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DeepDives



# The FUTURE of AI for National Security

## INSIDE:

- What's Next for DOD's AI Plans ..... 3
- The Military's Strategic Goals ..... 7
- The Navy's AI-Enabled Unmanned Fleet ..... 12

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# From the editor's desk



Ross Gianfortune, Managing Editor

## Using AI to Stay Ahead of Adversaries

The Defense Department has been in the business of artificial intelligence for decades, but the technology's emergence in recent years has sped up development and needs for the military. DOD components are increasingly using AI, data, analytics and capabilities to further mission.

DOD's AI adoption strategy plan outlines the interdependent goals for the department's use of emerging technology. With data quality as its base, the plan requires trusted, high-quality data.

The Navy is changing how it buys and maintains its AI-

enabled unmanned cooperative combat aircraft. Elsewhere, Air Force Research Laboratory, Army Software Factory and Defense Innovation Unit cited AI as aiding mission efficiency, joint force design and other Pentagon priorities.

Collectively, military leaders are all in on AI. As Air Force Research Laboratory AI Lead Amanda Bullock said, "The future looks bright, but to stay ahead of our adversaries and keep the fight unfair, the Department of the Air Force will need to accelerate its capabilities in artificial intelligence and machine learning." ✨

# Table of Contents



Michael Hoffman,  
President



Silvia Oakland,  
Staff Writer



Dana Klosner,  
Staff Writer



ARTICLE

## **DOD Tech Leaders Highlight What's Next in the AI Wave**

Defense leaders share how they are strategizing artificial intelligence for national security applications.

BY SILVIA OAKLAND AND DANA KLOSNER



INFOGRAPHIC

## **DOD's Artificial Intelligence Adoption Strategic Goals**

The new strategy outlines responsible AI and its role in decision advantage. These interdependent goals support the department's needs in responsible AI deployment, quality data and insightful analytics.

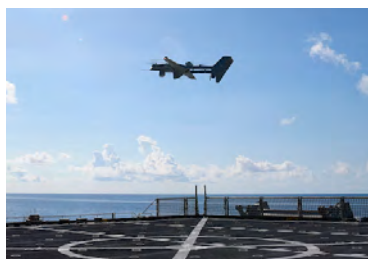


PARTNER INTERVIEW

## **Leveraging AI at the Defense Edge**

Emerging technology can help accelerate decision-making to gain a tactical edge against global adversaries.

**Christopher Yates, Principal Chief Architect, Red Hat**



ARTICLE

## **Navy Plans to Revolutionize How It Buys a New, AI-Enabled Unmanned Fleet**

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BY MICHAEL HOFFMAN

## DOD Tech Leaders Highlight What's Next in the AI Wave

Defense leaders share how they are strategizing artificial intelligence for national security applications.

BY SILVIA OAKLAND AND DANA KLOSNER

Federal and industry leaders from the Defense Department presented their insights and predictions on how artificial intelligence will transform the future of national security.

AI defense leaders spoke about use cases and analysis at the GovCIO Media & Research Defense IT Summit in Arlington, Virginia.

### 'Cheats Time'

"We're looking to insert AI into everything we do, from combat operations, to reducing the toil and administrative tasks. We define toil as anything that keeps our people from performing the mission," Amanda Bullock, Air Force Research Laboratory AI Lead, said in her remarks.

She acknowledged that AFRL is navigating its relationship with AI and machine learning, and said it has been using AI to "cheat time."

She told the story of a dashboard that needed to be cleaned up and combined manually. Even after some macros were created by the inspector general, the process still took eight hours a month for the team to complete.

"How could they cheat time? By creating an automated data workflow that required only a single upload of data. No more merging spreadsheets running Excel macros than uploading the resulting spreadsheet to Tableau," she said.

"They now have a visualization in seconds. It was so well received the other



[inspectors general] across the Air Force are looking to adopt it."

Last summer, the lab successfully demonstrated the first-ever flight of a machine learning-trained AI algorithm. The algorithms were matured for millions of hours of simulation events, hardware in the loop and ground test operations.

