



Version 6.1 Updated for the 2021
Project Management Professional (PMP)[®] Exam



Crosswind Success Series: PMP[®] Exam Bootcamp Manual

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Version 6.1 aligned with the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK[®] Guide)* - Sixth Edition, Project Management Institute Inc., 2017

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12.10.1. Cost Management Plan

The cost management plan helps the project manager and team do the following:

- Establish the cost of activities and work packages on the project
- Establish the cost accounts and the procedures necessary to use the chart of accounts with the WBS and schedule
- Establish policies associated with updating the budget and distribution of the budget through the work of the project
- Update actual costs and adjust the cost baseline
- Establish the policies and procedures for changes to cost

The cost management plan can be used to establish:

- Level of accuracy
- Units of measure
- Organizational procedures links, which includes control account (CA) links to the project WBS and company accounting system
- Control thresholds
- Reporting of cost performance

The source for the above text is the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute Inc., 2017, Pages 235-239

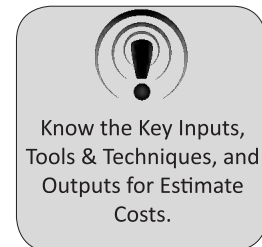
12.11. Estimate Costs (Planning Process Group)

The Estimate Costs process is vital because the accuracy of cost estimates directly impacts the likelihood that a project does not exceed its budget. The focus is on establishing the costs of either the work packages or the activities in order to establish the total project cost.

There are a number of cost estimating methods that can be used to establish activity cost estimates:

- Analogous (comparison to a previous, similar project)
- Parametric (parameters for building the estimate)
- Bottom-up (estimates of individual items that are added together to establish a total cost estimate)
- Computerized tools

Depending on what is known about the scope of the project, the choice of method can be influenced by schedule, resources, and risk.



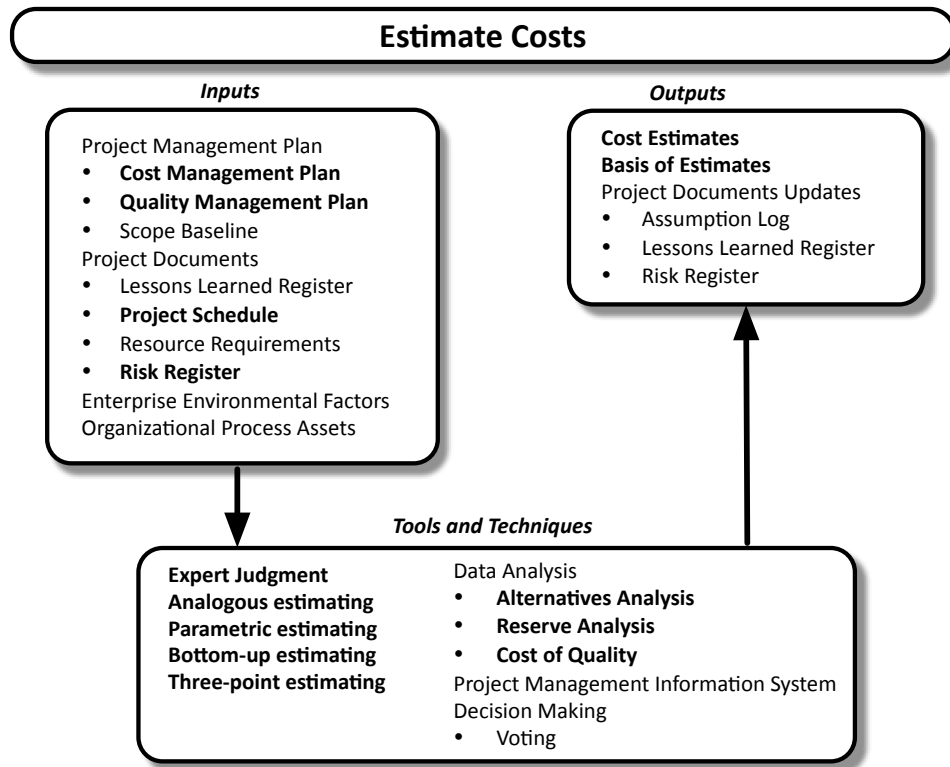


Figure 12-3: Estimate Costs Data Flow Diagram

The source for the above figure is the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) – Sixth Edition*, Project Management Institute Inc., 2017, Figure 7-4, Page 240

