

Digital Materiel Management in the DAF

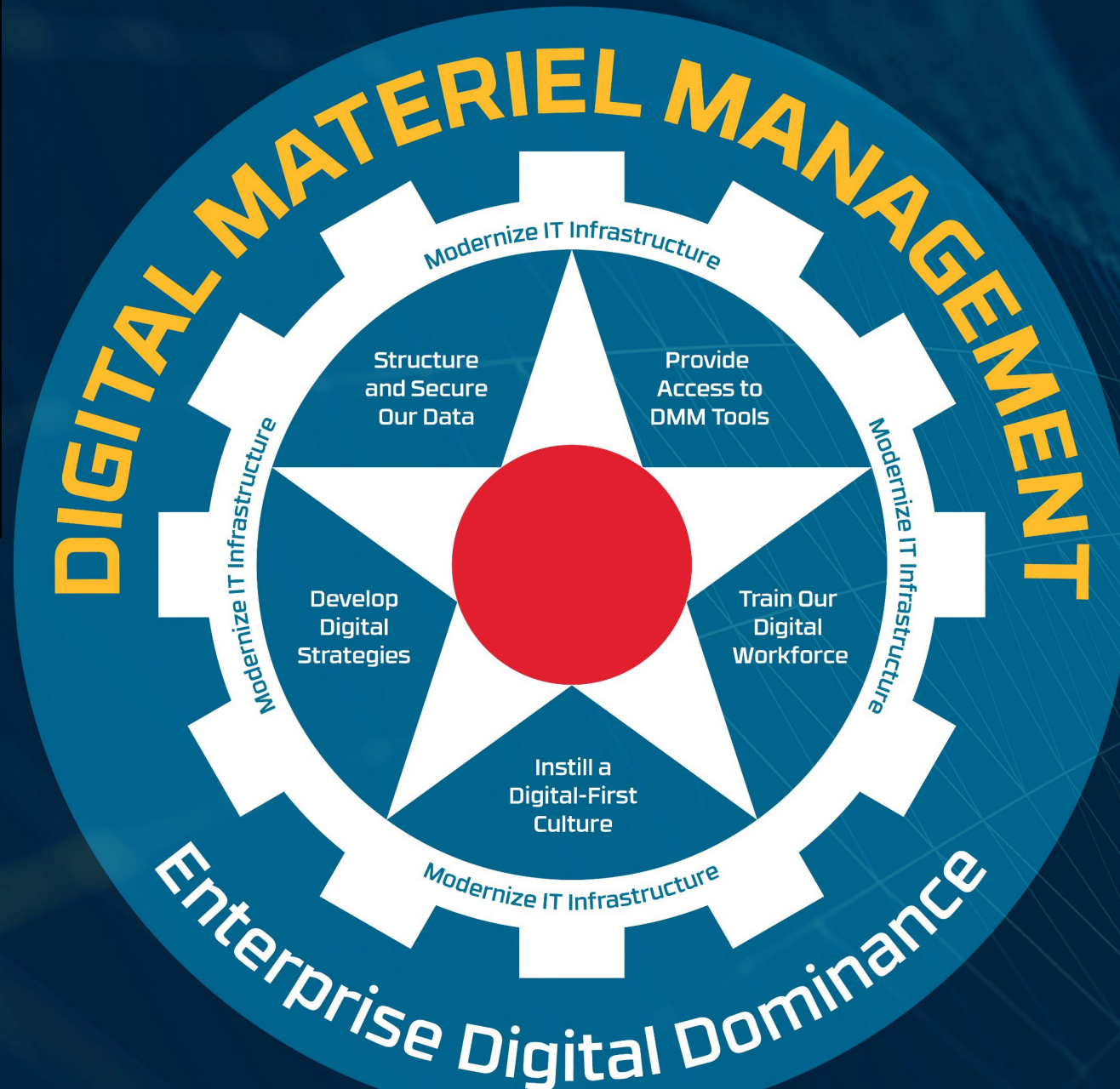
**Mr. Robert Fookes
HQ AFMC/EN**

**Col Erik Quigley
HQ AFMC/DATF**

**Mr. J. Kyle Hurst
HQ AFMC/ENZ
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Digital Materiel Management:

Ensure critical processes employ digital methods across the entire lifecycle – from invention to retirement – for both warfighting capabilities as well as installation and mission support capabilities



[DMM: An Accelerated Future State Whitepaper](#)



[Video OV-1](#)

Strategically Aligned

AQ Digital Acquisition Priorities

1. Implement Open Systems Standards and Reference Architectures
2. Ensure Programs Are "Born Digital" or Digitally Adapt over the Lifecycle
3. Expand Enterprise Solutions and Embrace Cloud-based Collaborative Environments
4. Institutionalize Processes for Agile Software Development and Software-Intensive Systems

