



BEST PRACTICE

Implementing a Measurement Program

The key to a good measurement program is knowing what results are wanted, and what drives those results. Then metrics need to be developed to measure those results and drivers. This section explains how an effective measurement program is implemented.

The Need for Measurement

Current IT management is often ineffective because the IT function is extremely complex, and has few well-defined, reliable process or product measures to guide and evaluate results. Thus, accurate and effective estimating, planning, and control are nearly impossible to achieve. Projects are often characterized by:

- Schedule and cost estimates that are grossly inaccurate
- Poor quality software
- A productivity rate that is increasing more slowly than the demand for software
- Customer dissatisfaction

Addressing these problems requires more accurate schedule and cost estimates, better-quality products, and higher productivity that can be achieved through improved software management. Improvement of the management process depends upon improved ability to identify, measure, and control essential parameters of the IT processes. Measurement is an algorithm connecting the desired result (i.e., the effect wanted) with the contributors or causes that will enable that effect to be achieved. The results are what management wants, and the contributors are attributes of the processes that will be used to achieve those results. By measuring processes and products, information is obtained that helps control schedule, cost, quality, productivity, and customer satisfaction. Consistent measurements provide data for the following:

- Expressing requirements, objectives, and acceptance criteria in a quantitative manner
- Monitoring progress of a project and/or product
- Making trade offs in the allocation of resources
- Evaluating process and product quality
- Anticipating problems
- Predicting deadlines of current project
- Estimating future projects of a similar nature



Results indicate that implementation and application of a measurement program can help achieve better management results, both in the short run (for a given project) and in the long run (improving productivity on future projects).

Prerequisites

Implementing a measurement program requires four prerequisite steps:

1. Perceive the need for a measurement program and make a commitment to it.

- The lack of timely and usable quantitative information to solve major project problems becomes apparent at the senior management level. Seeing the need for better management information (as discussed in the prior section), the site manager, general manager, or division VP sponsors an organizational commitment to a measurement program. As a senior manager, the sponsor has the authority to ensure understanding at all levels in the organization.

2. Identify a champion and change agent, and assign organizational responsibility.

- A champion is an advocate for the program by virtue of his/her technical credibility and influence. Champions are managers at the senior, middle, program, or project level, and are assisted by a change agent.
- A change agent is a management leader empowered by the sponsor and champions to plan and implement the program. Change agents are most effective when they are members of working groups that will benefit from the measurement program. They have the operational knowledge needed to schedule, monitor, control, and report the accomplishments of the measurement program.
- The project or organization selected for the implementation of the measurement program should have the resources, authority, and responsibility to make the program happen. Unless a very limited program is contemplated, responsibility for implementing the program should not be given to a single individual.
- During this step, idea generators, idea exploiters, and information gatekeepers should be identified. Idea generators contribute new ideas about the measurement program. Idea exploiters implement the new ideas in the form of pragmatic programs. Information gatekeepers are experts in measurement, and can provide informed realities of it. These people implement the ideas to form a workable measurement program and ensure developers accept the program.



3. Establish tangible objectives and meaningful measurement program activities.

- The change agent guides the planning of the program, including the creation of program objectives and the design of program activities. The planning takes the sponsor's goals for more effective information and defines expected results, needed resources, tasks, and organizations responsible for implementing the program.

4. Facilitate management buy-in at all levels for the measurement program.

- The measurement program's sponsor must clearly inform all levels of management of his/her interest in the measurement program and motivate their cooperation. They need to know the implementation team's goals, responsibilities, authority, and interfaces with other organizations. Also important is to work with affected managers to obtain their buy-in, by tailoring the implementation so that most of their needs are met.

For each of the arguments against measurement that might be raised, there is a counter argument as to its importance.

- Measurement has a high cost; too much investment is required and the return is too low.
 - Actual experience with measurement suggests that recurring costs of 2 - 3% of direct project costs are adequate for data collection and analysis and for project tracking and monitoring. This small price buys real help in meeting project goals, and in increasing project control through better budgeting, problem anticipation, risk reduction, and incremental process improvement.
- All the data exists to support special studies for the senior management.
 - Data in many forms is typically scattered throughout an organization, but the data may not be organized, available, or accessible on a timely basis. All levels of management need measurement data in a meaningful form. Lower levels of management may need more detailed, quantitative technical information, but all levels need the information that the measurement function can provide.
- The ability to measure exists if and when it is needed.
 - Many organizations have the ability to measure their performance, but they only do it when a problem is apparent. At that point, appropriate information, if it exists at all, may not be available in time to solve the problem. System measurement, if practiced in a



- systematic manner, ensures that information is available at all times, for all projects, over all levels of management, when needed for problem solving and decision-making.
- Our estimates are based on standard industry methods, and our budgeting and planning is sufficient.
 - To be good enough, estimates, estimating algorithms, metrics, and experience data need to be tailored to an organization's unique environment and processes. Industry standard estimating algorithms, while useful, must have their parameter values calibrated to reflect the organization's unique environment; otherwise, they produce estimates that are not meaningful or reliable in that environment. Experience shows that controllability of system development projects decreases when budgets and the budgeting process bear little relation to the operating environment.
- If data is collected, the prime contractor may want to see it, take it away, or use it to harm your organization.
 - The customer has access to all customer contract data, and can require access to a central measurement database, including management data not collected as a part of the contract. The measurement database will contain information from past projects as well as ongoing projects. After a contract is satisfactorily completed, it is unlikely that the old data will be requested. Because this database will prove vital to the management of the business, it should be kept under a reasonable level of security.
- There is no use for a measurement program in the organization.
 - The bottom line is that if a business cannot be measured, it cannot be successfully managed for long without information. Reliable information about a business requires measurements.

References

Guide – CSTE Common Body Of Knowledge, V6.1 and CSQA Common Body Of Knowledge, V6.2