Terms of Reference
Software-Intensive Systems
NRAC Summer Study 2006

Objective

This study will examine how systems engineering, model driven architecture, and modular software specification and implementation methods can be applied in a realistic manner to specifying, bidding, and engineering of software-intensive systems, across multiple organizations. Beyond technical considerations, this study will investigate challenges with using and fielding computer-based acquisition tools in the context of existing Navy organizational structures, policies, and the overall workflow associated with the acquisition of new systems.

Background

There is a great opportunity to introduce efficiencies, transparencies, and tracking into the overall workflow involved in acquiring new systems and platforms by applying information technology and constructs from information technology in a beginning to end manner. Key S&T is required for understanding how to insert modeling, simulation, and computer-based representations into the design, construction, testing, and maintenance of software-intensive systems. Particular opportunities include the application of ideas developed in industry for the decomposition of software systems into interacting modules with clearly defined interfaces in a comprehensive manner, touching multiple points in the acquisition process.

The study will require the participation of experts with a detailed understanding of the Navy's software systems acquisition process as well as experts on systems engineering, modeling and simulation, and on principles of modular design. The study would build on the prior NRAC study on system modularity, but would direct a focus of attention on the technical and organizational challenges of acquisition.

Specific Taskings

- Review current relevant DoD programs (e.g. Navy Open Architecture, Single Integrated Air Picture, etc.).
- Review and assess current industry tools, practices and standards for developing complex system architectures (e.g. Modular Open Systems Architecture, Model Driven Architecture, etc.).
- Identify potential benefits to the Navy of shifting to evolving industry best practices.
- Recommend changes in Navy acquisition management, systems engineering, training, education, and business practices.
- Identify S&T investment paths.
- As appropriate, evaluate emerging tools for specifying, bidding, and engineering software-intensive systems and suggested strategies for use across multiple organizations.

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