

# Beyond Transformation: The Navy's Digital Evolution through the Industrial-Based Cloud

PLM Road Map & PDT North America 2025

**PEO IWS**  
INTEGRATED WARFARE SYSTEMS  
EST. 2002

**MARITIME INDUSTRIAL BASE**  
**MIB**  
U.S. NAVY

**PROGRAM EXECUTIVE OFFICE**  
UNMANNED AVIATION & STRIKE WEAPONS

*"Sea Power to the Hands of Our Naval Force"*

## NAVSEA's DIGITAL EVOLUTION

*"Forged for the Sea"*

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**The "Push" to Digitally Evolve**  
Moving from Strategic to Tactical Implementation

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**2023 NSS:** Equip workforce with cutting edge technology and better integrate data and analytic tools to support decision-making.

**2022 NDS:** Enable more comprehensive, data driven assessment and reporting of readiness. Assess availability and demands against long-term force readiness, threats, missions, sustainability, recap and modernization.

**2022 NDBOP:** Enable root cause analysis to achieve the target. Ensure accurate, timely, and relevant performance and cost data for decision-making with skills and knowledge to analyze results.

**2019 DOD DMS:** Treat Data as a Strategic Asset. Develop data standards supporting interoperability. Deliver a DoD Enterprise Cloud Environment to leverage commercial innovation. Analyze data to generate insights, answer critical operational and business questions.

**2019 DOD DES:** Provide an enduring, authoritative source of truth. Formalize the development, integration, and use of models to inform enterprise and program decision making. Transform the workforce to support digital engineering across the lifecycle.

**2020 DOD Data Strategy:** Make Data VAULTIS = Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, Secure

**2023 DOD DA&AIAS:** Make rapid, well-informed decisions by expertly leveraging high-quality data, advanced analytics, and AI as part of a continuous, outcome-driven, and user-focused development, deployment, and feedback cycle.

**2020 DON DES:** Implement Digital Engineering for all new and legacy Naval programs as determined by the PEOs. Develop authoritative knowledge source to access models, data and strategies that support digital transformation.


**2023 DODI 5000.97:** Use digital engineering methodologies, technologies, and practices across the life cycle of defense acquisition programs, systems, and systems to support research, engineering, and management activities.

**2024 DON AdvMS:** Implement digital manufacturing practices to enable the adoption of advanced manufacturing technologies like Additive Manufacturing (AM), Robotics, and Digital Twins. Integrate shop floors to link qualified manufacturing designs with machinery, monitor equipment health, and enhance workflow connectivity

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## Industrial-Based Cloud


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## The Digital Evolution Application

Developing a Mission First Alignment Mindset

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	CNO's Seven Targets	PEO, MIB, NSWC Collaborative Operational Mission Alignment
 <p><b>CHIEF OF NAVAL OPERATIONS NAVIGATION PLAN FOR AMERICA'S WARFIGHTING NAVY 2024</b></p>	Ready the force by eliminating ship, submarine, and aircraft maintenance delays	<b>Strengthen and integrate engineering, logistics, technical, analytic and manufacturing to optimize Fleet, Joint, and combined operations.</b> Create Digital Twin - Thread - Twin connections optimizing CM, ECP to SCD, MRO & Advanced Manufacturing operations for rapid turnaround to the Fleet.
	Scale robotic and autonomous systems to integrate more platforms at speed	Move integration and testing <i>left</i> using state of the art techniques and tools, maximizing automation and testing in digital environments. Integrate PLM & MBSE to digitize design, improving CM of models, connected HW & SW. Rapidly develop digital approval of SETRs.
	Create the command centers our fleets need to win on a distributed battlefield	<b>Treat Data as a strategic and tactical product.</b> Leverage authoritative data to master business and acquisition processes across the Naval Enterprise. Create and maintain information and decision superiority.
	Recruit and retain the force we need to get more players on the field	Develop a <b>digital ecosystem</b> with warfighter in mind. Develop a digital doctrine with standards, operations, tactics, techniques, capabilities and command and control architecture.
	Train for combat as we plan to fight, in the real world and virtually	<b>Move at the speed of data to learn from observations in the digital and real-world ecosystems. Innovate</b> to defeat threats before we are on the battlefield. Experiment, demonstrate, and rapidly deliver capability to fill gaps in our Fleet. <b>Build once, deploy many</b> - scalable to meet different analytic, modeling and simulation needs.
	Restore the critical infrastructure that sustains and projects the fight from shore	<b>Apply agile principles to hardware and software to enable faster, more reliable upgrades in collaboration with training, safety, and tactics communities.</b> Build tight, positive relationships with internal and external stakeholders to share common sight pictures and build trust.
	Deliver a quality of service commensurate with the sacrifices of our Sailors	<b>Its all about People!</b> The technology and processes exist, our Sailors are tech-savvy. The best investment is in their development. <b>Training, Training, Training!</b>



