Engineering for Production

Software architecture is gaining traction within the DoD acquisition community as a viable and necessary part of the acquisition and development process. Software product lines (SPLs), when integrated through a systematic approach, are the penultimate expression of sound software architectural technique. The ability to satisfy a wide array of needs with a single, configurable product is extremely powerful.

SPLs can save taxpayer money, quickly adopt next-generation technology, and turn a software support activity into its own program management entity. SPLs also have the ability to cross service and national borders, eliminate vendor-proprietary, stove-piped software solutions, and quickly adapt to new technology.

While some practitioners, developers, and managers see multiple benefits in this overarching approach, others may feel threatened. The basic question of how to retain technical and fiscal control of all aspects of their systems, while protecting the bottom line, is important. And can a project manager truly rely on this approach without threatening core capability or leaving their technology behind?

These concerns present us practitioners with many challenges. We must build trust with program managers, proving over and over that their needs take a back seat to no one, and their dollars are well and properly spent. We must demonstrate that their trust buys them more capabilities and higher quality than their original dollars could ever have afforded. We must develop incentive/reward approaches that encourage development and use of SPLs by developers, acquirers, and vendors. We must enable vendors to explore advanced development of implementations that propose and meet future needs, and empower them to participate in the maturation and expansion of the SPL's architecture and market.

The real issue is that every challenge must be met, and met concurrently. This means changing the acquisition culture so that SPLs and other software production efficiencies are the expectation, not the exception. In turn, the public gets the most for their hard-earned taxes, and the warfighter gets the highest quality, best of breed software capability possible.

No single one of these challenges is insurmountable. There are examples of SPLs having some success within the DoD, such as with the Tactical Control System, the Portable Flight Planning System, and the Joint Mission Planning System.

The articles in this issue of CROSSTALK address an innovative look at a wide spectrum of possibilities to consider when focusing on SPLs. In *Production Planning for a Software Product Line*, Dr. Gary J. Chastek, Linda M. Northrop, and Dr. John D. McGregor present a three-step approach to taking an organization from their SPL goals to a comprehensive production plan. To better understand what project managers might face when transitioning to an SPL approach, read Dr. Paul Jensen's article, *Experiences With Software Product Line Development*, on the experiences at Overwatch Systems during their move to an SPL. Dr. Christof Ebert's article, *Software Product Management*, outlines the role of a software product manager and provides software product management best practices that will help in attaining market success.

There are also examinations of other ways to improve software production and overall effectiveness. In *"Spending" Efficiency to Go Faster*, Dr. Alistair Cockburn shows how software development projects can improve total system results by reducing the impact of "bottlenecks." Through interviews with practitioners, Dr. Mahmood Niazi identifies the critical barriers that impede Software Process Improvement programs and provides guidelines to help avoid those barriers in his article, *Software Process Improvement Implementation: Avoiding Critical Barriers*. And if your software organization needs to change course, you'll want to read Esther Derby's article, *Three Encouraging Developments in Software Management*, which examines the benefits of evidence-based management, Lean principles, and Agile methods.

I know you will enjoy the valuable insights that this issue of CROSSTALK brings to the challenges and possibilities of transitioning to SPLs, as well as to other software practices.

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