Navy ManTech Program

Naval Shipbuilding and Advanced Manufacturing (NSAM) Center of Excellence

Bobby Mashburn, Deputy Director

NSRP All Panel Meeting

28 March 2023

Background

Mission: Identify, develop and deploy advanced manufacturing technologies that reduce the cost, time to build/repair and/or increase performance of Navy platforms.

- ATI's Virtual COE Model: Deliver the best value to the Navy by:
  - *Employing our proven successful virtual center model*
  - Identifying, developing, and executing comprehensive research and development efforts to address critical needs in construction and repair of key U.S. Navy platforms
  - *Teaming with Navy OEMs, industry experts, and the best technology providers*
  - *Driving state of the art solutions from the best available sources to implementation on target platforms*

Relationships

Stakeholders

Platform OEMs

Technology Providers

NSAM Center Structure


Marty Ryan
Executive Director


Bobby Mashburn
Deputy Director


George Caramico
Technical Director


Melissa Frady
Business Manager


Skip Solis
Contracts Manager

Technical Consultants

Edison Welding Institute

Penn State University

Vicki Dlugokecki

Richard Storch

Barry Espeseth

Ken Brill

Lee Kvidahl

Resource Network

Platform OEMs

- FMM
- GDBIW
- GDEB
- HII-Ingalls
- HII-NNES
- Lockheed Martin

Industry Tech Providers

Universities


Scott Truitt
Project Manager


Sean McDowell
Project Manager


Dan Reed
Project Manager


Robert Conley
Project Manager


Tim Macon
Technical Support

5 Subcontract
Administrators


Chelsea Nugent
Project Manager


Steve Gaschler
Project Manager


Chance Roman
Project Manager


Dale Orren
Program Mgmt.


Nikki Crosby
Program Admin

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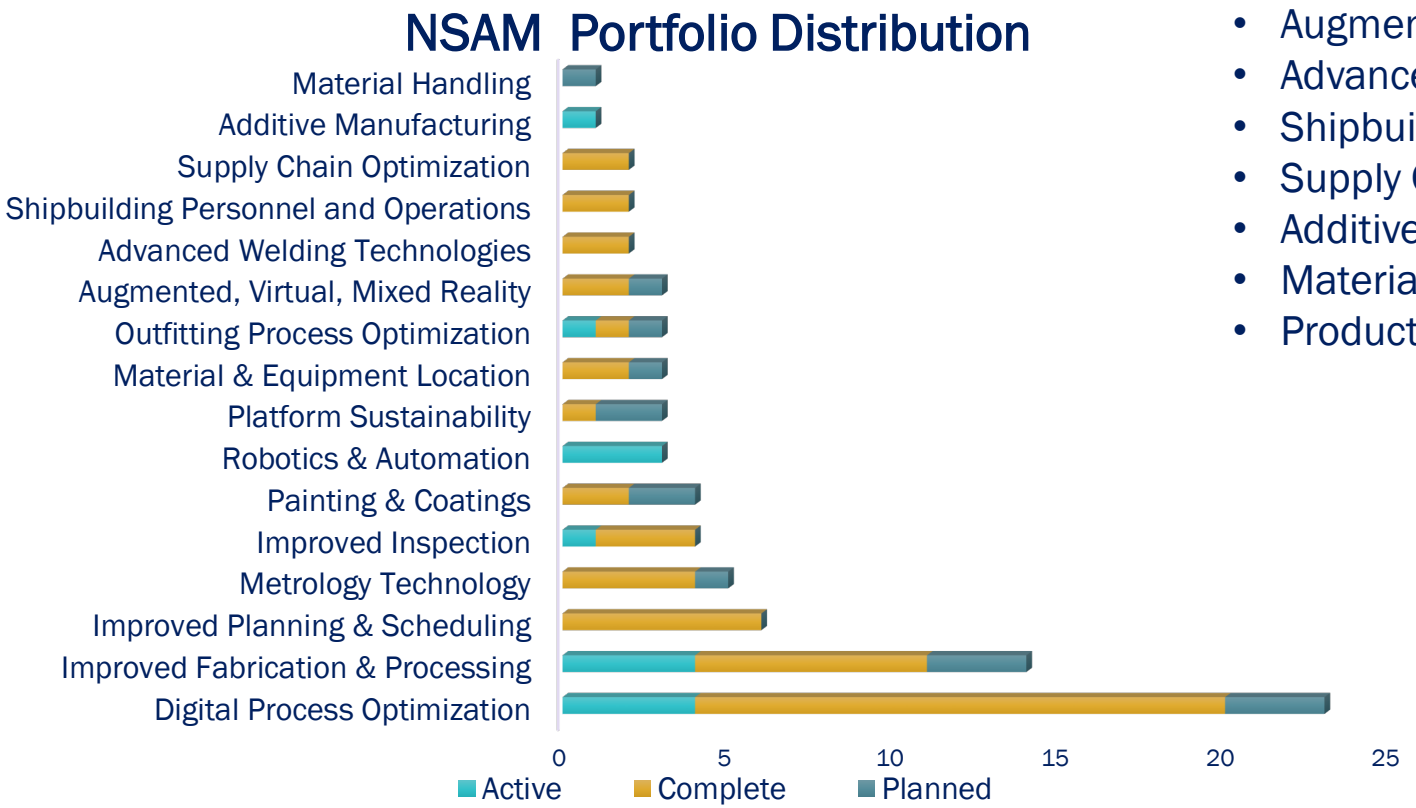
NSAM Technology Areas

