OEM-Supplier-Vendor, Deploying Standards and Associated Requirements

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MBSE Workshop

Define MBSE

- **MBSE, INCOSE definition: The formalized application of modeling to support System requirements.**
- **The communication process (requirements flow and traceability) between the domains, teams, partners and contributors**
- **A unified digital representation of a product's design, implementation, delivery and support (RFLPM)**

The complexity of future designs exceeds a documentation process, therefore…..

We must use MBSE to control future costs!

Other Types of Standards - Comparison

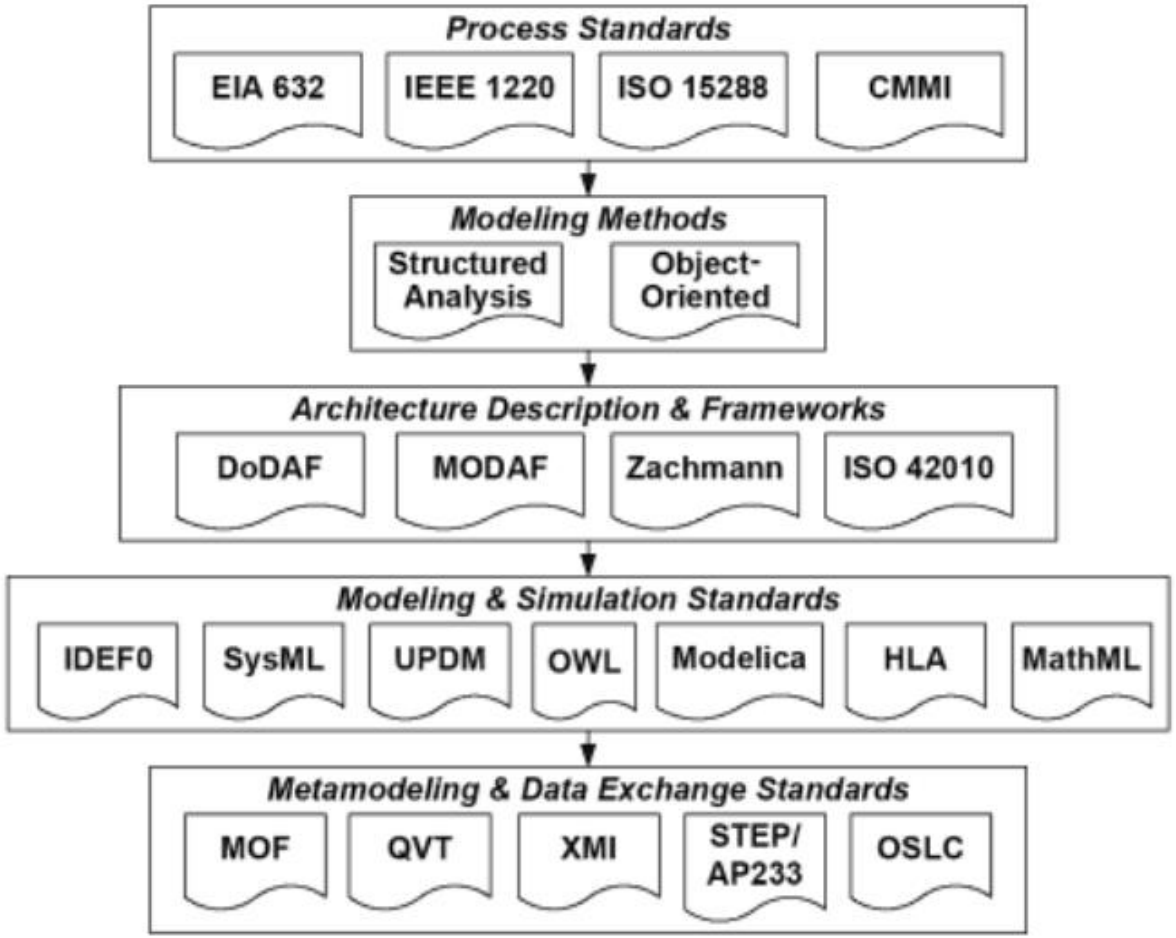
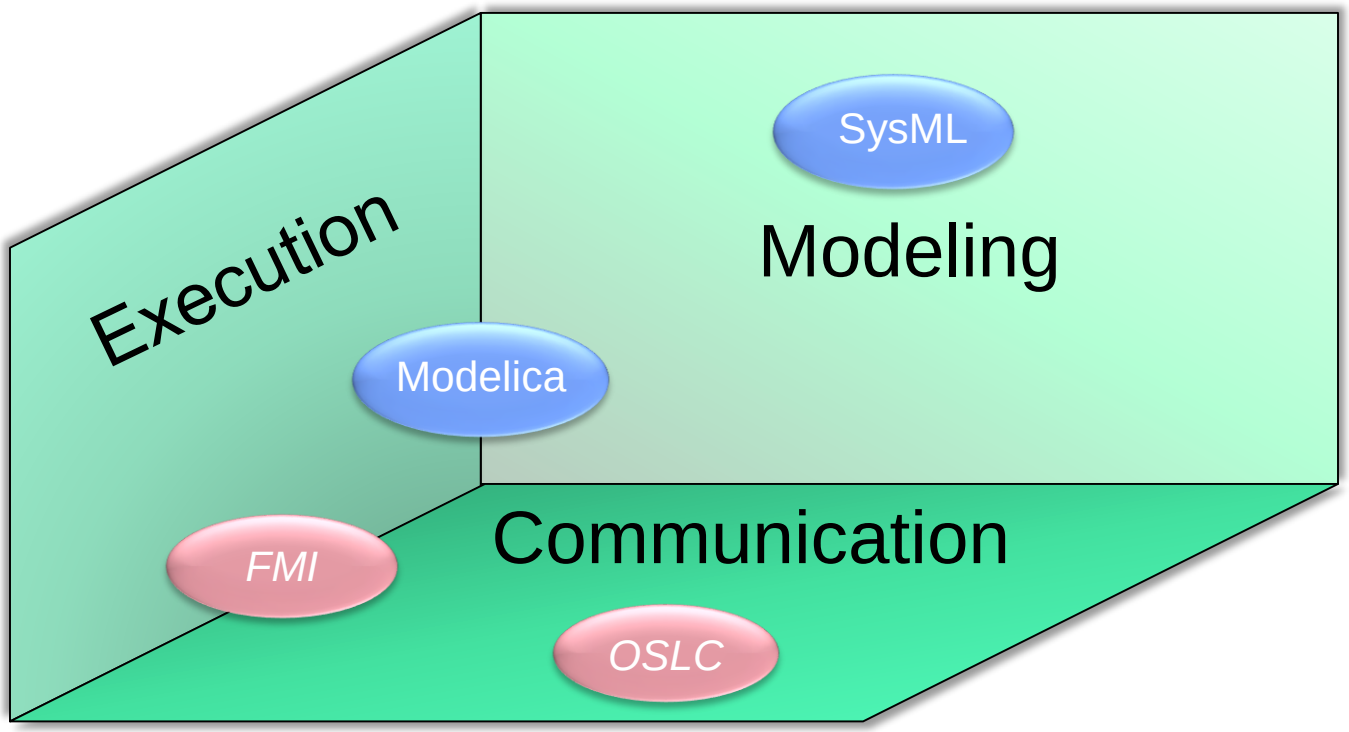


