

# The Importance of Modeling Relationship Maturity Characteristics in a Digital Thread

How to Effectively Leverage Digital Thread to support the Model-Based Enterprise

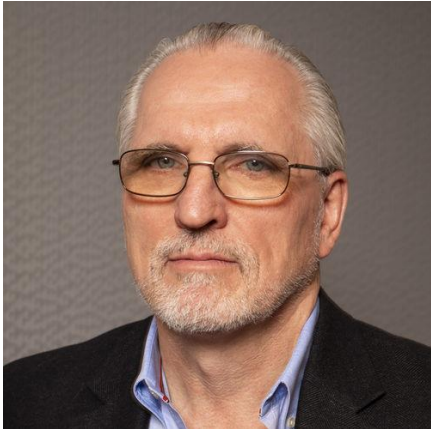
Paweł Z. Chądzyński

## GLOBAL PRODUCT DATA INTEROPERABILITY SUMMIT 2023



# Paweł Z. Chądryński Bio

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Paweł Z. Chądryński is a Sr. Director, Product Marketing, at Aras Corp. Paweł is currently driving strategy and direction for advanced solutions on the Aras PLM Platform. This includes Requirements, MBSE, Simulation, ALM, Sustainability, Digital Thread and the related inter-disciplinary design and product data management methodologies. Paweł is also representing Aras at the INCOSE CAB. Before Aras, Paweł held several management and technology leadership positions including Cadence, PTC, software startups, and others. He is an expert in Printed Circuit Board design and manufacturing technologies. Paweł holds an MS in Technology Management and a BS in EE/CS from NYU/POLY.

# Digital Thread – Why?

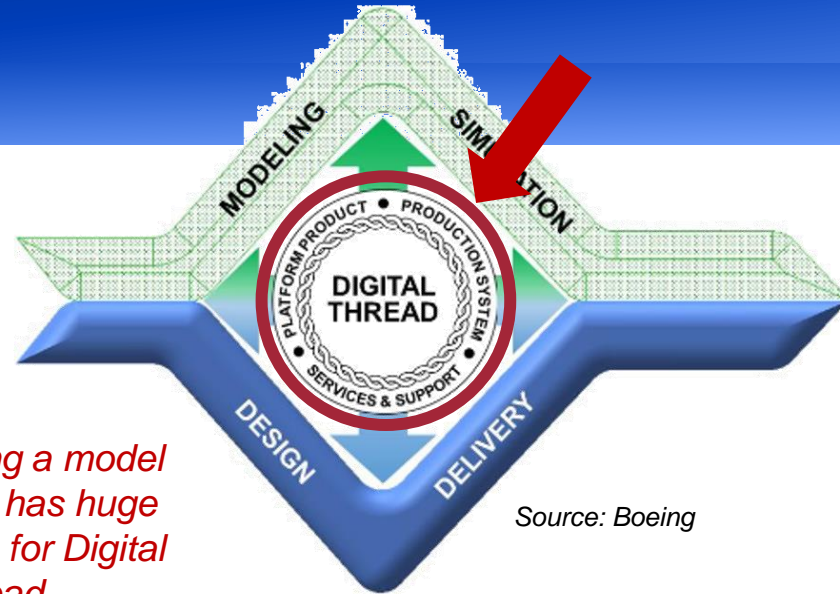
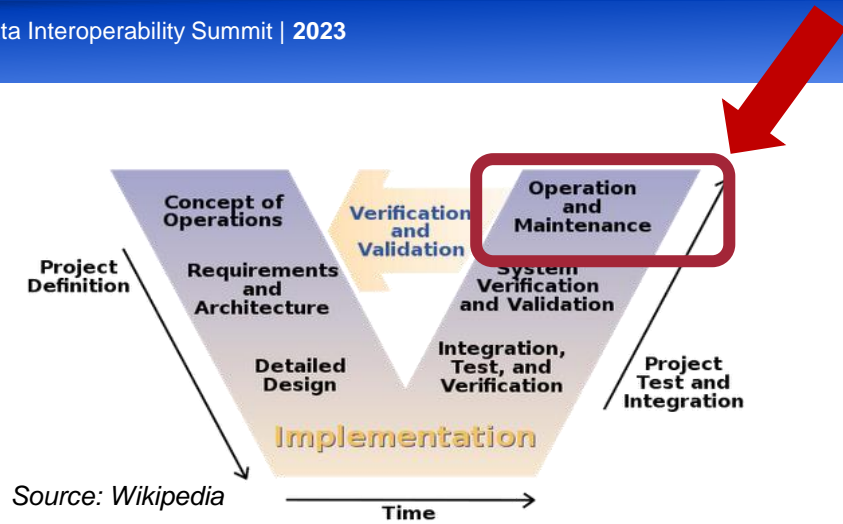
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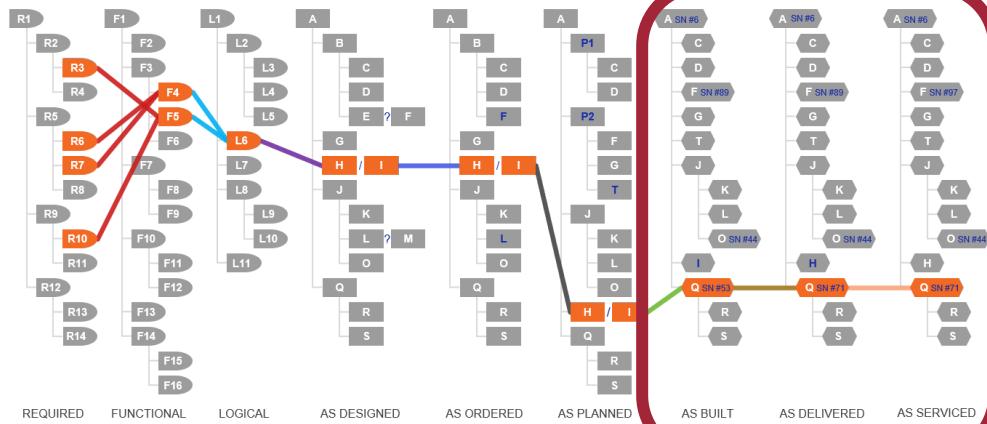
**I know I can trace it but how do I do it ... now**

