

Executive Panel

SERC Research Review 2024

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Systems Engineering & Architecture
SERC Research Review 2024

November 12, 2024





Digital Transformation

"Modeling and simulation will be used to train our forces, to aid our decision makers, and to acquire new weapon systems. But we have only begun to exploit the power of modeling and simulation to support these objectives."

HON Dr. Paul Kaminski (1996)

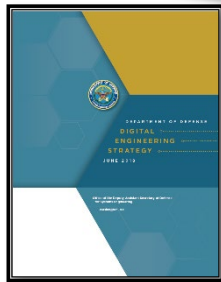


"We must field and upgrade weapon systems on much faster cycle times to make the best use of continuing advances in technology, as well as trim costs. Techniques like modeling and simulation can help us in those areas by reducing risk, by saving time in development and production and by making efficient use of scarce and increasingly expensive resources."

HON Dr. Jacques Gansler (1998)

"... transforming its engineering practices to digital engineering, incorporating technological innovations into an integrated, digital, model-based approach."

Digital Engineering Strategy (2018)



Initial Digital Engineering Body of Knowledge (DE Bok)

Technical Workforce:
• CENG 001: Digital Engineering for DoD Consumers Credential



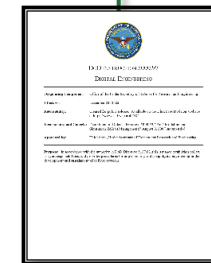
"...the Secretary of Defense shall issue or modify policies and guidance to ... promote the use of digital engineering"

"...It shall be a policy of the Department of Defense to promote and maintain digital expertise ... as core competencies of civilian and military workforces"

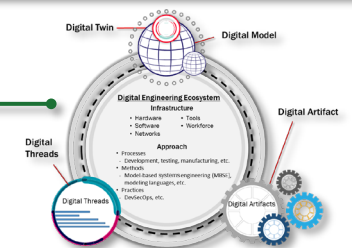
FY 2020 NDAAs

"The committee commends the Department for the December 2023 release of Instruction 5000.97, which outlines the strategic implementation of digital engineering across defense acquisition programs. . . .digital engineering can offer significant improvements in efficiency, costs, and capabilities in procurement and lifecycle management. . .the instruction provides needed direction for the Department and contractors in this space."

House Armed Services Committee Report 118-529



DoDI 5000.97 Digital Engineering



Transforming the engineering practices



Digital Transformation: Path Ahead

2024

Technical Reports:

- SysML v1 to SysML v2 Model Conversion Approach (March 2024)
- SysML v1 to SysML v2 Transition Plan Template (March 2024)

2025

Application Programming Interface (API)
Technical Guidance document (August 2024)

API characteristics:

- Interoperable
- Discoverable
- Adheres to common standards
- Platform and language independent
- Zero-Trust secured
- Resilient

2026

Focus Areas:

- **Advancing the Practice (Modeling: SysML v2.0)**
- **Incorporating Data into Decision Making (API)**
- **Upskill the Workforce (DE Credential, Handbook)**
- **Avoiding “Vendor Lock” with Tools (DETECT)**
- **Transition to Commercial Standards (Unified Architecture Framework v2.0)**

NEW: Object Management Group (OMG) release of:

SysML v2.0

- Interoperability with other engineering models and tools (API-enabled)

NEW: Digital Engineering Tool Evaluation Criteria Template (DETECT)

- Provide tool agnostic selection criteria

UPDATED:

MIL-HDBK-539 Digital Engineering & Modeling Practices Handbook

- Provides guidance on how digital engineering and modeling activities can be integrated across all disciplines and functional areas

NEW:

- Modular Open Systems Approach (MOSA)Guidebook – Improves future designs

UPDATE:

- ASSIST Database Upgrade – Moving to “machine-readable” standards

NEW: Technical Workforce

- CENG 028: Intermediate Digital Engineering Credential

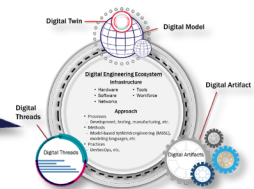
2027

NEW: OMG release of:

Unified Architecture Framework (UAF 2.0)

- Integration to SysML v2.0
- API-enabled

Transforming the engineering practices





“Creating Data Advantage” for Decision Makers

Deputy Secretary of Defense Memorandum,
“Creating Data Advantage” (May 5, 2021)

“Data is a strategic asset. Transforming the Department of Defense (DoD) to a data centric organization is critical to improving performance and creating decision advantage at all echelons from the battlespace to the board room, ensuring U.S. competitive advantage.”

DoD Data Strategy (2020)

Vision:

“DoD is a data-centric organization that uses data at speed and scale for operational advantage and increased efficiency.”

Defense Business Board (DBB) “Creating a Digital Ecosystem” (2024)

“The recently released DoDI 5000.97 Digital Engineering policy further complements this Study and provides a foundation for executing some of the Board’s recommendations.”

Defense Innovation Board, “Building a Data Economy” (2024): “DoD should address its lack of data extensibility across environments by using Application Programming Interfaces (APIs)...”

APIs allow two or more components to communicate/exchange data