## The Problem Statement

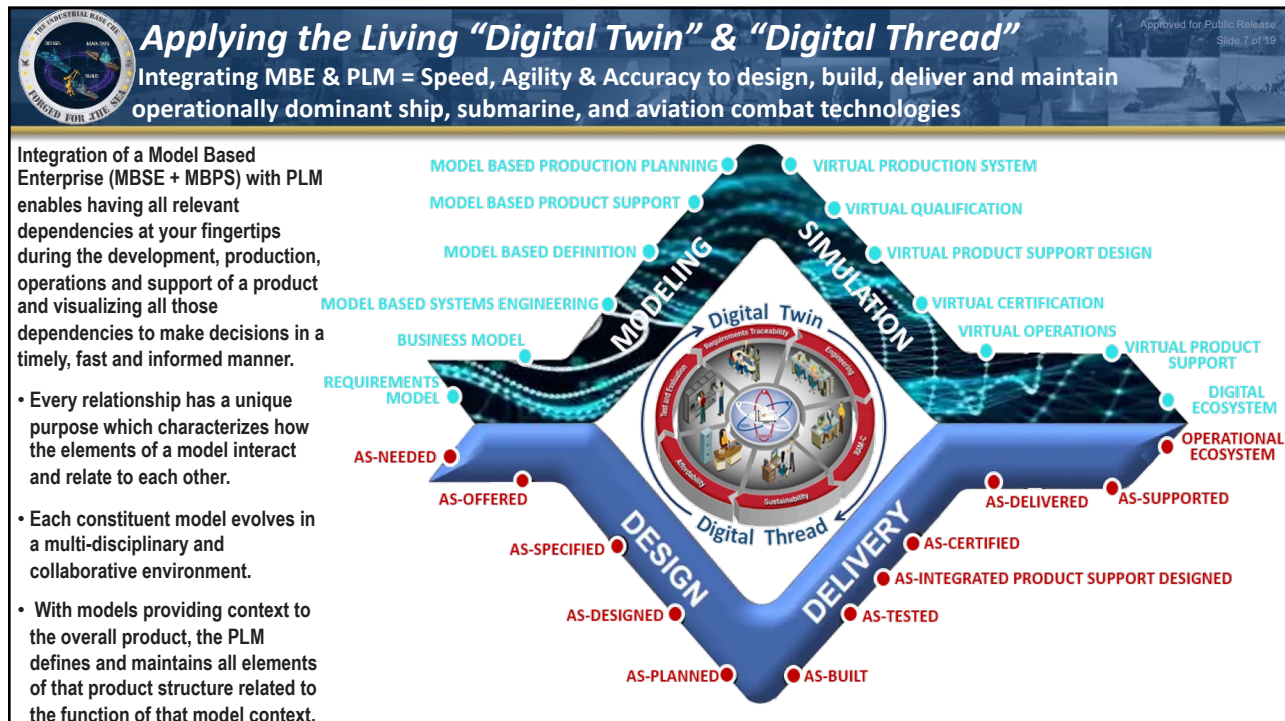
