

DAF Digital Transformation: An Accelerated Future State

DAF Vision



DTO

ACCELERATE

CHANGE

OR

LOSE

AUGUST 2020

“The current acquisition process is not built to maintain our advantage in tomorrow’s fight”

“We are seeing competitors outpace our current fielding timelines”

“Good enough today will fail tomorrow”

“Victory smiles upon those who anticipate the change in the character of war, not upon those who wait to adapt themselves after the changes occur.” — Giulio Douhet

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Strategic ‘Why’: Competing in Time

- “it takes the US on average sixteen years to deliver an idea to operational capability, versus fewer than seven for China”
- “Defense acquisition process and legacy defense industrial base approach struggle to accommodate timely adoption of these emerging technologies”
- “Competitive advantage comes from the scale of available options, tempo of decision-making, and superior decision processes”

China iterates twice as fast through military development and fielding cycles

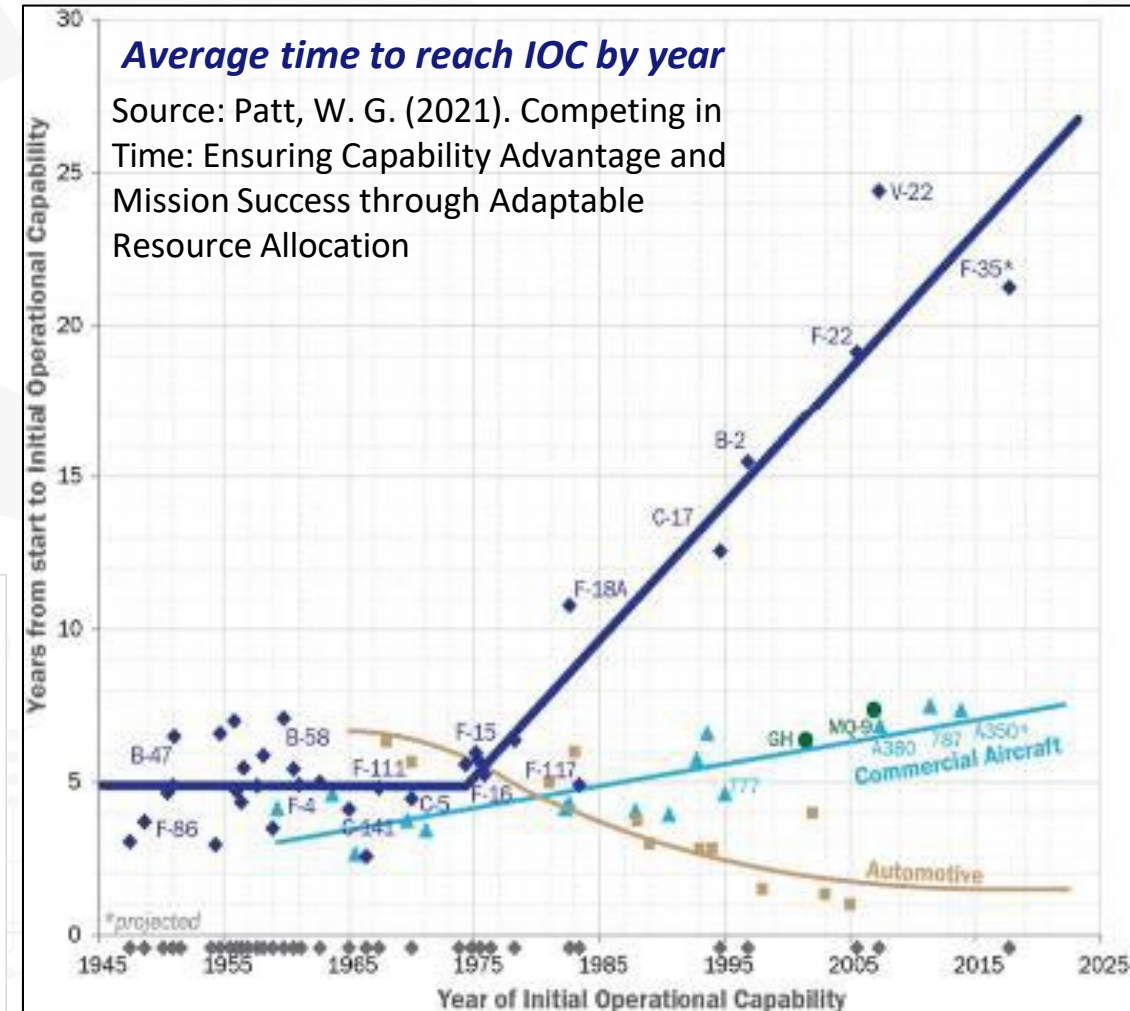
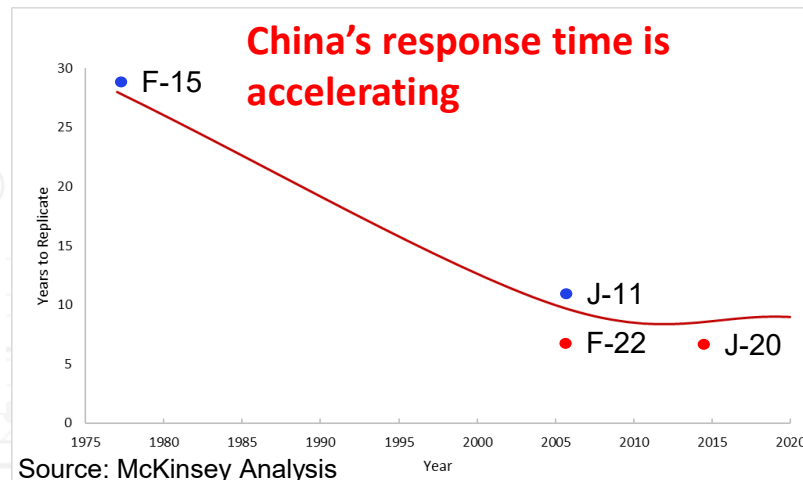
[Source: Acquisition Talk](#)

