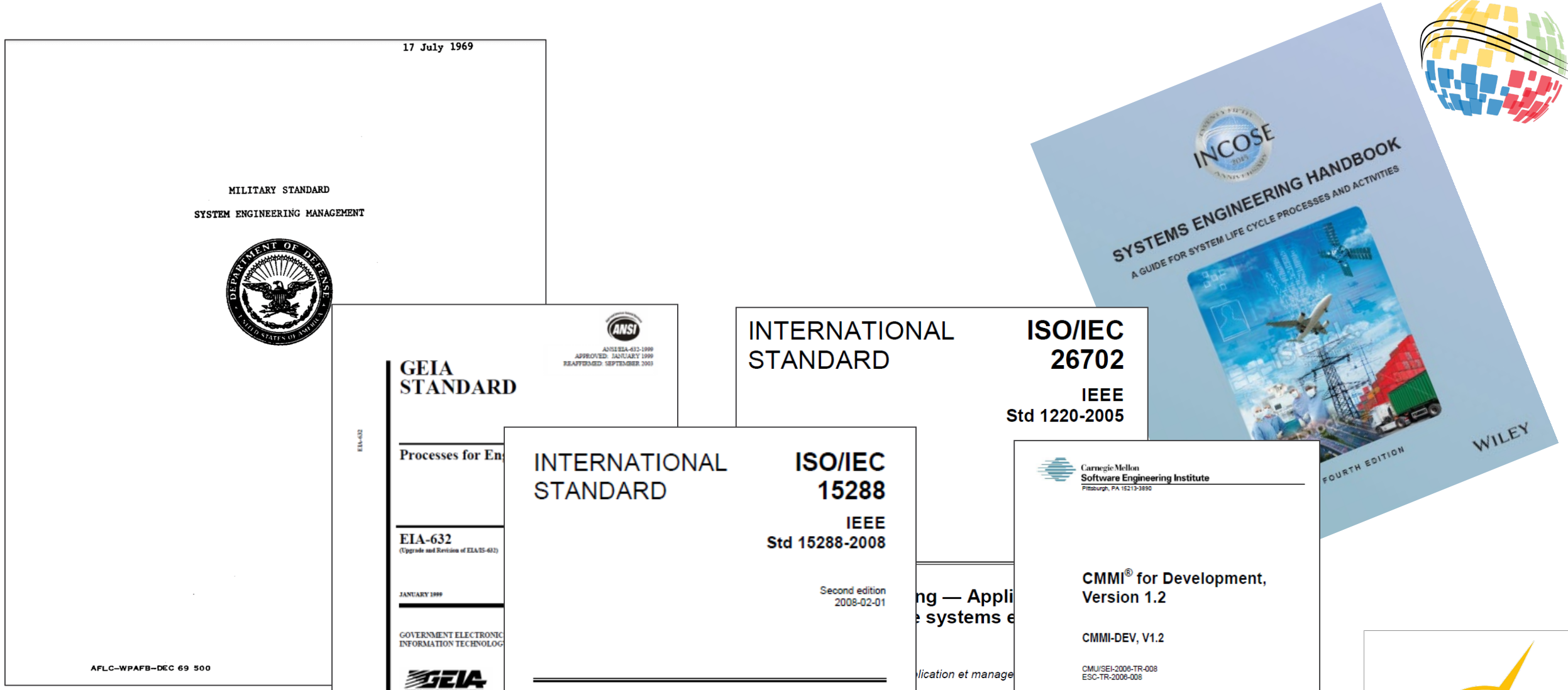
2021 Annual INCOSE international workshop
Virtual Event
January 29 - 31, 2021
Premier Systems Engineering Workshop

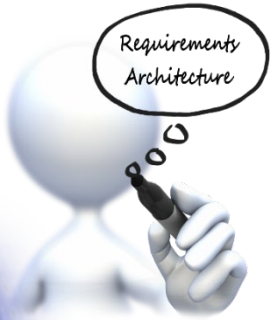
Schema, Metamodels, and Ontologies, Oh My!

MBSE Lightning Round



MBSE Lightning Round

Moving from Ambiguity to Clarity, “One Idea in One Place”



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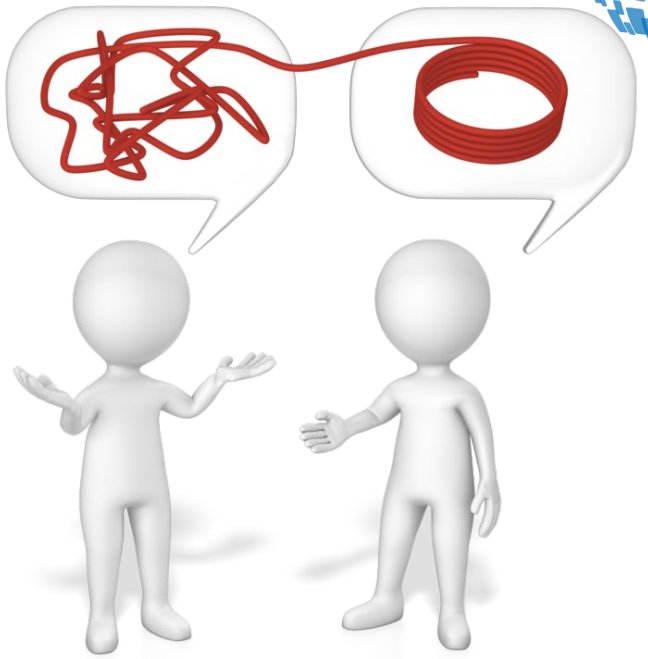
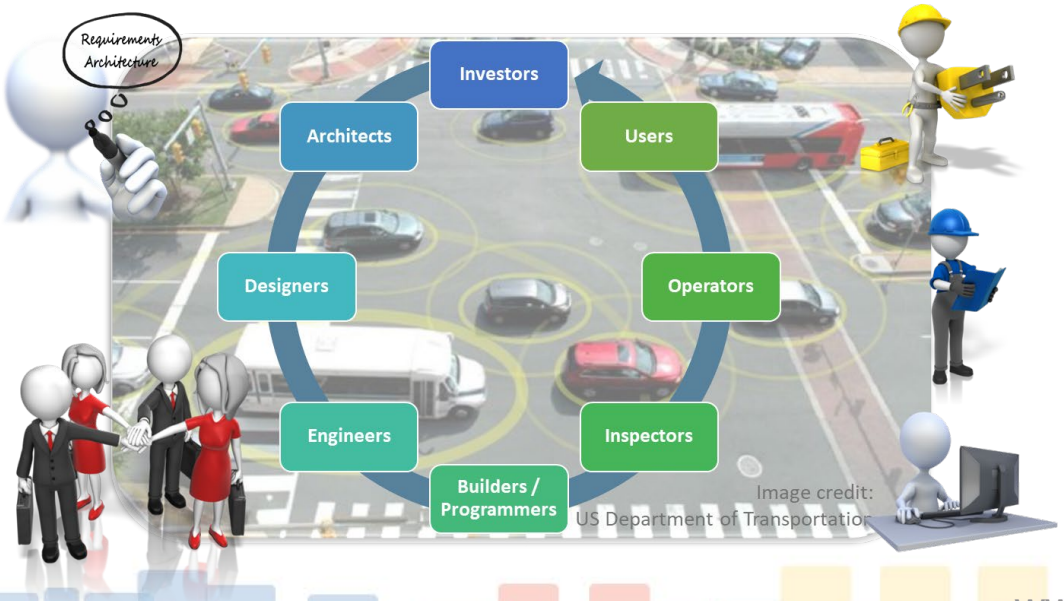
EXPLICIT > IMPLICIT



CLARITY > AMBIGUITY



ACCURACY || PRECISION

MBSE Lightning Round

Ontology, Metamodel, and Schema

Ontology: a set of concepts and categories in a subject area or domain that shows their properties and the relations between them

Oxford Languages

Metamodel: a model which is intended to give an all-inclusive picture of a process, system, etc., especially by abstracting from more detailed individual models contained within it

