

DEPARTMENT OF THE AIR FORCE CHIEF DATA & AI OFFICE

INTEGRITY . SERVICE . EXCELLENCE

MAJ GEN JOHN M. OLSON, PH.D.
CHIEF DATA & AI OFFICER, DAF





DAF: DELIVER DYNAMIC AIR, SPACE, & CYBER

Data & AI/ML/DL are Foundational



Operationalization of
Data & AI/ML/DL
Readiness

DAF in 21st Century: Data-
Driven & Digitally
Dominant

Strategic Digital
Imperative: Enterprise
IT, Data, Analytics,
AI/ML/DL

Operational Imperative: Deliver
Decision/Information
Advantage

"In God We Trust, All Others Must Bring Data."

- W. EDWARDS DEMING



OPERATIONAL NEED: DIGITAL DOMINANCE

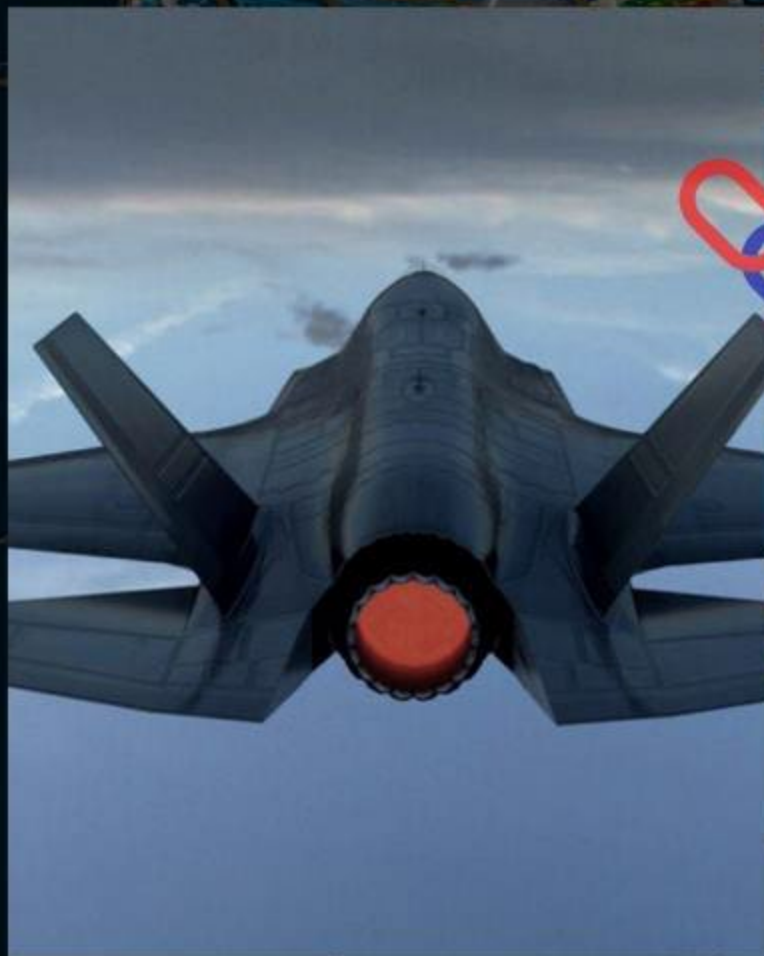


Deliver Mission Solutions at the Speed of Need



CALL TO ACTION

Transforming the Future Battlespace

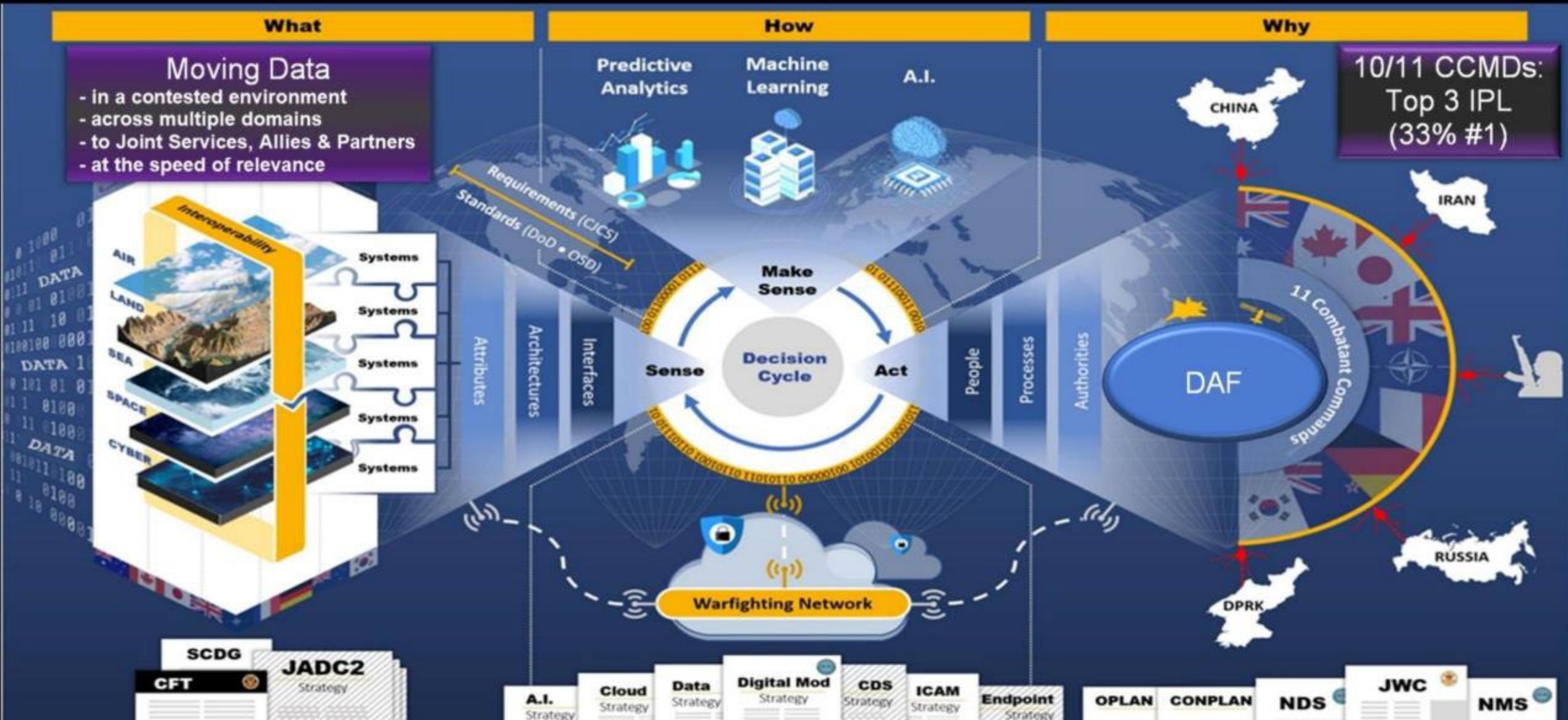


Being AI-Competitive by 2027 means we must

"Lead, Breed, Feed, Heed, & Do the Deed at the Speed of NEED."



DATA & AI ARE STRATEGIC IMPERATIVES





SECAF OPERATIONAL IMPERATIVES (7 OIS)

"...moving from [AI] experimentation to real military capability in the hands of operational warfighters, significantly reduced the manpower-intensive task of manually identifying individual targets, shortening the kill-chain, & accelerating the speed of decision making."