AMERICAS ARMS ASIA PACIFIC POLITICS

China Weapons Acquisition Five Times Faster Than US: Defense Official

[Source: The Defense Post](#)

DTO



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Better Capability, Faster

Research Develop Design Test Supply Sustain Maintain Retire

Prototype

Requirements

Analysis

DT & OT

SLEP

Modernize

DMSMS



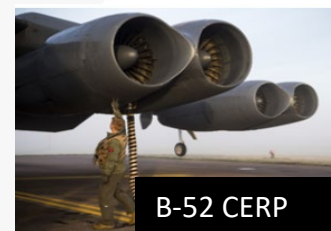
- First flight in 36 mo from concept dev.
- Modularity enables >10 variations
- Digital models enables rapid design/test/validate cycles w/warfighter feedback



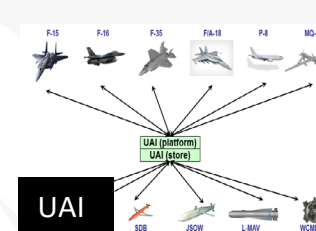
- >6B design variants analyzed to optimize performance
- ~6 month reduction in time to SRR
- VR based training for operators/MX



- Months → Days for software development & release
- 1000's of high fidelity design iterations
- Months → Weeks prep time for acq. reviews
- Pivot w/evolving threat



- >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

Model Based System Engineering (MBSE)

Threat Informed Mission Modeling

Acquisition Data Management

Open Standards

Reference Architectures

Foundational Supporting Capabilities

Automated Certification Processes

Authoritative Sources of Truth (ASoT)

Enterprise Tools

PLM & linkage to Log-IT

Robust IT Infrastructure

Workforce Training

Enterprise Policy & Governance

Digital Culture

Overcoming silo's and enabling enterprise scale requires enterprise investment

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MISSION

AFMC Strategy Map

VISION

Our Cross-Cutting Attributes

Speed • Strength • Endurance • Balance • Flexibility • Coordination

Our Commitments

Enable DAF Priorities • Support the Warfighter & Respect the Taxpayer • Focus on Enterprise Solutions & Digital Materiel Management • Provide All Airmen the Opportunity to Reach Full Potential • Embrace Innovation

Our Lines of Effort

LOE 1

Deliver Integrated Capabilities

Integrate research, development, test, sustainment, support, and infrastructure to maximize readiness and lethality for each individual capability and across all capabilities.