Figure 1.9 –from Sandy's Book

CREDIT: A Practical Guide to SysML
by Sanford Friedenthal, Alan Moore, Rick Steiner
The MK/OMG Press)

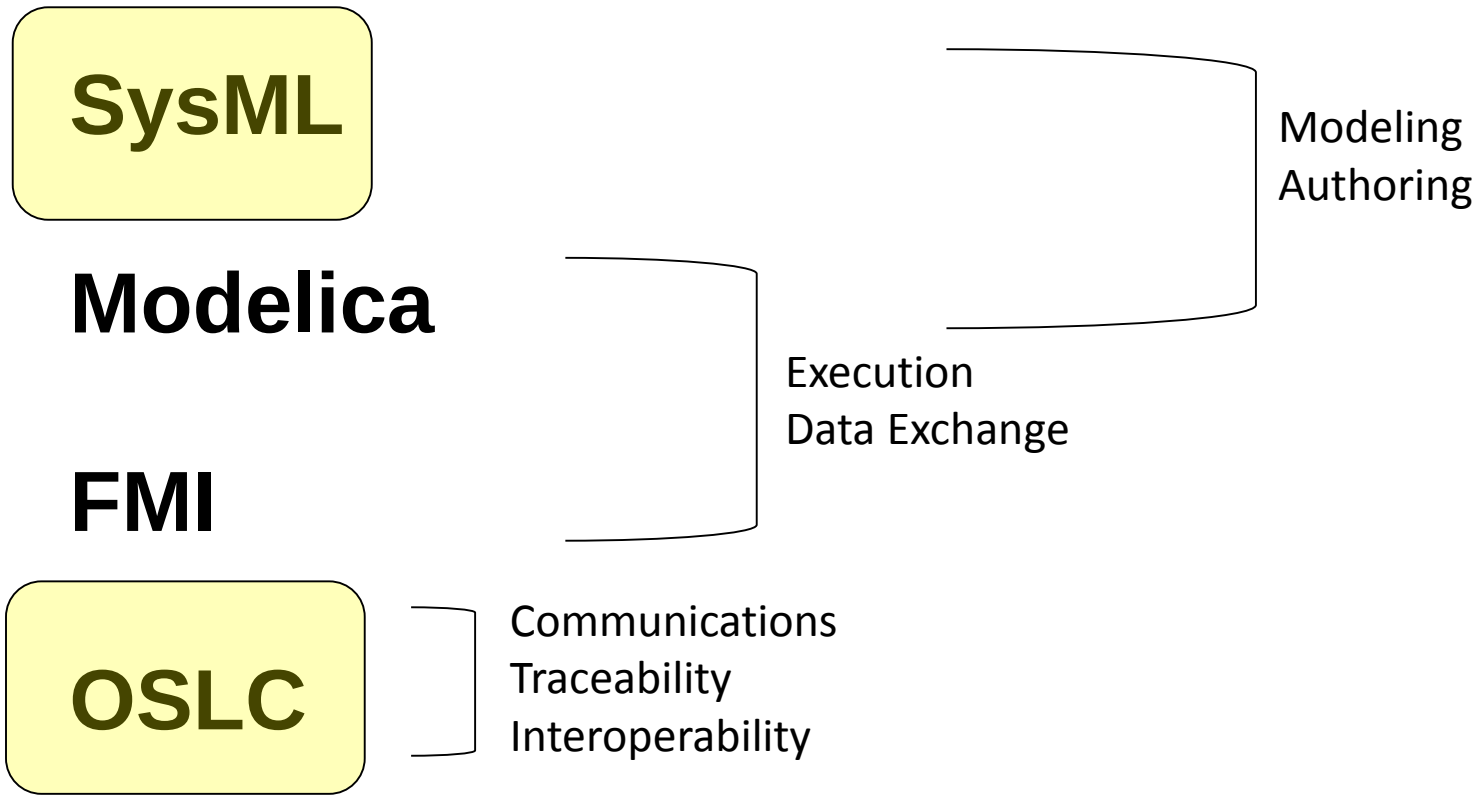
2015 GPDIS Workshop Recommendations

- **4 specific "standards" in the Collaboration Space**
- **Several axes, numerous directions!**