AFRL leaders demonstrated that AI machine learning can perform aerial



# Amanda Bullock

AI Lead, Air Force  
Research Laboratory

operations autonomously, resulting in much safer and efficient operations in the future.

“The future looks bright, but to stay ahead of our adversaries and keep the fight unfair, the Department of the Air Force will need to accelerate its capabilities in artificial intelligence and machine learning,” Bullock said. “Leading that charge will be AFRL. ... What’s next in AI and machine learning is an environment where we save more lives, save more money and cheat time.”

## ‘Responsible Agility’

DOD needs to practice responsible agility while it accelerates the adoption of data analytics and AI, said DOD Chief Digital and AI Office CTO William Streilein. Experimentation and capability at scale are key.

“First off we’re driven by experimentation,” Streilein said. While it is imperative that experiments iterate quickly and “fail fast,” the terminology has a negative connotation. Streilein prefers the phrase, “iterate and learn.”

“It means you realize you’re going to try something out and take away from that learning, but also leave behind capability there,” he said.

The department will scale capabilities by using scaffolding for data labeling and the replicator initiative. The department takes the approach of the hierarchy of needs in terms of leveraging AI. This means taking care of data first. Data is critical for algorithm and AI development.

DOD is prioritizing responsible AI development through problem-driven data management, talent management and product management, Streilein said.

## Future Force

The Army Software Factory prototypes the Future Force design, according to CISO Angel Phaneuf.

“[AI and machine learning] are tools that empower our soldiers to make data-informed decisions, revolutionizing the way we approach and execute the

**“The future looks bright, but to stay ahead of our adversaries and keep the fight unfair, the Department of the Air Force will need to accelerate its capabilities in artificial intelligence and machine learning.”**

**— Amanda Bullock, AI Lead, Air Force Research Laboratory**

mission on the battlefield,” she said. The Army Software Factory selects 25 military and civilian candidates biannually to learn product management, design software development and platform engineering.

Data is a strategic asset. AI and machine learning technologies can give the ability to forecast the enemy’s movements and potential threats in the DevSecOps framework. These technologies can identify patterns, threats, and enable commanders to anticipate and prepare for various scenarios.

On the warfighter level, these technologies empower soldiers to make tactical decisions aligned with overall strategic objectives. AI alleviates that

burden of cognitive load on the warfighter. By automating routine tasks and data analysis, soldiers can focus on higher level decision-making and strategy on the battlefield based on generated insight.

### **‘New Version of Oppenheimer’**

It is the nations that adopt AI that are going to consume and move forward and faster than those that do not, said Jaime Fitzgibbon, AI/ML program manager for the Defense Innovation Unit.

“We’re in a new version of ‘Oppenheimer,’ we are at a race to get to AI faster,

but not just get to it, get to it where we can actually ingest it," she said.

While AI is not new, the attacks and implications are becoming more tangible and real. Data and processing power are the fuel that powers the machine.

Defense is moving from 2D visualization molecules to 3D. This change brings in bio-mapping capabilities that enable personalized health and medicine, affecting veterans as well as warfighter readiness.

With a new way of doing additive manufacturing, more things can be brought to the U.S. on demand to be operationally ready. AI provides new sensors and geo-intelligence, and new ways of staffing skills lead to more niche opportunities.

"The superheroes of the future are actually going to be the people in the

CIO shop that rethink architecture," Fitzgibbon said. "Anyone in the IT department ... and the people in acquisition, that rethink how we can acquire and move faster, and getting these things on contract into our government and getting them tested, and not failing, but failing forward."

## Cyber Resilience

Cohesity Field Technical Director of AI Bharath Nagaraj closed the panel from an industry leader perspective highlighting how industry partners are working to adopt AI to help with data management, cyber resilience and cyber recovery.