- **Sustain the Legacy Force (Internal/External):** Integrate all efforts within and across our centers by working together as One Team to ensure the current force structure is ready anytime and anywhere against any adversary.
- **Deliver the Future Force (Internal/External):** Create future capabilities that deter and disrupt our adversaries using the same integrated intra- and inter-center One Team approaches.
- **Seek DAF Enterprise Solutions (Internal/External):** Through intra- and inter-center integration and coordination, deploy DAF enterprise solutions to the max extent and defer to unique solutions only when necessary.
- **Responsive Support (Internal/External):** Deliver AFMC materiel capability and combat support; integrate to ensure operational surge and sprint capabilities meet warfighter and humanitarian requirements

LOE 2

Strengthen Our Team

Advance the professional and personal development, retention, and resiliency of our entire workforce so every AFMC Airman can achieve their full potential.

- **Build Full Potential Airmen (Internal):** Provide intentional opportunities for military, civilian team members to achieve their professional and personal goals, ensuring diversity, equity, inclusion, and accessibility.
- **Entrust Decisions to Lower Levels (Internal):** Push responsibilities and decision-making to trained-and-ready lower levels within the command structure, with empowered people, resources, and information.
- **Develop Leaders at All Levels (Internal):** Develop leaders at all levels to ensure every Airman can professionally and personally thrive.

LOE 3

Revolutionize Our Processes

Implement AFMC Enterprise Solutions and Digital Materiel Management, revolutionizing critical processes in support of mission execution and the warfighter.

- **Build One AFMC Business Enterprise (Internal):** Inculcate internal processes that activate speed, strength, endurance, balance, flexibility, and coordination in AFMC's ability to deliver capabilities on relevant timelines in spite of fluid threat environments.
- **Employ Digital Materiel Management (Internal):** 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.

LOE 4

Amplify Warfighting Culture

Connect every Airman to the mission and focus the materiel enterprise on delivering capabilities and services in support of operational execution and deterrence.

- **Connect to the Mission (Internal):** Ensure every team member and unit understands their role, value, and connection in materiel capability delivery to the operational units we support.
- **Be the Trusted Partner (Internal/External):** Drive toward the speed of trust with one another, the warfighter, industry, and our mission partners.

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Powering the world's greatest Air and Space Forces... We develop, deliver, support, and sustain war-winning capabilities.



