



Exchanging Digital Engineering Information in a Global Supply Chain

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Office of the Under Secretary of Defense for
Research and Engineering

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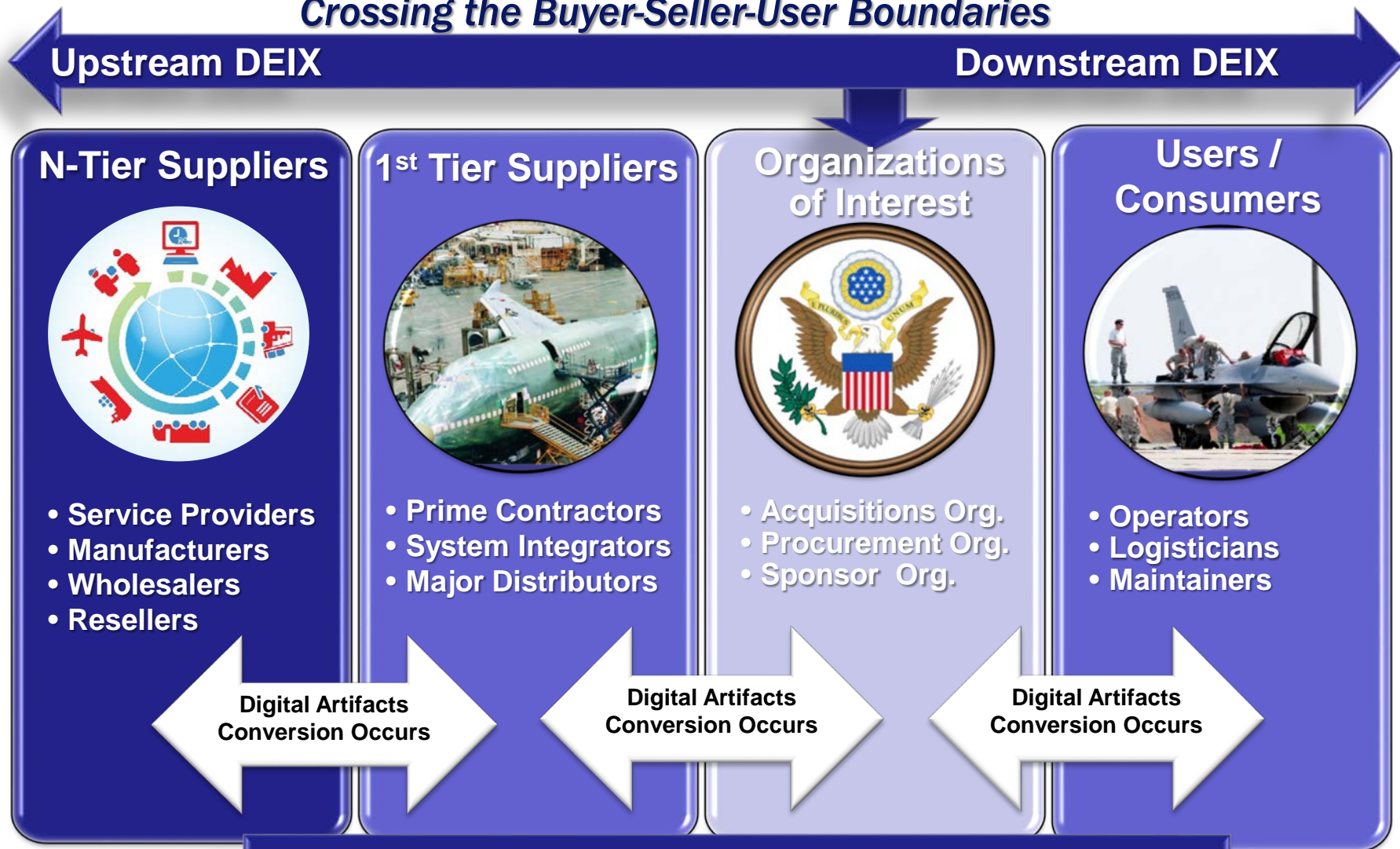


Why is it so hard to exchange engineering artifacts in a digital era?

