

Department of the Air Force

SAF/AQR Priorities and Opportunities Related to NDIA Systems Engineering Division Capabilities



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SAF/AQR Science, Technology & Engineering Priorities

Drive Implementation of S&T 2030 Strategy



- Oversee and focus Vanguard Programs; identify transformational S&T investments and enablers to maintain technological advantage
- Prioritize Prototyping/Experimentation to accelerate tech transition to programs

Strengthen Cyber Resiliency of Weapons Systems



- Advance system security engineering practice and vulnerability mitigation
- Extend balanced protection actions to acquisition and S&T communities

Ensure Technical Rigor & Risk Management



- Implement Digital Engineering Management; advance engineering policy, guidance, standards
- Update DAF independent technical review methodology; implement with programs

Advance Science and Engineering Talent and Tools



- Address long term AF and SF human capital needs, workforce diversity
- Adopt digital tools, M&S, open architecture, and manufacturing technologies

Accelerate Digital Transformation with Technology, Tools and Talent



Department of the Air Force Digital Trinity

PRINCIPLES OF DIGITAL ACQUISITION

DIGITAL TRINITY

Agile Development

Digital Engineering Management

Open Architectures

Own, Share & Furnish the Tech Stack

Warp from Stack to the Edge

eCreate before you Aviate

“Speed and Agility”

Provide Continuous Disruptive Capability to the Field

e-SYSTEMS IMPERATIVES



COLLABORATIVE ENVIRONMENTS

Digital Thread
Requirements
Systems Design
Test & Evaluation
Manufacturing
Sustainment
Mission Engineering

ASSURED CODING

Containerization/Security
Artificial Intelligence
Automated Test, V&V,
Uncertainty Quantification
Microservices at Scale
Enterprise Architectures
Military Internet of Things

AUTHORITATIVE LIFECYCLE MODELS

Digital Twins
Mission Performance
Operational Availability
Optimized Processes
Digital Risk Reduction
Open Architectures
Data Rights

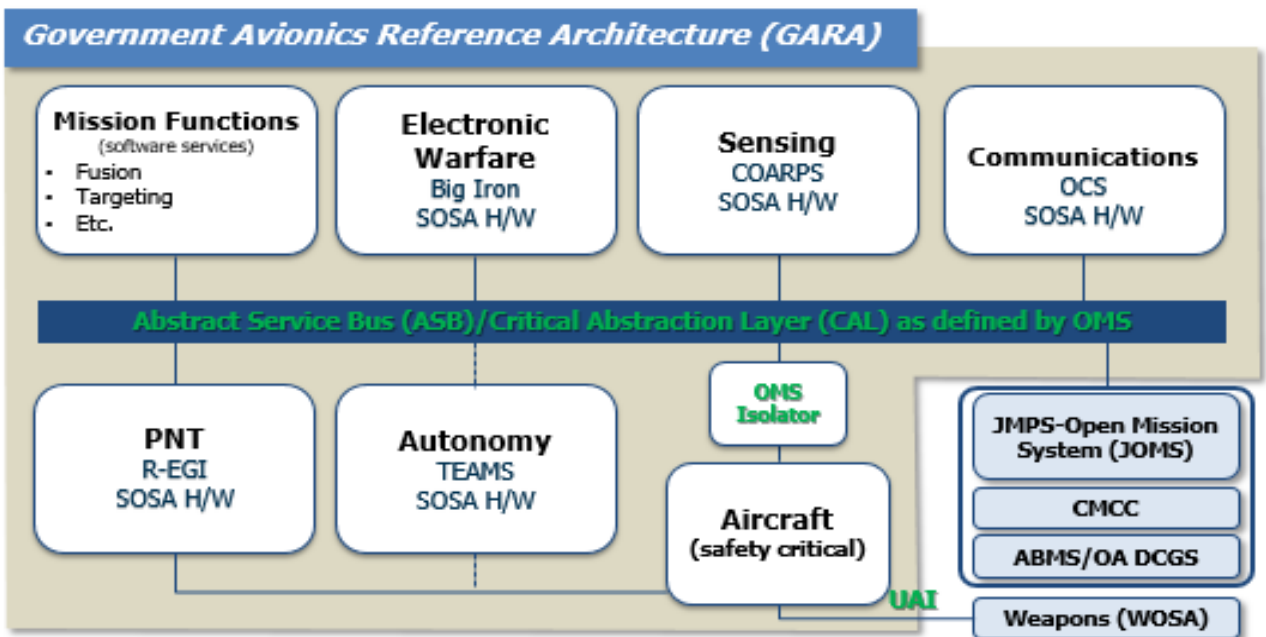


There Is No Spoon:
_The New Digital
Acquisition Reality
Dr. William Roper, USAF
Oct 2020