Mr. Frank Kendall
United States Secretary of the Air Force





Pu

$[Rn]7s^2 5f^6$
plutonium
(242)

DATA IS THE NEW **PLUTONIUM**

Data is not the new oil...it is the new PLUTONIUM.

It needs to be **enriched** and **refined**.

"Amazingly powerful, dangerous when it spreads, difficult to clean up and with serious consequences when improperly used."

- Jim Balsillie, International Businessman





OPERATIONALIZING

DATA

BIG
DATA

FOR
DECISION-ADVANTAGE

AND MISSION SUCCESS

Key Outcomes:

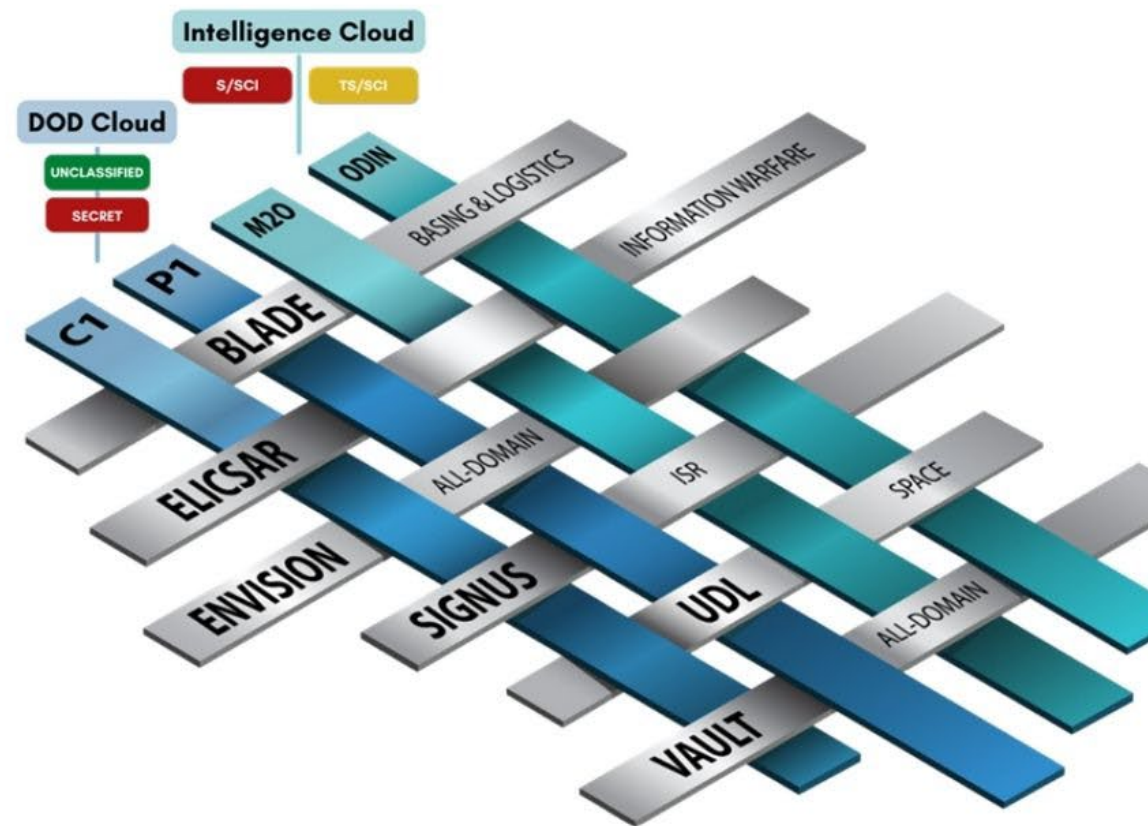
AI Ready: 2025, AI Lead: 2027

Increase Business Enterprise Efficiency – 30%

Increase Mission Operations Capability – 25%

Increase Warfighting Capacity – 2x

DAF DATA FABRIC





DATA & PEOPLE

ARE OUR
GREATEST
ASSETS

All elements of digital transformation — big data, analytics, artificial intelligence, and machine learning — depend on having secure, high-quality data and a well-trained, data-savvy workforce.