USSF Vision for a Digital Service

1. Digital Engineering
2. Digital Workforce
3. Digital Headquarters
4. Digital Operations

AFMC DMM Initiatives

1. Structure and Secure our Data
2. Facilitate Digital training across AFMC
3. Identify and facilitate access to critical DMM tools
4. Develop Digital strategies across AFMC organizations
5. Instill a digital-first culture across AFMC
6. Modernize IT Infrastructure

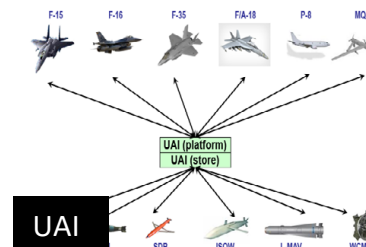
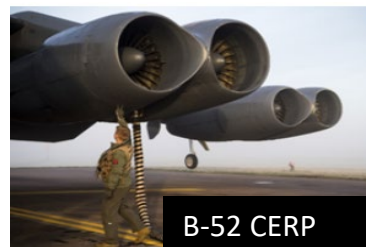
SSC Digital Engineering Lines of Effort

1. Digital Engineering Environment
2. Digital Engineering Standards and Workflows
3. Government Reference Architectures
4. Business Processes
5. Workforce Training

DMM Across the Lifecycle



Prototype Requirements Analysis DT & OT SLEP Modernize DMSMS



- Requirements owners and acquisition professionals collaborating in a common environment
- Warfighting requirements and use cases communicated in a data-driven, model-based way

- First flight in 36 mo from concept dev.
- Modularity enables >10 variations
- Digital models enables rapid design/test/validate cycles w/warfighter feedback

- >6B design variants analyzed to optimize performance
- ~6 month reduction in time to SRR
- VR based training for operators/MX

- >60 day reduction in time to PDR w/shared digital tool environment
- Months saved in virtual validation of assembly & MX
- Virtual training opportunities for crews/MX

- >2 yrs, \$2M saved in ICD dev't and SIL testing for F-15/SDB II integration
- For NATO munitions: 19 & 15 months saved on wpn integration compared to 5 year nominal avg

- ~1 yr saved in design qualification
- ~60% reduction in sustainment eng response time
- 2000 hrs or A/C downtime reduced to 700 hrs



Warfighter use case modeling
Agile requirements collaboration

Model Based System Engineering (MBSE)
Robust IT Infrastructure

Threat Informed Mission Modeling
Automated Certification Processes
Workforce Training

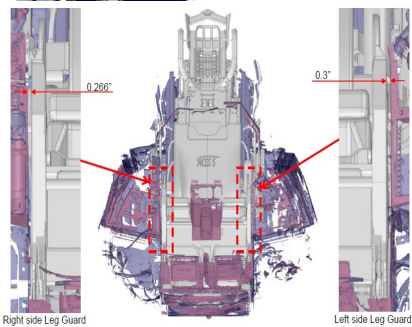
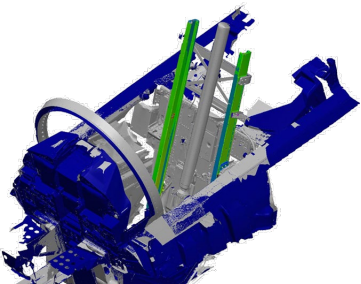
Acquisition Data Management
Authoritative Sources of Truth (ASoT)
Enterprise Policy & Governance

Open Standards
Enterprise Tools

Reference Architectures
PLM & linkage to Log-IT
Digital Culture

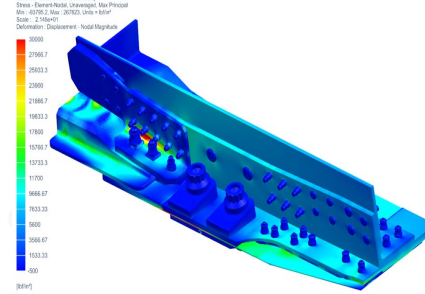
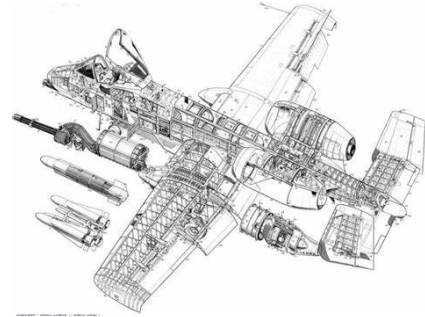
Foundational Supporting Capabilities