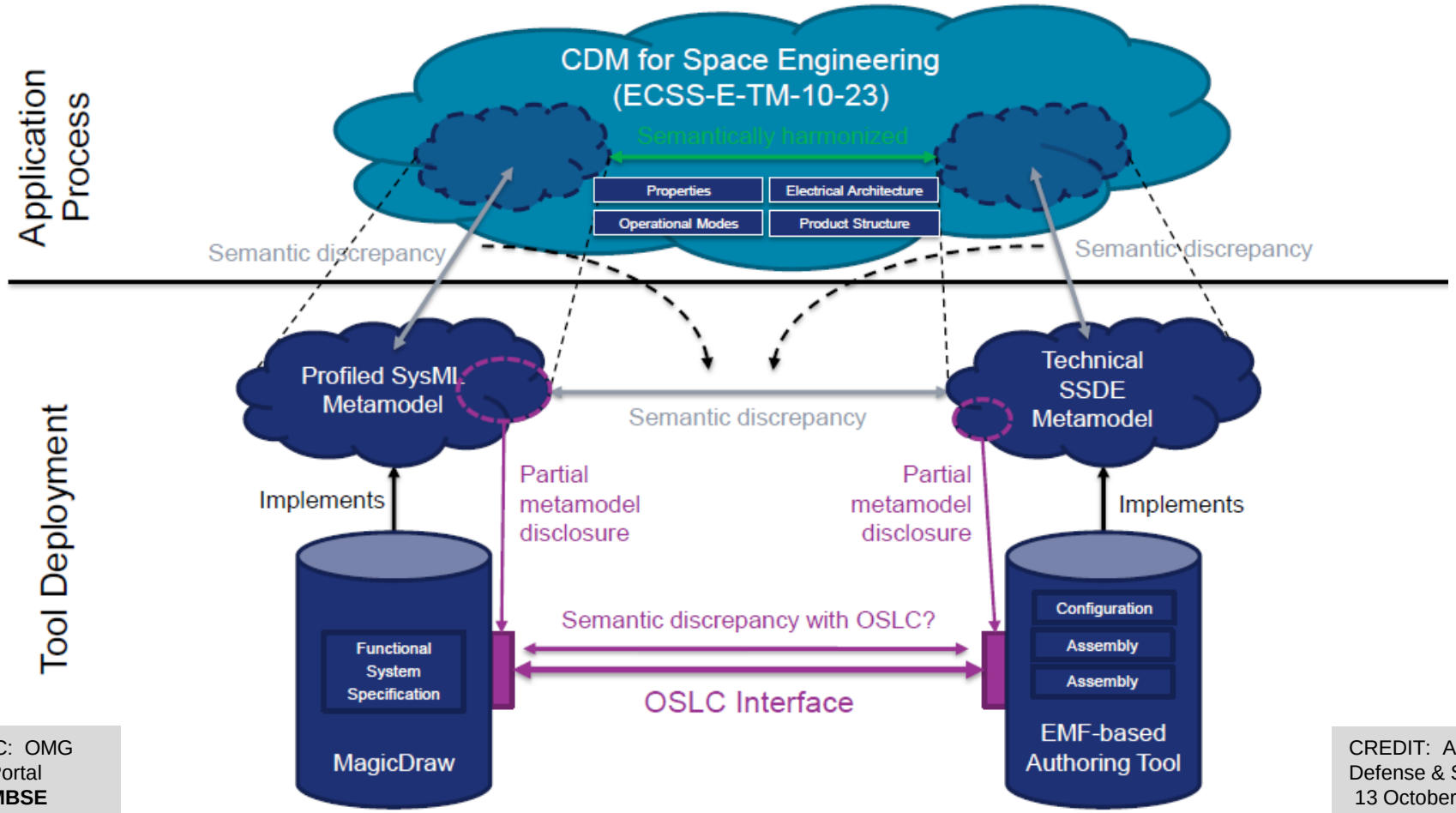
Evaluate Two of the Recommendations

Develop Deployment Use Cases –
Assuming these are recognized and acceptable standards



OMG – OSLC for MBSE Working Group

Proposed OSLC test setup with MagicDraw and an EMF based system authoring tool with different elaboration levels