Oxford Languages

Schema: the organization of data as a blueprint of how the database is constructed

Wikipedia

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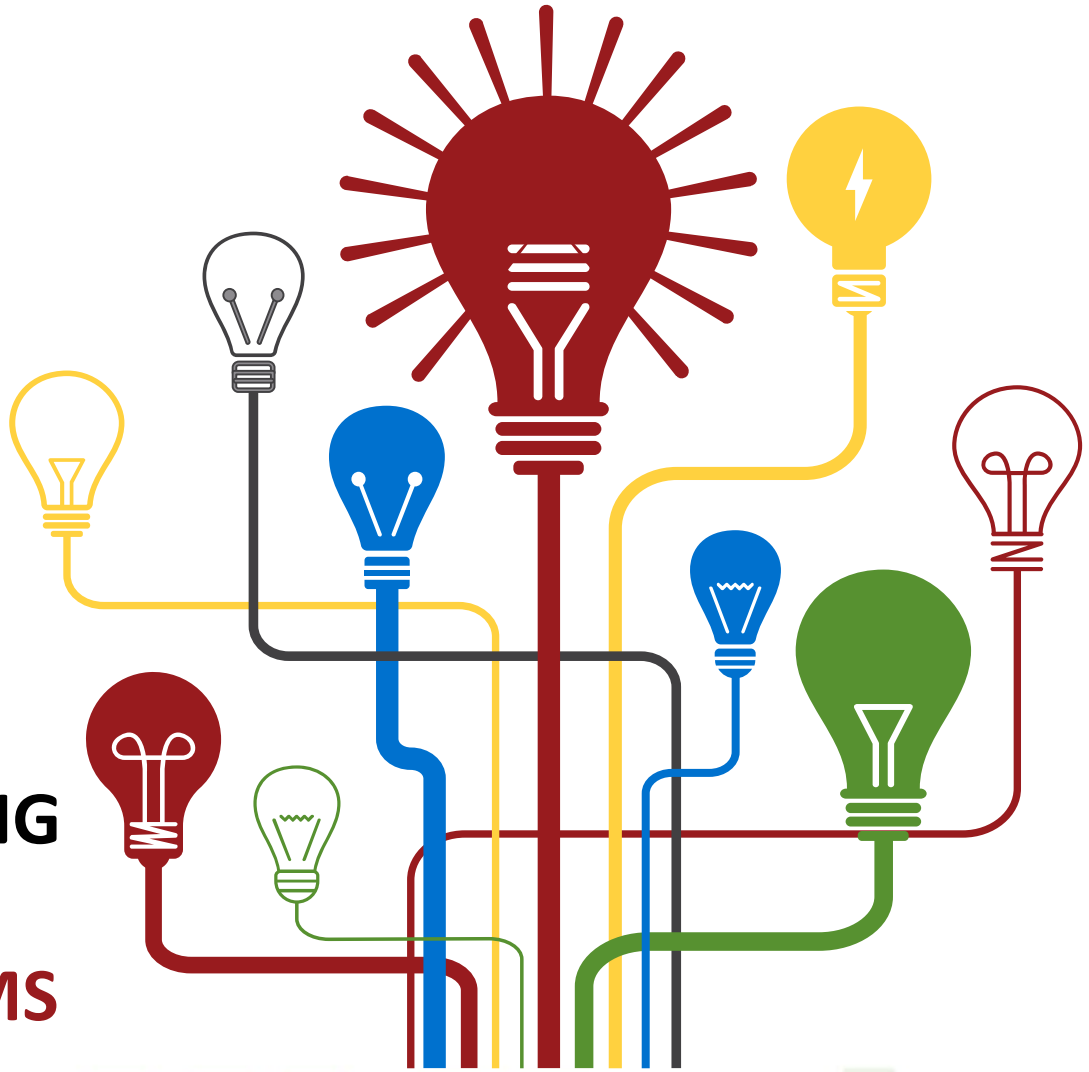
Setting the Right Context

HUMAN

MACHINE

SYSTEMS ENGINEERING

ENGINEERING SYSTEMS



FOUNDATION

EDUCATION

INTERCHANGE

INTEROPERABILITY

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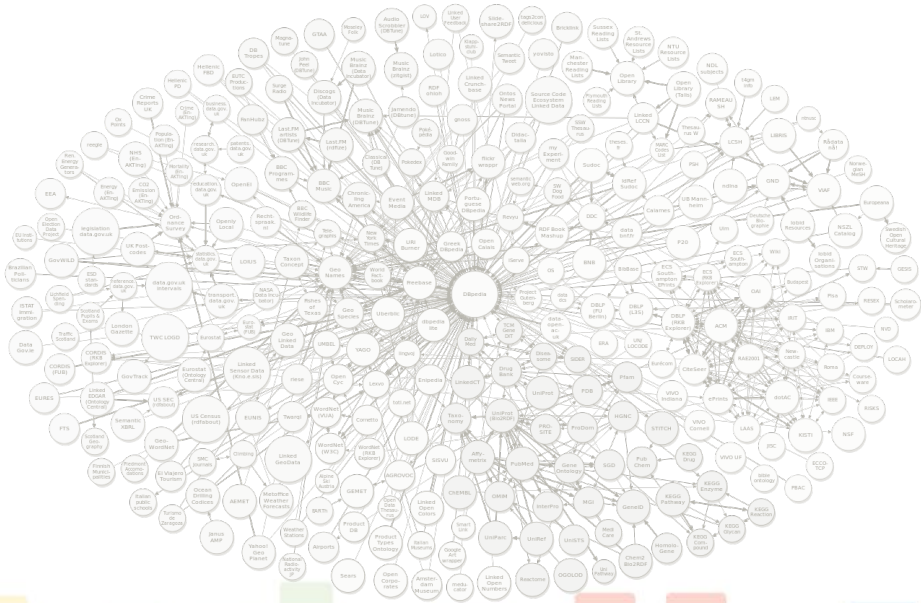
Avoiding the Perils of the Extremes

"For every complex problem, there is an answer that is clear, simple, and wrong"

H.L. Mencken



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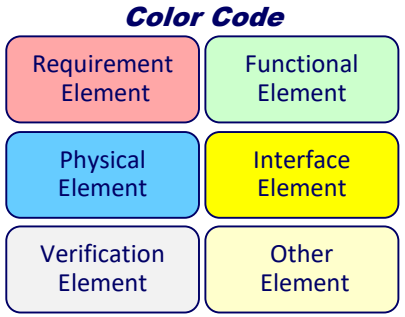
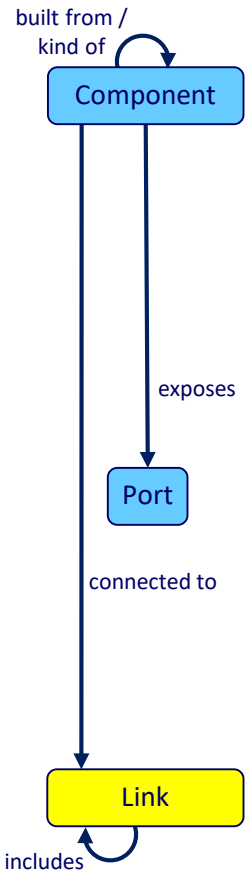
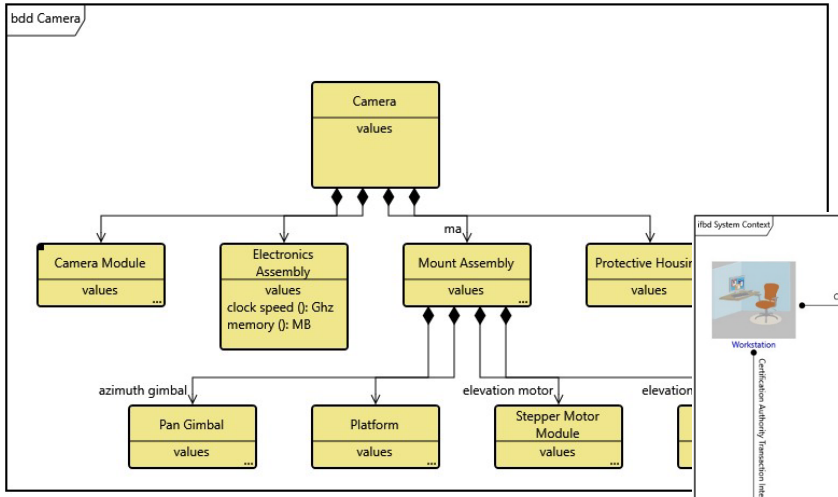
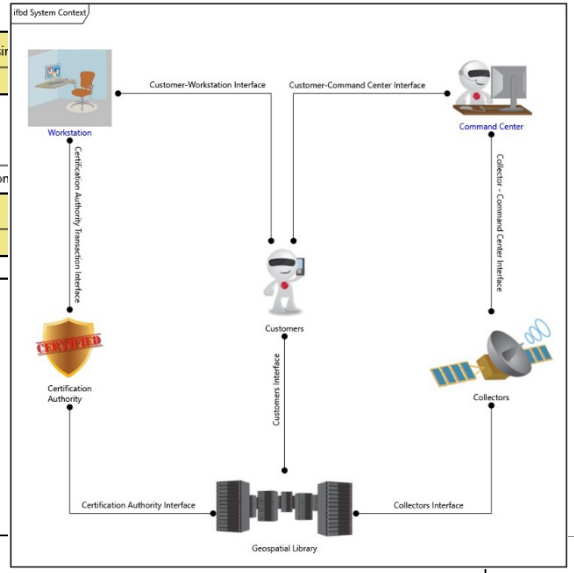
Towards an Essential Systems Metamodel or Sparse Information Model or Minimal Systems Ontology or …