IGNITING FOCUSED INNOVATION

CDAO must **drive**
innovation for key tech
areas to provide **mission**
impact across DAF OIs.

- DATA AS A STRATEGIC ASSET
- HUMAN MACHINE LEARNING
- ADVANCED SCENE UNDERSTANDING
- INTELLIGENT EDGE DEVICES, COMPUTING, & NETWORKING
- ROBUST & RESILIENT AI
- TEST & EVALUATION VERIFICATION & VALIDATION
- NOVEL MACHINE LEARNING APPROACHES
- MORE GENERAL AI





US AIR FORCE

US SPACE FORCE

FOUR PILLARS OF DAF CDAO



People

- Recruiting, Results, and Retention
- Scaling for Success
- Industry & Academia Partnerships
- Growing a Mission-driven Workforce

Policy

DAF AI policy aligns to DoD and Federal policies around AI



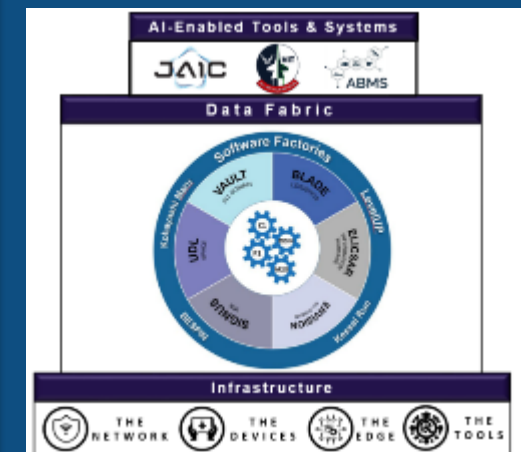
Principles

DoD AI Ethical Principles

- **Reliable** – Testing and assurance of well-defined use cases
- **Governable** – Detect and Avoid unintended consequences and behavior
- **Responsible** – Humans remain responsible for AI decisions
- **Equitable** – Minimize unintended bias
- **Traceable** – Transparent auditable methodologies, data provenance, and documentation

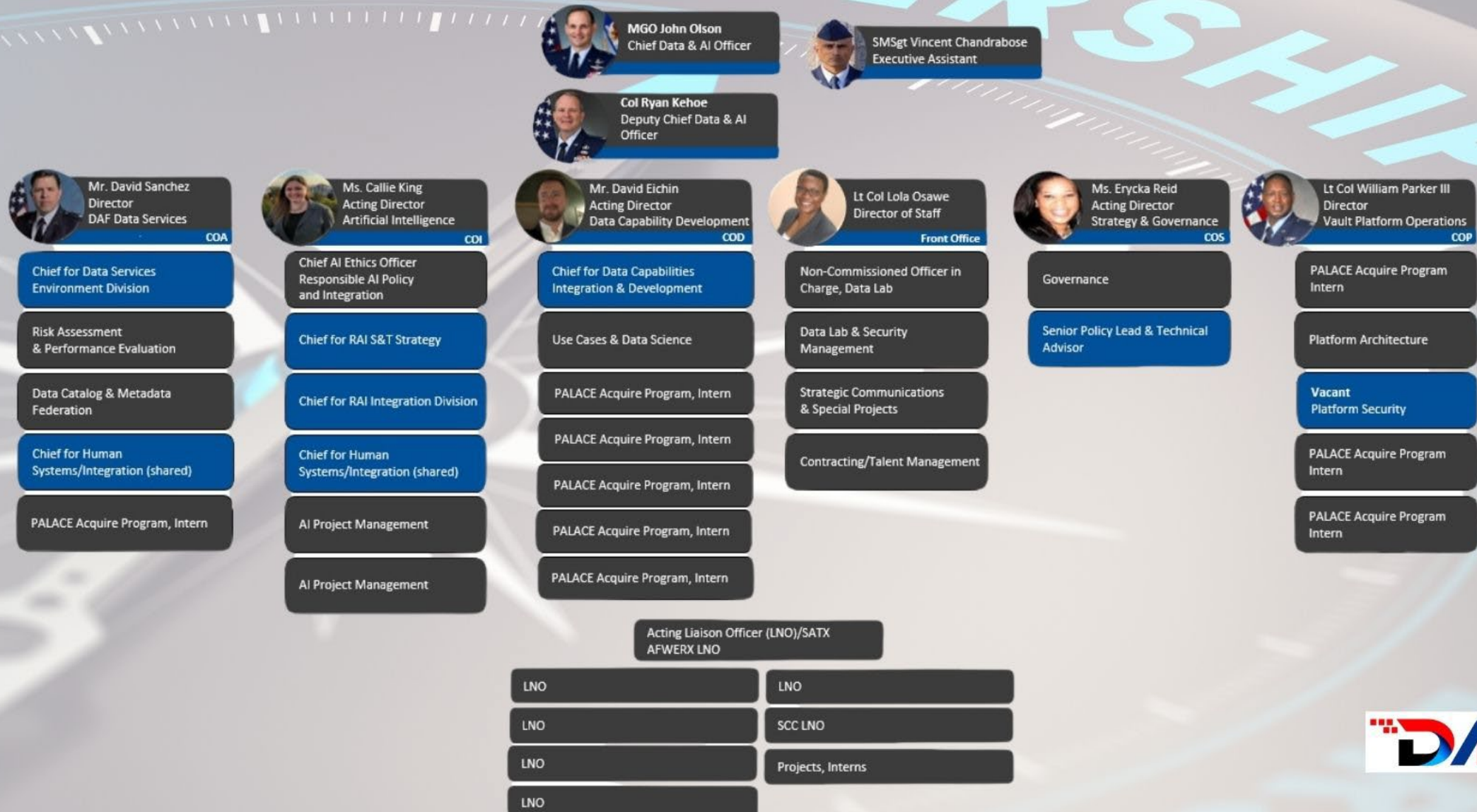
Products

DAF Data Fabric and the Technology Roadmap





CHIEF DATA & AI OFFICE ORGANIZATIONAL CHART





MISSION + VISION



DATA



AI*

VISION

Operationalize all DAF enterprise data for increased business efficiency, mission capability and warfighting capacity