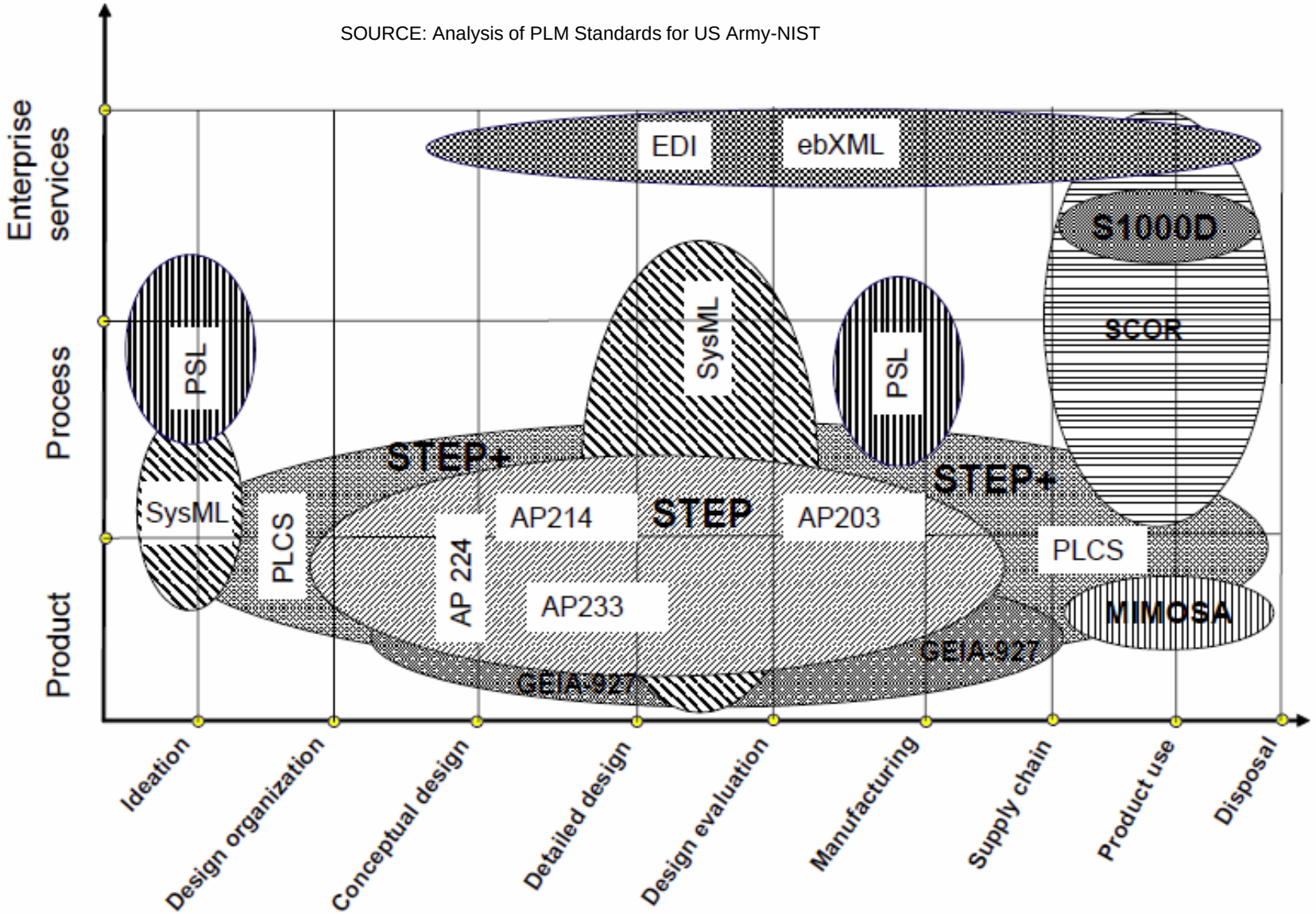
SOUREC: OMG SysML Portal **OSLC4MBSE Working Group**

CREDIT: AIRBUS Defense & SPACE 13 October 2014

What is SysML and Potential Alternatives?

- **System Architecture Definition**
- **Combination of Product and Process Definition**
- **Mapping of requirements, functions, and logical implementations**
- **VISIO, EXCEL, Text, Proprietary Solutions**
- **SysML is Dependent on XMI, AP233, AP239**

