



C3 AI Readiness

**Maximize Asset Availability
with Enterprise AI**

Use AI-optimized maintenance schedules
and part demand forecasts to reduce
scheduled and unscheduled asset downtime.



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C3 AI + Raytheon

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The Readiness Challenge

A 2020 report from the Government Accountability Office (GAO) found that of 46 aircraft types analyzed across all military branches between 2011 and 2019, only 3 platforms met their annual mission capable goals. Further, 24 aircraft platforms did not meet any of their goals during any year. While this may appear to be a unique problem with aircraft, other assets such as ships, trucks, and tanks also struggle to maintain their prescribed operational readiness levels – stemming mainly from existing maintenance practices.

Current maintenance efforts in the DoD and commercial sectors are primarily reactive and rigidly prescribed by policy – blind to the real-time conditions of the component or subsystem. Data from maintenance logs, operational histories, and sensors are often miscategorized or missing, rarely updated, trapped in multiple system silos, and fragmented across asset types and program offices. Given this lack of reliable and consistent data, analysts and maintenance professionals are often “flying blind” and reacting to, rather than predicting, failures.

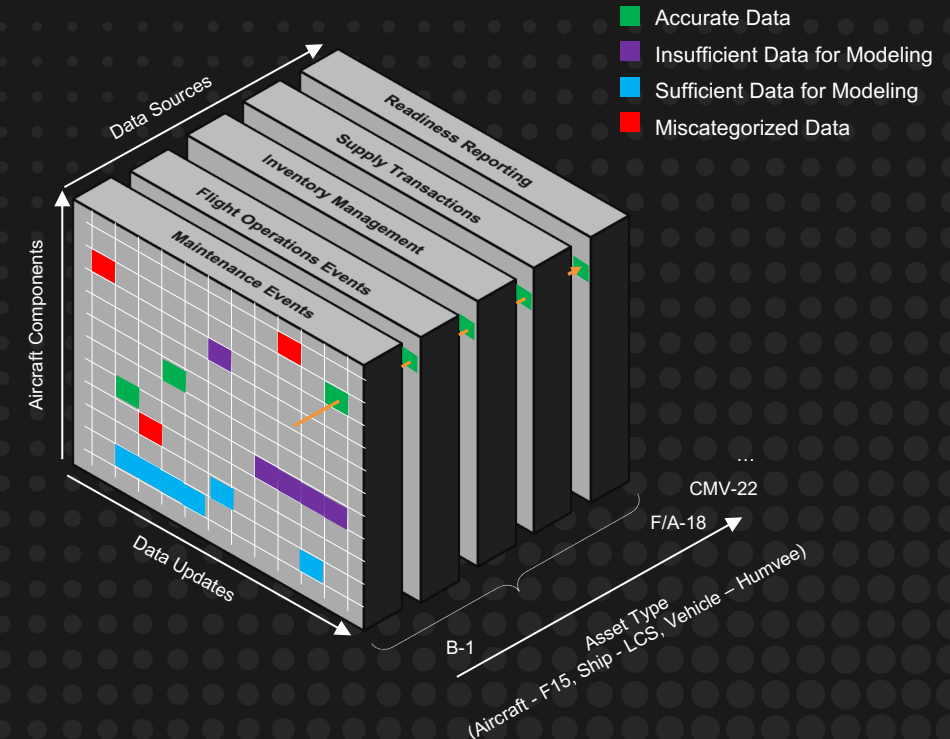
Enterprise Asset Maintenance Data Problem

Siloed Efforts; Cross-Org Visibility; Multi-Dimensional Scalability

Current Approach



Significant manual effort required to **aggregate**, **adjudicate**, and **synthesize** cross-org data for downstream reporting and decision making



1. <https://www.aviationtoday.com/2020/11/20/dod-aircraft-not-meet-mission-capable-goals-new-study-finds/>

Predicting Failures Starts With Reliable Data

The first step in improving asset readiness is to cleanse, validate, and integrate data from all available sources, including but not limited to sensor, maintenance, operations, and weather. Creating this common thread throughout disparate data sources requires the unification of very different data types – from high-frequency sensor data to structured data, and even handwritten maintenance notes. Once integrated, the data layer also needs to manage missing or miscategorized data. Preconfigured data transformations need to prepare the data for downstream predictive analytics.

A unified, cleansed and common data set lays the groundwork for powerful AI and machine learning models that provide component-level failure predictions, optimal maintenance schedules, and fleet insights. Failure predictions form the basis of optimized maintenance schedules and generating parts demand forecasts to ensure that the correct parts are available during maintenance. AI/ML models help determine a component's remaining useful life, optimize base-level parts inventory, and help reduce downtime due to parts unavailability.

AIRCRAFT	READINESS
F-16	68%
F-18	53%
F-22	49%
F-35	55%

\$293B DoD spend on operations and maintenance (O&M)

\$41B of the FY2020 Defense Budget was allocated to **improving processes related to improving aircraft MC**

Maximize Asset Uptime

C3 AI® Readiness provides maintenance and logistics teams in military and commercial agencies with a comprehensive set of diagnostic and operational tools to assess asset, subsystem, and components at risk, enabling higher asset uptime and mission readiness.



