Project management for researchers and evaluators

Estimating project timelines and cost

Developing estimates can be challenging, but there are several useful strategies for improving our accuracy

One of the trickiest parts of planning a research or evaluation project is estimating how much it will cost and how long it will take to complete. By definition, all projects are unique endeavors. If each project is unique, how can we estimate what it will take to complete it? Fortunately, there are established practices that we can apply to develop timeline and cost estimates, giving us information that we need to prepare project proposals or bids, negotiate projects with clients or collaborators, and develop plans for implementing the project.

Precise estimation requires a clear understanding of the project

You cannot create reasonable estimates if you do not understand the scope of work or the steps required to complete the project. Imagine that a potential client calls you and asks "how much will it cost to evaluate my program?" There is no way to answer that question without understanding what the program is, who it serves, what the core evaluation questions are, what values will guide the evaluation, what methodology might be appropriate, etc. Without knowing what the project entails, we cannot begin to estimate the cost of the evaluation or the time that would be required to complete it.

That being said, you may need to prepare estimates before you have a detailed understanding of the project. For instance, you may be submitting a bid for a project based on a written Request for Proposals. While there are typically opportunities to ask some questions, you might need to create initial estimates based on an incomplete understanding of the project parameters. In other cases, you may already have all of the information that you need to develop more refined estimates.

The project management field distinguishes between these two types of estimates.

Initial "ballpark" estimates

Initial "ballpark" estimates are referred to in project management as "rough order of magnitude" estimates. These estimates assume that you have only partial information about what the project will entail. Because these are more preliminary estimates, they also assume that you could be quite mistaken, with an accuracy range of -25% to +75%.

EXAMPLE: While preparing a project proposal, you estimate that an evaluation project will take 35 weeks to complete and will cost $30,000. Given that we do not know all of the details about the project, it is helpful to apply this correction to identify the most likely time and cost ranges. For this example, the project is likely to end up actually costing between $22,500 and $52,500, and will require 26-61 weeks to complete.

Community Research Solutions, LLC
CONSULTING AND RESEARCH TO MAKE A DIFFERENCE

With such wide ranges, why bother creating a rough order of magnitude estimate at all? This can actually be a very useful step to take when creating initial project bids or estimates. In this example, if you know the potential client needs to have the project done for under $35,000, you can make a more informed decision about your level of confidence.

While your estimate falls under their spending limit, your upper end estimate is considerably higher. This does not mean that you need to change your bid, though you may decide to. However, it will give you a sense of the degree of risk that you may be taking on, or inform the way that you negotiate the actual scope of work so that you are more likely to be able to complete the project on budget.

More definitive estimates

Once you have a more complete understanding of a project scope and tasks, you can create a more refined estimate. Even with this detail, your estimates are still just that…estimates. However, with more information about the project you can reduce the margin of error dramatically. "Definitive estimates" – that is those based on a more detailed understanding of the project requirements - are generally considered to have an accuracy range of -10% to +15%.

EXAMPLE: Based on your updated assessment of the project, you now estimate that it will take 30 weeks to complete and will cost $34,000. Applying this correction to your estimate, you can feel fairly confident that your actual timeline will be 27-35 weeks and your actual cost will be $30,600-$39,100.

You can use multiple strategies to create estimates

So, how do we create these initial estimates for a project? In some cases, we may be able to simply roll up fairly exact costs. For instance, if you subcontract interviewing to someone who will charge you $75 per interview, and you need 25 interviews to be done, you know that you will need to budget $1,875 for that activity. If you have specific costs or timelines for each activity, you can simply roll these estimates together to come up with your overall projections.

However, more often we need to estimate tasks that are not quite as clearly defined. For instance, how many hours do we think we will really need to code

and analyze 50 qualitative interviews? How long will it take to write up a summary of our research findings? If we are hoping to do a series of one-on-one interviews with project stakeholders, how long should we allocate to engagement and recruitment?

There are several general strategies we can use to generate these estimates:

One strategy is to rely on **historical data** that documents the timelines and costs we needed to do the same work in the past. Historical documentation can be very accurate (assuming that there have not been significant changes in how the work would be conducted). For instance, perhaps you have analyzed a consistent set of program data each year as part of a multi-year grant. Assuming that the type of data and the way that you will obtain it have not changed over time, historical records regarding timelines and costs should be very helpful in creating current estimates.

Historical data is most useful when we are repeating a project or task that we have done previously. As professional researchers or evaluators, we know that we are often creating new approaches and techniques, designed to meet the specific needs of a program or stakeholders.

If you do not have relevant historical data, consider whether you have **analogous data** that would inform estimates. You may not have done this precise task before, but have you done something similar? For example, perhaps the focus groups that you recently completed with participants in a parent support program would provide some initial estimates for a new project that requires focus groups with teachers participating in a training program.

Another option for developing estimates is to rely on **expert judgment,** which uses the guidance of specialists with experience in completing related tasks. Depending on your background and expertise, you may possess the expert judgment needed to develop project estimates. However, if you are just beginning to work in the field of evaluation or research, or you are using methods or approaches with which you have less familiarity, you may need guidance from others. Talk to other more experienced researchers, or look for published best practice guides to inform your estimation.

Tips for estimating project time and cost

Involve others in the estimation process

Talk to your client, colleagues, or collaborators about how the project will be completed. Try to avoid basing estimations solely on your assumptions about what is needed or how the project will unfold. Share your initial ideas and work plan, so that others can help fill in missing details, clarify misunderstandings, and provide input.

