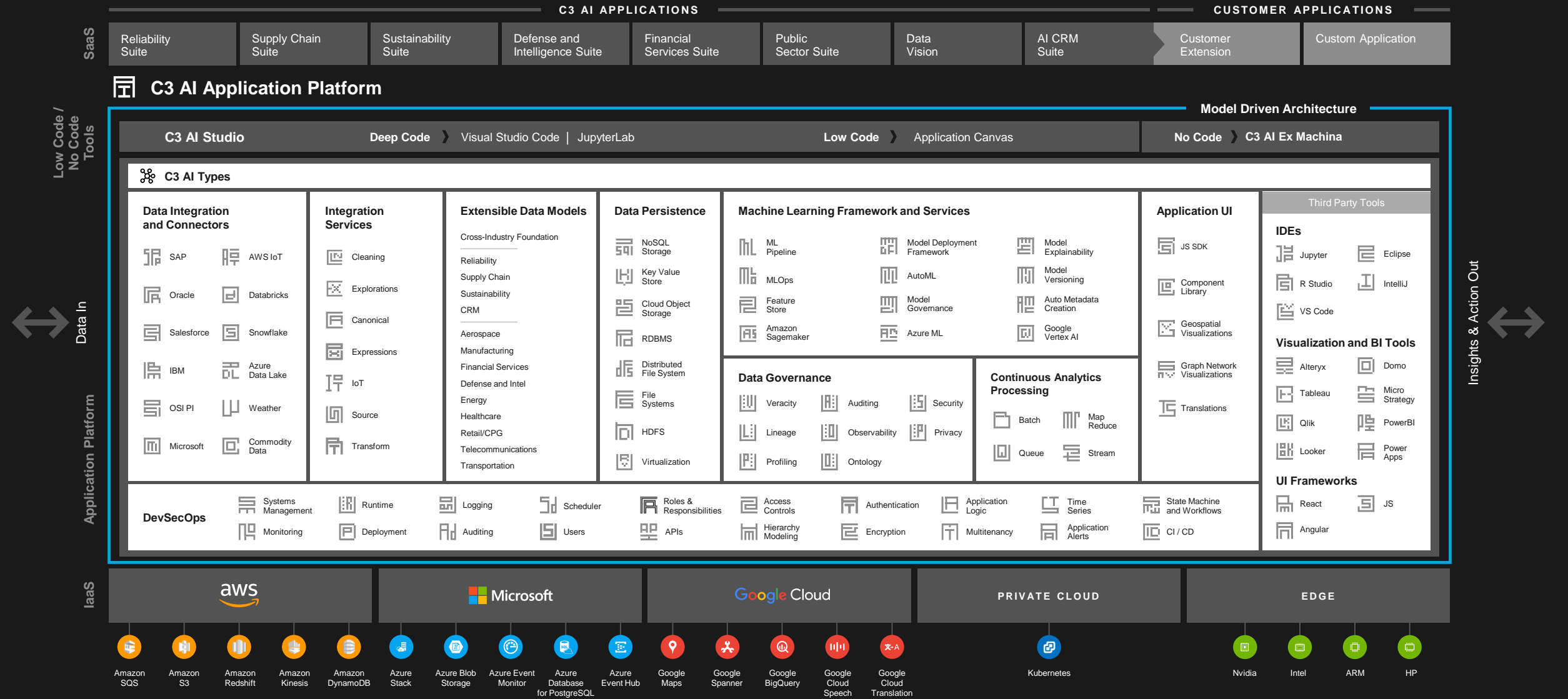**C3.ai**

Turnkey AI Solutions to Increase Readiness

AI Technology Impact Forum

September 2024

C3 AI's Enterprise AI Software

C3 AI APPLICATIONS   **CUSTOMER APPLICATIONS**

| SaaS | Reliability Suite | Supply Chain Suite | Sustainability Suite | Defense and Intelligence Suite | Financial Services Suite | Public Sector Suite | Data Vision | AI CRM Suite | Customer Extension | Custom Application |

C3 AI Application Platform

Model Driven Architecture

| Low Code / No Code Tools | **C3 AI Studio** | **Deep Code** ❯ Visual Studio Code \| JupyterLab | **Low Code** ❯ Application Canvas | **No Code** ❯ C3 AI Ex Machina |

C3 AI Types

Data Integration and Connectors
- SAP
- AWS IoT
- Oracle
- Databricks
- Salesforce
- Snowflake
- IBM
- Azure Data Lake
- OSI PI
- Weather
- Microsoft
- Commodity Data

Integration Services
- Cleaning
- Explorations
- Canonical
- Expressions
- IoT
- Source
- Transform

Extensible Data Models
- Cross-Industry Foundation
- Reliability
- Supply Chain
- Sustainability
- CRM
- Aerospace
- Manufacturing
- Financial Services
- Defense and Intel
- Energy
- Healthcare
- Retail/CPG
- Telecommunications
- Transportation

Data Persistence
- NoSQL Storage
- Key Value Store
- Cloud Object Storage
- RDBMS
- Distributed File System
- File Systems
- HDFS
- Virtualization

Machine Learning Framework and Services
- ML Pipeline
- Model Deployment Framework
- Model Explainability
- MLOps
- AutoML
- Model Versioning
- Feature Store
- Model Governance
- Auto Metadata Creation
- Amazon Sagemaker
- Azure ML
- Google Vertex AI

Data Governance
- Veracity
- Auditing
- Security
- Lineage
- Observability
- Privacy
- Profiling
- Ontology

Continuous Analytics Processing
- Batch
- Map Reduce
- Queue
- Stream

Application UI
- JS SDK
- Component Library
- Geospatial Visualizations
- Graph Network Visualizations
- Translations

Third Party Tools

IDEs
- Jupyter
- Eclipse
- R Studio
- IntelliJ
- VS Code

Visualization and BI Tools
- Alteryx
- Domo
- Tableau
- Micro Strategy
- Qlik
- PowerBI
- Looker
- Power Apps

UI Frameworks
- React
- JS
- Angular

DevSecOps
- Systems Management
- Runtime
- Logging
- Scheduler
- Roles & Responsibilities
- Access Controls
- Authentication
- Application Logic
- Time Series
- State Machine and Workflows
- Monitoring
- Deployment
- Auditing
- Users
- APIs
- Hierarchy Modeling
- Encryption
- Multitenancy
- Application Alerts
- CI / CD

Data In — *Insights & Action Out*

Application Platform

| IaaS | aws | Microsoft | Google Cloud | PRIVATE CLOUD | EDGE |

- Amazon SQS
- Amazon S3
- Amazon Redshift
- Amazon Kinesis
- Amazon DynamoDB
- Azure Stack
- Azure Blob Storage
- Azure Event Monitor
- Azure Database for PostgreSQL
- Azure Event Hub
- Google Maps
- Google Spanner
- Google BigQuery
- Google Cloud Speech
- Google Cloud Translation
- Kubernetes
- Nvidia
- Intel
- ARM
- HP