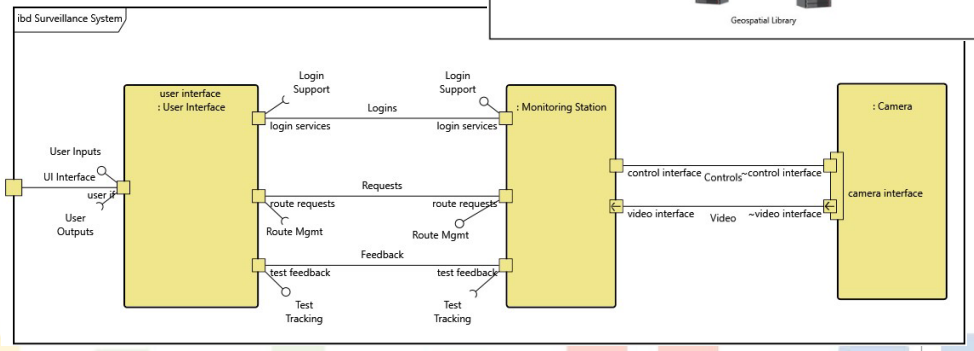
Understanding the Systems Metamodel







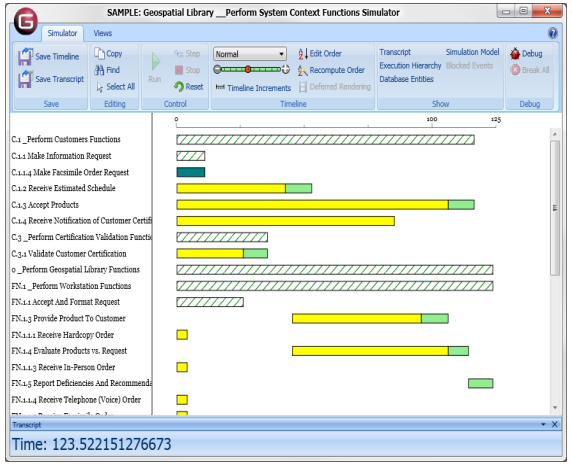


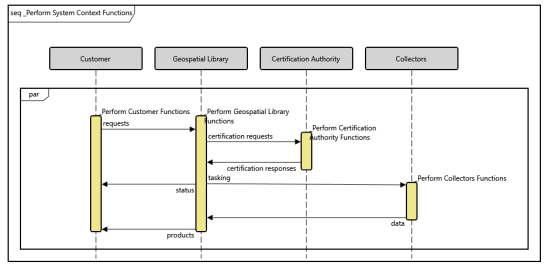


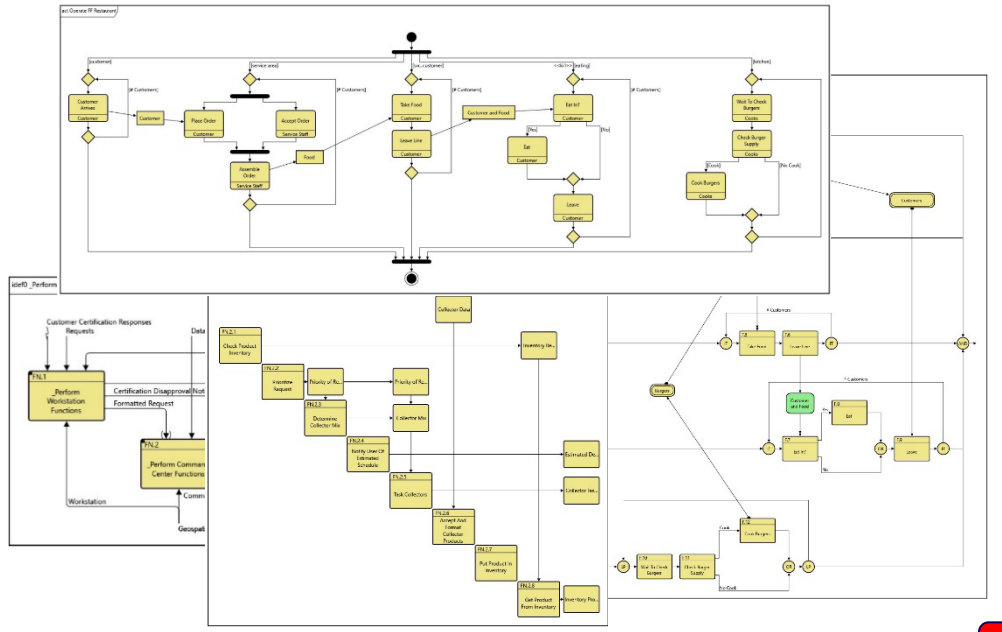
Understanding the Systems Metamodel

Color Code

Requirement Element	Functional Element
Physical Element	Interface Element
Verification Element	Other Element