Estimate Costs (Planning)		
Key Inputs	Cost Management Plan	The cost management plan is a component of the project management plan that details the manner in which project costs are planned, configured, and controlled. It documents the processes and tools that will be used to manage project costs. Typically, it addresses metrics, the establishment of earned value management techniques, the junctures in the work breakdown structure (WBS) used to measure control accounts, acceptable cost performance variances, reporting configurations, satisfactory levels of accuracy (range) and precision (rounding), and the unique codes that associate the control accounts to the organization's accounting system.

Estimate Costs (Continued)		
Key Inputs (Cont.)	Quality Management Plan	The quality management plan is a component of the project management plan that details the manner in which the policies, methods, and criteria of the organization are executed. It details activities and necessary resources to accomplish quality goals. Typically the plan addresses quality criteria, roles and responsibilities, tools, objectives, and procedures (including those for continuous improvement). It also identifies the processes and deliverables subject to quality review.
	Project Schedule	The project schedule is the product of a schedule model containing linked activities and their planned dates, durations, milestones, and resources. Duration estimates impact cost estimates when resources fluctuate seasonally and are changed based on unit of time. Useful data can be obtained from the schedule in cases where the cost of financing, such as interest charges, is included in the project.
	Risk Register	The risk register documents identified project risks. The volume of documentation varies in accordance with the size and complexity of the project. Typically the risk register includes the list of risks sufficiently described to ensure clear-cut understanding, the risk owner for each risk, and the response(s) for each risk.
Key Tools & Techniques	Expert Judgment	Expert judgment is judgment based on expertise acquired in a specific area. It is often more significant and accurate than the best modeling tools available and can be provided by stakeholders, organizational personnel external to the project, professional organizations or groups, and consultants. It is important to consider expertise related to authoritative information in cost estimation and financial administration, earned value management, and similar projects.
	Analogous Estimating	Analogous estimating is a high-level estimation technique based on historical duration or cost data from a similar activity or project. The technique adjusts for known variances in complexity from the current activity or project under consideration and the historical activity or project. Analogous estimating is typically used to estimate a value or values in projects where there is a limited amount of detailed data. It can be used to estimate the entire project or a portion of the project. While this technique costs less and is not as time consuming as more detailed techniques, it is typically not as accurate.

Estimate Costs (Continued)		
Key Tools & Techniques (Cont.)	Parametric Estimating	Parametric estimating is an estimation technique in which an algorithm is used to calculate duration or cost based on historical duration or cost data and other variables from a similar activity or project. The quantitative technique uses a mathematical relationship between historical data and other variables. Parametric estimating can be used to estimate the entire project or a portion of the project. The accuracy of this technique is dependent on the underlying model.
	Bottom-up Estimating	Bottom-up estimating is an estimation technique in which duration or cost is determined by rolling up estimates of each WBS component of the item being estimated. The size and complexity of the item being estimated impacts the cost and accuracy of the estimation.
	Three-point Estimating	Three-point estimating is an estimation technique in which the range for activity duration is averaged based on pessimistic, optimistic, and realistic (most likely) estimates. The triangular distribution formula is often used if the historical data is insufficient and the beta distribution formula is often used when the historical data is sufficient. Triangular estimating, unlike PERT estimating, does not apply a weighted average.
	Alternatives Analysis	Alternatives analysis is a technique utilized to assess the most appropriate options to execute the work of the project. Some examples are renting a resource rather than purchasing it, purchasing off the shelf software rather than programming an application in-house, and utilizing a vendor to perform new equipment installation instead of in-house technicians.
	Reserve Analysis	Reserve analysis is used to determine the amount of contingency and management reserves required for the project. By analyzing the known unknowns (identified risks, typically with mitigation plans), contingency reserves can be determined to account for budget uncertainties and are included in the cost baseline and project funding requirements. Management reserves are budget reserves set aside to account for unknown unknowns (unforeseen work within the scope of the project). They are part of the overall project budget and are considered in the funding requirements. Funds in the management reserve are not included in the cost baseline until they are used for unforeseen work.

