



# Achieving Digital Engineering Value on Day One


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SAIC

PLM Road Map™ & PDT North America 2024  
*Value Drivers for Digitalization of the Product Lifecycle*  
Insights for the PLM Professional – Why the investment, what are the returns, and how are they achieved?  
May 8 & 9

CIMdata | eurostep

# Digital Engineering



**DoD INSTRUCTION 5000.97**  
**DIGITAL ENGINEERING**

**Originating Component:** Office of the Under Secretary of Defense for Research and Engineering

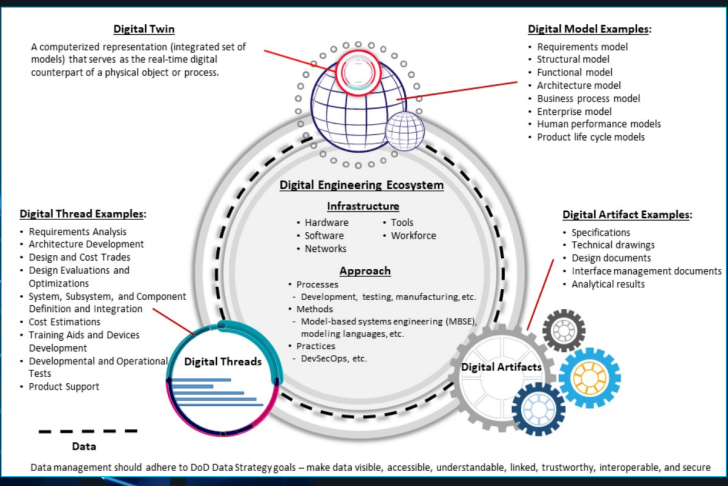
**Effective:** December 21, 2023

**Releasability:** Cleared for public release. Available on the Directorate Division Website at <https://www.ouso.dod.mil/DID/>.

**Incorporates and Cancels:** Department of Defense Directive 5000.59, "DoD Modeling and Simulation (M&S) Management," August 8, 2007, as amended

**Approved by:** Heidi Shyn, Under Secretary of Defense for Research and Engineering

**Purpose:** In accordance with the authority in DoD Directive 5137.02, this instruction establishes policy, assigns responsibilities, and provides procedures for implementing and using digital engineering in the development and sustainment of defense systems.



**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:**

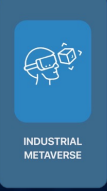
- Specifications
- Technical drawings
- Design documents
- Interface management documents
- Analytical results

**Data**  
Data management should adhere to DoD Data Strategy goals – make data visible, accessible, understandable, linked, trustworthy, interoperable, and secure

# Digital Engineering

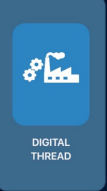


GENERATIVE AI




INDUSTRIAL METaverse

### Technology Pillars



DIGITAL THREAD



HYPERSCALERS

### DE Growth

CXOs are committed to innovation, despite this volatility, by funding it with cost optimization and productivity gains

Continued focus on digital transformation and pervasive consumption on Cloud, chips, and data will fuel DE spending

### DE Spend

- **\$810B** DE Spend 2022

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- **\$1.584B** DE Spend 2026 est


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- **18%** CAGR%


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- **1.9X** Spend Increase -4yrs

CREDIT :The Inevitable Rise and Impact of Digital Engineering – Zinnov 2023



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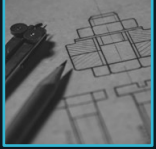
## Digital History

*DE ⊂ DT*

Exposed gaps in Digital Transformation

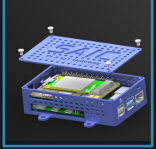
Digitization success, integrated digital processes lacking

**Digitalization is transforming the world of work. The acquisition of digital skills has now become a prerequisite for individual, industry, and regional success – Brookings**




### Digitization

The process of changing from analog to digital form - Gartner




### Digitalization

The use of digital technologies to change a business model and provide new revenue and value-producing opportunities – Gartner




### Digital Transformation

The fundamental rewiring of how an organization operates. The goal of a digital transformation, should be to build a competitive advantage by continuously deploying tech at scale to improve customer experience and lower costs. - McKinsey




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# Data Accessibility

The inability to rapidly access accurate, timely, and applicable data can present risk and missed opportunities




34%

Department Data is widely available




16%

Enterprise data is widely available



9%


Customer / field data is widely available




8%

Supplier Data is widely available

Reference: The State of the Digital Thread White Paper, S. Dertien, W. Hastings, PTC 2021



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# ReadyOne™

Integrated Digital Engineering Processes & Training

System Architecture

Design & Development















Modeling & Simulation


Sustainment

Mfg & Quality

➔

Integrated Digital Thread Platform







Configuration
Dashboards
Content
Platform Features
Prod. Nav.
Graph Navigation
...