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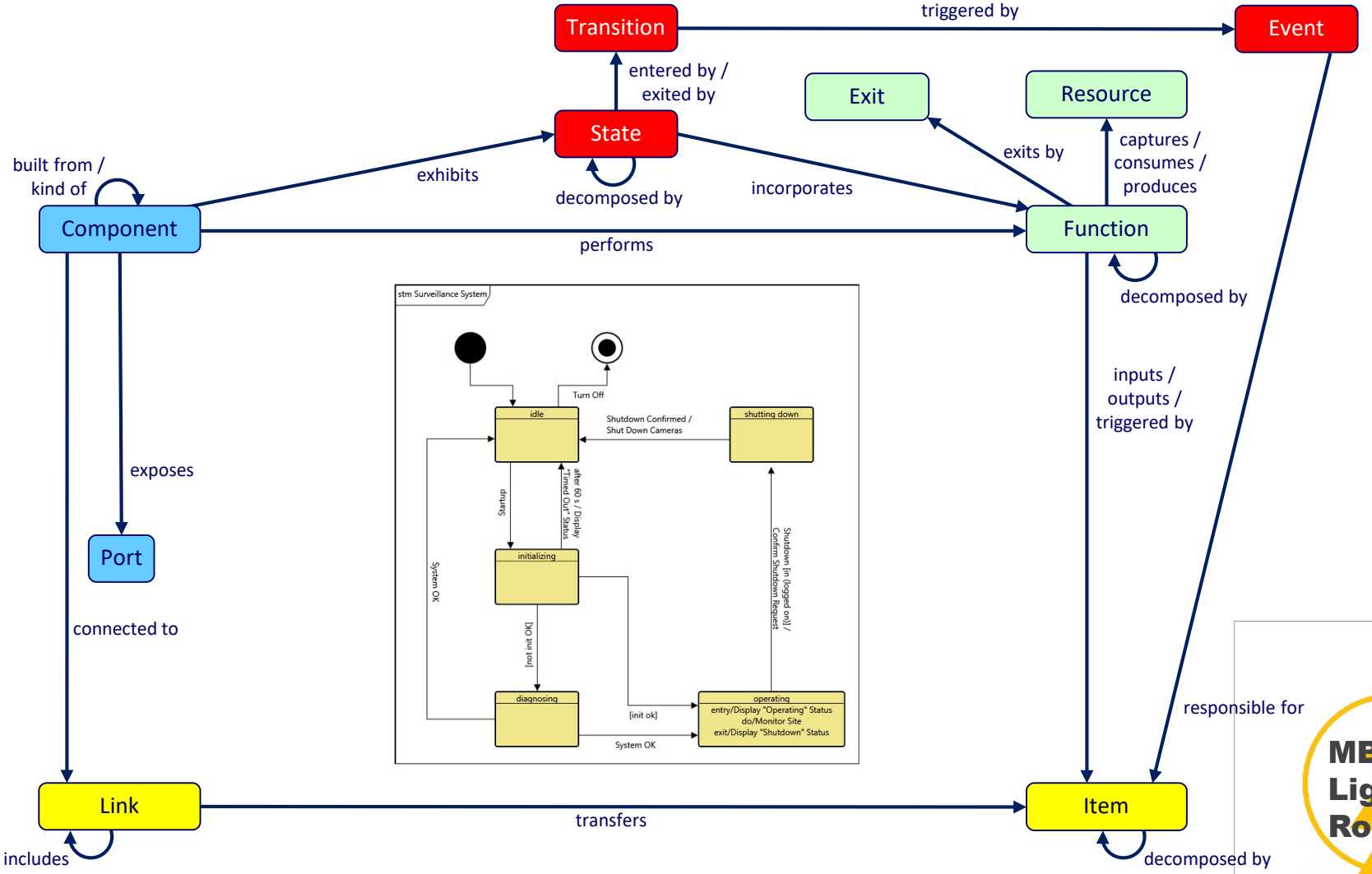

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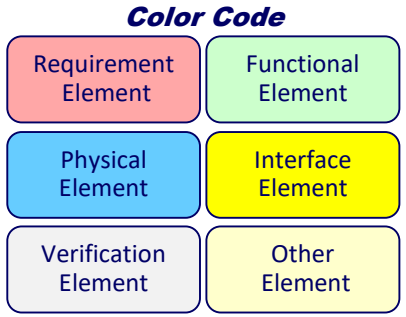

