ptc

DIGITAL TRANSFORMS PHYSICAL

DOD INSTRUCTION 5000.97 ON DIGITAL ENGINEERING

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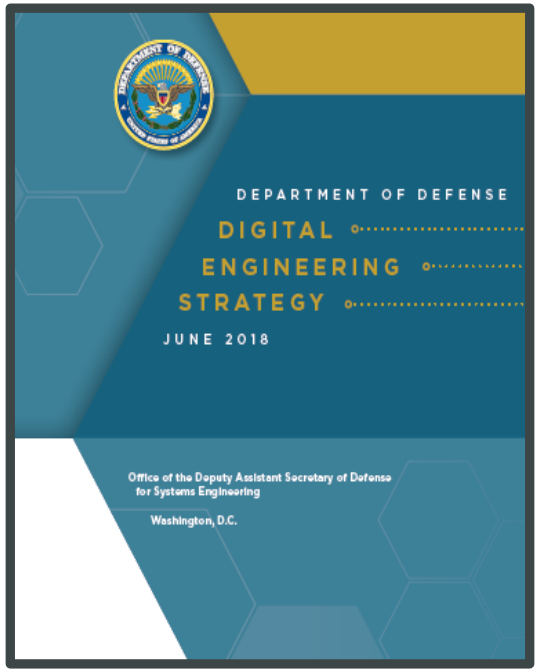
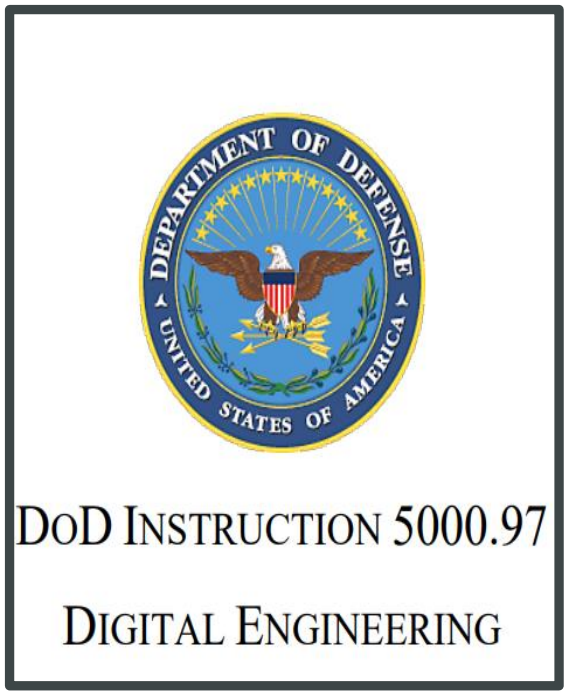
DOD INSTRUCTION 5000.97 ON DIGITAL ENGINEERING

2018…
DE Policy

- From document-centric approach to digital models.
- Engineering as a continuum across the product lifecycle.
- Product support models.





2023…
Instruction 5000.97

- Guidance on DOD PM implementations of digital engineering.
- Applies to new programs started after 12/2023.
- Clearly defines 'Capability Elements'…Ecosystem, Models, Threads, Artifacts.

2018 DE policy was service-branch focused.
2023 instruction is program-focused.

TAKE AWAYS FOR DOD INSTRUCTION 5000.97

- **Background -** Guidance on DOD implementations of digital engineering (more detailed vs. 2018). Replaces 2007 DOD Directive 'DoD Modeling and Simulation (M&S).
- **All New Programs -** PMs must address DE in acquisition strategy 'as early as possible' (how, when, benefits). Present the DE approach at each program milestone.
- **6 Acquisition Categories -** Major Capability, Middle Tier, Software, Defense Business Systems, Urgent Capability, Services. Each is rooted in its own DoDI, thus each have different language regarding DE adoption.
- **'Capability Elements' -** Much detail explaining 4 distinct concepts…'Digital Ecosystem' / 'Digital Models (Twins)' / 'Digital Threads' / 'Digital Artifacts'.
- **CR Logjam -** Applies to all programs started after 12/21/2023. Logjam of FY '23, '24 programs due to CR.
- **CDRLs / DIDs -** PM will require digital models, artifacts, and data sets as deliverables in the contract through contract data requirements lists and data item descriptions.
- **Non PMs -** DE be accessible to, and usable by, other parts of DOD (requirements, architecture, capability design, development, testing, evaluation, operation, training).

Across the DOD and the DIB, digital engineering capabilities from PTC will be critical to accelerating adoption!

KEY QUOTES FROM INSTRUCTION 5000.97

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1.2. POLICY.

c. Digital engineering requires planning and providing financial and other resources for digital methods (e.g., model-based systems engineering (MBSE), product life-cycle management, computer aided design) in support of program activities to the maximum extent possible.

3.4. IMPLEMENTATION OF DIGITAL ENGINEERING.

a. The PM must implement digital engineering procedures as early in program planning as possible and across the system life cycle.

DE is no longer an IT effort, but is now linked directly to supporting strategic program activities. MBSE, PLM, CAD all mentioned.

DIGITAL ENGINEERING FRAMEWORK

Digital Twin

A computerized representation (integrated set of models) that serves as the real-time digital counterpart of a physical object or process.

Digital Model Examples:

- Requirements model
- Structural model
- Functional model
- Architecture model
- Business process model
- Enterprise model
- Human performance models
- Product life cycle models

Digital Engineering Ecosystem

Infrastructure

- Hardware
- Software
- Networks
- Tools
- Workforce

Approach

- Processes
  - Development, testing, manufacturing, etc.
- Methods
  - Model-based systems engineering (MBSE), modeling languages, etc.
- Practices
  - DevSecOps, etc.

Digital Thread Examples:

- Requirements Analysis
- Architecture Development
- Design and Cost Trades
- Design Evaluations and Optimizations
- System, Subsystem, and Component Definition and Integration
- Cost Estimations
- Training Aids and Devices Development
- Developmental and Operational Tests
- Product Support

Digital Artifact Examples:

- Specifications
- Technical drawings
- Design documents
- Interface management documents
- Analytical results

CAPABILITIES FROM PTC WILL BE CRITICAL IN ACCELERATING 5000.97 ADOPTION

DoD Instruction 5000.97 Capability Elements

1. DIGITAL Eng Ecosystem… COLLABORATION
2. DIGITAL Model / Twin… TRACEABILITY
3. DIGITAL Thread… ANALYTICAL FRAMEWORK
4. DIGITAL Artifacts… GENERATED FROM MODELS

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thingworx®
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NEAR FUTURE?

- **Existing Programs -** Many already adopting
- **NASA and Department of Energy -** Considering
- **Industry -** Win theme

FOR MORE INFO ON DOD 5000.97

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