Unify your data sources



Use AI to identify failure risk at any level of asset hierarchy

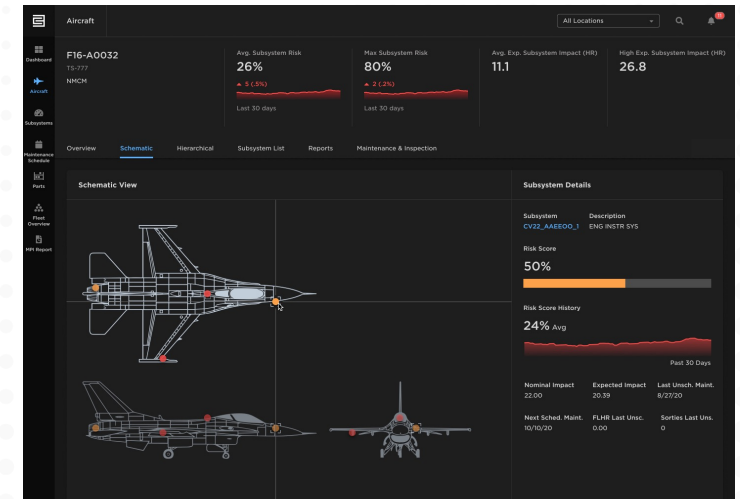


Order parts and schedule maintenance before failure

C3 AI Readiness assists maintenance professionals with AI-driven insights that identify subsystems and components at risk of failure. The application enhances troubleshooting capability through highly interpretable machine learning recommendations and root-cause analyses. It also provides logistics managers with short- and long-range part demand forecasts based on near real-time conditions to maximize asset availability.

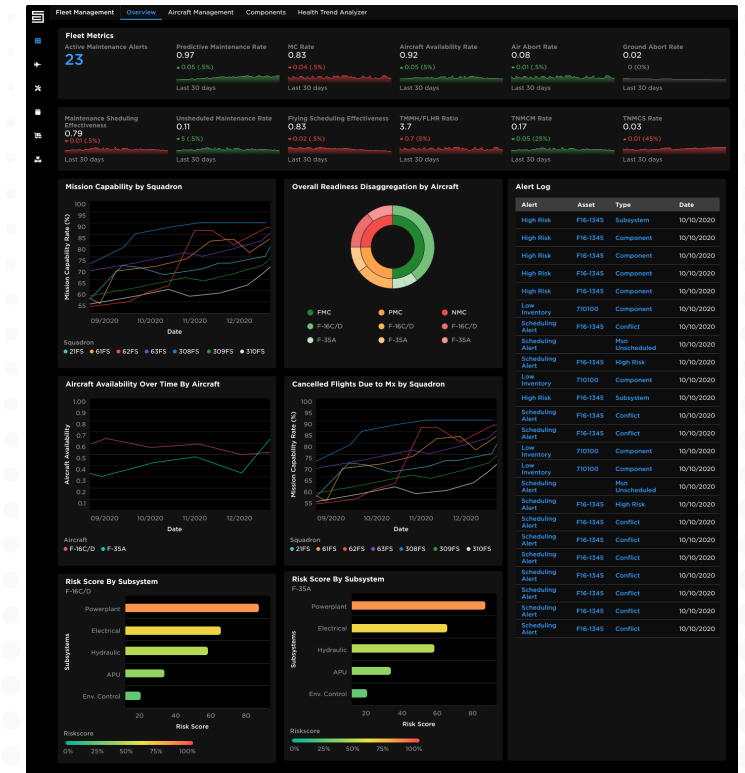
Built on the revolutionary C3 AI Suite – a next-generation platform enabling rapid development of AI, IoT, and Big Data applications – C3 AI Readiness supports custom functionality for unique asset platforms and mission requirements, all supported by a future-proof infrastructure.

C3 AI Readiness



AI-driven Maintenance Operations

- ✓ Understand readiness risk across a fleet of assets
- ✓ Apply next-gen failure prediction AI algorithms
- ✓ Prioritize scheduled maintenance
- ✓ Ensure parts availability
- ✓ Eliminate bad-actor components
- ✓ Assess impact of maintenance events
- ✓ Track component and subsystem lifecycle performance
- ✓ Launch work orders directly within the application
- ✓ Ensure effective communication and collaboration



Maintenance With the Right Part at the Right Time

C3 AI Readiness integrates and unifies data from sensors, maintenance logs, and operations systems. It leverages advanced AI models to monitor subsystem health and predict component failures. The application then recommends optimal maintenance schedules and forecasts part demand to ensure that maintenance can be executed at the right time and place, with the right parts. C3 AI Readiness reduces unscheduled downtime and increases asset availability – all while providing a novel future-proof architecture. Customers are not “locked-in” and maintain ownership of their data.

