Naval Postgraduate School Acquisition Research Symposium

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SE MOD Directorate Mission and Priorities

SE MOD VISION

Modernize Systems Engineering and Modular Open Systems Approach practices through digital transformation to accelerate the delivery of lethal capabilities to the Warfighter.

SE MOD STRATEGY

We will advance Digital Transformation through the implementation of SE Modernization and MOSA practices within acquisition strategies, AoAs, SEPs, TEMPs, TRAs, ITRAs, and implementation plans for all programs to support MEIA and promote mission engineering capabilities, interoperability, agility, competition, and reduce life cycle costs. We will empower the DoW's practitioner level engineers to enhance SE processes to acknowledge and accept more risk through the rapid development and deployment of integrated digital tools, dashboards, and environments; provide modern guidance and training; and ensure that the necessary resources are planned to create a more agile and responsive acquisition system.

FY26 SE MOD LOEs

LOE 1 – Advance the Engineering Practice
- Acquisition Transformation Strategy: Initiatives 4.2
- Modernize engineering practices and tools

LOE 2 – Connect & Strengthen the Technical Community
- Acquisition Transformation Strategy: Initiatives 4.2
- Build strong partnerships with DoW, Industry, and Academia

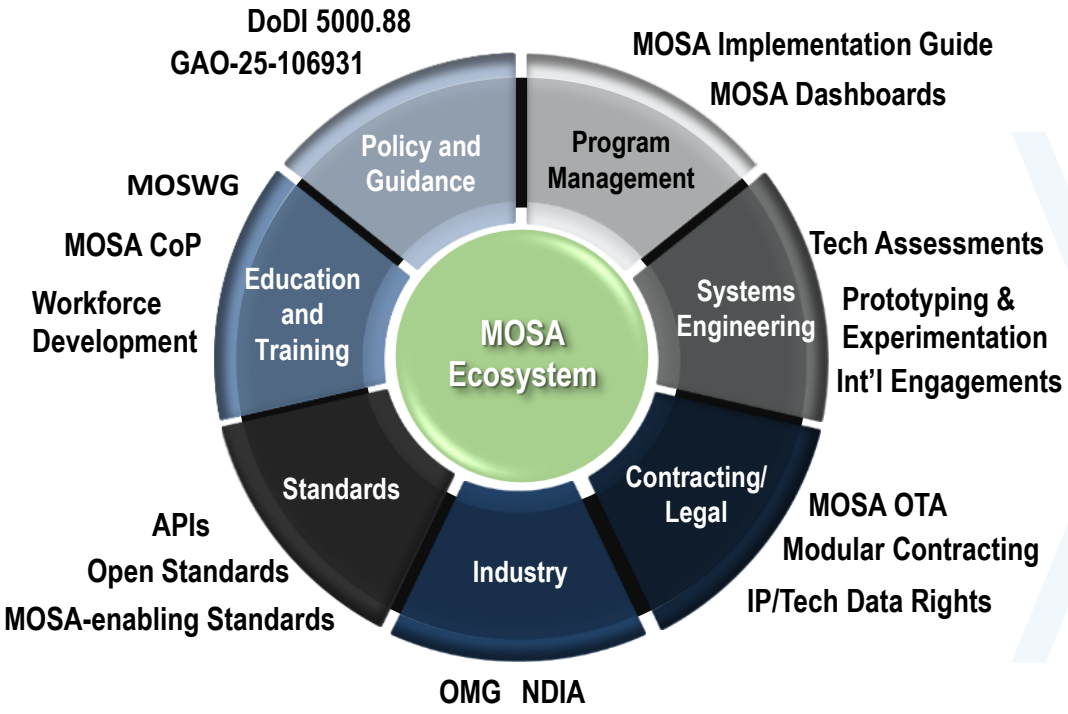
LOE 3 – Develop the Workforce
- Manage and improved the acquisition tech workforce
- Identify new tech skills and competencies, update training

LOE 4 – Advance and Manage Standards
- Acquisition Transformation Strategy: Initiatives 4.4
- Open Interface Standards Management with ASSIST

LOE 5 – Provide Technical Support for Program Reviews
- Provide independent engineering and technical risk assessments for DTE&A (SE and MOSA)
- Provide SME reviews for SE related acquisition artifacts.