SOURCE: Analysis of PLM Standards for US Army-NIST

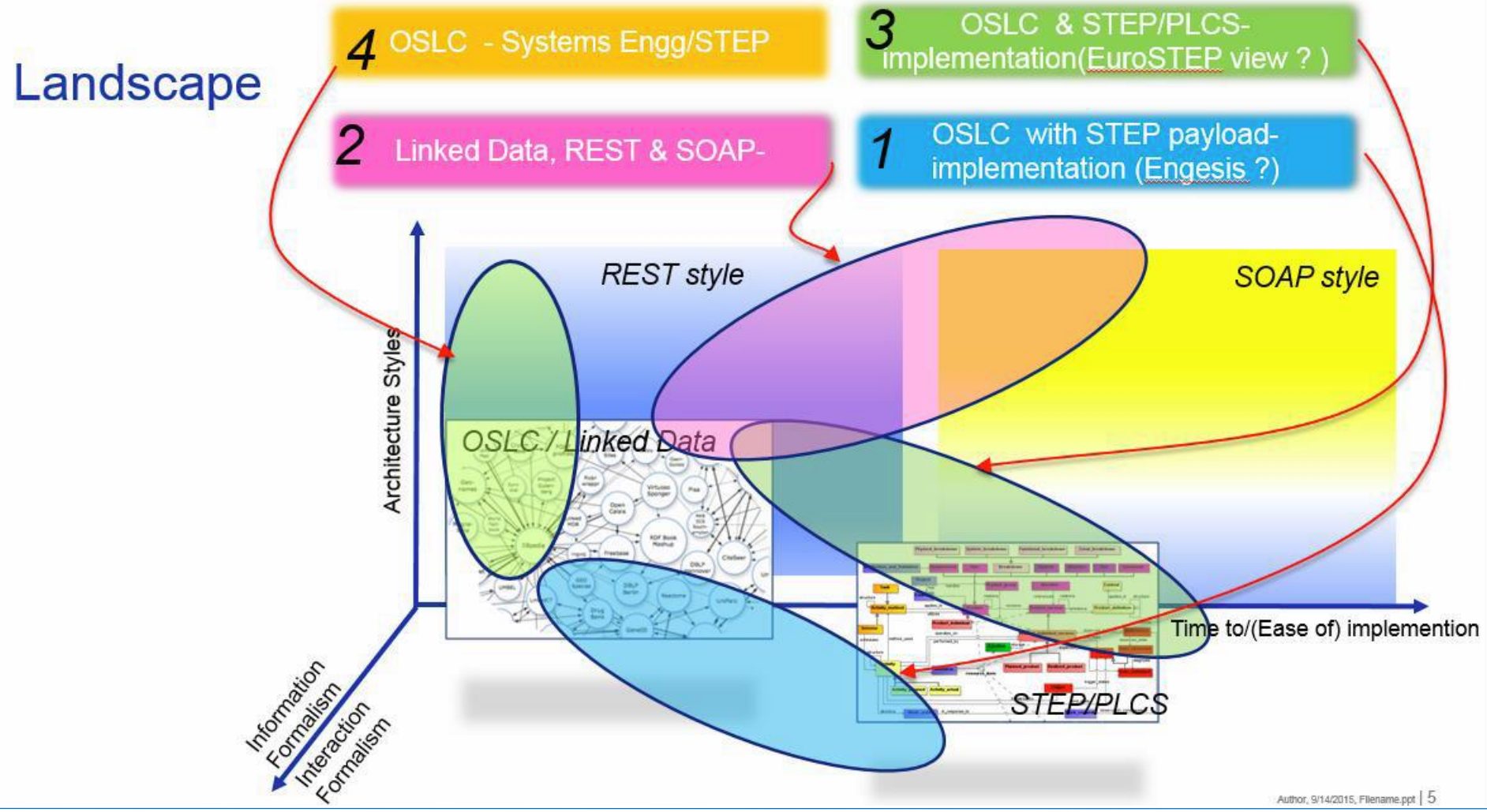


The National Institute of Standards and Technology, a unit of the U.S. Commerce Department, formerly known as the National Bureau of Standards

What is OSLC and Potential Alternatives?

- **Linking communication standard (OASIS)**
- **Combination of Product and Application Links**
- **Verification, source, reference functions and results**
- **RDF, OWL, Sematic Web technologies**
- **OSLC is dependent on W3C capabilities**

Managed Integration Alternatives



If an OEM was to Deploy the SysML and OSLC Standards

Must Define Guidelines:

1. **Requirements for the OEM enterprise, division, and/or program**
2. **Requirements for the small application companies, mid-tier Vendors, the large integrated PLM companies.**
3. **Requirements and expectations for the SubSystem Suppliers**

(No specific order implied)

OEM Deployment Considerations

Considerations for OEM enterprise, and/or program

- **Process and scope: How to measure compliance, and benefits?**
- **Technology, Tool maturity, User process, Applications, Infrastructure**
- **Integration within the PLM system?**
- **The cost/value of a Supplier implementation**

Considerations for Supplier Guidelines

- **All, or a subset of major Suppliers**
- **Cross-platform, multi-tool deployments, compatibility**
- **Internal design definition, management, linking requirements**

Supplier Deployment Considerations (SysML)

Requirements and expectations for the SubSystem Suppliers

- **Define which product representations must comply?**
- **Must consider blocks of data that are and are not transferred (integration and other supplier IP)**
- **Format, authoring guide, profile, stereotypes**
- **Define how to translate, interpret and integrate the results**
- **Contractually defining SDRL/CDRL deliverables**

Vendor Deployment Considerations (OSLC)

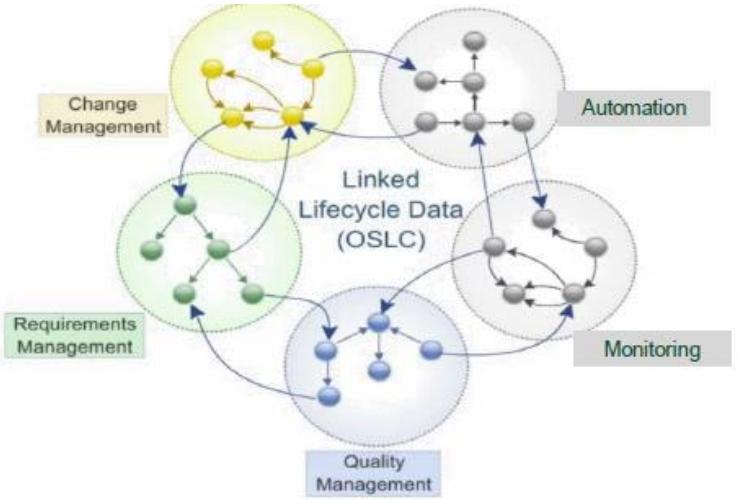
Rule Considerations for the Tool Vendors

- **Are the goals/requirements different based on Vendor's capabilities?**
- **How to define compliance and success criteria**
- **Define contractually as part of license agreements?**

1. **Small applications shall provide plugins for OSLC integration**
2. **Mid-tier application companies shall provide access API or access exposure layer for PLM Tools**
3. **Large PLM Vendors shall provide a OSLC server/service to access external repositories**

Why OSLC Communication?

- Management of linked data
- Tool to tool integration
- Standards-based communication



OSLC
Inspired by the web

- Open Services For Lifecycle Collaboration(OSLC) solves traditional tool integration challenges
  - Resilient, standards based approach minimizes IT maintenance
  - Seamless experience maximizes user productivity
  - Tool vendor IP protection maximizes commercial appeal

Key Interactions in the Flow

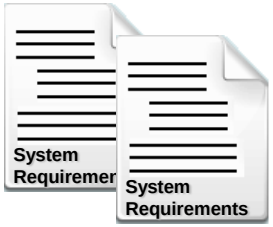
- **Data**
  - **e.g. netlist, schematic to cabling, etc. Bulk data transfer**

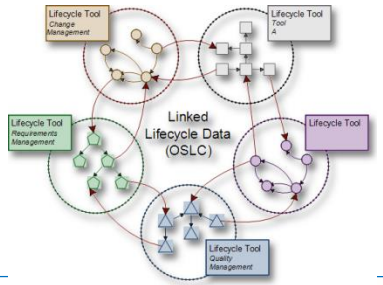
Netlist or Transform

- **Behavior**
  - **Executable models, run time code, functional co-simulation**