Up to
40%

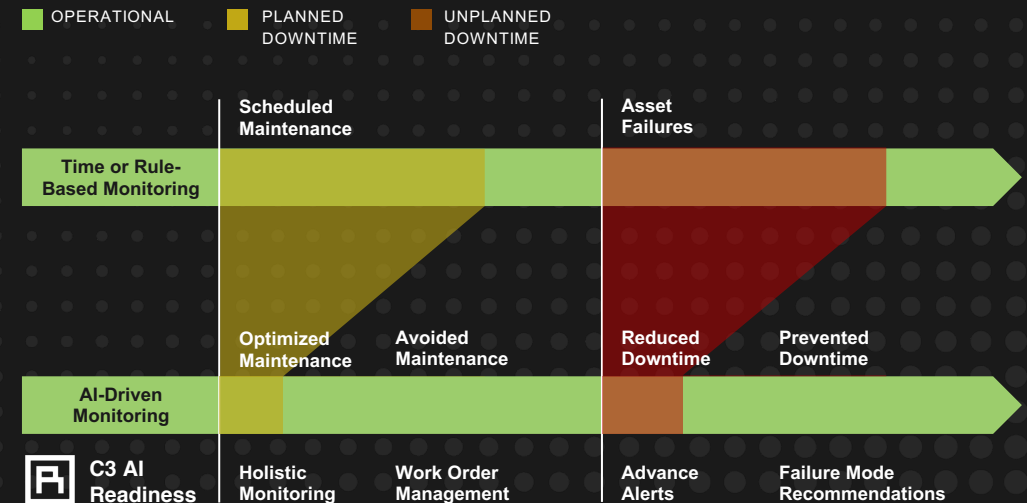
Unscheduled maintenance events predicted in time

Up to
35%

Reduction in downtime due to awaiting parts

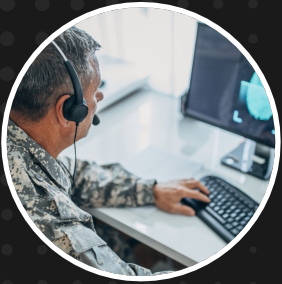
Up to
15%

Improvement in asset uptime



AI-Driven Maintenance Operations

AI-Enhanced Maintenance Planning



Maintenance Analysts

Receive alert of impending component issues

AI-Enhanced Failure Troubleshooting



Maintainers

Validate component health and asset readiness

AI-Enhanced Global Part Demand Visibility



Supply Chain Specialist

Ensure adequate supply and proactively order parts

AI-Enhanced Operational Decision-making



Leadership

Deploy operationally ready assets

SOLUTION IN ACTION

Announcements

US Defense Department Awards C3.ai \$95M Contract Vehicle to Improve Aircraft Readiness Using AI

January 15, 2020



AI for Predictive Maintenance

Improving Mission Readiness

Problem

- Distributed global logistics operations
- Legacy systems with maintenance challenges
- Performance data volume

Deployment Support

- AL Dhafra Air Base (UAE)
- Aviano AB (Italy)
- McEntire National Guard Base (SC)

Metrics for Success

- **Operation Impact:** now projecting 3-6% mission capability improvement and up to 40% unscheduled maintenance reduction
- **User Adoption:** Uptake rate & feedback of technology continue to improve over time with units and leadership
- **Savings:** Working with HHQ to quantify estimated financial projections



DIU is a fast-moving DoD organization that contracts with commercial companies to solve national security problems.

Accelerate

DoD adoption of commercial technology

Transform

Military capacity and capabilities

Strengthen

The national security innovation base

C3 AI + Raytheon: Partnering for a Resilient Future

The C3 AI + Raytheon Intelligence & Space alliance offers the only complete product suite designed to rapidly develop and scale Enterprise AI solutions for aerospace and defense missions that serve government customers across all domains, missions and classification levels.

This alliance provides the combination of leading provider of pre-built, proven Enterprise AI applications with mission domain experience of largest aerospace & defense manufacturer in the world.

For example, work is underway for the V-22 Joint Program Office to support Osprey tiltrotor¹ collision-avoidance Radar, a Raytheon product, for the Marines, Air Force Special Operations Command², and now the Navy³.

Additionally, the team is looking at ways to perform predictive maintenance on the many complex components.

1. <https://breakingdefense.com/2018/02/streamlined-mv-22-maintenance-from-70-osprey-types-down-to-5/>

2. <https://breakingdefense.com/tag/afsoc/>

3. <https://breakingdefense.com/2020/02/navy-gets-first-bell-boeing-cmv-22b-what-it-means/>



C3 AI + Raytheon: Proven Experience & Expertise

Raytheon Intelligence & Space (RI&S), a Raytheon Technologies business:

- Is a developer of advanced sensors, training, and cyber, and software solutions.
- Is delivering disruptive technologies that customers need to succeed.
- Provides a decisive advantage to military and commercial customers in more than 40 countries around the world.

RI&S's deep aerospace and defense knowledge and integration expertise, combined with extensive capabilities of C3 AI, helps military and intelligence communities improve readiness globally and accelerate decision making to maximize mission impact.



Ready to Get Started?

Learn how you can maximize mission capability using AI.

- 1 **Contact C3 AI**
- 2 **Test Drive**
- 3 **Meet with us**

Get started: c3.ai/get-started