# Digital Thread – What is it?

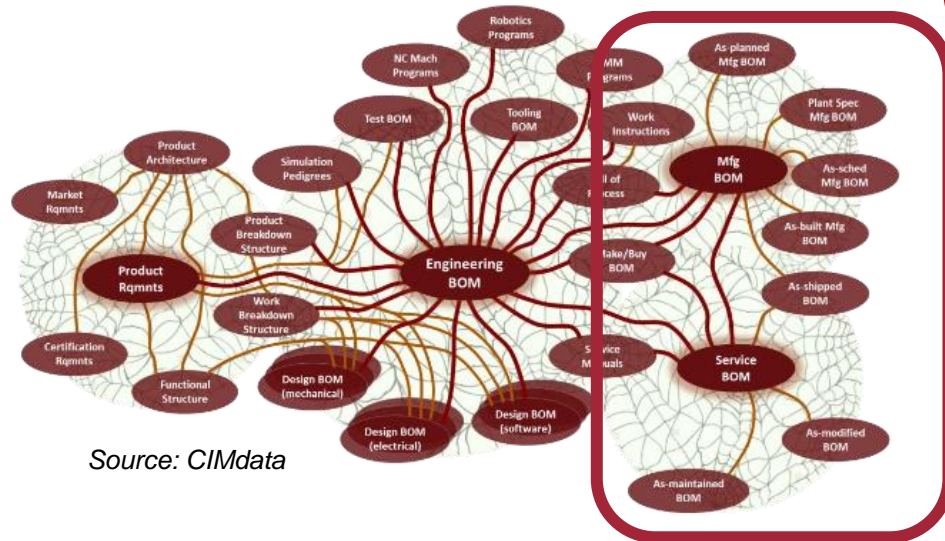
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*Transforming a model to an asset has huge implications for Digital Thread*