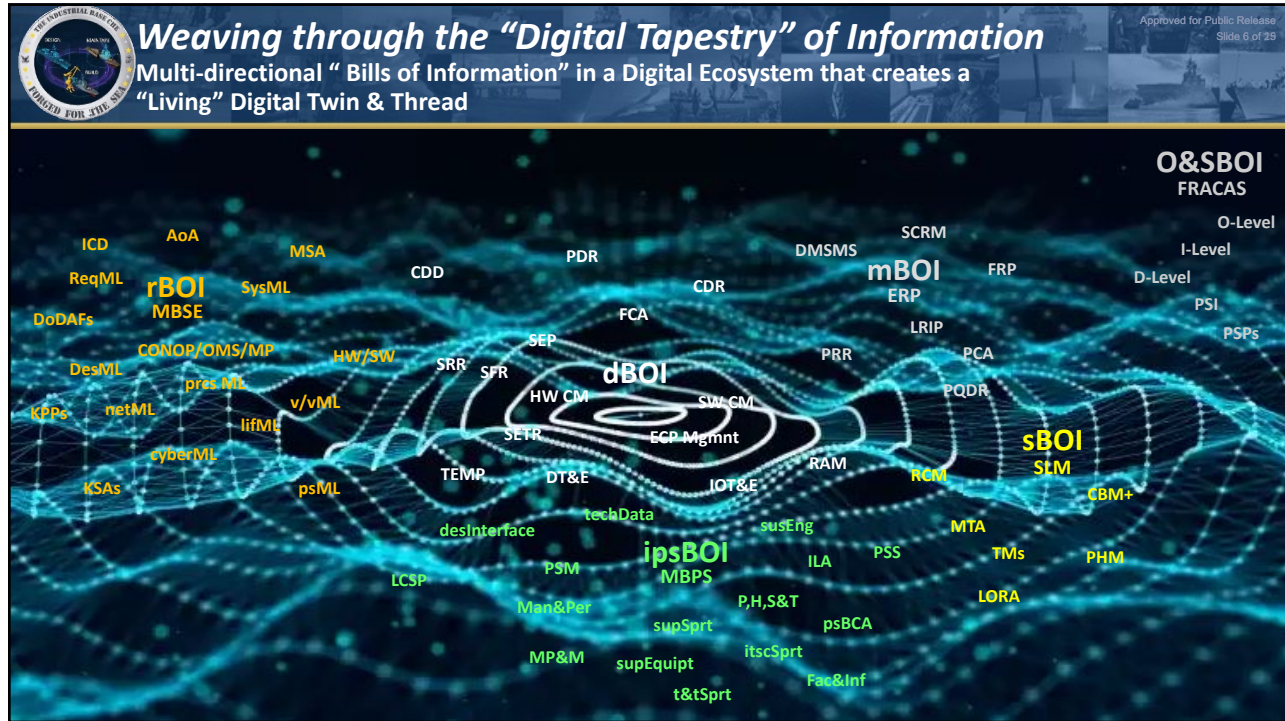
Getting to the Root Causes Impacting Today & Tomorrow's Navy