THE CHALLENGE

The Digital Exchange Context

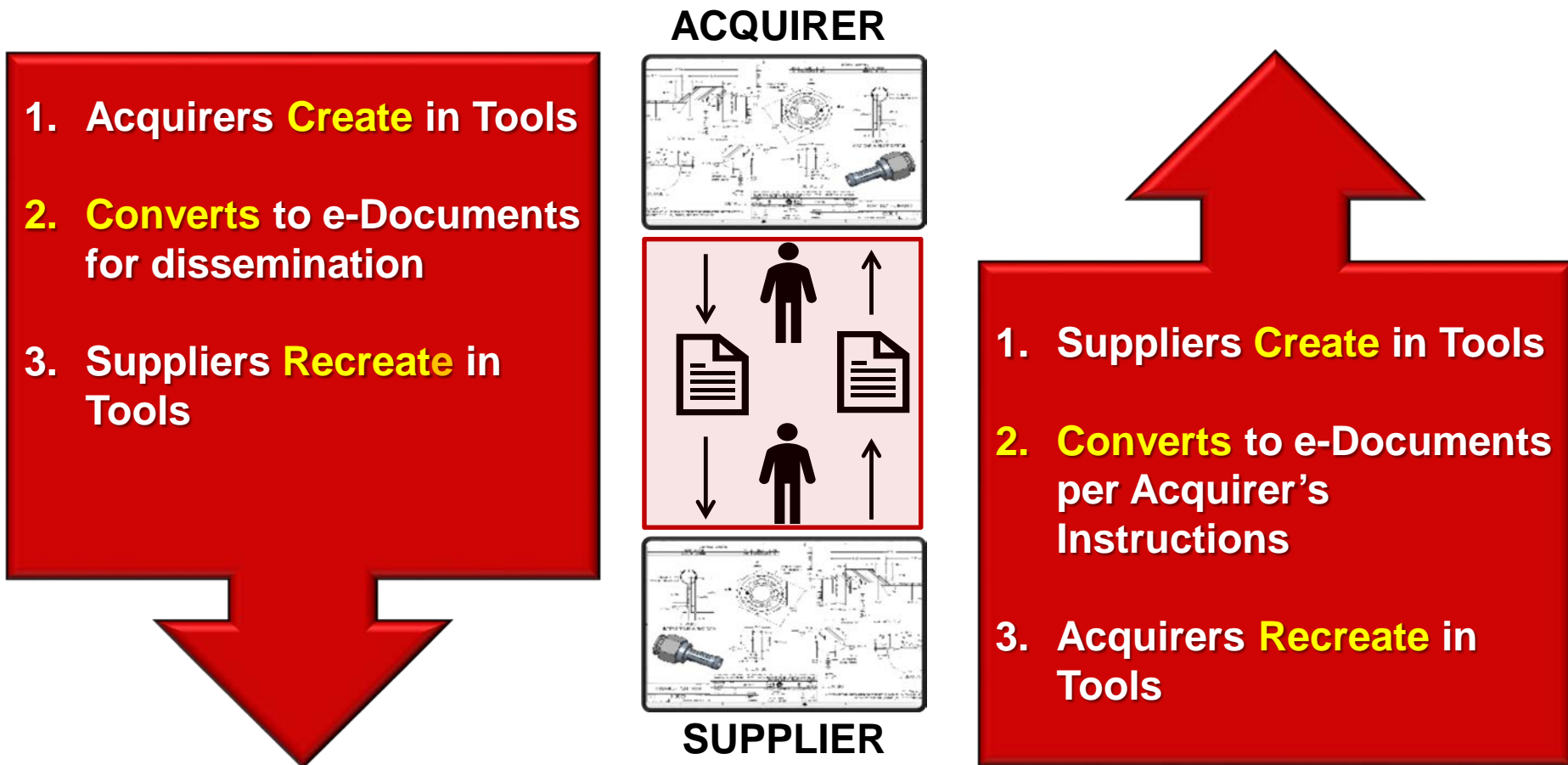
Crossing the Buyer-Seller-User Boundaries



How do we exchange digital artifacts using historical contracting-language from a document-based tradition?