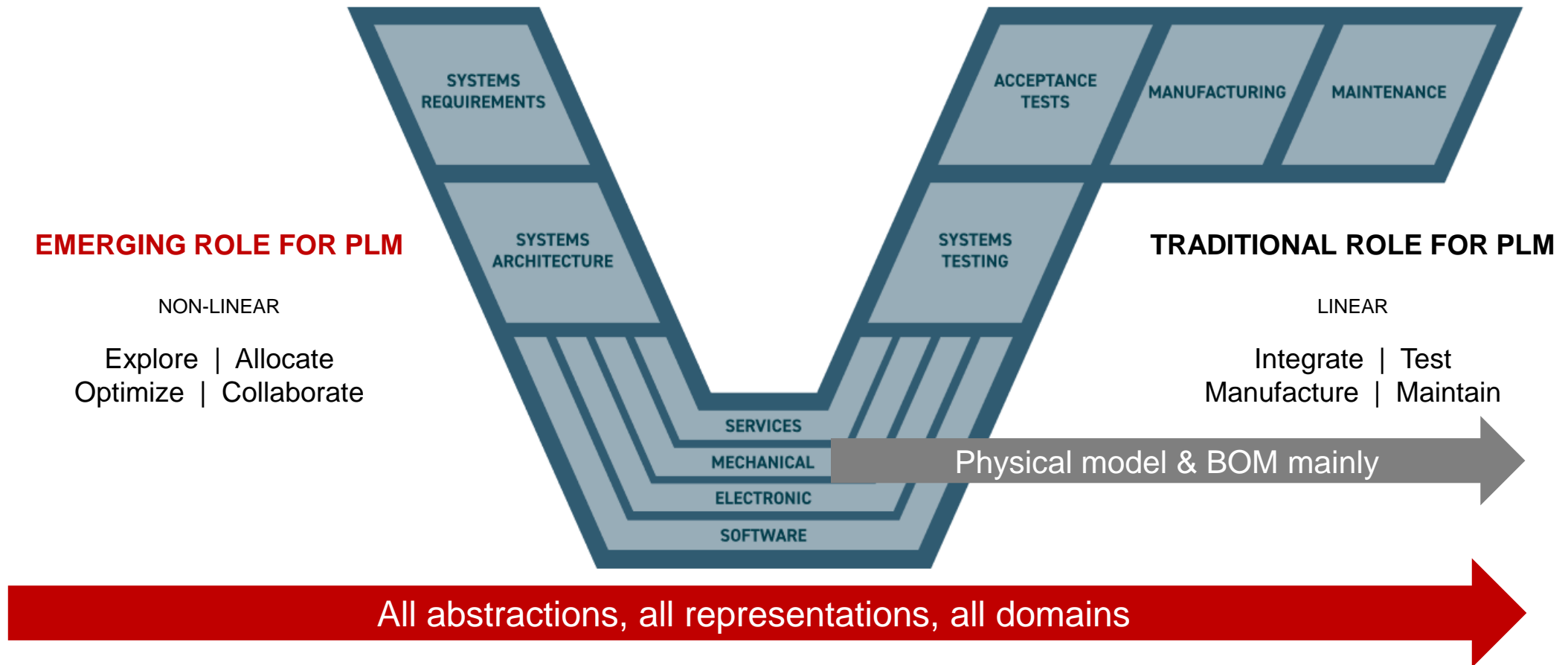


Source: Aras



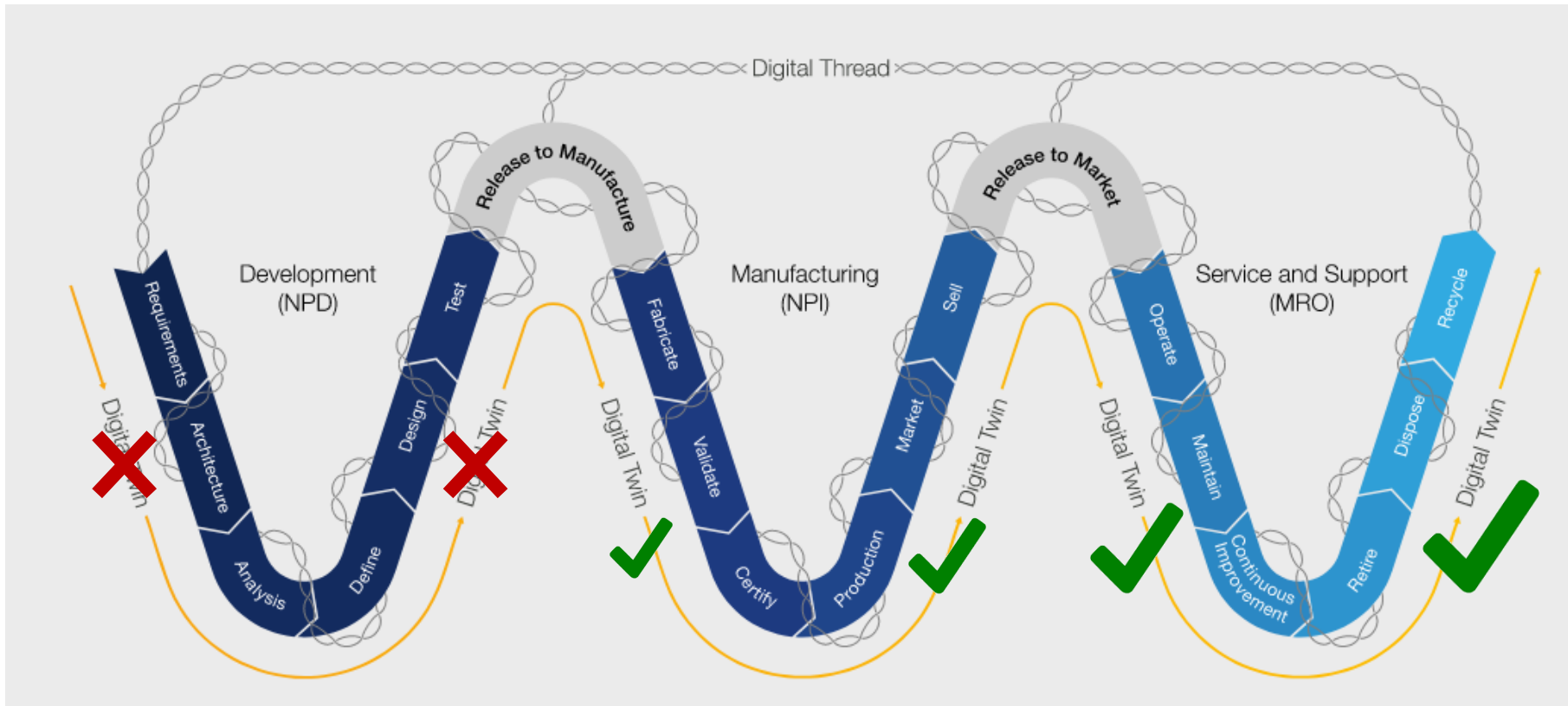
# PLM – No Longer a BOM-centric Traceability