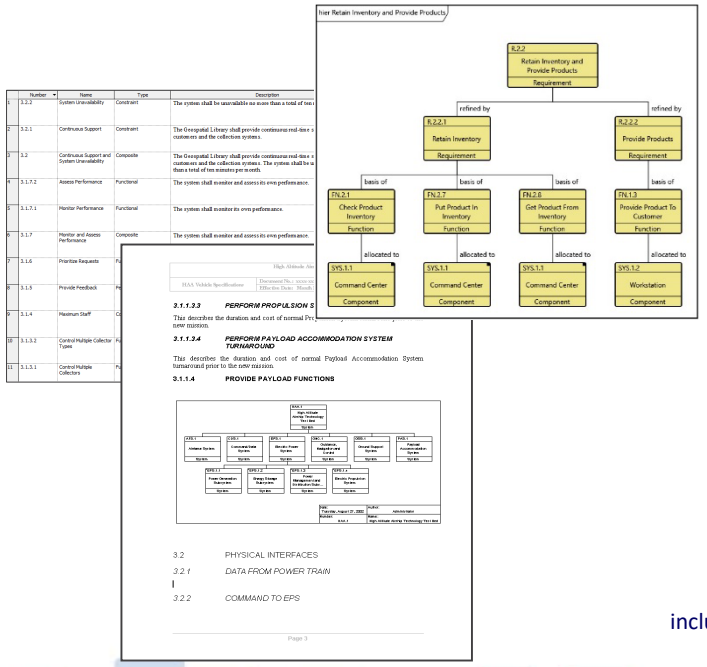

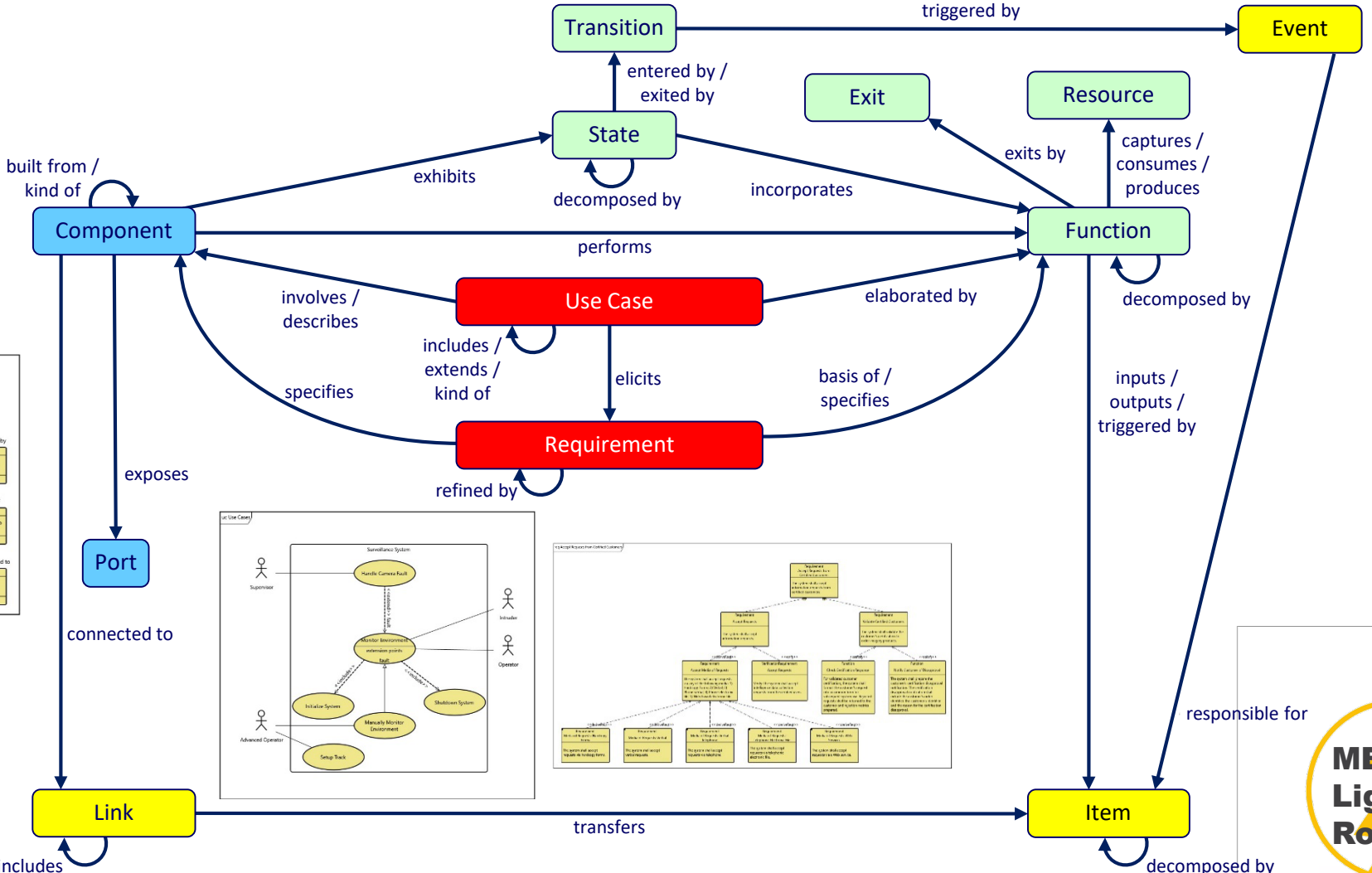

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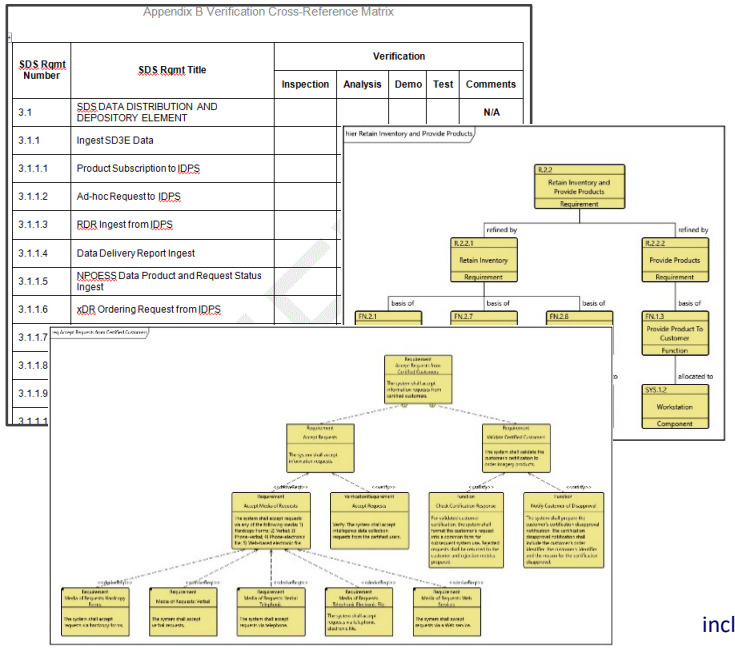

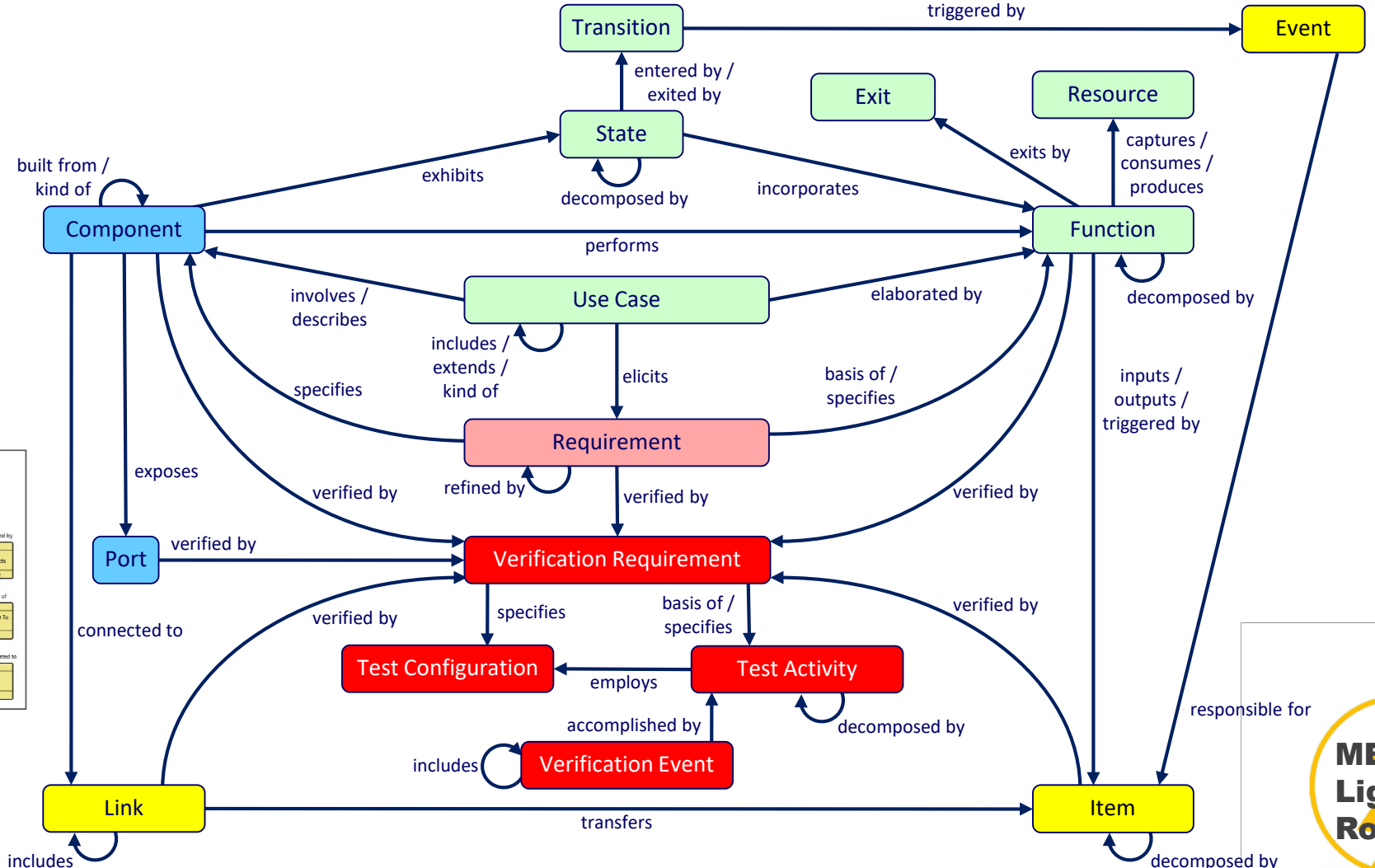

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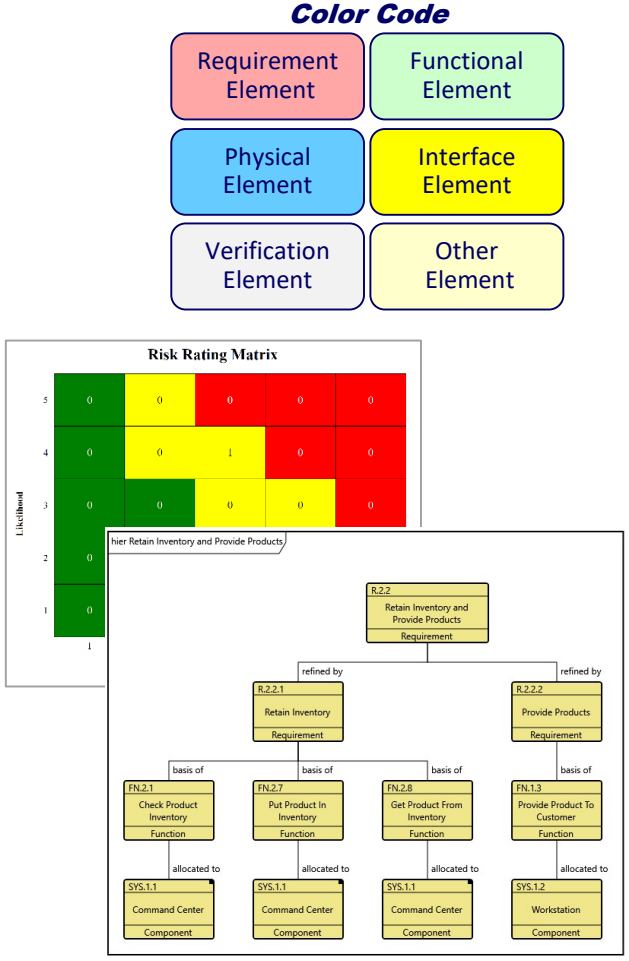