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<p><b>DefenseNews</b> April 2024</p> <p><b>SECNAV 'flooded' by Pacific Ally's Shipbuilding Abilities Amid American Warship Production Woes</b></p>	<p><b>Highlights:</b> SEC NAV Del Toro's Visit of South Korea's shipbuilding</p> <ul style="list-style-type: none"> <li>"...we were <b>flooded at the level of digitization</b> and real-time monitoring of shipbuilding progress, with readily available information down to individual pieces of stock materials."</li> <li>"What science and technology innovations can we bring to the table that perhaps aren't being used here in the United States, that are being used elsewhere with our partners, for example, to <b>help digitize our public shipyards.</b>"</li> </ul>
<p><b>GAO</b> May 2024</p> <p><b>NAVY FRIGATE</b></p> <p>Unstable Design Has Stalled Construction and Compromised Delivery Schedules</p>	<p><b>Highlights:</b> Construction started in AUG 2022; first ship to be delivered APR 2026 slipped to 2029.</p> <ul style="list-style-type: none"> <li>The frigate is using many mission systems already proven on Navy ships. The Navy leveraged an existing ship design to reduce technical risk and deliver frigates sooner.</li> <li>The program office tracks and reports design progress, but its design stability metric hinges largely on the <b>quantity</b>—rather than <b>quality</b>—of <b>completed design documents.</b></li> <li>The program's <b>functional design and 3D model remained incomplete leading to a negative cascading effect</b> on other design activities, including 3D modeling, detail design, and development of work instructions needed to build the ship.</li> <li><b>Lack of completing critical, open design documents</b> is not due to added design scope but on <b>finalizing key design details, which are required</b> for shipbuilder to complete the ship's 3D model, from which the shipbuilder develops the detail design for individual grand modules.</li> </ul>
<p><b>GAO</b> September 2024</p> <p><b>NAVY READINESS</b></p> <p>Actions Needed to Improve Support for Sailor-Led Maintenance</p>	<p><b>Selected Quotes from Ship Officers and Crew</b></p> <ul style="list-style-type: none"> <li>"<b>Ship configuration is so different from one ship to another</b> of the same type and we are expecting a 19-year young adult to know what alterations the ship has received"</li> <li>"Sailors have to work with <b>several separate computer programs with zero integration - each maintaining a unique and un-linked database...</b>"</li> <li>"Each time a ship comes out of intermediate- or depot-level maintenance, they are forced to play catch up in corrective maintenance which when <b>compounded with the lack of new system technical documentation, reduces readiness for critical systems.</b>"</li> <li>"The two largest barriers to effective shipboard maintenance are: <b>a) Inefficient and ineffective maintenance management tools and b) poor parts availability complicated by a labyrinthine logistics support system.</b>"</li> </ul>
<p><b>GAO</b> November 2024</p> <p><b>AMPHIBIOUS WARFARE FLEET</b></p> <p>Navy Needs to Complete Key Efforts to Better Ensure Ships Are Available for Marines</p>	<p><b>Highlights:</b> 16 of the Navy's 32 amphibious warfare ships are in unsatisfactory condition impacting its ability to align amphibious ship schedules with the Marine Corps units that deploy on them</p> <ul style="list-style-type: none"> <li>GAO identified factors that contributed to the fleet's poor condition and reduced its availability for Marine Corps' operations and training due to challenges with spare parts, reliability of ship systems, parts obsolescence and supply, poor equipment design.</li> <li>Navy should make long-term improvements:             <ol style="list-style-type: none"> <li><b>sparring and orphaned parts</b>—managing supply for spare and orphaned parts;</li> <li><b>configuration management</b>—keeping consistency of parts and systems across ships and better documenting changes;</li> </ol> </li> </ul>

