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DEPARTMENT OF THE NAVY

STRATEGY TO WEAPONIZE DATA AND AI

Expediting Adaptation and Delivery of Data-Driven Effects



FOREWORD

FROM THE

SECRETARY OF THE NAVY

The Department of the Navy's (DON) renewed focus on warfighting coincides with one of the most demanding periods of maritime operations in recent history. Our naval forces have defeated hundreds of drones, cruise missiles, and ballistic missiles from Iran and its proxies. Our actions in this region highlight the readiness and resolve of our warfighters navigating the most compressed period of active learning and adaptation for combat operations at sea in recent memory.

This strategy sets the conditions to equip and empower all DON missions with the data and artificial intelligence (AI) capabilities necessary to rapidly learn and adapt to fight better tomorrow. It is our blueprint for becoming an "AI-first" maritime force, where speed is the decisive variable in maintaining dominance. Similar to traditional assets such as personnel, weapons systems, and munitions, our data and AI must be deliberately integrated and employed across the fabric of operations to realize the exponential warfighting advantage of the digital age.

Weaponizing data and AI, in this context, is about purposely applying these technologies to produce, improve, and accelerate data-driven advantages that dramatically improve warfighting effects, optimize our essential business operations, and protect our competitive edge as the world's dominant maritime force. Employing our digital adaptation framework, the Bits2Effects Cycle, to weaponize data and AI will enhance our capabilities, tactics, decisions, and training to greatly improve our lethality and warfighting effectiveness. Access to modern technology alone is insufficient to produce these outcomes; we will advance the policies, doctrine, culture, processes, training, and partnerships that foster innovation and experimentation, focus investments in areas that measurably enhance warfighting outcomes, and help our workforce develop the skills and adaptive mindset essential for tomorrow's conflicts.

This strategy's six goals and supporting objectives advance the Department of War Artificial Intelligence Strategy and provide a unified framework for delivering data-driven and AI-enabled effects across the DON. The Office of DON Chief Information Officer (CIO), led by the Chief Data and AI Officer (CDAO), will work with the data and AI senior leaders of the Navy and Marine Corps to implement an integrated plan that removes duplication and supports a fully aligned Department-wide implementation roadmap. This roadmap will serve as an integrating force, driving accountability, collaboration and resourcing across our execution centers. We will work closely with other military services, federal agencies, academia, allies, partners, and industry to advance common objectives and seamlessly integrate naval innovations into joint operations.

Every part of the DON can weaponize data and AI for advantage. We must seize this opportunity to change our ways of working, transform our culture, optimize our technology ecosystem and ultimately equip and empower naval innovators to harness these transformative technologies to protect our maritime dominance now and into the future.

SIGNED: Hung Cao, Acting Secretary of the Navy

A rectangular box containing a handwritten signature in black ink. The signature is cursive and appears to read "Hung Cao". The box is white with a thin black border and is centered horizontally on the page.

INTRODUCTION

Organizations trained merely to field static capabilities face significant disadvantages against those that are structured to continuously learn and adapt. This strategy provides an overarching vision and an execution framework for the DON to weaponize data and AI and thereby expedite learning and adaptation and maximize warfighter effectiveness at scale.¹

PROBLEM STATEMENT

Battlefield commanders – both friendly and enemy – face an urgent but daunting digital learning dilemma: how to convert the vast swaths of new data from diverse systems into mission-relevant actionable information?

Current conflicts reveal how adaptive militaries quickly respond to rapidly changing conditions, while those failing to adapt quickly see their weapons literally fall out of the sky. Organizations that merely field static capabilities face significant disadvantage against those structured to continuously adapt from automatically collected data, particularly in protracted conflicts with multiple adaptation cycles.

The DON's hundreds of data, analytics, and AI projects illustrate how the Department is already leveraging technology to increase lethality and accelerate mission outcomes.² Responsibly scaling these successes is our greatest opportunity to expedite adaptation and effectively compete with adaptive adversaries.

¹ **Weaponizing data** means the deliberate transformation of raw, multi-source information into immediate, leverageable effects, while **Weaponizing AI** means operationally employing artificial intelligence models to sense, decide, and act and continuously learn from feedback to produce effects across all domains.