FMI, Phoenix, xUML

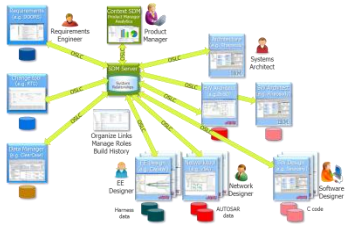
- **Intent**
  - **Requirements, work items, dependencies, meaning**



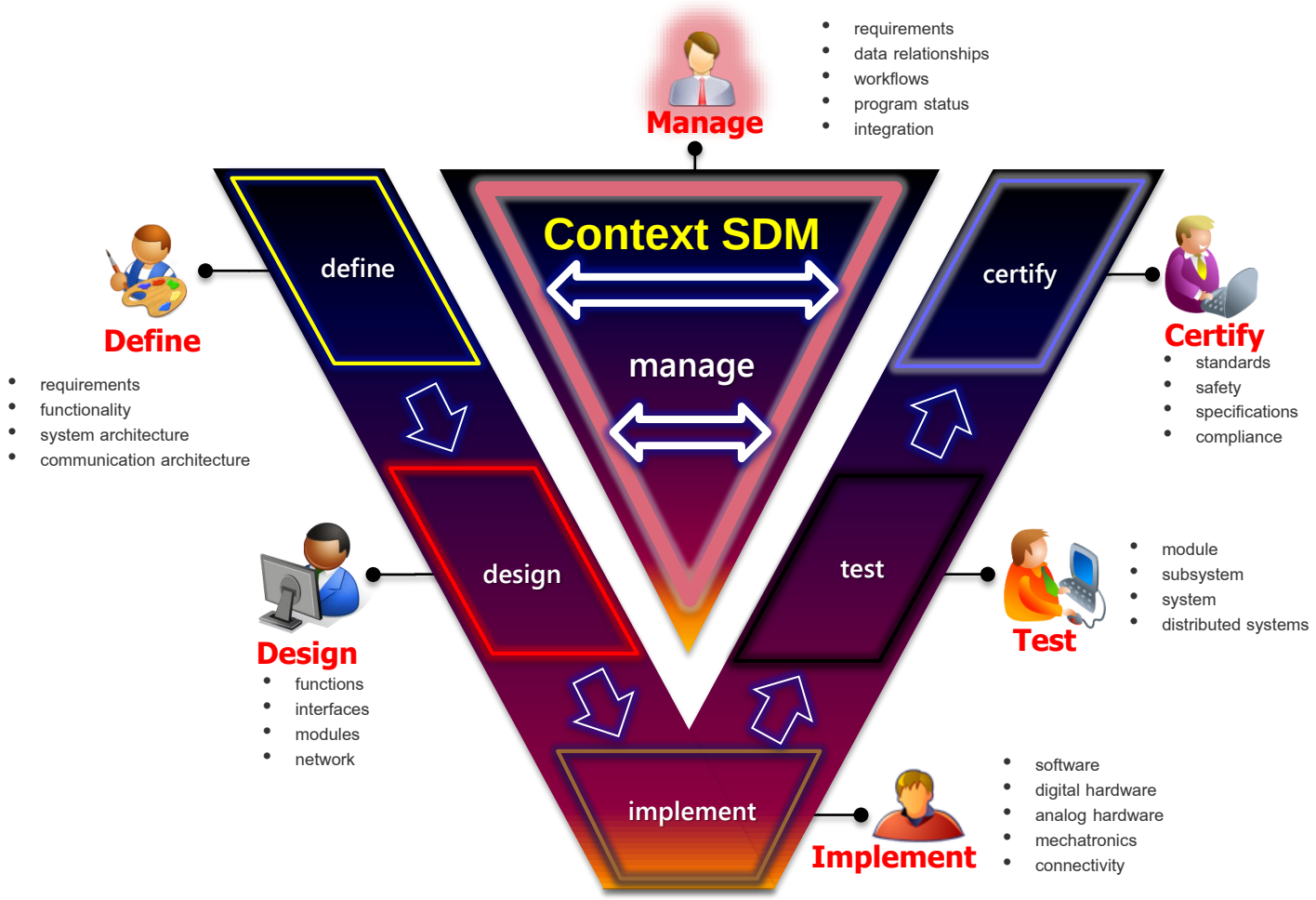


Linked Data, Shared Information

OSLC Inspired by the web



Interoperability: Where to start?