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C3 AI Select Customers

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Select Defense & Intelligence Use Cases

USAF RSO
(Readiness)

Local Law Enforcement
(Investigation Dossier)

MDA
(Modeling & Simulation)

F-35 JPO
(Data Fusion)

DCSA
(Continuous Evaluation)

USA & AFC
(Model Trust)

CDAO
(Executive Decision Support)

Prime Contractor
(Production & Supply Chain Optimization)

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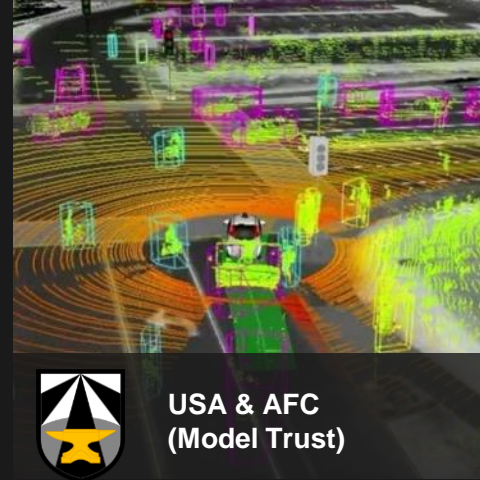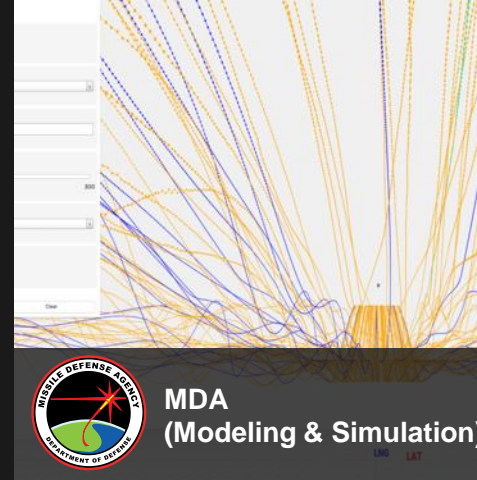
Turn-Key Enterprise AI Applications

Financial Services

C3 AI Anti-Money Laundering

C3 AI Smart Lending

C3 AI Cash Management

C3 AI Securities Lending Optimization

C3 AI Customer Churn

C3 AI CRM

Manufacturing

C3 AI Inventory Optimization

C3 AI Supply Network Risk

C3 AI Reliability

C3 AI Digital Twin

C3 AI Process Optimization

C3 AI Energy Management

C3 AI Production Schedule Optimization

C3 AI CRM

Aerospace & Defense

C3 AI Readiness

C3 AI Data Fusion

C3 AI Intelligence Analysis

C3 AI Workforce Analytics

C3 AI Reliability

C3 AI Inventory Optimization

C3 AI Supply Network Risk

C3 AI Customer Churn

C3 AI Energy Management

C3 AI CRM

Healthcare

C3 AI COVID-19 Data Lake

C3 AI Safe Cities

C3 AI Inventory Optimization

C3 AI Supply Network Risk

C3 AI Reliability

C3 AI Fraud Detection

C3 AI Energy Management

C3 AI CRM

Telecom

C3 AI Reliability

C3 AI Digital Twin

C3 AI AMI Operations

C3 AI Customer Engagement Portals

C3 AI Energy Intelligence

Smart Institutions

C3 AI Fraud Detection

C3 AI CRM

Oil & Gas

C3 AI Inventory Optimization

C3 AI Reliability

C3 AI Digital Twin

C3 AI Production Optimization

C3 AI Well Development Optimization

C3 AI Process Optimization

C3 AI Energy Management

C3 AI Production Schedule Optimization

C3 AI CRM

Utilities

C3 AI Reliability

C3 AI Digital Twin

C3 AI Revenue Protection

C3 AI AMI Operations

C3 AI Customer Engagement Portals

C3 AI Energy Management

Smart Institutions

C3 AI Fraud Detection

C3 AI CRM

Energy Sustainability

C3 AI Reliability

C3 AI Inventory Optimization

C3 AI Customer Insights

C3 AI Supply Network Risk

C3 AI Fraud Detection

C3 AI Energy Management

C3 AI CRM

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AI Software Cluster

AI Software Stack

Cloud Object Storage
- Amazon S3
- SQL Data Warehouse
- Azure Data Lake
- Azure Blob
- snowflake

Batch Processing
- APACHE STORM
- APACHE Spark
- Azure Analysis Services
- Amazon SageMaker
- Amazon DynamoDB
- Amazon RDS
- databricks

Relational Database
- HIVE
- APACHE DRILL
- Cloud Spanner
- Amazon Aurora

Stream Processing
- APACHE STORM
- APACHE Spark
- Stream Analytics
- Amazon DynamoDB
- Azure Event Hubs
- AWS Lambda

Data Integration
- AWS IoT
- IBM MQ
- confluent
- Amazon Kinesis
- talend
- HDInsight
- kafka
- AWS Lake Formation
- AWS IoT Events
- Amazon SNS
- Amazon SQS
- Amazon Firehose
- AWS CloudFormation

Machine Learning Framework and Services
- TensorFlow
- Azure ML?
- H2O.ai
- DataRobot
- KNIME
- rapidminer
- NVIDIA
- ECLIPSE FOUNDATION
- skymind

ECLIPSE FOUNDATION
Jupyter
R

Application Development Tools

Non Relational Database

CLOUDERA
cassandra

hadoop HDFS

Hadoop Storage

- Amazon DynamoDB
- DATASTAX

NoSQL Storage
- mongoDB.
- Cloud Spanner

Data Connectors, APIs, Enterprise Application Infrastructure
- Amazon API Gateway
- Amazon CloudFront
- Amazon CloudWatch
- Elastic Load Balancing
- AWS CloudTrail
- Azure Data Factory
- Azure Data Catalog
- TIBCO Spotfire
- Grafana

Platform Management Services
- Apache Ambari
- OOZIE
- Trusted Advisor

Search?