² DON Analytics and AI Inventory, snapshot as of May 2025

ACCELERATING DATA-DRIVEN EFFECTS

The Observe, Orient, Decide, Act (OODA) loop framework has long been used to outmaneuver adversaries in human time scales. When that loop slows or fails to produce the right operational decisions, lethality suffers. Building on this concept, the DON will integrate data and AI for mission impact through a five-step digital adaptation framework: the Bits2Effects Cycle. This cycle measures the time from data creation (bits) to delivery of data-driven effects, representing our time to learn and adapt during competition and war. Over a protracted conflict with more learning cycles, the force that learns and adapts faster will dominate its enemy.

Priority Types of Data-Driven Effects

Calibrating Operational Systems. Adapting hardware, software, and system functionalities and updating software directly from telemetry insights.³

Tailoring Operational Tactics. Changing how we employ assets by refining tactics, techniques, and procedures through mechanisms like controlled experimentation and machine learning (ML).

Automating Decision Advantage. Integrating data into strategic and operational cycles including indicators and warnings and optimizing path planning.

Adapting Training and Readiness. Utilizing real-world data from operations and exercises to refine training programs and practice adapting on a “night after” timeframe.

Emergent Capability Development. By collecting, fusing, and leveraging software and AI, novel capabilities may emerge during competition and war that were not anticipated or planned.

³ Telemetry data refers to data that is automatically collected and transmitted from remote sources (e.g., sensors, radars, systems, and networks) to processing centers for monitoring and adaptation. Applications of telemetry data are prevalent across a variety of industries and use cases, such as the use of mechanical sensors to predict preventative maintenance actions, the use of radar to detect and track targets and potential threats, and the use of system logs and clickstream data to understand user behaviors and improve user experience.

THE BITS2EFFECTS CYCLE

The Bits2Effects Cycle uses a key measure — Mean Time to Effect (MTTE). If our MTTE is faster than our adversaries', we adapt to them faster than they can adapt to us. MTTE will serve as the DON's master metric for digital adaptation.

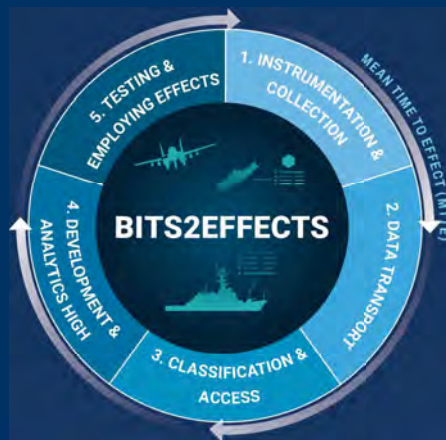


Figure 1:
The Bits2Effects Cycle is the DON's digital adaptation framework for integrating data and AI for mission impact.

The cycle flows through five sequential stages:

Instrumentation and Collection – automatically capturing data from sensors, weapons systems, and platforms rather than discarding it.

Data Transport – transporting data to processing environments, particularly from deployed platforms in communications-degraded environments.

Classification & Access – increasingly automating security markings and access controls that enable rather than prevent data use.

Development and Analytics – providing AI and ML tools, computing infrastructure, and trained personnel to transform data into capabilities; and

Testing and Employing Effects – delivering data-driven effects to the warfighter and feeding resulting data and learnings back into the cycle.

Each stage depends on the preceding stage — a bottleneck at any point blocks the entire pipeline. The framework's value is diagnostic: by measuring performance at each stage, leaders identify the specific constraint limiting adaptation speed and/or capability development.

VISION

The DON is a data-ready and AI-enabled organization that is equipped and empowered to weaponize data and AI for mission impact.

GOALS AND OBJECTIVES

Following explicit direction from the Secretary of War that “speed wins,” the DON is already moving out to integrate data and AI into its operations.

The following goals and objectives serve as foundational targets to direct the advancement of the DON’s Data and AI vision and optimize the Naval Information Environment to meet the continuously evolving demands of the warfighter.

The Office of the DON CIO, led by the CDAO, will integrate Service level implementation plans based on these goals and objectives to develop and maintain a Department wide data and AI roadmap. This roadmap will serve as an integrating force to drive transparency, accountability, collaboration, and resourcing across the DON and ensure enterprise alignment with America’s AI Action Plan and the Artificial Intelligence Strategy for the Department of War. The DON Data and AI Governance Board will serve as the senior decision forum for issues related to this strategy’s implementation.