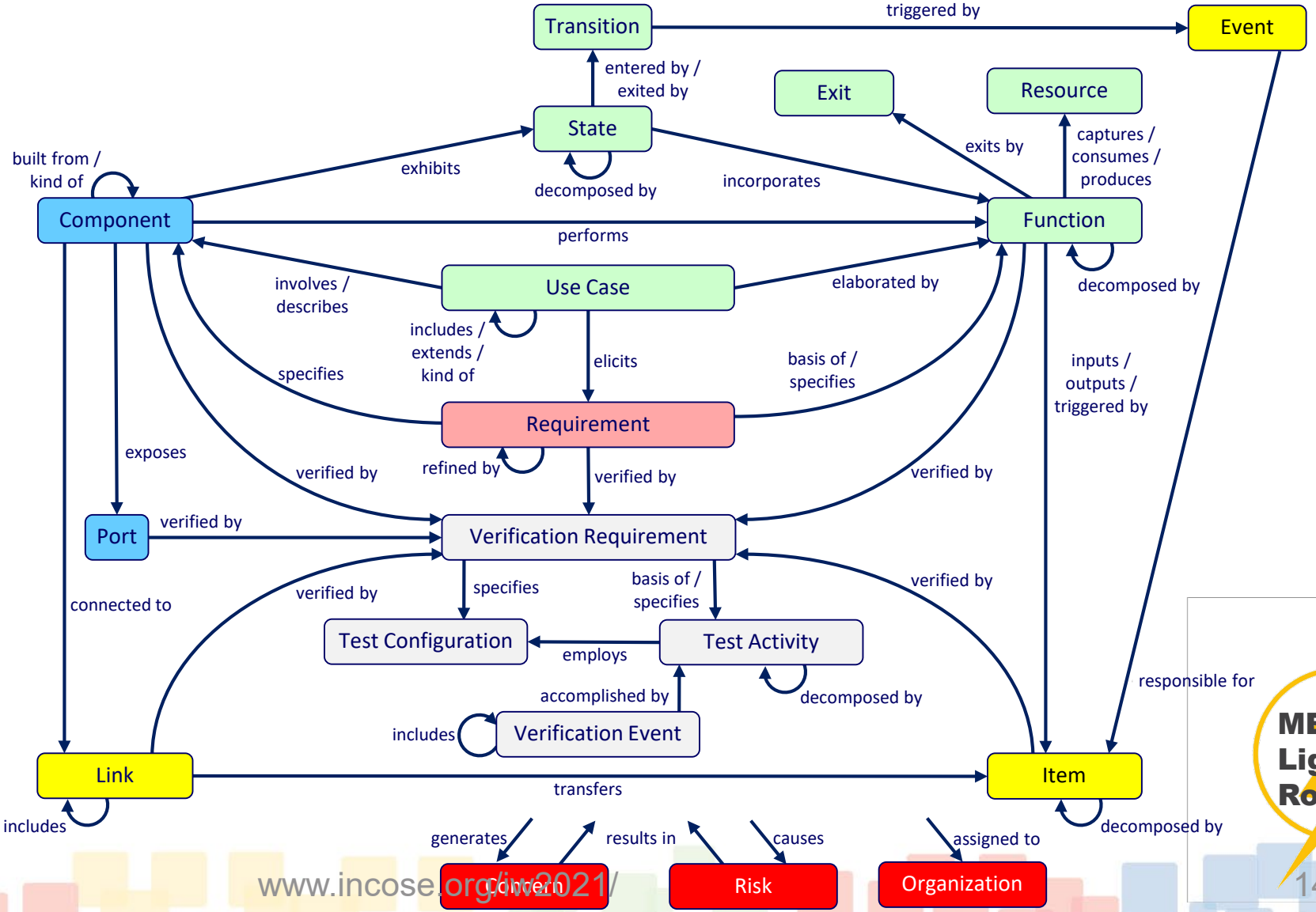

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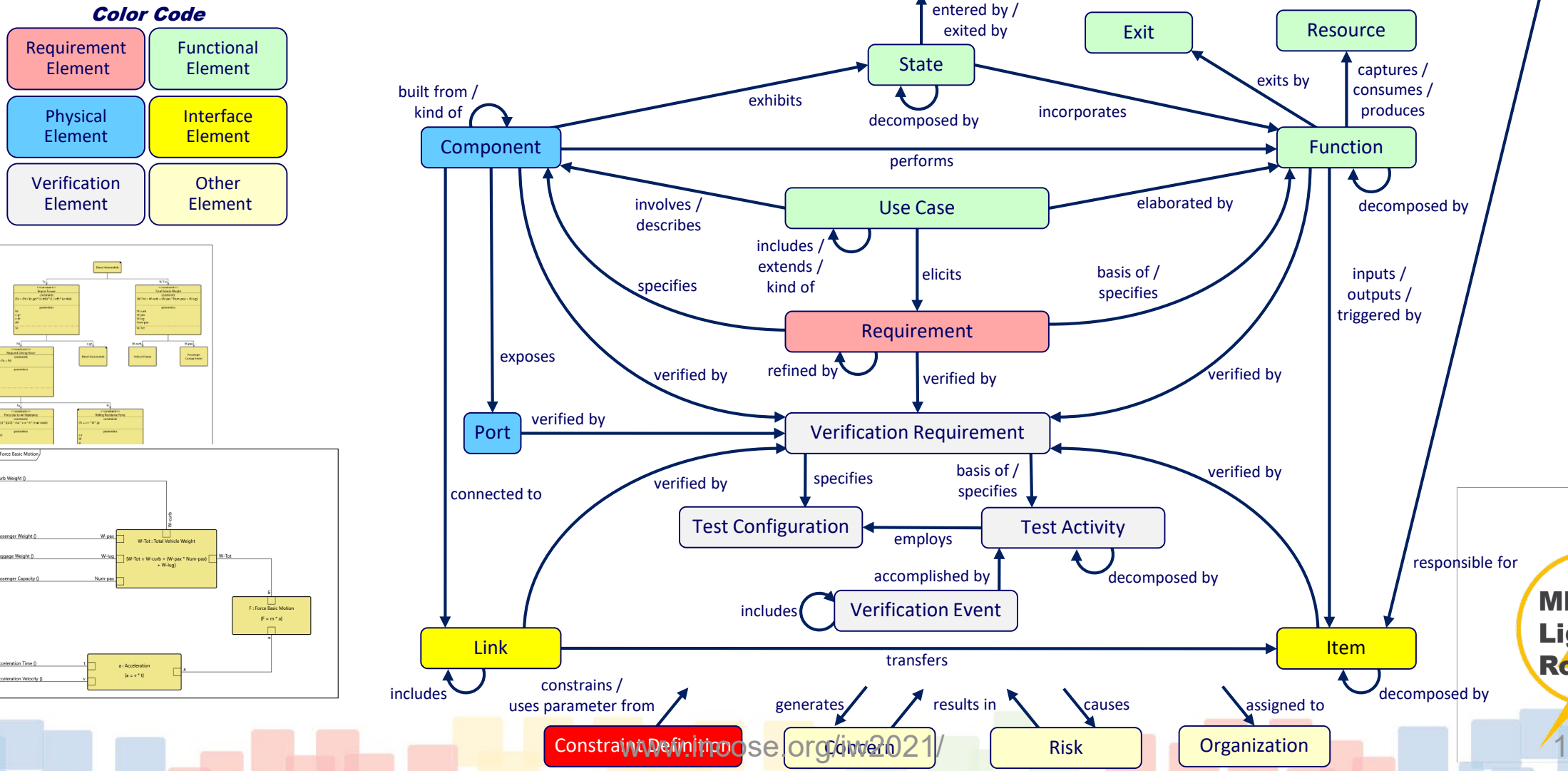

Developing a Better Metamodel

- Define your scope (engineering > modeling)
- Focus on the language of the domain
- Leverage both domain and language experts (but few heads are better than many)
- Manage the size (100 >> 1000 >> 10000)
- Emphasize interrelationships alongside concepts
- Begin with a proven base