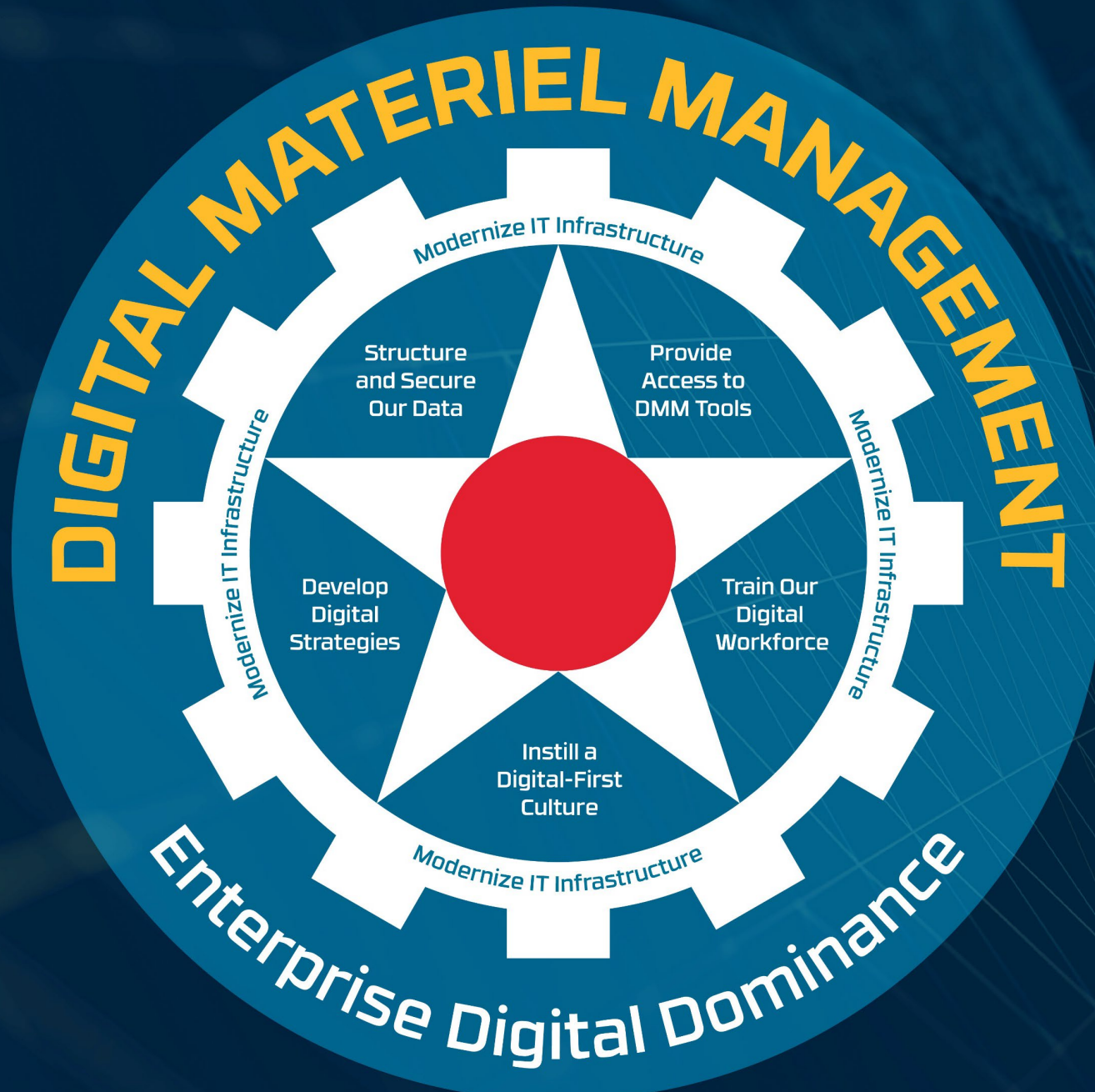
One AFMC--integrated, innovative, trusted, and empowered...

Indispensable to our nation, disruptive to our adversaries.





[Video OV-1](#)



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

DMM: An Accelerate Future State

Lifecycle DMM

Invention

Systems Engineering and Requirements Decomposition

Performance Modeling and Design

Test and Performance Verification

Production

Product Support Data Cataloging

Sustainment

Modifications

Installation and Mission Support

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



DMM: An Accelerate Future State

Functional DMM

Program Management

Contracting

Engineering

Logistics

Financial Management

Test and Evaluation

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



FINANCIAL MANAGEMENT

DMM means instant access to current budget, cost, and program execution data for financial managers. System performance models can rapidly reflect cost considerations in design trade-space analysis, allow financial professionals to execute a series of 'what-if' analyses to work towards an optimal solution for the enterprise, and streamline Financial Improvement and Audit Readiness (FIAR) compliance for all lifecycle phases.



