

5 Reasons Why Validating Project Cost Estimates Early is Good Practice



Danquah Group

Executive Summary

Only 57% of all projects finished within their initial budget last year, according to an annual survey from the Project Management Institute (PMI)'s 2019 Pulse of the Profession—the global survey of project management practitioners.

The survey identified inaccurate cost estimates as one of the leading causes of failure for projects that were deemed “failures” within the period of study.

This survey reinforces the importance of accurate preliminary cost estimates and budgets in the early planning phase of a capital program. It is believed that a project's scope determines the budget, but one could argue the alternative—early budget planning determines and shapes the scope of a project. Therefore, establishing an accurate preliminary cost estimate should be the overarching goal of planners, designers, engineers and owners of capital programs.

However, the current process used to establish preliminary cost estimates for capital programs does not lead to accurate cost estimates and budgets most of the time. Preliminary estimates are not based on results from requirement elicitations, and tend not to reflect actual site conditions, stakeholders' requirements and end-user imputes.



Objectives

For this reason, we are recommending that architects, engineers and managers tasked with the design and execution of capital programs must first validate their project budgets. There are many other reasons to validate project cost estimates prior to design work. In this article, we will provide the top five reasons.

In addition, it is important to have insightful conversations with an owner regarding their project costs. It helps you and the owner make a good case for budget adjustments to levels commensurate with the owners' requirements. This is a win-win situation for both the owner and the design team.



5 Reasons Why Architects and Engineers Need to Validate Preliminary Cost Estimates Prior to Design



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In the construction and engineering industry, the process leading to estimating preliminary project budgets generally follows a logical sequence: The owner identifies a need, then communicates the need to the design team. The design team estimates and communicates the cost to the owner, and the owner reviews and approves construction cost. But this is not always the case, especially within the public building and infrastructure procurement environment.

Within the public sector, owners rely on in-house or third-party firms to establish preliminary construction cost estimates for the capital programs. These preliminary estimates are sometimes based on over-the-shelf unit costs for typical projects.

For example, an owner may use the average cost/GSF of a \$1200/GSF 200-bed hospital recently built in North San Francisco for a similar project near the bay in San Francisco. Preliminary estimates could also be based on concept design with very little information. Armed with a preliminary estimate, the owner then invites an A&E firm to design the project within the budget established.

The Problem

There are advantages to this process. First, it gives the owner some control over cost of their capital programs; second, it helps contain design to functional requirements, limiting excessive aesthetics; and third, it is always good practice to start a project knowing how much it is going to cost. However, this approach also has its flaws.

It does not give the design team enough room to evaluate and add value to the project. Rather, they must hold off on any value creation ideas. These ideas could create better overall value for the owner, increase utility for end-users, or result in lower overall cost. For instance, upgrading some aesthetic features on an office complex could add 5% to the capital cost, but result in a 10% reduction in operation costs.

Owners' preliminary budgets are not normally based on results from requirement elicitations, and tend not to reflect actual site conditions, stakeholders' requirements, or end-users' inputs. They may also be subject to optimism bias.



The Solution

Architects, engineers and managers tasked with the delivery of capital programs must validate the budget prior to design or very early in the design process. Validating means seeking a third-party peer review, estimate, or performing in-house concept estimates.

The costs validation process provides assurances to both the owner and the design firm. It also gives the architects the opportunity to offer value creation ideas to the owner.

There are many other reasons why design teams must validate project cost estimates early. In this article, we provide five reasons why this is important to the owner and the design firm. With these reasons, one can have an insightful conversation with an owner regarding their project costs prior to design commencement.

This helps you and the owner make a good case for budget adjustments to levels commensurate with the owners' requirements. This is a win-win situation for both the owner and the design team.

5 Reasons Why Validating Project Cost Estimates Early is Good Practice

1. Budgets May Have Been Established Too Early Without Considerations of Key Stakeholders and End-User Inputs

Capital projects are expensive and require long-term commitments, inputs and considerations from stakeholders and end-users. Most projects start with requirement elicitation—this is where all of the requirements (stakeholders, end-user, cities, state, federal) for the projects are gathered.

Good requirement gathering and discovery leads to better defined scope and preliminary cost estimates. But most preliminary estimates are Rough Order Magnitude (ROM) or over-the-shelf unit costs that do not always take into considerations the general and project-specific requirements. These requirements influence the project costs and could add a substantial amount to the final cost of the project.

2. The Budget May Have Been Established Without Detailed Site Investigation

The budget might have been established prior to any site feasibility studies, and therefore site-specific requirements might not have been included in the budget. Differing site conditions account for a substantial number of litigious claims in the construction industry.

Site investigations might reveal site-specific challenges such as presence of hazmat, wetlands, endangered species and other unfavorable conditions. These conditions could add substantial costs to the program.

Early identification of these site conditions is crucial to the long-term success of the capital program.

If there are preliminary soil reports, the design team should review the reports, paying close attention to unfavorable site conditions that could dictate the need for a deeper and larger foundation than is usually required.



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3. Budgets May Have Been Established at Different Economic Periods

The construction industry is cyclical in nature, with booms and bursts dictated by the larger economy, consumer behavior and global economics outlook. Such ups and downs in construction economics influence project costs.

