

# Data and the Future of Defense

How prepared is the Department of Defense for modern warfare?



## INTRODUCTION

# The Joint All-Domain Command and Control

The room is dark. A central aisle leads to a massive screen covered in maps, numbers, graphs and videos. It's a familiar scene depicted in movies of future warfare or space exploration. The visualization of complex data, not to mention the ease of communication, control and coordination requires that data is shared across a wide range of historically incompatible systems.

Fortunately, modern solutions are within reach to help break down silos and ease complex command and control. With the right tools, defense operations can be orchestrated at a grander scale, powered by data insights that encompass all domains in real time.



## Investigate, monitor, analyze and act

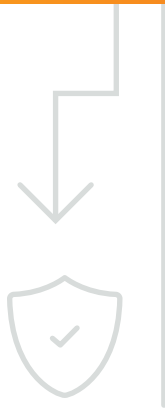
Although no company deals with the same levels of scope, complexity or high risk as the DoD, we're already seeing data-driven success at a smaller scale in the public sector, including spaces like energy, manufacturing and disaster response.

These sectors include organizations that manage:

- high personnel counts
- complex data systems
- large capital assets
- significant compliance and risk management considerations

Whether it's ensuring plant safety or responding to a natural disaster, organizations succeed by making data available to a family of systems in real time. With the right technology, previously siloed organizations can investigate, monitor, analyze and act on their data for the best outcomes. These use cases are expanding rapidly and provide a window into the future of predictive analysis, allowing warfighters to decide and act at machine-speeds.

Now that the data tools and platforms exist, the DoD can accelerate its time to fully operationalize a Joint All-Domain Command and Control (JADC2) capability. It could effectively predict and solve future problems with a strong data-driven platform that takes into account all of its assets.



## What is JADC2?

**JADC2, or Joint All-Domain Command and Control**, is the emerging term senior DoD officials are using to describe linking military sensors to all war fighters — across all services and domains — providing decision makers with the most accurate situational awareness possible.

Because JADC2 covers all domains — air, land, sea, undersea, space and cyberspace — it's possible to optimize warfighting operations on a global scale with data as a key asset.

“Data is the ultimate currency in any particular field today. It's the most important thing on Earth. It'll be the most valuable thing on the battlefield.”

— Will Roper, Service Acquisition Czar

Only a data-to-everything platform will make this possible, as it can ingest raw data from a range of sources. Some of the data will be classified, other data may be only found locked away in silos. But the right platform will allow people with different levels of security clearance to access information in real time without compromising integrity or security. It will be able to parse what the data is saying in all domains and at relevant classification levels for the most comprehensive answers to the who, what, when, where and how of potential military activity.

Today, PPTs, emails and documents are coordinated for briefings and decision making. For many real-time decisions, glass boards and grease-markers are still in use. This requires hours of human interaction and effort, and is prone to both old intelligence and misinformation. As data flows from the source to the highest levels of government, it can become distilled, aged and misrepresented. This causes problems as senior leaders are making quick decisions that can have major ramifications.

But that's all quickly changing. The right data platform will support critical infrastructure projects in healthcare, manufacturing, energy and local governments. It will do the same for the military. As the military continues to adopt new technology that generates troves of data, only machine learning and automation will usher their operations into the future.

But like all worthwhile outcomes, there are challenges to overcome.



## What are the challenges?

- Automating responses at machine speed in near real time
- Preparing leaders to understand what the data is saying in contested or denied environments
- Anticipating adversary tactics
- Linking every sensor to every shooter via a military IoT
- The complexity engendered by all the different sources, domains, uses
- Compressing the OODA (observe, orient, decide and act) loop