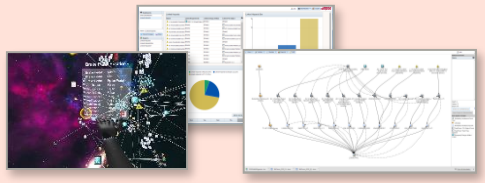


OSLC Tool Interoperability Vision

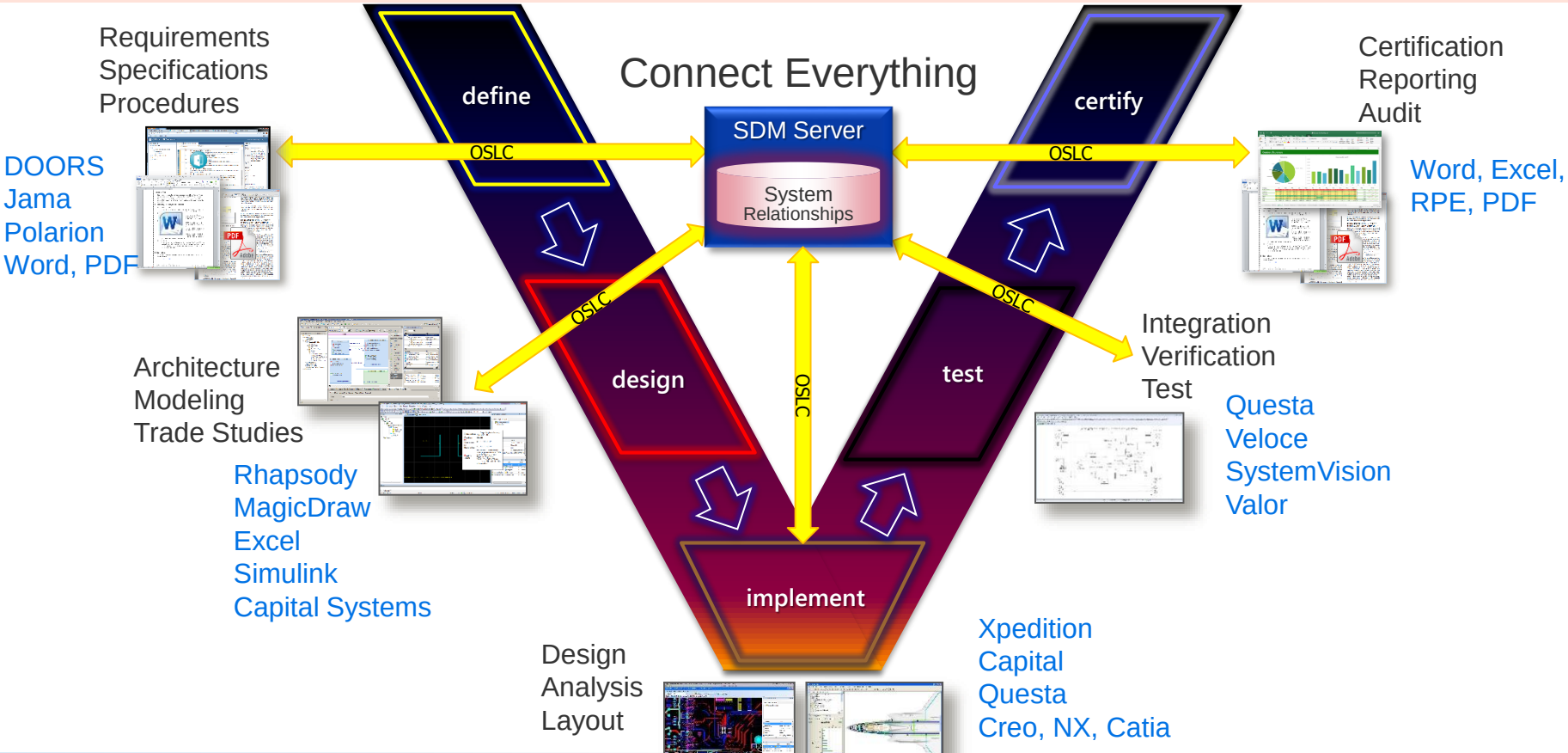
Global Product Data Interoperability Summit | **2016**

- Direct Tool Integration
- Process Automation
- Live Real Time Information
- Coordinate Across Disciplines

- Tasks
- Workflow
- Process



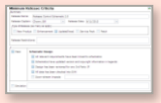
- Traceability
- Tracking
- Project Management

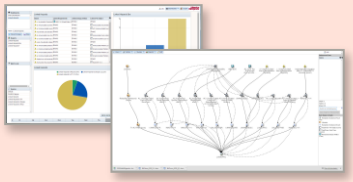


Process and Tool Interoperability

- Direct Tool Integration
- **ISO26262, ARP4754A** Templates
- Live Real Time Information
- Focused Configuration

- Tasks
- Workflow
- Process





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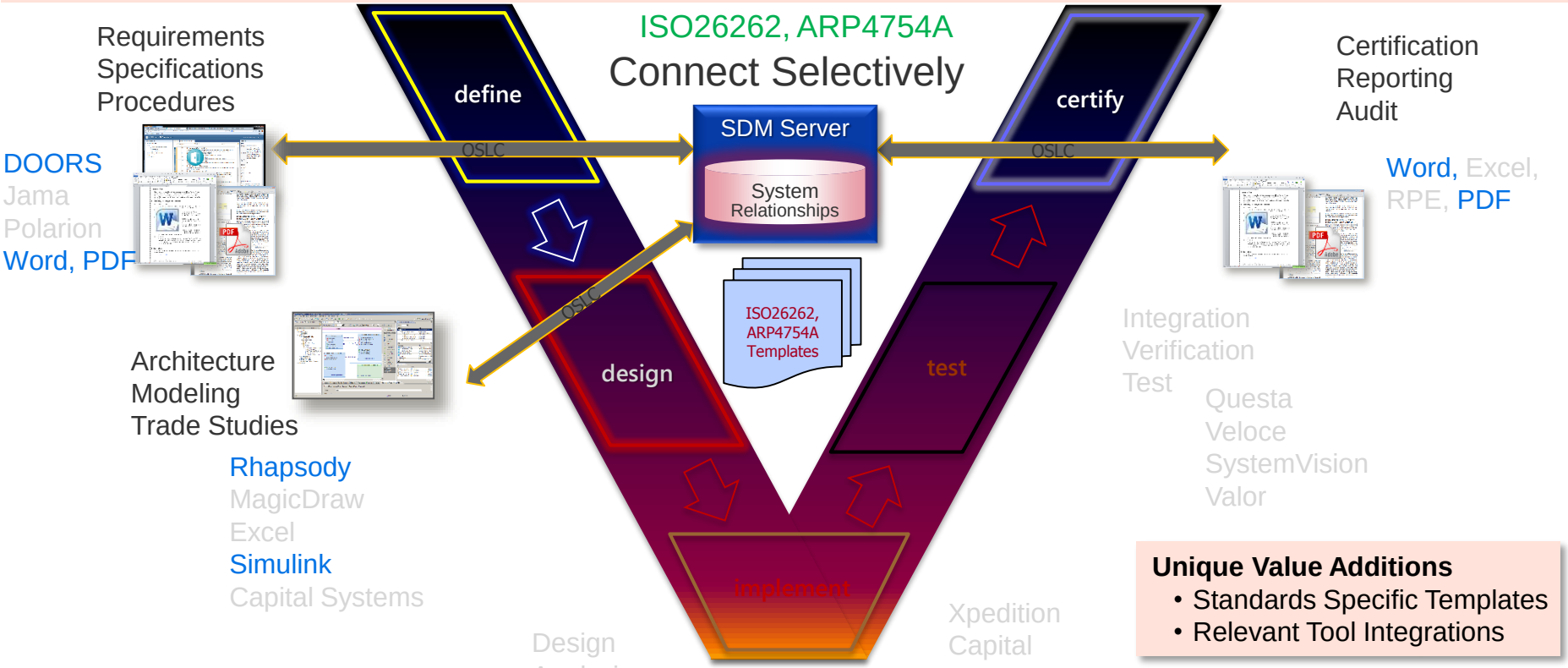