MOSA FY26 Lines of Effort (LOEs)

Strengthening MOSA Technical & Acquisition Communities



Problem Statement: Efforts to implement standards, specifications, and architectures that enable MOSA in Systems of Systems (SoS) are not communicated across the Department and MILDEPs

FY26 SE&A LOEs

LOE 1 — Advance the Engineering Practice
- Acquisition Transformation Strategy: Initiatives 4.4
- Acquisition Transformation Strategy: Initiatives 4.2

LOE 2 — Connect & Strengthen the Technical Community
- Acquisition Transformation Strategy: Initiatives 4.2

LOE 3 — Develop the Workforce
- Warfighting Acquisition University engagements (CLE 019 Updates, MOSA CoP Modernization)

LOE 4 — Advance and Manage Standards
- Acquisition Transformation Strategy: Initiatives 4.4
- Open Interface Standards Management: MOSS area in ASSIST

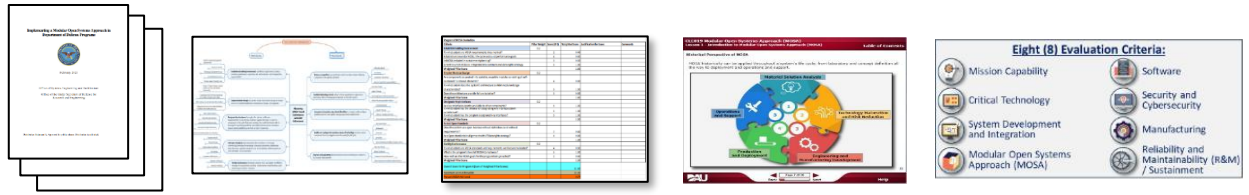
LOE 5 — Provide Systems of Systems (SoS) Architecture
- Open Interface Standards Data Call and Review
- MILDEP Collaboration

Path Forward:
- Engage with A&S, DSPO and Services to address ATS Initiative 4.4 and 4.2
- Leverage the MOSWG for data calls and technical interchange meetings
- Align MOSA to Initiatives across the ATS