Primary:

- Digital Manufacturing Process Optimization
- Improved Fabrication and Processing
- Improved Planning and Scheduling
- Improved Metrology and Inspection Technologies

Secondary:

- Painting & Coatings
- Robotics & Automation
- Platform Sustainability
- Material & Equipment Location
- Outfitting Process Optimization
- Augmented, Virtual, Mixed Reality
- Advanced Welding Technologies
- Shipbuilding Personnel and Operations
- Supply Chain Optimization
- Additive Manufacturing
- Material Handling
- Product and Platform Design



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Advanced Diagram Development and Management (S2802)

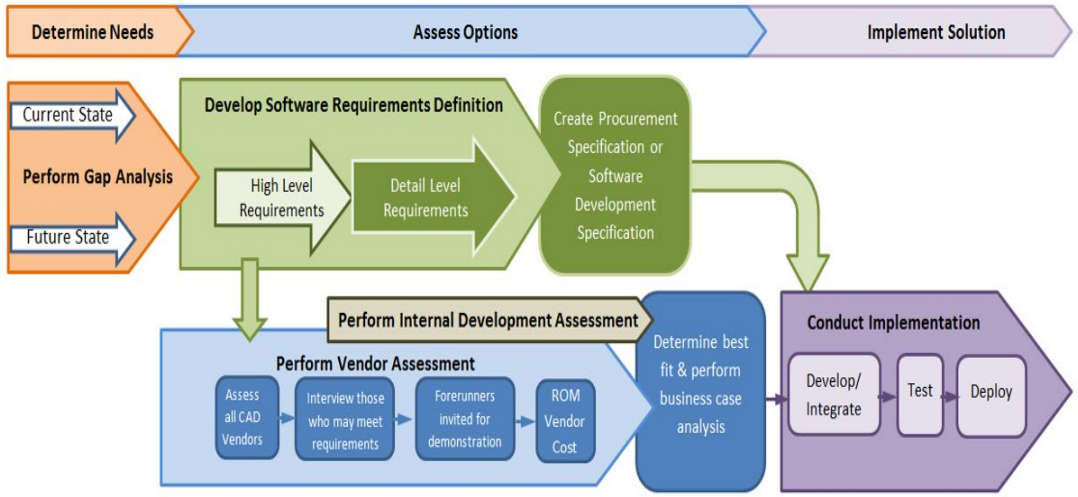
PEO	Shipyard Lead	Project Status	Cost Savings
Ships (PMS 400D)	General Dynamics Bath Iron Works	Complete	$5.5M 5-year 1.01 5-year ROI

Objective

- Development of a standardized and integrated data architecture to store drawing information
- Use developed architecture to create intelligent, linked, attributed, and standard products

