

A Method for Organized Institutional Learning in the Navy Shipbuilding Community

by

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Abstract

The implementation of a Set-Based Design (SBD) process by the U.S. Navy's DDG(X) program was observed by the author beginning in June of 2020. Capturing knowledge and lessons learned is an important part of the SBD process. The adoption of SBD by the naval ship design community presents the Navy with an opportunity to implement a new system for capturing, storing, and providing access to institutional knowledge.

Literature reviews covering recent surface combatant programs and the progression of SBD were completed as background. The challenges faced by naval ship acquisition programs have been well documented but the transition from early-stage design, executed by Navy-led team, and detailed design and construction, executed by civilian shipbuilding teams, has repeatedly proven difficult to manage. Involving shipbuilders in the early stages of ship design is a common recommendation from past programs, but the government-shipbuilder relationship during early-stage design is hindered by the prospect of more future contract competition. Implementing a process for institutional learning will reduce the Navy's reliance on civilian contractors and shipbuilders by capturing the impacts that design choices have on future outcomes, including producibility.

Based on the system implemented by the DDG(X) team and inspired by the engineering checklists used by Toyota, a Navy Design Notebook System (NDNS) is proposed. The NDNS incorporates standard design documentation, lessons learned, and a networked storage system like the existing Integrated Design Environments (IDE) used by Navy programs. Guidance to support the implementation of the NDNS compatible design documentation system on a fictional ship design program, called Program(X), is presented. The role of NDNS system maintainers is defined and a format for capturing lessons learned throughout a ship's lifecycle is presented.

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