Problem Statement: Digital Artifact Conversion Occurs

The World of Data Item Descriptions (DID) & Contract Data Requirements List (CDRL)
“The Cycle of Create and Recreate”

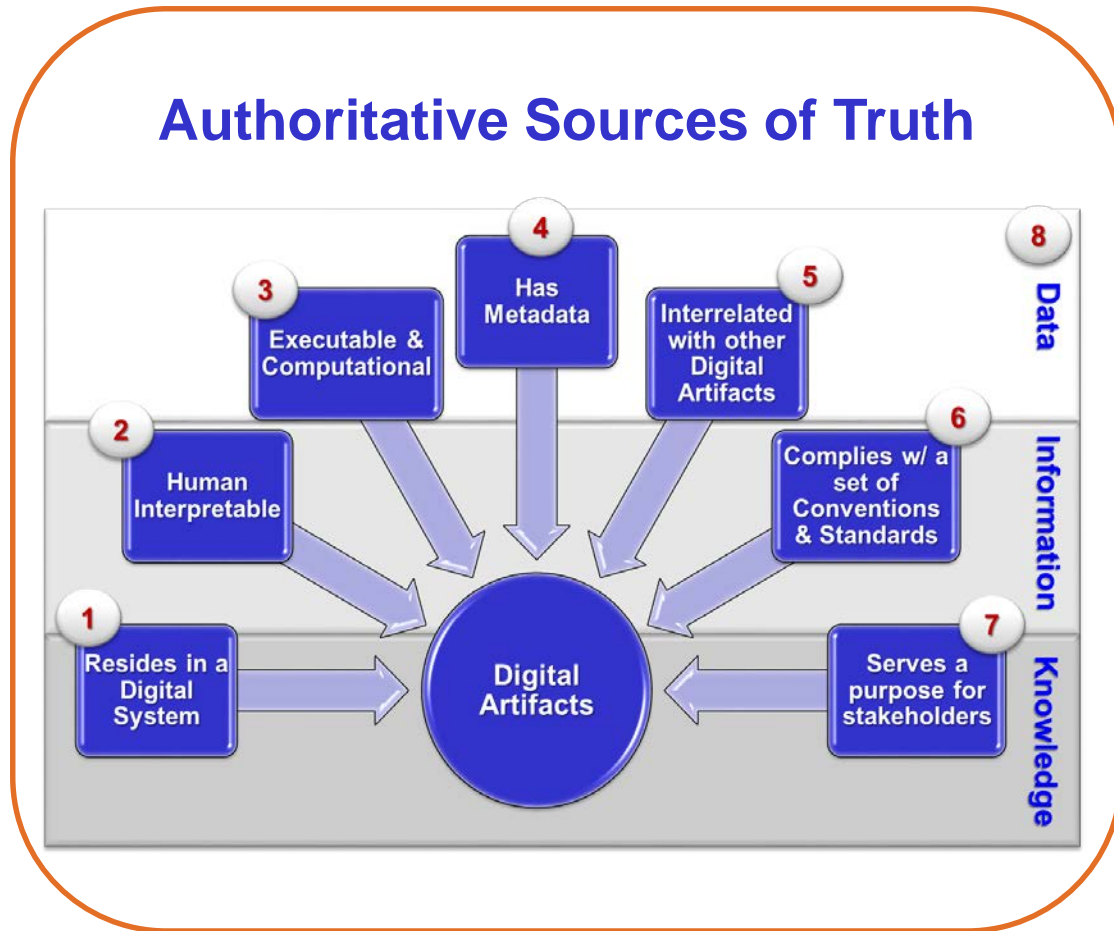


A New Way of Thinking about Exchanging Digital
Engineering Information

A CONCEPTUAL APPROACH

An Evolved Concept of Digital Artifact

- Any digital object produced with digital technology.
- It represent concepts, items, or phenomena.
- Contains following Characteristics:



