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OPEN ARCHITECTURE TECHNOLOGY FOR PRODUCTIVITY AND LIFE CYCLE COST REDUCTION

The Consulting Network, Inc.'s open architecture framework and toolset allow technology insertion into current Navy systems, increasing the systems' life cycles and reducing costs related to the technology insertion process.

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THE CHALLENGE

Rapid changes in technology cause functional and economic obsolescence to Navy systems, leading to high life cycle costs. Technology insertion is a solution to increase the life cycle of Navy systems. Existing technology insertion efforts were focused on electronic systems, but did not address the entire electronic spectrum, nor mechanical or electro-mechanical systems. The Navy sought tools that addressed obsolescence in electronic, mechanical or electro-mechanical systems, in addition to tools that would help reduce costs related to the technology insertion process. The flexibility of open architecture framework can extend the life cycle of Navy systems, while reducing costs and aiding in technology insertion.

THE TECHNOLOGY

The Consulting Network, Inc. (TCNI) designed and developed an open architecture framework and tool set for specifying and implementing interoperability and portability in any Navy computing system. TCNI's open architecture framework and toolset allow technology insertion into current and next-generation Navy systems.

THE TRANSITION

TCNI was awarded an SBIR Phase I contract by Naval Supply Systems Command (NAVSUP) to develop a robust life cycle cost tracking system. This system allowed logistics personnel to better track the cost/benefit relationship for software and hardware systems. NAVSUP awarded a subsequent SBIR Phase II contract, in which TCNI's efforts were aimed at cost avoidance through obsolescence management. During the Phase I and II efforts, TCNI discovered that systems consistently developed with open architecture computing environments (OACE) had a longer life cycle because elements of OACE enabled systems could migrate to current technology and avoid obsolescence.

Based on this observation, TCNI proposed to investigate how the OACE approach was applied to submarines' acoustic rapid commercial-off-the-shelf (COTS) insertion program and the resulting sustained program success through an affordable technology refresh project. NAVSEA awarded an SBIR Phase III contract (N00024-08-C-6264) to TCNI to investigate and evaluate this OACE system and to develop an approach to integrate emerging OACE standards onto an already implemented open architecture submarine system. TCNI used the submarine process as a model for comparison and expansion of open architecture systems. A second SBIR Phase III contract (N0024-19-C-5228) was awarded to TCNI by NAVSEA for open architecture concepts. A follow-on contract was awarded by PEO Integrated Warfare Systems (IWS) through FY2028.

THE NAVAL BENEFIT

The application of open architecture framework to Navy systems offers benefits in addressing the challenges of implementing increasingly more complex systems. Open architecture framework promotes rapid innovation without imposing over-restrictive and technology-limiting specifications which can increase the cost of implementing changes to Navy computer systems. An open architecture framework extends the life cycle of a system, reducing overall costs of upgrading and maintaining the system.

THE FUTURE

As the Navy continues to migrate to open architecture framework for different systems, TCNI continues to provide system engineering, software architecture design, software engineering, prototyping, integration and test activities.