

The ins and outs of estimating

In a world that followed the 'normal' distribution curve there would be as many tasks in our projects that finished early and under-budget as late and over budget.

Generally, that isn't the case with project performance: 'actuals' are almost always worse than estimate, so what factors explain this?

'Early' or 'over budget' are measured relative to the expectation/baseline/or estimate. Without estimates that faithfully approximate the reality, all other aspects of scheduling and budgeting are unreliable.

Estimates have two dimensions: first producing them and second using them. Both are fraught with issues, misconceptions and opportunity for easy improvement.

Accuracy v precision

An estimate must at all times have the quality of 'accuracy': the correlation between an assertion and the facts. If an estimate is inaccurate then its producer was incompetent. An estimate also has the quality of precision or exactness: the degree of variation the assertion allows while still being accurate.

For example, if I had estimated your time to read this far at three point five seconds, I'd be precise and wrong. If I estimate that you have taken between a second and an hour to read this page so far, my estimate is highly likely (but not guaranteed) to be accurate but is far from precise.

Accuracy is binary, while the 'price' for accuracy at all time is varying levels of precision. To understand how to use this insight to advantage in a project requires that we consider who uses an estimate and what for.

Estimates are a decision support aid

Estimates are used to support one of two types of decision. Rationing and coordination:

- 1 How much of some rationed resource should be applied where? If supply is limitless no estimate is required.
- 2 To coordinate two or more parallel work-streams to arrive somewhere, or 'some-when', in a coordinated fashion. Basically either together or one after another.

The estimate's producer is responsible for an accurate estimate, while it is the decision maker's problem to assess if the estimate is precise enough for the decision required.

On these points pivot some of the key actions for improving estimating.

Producer's duty

Producers must understand that accuracy is mandatory and thus to ensure it, they must quote a wide enough range. That is an estimate cannot be just a number - which begs the question 'what is the content of an estimate?'

Recipient's duty

Recipients must understand that precision reflects previous experience, completeness of specification, time given to create and perhaps verify the estimate and is a variable that can be improved but at a cost.

What is an estimate?

An estimate is a package of information that comprises, as a minimum, a scale and two places on that scale, the maximum and minimum (which establish the range required to guarantee accuracy). The two places should be accompanied with the audit trail of factors, formulae or comparisons upon which they are based. If an estimate comprises a minimum of three values, where the third is the most probable final value, then much more than is discussed here can be done and confidence levels can be established for tasks and groups of task to establish cost and schedule budgets and contingencies.

However producing estimates is less than half the story.

Using estimates

The typical project participant when asked for an estimate gives a single value heavily influenced by their recent experiences and their perception of what happens if they over-run. Typically the estimate contains 'extra', just in case, and if the local culture means that management arbitrarily guess how much 'extra' can be removed, then the estimate will contain 'extra-extra'.

Finishing early and late

Whatever games are played with adding and subtracting 'extra', the user of the estimate will make their own estimate of the adequacy of what they are given. If they judge there to be an over allowance, it is likely some time or resource will be diverted to any surrounding task under pressure - especially if a system of booking codes operates.

If the task is completed within the allowance, then it will be booked as taking exactly what was allocated, unless there is a direct incentive to

declare the gain and confidence that declaring the achievement has not just reset the target for next time the task is allocated.

And if the task is over extended, either through too much diversion at the beginning, or genuine miss-estimating, then it is likely to be cross-subsidised from the next task, or the losses are declared and accumulate. Thus tasks hardly ever appear to come in early, as any gains that are made are undeclared, hidden, cross subsidised or wasted, while overruns that cannot be cross subsidised accumulate.

A better approach to usage

When the producer creates an estimate, they should insist on three values:

- an expected value and the justification for it,
- a best case and the justification for its variation from the expected, and description of the action required to achieve the best,
- a worst and the circumstances that would cause deterioration from the expected

When using the estimate, allocate the expected (or best) and hold the delta (the difference of variation) to the worst case in reserve, to be allocated on presentation of a sound justification.

One other useful action is to insist on truthful recording of actuals. If we start with inaccurate estimates, then we don't deliver to them, and then miss-book (ie, book dishonestly) to appear to match them, it creates fresh estimating data that is wrong and leads to future inaccurate estimates!



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