# Compressing the OODA loop?

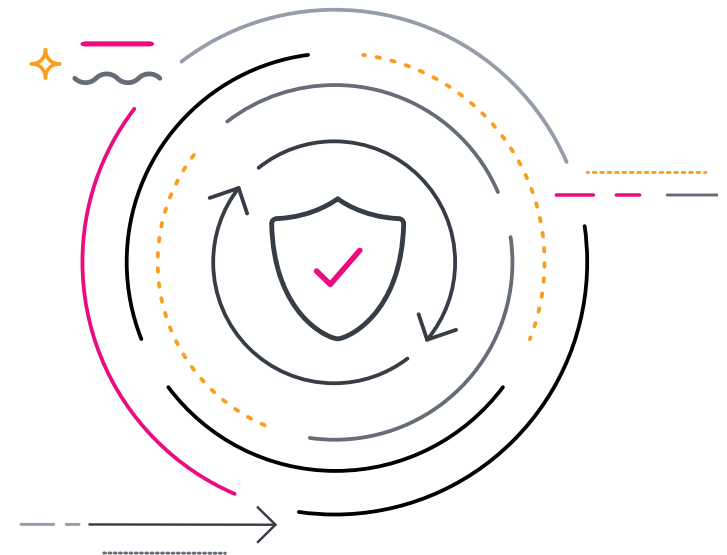
Overcoming technological barriers won't mean much if the decision making cycle isn't streamlined.

The OODA loop (short for observe, orient, decide and act) is a flow used in the armed forces to direct how data is processed and acted upon. Decision makers must compress the loop to effectively use the data (the goal of a JADC2 system).

For instance, in highly contested domains — think satellites being jammed or challenged in the space domain — how can the OODA loop be completed effectively so that the data coming from those satellites delivers the best value for both defense and offense.

This is particularly challenging in legacy environments. Data analytics can't be conducted across disparate and disjointed domains and systems. Because of hurdles from architecture to policy, it's nearly impossible to take action in real time.

Methods for potentially overcoming this problem, like master data management projects, exist. But they're manual, slow and potentially error-prone.

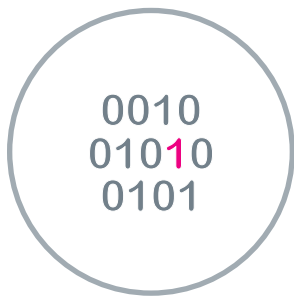




# What would a JADC2 look like?

A traditional approach to data management relies on building relational structured databases and integrations. Often these legacy systems rely on gathering all present and future requirements. They aren't best suited to dynamic and fast-changing battlefields.

An advanced battle management system (ABMS) should focus on four key areas. Building a solid, reliable data foundation remains the first step toward effectively handling each area.



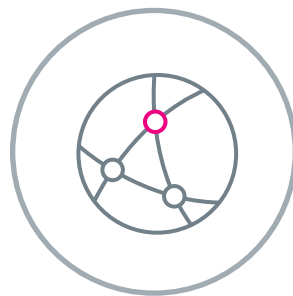
## Data

Streaming, Fusion, Discoverability, Algorithms and Analytics



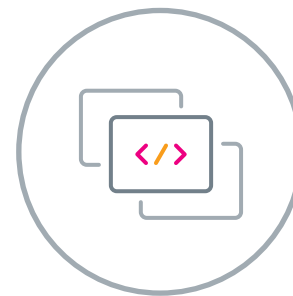
## Secure Processing

Multi-Cloud Monitoring, Continuous Compliance, AR Analytics, Streamlined Provisioning



## Connectivity

Information Assurance, Predictive Analytics, Automated Restoration



## Apps

AI/ML-powered Planning, Data/Sensor Fusion, Metadata Scoring, Visualization, Decision Support



## JADC2 in action

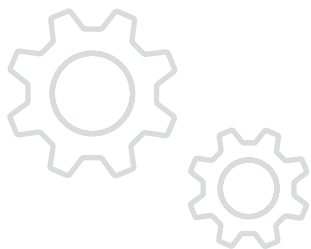
There are nearly limitless tactical advantages to a fully operational JADC2. The best current examples come from humanitarian responses to natural disasters — from category five hurricanes to the wildfires that devastate California each dry season. Firefighters and emergency front-line responders are among a growing number of examples of the OODA loop in action. Faced with a need for rapid decision making and elevated situational awareness, these teams must use every available tool to make life and death decisions.