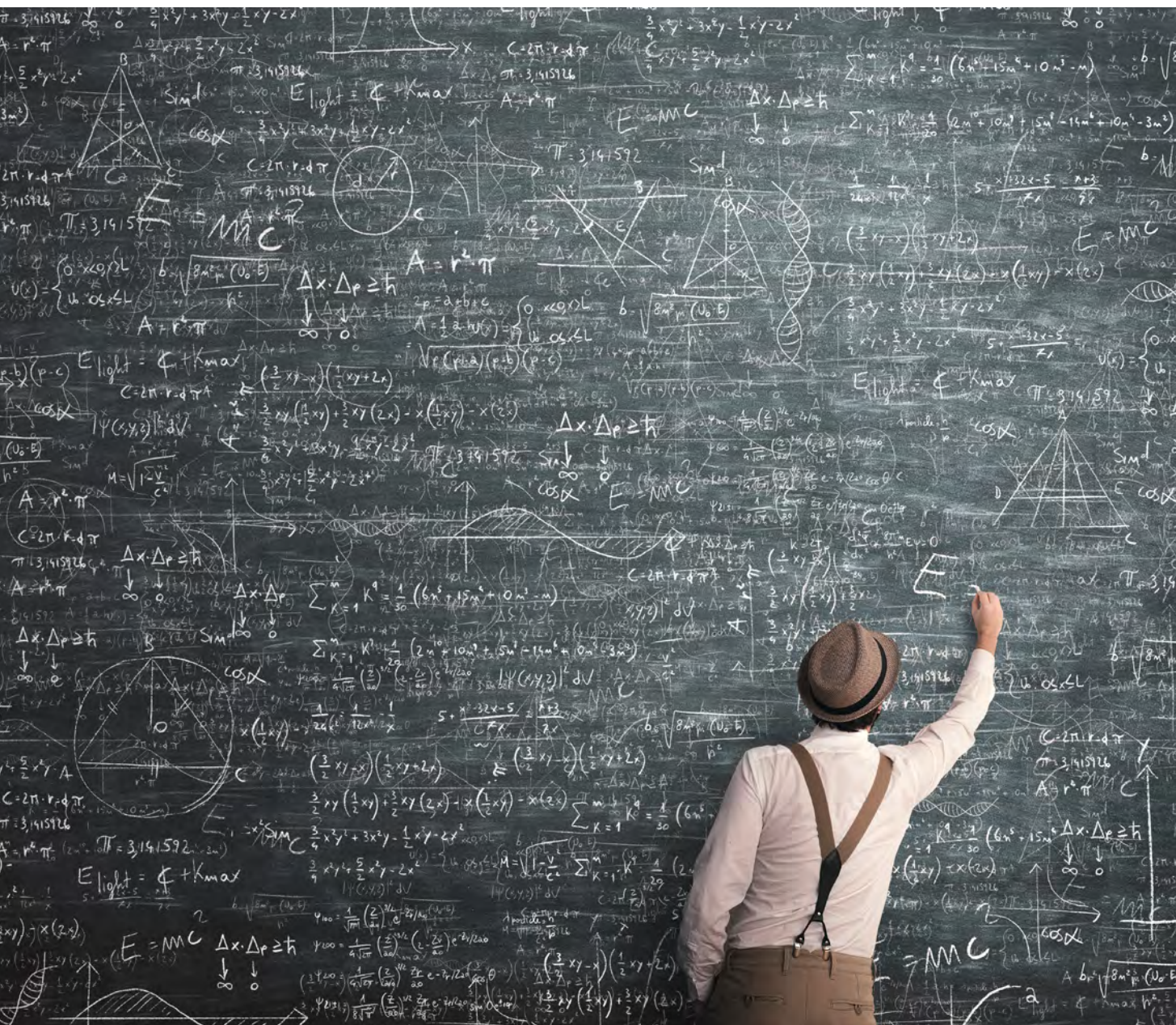
"[Between 2000 and 2020] the amount of technologies that produced data was great, the amount of data increase was insane, but they all became silos of data that just kept getting exponentially proliferated," he said. "What we're trying to do is unify that data, we're trying to consolidate it, we're trying to make it addressable."