Approach

- Current state / future state process analysis and roadmap
- Vendor assessment
- Develop data architecture and flow roadmap
- Define software architecture, tools and interfaces
- Develop software architecture, tools and interfaces
- Pilot integrated system architecture with back end interfaces



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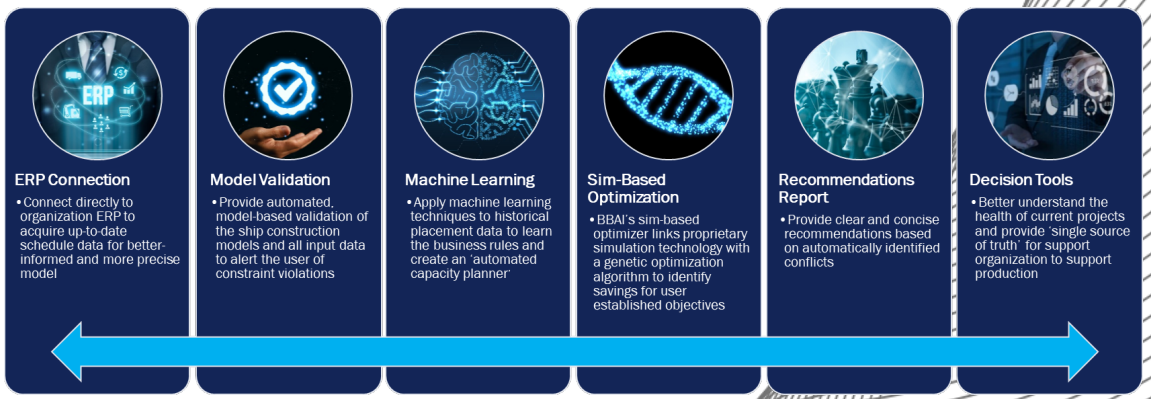
Machine Learning and Schedule Optimization (S2959)

PEO	Shipyard Lead	Project Status	Cost Savings
Ships, Carriers, & Subs (PMS 400D, 450/397, 379)	HII-Ingalls & HII NNS	Active	Estimated combined 5-year ROI of 5.0

Objective

- Enhance Shipyard AI product to incorporate Machine Learning (ML)
- Utilize ML techniques to 'learn' business rules based on historical data
- Identify common features & create classifications
- Make placement recommendations based on ship unit attributes



Approach

- Conduct Organizational Needs Workshops at NNS and Ingalls
- Gather Use Cases and Functional Requirements for NNS and Ingalls
- Incorporate Use Cases and Functional Requirements into System Design
- Develop Initial Proof of Concept and installed at both yards
- Conduct Initial Proof of Concept testing

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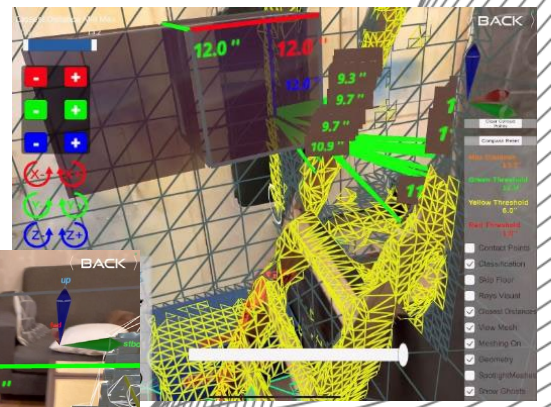
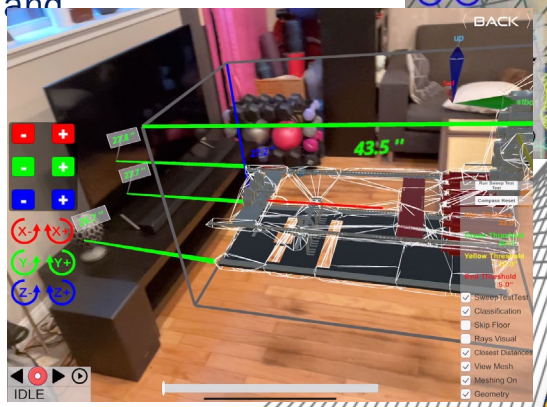
Virtual Load Out Interference Detection (S2899)