Unique Value Additions
- Standards Specific Templates
- Relevant Tool Integrations

Vendors need from OEMs:

- **Common vision and coordination between tools and process teams**
- **Communicate your business and engineering problems, not just technical tool issues**
- **Influence other tool vendors that open tool interoperability is important to your business**

Vendors need from Suppliers:

- **Pull in supply chain and contracts personnel into Model-based engineering planning**
- **Coordinate (and fund) cross-company pilot projects and research opportunities**
- **A willingness to share some risk**

Vendors need from other vendors:

- **Small**
  - **View interoperability as a marketing opportunity**
  - **Connections are a potential inroad to new business**
- **Medium**
  - **Push standards forward**
  - **Don't view interoperability as a threat, but as an opportunity**
- **Large**
  - **Maintain a relentless customer focus and resist urge to pursue closed eco-systems**
  - **Be a leader in interoperability**

Vendors need from standards organizations:

- **Be open that standards/processes are more than just paper documents now**
- **Be open to new licensing models and concepts**
- **Be partners with vendors and users implementing standards**

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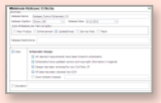

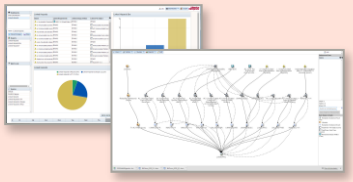

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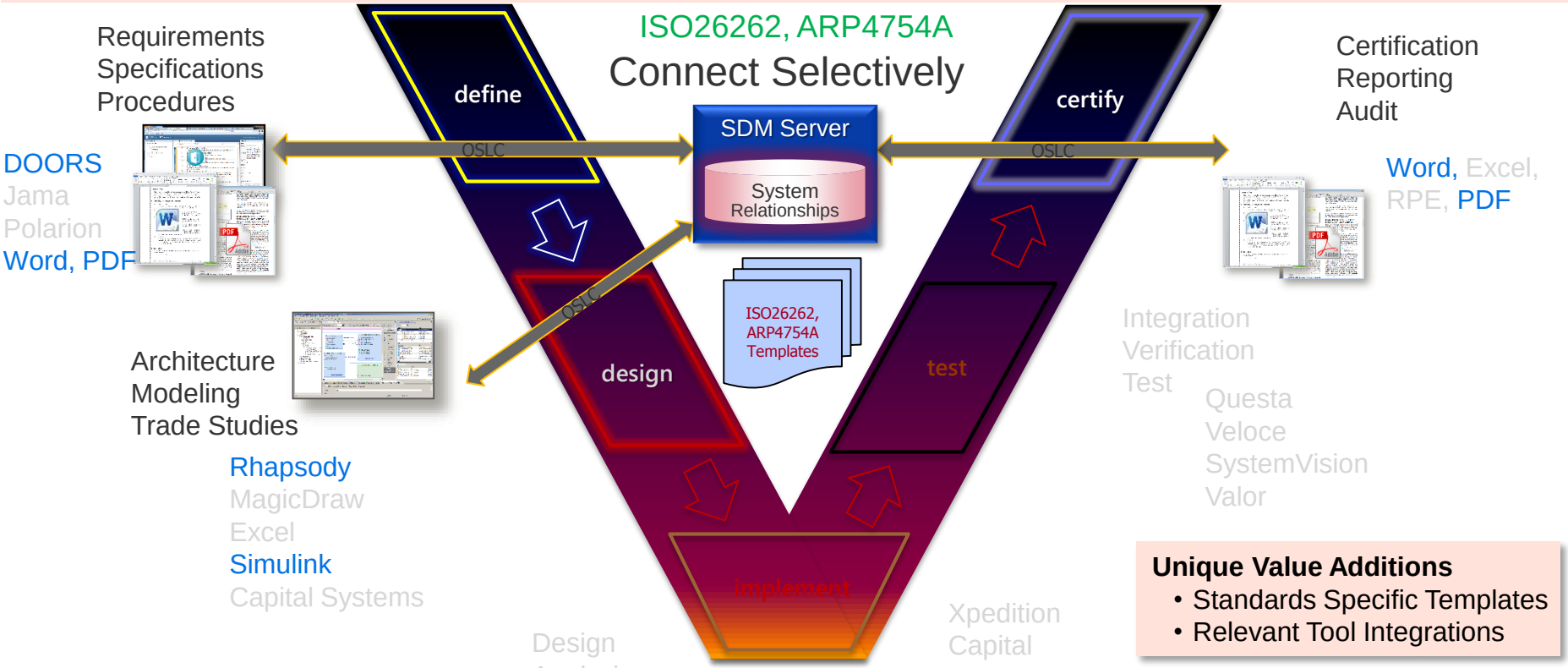

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