# Beyond Transformation: The Navy's Digital Evolution through the Industrial-Based Cloud

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# Beyond Transformation: The Navy's Digital Evolution through the Industrial-Based Cloud

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**Forging NAVSEA's Digital Evolution**  
Through the Industrial Base Cloud Hosting Environment (IB CHE)

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### The IB CHE is a strategic approach across the process and technology continuum

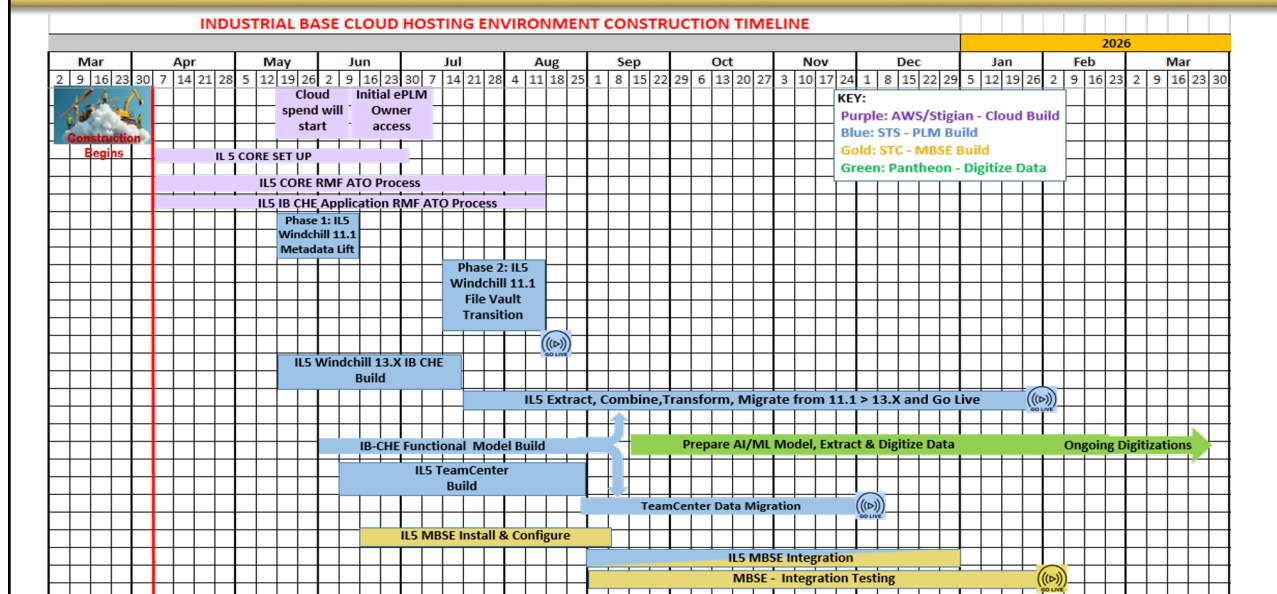
#### The IB CHE:

- Is a collaboration between the Maritime Industrial Base (MIB) Direct Reporting Program Office (DRPM), Program Executive Office Integrated Warfare Systems (PEO IWS), PEO Unmanned & Weapons (PEO U&W), and Naval Sea Systems Command.
- Will not taking years to develop or deploy as it goes to production by this year
- Will be enabled with both Unclassified and Classified capabilities
- Consists of leading edge commercial technologies that will be utilized as out of the box solutions which maintains low cost to build, operate and sustain, modernize and innovate- NO CUSTOMIZING
- It will span several crosscutting technologies with significant implications and applications for Naval Warfare and its Industrial Base, including Additive Manufacturing (AM) or 3-Dimensional Printing, Subtractive Manufacturing (i.e. Computer Numerical Control, CNC); Artificial Intelligence/Machine Learning (AI/ML) that supports Robotics and Automation, Advanced Machining, advanced analysis, modeling and simulation, from requirements throughout acquisition, manufacturing, operations, supply, maintenance, repair and overhaul, sensing, measurement, and digitalization and connectivity
- It will utilize AI/ML capabilities to transition NAVSEA from "Analog to Digital" to power the mission impact of our workforce



**Forging NAVSEA's IB CHE: Getting it Done in '25**  
It is a critical need if the DON is to meet mission-first alignment, consolidate functions, flatten hierarchies, develop speed over process towards digital-first operations.