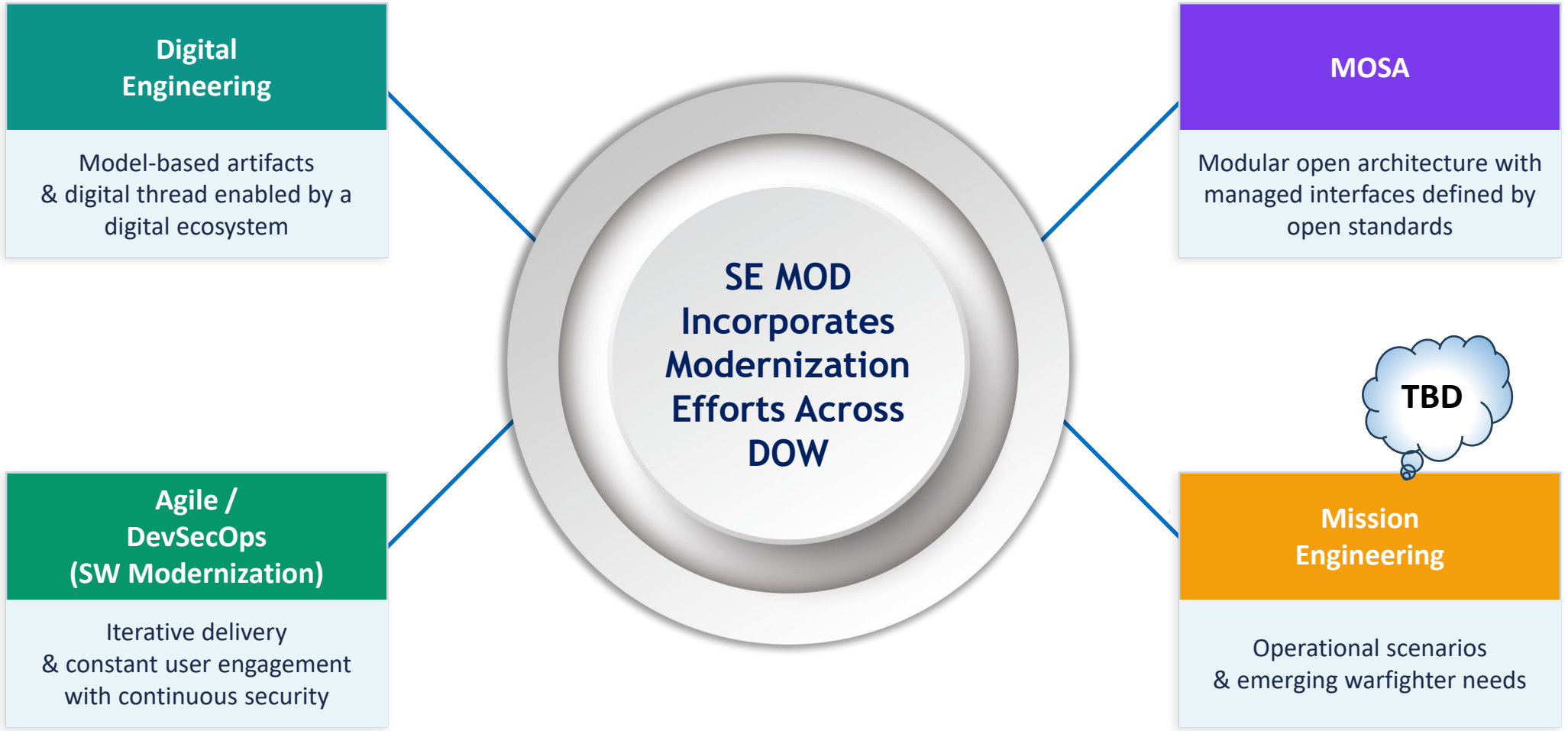
MOSA LOEs, Activities, Deliverables, Customers

LOE 1 –Advance the Engineering Practice
LOE 2 – Connect & Strengthen the Tech Community
LOE 3 – Develop the Workforce
LOE 4 – Advance and Manage Standards
LOE 5 – Digital Acquisition Thread Exemplar
LOE 6 – Provide Systems of Systems (SoS) Architecture

MOSA Implementation Guide
MOSA Repositories
MOSA Verification Tools
MOSA Training – DAU CLE 019
MOSA CBA Framework
ITRA Review SME Support