- SAS
- KNIME
- rapidminer
- Solr
- Azure Data Explorer

Data Exploration Tools

UI and Data Visualization Tools
- tableau
- alteryx
- DOMO
- MicroStrategy
- Qlik Q

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In enterprise AI the **algorithm** is less than 5% of the code

Configuration

Data Collection

Data Verification

ML

Analysis Tools

Feature Extraction

Process Management

Machine Resource Management

Serving Infrastructure

Monitoring
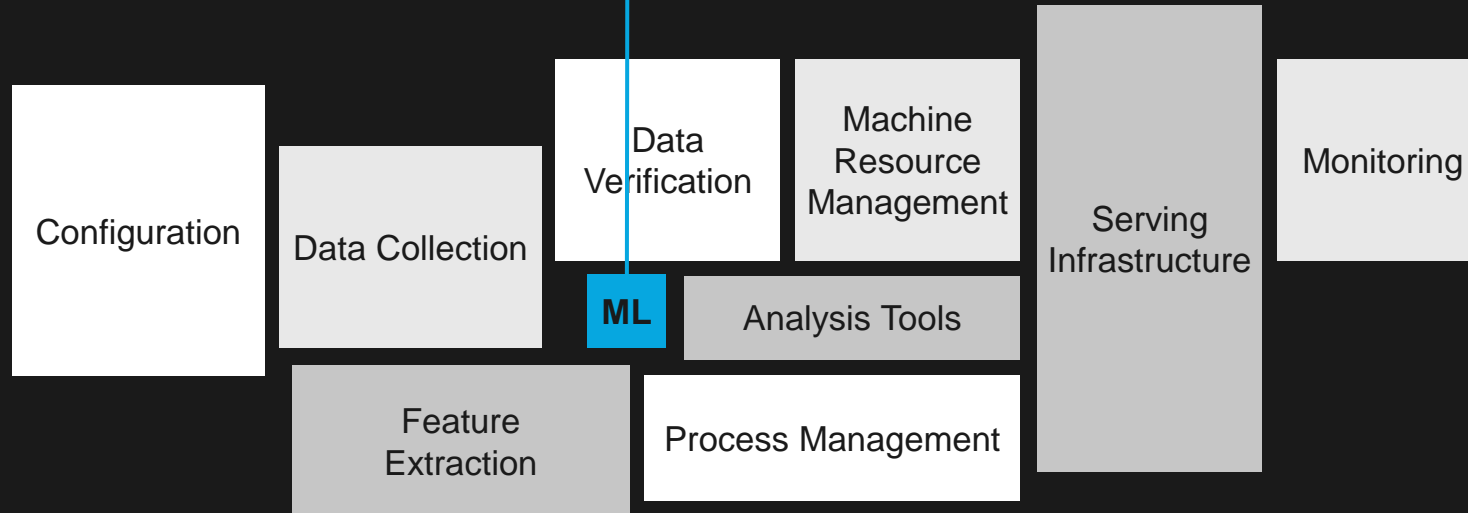
– D. Sculley, et. al., Hidden Technical Debt in Machine Learning Systems, NIPS 2015[1]

1. http://papers.nips.cc/paper/5656-hidden-technical-debt-in-machine-learning-systems.pdf

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Our Approach

C3 AI Platform

C3 AI Named a Leader in AI and Machine Learning Platforms

FORRESTER®
WAVE LEADER 2022
AI and Machine Learning Platforms

Model-Driven Architecture

| C3 AI Studio | *Deep Code* | *Low Code* | C3 AI Ex Machina | *No Code* |

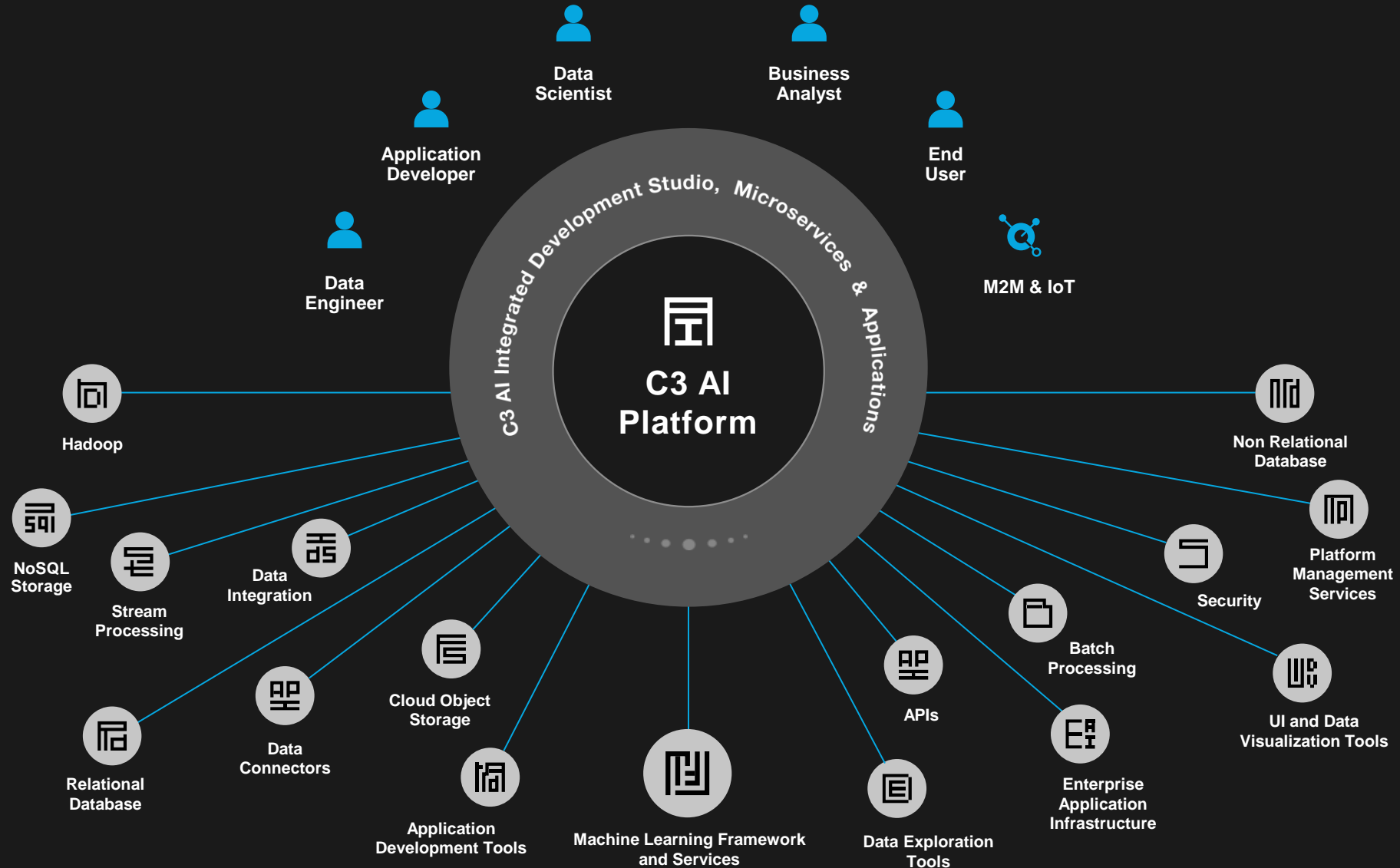| Data Integration | > | AI/ML Model Development, ML Ops, and Application Development | > |

| Operations & Security Services | > |

| aws | Microsoft | Google Cloud | Private Cloud | Edge | > |

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Faster, Flexible Approach with Model-Driven Architecture