Enable world-class RAI-powered Air, Space & Cyberspace solutions for US National Security

MISSION

Lead DAF data innovation, management and governance or responsive data-driven decisions and Information Advantage

Lead advancement and operationalization of data and AI to empower and enlighten Airmen and Guardians for U.S. Information Advantage

GOALS

1. Fully optimize, leverage and integrate the DAF Data Fabric
2. Ensure all DAF data has VAULTIS attributes
3. Train, develop and retain a data-savvy workforce
4. Create a data-centric culture of innovation and action

1. Become a global leader in RAI & ethics for defense mission systems and operations
2. Expand DAF mission capabilities for Decision Advantage
3. Be AI-Ready by 2025 & AI-Competitive by 2027

DATA → DATA DRIVEN DECISIONS → DECISION / INFORMATION ADVANTAGE



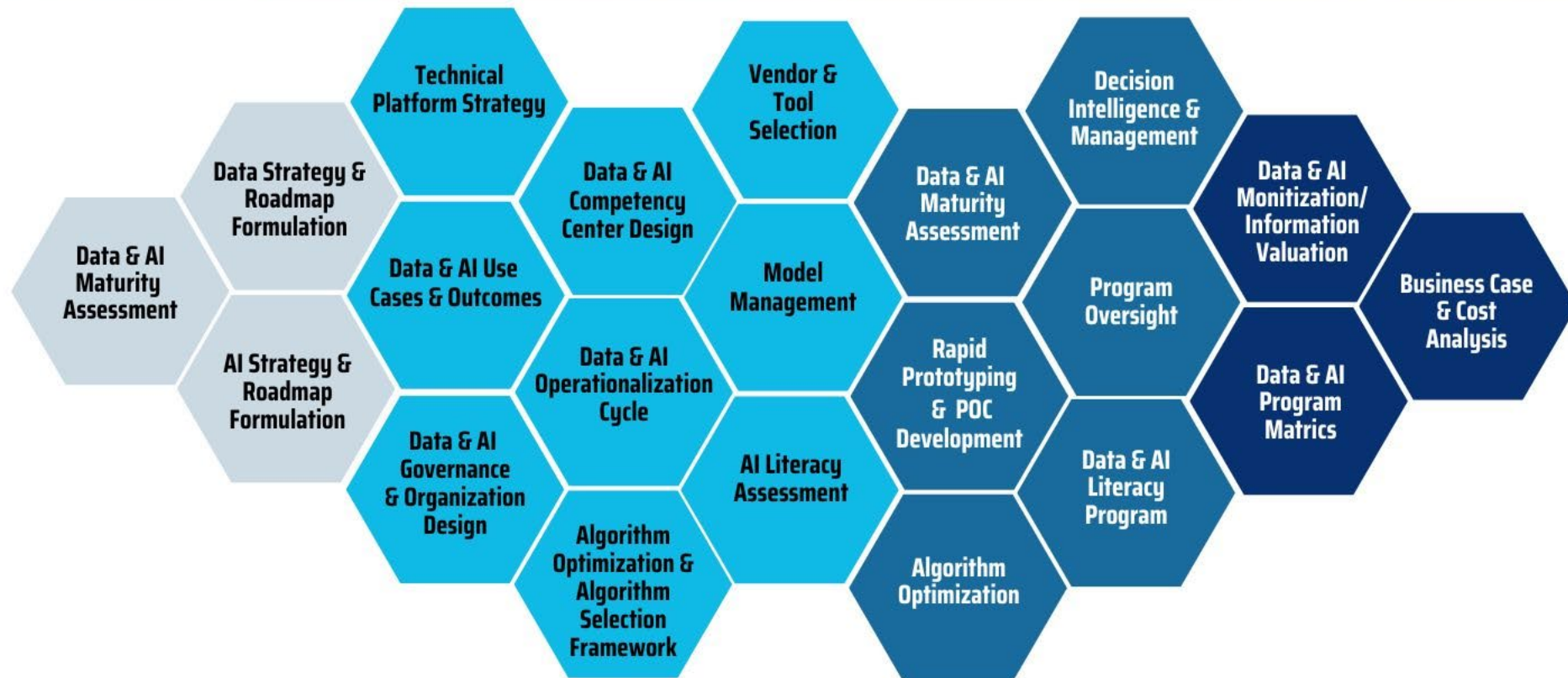
DATA & AI JOURNEY

Strategize and Plan

Operationalize

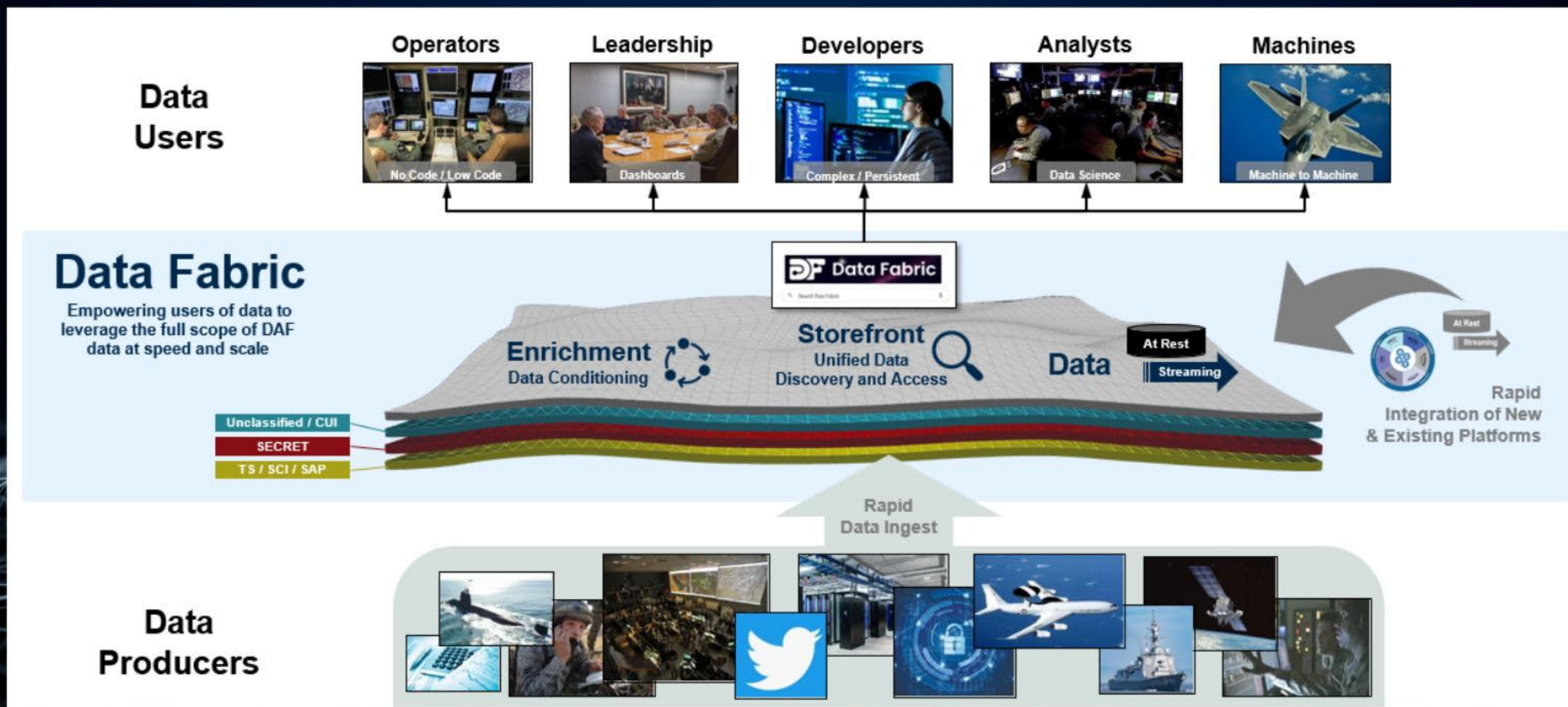
Accelerate Deployment

Realize Value





DAF ENTERPRISE DATA ARCHITECTURE





DAF DATA & AI FY22 ACTIONS

Policy & Products

Conduct a DAF AI maturity assessment and gap analysis: 3Q22
Integrate w/JAIC on 2022 DoD AI Strategy, DAF AI Strategy: 3Q22