SE MOD Approach

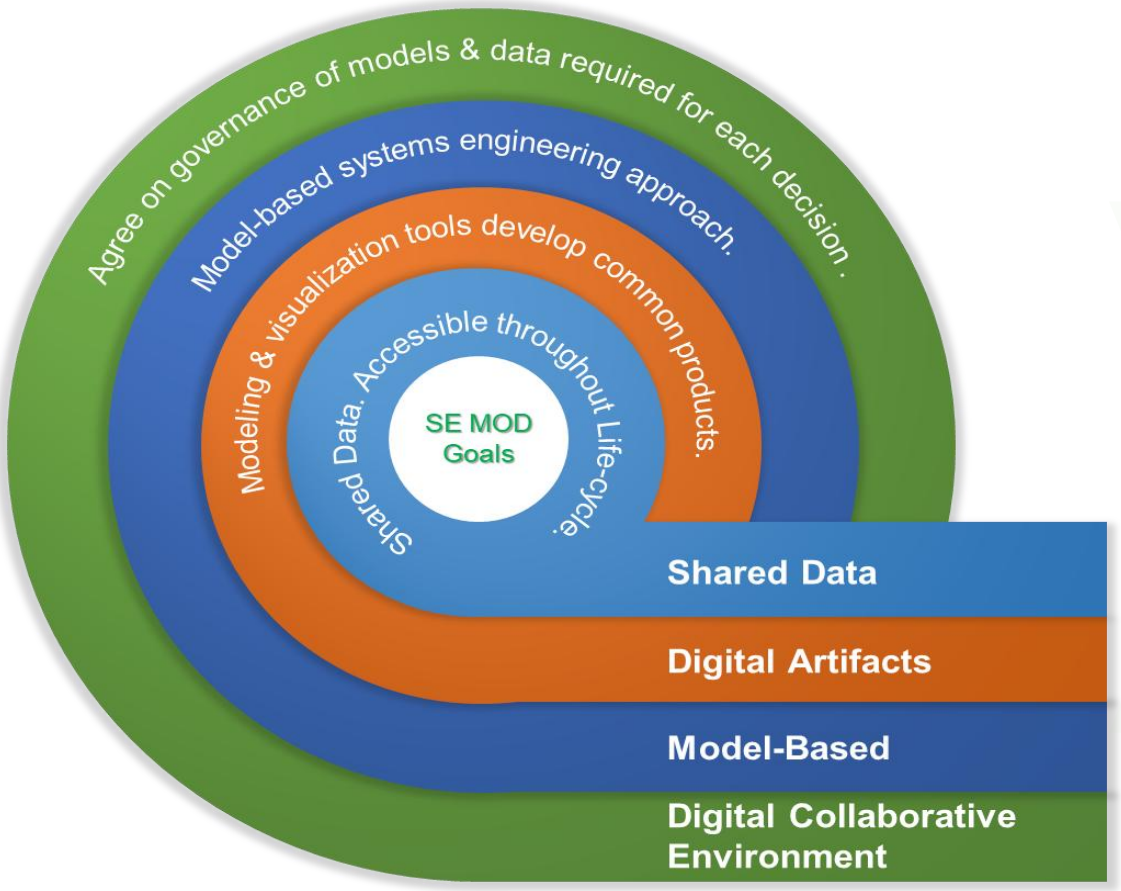


SE MOD connects Digital Engineering, MOSA, Mission Engineering, and Agile/DevSecOps into a unified modernization strategy.

Systems Engineering Modernization (SE MOD)

Objectives

- ❑ Accelerate the implementation of the digital transformation (Digital SE Enterprise Tools & MBSE) into SE Workflow, Decisions and Practices
- ❑ Sustain SE Community of Practice (CoP), Collaborate w/Industry & Academia
- ❑ Identify & recommend SEMOD Workforce Roles & Skills Gaps



SE MOD Lines Of Effort

- SEMOD BoK located in DEBoK
- Policy & Guidance Review & Update
- Model Based, Data Driven SE Workflows & Decisions
- Roadmaps & Framework (Agile Iterative Mental Model)
- COP/ Best Practices/ Exemplars
- Workforce: DE/SE Workshops & Webinars

So…How Do We Enable SE Modernization?

Here's How…

SE Supra-System describes 3 concurrent processes:
– SE life cycle
– Data and model life cycle
– Engineering life cycle

SE Modernization is a continuous process that is iterative with a seamless and efficient transfer of data and models.

Leverage SW Modernization as an exemplar of Agile practices – responsive to changing stakeholder needs

Use **Ontologies** to build common understanding

New Mental Model

Implement Modern Design Principles (MOSA & Agile)

Model-Based

Data Centric

Collaboration

Decomposable Architecture with Open Interfaces

Iterative Approach to SE Processes with **data and models across the lifecycle**

Exemplar Reference implementations will provide templates to help programs get started

"Knowledge needs to be liberated from the artifacts"
Dr. Steve Jenkins
JPL/NASA (Retired)

Vision: Seamless & Efficient Acquisition/Engineering Process Integration

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FY24 SETR Transformation

- Conducted at key knowledge points aligned to AAF pathway
- Relies on subject matter expertise
- Redundant
- Difficult to keep all documents up to date