1. Accelerate Operational AI

Identify the most promising AI projects and rapidly evaluate successes for full scale implementation.

1.1. Increase Visibility. Develop and maintain an authoritative inventory of mission-aligned AI use cases prioritized based on their feasibility, impact, and alignment. To do this, the DON will enhance and scale adoption of the DON AI and Analytics Inventory as the authoritative registry of DON AI products and initiatives by FY27Q1.

1.2. Drive Experimentation. Reduce risks, conserve resources, and speed delivery by setting the conditions for decentralized pilots and experimentation that scale the value of current efforts like Data Science @ Sea.⁴ To rapidly generate functional software and hardware prototypes that address scoped technical challenges, the DON will run at least one hackathon per quarter to rapidly prototype solutions for operational problems, starting in FY27Q1.

1.3. Field Rapidly. Leverage rapid fielding pathways that accelerate delivery of capabilities that are ready for full scale implementation. To do so, DON Portfolio Acquisition Executives and the Rapid Capabilities Office will scale successful prototypes via the Research, Development, and Acquisition Software Acquisition Pathway and quickly onboard at least 5 mission relevant AI capabilities and enablers using the DoW-approved Modular Open Systems Approach by the end of FY27Q1.

2. Improve Data Readiness

Standardize, simplify, and scale data management capabilities to ensure mission-relevant data are ready to be easily discovered and shared.

2.1 Adopt Data Production Standards. Develop and implement enterprise data production standards, including cataloging and metadata requirements and quantifiable performance metrics.⁵ Operationalize the DON’s data production standards by increasing usage of the DON Data Catalog as the authoritative enterprise source of data and metadata. Develop a roadmap of catalog improvements and feature enhancements to scale data discovery and accessibility by FY27Q1.

2.2 Simplify Data Flows; Publish Data APIs. Designate data platforms to exchange authoritative data via application programming interfaces (APIs) and establish an API management service to improve access to data sets and data sharing across business and warfighting data ecosystems. The DON will pilot, select, and scale an enterprise API management service by FY27Q1.

2.3 Automate Data Labeling for Sharing. Automate data sensitivity and classification determinations of individual and aggregated data, such as those required for joint and cross-domain data sharing using attribute-based access control. The DON will deliver a solution to automate security classification determinations by FY27Q2.

⁴ Sailors Must Do Data Science at Sea | Proceedings - February 2023 Vol. 149/2/1.440

⁵ Data must be Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, and Secure (VAULTIS). These goals for DoW data were originally published in the 2020 DoW Data Strategy.

3. Optimize Data and AI Infrastructure

Deploy reliable, secure, and modular data and AI environments including the hardware, software, and data needed to support advanced analysis and the full range of AI capabilities.

3.1. Commoditize Enterprise Data and AI Ecosystem.

Drive down costs, reduce complexity, and accelerate development by designating enterprise services to support common data and AI activities and enable rapid innovation at the speed of mission. Through the CATTLE DRIVE initiative, the DON will decommission all duplicative capabilities into Enterprise Data and Analytics Services (e.g., War Data Platform) by the end of FY27.

3.2. Expedite an Operational Data and AI Ecosystem.

Scale capabilities supporting near real-time data collection, processing, and analytics at the tactical edge, including operational systems and sensors. The DON will deliver these systems and sensors within an operational data ecosystem and demonstrate operational telemetry capabilities from field to enterprise by FY27Q2.

3.3 Leverage AI Sandboxes and Test Ranges. The DON will accelerate developer velocity to industry speeds by fielding controlled unclassified information (CUI) and SECRET permissive development environments where operators can rapidly prototype solutions using natural-language-to-code tools with access to real mission data by FY27Q1, and prepare infrastructure for TOP SECRET environments by FY27Q2.

3.4. Deploy Large Language Models (LLMs) and Agentic Capabilities. The DON will partner with the Office of the Secretary of War Chief Digital and AI Office and the Services to deliver Generative AI capabilities capable of operating in

a Denied, Degraded, Intermittent or Latent environment to ships and Marine Air-Ground Task Force elements, enabling the development of Sailor- and Marine-driven applications by FY27Q1.