Demonstrated Success



F-16 Geometric Twins

- Clearance issue ID
- Analogous fit check study costs > ~\$250k



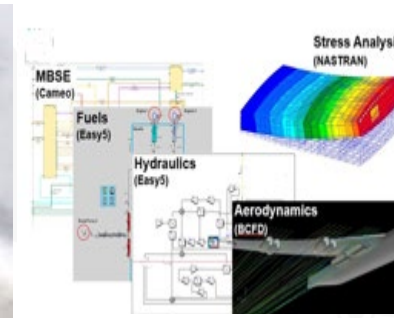
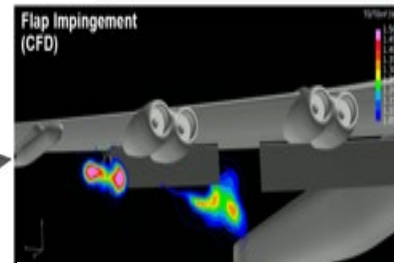
A-10 Centralized PLM

- Organic PLM development
- >85k models in PLM instance
- ~\$300M, 1yr design ROI



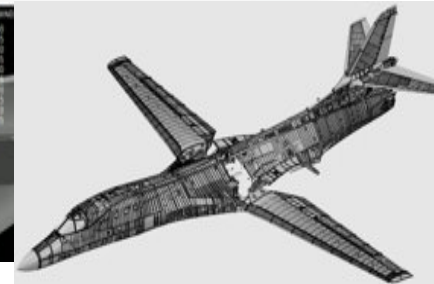
C-130 Electrical Load

- Electrical Load Analysis model developed
- ~\$30k, 9 months ROI



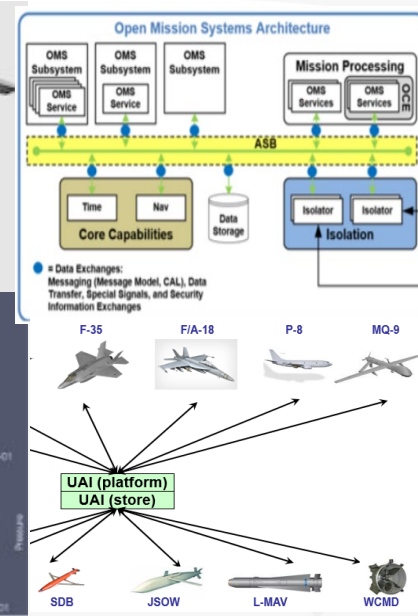
B-52 Digitalization

- Digitizing historic files
- 3D cockpit, MX ops models enables early PVI, TO development



B-1 Depot Repair

- Experienced aft fuselage buckling
- Used NIAR developed digital twin >1yr repair ROI



Open Architecture

- 3 vs 33 month integration w/OMS
- ~2yrs, \$2M in ICD development w/UAI

Ongoing Efforts

DATF MTO Overview

- **MTO #1 – Collaborative Digital Environments**

- Providing flexibility in developing, identifying, or recommending collaborative solutions for SAP IDEs and their deployment.
- Assisting Lead Command in establishing a realizable schedule and delivery across the digital systems.
- Working with key stakeholders, end users, authorizing officials, and others to support technical requirements and solutions.

- **MTO #2 – Industry Consortia**

- Establishing recurring USAF and industry consortia for further DMM development of products and deliverables in targeted formats for broader Defense Industrial Base (DIB) inclusion and feedback.
- Communicating primary inhibitors and pain points that restrict Digital Transformation.

- **MTO #3 – DMM Playbook**

- Building a clear and functionally specific “playbook” to guide lifecycle-phase specific execution by utilizing best practices and lessons learned across the USAF acquisition enterprise through HQ AFMC.
- Leveraging our understandings of AFMC Centers’ strengths and areas of improvement to empower contractors to provide specific resolution at the DAC.

- **MTO #4 – Secure and Structure Data**

- Creating coherent and tactically useful incentives, data standards, and formatting/modeling guidance that are readily available and controlled by set requirements.
- Ensuring data formatting, standards, and management methodologies are understood across the enterprise.