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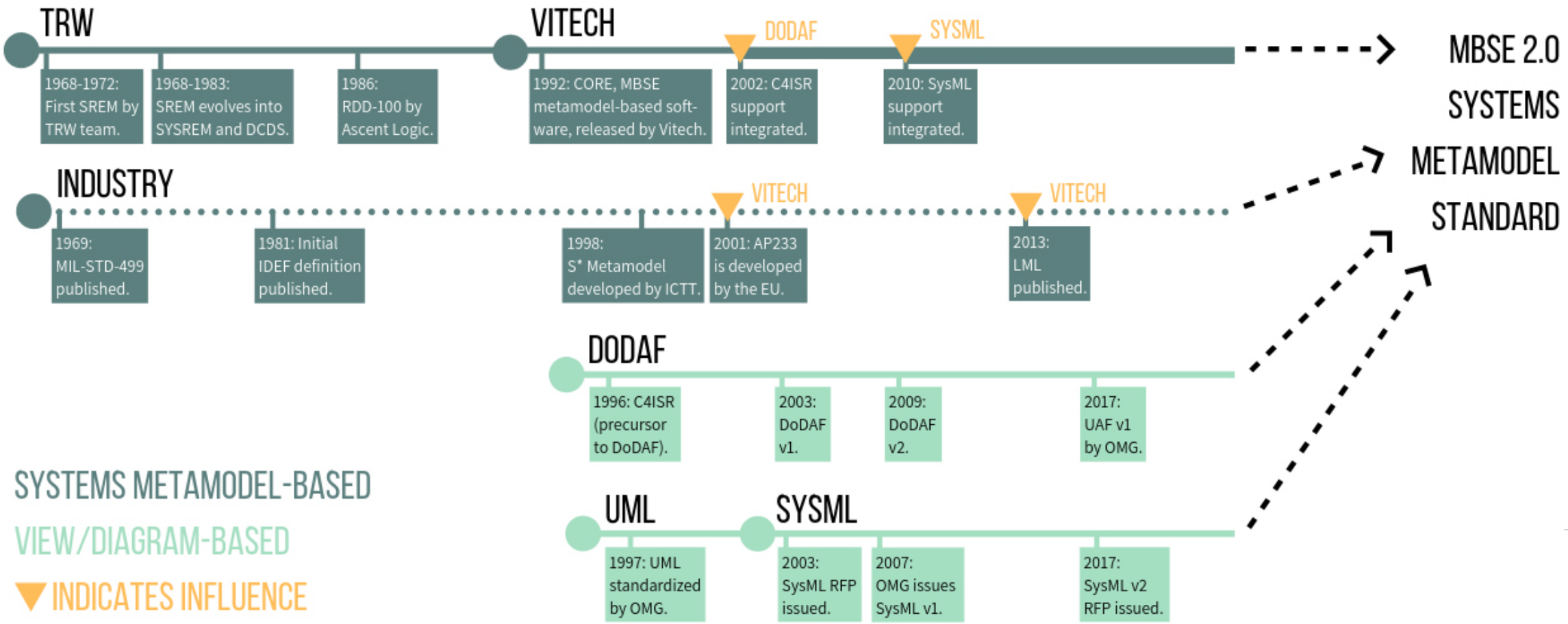
DEVELOPMENT OF THE SYSTEMS METAMODEL

50 YEARS OF ADVANCEMENT



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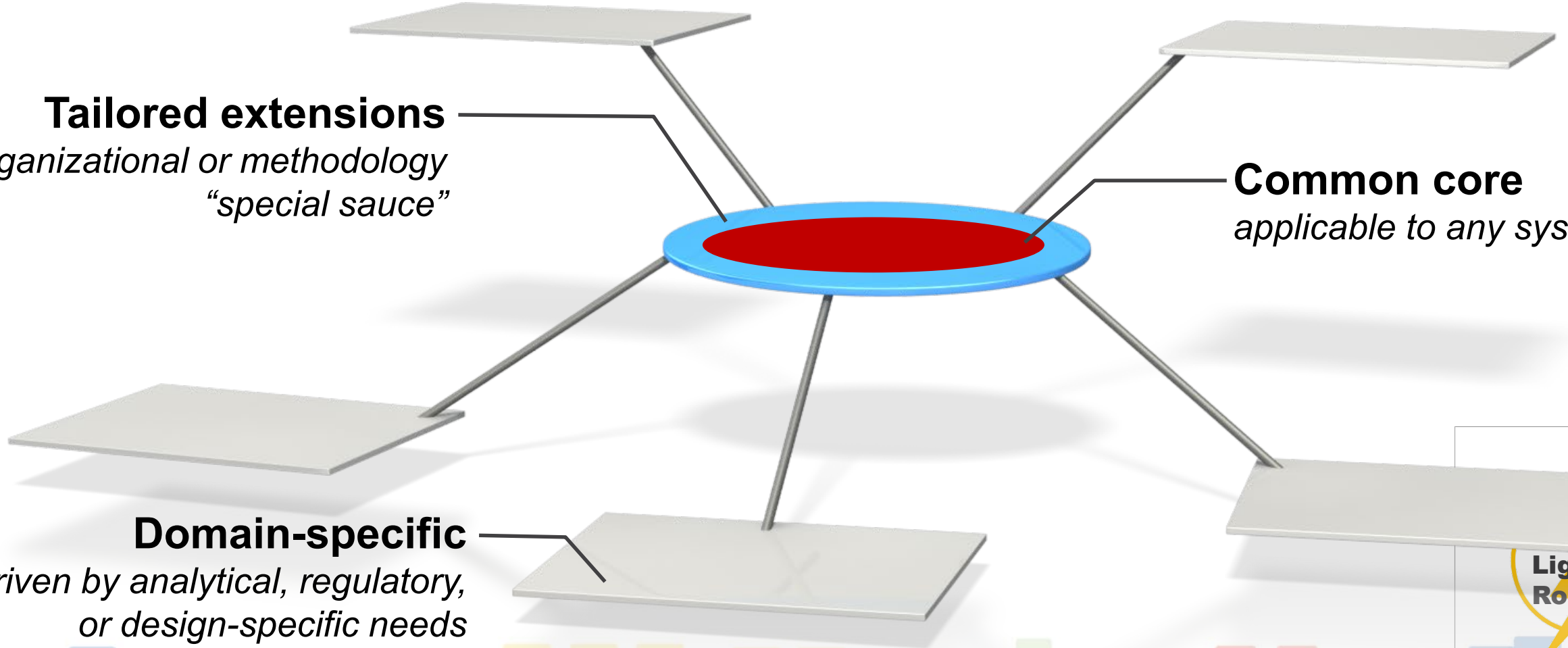
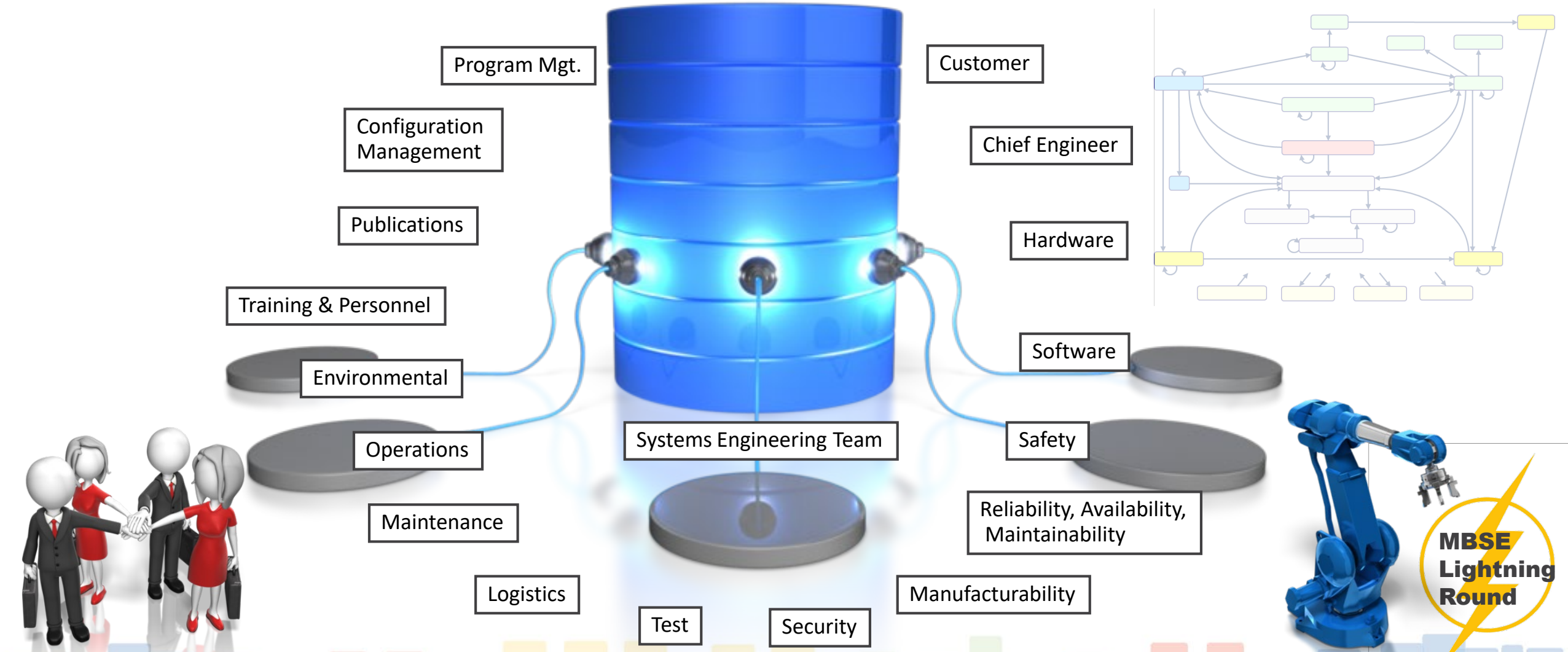
Leveraging and Connecting Core, Tailored, and Domain-Specific



