

Basics of Software Estimation

Estimation techniques are of utmost importance in software development life cycle, where the time required to complete a particular task is estimated before a project begins. Estimation is the process of finding an estimate, or approximation, which is a value that can be used for some purpose even if input data may be incomplete, uncertain, or unstable.

The four basic steps in software project estimation are:

- 1) Estimate the size of the development product. This generally ends up in either Lines of Code (LOC) or Function Points (FP), but there are other possible units of measure. A discussion of the pros & cons of each is discussed in some of the material referenced at the end of this report.
- 2) Estimate the effort in person-months or person-hours.
- 3) Estimate the schedule in calendar months.
- 4) Estimate the project cost in dollars (or local currency)

Estimation is based on –

- Past Data/Past Experience
- Available Documents/Knowledge
- Assumptions
- Identified Risks

Estimation need not be a one-time task in a project. It can take place during –

- Acquiring a Project.
- Planning the Project.
- Execution of the Project as the need arises.
- ✓ Project scope must be understood before the estimation process begins. It will be helpful to have historical Project Data.
- ✓ Project metrics can provide a historical perspective and valuable input for generation of quantitative estimates.
- ✓ Planning requires technical managers and the software team to make an initial commitment as it leads to responsibility and accountability.
- ✓ Past experience can aid greatly.
- ✓ Use at least two estimation techniques to arrive at the estimates and reconcile the resulting values. Refer Decomposition Techniques in the next section to learn about reconciling estimates.
- ✓ Plans should be iterative and allow adjustments as time passes and more details are known.

General Project Estimation Approach

Step 1 – Understand the scope of the software to be built.

Step 2 – Generate an estimate of the software size.

- ✓ Start with the statement of scope.
- ✓ Decompose the software into functions that can each be estimated individually.
- ✓ Calculate the size of each function.
- ✓ Derive effort and cost estimates by applying the size values to your baseline productivity metrics.
- ✓ Combine function estimates to produce an overall estimate for the entire project.

Step 3 – Generate an estimate of the effort and cost. You can arrive at the effort and cost estimates by breaking down a project into related software engineering activities.

- ✓ Identify the sequence of activities that need to be performed for the project to be completed.
- ✓ Divide activities into tasks that can be measured.
- ✓ Estimate the effort (in person hours/days) required to complete each task.
- ✓ Combine effort estimates of tasks of activity to produce an estimate for the activity.
- ✓ Obtain cost units (i.e., cost/unit effort) for each activity from the database.
- ✓ Compute the total effort and cost for each activity.
- ✓ Combine effort and cost estimates for each activity to produce an overall effort and cost estimate for the entire project.

Step 4 – Reconcile estimates: Compare the resulting values from Step 3 to those obtained from Step 2. If both sets of estimates agree, then your numbers are highly reliable

Step 5 – Determine the cause of divergence and then reconcile the estimates.