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Accreditation Status

Chief Digital + AI Office	Defense Counterintelligence + Security Agency (DCSA)	USAF Rapid Sustainment Office (RSO)	Crowd Source Flight Data (CSFD)	Missile Defense Agency (MDA)	Health + Human Services (HHS)
Swap Approved	**ATO Awarded**	**ATO Awarded**	**ATO Awarded**	**Software Approved**	**ATO Awarded**
IL-5 CUI, IL-6 SECRET, JWICS	IL-5 CUI	IL-5 CUI	IL-5 CUI, IL-6 SECRET	IL-6 SECRET	FedRAMP Moderate
aws	aws	aws	On Prem	Microsoft	aws

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Use Cases Enabled by the C3 AI Platform

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Aircraft Readiness

Objective — Enable digital transformation by deploying machine-learning and advanced analytics across the United States Air Force (USAF) Rapid Sustainment Office (RSO) to deliver a mission enabling insights, optimize maintenance processes, and develop new digital products & services.

Key Results

22+
USAF Aircraft Platforms

C3 AI Suite Enabled Predictive Maintenance

B1-B	F-16	E-4B
F-15	C-17	E-4B
KC-135	B-2A	T-38C
C-5M	B-52H	…

CLOUD ONE
Deployment Environment

1,000+
Target User Community

20+
User Discovery Interviews Completed

14.5TB+
Maintenance Data & Supply Records

6
Systems of Record Identified

IMDS	G0-81
ILS-S	RAMPOD
eMOCC	PEX

+$5.0B
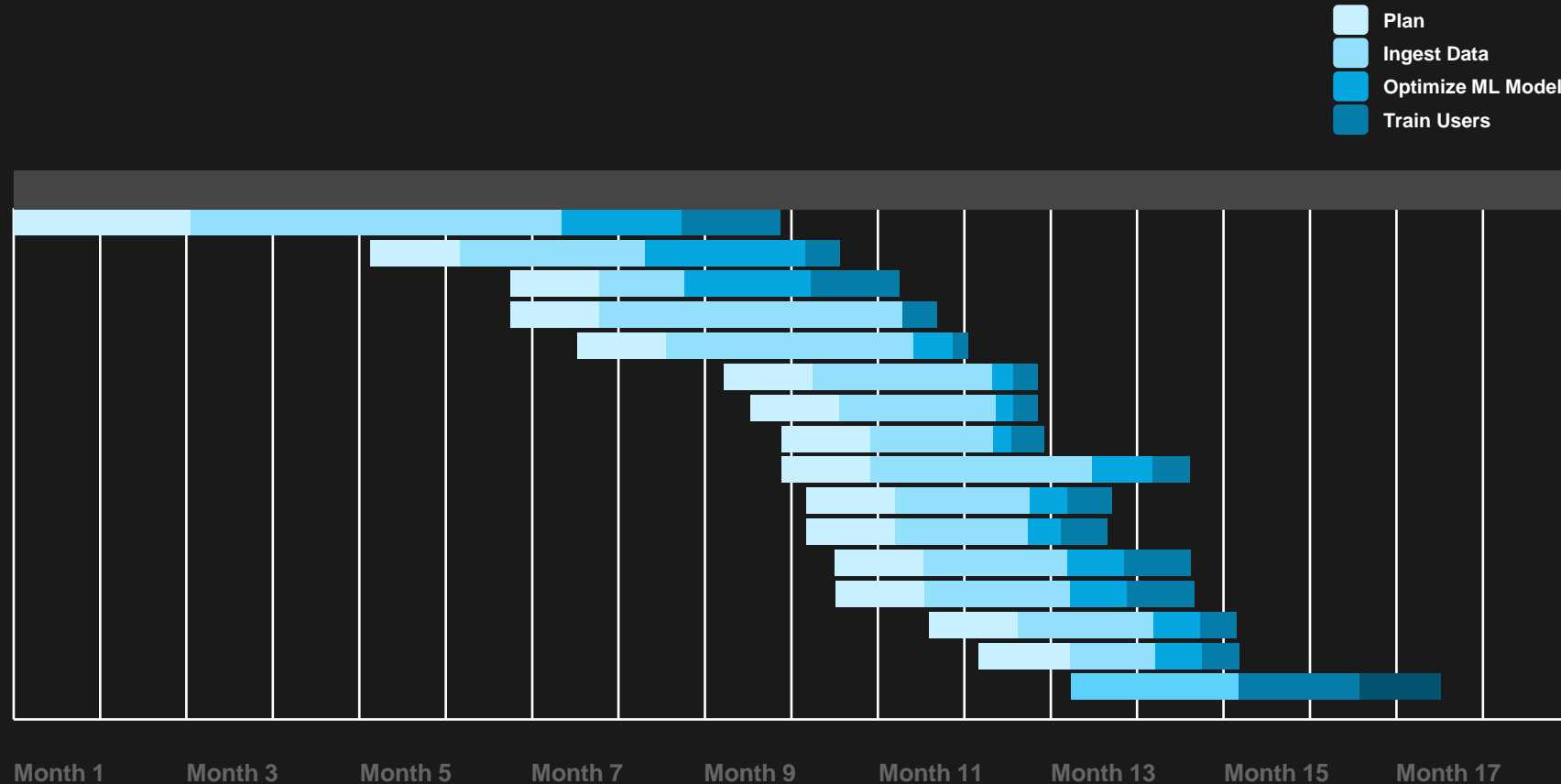**Potential DoD Savings with Predictive Maintenance capabilities fully implemented**

"By partnering with C3.ai, RSO's CBM+ Program Office will be able to accelerate scaling AI and ML capabilities across the Air Force enterprise, and combine data science with Air Force operational maintenance, to digitally transform how we maintain our global fleet."