3.5. Digital Twin Simulation Environment. Accelerate authorization processes for new capabilities by using mission-aligned digital twins to support evaluations, testing, and assessments that provide verifiable evidence for security and survivability claims. This environment will be used to conduct acceptance testing within the DON by FY27Q2.

4. Streamline Data and AI Governance

Modernize organizational and governance processes to accelerate change and push risk determinations to the lowest level.

4.1 Incentivize Innovation. The DON will establish a Data and AI Adaptation Team that will work with each functional community to establish priority Bits2Effects cycles and report their performance—including MTTE and the bottom 10th percentile—quarterly by the end of FY27Q1.

4.2 Manage Risk. The DoW AI Strategy is clear that “the risks of not moving fast enough outweigh the risks of imperfect alignment.” The DON will accelerate time to access and support mission development needs. The DON CDAO, in coordination with the Services, will establish a monthly cadence to review requests for barrier removal with the authority to grant waivers for non-statutory requirements that inhibit speed in data sharing, contracting, and fielding by FY26Q3.



4.3. Establish a 'Wartime' Approach to Blockers. Aligned with the DoW, the DON will approach risk tradeoffs and organizational equities in a wartime footing – with a bias for action at speed. The DON will establish an AI War Council to prioritize use cases, align resources, and pre-authorize wartime modifications to data sharing, classification, and AI deployment authorities by FY27Q1.

5. Build a Data and AI Ready Workforce

Build an agile, highly skilled, data and AI workforce capable of harnessing advanced technologies to meet the dynamic challenges of modern warfare.

5.1 Manage and Qualify Workforce. Leverage the DoW Cyberspace Workforce Qualification and Management Program to identify, recruit, develop, and retain a highly skilled, engaged, and productive data and AI workforce. The DON will produce a training and billet build plan by FY27Q1 that doubles the number of qualified data engineers, data scientists, and AI/ML engineers by FY29Q4.

5.2 Modernize AI Education and Training. Remain responsive to operational needs and the rapid pace of AI evolution by leveraging modern education and training tailored to personnel roles. The DON will enhance data literacy for all personnel and provide easily accessible, high-quality resources for all levels of AI knowledge by FY27Q1.

5.3 Organize Interdisciplinary Adaptation Teams. Form interdisciplinary adaptation teams of operators, data and AI engineers, and acquisition specialists focused on enhancing existing capabilities and prototyping emergent capabilities from automatically collected data by FY27Q1.

CONCLUSION

Transforming the DON into a data-ready, AI-enabled force represents our most significant opportunity to rapidly enhance warfighting effectiveness in the digital age. Empowering DON missions to harness AI, including ready access to quality data and AI-enabling technologies, can spur innovations that accelerate learning and generate decisive operational advantages. The efficiencies created through strategic and purposeful integration of AI will return valuable resources—time, funding, and human effort—directly to mission priorities.

SIGNED: Hung Cao, Acting Secretary of the Navy



6. Partner and Collaborate

Leverage the strength of industry, academia, Federal Government stakeholders, and allies and partners to accelerate delivery of industry leading data and AI solutions.

6.1 Strengthen Industry Partnerships. Accelerate speed to value by partnering with industry leaders who can help the DON adopt state-of-the-art data and AI solutions tailored to its needs. The DON will create and maintain a prioritized list of targeted priority industry partnerships by FY27Q1.

6.2 Expand Collaboration with Academia. Foster and develop partnerships with naval, defense, and universities to upskill Sailors, Marines, and civilians in data and AI through courses, certificate, and degree programs. The DON will establish and maintain an authoritative list of approved partnerships and publish it to all DON employees by FY27 Q1.

6.3 Partner with Federal Stakeholders. Collaborate with the DoW, other Military Departments, and Federal agencies on joint initiatives and use cases that increase capability, accelerate deployment, and ensure Service-specific innovations can rapidly scale to joint environments. The DON will establish a prioritized list of joint initiatives by FY27Q1 and update it at least quarterly.

6.4 Leverage Alliances and Partnerships. Conduct realistic exercises and experiments with joint forces and allies to ensure interoperability and exchange best practices. The DON will identify priority exercise opportunities by FY27Q1 and update this list at least quarterly.