Contracting Policy for AI-Ready Data as a Deliverable: 3Q22
Enterprise Metadata Standards and Policy: 3Q22
DAF RAI Governance Framework and Charter: 3Q22
Enterprise Data Catalog Standards and Policy: 4Q22
Support DoDD 3000.09 Re-write (FY22-23)
Stewardship Policy: CY23
Weapon System Interface Policy: CY23

People

AI Directorate Resourcing Plan: 2Q22
DAF SCSP: 2Q22, DAF AI HQE: 3Q22
Joint Duty Civilians: 4Q22
Drive AI & CHCO Manpower studies for AI Req't's
Attract AI talent into DAF (Mil, Civ, Ktrs)
Cultivate a Data/Digital-savvy AI-ready Workforce

Resources

Data Technical Roadmaps (OV-1 & SV-1): 3Q22
RAI Analysis: Enterprise Data & AI Req't's, R&Rs: 3Q22
FY23 Adjustments, FY24 POM: 2Q22, 3Q22





TODAY'S SUCCESSES

2019-2020 VAULT, UDL, SIGNUS, ELICSAR, ENVISION, BLADE Initiated as prototypes and pathfinders

External Collaborations

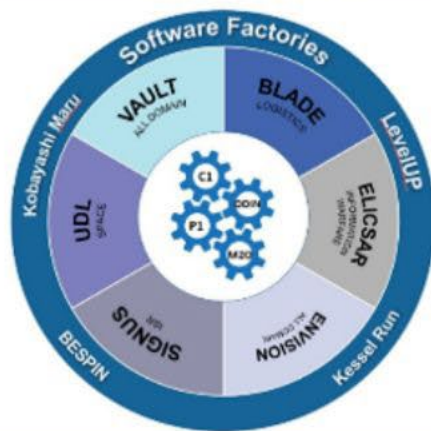


And more...

AI-Enabled Tools & Systems



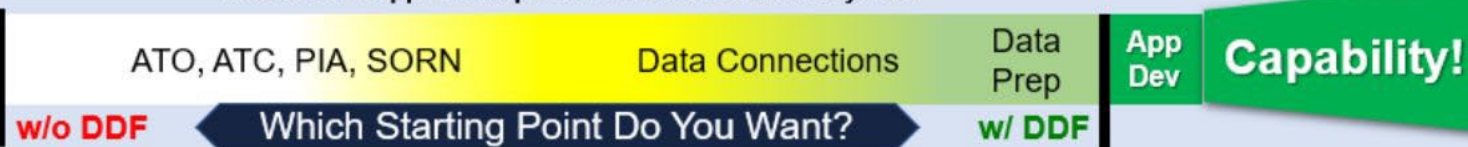
Data Fabric



Infrastructure



Data-driven App Development Timeline Reduced by 83%



DATA

- ~308 real-time connections to data sources from across DAF, DoD, and USG agencies
 - 80+ Envision
 - 63+ ELICSAR (w/ 1953 sub-feed)
 - 90+ Unified Data Library
 - 49+ VAULT
 - 26+ BLADE