– **Nathan Parker,** *RSO Deputy Program Executive Officer*

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USAF Rapid Sustainment Office Readiness Rollout
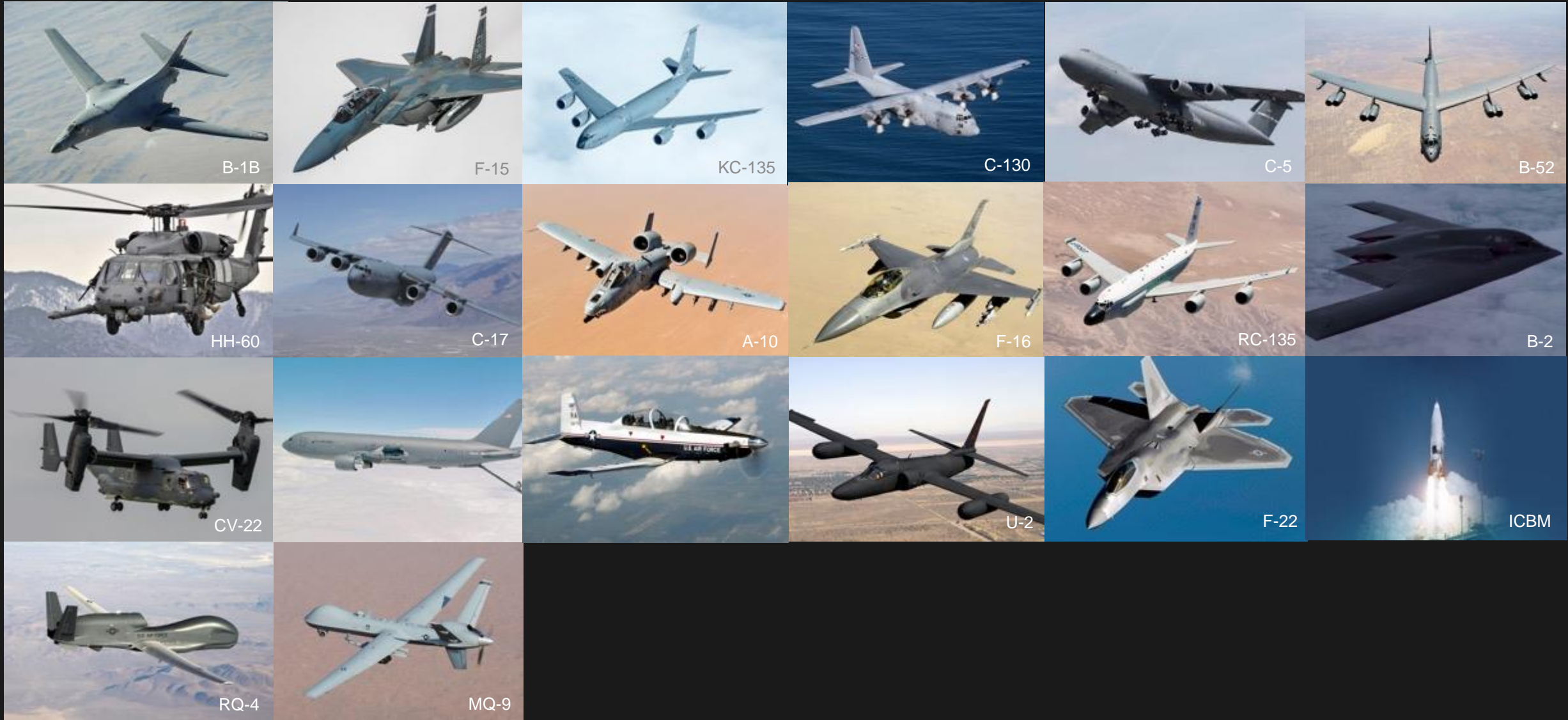
Enterprise AI for the US Air Force: Rapid scalability across aircraft platforms with accelerating time-to-value through high reuse

Legend:
- Plan
- Ingest Data
- Optimize ML Model
- Train Users

Month 1   Month 3   Month 5   Month 7   Month 9   Month 11   Month 13   Month 15   Month 17

First 16 Platforms in 16 Months

Enterprise AI for the US Air Force: C3 AI Readiness named the System of Record for Predictive & Conditions-Based Maintenance

U.S. AIR FORCE

RAPID SUSTAINMENT OFFICE RSO

PANDA – The Predictive Analytics & Decision Assistant – powered by C3 AI has been designated

the US Air Force system of record

for all USAF Conditions Based Maintenance Plus and Predictive Maintenance (April 14, 2023)

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CASE STUDY

Generative AI for Intelligence Retrieval

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C3 AI Intelligence
Generative AI for Intelligence Retrieval

Objective

Configure C3 AI Generative AI Suite to support intelligence community report production by enabling **natural language search** of key contextual data such as order of battle.

Project Details

7	**4-part**	**6**
classified datasets	workflow supported by natural language queries	data types, including track files, imagery, and parametric and non-parametric entity data

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Generative AI for Intelligence Retrieval

Structured Response

Unstructured Response

Access Control-Consistent

Natural language search and sourced responses from 7 IC systems/databases

USE CASE

USSOCOM Commander's Dashboard

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Commander's Dashboard Suite

Enable decision makers and their staff at all echelons to develop insights rapidly across the entire enterprise

Mission

- **Command Visibility** to understand the health of an organization in real-time

- **Risk Mitigation** across command staff focus areas

- **Enterprise Alignment** with interconnected, operational dashboards

Challenge

1. Modernize user experiences to enable **intuitive navigation** across priorities

2. Define and connect the essential data for **impactful analytics**

3. Enable in-application **goal creation and tracking** to define success

SOCOM Overview
(CG Landing Page)

Manpower	Money	Materiel	Education (Talent Management)
Recruit and Retain	Cancelling / Expiring Funds	Equipment	Professional Military E
Dwell-to-Deployment	Burn Rate	Supply	JSOU Ed
Non-Deployable Status	Audit Compliance	Program Performance	
Personnel Readiness		Program Transition	
Health of SOCOM			
Commander Zone			
Personnel Accountabili			

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CASE STUDY

Logistics Supportability Analysis

Joint Staff J4 Logistics Feasibility and Supportability Planning for Operational COAs

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C3 AI Joint Staff J4 Logistics Support Analysis