- INCOSE /NDIA– DE WORK, FUSE, DEMM,
- SERC studies (SUPRA Cycle)
- SE MOD LOEs/MBSE/Ref Arch/SEP
- DE: DEM&S COP, DEBOK, MBSE
- OMG- MBAcq

- Test Continuum – MB TEMP
- Digital SEP
- R&M COP
- SW Modernization
- Data Strategy (CIO)
- Ontology WG
- MOSA

- MBSE
- DE Infrastructure
- Collaboration around Data & Models
- Data & Model Governance

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MOSA Aligned – Technology Transition Framework (NPS Panel 2025)

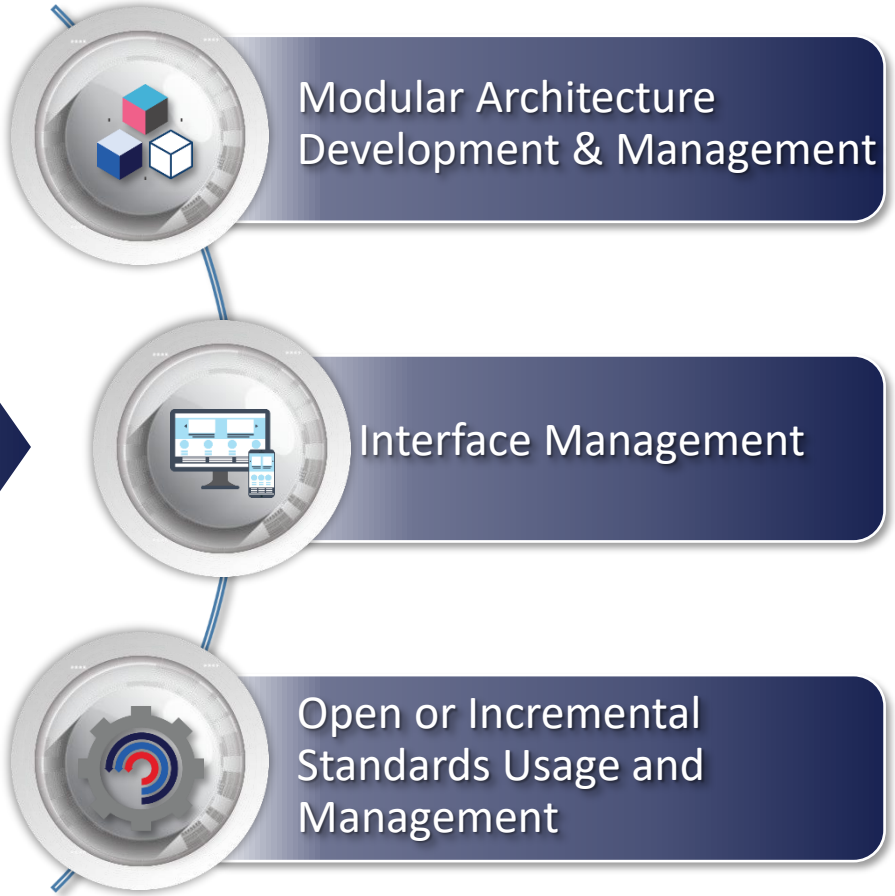
Addresses MOSA Considerations During Technology Development through:

-Architecture Development & Management planning that uses MBSE tools to manage model-based systems engineering (MBSE) to consider optional solutions.

-Interface Management that supports integration & interoperability goals to include reuse strategies such as product line architecture.