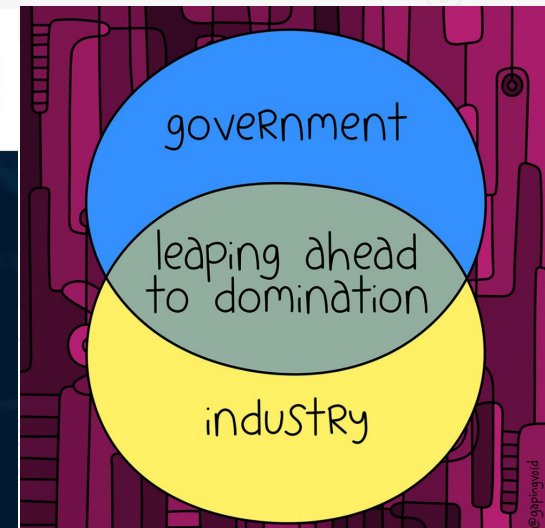
DAF Digital Industry Consortia

FFRDC/UARC Coalition on
DMM/Digital Engineering

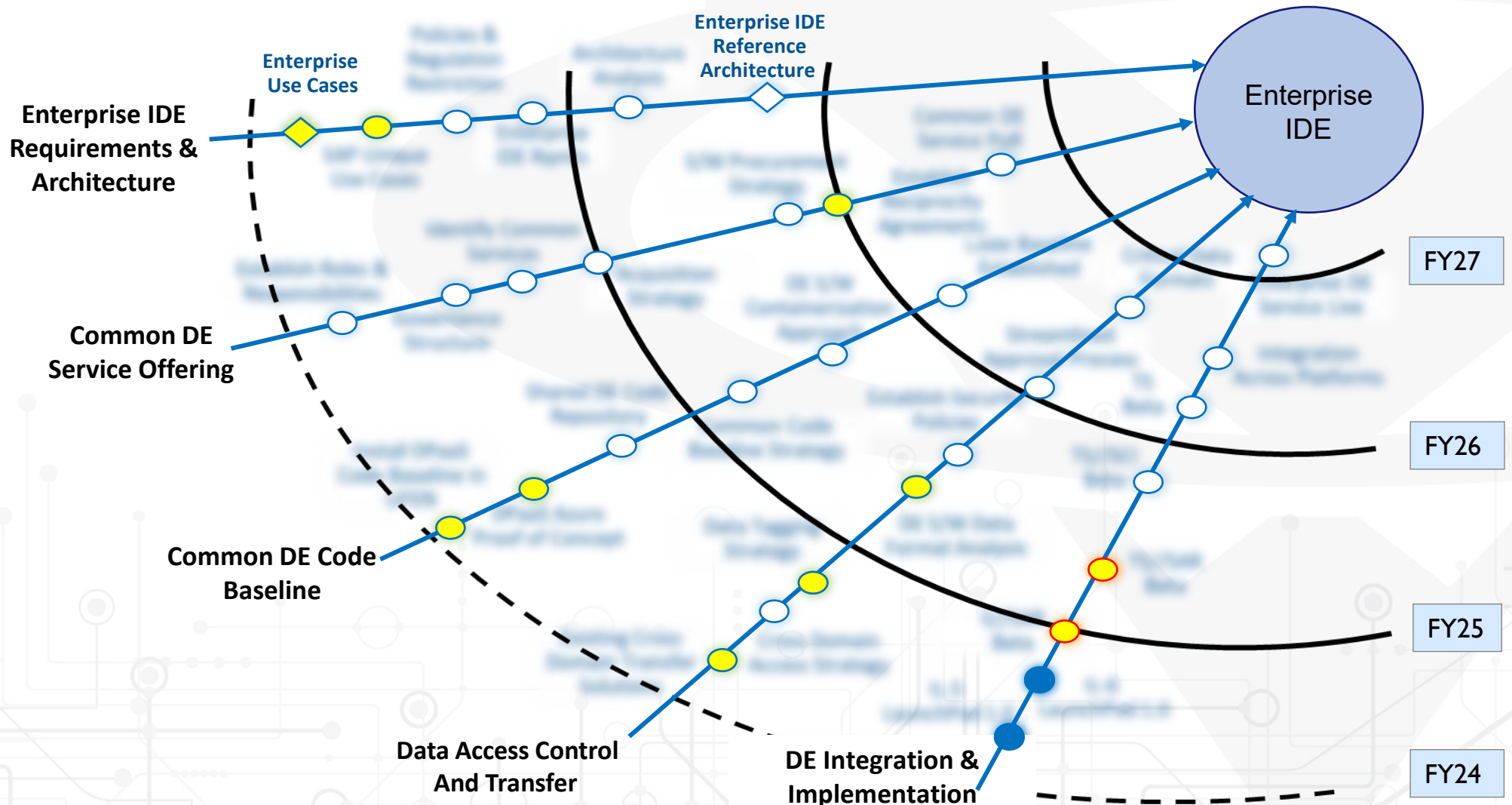
Industry Association Consortium (IAC)



Open, collaborative opportunity for the DIB to contribute to the identification and articulation of barriers and develop potential solutions associated with the rapid, full-scale adoption of DMM