PEO	Shipyard Lead	Project Status	Cost Savings
Ships & Subs (PMS 400D& 450/397)	GDBIW & GDEB	Active	$3.8M 5-year 3.59 5-year ROI

Objective

- Develop a device with an augmented reality (AR) application that will identify interferences in the loadout path in real time, on the deck plates, prior to loadout for event planning.
  - Enable better loadout planning by utilizing as-built conditions of the components and the compartments
  - Allowing the user to move a virtual object through the loadout path
  - Aiding the user in identifying objects in way of the loadout





Approach

- Conduct current state process analysis
- Define project technical requirements
- Design solution system
- Develop prototype system
- Prototype System pilot and demonstration

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Visual Search Engine (S2889)

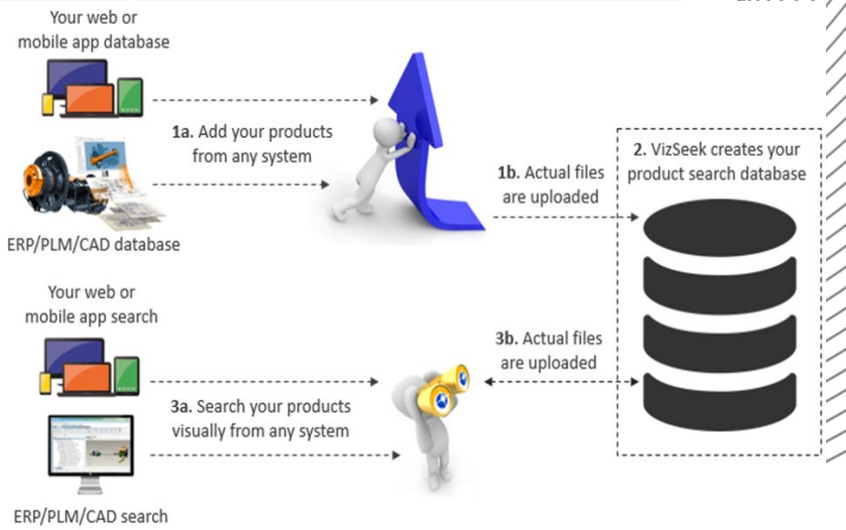
PEO	Shipyard Lead	Project Status	Cost Savings
Ships (PMS 400D)	HII-Ingalls	Complete	$7.6M 5-year 4.37 5-year ROI

Objective

- Adapt and develop software to index part data, not only at the meta data level but also, at the geometric level.
- Provide ability to search by geometric features as well as identify duplicate, or closely matched, parts across multiple platforms.
  - Reduce the amount of labor searching for parts
  - Reduce the amount of labor generating new part data
  - Reduce the amount of duplicated parts.

Approach

- Examine and document relevant current engineering parts search, supply chain, and logistics processes
- Document capability gaps; and perform a technology survey to identify candidate search technologies and vendors.
- A trade space analysis was conducted to establish a specific candidate technology for design and development
- Design and develop a prototype system
- Pilot the system to verify the system operates as expected under real-time operating conditions



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Digital Data for Next Generation Measurement / Locating Tools (S2699)

PEO	Shipyard Lead	Project Status	Cost Savings
Ships & Subs (PMS 400D & 450/397)	GDBIW & GDEB	Complete	5-year $12.85M 5.23 5-year ROI

Objective

- Improve the processes used to locate and install paint masking and hanger stud positions through:
  - Development of automatic queries of the CAD model and planning databases for location and work sequencing data needed to drive the projectors
  - Development of a mobile optical projection device (MOP) and supporting software to receive and process CAD and product data
  - Integration of paint masking data with the MOP
  - Integration of stud location data with the Total Station system

Approach

- Development of shipbuilder end use software that automatically queries the CAD model and planning databases for location and work sequencing data
- Design and prototype of a mobile optical projection (MOP) device and supporting software to receive and process CAD and related product data
- Integration of paint masking data with the mobile optical projection and stud location data with the Total Station system to validate the accuracy and repeatability of the improved process

