



What Makes Software Process Improvement Happen?



The Department of Defense spent an estimated \$35.7 billion on software in 1995 and it will spend \$20 billion annually on embedded software alone beginning in 2002 [1]. When software process improvement is applied to all software efforts, the savings could be \$5 billion per year or better. This is based on government and industry data collected over the past 10 years.

One example is the Software Engineering Division at Hill Air Force Base, Utah, which announced its Level 5 Capability Maturity Model (CMM®) achievement and reported a 35 percent cost savings in its software maintenance activities [2]. Industry and government sources have reported cost savings from 9 percent to 67 percent, reductions in software errors from 10 percent to 94 percent, and schedule compressions from 15 percent to 23 percent [3].

In addition to the primary benefits to process improvement there are significant secondary benefits. These include improved employee morale, less overtime, fewer crises, less absenteeism and less attrition. Less attrition can be a significant savings to software organizations that experience a 16 percent industry-wide turnover rate, according to Boeing Information Systems data. Organizations with well-developed processes show 3 percent attrition.

The business case for software process improvement is well established but how does it happen? It must begin with top management sponsoring the effort. This means a commitment of management time and corporate resources. A blessing by top management with a launch-and-forget mentality will fail. Process improvement requires the time and attention of senior leaders. They must attend the planning sessions, the report and review sessions, as well as the decision sessions.

They must approve the selection of the organization's best performers to conduct the improvement effort. The quality of the individuals selected to staff technical working groups is a demonstration of management's commitment to succeed by engaging those most likely to succeed. George Jackelen's article on page nine addresses some of the issues about getting started. Participation was slow initially. A common understanding of the project, the goals, and definitions were needed. It takes time to focus an organization on process improvement. There is a period of buy-in where employees test management's resolve. The question weighing on their minds is how serious is management. Is this just another quick fix, feel good activity that will pass in a few days or months?

In addition to sponsorship, the culture and capabilities of the organization need to be considered. Beginning on page four, Tim Kasse and Dr. Patricia McQuaid discuss many issues affecting process improvement. Does the organization have a history of resistance to change? Do they have qualified human resources? Process improvement is not a substitute for engineering capability. A Level 1 organization can at least deliver software; they are just inefficient at doing it. Teaching those who are software illiterate the virtues of CMM is entertaining but not productive.

There are cultural issues to change. Marriages between two cultures often fail. Neither partner has a basic understanding of the other's needs. Organizations develop a cultural pattern. They have their unwritten rules of order. When these rules are violated, change becomes difficult. When they are understood and applied, change flows more quickly and efficiently.

Progress toward a goal is best achieved when the goal is known and improvements are measured. A CMM-based Appraisal for Internal Process Improvement is an important milestone. A team of people composed from inside and outside the organization conducts this assessment. What an organization learns from this assessment will focus their efforts on what needs to be done.

Reuel S. Alder
Publisher

1. Sanders, Dr. Patricia. Improving Software Engineering Practice, *CROSS TALK*, January 1999, Vol. 12, No. 1.
2. Oldham, Leon, et al. Benefits Realized from Climbing the CMM Ladder, *CROSS TALK*, May 1999, Vol. 12, No. 5.
3. Griffin, Scott. Boeing's Continuous Improvement Journey, SEPG 2000.