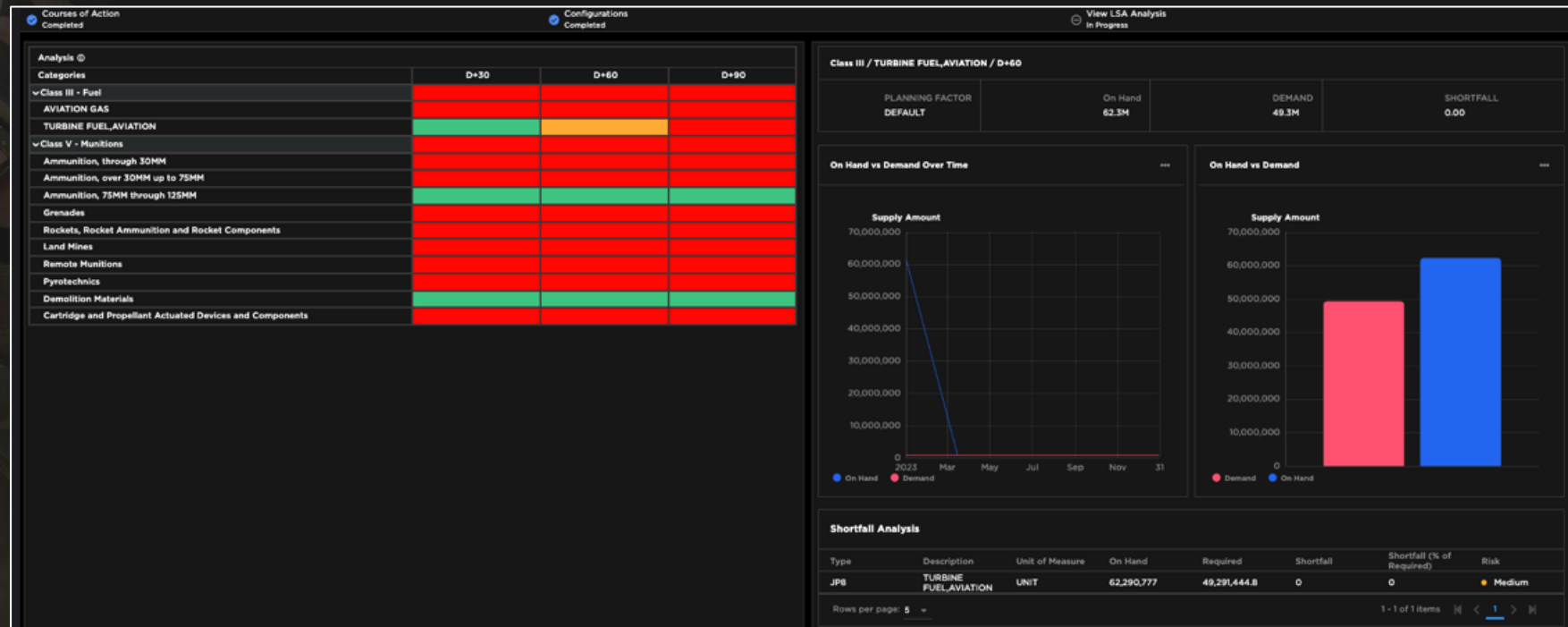**Enables**

Rapidly estimate and **forecast** operational mission sustainment requirements (e.g., bulk fuel, ammunition)

Evaluate and modify sustainment plans in **minutes** vice **weeks** to support multiple Operational Plans

USTRANSCOM
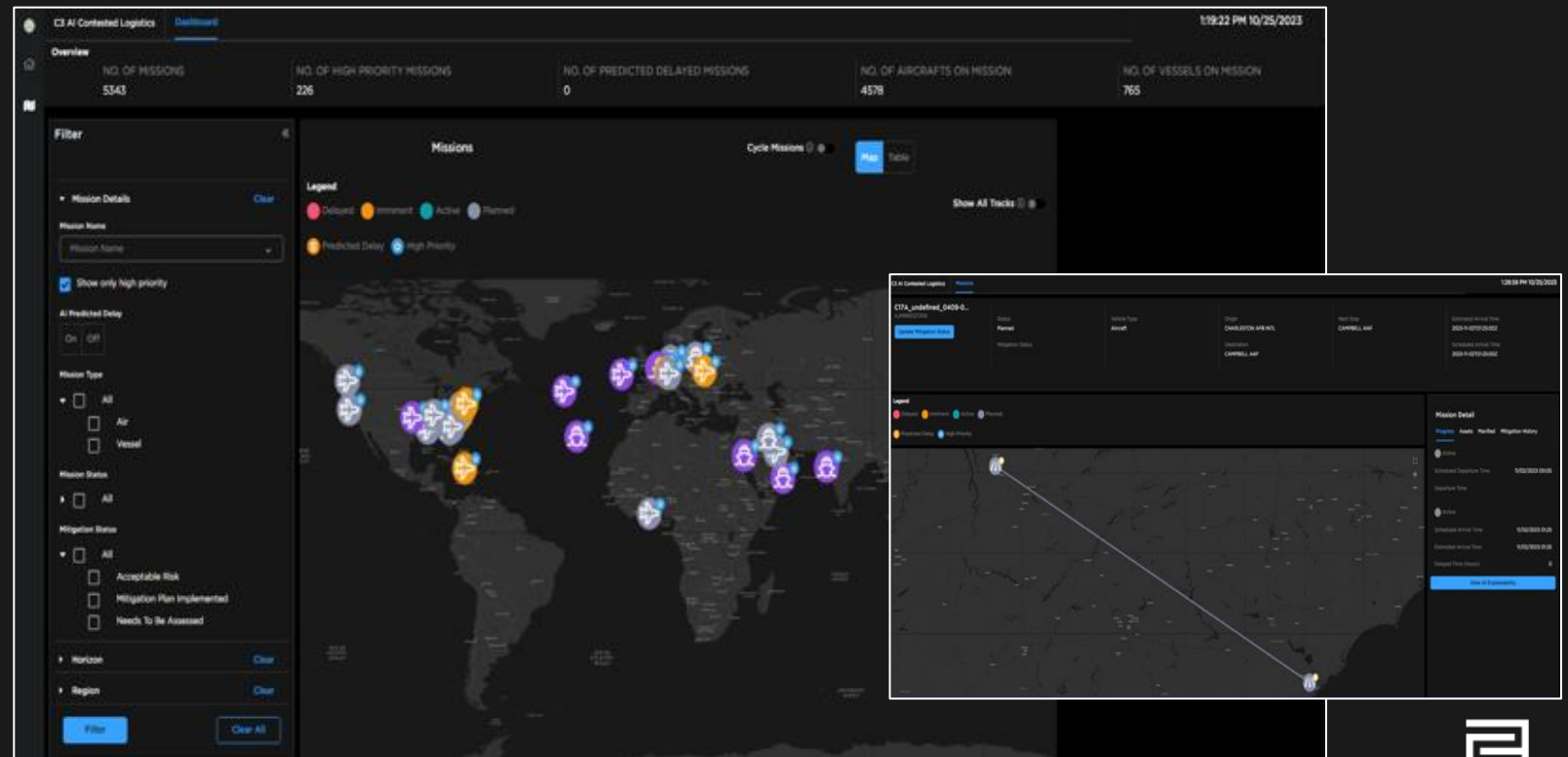## *Contested Logistics Global Operations Center*

C3 AI Contested Logistics
USTRANSCOM

Enables

Global insight into the status of troops and cargo movements via air and sea missions