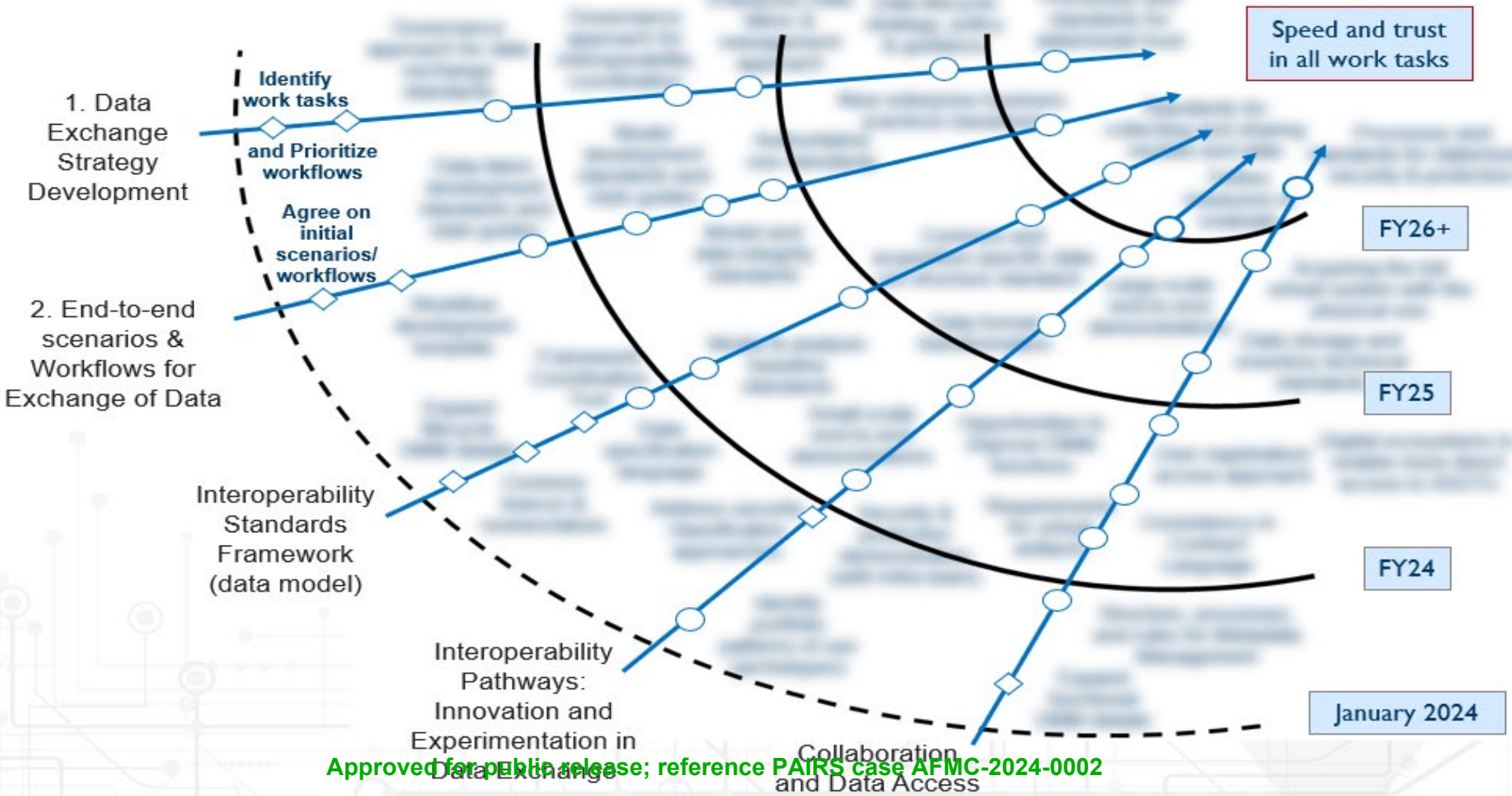


Enterprise IDE Roadmap

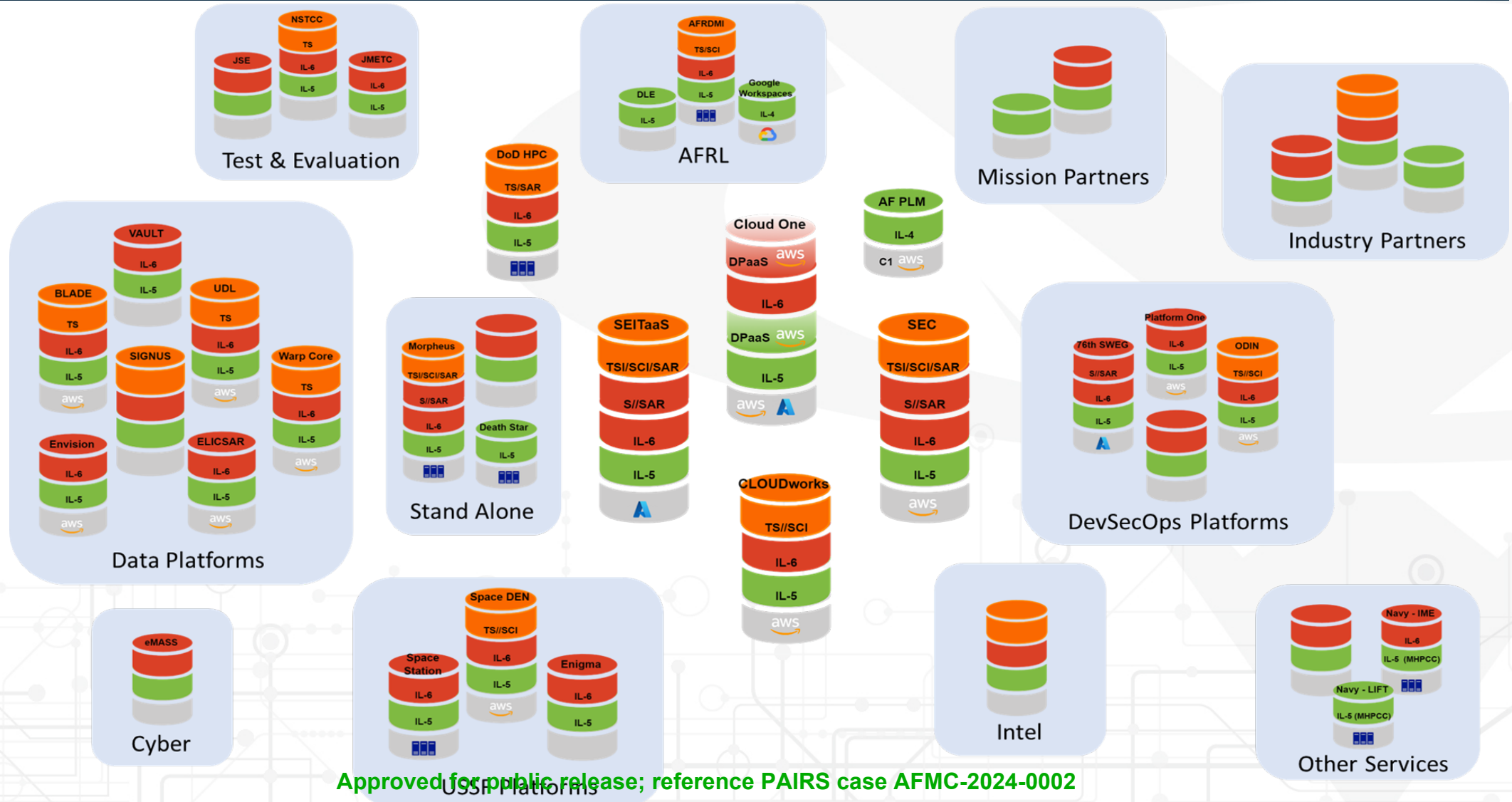


- Available
- In progress
- Not Started
- SAP Specific
- ◇ Product

Structure, Secure Data Roadmap



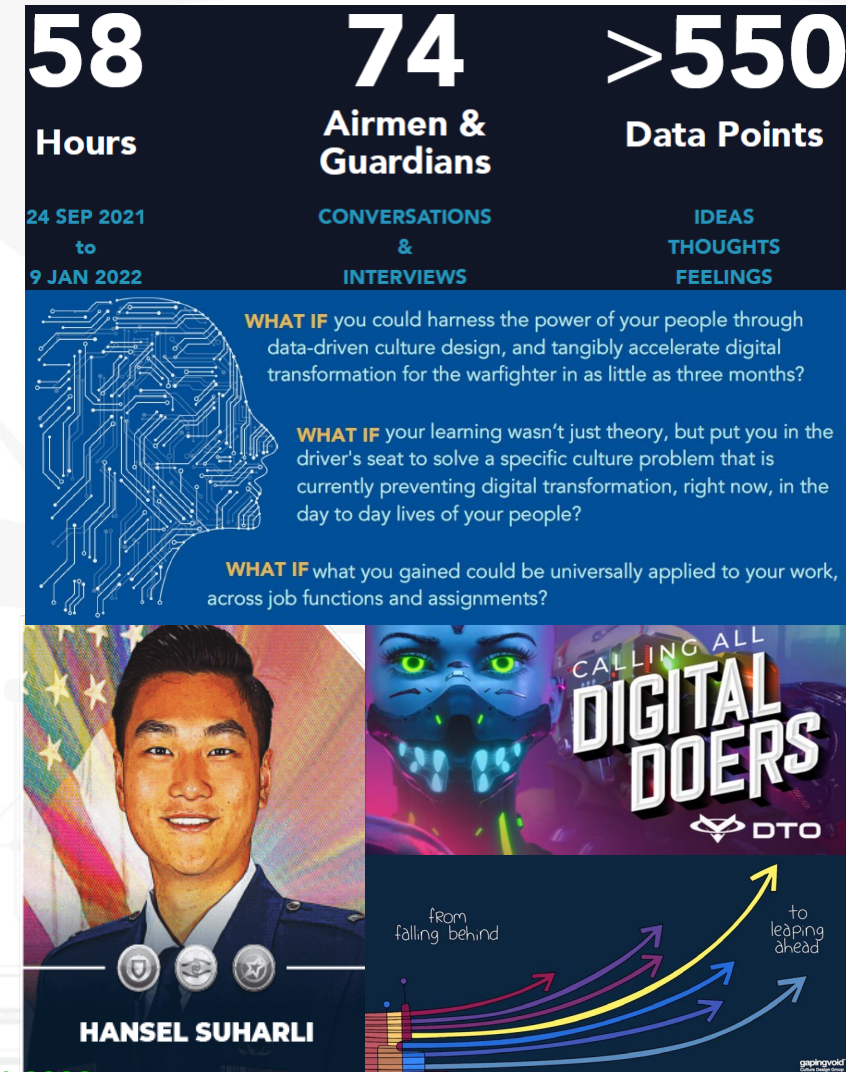
As-Is Enterprise IDE



Approved for public release; reference PAIRS case AFMC-2024-0002

Instill a Digital First Culture

- 2021/22 – Conducted *Culture Science Assessment* to baseline current workforce perceptions and attitudes around Digital Transformation; key findings included:
 - Would be excited if leadership messaged differently
 - More clarity around terms/intent is needed
 - Start small, stop talking about BIG programs
 - Provide access to the needed tools to do DMM
 - Provide access to training needed to do DMM
- **Leadership Messaging:** Kicked off and completed first ever *Digital Masterclass* focused on leadership messaging and culture design for DMM enabling
- **Clarity around terms:** Focused scope to *Materiel Management*, defined in AFMC Strategic Plan, drafted OV-1 to describe it, and a whitepaper to propagate it
- **Start Small:** [Hero Recognition Campaign](#) – finding tactical doers in the community today and spotlighting their ‘digital wins’



Provide Access to DMM Tools

Launchpad Status Dec 2023:

- IL-5 enterprise capability
- IL-6 beta testing, initial users live
- Tools
 - Cameo Systems Modeler
 - Cameo Enterprise Architect
 - Cameo Teamwork Cloud
 - Doors
 - Assurant
 - MATLAB