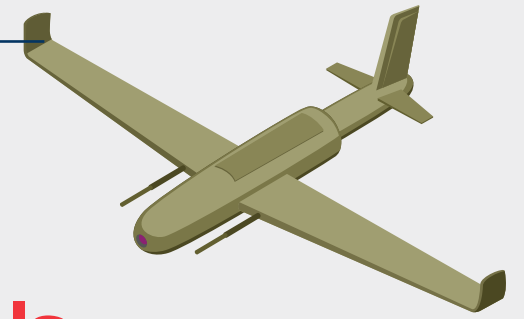
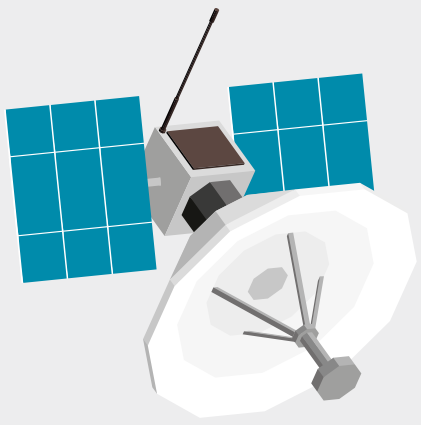
He emphasized the need for common language and data management spaces to allow quick and accurate responses to prevent cyberattacks. He also said this type of system would allow for understanding of what potential future risks could look like.

"Imagine bringing security and IT into the same space. Imagine security is one part of the brain and IT is the other part of the brain. And inside of a cyber resilience conversation, we need that brain to work together," he added.

Nagaraj said he believes cyberattacks are going to increase in the years ahead, and DOD needs to prepare now.

"We have to find ways to unify, we have to find ways to consolidate, we need to bring our organizations closer together," Nagaraj added in agreement with the previous speakers. "We then need to unleash the power of generative AI, but in a responsible and governed manner, so that we can make decisions faster." ✨





## DOD's Artificial Intelligence Adoption Strategic Goals

The Defense Department's Data, Analytics, and Artificial Intelligence Adoption Strategy outlines how it will use AI responsibly and effectively for decision advantage. These interdependent goals support the department's needs for responsible AI deployment, quality data and insightful analytics and metrics.

✓ Strengthen governance and remove policy barriers.