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# Engineering ... and Beyond

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**Without Manufacturing there is no Digital Twin – only a Digital Model**

# Resilient Digital Thread Data Model

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- Changing authoring tools
- Isolated custom data silos
- Static content based on file formats
- Unstructured information
- Internal and external digital threads
- Engagement of external resources
- **“Something new” will be needed in the future**



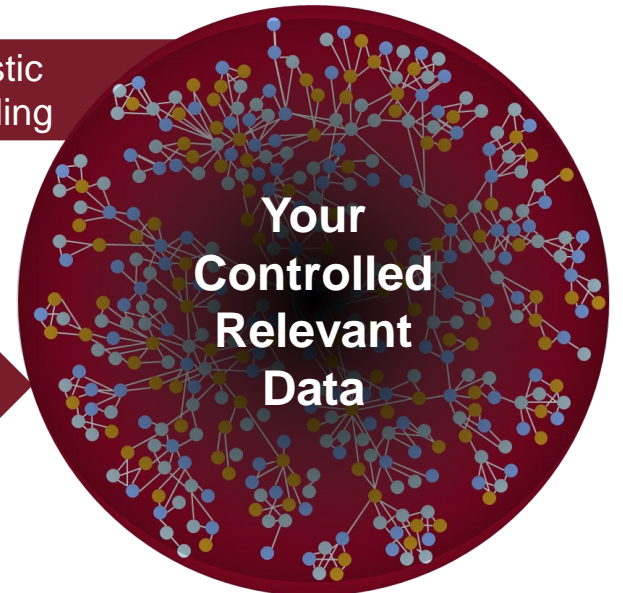
*Very long-term traceability  
resilience between very  
large set of data types and  
very large sets of elements*



The  
World of  
Whatever  
Data

- Explicit
- Federated
- Granularity Levels
- Sources & States
- Context Setting Relationships