Industry Leading TOOLS



Supporting over 15K+ Users





PROGRESS

Enterprise Data Services

Awarded
Data Services
Contract

Stood Up
Program
Management
Office

Developed
DAF Data
Catalog

Integrated
Metadata
Tagging



1 Aug 2022
8(a) Small Business

DAF Data Fabric
**Stood up & Expanded
Scope**

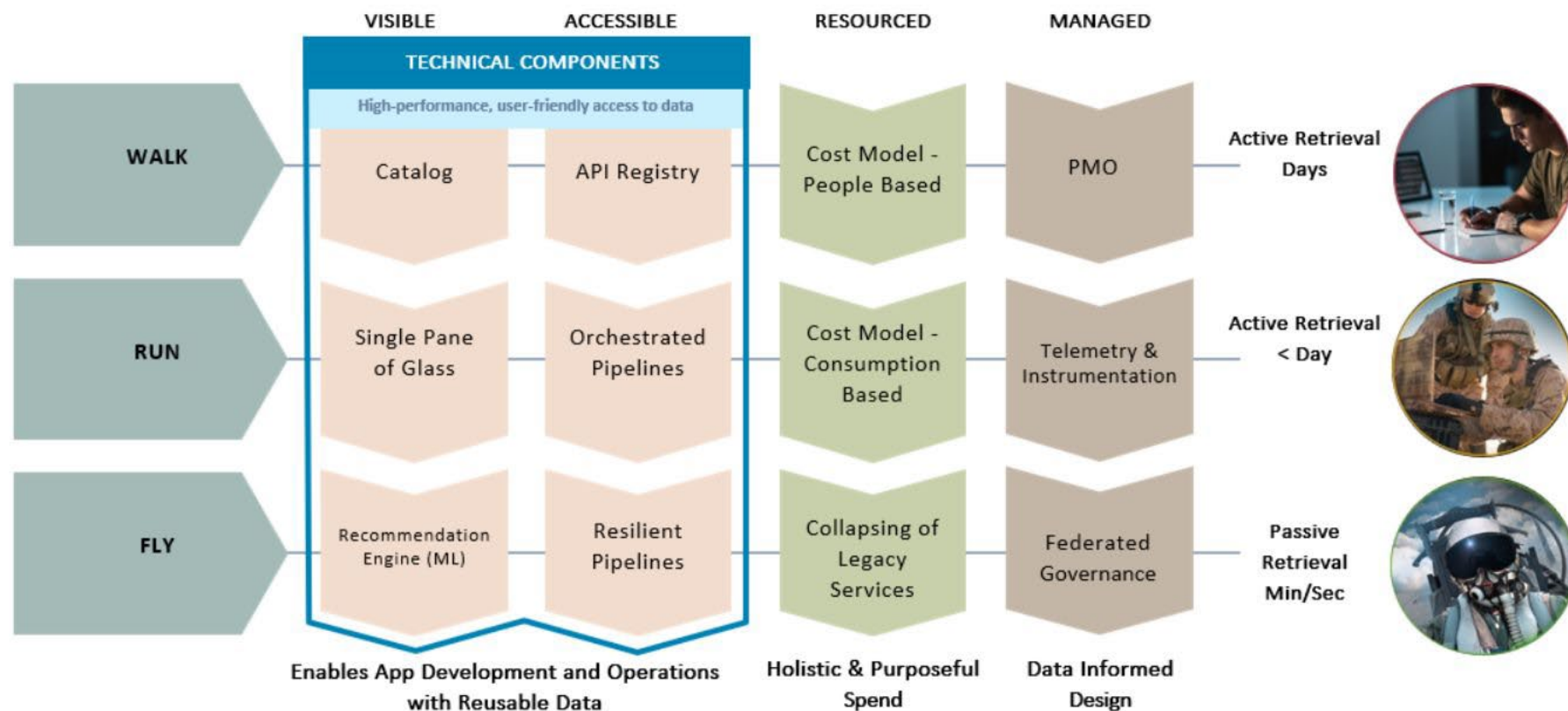
Enterprise-wide
**Making Data Accessible
& Actionable**

**Making the right data
available
at the right time**



DATA AND AI/ML FLIGHT PLAN

DATA FOUNDATIONS FOR AI & ML





DATA SUCCESS STORIES

BY THE NUMBERS: ROI

\$430M



FYDP
AVOIDED

DAF Data Fabric consists of six data management platforms across Air, Space, Cyber, & Business domains. one platform, VAULT, has 71 tenants and growing. Of these, the 15 largest, such as A1, F-35 JPO, AETC, AFHO, & AFAC, to name a few, collectively avoid \$86M annually by using the DAF Enterprise solution. These 15 orgs alone avoided \$430M across the FYDP.

\$331M



FYDP
can be
AVOIDED

Maintaining the status quo requires costly, non-standardized, and duplicative point-to-point connections between 2800+ IT systems. Conservatively, if every IT system in the DAF connected to the DAF Data Fabric, the man-hour cost-driver would only be \$48M total, vs. an estimated \$379M in the status quo construct.

83%



Data-Driven Apps
REDUCED
Develop Time

Historically, data-driven applications take 10-30 months to develop, depending upon complexity, access to data, & state of the data. By utilizing already ATO'd, PIA-approved, & maturing data management platforms of the DAF Data Fabric; data-driven apps can be developed in 3-12 weeks.

