

Mobile Computing Design-Build Process

Status: Implemented

PROBLEM / OBJECTIVE

The VIRGINIA Class Submarine (VCS) Program uses work instructions and traditional engineering drawings to complete builds. These drawings can become very cumbersome, difficult to read and time-consuming to manage because VCS work instructions come with traditional engineering drawings that contain much more information than is needed for a particular work task. VCS legacy data does not contain the level of data attributes that are contained in COLUMBIA Class (CLB) Program product design. When VCS data is migrated/translated to NX, some of the VCS data may be lost.

Starting over two years ago, General Dynamics Electric Boat (GDEB) approached this issue by generating 2D Manufacturing Assembly Plans (MAPs) that acted as references to these drawings. The MAPs contained only the information needed to accomplish a particular task and were organized into a preferred build sequence with colored 3D graphics. It provided weld information, weld times, fitting aids and references. While effective, the process was very time-consuming. The purpose of this project was to develop a process and tool that automates the creation of MAPs. The tool would manage all VCS data and GDEB's Build Authority (BA) auto views and provide an electronically accessed drag and drop editor for trades.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The *Mobile Computing Design-Build Process* Project created tools and processes to enhance GDEB's lean work package, structural fabrication, and outfitting system. The team created a lean paperless work package, with graphics geared only to the work at hand, built from legacy VCS product model. Conversion of the legacy VCS design data allows for the creation of BA views and models. BA models provide graphical views that represent build (as opposed to design) geometry. These tools and processes support shift-level work instructions, delivered on a tablet in PDF form (including PDF + 3D JT), for the GDEB Quonset Point Facility using legacy VCS data. The Mobile Computing Project

How the ManTech Mobile Computing Design- Build Process project Enables the Lean Paperless, Tablet-Based, Work Package Process

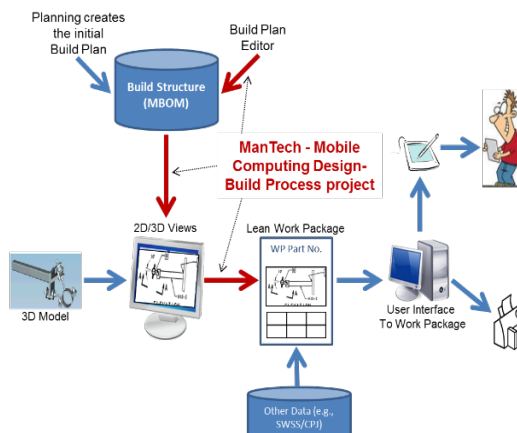


Diagram Courtesy of Electric Boat Corporation

focused primarily on work instructions for structural fabrication. However, the improvement outcomes are applicable to other disciplines.

Implementation and Technology Transfer:

The IT Department handled distribution as well as data integration with other GDEB data sources such as Artemis Project Management and TeamCenter Product Lifecycle Management Systems. Project implementation into a production environment started in the 3rd quarter of FY18 on SSN798.

Expected Benefits and Warfighter Impact:

The *Mobile Computing Design-Build Process* is revolutionizing the approach to shipbuilding and has generated additional innovative ideas. The team has demonstrated a 25% efficiency with the use of MAPs and is now able to produce 40% more MAPs annually. They have also demonstrated a 15% improvement in MAP Revisions. These production gains translate into a cost savings of \$367K per VCS hull and a 5-year savings of \$3.67M.

TIME LINE / MILESTONES

Start Date: February 2017
End Date: May 2019

FUNDING

Current Navy ManTech Investment: \$825K

PARTICIPANTS

Navy ManTech
General Dynamics Electric Boat
Naval Shipbuilding and Advanced Manufacturing Center