Digital Guidance and Policy

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



[Department of the Air Force Digital Guide \(public facing\)](#)

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TAB 3: DIGITAL BUILDING CODE FOR OPEN SYSTEMS ARCHITECTURE

The term "Open Architecture" has been widely used and is often misused. In defense acquisition, it refers to adopting consensus-based standard interfaces, acquiring components and subsystems that comply with these interfaces, and integrating these components or subsystems using appropriate interface standards. Programs leverage a modular open architecture approach, or MOA, to implement an open system architecture (OSA) for a system and can bend competition, innovation getting more cutting-edge.

As discussed in *Bending the Spoon: Guidebook for Digital Engineering and e-Series*, the key to employing Digital Engineering is achieving a measure of *enrichive virtualization* that replaces, automates, or truncates formerly real-world activities. This is how you realize game-changing agility that Digital Acquisition can deliver for your mission and our warfighters. And it is also how you will realize the return on investment for digital engineering.

The following Engineering:

1. Implement an Open

- 1.1. Build and (COTS) and functions, in
- 1.2. Reference a Digital Guid style guide.
- 1.3. Encapsulate requirement (e.g., techn
- 1.4. Construct a requirement thread analy
- 1.5. Include cap system or its

2. Develop a digital t

- 2.1. Establish an authoritative threads com Update digit
- 2.2. Construct a transformati architecture archival/vets transformati

3. Implement an inte

- 3.1. Use an integ for collabor methodology procedures t
- 3.2. An ideal IDI

Over the past two years, we have seen software development transformation take root across the Air Force and Space Force in programs ranging from the F-16 to the Ground Based Strategic Deterrent (GBSD) to the Advanced Battle Management System (ABMS) to the T-38A. This transformation was propelled by adoption of the *DevSecOps* approach, agile software development, and open system architectures based on containerized microservices (orchestrated by Kubernetes and secured with Zero Trust). It will continue to expand through the use of common software development tech stacks that are converging around the *CloudONE PlatformONE* environment. The payoffs have been game-changing for pathfinding programs. In 2020, the U-2 program made DoD history by becoming the first platform to push a software update to a jet while in flight (made possible via Kubernetes-deployed software containers). Just weeks later it became the first platform to put an artificial intelligence (AI) "operator" in control of a mission system with the deployment of the "ARTU" application. These transformational leaps forward attest to just how powerful this approach can be for existing programs as well as new ones.

It is now time to take this Agile Software transformation from experimental start-up phase to a coordinated, standards-based scale-up across the Department. System and component interoperability, code reusability, security assurance and continuous authority-to-operate (c&AO), and other efficiencies – not to mention the Department-wide enablement of AI and machine learning (ML) – can only be fully realized if the Department converges around common development standards, many of which are outlined below.

The following standards employ open system architectures, ensuring the Department is postured to adapt as new technologies, methods, or needs arise. (For clarification, a modular open systems approach, or MOA, is the *process*; programs should leverage to achieve an open systems architecture [OSA]). Convergence on development standards does not mean innovation stops; rather, convergence around these development standards is what will unleash functional innovation at scale, and allow software development teams to focus on rapid development and deployment of new capabilities warfighters count on.

The following guidance is provided to assist PEOs/PMs to implement Agile *DevSecOps*, software development, or "Agile" for short:

1. Implement *DevSecOps* software development methodology and reference design

- 1.1. Adopt the use of Agile *DevSecOps* methodology as guided by the Department of the Air Force Chief Software Officer (DAF CSO) for all non-commercial software development, including development work performed by our Defense Industrial Base (DIB) partners.
- 1.2. Move away from Waterfall-based development to Agile. Many programs are adopting Agile for their software development but leverage waterfall-like processes for their program management. This brings all the impediments of waterfall while not fully benefiting from the return on investment of Agile. Programs should adopt end-to-end Agile principles to the maximum extent practicable.
- 1.3. Implement the DoD Enterprise *DevSecOps* Reference Design: CNCF Kubernetes along with or including industry partners.
 - 1.3.1. The Minimum Viable Product (MVP) requirements in this reference document are continuously updated and precisely define the requirements for DoD-wide reciprocity including Kubernetes, the Sidecar Container Security Stack (SCSS), and Open Container Initiative (OCI) compliant containers.