99.9%



Threat Detection
FORCE
MULTIPLIED

The AFNet is hit w/ 7M+ potential intrusions per week, making human-detection & identification impossible. Utilizing the DAF Data Fabric & a Machine Learning analytic algorithm, 16th AF added the power & capacity that would historically require 556 fully trained cyber operators while still achieving a current 99.9% threat detection accuracy rate.

400+



Readiness Toolkit
People Hours
SAVED

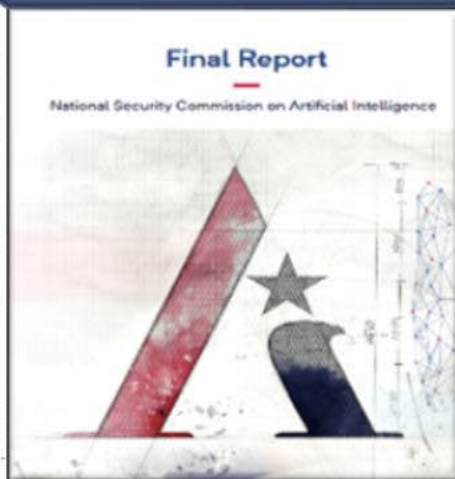
At-a-glance, career field health for 73 AFSCs; Basic personnel readiness tool available on NIPR/SIPR for all DAF units for improved data quality on readiness drivers for HHQ: MVP: Pilot units at 621 CRW (McGuire/Travis) - 90% Faster Prep - takes one person six min vs 10 ppl several hours; Saves 400+ person-hours/month for 1300 PAX geographically separated wing.



AI STRATEGIC GUIDANCE

AI Ready by 2025

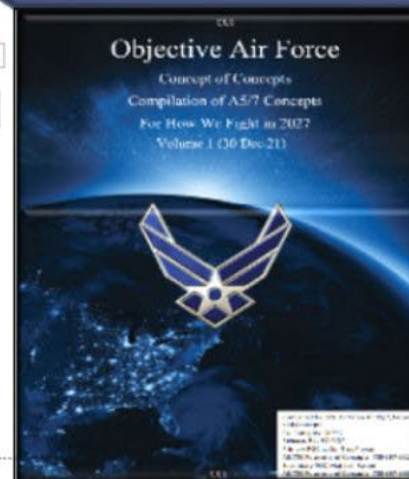
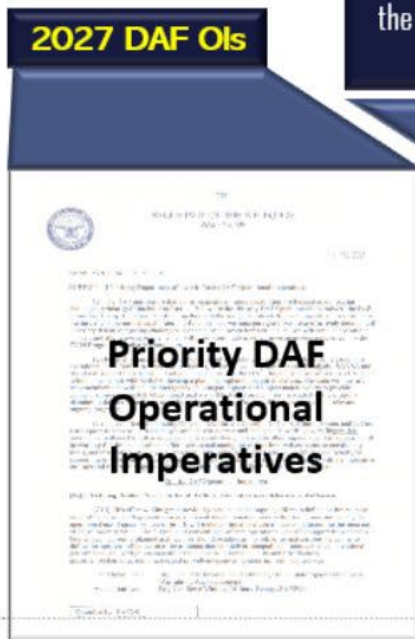
"Warfighters enabled with baseline digital literacy and access to the digital infrastructure and software required for ubiquitous AI integration in training, exercises, and operations."



AI Competitive by 2027

"As the PRC achieves its goals the US risks losing the race to create a force optimized for conflict in the twenty-first century. Thus, the US must be ready to present a credible force by 2027, not 2035"

2027 DAF OIs



2030: "AI should be expansively deepened and greatly expanded into production and livelihood, social governance, national defense construction, and in all aspects of applications."

2030: China aims to be a "world leader in AI"

Full Translation: China's 'New Generation Artificial Intelligence Development Plan' (2017)





DAF AI 2022 PRIORITIES

LOE #1: Policy, Strategy, & Governance

LOE #2: Talent Management

LOE #3: Capability

LOE #4: AI Ecosystem





TOP FIVE DAF AI THEMES/MESSAGES

1. Deliver

DAF is delivering AI capabilities that provide a competitive military advantage for the warfighter

2. Scale

DAF is scaling AI capabilities to create critical mass & repeatability to drive broader AI adoption

3. Cultivate

We will transform the DAF by recruiting talented AI professionals and promoting a culture that embraces AI

4. Engage

We will engage with commercial industry, academia, and allies/partners to foster collaboration & create partnerships