In periods of low construction activities, more contractors respond to bids. With more contractors going after fewer projects, bid prices tend to be lower. The situation reverses during periods of economic booms. Bid prices have been found, on average, to be 15% higher than engineers' estimates when there is only one bidder, and 5% lower when the number of bids increased to five.

Costs predictions tend to be dictated by the market conditions. The unit rates and overheads are all dictated by the current market prices. In addition, the index (escalation rate) used to project current cost estimates into the future is also dictated by current market conditions.

Thus, budgets established during recessionary periods for a project commencing in a boom period is bound to be lower, and one established in boom period for a project commencing in a recessionary period could be overestimated, all other things remaining constant.

It is good practice to inquire as to when preliminary cost estimates were established, if an owner insists on using their preliminary cost estimates as basis of design. Preliminary cost estimates must be escalated to reflect the time and period of construction.

4. Underlying Assumptions

Because preliminary cost estimates for capital projects tend to be based on either parametric estimates or on the cost of similar projects, estimators and quantity surveyors tend to ignore assumptions underlying target projects.

Assumptions about end-users, stakeholders and even organizations vary from one organization to the other. Although two organizations might want class A office building, one might put an emphasis on unique branding in its design, calling for high-end finishes, unique material selections, different procurement methods and preferences. Furthermore, some organizations have preferred contractors or delivery teams.

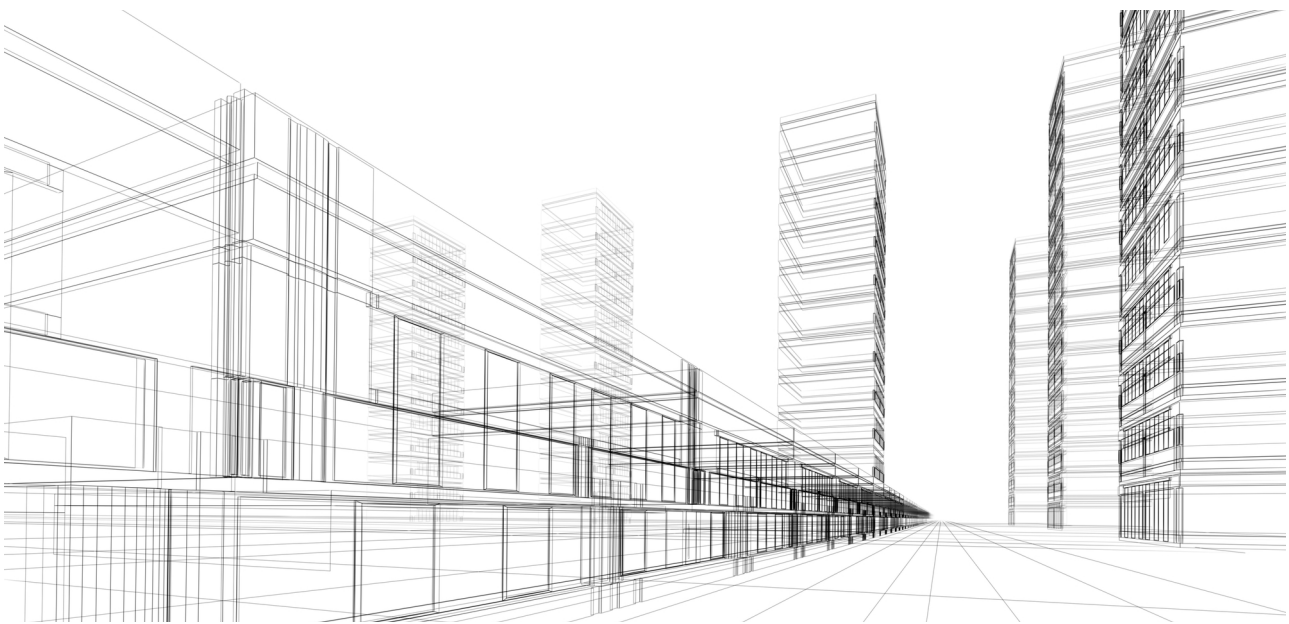
Disparities in preferences result in different costs for similar projects. Even when sponsoring organizations have set assumptions on their projects, these assumptions and preferences can change over time.



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5. Reevaluation Presents an Opportunity to Assess Design Fees and Deliverable Schedules

Finally, validating or establishing an early planning budget gives the design team the opportunity to assess its fees and deliverable schedules. Having appropriate design fees gives the team the ability to allocate the appropriate resources to the project. Design fees are sometimes established based on construction cost. Therefore, underestimated construction costs lead to lower design fees.



Key Takeaways

The initial construction cost for a capital program is critical to its success. Techniques used to assess and control capital cost, such as risk management, value engineering and cost control become more useful to the owner when the construction cost is commensurate with the intended scope. When the initial cost is too low, no amount of value engineering, risk management, or cost control techniques and measures can save the project without substantial loss of value.

The best capital cost estimate is one that reflects current economic conditions and intended scope, takes into consideration specific site conditions, as well as stakeholder demands and requirements and is established close to the project execution date. It is good practice to validate the budget prior to detailed design work, or very early in the design process.

How Danquah Group Can Help You

Danquah Group LLC is a professional services firm providing consulting, training programs and technology solutions to help organizations deliver their strategic objectives. We provide project management support services, including project cost management and controls. Danquah Group also provides training for construction management professionals to help them manage their construction projects. Our past projects involve some of the largest capital improvement programs, including the California High Speed Rail.

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