Lightning Round

Aligning across the Engineering Enterprise

Right Data, Right Place, Right Time, Right Presentation



Recognizing Roadblocks and Risks

- Overestimating current implementation
- Underestimating relationships
- Notation vs concept
- Amateur experts
- Emphasizing tools and artifacts
- Standards (proliferation)
- Reinventing the wheel
- Pursuit of perfection
- Attention Deficit Disorder
- Define and use

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Aligning SE, MBSE, and Digital Engineering

Digital Engineering

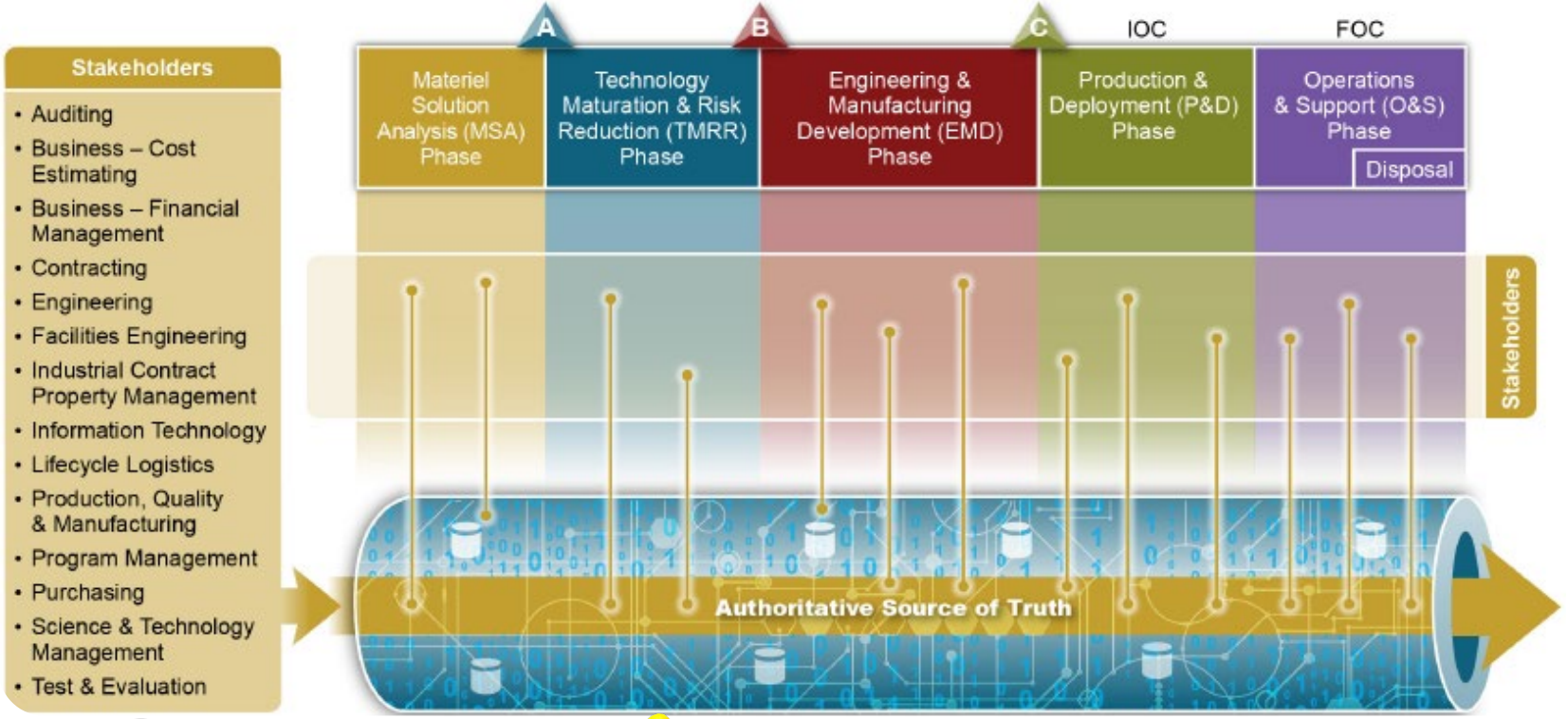
critical enabler for the modern engineering enterprise

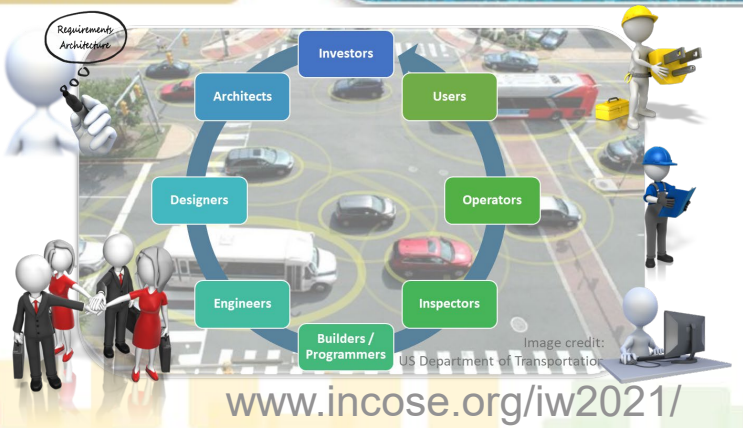
MBSE

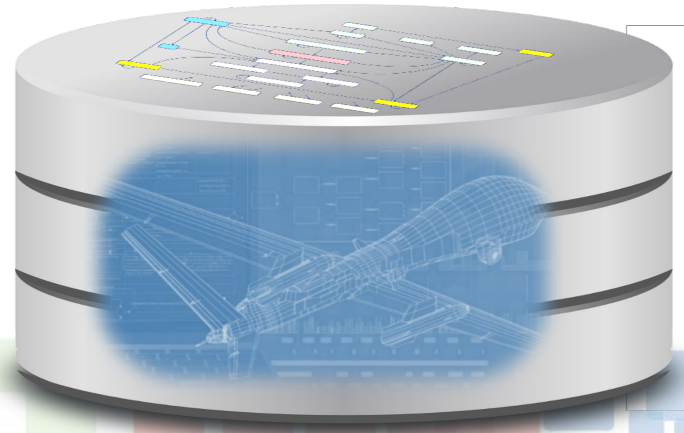
connective tissue of the Digital Engineering environment

Systems Engineering

technical connective tissue of the project team







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For More Information or to Continue the Dialog

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www.incose.org/iw2021/

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