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIAL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

10 February 2023

MEMORANDUM FOR AFMC WING CYBERSECURITY OFFICES

FROM: HQ AFMC/A3/6 (CIO)

SUBJECT: Onboarding Applications to AFNET/AFNET-S Within AFMC

1. The process by which we onboard commercially available software products is complex and often misunderstood. The current process results in real/perceived delays in applications being authorized for use and inconsistent results when processing requests base-by-base.

2. AFMC/A3/6 is working with ACC/A6 and HQ Cyber Capabilities Center to identify long term/permanent improvements to cybersecurity processes for software products. In the meantime, we will seek opportunities to limit inconsistencies and reduce rework across AFMC installations.

3. AFMC Information System Security Managers (ISSMs) will leverage the most expedient method available to support a Security Impact Assessment (SIA) and authorization of a software product.

a. Presumptively accept a Security Impact Assessment conducted by another DAF ISSM for AFNET or AFNET-S. Due diligence, as required by AFI 17-101, has been accomplished by the other ISSM; concerns regarding the efficacy of assessments by other organizations should be addressed with that ISSM, AFMC/A6/C, or ACC/A6L.

b. For any software product that has been certified by an Air Force Authorizing Official or Security Control Assessor, a Security Impact Assessment should be limited to confirming that the assessed environment was sufficiently similar to AFNET/AFNET-S and that the software will be used in accordance with the original authorization (e.g., required mitigations are implemented). ISSMs should not repeat or augment assessments certified by cognizant authorities based on local procedures except as required to address dissimilarities between AFNET/AFNET-S and the previously evaluated environment.

c. Any software product on the Air Force's Evaluated Products List (EPL) does not require additional security evaluation to support authorization.

d. ISSMs should consider leveraging the Air Force's Assess Only Guide located on the Air Force RMF Knowledge Service.

One AFMC...Powering the World's Greatest Air Force

Digital Building Code:

- (a) Digital
- (b) Agile
- (c) Open

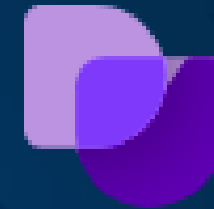
SW Reciprocity Memo

DTO

Tools and Training



DPaaS
LAUNCHPAD

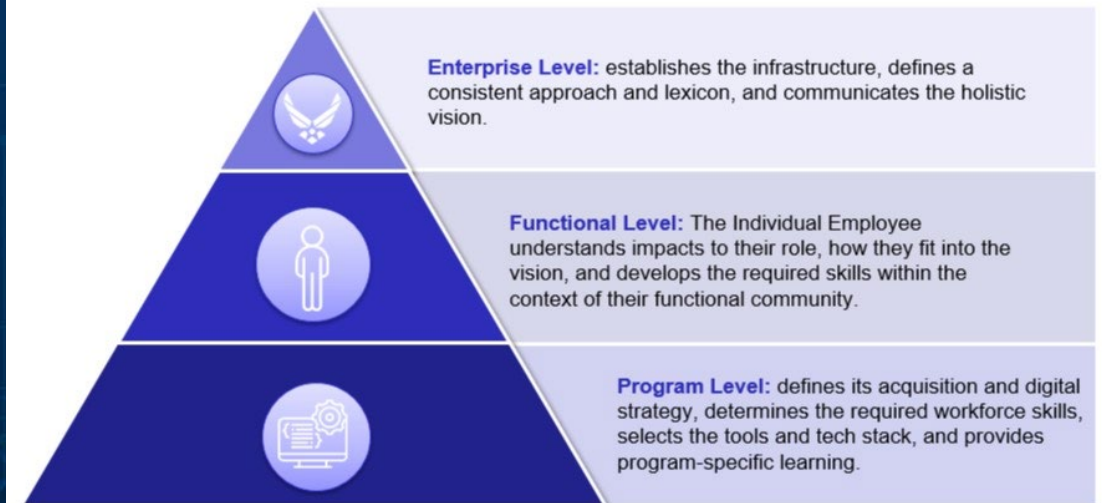


**DIGITAL
UNIVERSITY**



AVOLVE

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



Culture Design and Engagement



WHAT IF you could harness the power of your people through data-driven culture design, and tangibly accelerate digital transformation for the warfighter in as little as three months?

