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“Most of the effort in the software business goes into the maintenance of code that already exists.”

*–Wietse Venema,
Dutch programmer, physicist,
and author of the Postfix email system*



Operations and Maintenance. Welcome to the May/June 2017 edition of CrossTalk.

The development and procurement of new weapons, platforms, and capabilities is not the most expensive part of acquisition within the Department of Defense: it is the operations and maintenance of those systems and capabilities over their lifetimes. For the physical systems, those costs are fairly well known and predictable. For the software upon which the DoD depends, that picture is not as clear.

With the recent history of tight military budgets and an increasing pace of military operations, the DoD has had to re-allocate funding to maintain the operational pace of the War on Terror. Necessary expenditures and activities have been prioritized, with those of a lower priority being deferred in order to support the near-term mission. The effect of that in the long-term for the

DoD can be extrapolated from statements made recently by Vice Chief of Naval Operations Admiral William Moran on January 11th 2017 at the Surface Navy Symposium in Arlington, Virginia. At the event he said “Deferred maintenance is insidious, it takes a toll on the long-term readiness of the fleet...” “When the transition team came around to all of us in the building and asked us what we could do with more money right now, the answer was not to buy more ships. The answer was to make sure the 274 that we had were maintained and modernized to make 275 ships worth of combat power...”¹ This issue might be considered an inconvenience or even a hazardous condition in a fight where our forces hold an overwhelming advantage over the enemy. In the event of a conflict between peer-level nation states it could mean the difference between victory and defeat.

A similar influence has been seen in the operations and maintenance of DoD software. The high demand for new software capabilities to meet the challenges of the changing battle space environment has resulted in an informal reprioritization of software development activities. Efforts to remove known defects from fielded software systems are often given a low priority in order to get new capability to DoD forces quickly. The new capabilities being developed and fielded have been impacted as well; as software developers, in the name of speed, are often allowed to cut corners in software quality processes, documentation, and other activities that would make those systems more usable, reliable, and maintainable. In the near-term, the operators of DoD software systems rely on workarounds to mitigate the impact of non-critical defects, and DoD software maintainers are faced with code that is not well documented and which contains an unknown number of preventable defects. This might be an inconvenience today, but the effect on operations and maintenance in a peer-to-peer conflict could be serious.

In order to prepare for emerging threats, the DoD is facing an expensive and lengthy effort to correct the shortfalls in critical capabilities caused by years of shifting operations and maintenance priorities. The world of DoD software systems is facing a similar challenge. Fortunately, this edition of CrossTalk provides the reader with some tools to assist in identifying areas of risk, improving the ability to predict the cost and schedule impact of software development and maintenance, and in adopting processes that will deliver better engineered software.

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