Increased identification of mission delays by **200%** from **1.7K to 4.2K**

Capability provides the foundation for COA development and analysis
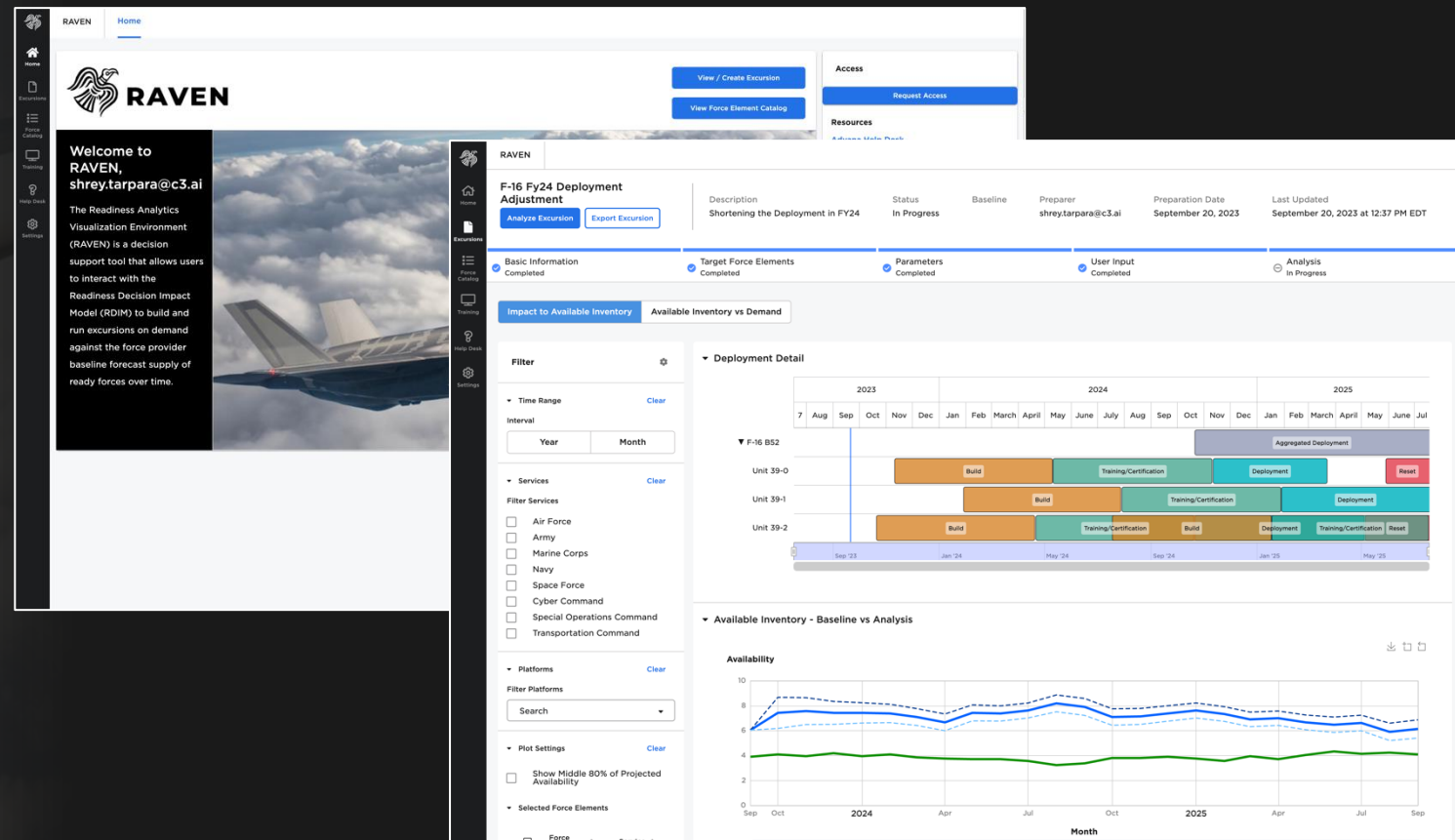
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RDIM / RAVEN
Strategic Force Readiness Forecasting

C3 AI's Readiness Analytics Visualization Environment (RAVEN)

Enables

Simulation of global resource planning scenarios and readiness impacts

Generation of insights on how to respond to emerging global threats

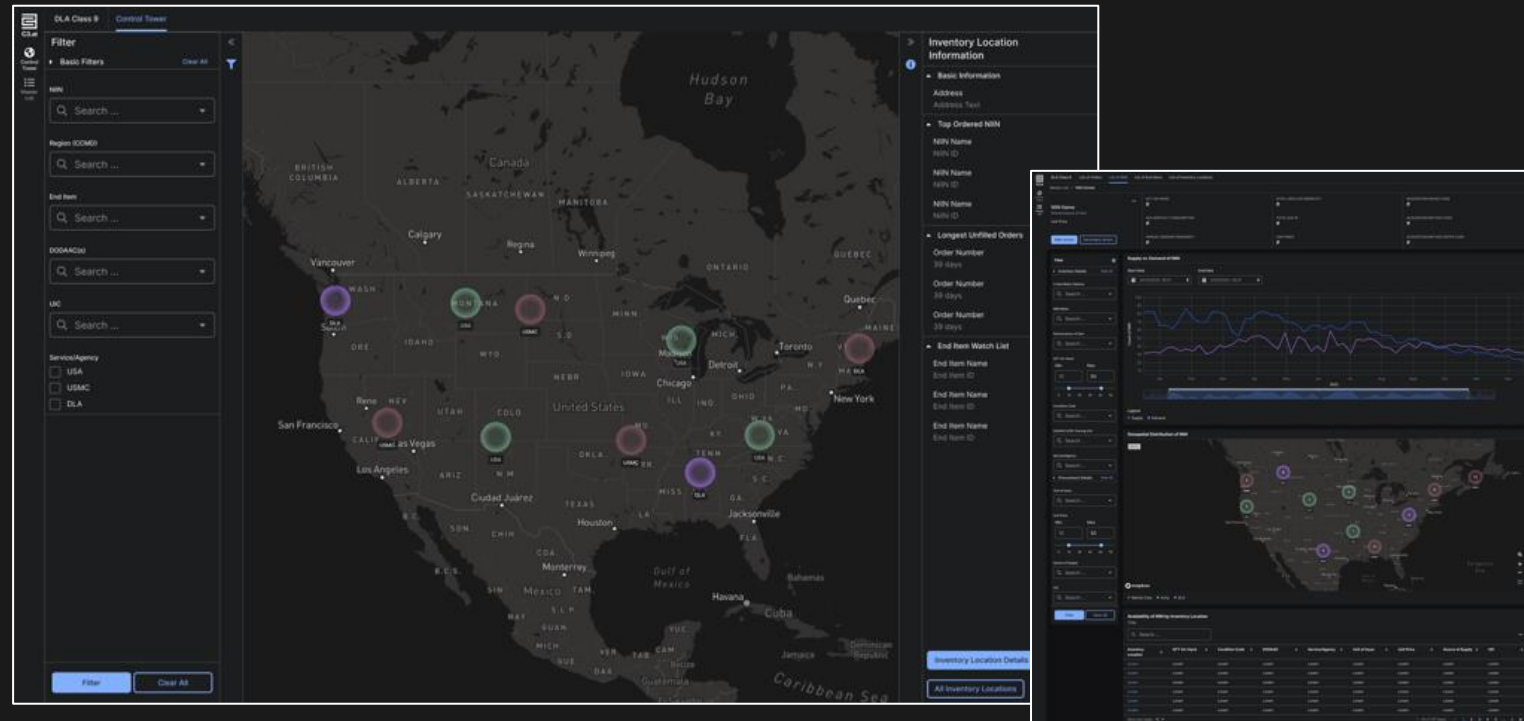# C3 AI Contested Logistics for DLA J3 (Supply Class IX)