WHAT IF your learning wasn't just theory, but put you in the driver's seat to solve a specific culture problem that is currently preventing digital transformation, right now, in the day to day lives of your people?

WHAT IF what you gained could be universally applied to your work, across job functions and assignments?

Hero Recognition Campaign



Developing an open architecture that's measurable and can be put on contract is hard. Doing it for an entire portfolio of weapons? Harder. **BUT JONATHAN MADE IT HAPPEN.**

DYNAMIC COLLABORATION

FEARLESS LEADERSHIP

DAF DIGITAL AGENT OF CHANGE
JONATHAN SHAVER
WOSA lead, AFRL/RWW

CAPT GOODMAN USED ASSESSMENT TO DRIVE ENABLED IMPROVED INTEGRATION ACROSS
Now these programs are initiatives in lockstep, where they're well on their way

UNBRIDLED

DYNAMIC COLLABORATION

FEARLESS LEADERSHIP

DAF DIGITAL AGENT OF CHANGE
TYLER GOODMAN
Capt, USAF & Chief, B-52 Digital Engineering Section

ANDY HAS CHAMPIONED THE DAP'S DIGITAL CULTURE CHANGE FROM THE START. His deep knowledge and experience, along with his persistence and positivity, have been instrumental to advancing strategic planning efforts. While Andy recognizes the magnitude of the challenge, he's meeting it head on and inspiring others to do the same.

HYPERSONIC HUSTLE

DYNAMIC COLLABORATION

DAF Digital Agent of Change
ANDREW STAMER
Acquisition Program Manager, C

JAMIE WAS A HERO ON THE ASDP EFFORT. With an entrepreneurial spirit, she used existing tools to develop a standard that takes a cross-functional approach to data communication.

HYPERSONIC HUSTLE

UNBREAKABLE FORTITUDE

RAZOR-SHARP KNOWLEDGE

DAF DIGITAL AGENT OF CHANGE
JAMIE SUTER
AFLCMC/LC LZ

DEFEATED: FRAG MEN

DEFEATED: HARD-LINE

DTO

Outreach and Ongoing Efforts



Category	Metric	Metric Component
Infrastructure	Model Environment	Tool Access and Governance
		Data and Tool Interoperability
	Collaboration	Capability
Modeling / Analysis	Quality	Security
		Authoritative Sources of Truth
		Metrics
		Model-Based Verification and Validation of Systems
		Digital Management Strategy
		Model-Based Systems Engineering

Digital Maturity Assessment

“Tools for All” Business Model Exploration

Program Outreach and Strategy Development

Industry Outreach/Colliders

Data Management Frameworks

ATO/EPL Process Improvement

AFIT Digital Center of Excellence

Open-Source SW inclusion



Tool interop/COTS SW use

Certification Pathfinding

AFMC Digital Airworthiness Team

DIGITAL MODEL CERTIFICATION

#OCADMC



THE **CATALYST** ACCELERATOR



UNITED STATES AIR FORCE

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA)

Gov't/Industry Interactions

Owning the Technical Baseline for Acquisition Programs in the U.S. Air Force

DEPARTMENT OF DEFENSE
DIGITAL ENGINEERING STRATEGY
JUNE 2018

Office of the Deputy Assistant Secretary of Defense for Systems Engineering
Washington, D.C.