Tool Agnostic  
Data Modeling

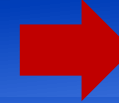


Your  
Controlled  
Relevant  
Data

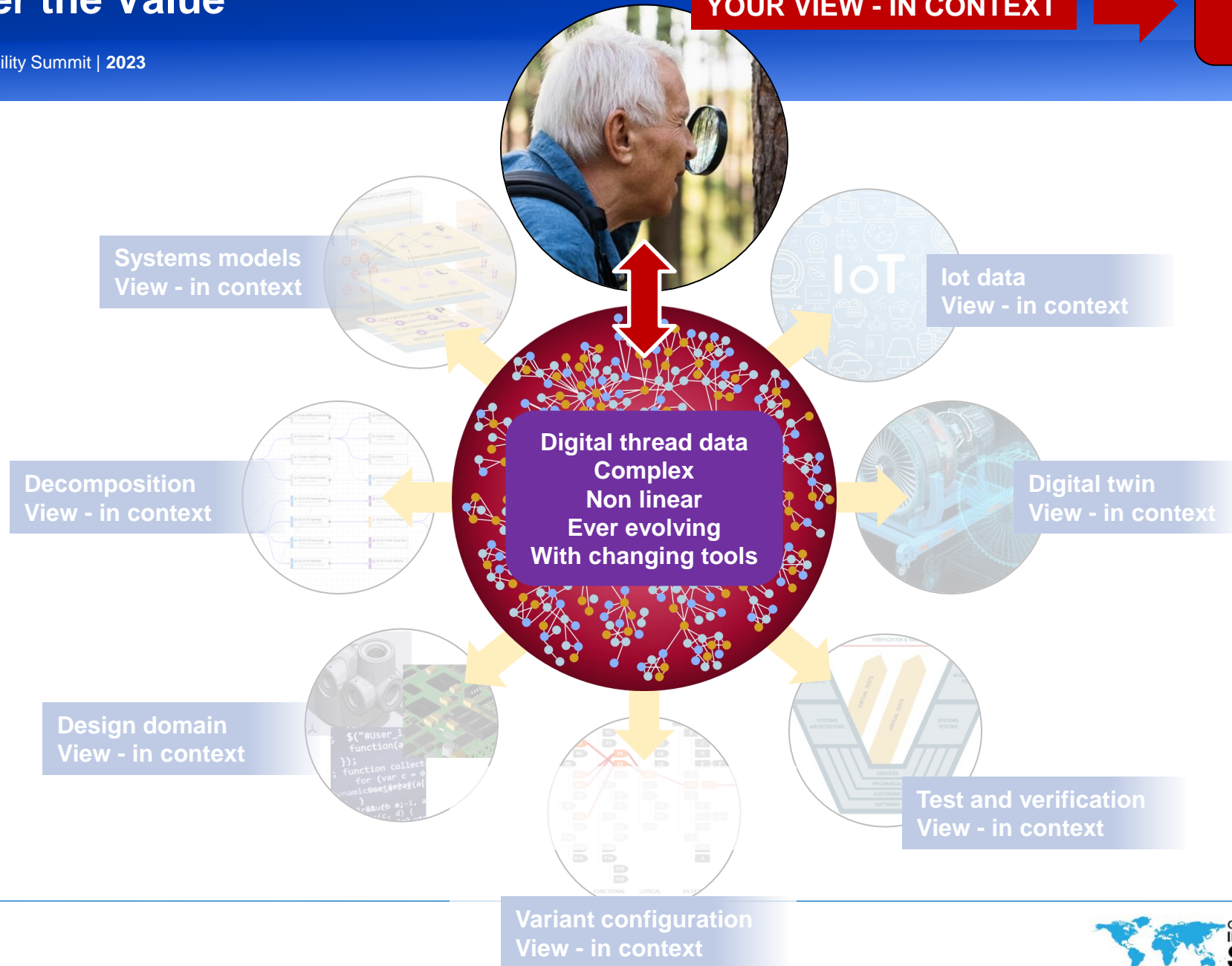
# Views Deliver the Value

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YOUR VIEW - IN CONTEXT



System of Record  
vs.  
System of Engagement











# Relationships With Evolving Maturity

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**Relationships** continue maturing providing digital twin context of the serialized asset

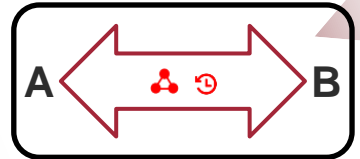
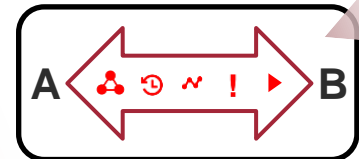
Asset lifetime

MATURITY - CONTEXT - VALUE

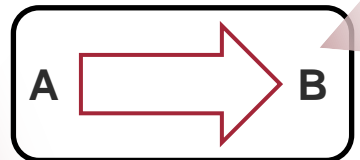
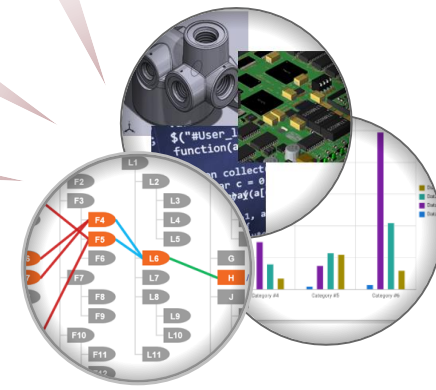
- Bidirectional 
- Semantics 
- Behaviors 
- History 
- Notifications 
- Triggers 

