What is Cost Estimation in Project Management?

By Tim Stobierski | November 11, 2019

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Project managers play an integral role in many organizations, ushering projects from inception all the way through to completion. To be effective in their roles, project managers perform a number of important duties and responsibilities (https://www.northeastern.edu/graduate/blog/project-manager-responsibilities/) throughout each stage of the project life cycle.

Each stage of the project life cycle is, of course, important. But perhaps none are as integral to the overall success of the project as the *planning phase*, which establishes a number of frameworks by which the project must be completed. These include the project's scope (https://www.northeastern.edu/graduate/blog/develop-project-scope-statement/), timelines, and budget.

A project's budget has the potential to impact nearly every facet of the project, making it one of the most critical responsibilities of a project manager. A poorly designed budget leads to improper asset allocation, unrealistic expectations, and potentially, a failed project.

Simply put, a budget *must* be accurate for a project to succeed. Cost estimation is one of the most effective tools in the project manager's tool belt for planning an accurate budget.

What is Cost Estimation?

In the field of project management, **cost estimation** is the process of estimating all of the costs associated with completing a project within scope and according to its timeline.

Initial, high-level estimates are often used in the earliest stages of project planning (https://www.northeastern.edu/graduate/blog/developing-project-management-plan/) and can determine whether or not a project is ultimately pursued. Once a project is approved and an organization chooses to move forward with it, more detailed and granular cost estimates become necessary in order to appropriately allocate various resources.

A thorough cost estimate should include both the direct and indirect costs associated with bringing a project through to completion. Depending on the specifics of the venture, this will likely include various overhead costs (utilities, labor, etc.), labor costs (including both time and wages paid), materials and equipment costs, vendor fees (if the project requires third-party workers, freelancers, or other contractors), and more.

4 Project Cost Estimation Techniques

How exactly project managers completing a cost estimate depends upon a number of factors. Some organizations, for example, require all projects to be budgeted for according to very specific policies; others may defer to the expertise of the project manager. Similarly, many organizations might work off of rough estimates in the earliest stages of project planning compared to later stages where more exact estimates are required.

Below, we explore four of the most common cost estimation techniques that you can leverage.

1. Analogous Estimating

Through **analogous estimating**, a project manager calculates the expected costs of a project-based upon the known costs associated with a similar project that was completed in the past. This method of estimation relies upon a combination of historical data and expert judgment of the project manager.

Because no two projects are exactly the same, analogous estimating does have its limitations. As such, it is often leveraged in the earliest stages of project planning, when a rough estimate can suffice. Analogous estimating can also be used when there is relatively little information about the current project available.

2. Parametric Estimating

In **parametric estimating**, historical data and statistical modeling are used to assign a dollar value to certain project costs. This approach determines the underlying unit cost for a particular component of a project and then sales that unit cost as appropriate. It is much more accurate than analogous estimating but requires more initial data to accurately assess costs.

Parametric estimating is often used in construction. For example, an experienced construction manager might understand that the typical new home will cost a certain number of dollars per square foot (assuming a particular margin of error). If this average cost, the margin of error, and the square footage of a new project are known, then parametric estimating will allow them to identify a budget that should accurately fall within this range. Other examples might include estimating the cost per unit to print and bind a book or to build an electronic device.

3. Bottom-Up Estimating

In **bottom-up estimating**, a larger project is broken down into a number of smaller components. The project manager then estimates costs specifically for each of these smaller work packages. For example, if a project includes work that will be split between multiple departments within an organization, costs might be split out by department. Once all costs have been estimated, they are tallied into a single larger cost estimate for the project as a whole.

Because bottom-up estimating allows a project manager to take a more granular look at individual tasks within a project, this technique allows for a very accurate estimation process.

4. Three-Point Estimating

In **three-point estimating**, a project manager identifies three separate estimates for the costs associated with a project. The first point represents an "optimistic" estimate, where work is done and funds spent most efficiently; the second point represents the "pessimistic" estimate, where work is done and funds spent in the least efficient manner; and the third point represents the "most likely" scenario, which typically falls somewhere in the middle.

Three-point estimating relies on a number of weighted formulas and originates from the Program Analysis and Review Technique (PERT) (https://www.investopedia.com/terms/p/pert-chart.asp).

Scoping Out Your Own Path Forward

Cost estimation is a skill that takes time and practice to master. For those who have already completed formal education in project management, this can be as simple as seeking more opportunities to practice building and managing a budget using the various techniques outlined above.

Individuals who have found themselves in the position of managing projects without formal training in the field, however, stand to benefit substantially by completing formal project management training. Completing a master's in project management (https://www.northeastern.edu/graduate/program/master-of-science-in-project-management-online-252/) can, for example, help you develop important skills (like cost estimation) along with many other benefits (https://www.northeastern.edu/graduate/blog/5-reasons-masters-in-project-management-worth-it/) that can help you be more effective in your role—while improving your career (https://www.northeastern.edu/graduate/blog/project-management-career-guide/) in the process.

Want to learn more about starting or advancing your career in project management? Download our guide How To Break Into Project Management (https://pages.northeastern.edu/LM-PJM-BLOG-2017-8-PJM-Ebook_LP.html) *to learn more about the skills and education that can benefit you on your path to success.*

(https://pages.northeastern.edu/EMGLOGRADNETLMDEFBLOG2020-08-10PROJECTMANAGEMENTEBOOK_LP.html)

About Tim Stobierski

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