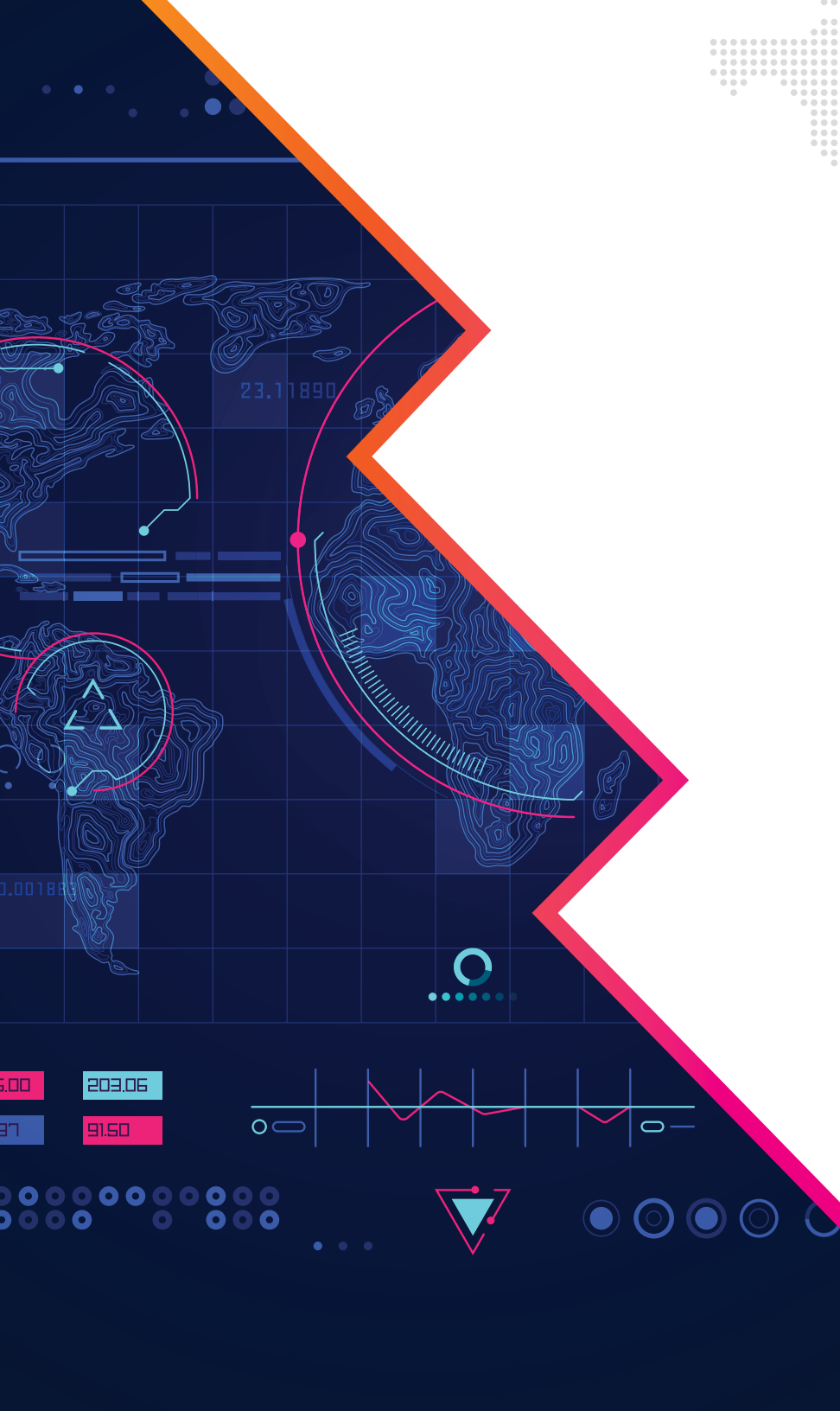
Human assistance in disaster response (HAIDR) often involves pulling data from disparate sources to make optimal decisions in real time. The data used to make these decisions might come from weather alerts and forecasts, social media messaging, email and state department reports. Firefighters may need to know how close they are to a water source. They may be equipped with IoT sensors, so that mission partners can track their body temperatures or estimate how hot a fire is burning. Is the wind blowing steadily from the East or it shifting?

A data platform can help leverage disparate, cross-domain data for confident decisions and fast actions at mission speeds. As with firefighters who need to battle an out of control blaze, the military is often called upon to address situations that are evolving. High pressure situations are not static. New information and new issues can arise as adversaries adjust and shift. Fusing AI and ML with automation and adaptive response capabilities can lead effective critical operations and contribute to mission success.