**Relationship** maturity indicators provide context for digital model

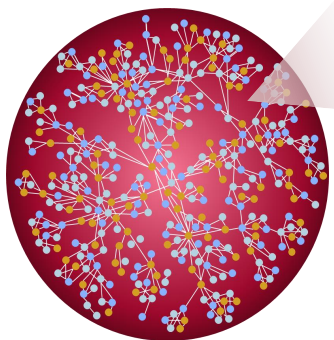
Certain maturity of **relationships** provide manufacturing context for the serialized asset



More mature **relationships** provide richer views in context



Least mature **relationships** behave like unidirectional URL links without context



TIME - LIFECYCLE - USE CASE

# Quick review

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- Uniqueness of your Digital Thread – *no OOTB solution*
- Expanding role of PLM – *beyond physical BOM*
- Transformation during manufacturing – *Model vs Twin*
- Tool specific vs tool agnostic – *very long view*
- Criticality of a view in context – *key end value*
  
- **Maturity of semantically rich relationships – *can't do it without***

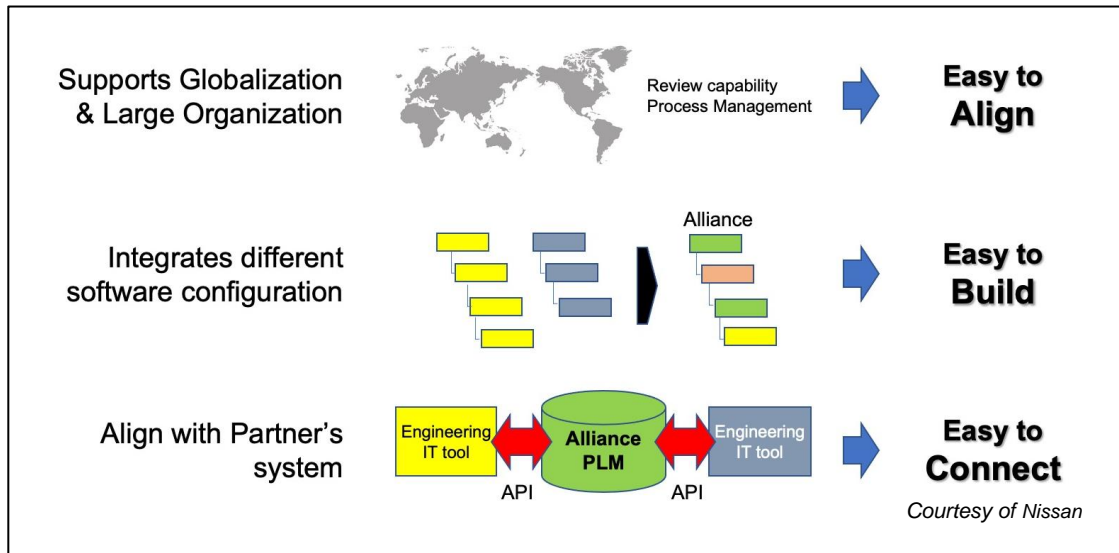
# Nissan Use Case (\*) - Managing In-Vehicle Software

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## PLM for Software Defined Product (vs “just” ALM) – imagine that!

- Business Challenges
  - Difficulty managing very complex in-vehicle software variants
  - Lack of traceability and reuse
  - Duplication of effort between Nissan and Partners
  - Manual and error-prone process
  - Lack of integration with Partners

- Solution
  - A single library of individual software functions
  - A single digital thread managed on a single platform
  - Maturity context of digital thread relationships
  - Integration with Partner's digital thread
- Benefits Achieved (Nissan & Partners)
  - Optimized reuse of existing and verified software implementations
  - Consistent traceability of requirement-function-verification
  - Instant identification of affected software configurations
  - Improved quality, reduced development time, and optimization of resources



Digital thread built on a PLM platform

*“Ten years ago, this idea was so grand and difficult that I couldn’t find any capable solutions. Today, Aras Innovator allows step-by-step realization of these goals via its ‘easy to build,’ ‘easy to align,’ and ‘easy to connect’ characteristics.”*

*Hiroaki Nemoto, Engineering & Design Systems, Nissan Motor Co.*

(\*) <https://www.aras.com/en/resources/all/cs-nissan>

# Thank You!

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Questions?

**Come to see a demo at the Aras booth!**