Measurements for Successful Software Project Management

William Nichols, PhD.,

Software Engineering Institute/Carnegie Mellon University

Abstract

Some people believe that software development projects are inherently unpredictable, but this confuses uncertainty with known ranges with true unknowns. True unpredictable behavior occurs when the development team lacks necessary capabilities, behaves inconsistently, or fails to apply necessary practices. At the Software Engineering Institute, we have studied the characteristics of many software development projects, both those that succeed and those that fail. Successful project teams approach software as an engineering discipline. They have well defined goals, apply good practices, plan their work accurately, estimate and track progress, revise the plan if changes are needed, manage stakeholders, and assign decision making authority at appropriate levels. They also make decisions using quantitative measurement, which is a true engineering practice. To achieve success, these disciplined behaviors are used by both senior management and everyone else in the organization.

Variance from plans is normal, but if not addressed, they cause software projects to exceed their budgets, waste resources, miss schedules or even result in cancellation. We must neither over react nor under react to the variation. Consistence and disciplined response requires objectivity. Objective evaluation requires measurement. But what measures can we use? We can approach this by forming questions that help us to identify what we really need to measure, then find measures.

- Are your software projects on schedule?
- Are the projects spending under or over budget?
- How complete is work at the end of sprints?
- Must add more sprints than originally planned?
- How much work is building products and how much work is applied to fixing bugs?
- When you need to accelerate a project, are you confident that skills and resources will be available when needed? Will your project be ready to use those resources when they are available?
- Are your customers satisfied with the product?

Quantitative measurement with clear goals is the key to this success. Quantitative measurement provides meaningful information about how a project is successful, where it fails, and how it can be improved. Quantitative feedback may apply to requirements, construction, process, design, schedule, or cost. Quantitative feedback guides learning and improvement. A person must have quantitative feedback to become an expert or achieve world class results. Projects need quantitative feedback to implement project management and control.

In this presentation, I will discuss how some highly successful projects have excelled by using a disciplined engineering approach supported by quantitative decision making – the next stage in the agile evolution.