An effective JADC2 should:

- Turn raw data into high value information
- Take action on the data in motion
- Protect sensitive data
- Distribute data to multiple destinations





## The JADC2 benefit

Deploying a data platform as part of a JADC2 would help to reduce the time and effort required for complex decision making and troubleshooting by 70-90%. A platform allows the government to fully or partially automate the Decision and Action portion of the OODA (observe-orient-decide-act) loop. Repetitive or predefined decisions and actions are built into the system — offloading these tasks from the warfighters and allowing them to focus on mission critical decisions.

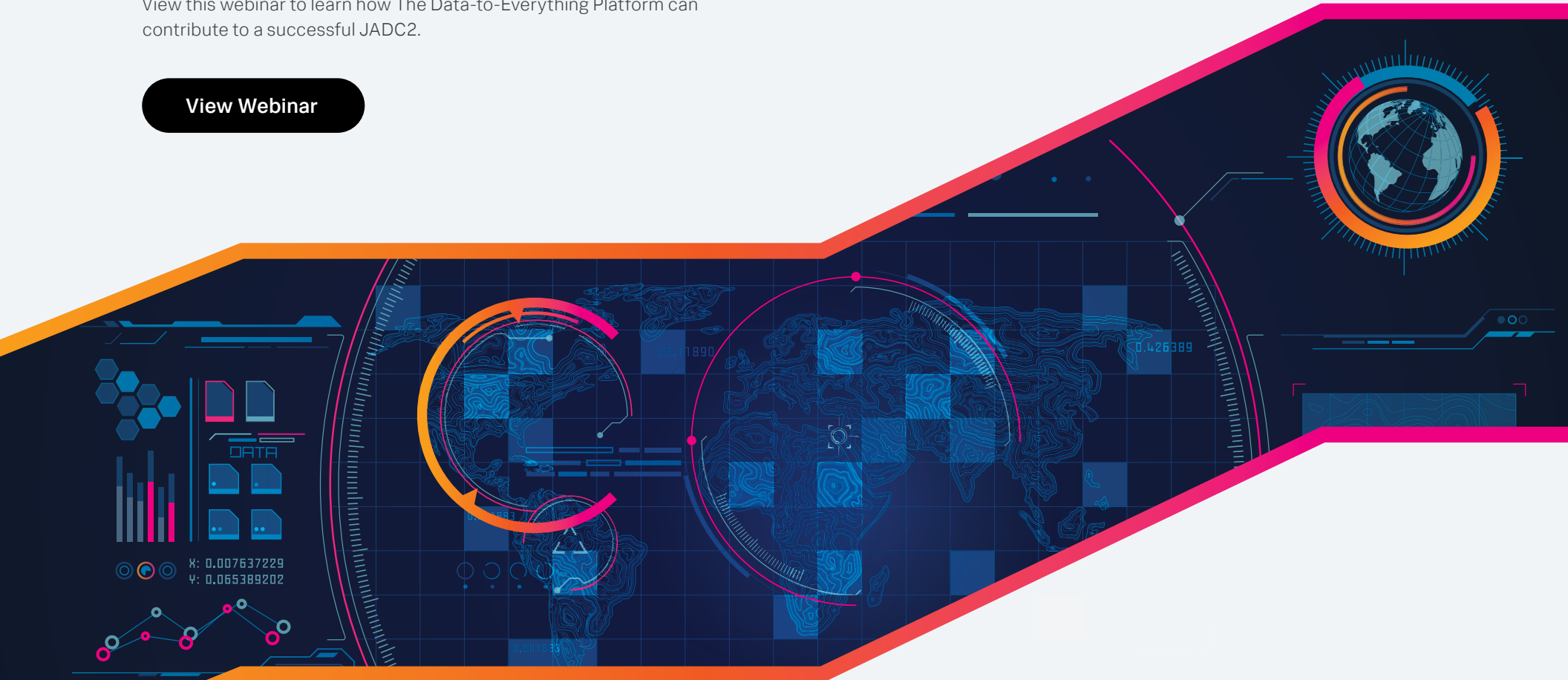
A fully operational JADC2 should work with a data platform to gather and correlate disparate data sources using standard APIs — providing automated and resilient workflow processes that leverage real-time data analytics and machine learning techniques. It's important to integrate raw, mission-centric data for accelerated decision making and simplified operational awareness.



# Learn More

View this webinar to learn how The Data-to-Everything Platform can contribute to a successful JADC2.

[View Webinar](#)



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