with cost management include:
 - Estimate Costs
 - Determine Budget
 - Control Costs
- Processes and related tools and techniques are usually selected when defining the project life cycle and are documented in cost management plan.

Please refer to *PMBOK® Guide* Fourth Edition, page 167, figure 7-1. This provides an overview of the processes in Project Cost Management.



Estimate Costs

- Process that develops an estimation of the monetary resources required to complete the project activities.
- Cost estimates are a prediction based on the information known at a given point in time.
- Process that identifies and considers costing alternatives to initiate and finish the project.
- Process in which the accuracy of estimation of costs increases as the project progresses through its life cycle.
- Process that makes a quantitative assessment of the likely costs of resources required to finish the activity.
- Process outputs are:
 - Activity cost estimates
 - Basis of estimates
 - Project document updates
- Differs from pricing: Pricing is what the seller charges for their products or services whereas costs are what the manufacturer incurs for manufacturing those products or rendering those services.



Estimate Costs – Tools and Techniques

- Expert Judgment
- Analogous Estimating
- Parametric Estimating
- Bottom-Up Estimating
- Three-Point Estimates
- Reserve Analysis
- Cost Of Quality (COQ)
- Project Management Estimating Software
- Vendor Bid Analysis

For details, please refer to *PMBOK® Guide* Fourth Edition, pages 171-173



Analogous Cost Estimating (Top Down)

- Uses the actual cost of a previous, similar project as the basis for estimating the cost of the current project
- Frequently used to estimate total project costs when there is a limited amount of detailed information about the project
- Uses historical information and expert judgment
- Generally is less costly than other techniques
- Is less accurate and time consuming
- Can be applied to a total project/segment of a project
- Provides reliable information when:
 - Previous projects are similar in fact and not just in appearance.
 - Project team members preparing the estimates have the needed expertise.



Bottom-Up Estimating

- Estimates the cost of individual activities or work packages with the greatest level of specified detail.
- Summarizes by rolling up the individual estimates to get a project detail.
- Summarizes or rolls up detailed costs to higher levels for further reporting and tracking.
- The level of accuracy and the cost estimate varies, depending on the size and complexity of the individual activity or work package.



Parametric Estimating

- Uses a statistical relationship between historical data and other variables to calculate the estimation of activity parameters
- Produces higher levels of accuracy based on the data and the sophistication built into the model
- Can be applied either to a total project or to segments of a project, in conjunction with other estimating methods



Three-Point Estimates

- Analytic technique that uses three cost or duration estimates to represent the optimistic, most likely, and pessimistic scenarios.
- Optimistic, most likely, and pessimistic estimates clarify the range of uncertainty of the cost estimates.
- Technique helps in improving the accuracy level of the cost or duration estimates, when the underlying activity or cost component is uncertain.
- Originated with PERT (Program evaluation and review technique). PERT uses this method of estimating to define the range for an activity's cost.



Activity Cost Estimates

- Quantitative assessments of the probable costs required to complete project work
- Can be in summary form or in detail
- Estimating the costs for all resources –direct labor, materials, equipment, services, facilities, information technology, and special categories such as an inflation allowance, and cost contingency reserve
- Indirect costs, if included in the project estimation, are included at the activity level or higher levels



AACE – Types of Estimates

- AACE has identified five types of estimates of construction costs during Engineering
 - Order of Magnitude
 - Conceptual
 - Preliminary
 - Definitive
 - Control

Estimate	% Variance
Order Of Magnitude	- 50% to +50%
Budgetary Estimates	- 15% to +25%
Definitive Estimates	- 5% to +10%



Determine Budget

- Process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.
- This baseline includes all authorized budgets, but excludes management reserves.
- Project budgets constitute the funds authorized to execute the project.
- Outputs of this process are:
 - Cost Performance Baseline
 - Project Funding Requirements
 - Project Document Updates



Project Schedule and Resource Calendars

Project Schedule:

- Part of the project management plan.
- Includes planned start and expected finish dates for the project's various components like activities, milestones, work packages, etc. This information is used to aggregate costs to the calendar periods in which the costs are planned to be incurred.

Resource Calendars:

- Provides information on which resources are assigned to the project and when they are assigned. This information can be used to indicate resource costs over the duration of the project.



Cost Performance Baseline

- An authorized time-phased budget at completion (BAC) used to measure, monitor, and control overall cost performance on the project.
- Developed by summing up the approved budgets by time period and is typically displayed in the form of an S-curve.
- In the earned value management (EVM) technique, the cost performance baseline is known as performance measurement baseline (PMB). For example, a spending plan or cash flow forecast is a cost baseline for measuring disbursements.



Revised Cost Estimates, Budget Updates, Re-baselining

- Revised cost estimates
 - Modification to the cost information used to manage the project
 - May or may not require adjustments to other aspects of the project plan

- Budget updates
 - Special category of revised cost estimates
 - Changes to an approved cost baseline

- Re-baselining
 - Process of redefining the cost performance/schedule/performance measurement/technical baseline.
 - If cost variances are very severe, re-baselining will be done to provide a realistic measure of performance.



Control Costs

- Monitor the status of the project to update the project budget and manage changes to the cost baseline.
- Any increase to the authorized budget can only be approved through the Perform Integrated Change Control process.
- Cost control efforts involve analyzing the relationship between the funds that have been utilized and the physical work accomplished for such expenses.
- For effective cost control, one must be able to manage the approved cost performance baseline and the changes to that baseline.
- Outputs are:
 - Work Performance Measurements
 - Budget Forecasts
 - Organizational Process Assets Updates
 - Change Requests
 - Project Management Plan Updates
 - Project Document Updates

For more details, please refer to *PMBOK® Guide* Fourth Edition, pages 179-188



Control Costs – Tools and Techniques

- Earned Value Management (EVM)
 - Commonly used method to measure performance.
 - The EVM principle is applicable to all projects, in all industries.
 - Planned Value (PV): Authorized budget assigned to work to be completed
 - Earned Value (EV): Value of work performed expressed in terms of the approved budget assigned to that work
 - Actual Cost (AC): Total cost actually incurred in doing the work required for an activity

- Forecasting
 - Estimating or predicting conditions and events in the project's future based on information and knowledge available at the time of the forecast.

- To-Complete Performance Index (TCPI)
 - The calculated projection of cost performance that has to be achieved on the remaining work in order to meet a specified management goal, such as the BAC or the EAC.



Control Costs – Tools and Techniques (continued...)

- Performance Reviews
 - It compares cost performance over time, schedule activities or work packages overrunning and under running the budget, and estimated funds needed to complete work in progress.
- Variance Analysis
 - A method of resolving the total variance in the set of scope, cost, and schedule variables into specific component variances associated with defined factors affecting scope, cost, and schedule variables.
- Project Management Software:
 - Used to monitor PV, EV, and AC so as to display graphical trends.