Ontology
Access
Configuration
Platform Services
Search
Visualization
Process

Modular Connector Architecture


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Connectors







Domain Tool Catalog


REQUIREMENT & VALIDATION




SYSTEM ARCHITECTURE




SIMULATION




CAD




MS OFFICE



SOFTWARE




MFG




Customer Tools & Business Systems


PDM




ERP




SIMULATION




CAD



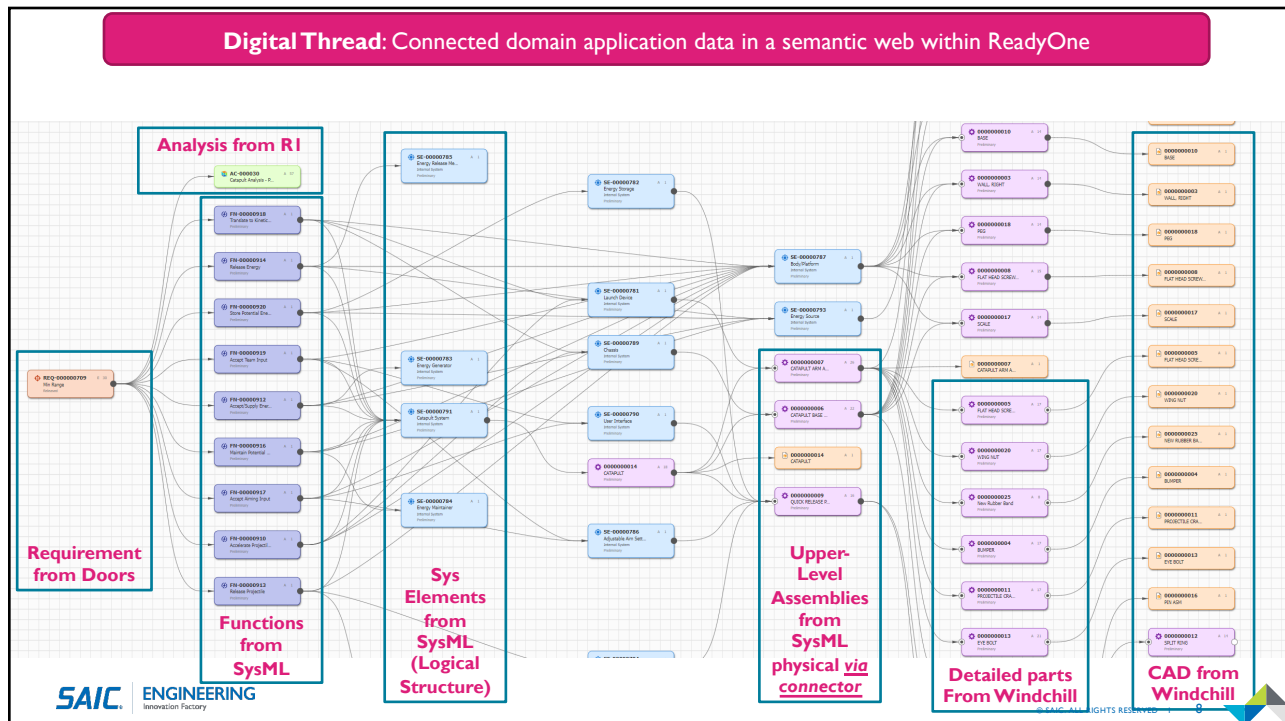
Digital Engineering Ecosystem



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3



# Measurable Value

## Not Just A Pretty Picture

The Digital Thread is a continuous flow of data that connects people, business practices & tools, products, facilities & equipment – bridging the digital and physical world with widespread access to data.

- **Speed to Fleet**  
Real-time collaboration and streamlined development effort with digital design practices – speeding design and analysis, reducing the need for physical prototypes.
- **Cost of Quality**  
Create a centralized source of truth for released product data to reduce defects caused by incorrect information
- **System Optimization**  
Develop new systems based on data, models, and simulation. Explore design spaces with automated modeling and simulation to identify optimal and unwanted design points
- **Operational Productivity**  
Enable collaboration across enterprise systems and supply chain supporting acquisition and sustainment

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**SAIC** ENGINEERING  
Innovation Factory

# ReadyOne™

## Digital Engineering on Day One