Establishing An Operationalized MOSA Approach

AADL/ACVIP Users Day 2021

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3 February 2021
Advancing Army Aviation

**FUTURE FORCE**

**AVIATION ENABLERS**

**ENDURING FORCE**

Increasing Reach, Protection, Lethality, and Mission Command
Setting the Stage – The Architectural Evolution

Yesterday

- Closed Hardware Architectures
- Closed Software Architectures
- Tightly Coupled Hardware/Software
- Many Unique Integrations
- Hardware Reuse (LRU Level)
- Opportunistic Software Reuse
- Document oriented procurement
- Isolated analysis
- Test–fix-test mentality

Transition

- Gov’t Prescribed Open Architecture
- Open Hardware Architectures
- Open Software Architectures
- Software portability & interchangeability
- Shared Integrations (partial qualification credit)
- Strategic Reuse (HW, SW, artifacts)
- Model-based procurement
- Model-based Systems Engineering (MBSE)
- Architecture Centric Virtual Integration/Analysis

Tomorrow

- Core Assets
- Platform Assets
- Avionics Mission System
**AADL/ACVIP & Future Vertical Lift (FVL)**

**ObjArch** is a selection of applicable RA content and applying it to a set of AVs that we intend to share a common set of attributes (could think of this as all sharing a “CAAS” or “MCAP” architecture, displays, etc). It is beginning to look like a system architecture, but it still is not specific to a single aircraft.

**RefArch** is a consolidated list of architectural resources such as FACE, JCA, HOST, reusable assets (e.g. IDM, 231, etc), domain specific data models, AV/MSA interface, use cases/CONOPs, policies and directives, and applicable standards, tools, practices such as MBSE, ACVIP, STPA etc.

**SysArch** is the result of taking the OA and expanding/tailoring to apply platform specific requirements. This is specific to a single aircraft, and from this comes a system design.

**MBSE Leveraging SysML** is applied to wide system level requirements modeling & analysis.

**MBE with ACVIP Leveraging AADL** is applied to embedded computing system level modeling & analysis to mitigate integration issues.
From S&T to Production & Fielding

Transition

- Generating the “Great Idea”
- Engineering “Know-How”
- Business “Savvy” to Make it Happen

Production Is a Complex, Socio-Technical System

Technology

People

Infrastructure

Processes

Goals

Transition
MOSA Objectives

**MOSA TO Designed to Achieve Outcomes ...**

- **More Effective** with Aligned Program Objectives and a Common End State
- **More Efficient** with Reduced Duplication of Effort
- **Credible to Industry** with Consistent Communication and Tangible Actions

**... While Supporting Broader PEO MOSA Objectives ...**

- Improved Affordability
- Increased Readiness
- Enhanced Capabilities
- Reduced Schedule Pressure
- Reduced Supply Chain Risk

**...and Aligned with MOSA ICRD Objectives**

- **Threat Based Capability Adaptability**
- **Faster Fielding of Innovation to Achieve Overmatch**
- **Total Lifecycle Affordability through Competition**
- **Enabling Commonality**
PEO Driving MOSA Transformation Effort
Aligning People, Tools, Processes for Successful Execution

**Current State**
- Industry
- Science & Technology

**MOSA 9 LOEs**
1. Governance & Policy
2. Architecture & Standards
3. Software Development
4. Collaborative Digital Environment
5. MOSA Conformance Center
6. Qualification & Material Release
7. Affordability & Savings
8. Contracting Efficiencies
9. Strategic Communications

Creating standardization, increasing communications, applying lessons learned, eliminating stovepipes

**Future State**
- Integrated, Aligned, Synchronized

- Holistic MOSA Application Across AVN Lifecycle
- Requirements/Validation
- Science & Technology Evaluations
- Product Design and Development
- Maintenance and Sustainment
- Training and Deployment
- Testing and Validation

‘Ready to Catch’ Modernization Efforts
Management Structure

Steering Committee led by PEO

*Bi-monthly Meeting*
AMC, FVL CFT, AVNCOE, AMCOM, DAMO-AV, ACC, ARSOAC, CCDC AvMC

DPEO Bi-weekly Reviews
Transformation Office (Dir. Matt Sipe, Dep. Tabitha Horrocks)

Steering Committee

Led by PEO and comprised of Army Aviation Executives to drive decision making, maintain accountability, and de-conflict issues.

DPEO
Serves as Day-to-Day Leader of This Effort, with Enterprise Oversight and Accountable for Results

Surge Support Empowered to Stand Up Governance Model; Responsible for tracking progress, elevating critical decisions

MOSA Implementation
To be reviewed thematically across 9 lines of effort (4-5 LoEs reviewed every two weeks)

LoEs Are Working Groups, Each with an assigned leader from one of the PMs as an extra duty. Steering Committee may provide leaders with surge support to accelerate progress

Each LoE Lead Selected Based on His/Her Expertise – and to ensure balanced representation of enduring fleet & FVL

- Governance & Policy
- Architecture & Standards
- MOSA Conformance Center
- Software Development
- Collaborative Digital Environment
- Qualification and Material Release
- Affordability, Funding & Savings
- Contracting Efficiency
- Strategic Communications
- Enterprise-wide MOSA Governance
- Maximize Competitive Environment
- Prep USG for New Industry Relations

Prep USG for New Industry Relations
Complementary Languages and Tools

Filling the Modeling and Analysis Gap for Cyber-Physical System
Development Environment Enablers

Development Environment, Tool Chain, and Process Controls Are Critical to Success
Near-term Efforts

- Issue Initial PEO Aviation MOSA **Policy and Guidance**
- Establish PEO Aviation MOSA **Governance** Body to Oversee Policy Implementation and Execution of MOSA Transformation Roadmap
- Identify, Prioritize, and Synchronize Cross-cutting Opportunities **Focused on Major System Components** (‘Crown Jewels’) for MOSA Implementation and Align Budgets Accordingly
- Develop PEO Aviation Reference Architecture and **Component Boundaries**
- **Establish Contract Vehicles** to Enable MOSA Implementation
- Identify **Sustainable Business Model** that Incentivizes Industry Implementation of MOSA
- Solicit **Industry Feedback** Through MSI RFI
- Invest in **Infrastructure** to Support Digital Environment and **Tool Chains**
- Focus on **Software Development and Acquisition** (Reuse, SDKs, USG Software Factory)
- Identify **Business Model** Elements to Incentivize Industry Implementation of MOSA
- Maintain Alignment with Army Futures Command (AFC) on Integrated Mission Equipment for Vertical Lift Systems (IME) and Other MOSA-related Efforts
- Ensure Continuity with ASA(ALT) Common Modular Open Architecture (CMOA) Effort
Key Take-Aways

• PEO Aviation Committed to MOSA Transformation Across the Aviation Domain
  • Expanding Beyond FVL Platforms
  • Developing Long-term MOSA Roadmap
  • Investing in MOSA-related Activities and Infrastructure

• Industry Collaboration is Critical to Successful Implementation
  • Request Quality Responses to RFIs (Industry Opportunity to Influence Future State)
  • Identify Mutually Beneficial Strategies to Make MOSA a Viable Business Case
Questions and Closing Comments