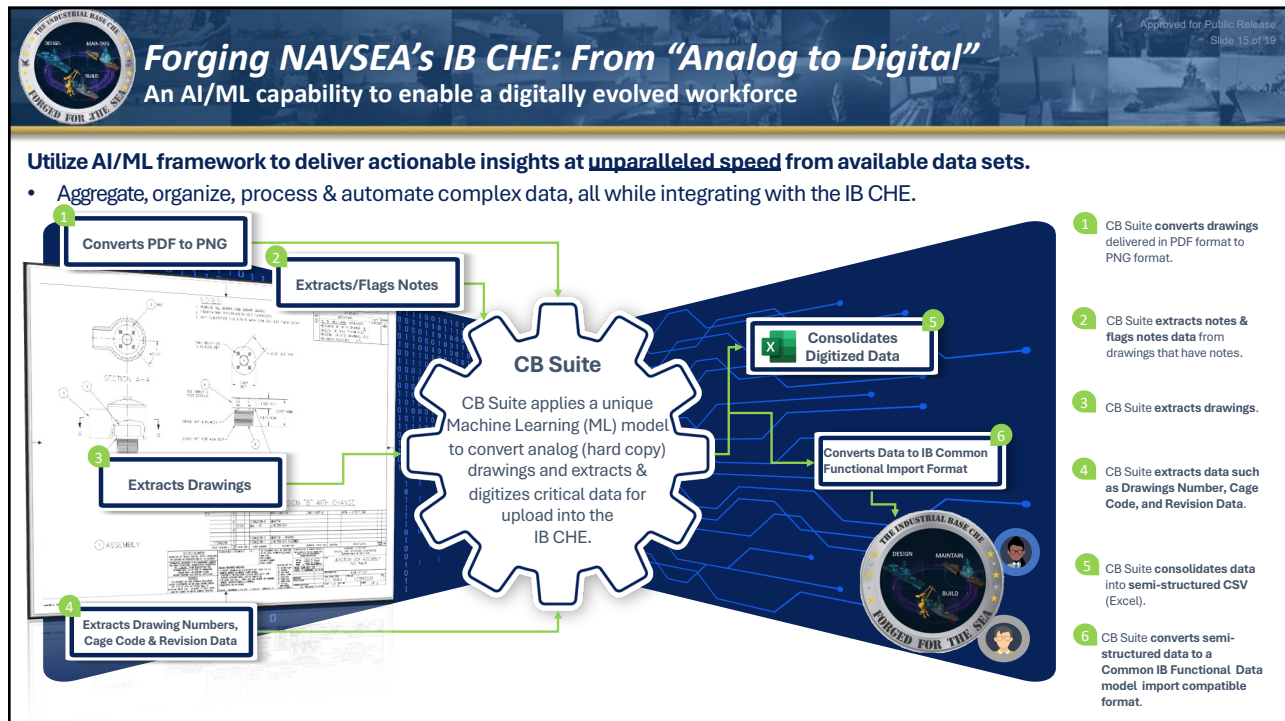
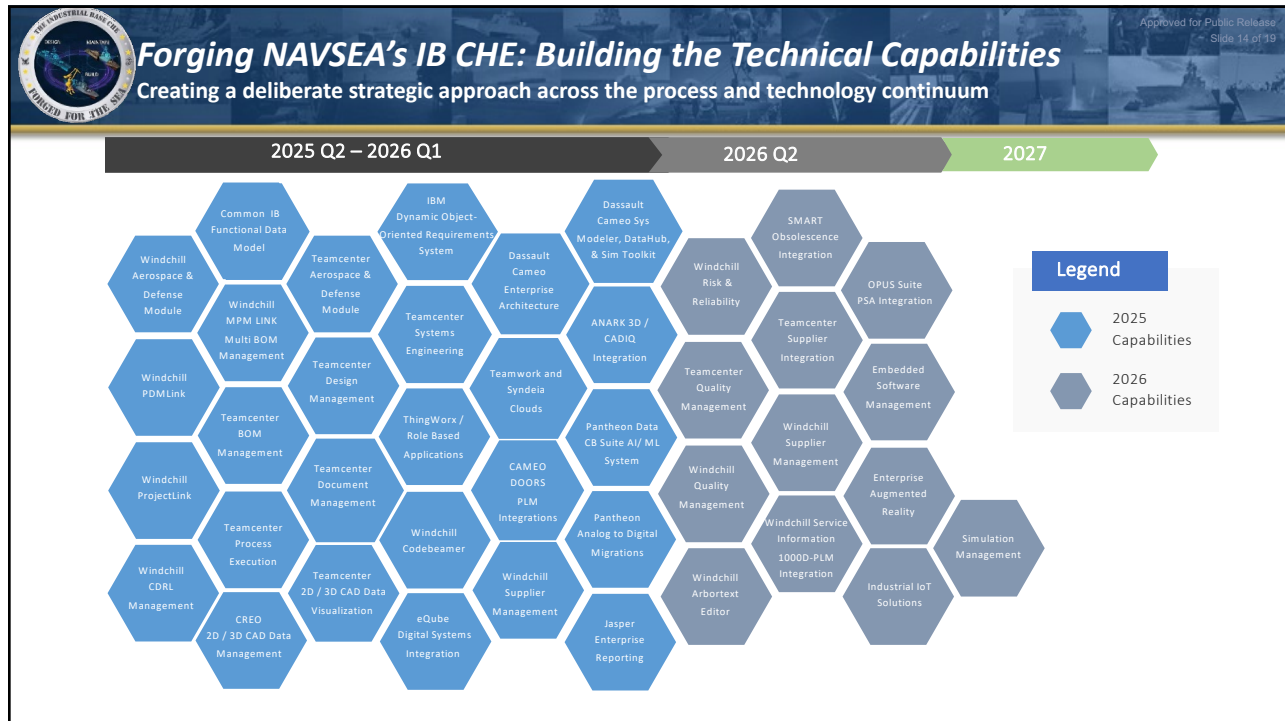
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### The IB CHE: A Coalition of the Willing