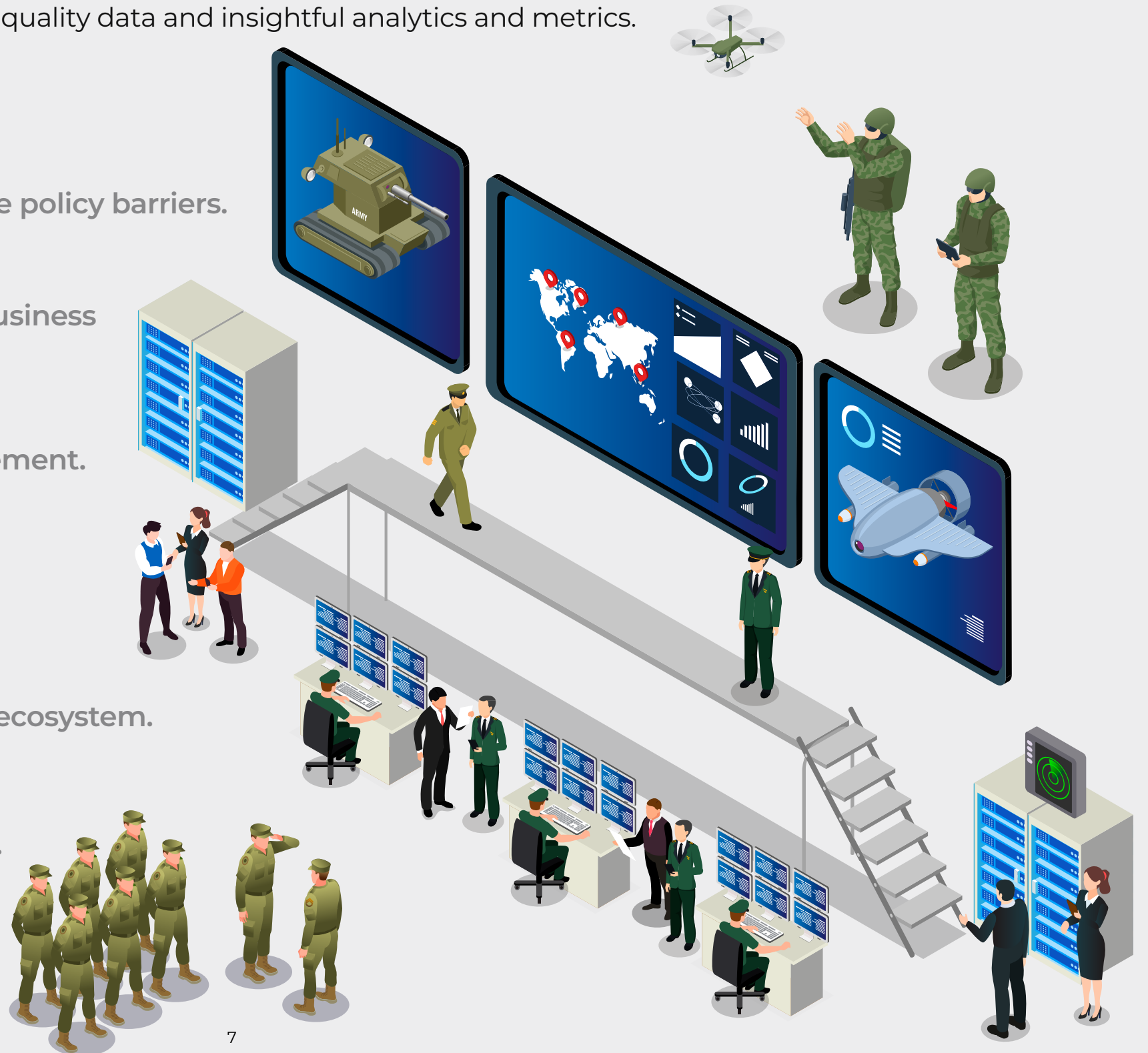
✓ Deliver capabilities for enterprise business and joint warfighting impact.

✓ Improve foundational data management.

✓ Invest in interoperable, federated infrastructure.

✓ Advance the data, analytics and AI ecosystem.

✓ Expand digital talent management.





PARTNER INTERVIEW



# Leveraging AI at the Defense Edge

Emerging technology can help accelerate decision-making to gain a tactical edge against global adversaries.

## What are the largest challenges facing the Defense Department around AI adoption in the battlespace?

**Yates** The biggest challenge for leveraging artificial intelligence in the battlespace at the edge is managing and deploying these new, sophisticated applications and architecture in the existing infrastructure.

Plus, where the capability is deployed impacts how quickly personnel can leverage AI applications. If the data collected from another country must be shipped back to the U.S. where it would be processed in a data center to make decisions and then communicated back to the battlespace, that would reduce advantages from AI. There needs to be data processing and analysis capabilities at the edge at the point of data collection and where the tactical decisions would be implemented.

It's also challenging to have the right controls in place to collect, process and share data and intelligence, internally from system to system, and externally from agency to agency and agency to allies.

(ctd.)



**Christopher Yates**  
Principal Chief Architect,  
Red Hat

## What impacts will warfighters see from AI?

**Yates** AI can improve decision-making by cutting the time a human spends in data collection, reporting, analysis and processing. A machine can perform those functions much more quickly than a human could.

All this contributes to outpacing adversaries' decision-making. In a game of chess, I don't have an advantage if I wait to make a move after you make a move. But if you make a move, then I can make two moves in the same amount of time, I have a significant advantage.

Previously, a lot of organizations were focused on big data. But the reality is that you don't really need all that data. What you need is the relevant data for the tactical situation. What AI does is give you the actionable capability faster

because it sifts through all the data and presents only what applies to the warfighter in that situation.

While the sensors and other collection capabilities gather all the data, the reason to have AI and machine-learning models at the edge is that you consume and operate at the speed of that tactical deployment while preserving all the data for strategic decision-making later.