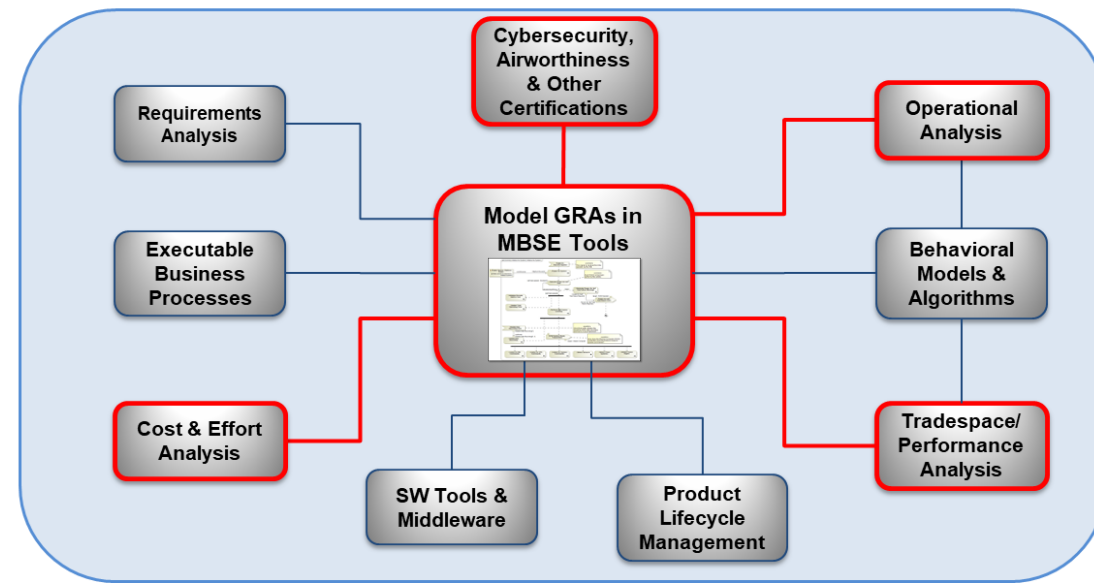


Digital Enabler – Government Reference Architectures

Government Reference Architectures *guide and constrain* solutions.
Developing GRAs, Models, Analytic tools, and Infrastructure that can be immediately leveraged by emerging and legacy programs to enable rapid development, testing, and integration.



Integrated, Gov't Owned Tech Stack





NDIA & Department of the Air Force Interests

Opportunities

Interests

Prototyping and Tech Transition



Utilizing rapid prototyping methodologies and model & sim for frequent iteration with operators to field MVP and optimize designs; engineering and architecting for tech transition/modernization

System Security/Cyber Resilient Engineering Methods & Practices



Protecting critical technical information in support of our national interest; ensuring designed-in cyber and system assurance and ability to detect/respond to attack.

Digital Engineering Design Reviews & Data Exchange Standards



Accelerating/transforming design reviews using continuous approval, shared tools/environments, standard views, and seamless data exchange.

S&E Workforce Talent and Diversity



Attracting skilled and knowledgeable talent to the defense sector; bringing new skills to an existing workforce; ensuring relevance, and maximizing our diversity and inclusion.



Some Potential Areas for NDIA Systems Engineering Division Support

- **Implementing DoD and Industry digital engineering**
 - **Digital Engineering approaches for Specialty Engineering Disciplines**
 - **Develop/streamline model based analyses, certifications (safety, security, airworthiness...unified certification system)**
 - **Transformation of engineering processes, reviews, standards**
 - **Identify/Demonstrate digital approaches to inform policy and guidance**
 - **Update assessment of digital engineering implementation risks and benefits**

 - **Demonstrated use of Reference Architectures and Open Standards**
 - **Demonstration & Assessment of methods and processes for transitioning new technologies, innovation rapidly into systems in development, or legacy upgrades**

 - **Shared initiatives to hire, develop and retain workforce**
 - **Competency models, shared training opportunities for hiring and development of system security engineers, digital/model engineers; data scientists**
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DISCUSSION/QUESTIONS?