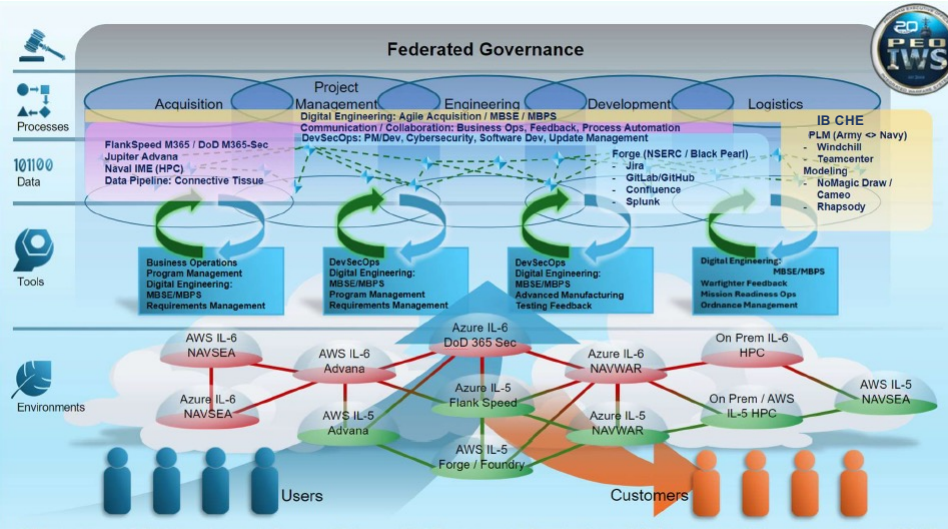
Alignment of the Partners: PEO IWS Digital Ecosystem

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#### PEO IWS Priorities

1. Readiness, Robust Product Support and Cyber-Resiliency are built into EVERYTHING we do.
2. Advancement of the IWS Digital Strategy for efficiency and effectiveness
3. Evolution of the IWS organization to optimize development of the common ICS
4. Delivery of lethality and capability at the speed of relevance.
5. Our systems are designed for FMS opportunities to expand our battle force



Distribution Statement D. Distribution authorized to the Department of Defense and U.S. DoD contractors only Information 1 October 2024. Other requests for this document must be referred to PEO IWS.



### The IB CHE: A Coalition of the Willing

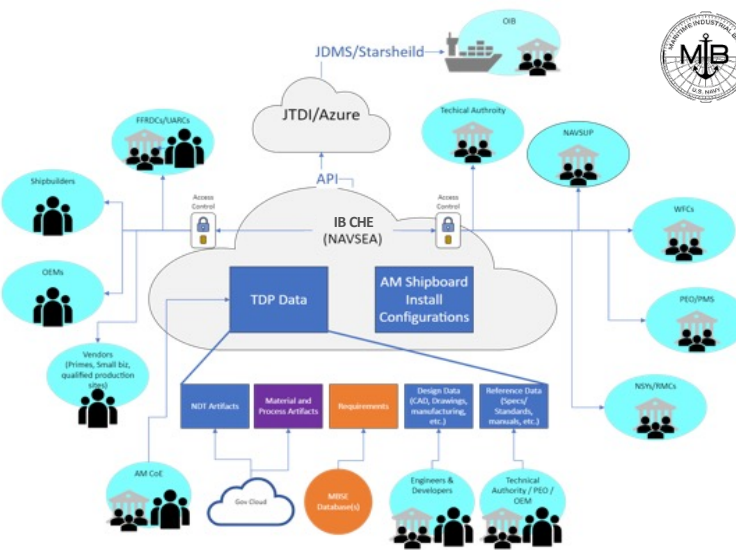
Alignment of the Partners: Maritime Industrial Base Digital Ecosystem