## What do you look forward to over the next year?

**Yates** From current adoptions of AI, the data shows AI models do poorly initially because they require a level of training to become more reliable, relevant and actionable. I look forward to the ongoing development of a

**“AI can improve decision-making by cutting the time a human spends in data collection, reporting, analysis and processing.”**

**— Christopher Yates, Principal Chief Architect, Red Hat**



strategy for dynamically training and updating those models, especially in the context of warfighting.

Provisioning the applications at the edge isn't enough — they need to be updated to improve their value to the warfighter. When we talk about data gravity, it's not just the production of the data or the processing of the data, but also the analysis of the data as well.

If we think about image recognition systems on a drone, for example, historically that footage is streamed back to a human analyst who watches it in

real time and cuts out a relevant snippet. They then forward that snippet to a person who makes decisions from that video. All this relies on the limitations of a human processing that data.

If an image recognition system is running on the drone, it can cut the relevant data feed and send that to the decision-maker. In addition to reducing the time to make the tactical decision, it reduces the amount of bandwidth necessary to collect, process and transmit that data. That means being able to handle more disparate information in the battlespace with the same available bandwidth. 🌟



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# Navy Plans to Revolutionize How It Buys a New, AI-Enabled Unmanned Fleet

The AI-enabled cooperative combat aircraft program will focus more on sensors and systems than platforms, Navy leaders said.

BY MICHAEL HOFFMAN

The Navy wants to revolutionize how it buys and maintains its AI-enabled unmanned cooperative combat aircraft (CCA) to focus less on the aircraft itself and more on its sensors and systems.

Rear Adm. Stephen Tedford, program executive officer for Unmanned Aviation and Strike Weapons, spoke at Sea-Air-Space 2024 in May about the Navy’s plans to outfit the sea service with its next generation drones. He said that the CCA will be an unmanned fleet built to fly in concert with the military’s sixth generation crewed aircraft systems currently being developed. The Air Force is building a similar fleet of collaborative combat aircraft.

Both the Air Force and Navy are hoping to launch unmanned fleets this decade.

Tedford said that he doesn’t want to include a long-term sustainment program for these aircraft to keep costs down and quickly upgrade the fleet as the sea service anticipates rapid technological advancements.

“We’re trying to get after CCAs in a revolutionary way,” Tedford said. “I don’t need them that long. I need a platform that instead of buying 500, I’ll buy 60 ... and I can do them in a rolling wave so I can keep pace with the technology of the unmanned platforms, but also keep pace with the threat by upgrading sensors, platforms, systems, weapons.”

Tedford said the Navy is approaching the development of these aircraft



differently than the service has done historically, noting that Navy leaders do not want a steep price tag for each platform itself. The Navy wants each aircraft to cost less than \$15 million allowing the service to consider its CCA fleet “consumable.”

Tedford said the “A” in CCA might stand for aircraft, but the Navy plans to develop the platform after the sensors and systems. In 2025, the Navy will launch



# Rear Adm. Stephen Tedford

Program Executive Officer for  
Unmanned Aviation and Strike  
Weapons, U.S. Navy

an analysis study for technologies connected to the CCA program.

Navy leaders want to invest research and development funds to ensure the security of the fleet's command-and-control systems and networks. The service will also need to further develop the navigation and positioning for the autonomous aircraft.

The Navy is closely following the advancements being made by the Air Force on its CCA program. The Pentagon is working to further integrate each service as part of the Combined Joint All-Domain Command and Control initiative, connecting systems and sensors throughout the battle space.

Tedford said the Air Force is "taking the lead on developing the government reference architecture standards for how we're going to be getting after AI and autonomy." Government reference architecture will guide the program's system design, development, production and sustainment processes.

To keep up with the pace of technology, Tedford said the CCA fleet must not pursue a "proprietary solution."

"It has to be universal. It has to be interdependent. And it has to be interchangeable," Tedford said. 🌟

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**—Rear Adm. Stephen Tedford, Program Executive Officer  
for Unmanned Aviation and Strike Weapons, U.S. Navy**