U.S. Space Force Vision for a Digital Service

SF/CTIO
MAY 2021

ACCELERATE CHANGE OR LOSE

AUGUST 2020

S. Q. BROWN, JR.
CHIEF OF STAFF

AIR FORCE MATERIEL COMMAND STRATEGIC PLAN 2023

the SPOON

WILL ROPER 01/19/21

DEPARTMENT OF THE AIR FORCE
WASHINGTON, DC

OFFICE OF THE ASSISTANT SECRETARY

MEMORANDUM FOR THE ACQUISITION ENTERPRISE

FROM: SAFAQ

SUBJECT: Guidance for e-Program Designation

3 May 2021

GUIDEBOOK for DIGITAL ENGINEERING and e-SERIES

AIR FORCE DIGITAL CAMPAIGN

Accelerate Digital or Lose

the SPOON

WILL ROPER 01/19/21

Digital Guide Home

Air Force Digital Transformation

Home

Newcomers Link

Quick Start Guide

Background

Enterprise Resources

Enterprise Processes

IDE Tools & Infrastructure

Data, Standards, Architect...

Training and Education

Function

FAQ

WELCOME TO THE DEPARTMENT OF THE AIR FORCE DIGITAL GUIDE

Welcome to the New Look of the Digital Guide
Please send any suggestions for further improvements to HQAFMCEN.DigitalCampaign@us.af.mil.

Click Here to See: **WHAT'S NEW???**

The Latest Digital Transformation News! [Click Here for Additional News!](#)

	FY21	FY22	FY23	FY24	FY25	FY26
Infrastructure						
Model Environment		Implement generic governance policies	Appropriately controlled access: Defined governance partially applied across enterprise			
		Define inter-database/tool associations	Data independent from tools; Limited item associations managed		Data portability & all data/item traceability	
Collaboration Space		IDE/MiHub IOC	IDE FOC - partial enterprise usage	Most IPTs integrated into IDE/MiHub	IPTs interacting across enterprise via IDE/MiHub	
		Define permission roles in enterprise	Enforce permissions across enterprise	Apply applicable IP policies	Secure, monitor & control models & data across enterprise	
Process/Policy						
Model Management		Develop digital management strategy	Inconsistent support from DE tools	Inconsistent support from DE tools	Mature IDE/consistent spt from DE tools	
		Develop full system models across the lifecycle		Consistent institutional approach to integrated system model		
		Define & implement configuration management processes in MiHub	Apply config mgmt in MiHub to some models/data	Apply config mgmt in MiHub to all models/data in enterprise		
		Map & identify standard V&V procedures and programs for limited models & data		Partially implement V&V procedures for identified models & data		
Data Management		Continually update processes to rely on data from ASOT	Update processes via digital thread -- employ limited twins	Decision making using thread/twins		
		Ingest enterprise data into MiHub	Conform data to common architecture -- plan automation techniques	Implement automation & data reuse		
		Employ some visualization tools	Consistently deploy UI & visualization tools that contribute to some enterprise decision making	UI able to interrogate ASOT		
Workforce/Culture						
Workforce Capability		Identify organizational training needs -- identify & promote courses	Develop strategic training plan; hire experts to review modeling methods/data mgmt; plan robust training			
		Identify, use, and promote common lexicons/sources across enterprise	Consistently use common lexicons/sources for lifecycle	Identify, use, and promote authoritative lexicons/sources		
Adoption			Isolated processes across enterprise use digital artifacts and data	Majority of enterprise processes & DM use dig artifacts/data		
		Utilize default architectures and begin customization for enterprise use	Define reference architectures -- plan/identify validation methods			
		Implement limited organizational coordination of digital artifact use as deliverables; Use models to record acceptance of items through model content/data review in modeling environment				
Modeling/Analysis						
Model & Data Quality		Plan/develop ASOT (MiHub)	Implement ASOT	Plan digital thread & limited twins to contribute to ASOT		
		Identify tools that assess model quality; map & define metrics for V&V of models		Implement and monitor metrics		
		Identify standard V&V procedures and programs that require V&V		Establish model dev't processes; select programs for V&V		Partially implement V&V

Legend

Level 0 Level 1 Level 2 Level 3 Level 4

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