Develop a Work Breakdown Structure

To develop more accurate estimates of project cost and time, you need to have a detailed understanding of each task that needs to be completed. It is extremely helpful to create a Work Breakdown Structure to identify each major component and task required to complete the project. [See the tip sheet in this series on "Developing Work Breakdown Structures" for more information about what these are, and how to create them].

Build your library of historical documentation over time

As you implement projects, keep records of your actual costs and timelines, and how these compared to your estimates. Use project debriefings to discuss these results, and to identify strategies for making more reliable estimates in the future. [See the tip sheet in this series on "Identifying lessons learned" for more information about project debriefings].

Adjust your estimate based on your team's experience

When relying on historical or analogous data, consider whether your project team has more experience than they had on earlier projects, which may reduce the cost and time to implement. On the other hand, if you have a team that is relatively new, or using methods that are new to them (i.e., data collection methods, analysis approaches, data visualization systems, etc.), take that into account when doing your estimate. Build in time to reflect the learning curve, and time that may be needed for training and mentoring of the team.

Document your assumptions

As you create your estimates, note any assumptions that you make about how the work will unfold. What are the conditions that need to be in place in order for you to complete the project within this time and cost estimate? As you implement the project, monitor whether your assumptions are accurate and determine whether you may need to adjust your estimates if work is not proceeding as you had planned.

Avoid the tendency to underestimate

As we develop estimated budgets and timelines, it is typical that we underestimate things that might go wrong, and overestimate our ability to complete projects quickly and easily. As a result, initial budgets and timelines are often underestimates. Most clients and collaborators will not mind if the project takes less time or costs less money than anticipated. However, we want to be cautious about overpromising due to underestimating.

Consider both the amount of effort and task duration when determining timelines

When creating a timeline, consider both the number of hours needed to complete a task and the actual duration (time from beginning to end) for this activity. For instance, you may determine that qualitative coding of interview data will take 80 hours to complete. However, because you have other project tasks to work on concurrently, it may take six weeks for you to complete the coding. You can budget for 80 hours, but will need to allow six weeks in your timeline.

Adjust your estimate to factor in level of risk and confidence

Once you have developed your best estimate, there are several other strategies that you could use to reflect the level of confidence that you have in the estimate, or to build in some room for things to go wrong during the project.

One helpful strategy is to use **three-point estimating**. To use three-point estimating, you try to develop three estimates: the optimistic (best case), pessimistic (worst case), and the most likely estimate. As you are constructing your initial estimates, consider the assumptions that are built into your reasoning. What might allow you to complete the project more quickly, or at a lower cost (i.e., your most optimistic estimate)? On the other hand, what might interfere with your ability to get the project done on time or at cost? What is your most pessimistic estimate for time or cost?

Note that the most optimistic and pessimistic estimates still need to be grounded in reality. In other words, we would not consider "one in a million" occurrences that are highly unlikely to occur. However, there may be reasonable situations in which we could expect our estimates to be too high or too low. For instance, you may determine that if surveys are submitted quickly, you would be able to complete the analysis before a scheduled vacation. While this is possible, you may think that it is more realistic that the data collection will progress more slowly, requiring you to shift the analysis until after your vacation, thus extending the timeline.

To apply three-point estimating, you simply need to apply the following formula: *Estimated time = [optimistic time + (4 x most likely time) + pessimistic time] / 6.*

EXAMPLE: You think it is most likely that a project will take 22 weeks. If everything proceeds smoothly, you may be able to get it done in 20 weeks. However, if some potential challenges emerge, you may need as much as 30 weeks. Applying three-point estimating, you adjust your proposed timeline to 23 weeks [(20 + 4x22 + 30)/6]

A different approach to factoring in risk is to use a **"rule of thumb"** adjustment. The rule of thumb adjustment still uses a pessimistic estimate, but also factors in the chance that something will go wrong

(based on historical records, analogous estimates, or your best judgment). To apply a rule-of-thumb adjustment: (1) subtract the most likely estimate from the pessimistic estimate; (2) multiply the difference by the estimated likelihood of the pessimistic occurrence; and (3) add the result as an adjustment to your original estimate.

EXAMPLE: You have estimated that you will need 20 hours to prepare a semi-annual project report. However, based on your historical documentation, you know that about 20% of the time, you have needed more time (up to 30 hours) to complete this report. You subtract the difference between your pessimistic estimate (30 hours) and your likely estimate (20 hours). You multiply the difference (10 hours) by the likelihood of occurrence (20%), yielding an adjustment of 2 hours. In creating your timeline, you add 2 hours to your most likely timeline, estimating 22 hours.

Monitor and adjust estimates as you move into implementation

Once you have finalized your estimates, you can use these to monitor your actual implementation. Document whether things are proceeding according to your estimates, and if not, determine why. Being clear about the assumptions that you made, and the potential risks that could impact your costs and timelines, will help you monitor implementation and address challenges as they emerge.

As you complete each project task, review your estimates for upcoming work and adjust them as needed. Ensure that the full team, along with the client or collaborating agencies, are aware of estimates that need to be revised, especially if changes in project scope will be needed. With practice and reflection, you will likely find that estimation will become easier and more accurate.

> **"To be uncertain is to be uncomfortable, but to be certain is to be ridiculous."**
>
> **- Chinese proverb**

AUTHOR: Cheryl Holm-Hansen, PhD is the founder and principal consultant at Community Research Solutions, LLC. She has more than 30 years of experience conducting community-based research and evaluation projects. A community psychologist by training, she also has a continuing education certificate in project management.