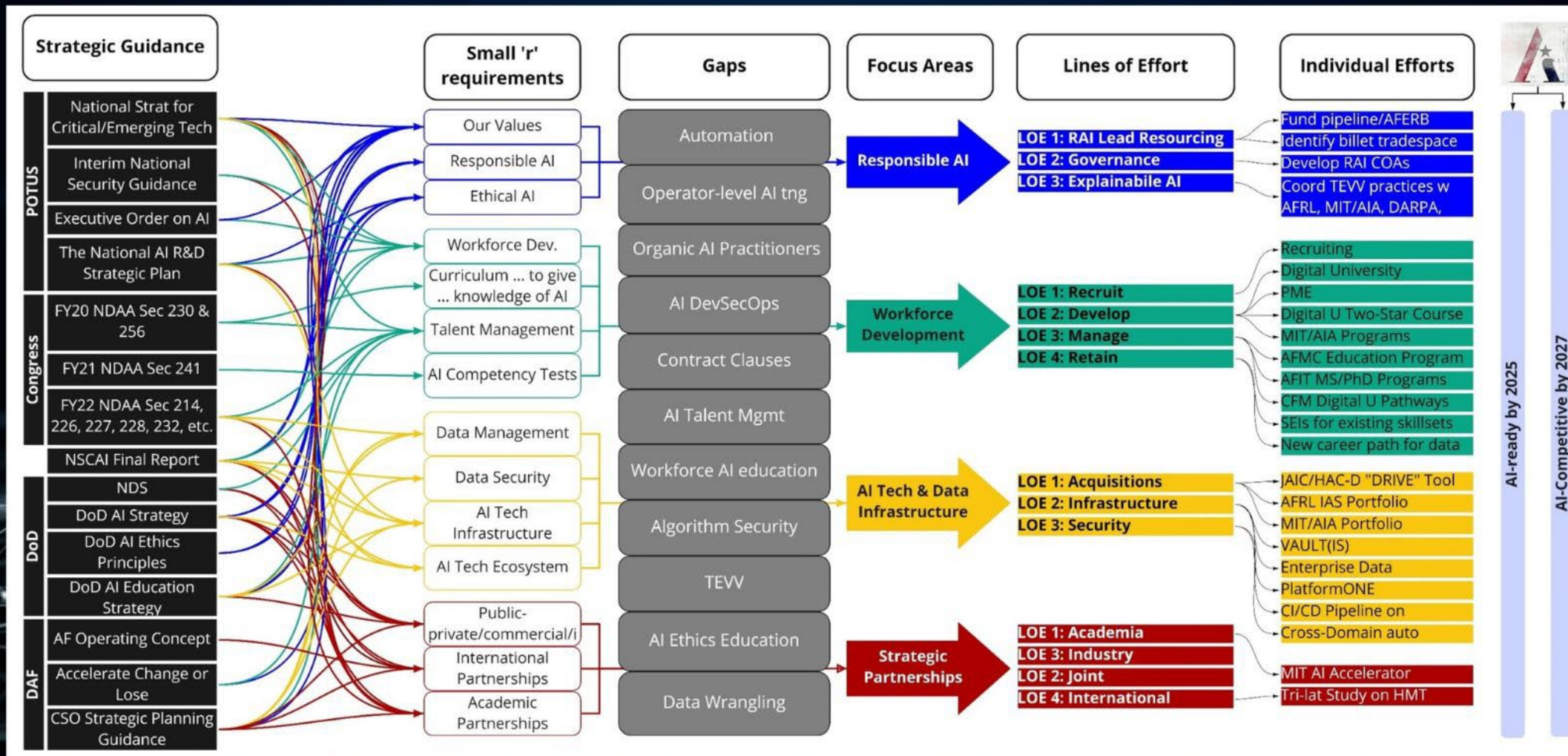
5. Lead

We will lead in AI tech, ops, governance, ethics, & safety





AI STRATEGIC FOCUS & 4 LOEs





DOING IT RIGHT = DAF RESPONSIBLE AI (RAI)



- Ethical Principles for Artificial Intelligence (SecDef, Feb 2020)
- Apply to combat and non-combat functions
- Chief Responsible AI Ethics Officer (CRAEO): Lt Col Joe Chapa, PhD

☒ **RESPONSIBLE**

☒ **EQUITABLE**

☒ **TRACEABLE**

☒ **RELIABLE**

☒ **GOVERNABLE**



DAF AI PROJECTS



Guardian
Autonomy



Earth
Intelligence
Engine



Fast AI: Data
Center & Edge
Computing



Multimodal Vision
for Synthetic
Aperture Radar



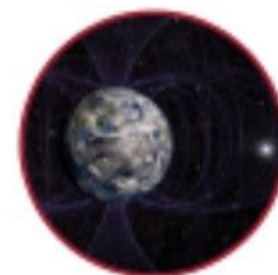
Conversational
AI



Performance
Prediction and
Optimization



Multi-Robot
Learning for
Rapid Disaster
Response



Neural Differential
Models for
Navigation



AI-Assisted
Optimization of
Training
Schedules



Spectral
Awareness and
Interference
Rejection



Space Domain
Awareness



AI Education
Lead, Drive, &
Create



PRIMARY INITIATIVES FOR FY24 POM

1

Centralized funding,
decentralized execution

2

Sustainment & scale of Envision

3

Sustainment & scale of VAULT

4

Sustainment & scale of enterprise
data service environment

5

Standup of Program Management
Office (PMO) for DAF Data Fabric

6

Expansion of LNO program

7

Creation, manning, & expanding
DAF AI Directorate





DATA AND AI ARE DAF STRATEGIC IMPERATIVES TO COMPETE & WIN

We must Prioritize, Resource, and ACT NOW!



**Advancing &
Operationalizing
Data & AI are
Strategic &
Operational
Imperatives**



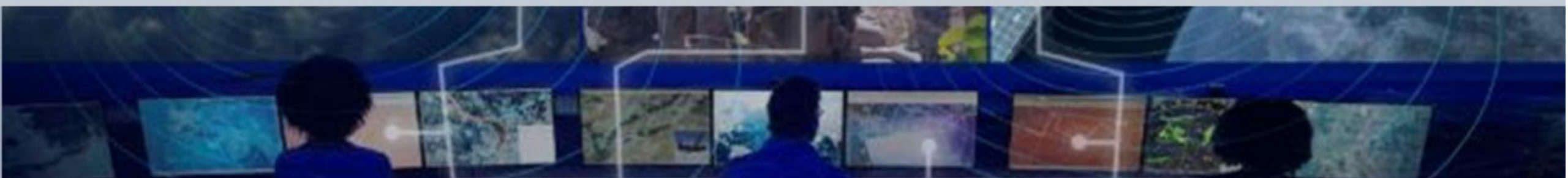
**Unity of
Command/Effort for
DAF Data & RAI
Across Enterprise
Teams**



**Results: Strategy,
Goals/Outcomes,
& POM**



**Must Prioritize
Resources & Personnel
to be
AI Ready in 2025 &
AI Competitive by 2027**





AI.

QUESTIONS?

Major General John M. Olson, Ph.D.
Chief Data & AI Officer
Department of the Air Force