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NSAM Project Focus

- Advance the state of the Model Based Enterprise in Navy platform manufacturing
- Implementing major innovations in manufacturing technology
- Automating labor intensive and critical processes
  - ➢ Improving safety, quality, and productivity
- Adapting new production methodologies to maintenance, repair, and overhaul needs
- Accelerate the capabilities of the Navy
  - ➢ Get new and better equipped ships in the water earlier
  - ➢ Support on-time delivery of sustainment activities

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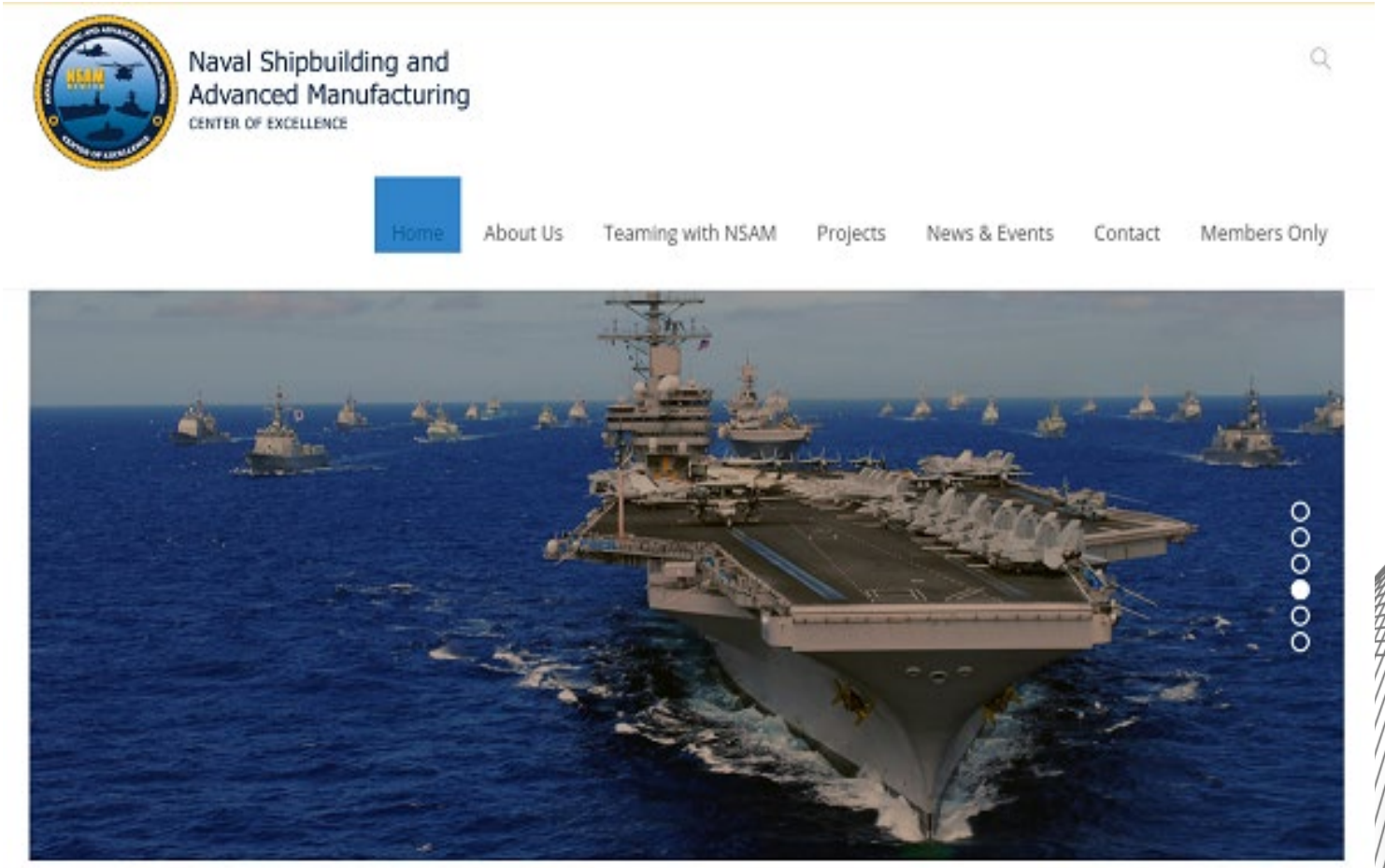

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