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Acoustic Rapid COTS Insertion -- Case Study

Boudreau, Michael W.

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ACOUSTIC RAPID COTS INSERTION—CASE STUDY

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by

Michael W. Boudreau

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Acoustic Rapid COTS Insertion—Case Study

Presenter: Michael W. Boudreau, Colonel, US Army (Ret), has been a senior lecturer at the Naval Postgraduate School since 1995. While an active-duty Army Officer, he was the Project Manager, Family of Medium Tactical Vehicles, 1992-1995. He commanded the Materiel Support Center, Korea, 1989-1991, and the Detroit Arsenal Tank Plant, 1982-1984. COL Boudreau is a graduate of the Industrial College of the Armed Forces; Defense Systems Management College; Army Command and General Staff College; Long Armour-Infantry Course, Royal Armoured Corps Centre, United Kingdom; and Ordnance Officer Basic and Advanced courses. He holds Bachelor of Mechanical Engineering and Master of Business Administration degrees from Santa Clara University, California.

Abstract

In the mid-1990s, the submarine community recognized the impending loss of US technical superiority in submarine acoustics when foreign submarines began to exhibit major reduction in noise signature. This resulted in a critical need to improve acoustic sensing systems to better recognize foreign submarines. Although new capability was critically needed, required resources were not available to support the developmental effort. Critical need and the absence of sufficient funding constituted a *crisis*—demanding a revolutionary approach to achieve necessary technological improvement.

The approach came to be called A-RCI—Acoustic Rapid COTS Insertion, which might be characterized in the following manner. A-RCI used modular open-system architecture (MOSA). Hardware and software would progress on different paths and timelines. Key interfaces, standards, and protocols would be rigorously controlled as necessary to insure that different modules would work together. Commercial Off-the-shelf (COTS) purchases would be encouraged, and software reuse would be accomplished where feasible. Innovative solutions would be sought from a deliberately broadened array of participants, including defense contractors, Government labs, academia, and small business. Technical performance would be demonstrated by testing against known real-world performance standards. Technical decisions would be validated by peer review.

The A-RCI approach demanded a new way of doing business. Technical approaches must compete on a level playing field. Contractual mechanisms must be established to address not only competition, but also cooperation among winning competitors once the selections were made. Intellectual property rights and sharing of information must be carefully structured to achieve fairness as well as practicality. Rapid improvement must be brought to fielding via demanding schedules. The Navy's relationship with the prime contractor must change dramatically. The submarine user community must be intimately involved.

A-RCI took an integrated acoustic system that was difficult and time consuming to change and converted it into a federated system that could be upgraded in modules—"Plug and Play." Such an approach was common in the private sector in the 1990s and even before. Although the idea wasn't new, the application of this approach to a warfighting system was daunting. As a point of reference, in the mid-1990s, IBM was struggling with the similar arguments about changing the way they did business; that is, should IBM stick with mainframe computers running proprietary programs, or should the company pursue the integration of "best

of breed" software solutions that could interoperate with competitors' software and run on computers manufactured by competitors of IBM? Even today, there are arguments within DoD about whether federated systems are a sound approach.

Acoustic Rapids COTS Insertion progressed at a seemingly crushing pace, with software changes being implemented annually and hardware changes biannually. A-RCI was a "poster child" for evolutionary acquisition, because the endpoint of the effort was not clearly defined, even though there was a recognized need for improvement.

The results of A-RCI were astounding cost reduction, dramatic improvement in technical performance, successful use of COTS hardware in a critical warfighting application, logistics support improvements, and an acquisition model that might have broad applicability across the DoD.

Together with A-RCI's amazing results came a series of questions that must be considered. Was A-RCI a one-time success, providing a model that could not be re-applied because of structural impediments within DoD? Was A-RCI leadership a unique alignment of extraordinary people that brought about change, but is unlikely to be duplicated for future systems? Is DoD's acquisition culture so rigid that it will stifle and kill future similar efforts? Will cooperation among the user community support similar efforts in the future? Are there such operational demands on the user community that members cannot tolerate the tempo of change that delivers new software or hardware technology annually or bi-annually? Is modular open-systems architecture scaleable to large warfighting systems: fire control or command and control systems, for example?

This research will result in publication of a case study in late summer 2006.

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