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#### Maritime Industrial Base (MIB) Advanced Manufacturing (AdvM) Digital LOEs:

1. Developing a data ontology for AdvM would allow us to integrate more data sources together to make data Accessible, Understandable, Linked, and Interoperable
2. Establishing IB CHE as our digital source of truth for our technical data is how we plan to make our data Visible, Accessible, Linked, Trustworthy, and Secure.
3. Establishing the digital ecosystem and relevant business rules to meet stakeholders needs, making data and the data bases Visible, Accessible, and Linked.
4. Technical Data Management
  - a. IB CHE MVP – ECD Apr 2025
  - b. TDP Development Process – ECD Jan 2025
  - c. ECP Process Digitalization – ECD Based on IB CHE
  - d. IB CHE APIs – ECD Based on IB CHE



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### ONE COLLABORATIVE MISSION

To Design, Build & Maintain

								
To develop, deliver and sustain operationally dominant combat systems to Sailors	Design, build, deliver and sustain the Navy's unmanned aircraft, weapons, targets, aircrew systems and common support equipment.	To modernize and strengthen U.S. shipbuilding, ensuring the capability and capacity to construct and sustain the fleet our nation needs.	Design, acquire, modernize, and support the current and future Surface Fleet for the United States Navy from cradle to grave.	Keep America's Navy #1 in the world by developing, acquiring, modernizing, and maintaining the world's best Submarines and Undersea Systems.	Deliver Aircraft Carriers On Time, Ready for Tasking, at an Affordable Cost Deliver operationally effective, suitable, safe, and sustainable capabilities to the warfighter in a timely manner. Enhance and sustain our delivered capabilities both directly and indirectly.	Provide full life cycle support of naval aviation aircraft, weapons and systems operated by Sailors and Marines through research, design, development and systems engineering; acquisition; test and evaluation; repair and modification; and in-service engineering and logistics support.	Provide fleet capability and capacity, supporting development and sustainment of Navy and Marine Corps helicopters, special mission aircraft and aviation anti-submarine warfare equipment and aircraft.	Deliver, acquire field and support C4I threat-based C4I capabilities to enable the fleet to compete, deter and win – tonight.

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### Success of a Digitally Evolved Team

Early Adopters improving Acquisition & Operational Readiness

**Assistant Secretary of the Navy (ASN (RD&A)) report to Congress recognized AN/SPY-6 (V) Family of Radars (FoR) as one of the top 5 highest performing and successful ACAT 1 Programs**

*"ePLM is just one of the many tools and people that pushed SPY-6 to the spotlight! ePLM helped ensure that all stakeholders had access to the same information, reducing errors and miscommunication. Provided a platform to help track changes to configuration, keeping the team in lock step. Overall ePLM aided the team in managing the complexities of SPY-6 FoR thus allowing the team to make informed, timely decisions."*

– Craig Yates, PEO IWS 2.0 2L PS PAMP

➤ ePLM IDE enables the AN/SPY-6 to build and deliver accurate Design Configurations that are used for direct import to analytic decision making applications enabling:

- ✓ Creation of Provisioning, FRACAS, and reliability configurations linked to Engineering Design that build an 80% solution used in Product Support Analyses, requiring only supply chain and deployment information to complete the model
- ✓ Frequent and proactive DMSMS assessments and Obsolescence Mitigation during design and sustainment
- ✓ Rapid development of complete bidder's libraries to enable future procurements
- ✓ Single source of TDP to enable Depot Standup





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 **QUESTIONS** Approved for Public Release  
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AMERICA'S  
**NAVY**  
FORGED BY THE SEA