C3 AI Contested Logistics
DLA Class IX Supply

Enables   **Instant** global visibility of **Class IX** supply part inventory across DLA, US Army, and US Marine Corps for the first time

Enables optimal part positioning and replacement

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# C3 AI Contested Logistics for DLA Energy (Supply Class III)

C3 AI Contested Logistics
DLA Energy (Class III) Supply Logistics

Enables

Instant global visibility of global petroleum, oil, and lubricants across 492 fuel depots

Forecasted fuel depot inventory levels and risks to enact mitigation plans

Increased risk lead time from **10 to 90 days** and reduced false positives by 50%

Screenshot – unclassified data
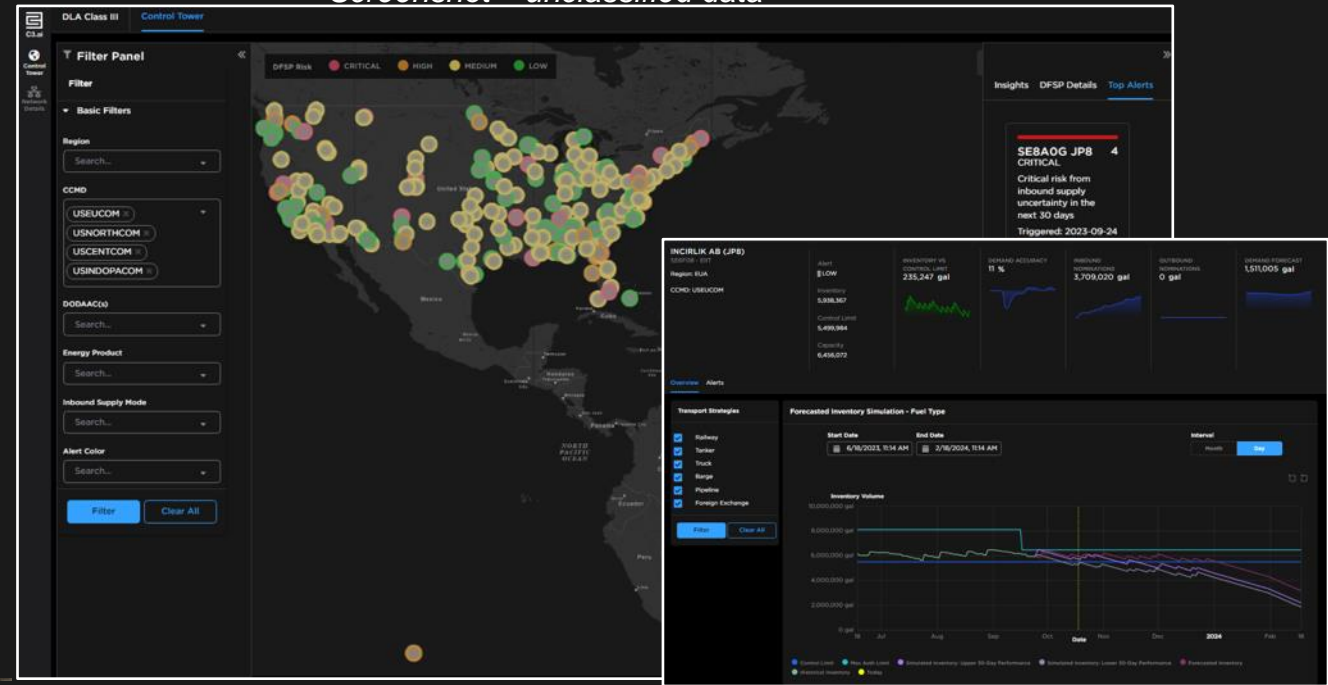
USE CASE

Data Integration Network for Operational Energy

Data Unification, Entity Resolution, & Fuel Consumption Modeling

Challenge

Develop a scalable AI-enabled predictive analytics application to provide an enterprise view of USAF energy optimization initiatives and predict fuel consumption for KC-135 and C-17 sorties

Pilot Details

7	**1.2B**	**20TB**	**3**
Siloed data sources unified	Rows of data ingested	Data analyzed	Production level AI/ML models

Results

92% Reduction in time from raw data to insights

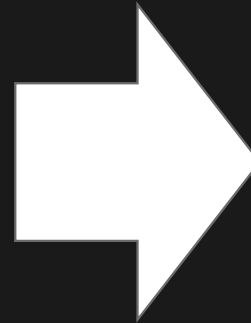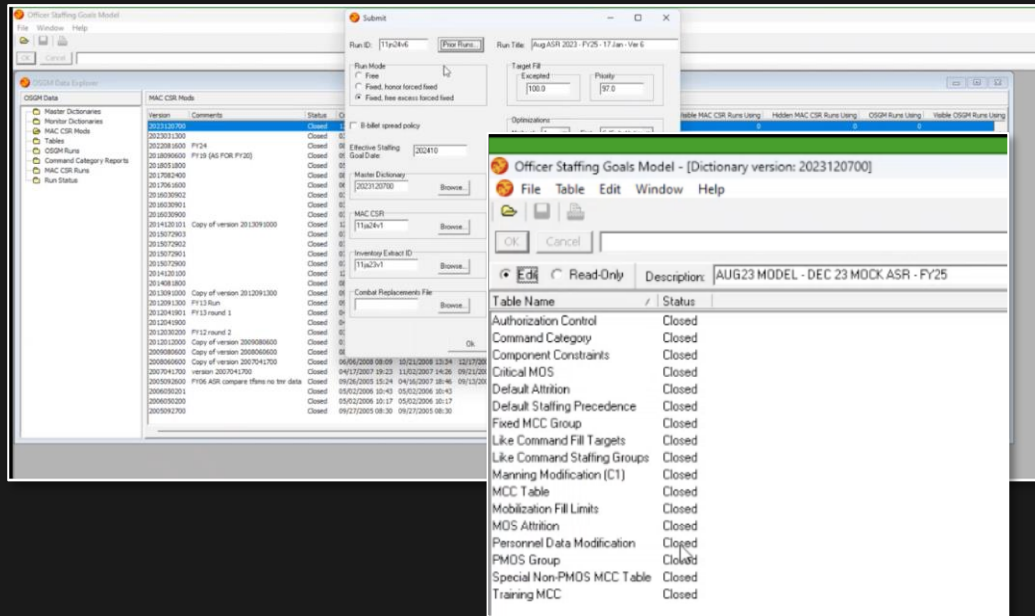**200x** Increase in data available for continuous analysis

1-2 Weeks to onboard a new aircraft platform

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USMC Staffing Goal Models Application Value Delivered

Legacy Officer Staffing Goal Model

Commander's Dashboard – USMC Staffing Goal

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