The Computer Aided Conversion: From Digital Artifact to Stakeholder Wisdom



Digital Artifacts



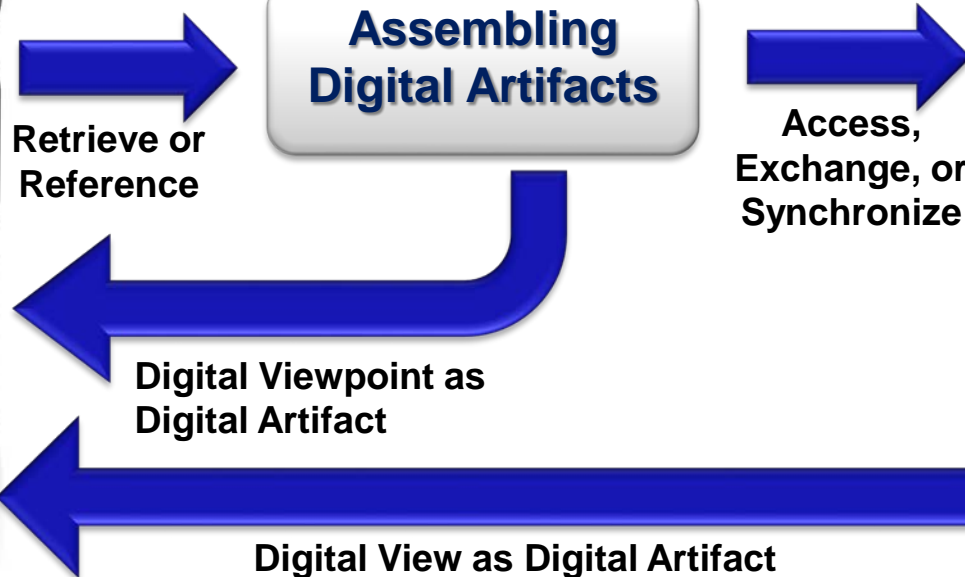
Software-Enabled Digital Viewpoint



Interactive Digital View



Assembling Digital Artifacts



Converting Digital Artifacts to Digital Views: Digital Viewpoint

Examples Digital Viewpoint Conventions

- An information model or design
- Selects, compiles, and displays digital artifacts
- Software-enabled conversions
- Catalyst for digital artifact exchange



User Experience Design (UXD) / User Interface Design (UID)



Converting Digital Views to Stakeholder Wisdom: The Digital View

- An interactive view on a digital display device
- It includes one or more assembled digital artifacts
- It enables stakeholders' unique activities
- It conforms to its digital viewpoint

Examples of Digital Views

2-D SE Models & Diagrams

Dynamic Data Visualization

3-D PDF's w/ 360° Perspectives

Dynamic Multimedia / Hypermedia Content

Videos of Tests

Decision Meeting Audio Recordings

Animations of Simulations



Opportunity Statement: Automated, Synchronized, & Interactive MBE Information Exchange



The World of Digital Engineering Information Exchange “Seamless Exchanges in a Digital Ecosystem”

1. Acquirer **Creates** Digital Artifacts

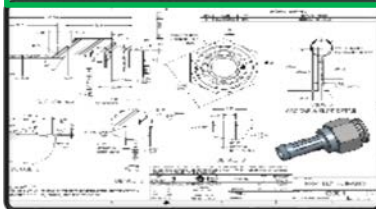
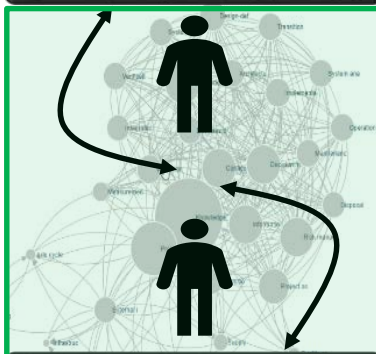
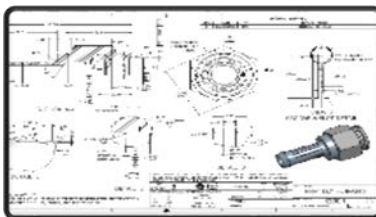
2. Software **Enables** Digital Viewpoints