-Plan for Consensus-based Open Standards or Incremental Standards that facilitate future upgrades and technology refresh cycles

Incorporate MOSA Principles into the Technology Development Strategy



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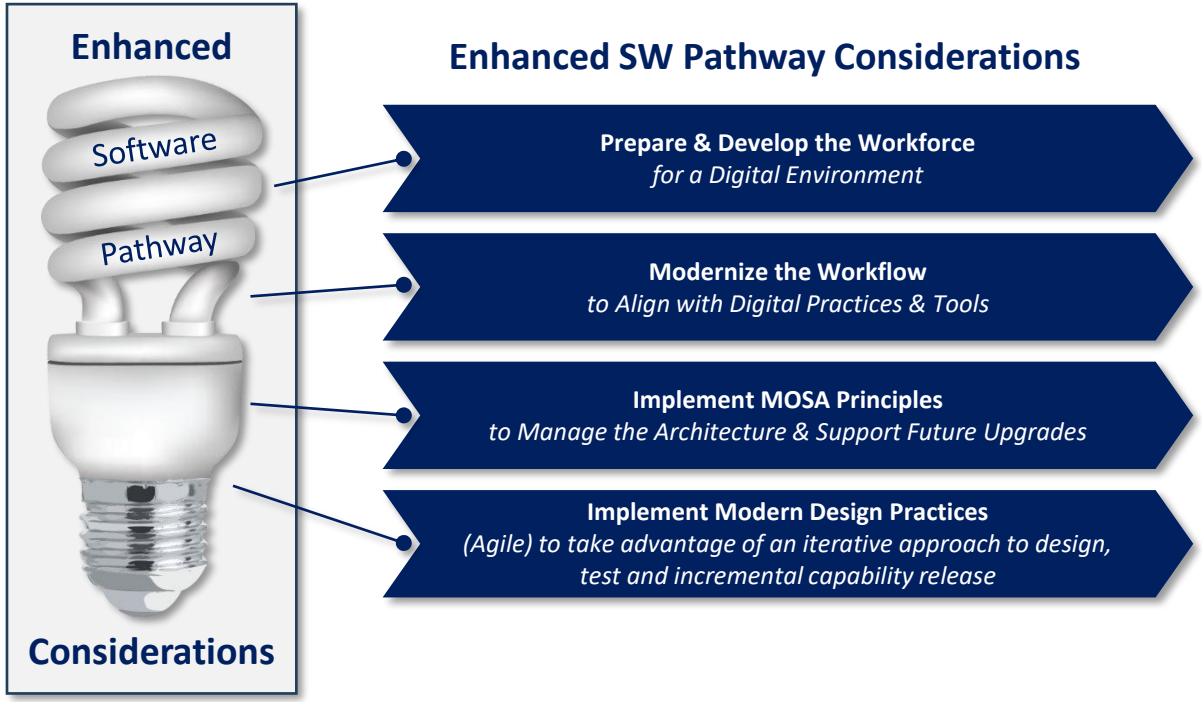
Systems Engineering Modernization (SEMOD) Considerations that Enhance the SW Acq Pathway

https://www.cto.mil/sea/dems/

- **Life Cycle Approach aligned to Acquisition Transformation**
  - Program managers and practitioners must actively manage these tradeoffs while tailoring their approaches to model-based development, collaborative engineering, and integrated testing across the life cycle that requires a digital ecosystem.
- **Recommended Metrics Description**
  - Qualitative or adjectival, requiring programs to conduct self-assessments and determine how to balance cost, schedule, and performance in alignment with their operational priorities and risk posture.
  - The target values for these metrics are examples intended to scale with the maturity and complexity of the program.



Digital Engineering Modeling and Simulation (DEM&S) White Paper with SEMOD Consideration (Hettema, Alexander September 2025) describes the considerations with subcategories that provide additional insights

Conclusions (MOSA Specific)

- MOSA statutes are expanding the expectations for programs to implement MOSA
- MOSA offers a viable set of principles that can benefit every phase of the acquisition lifecycle
- Upcoming by end of FY27
  - MOSA BCA approach
  - MOSA Architecture comparison tool
  - Update to the MOSA Implementation Guide- Draft (“Implementing a MOSA in DOD Programs”)
  - Interface Repository (Beta Version)
- Additional MOSA or SEMOD Resources at
  - www.cto.mil

Contact

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