Estimate Costs (Continued)		
Key Tools & Techniques (Cont.)	Cost of Quality	The cost of quality (COQ) considers preventative costs (costs associated with preventing unsatisfactory quality), appraisal costs (costs associated with evaluation and testing), and/or failure costs (costs associated with failure to meet stakeholder expectations) that relate to the result of the project (products, deliverables, and services). The cost of prevention and appraisal should be compared to the cost of failure in order to achieve the optimal balance. Models demonstrate that investing in additional prevention/appraisal is not cost effective.
Key Outputs	Cost Estimates	Cost estimates include quantitative estimates of work completion costs, contingency reserves for identified risks, and management reserves for unidentified work. The estimates consider all resources involved including direct labor, equipment, material, facilities, exchange rates, information technology, financing costs, inflation allowance, and/or a cost contingency reserve.
	Basis of Estimates	The basis of estimates for costs includes documentation that delineates the manner in which the estimates were determined, lists all assumptions and constraints, identifies the range of estimates used and the degree of certainty associated with those estimates, and details individual project risks that impacted those estimates.

Situational Question and Real World Application

Failure to effectively perform the Estimate Costs process can result in project termination if there is a funding shortfall or if a subsequent cost analysis shows that the project is operating with an unacceptable profit margin. Alternatively, the project could be subject to delays due to uncertainty about obtaining funding for the resources necessary to complete the project in a timely fashion.

12.12. Cost Range

Cost range tolerance varies from company to company. A key principle in any environment is that the less that is known (earlier in the project), the wider the tolerance of the cost range should be (compared to when more is known later in the project when the range is minimized).

To align with the new project management standards, the candidate must know that, during **initiation**, a **tolerance range for a rough order of magnitude (ROM) estimate could be -25% to +75%**, and as the project work evolves into **execution**, **the tolerance could narrow to -5% to +10%**.

Figure 12-4: Cost Funnel depicts a “rough order of magnitude estimate” and a “definitive estimate,” sometimes referenced as a “control estimate.”

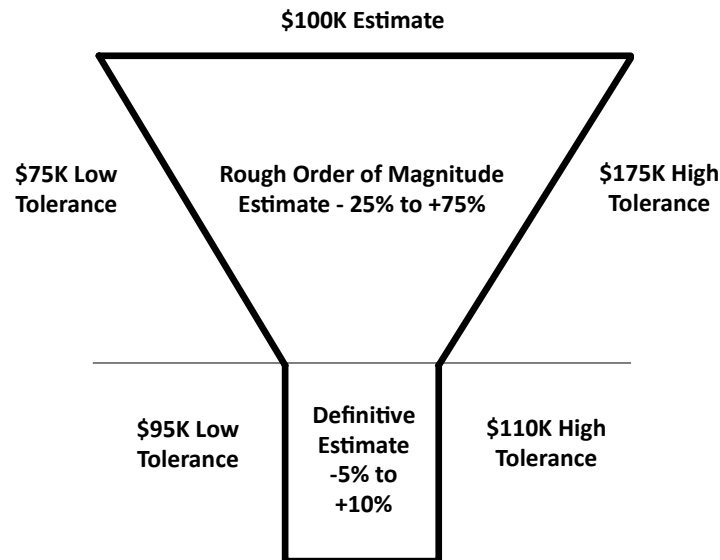


Figure 12-4: Cost Funnel

The rough order of magnitude estimate occurs at the start, or the top of, the project. It has the widest tolerance. The final definitive (or control) estimate occurs at the end, or the bottom, of the project. It has the least tolerance.

If a project has a \$100,000 estimate (assuming it didn't change as it went through the estimating process), the rough order of magnitude tolerance is \$75,000 to \$175,000. The definitive (or control) estimate tolerance is \$95,000 to \$110,000.

The source for the above text is the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute Inc., 2017, Pages 240-247

12.13. Determine Budget (Planning Process Group)

During the Determine Budget process, the primary activity is rolling up the cost estimates for the activities or work packages to create a total project budget amount that will serve as the cost baseline.

A detailed estimate of the project cost, as well as its individual pieces, is the result of this process.

The cost baseline created at this point should include a time-based approach to determine project cost needs as time passes. It establishes the basis for measuring, monitoring, and controlling project cost.