3. Acquirer **Grants** Access to Digital Views

And / Or

4. Acquirer **exchanges or synchronizes** Digital Artifacts

ACQUIRER



SUPPLIER

1. Supplier **Creates** Digital Artifacts in tools

2. Software **Enables** Digital Viewpoints

3. Supplier **Grants** Acquirer Access to Digital Views

And / Or

4. Supplier **exchanges or synchronizes** Digital Artifacts

Leverage the power of digital automation and
multimedia displays

THE PAY OFF

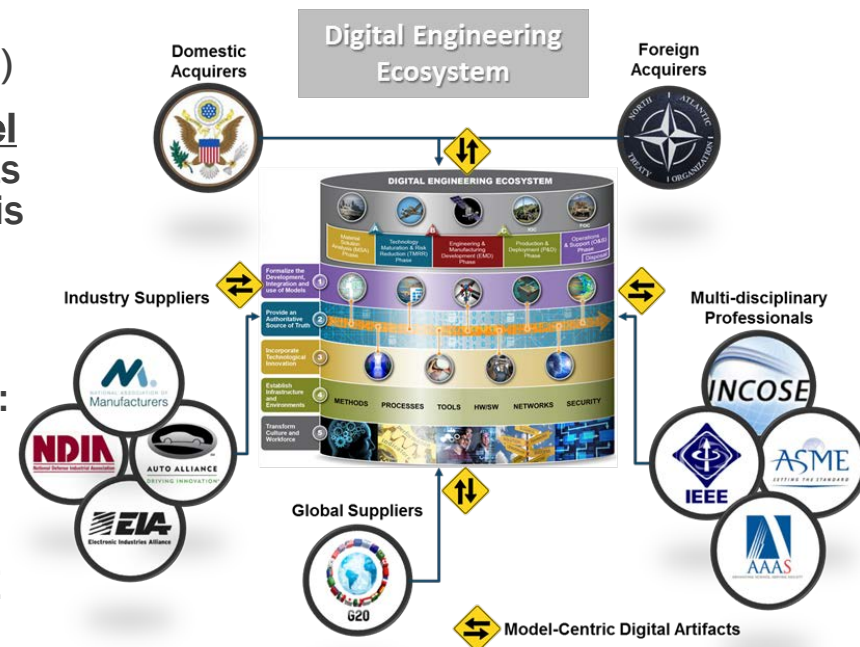
Digital Engineering Information Exchange Working Group

A Standardized Way to Offer, Request and Exchange Digital Artifacts

Product Descriptions

- **DEIX Primer:** A narrative that describes the concepts and interrelationships between digital artifacts, enabling systems, and exchange transactions (Project Lead: John Coleman, SAIC)
- **Digital Engineering Information Exchange Model (DEIXM):** A model for exchanging digital artifacts in an engineering ecosystem (Project Lead: Chris Schreiber, Lockheed Martin)
- **Digital Viewpoint Models (DVM):** Descriptive information models of digital views that form content for ISO 15288.2 reviews (Project Leads: Frank Salvatore, SAIC & Tamara Hambrick, Northrop Grumman)
- **DEIX Standards Framework (DEIX-SF):** A framework for official standards related to MBE Information Exchanges (Project Lead: Celia Tseng, Raytheon)

Information Exchange Model for Digital Engineering Ecosystem



DoD Research and Engineering Enterprise

Solving Problems Today – Designing Solutions for Tomorrow



DoD Research and Engineering Enterprise
<https://www.acq.osd.mil/chieftechologist/>

Defense Innovation Marketplace
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