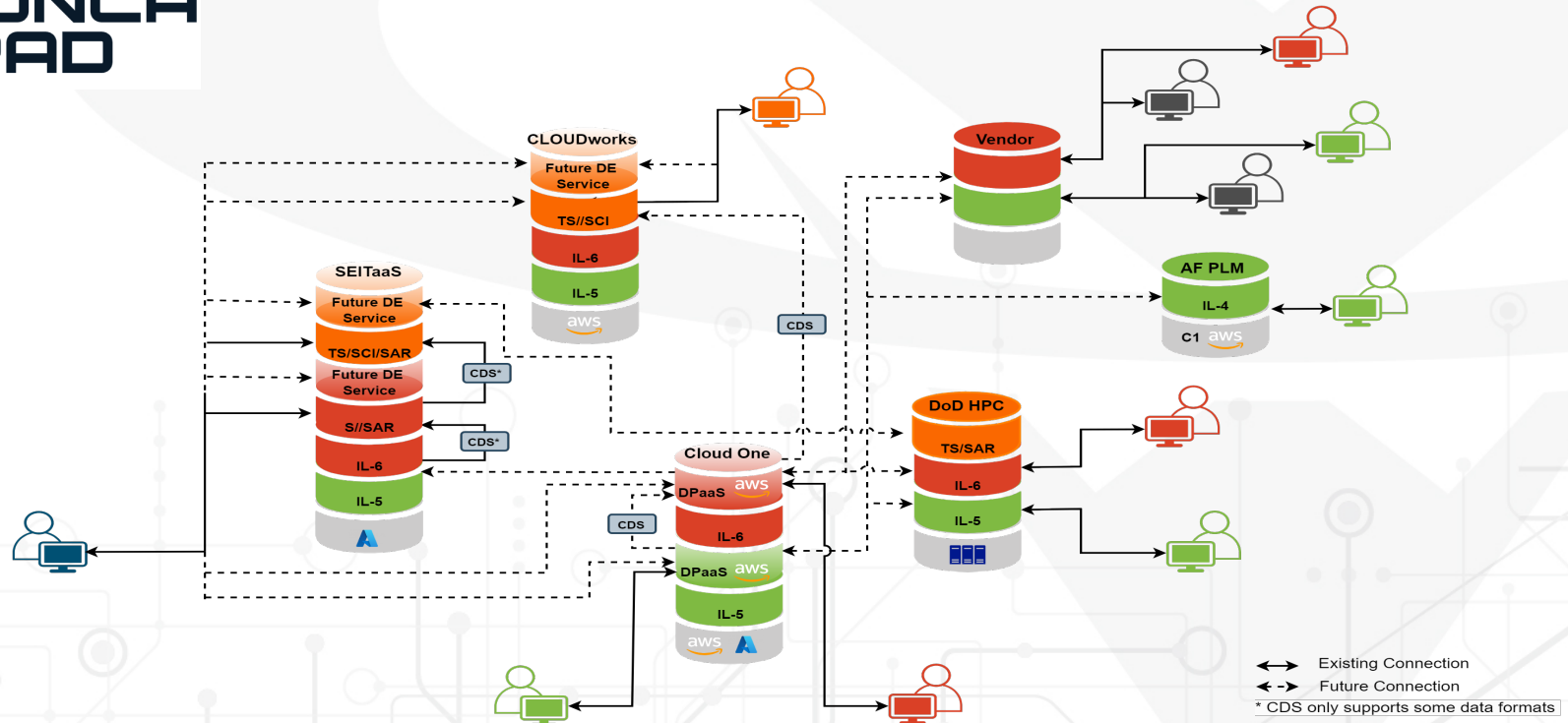


FY24 and beyond:

- Continue scaling in FY24 w/AFMC/CC management reserve
- Rearchitect, scale, and begin IDE integrations in FY25 and out
- Add additional licenses and new tools based on real time, data driven feedback from actual environment usage and user requests

On-Going Funded Improvements:

- Azure/AWS Compatibility Pilot
- Increasing Capacity to 1,000 total users
- Tools
 - Doors Next Gen
 - Jira/Confluence/BitBucket
 - Visual Studio Code
 - Solidworks
 - Sparx Enterprise Architect
 - Ansys (several)



Train Our Digital Workforce

DTO/AFIT Co-Sponsored Efforts

- **Digital Integration and Innovation Center of Excellence (DIICE)** is live: scales graduate and short course offerings, research transition facilitation, *technical program consultations/support*, best practices documentation
- **Digital Academy** (funded, “go live” in 2024): ~160 hour “bootcamp” over 3 months; technical and non-technical track
- **Short course curated learning**: WKSP 0732: Current Topics in Digital Acquisition & DMM; WKSP 0696: Applied MBSE Using SysML ; Avolve video-based and crowd-sourced Learning Paths

Other Training Efforts:

- Digital Guide: awareness, functional, and SW tool specific content
- “Badging” partnerships with AETC – curating content and credential tracking
- FY23 funded DAWDA projects:
 - AI enabled Digital Guide (chatbot, rapid query features)
 - NIAR developed geometric digital twin usage
 - Tactical, functionally aligned, and user specific vignette and workflow development and training content



DIGITAL
UNIVERSITY

DIICE
Digital Innovation & Integration Center of Excellence



Successful implementation and roll-out of digital capabilities requires preparation and action at three levels: the **Enterprise**, the **Functional**, and the **Program**.



Implement Digital Strategies

- [Digital Building Codes](#)
- [Digital Guide](#) – all available content, powered by and regularly updated by DELTA and DIICE
- [Digital Maturity Assessment Process](#) – framework for systematic program assessments and roadmap development
- [DMM OV-1 Video](#) and [Whitepaper](#) (DMM: An Accelerated Future State)
- [Digital Enterprise Launch Team for Acquisition](#) (DELTA) – Initial program workshops, Maturity Assessment support, RFP development
- [Air Force Product Lifecycle Management \(AF-PLM\)](#)

WELCOME TO THE DEPARTMENT OF THE AIR FORCE DIGITAL GUIDE

Overview

The Air Force must accelerate our enterprise to deliver war-winning capability. While USAF and USSF quality and effectiveness is excellent, the increasing time it takes us to field new capabilities is our greatest hindrance to maintaining dominance in the future.

1. Background	+
2. Digital Enterprise Processes	+
3. Data Standards and Architecture	+
4. Digital Enterprise Resources	+



Questions?