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URMSM – ny standard för interoperabilitet mellan olika länders industrier

What is IEC/ISO JWG21

Last JWG21 SIS Tk280 meeting, Okt 2024, in Stockholm and seminarie

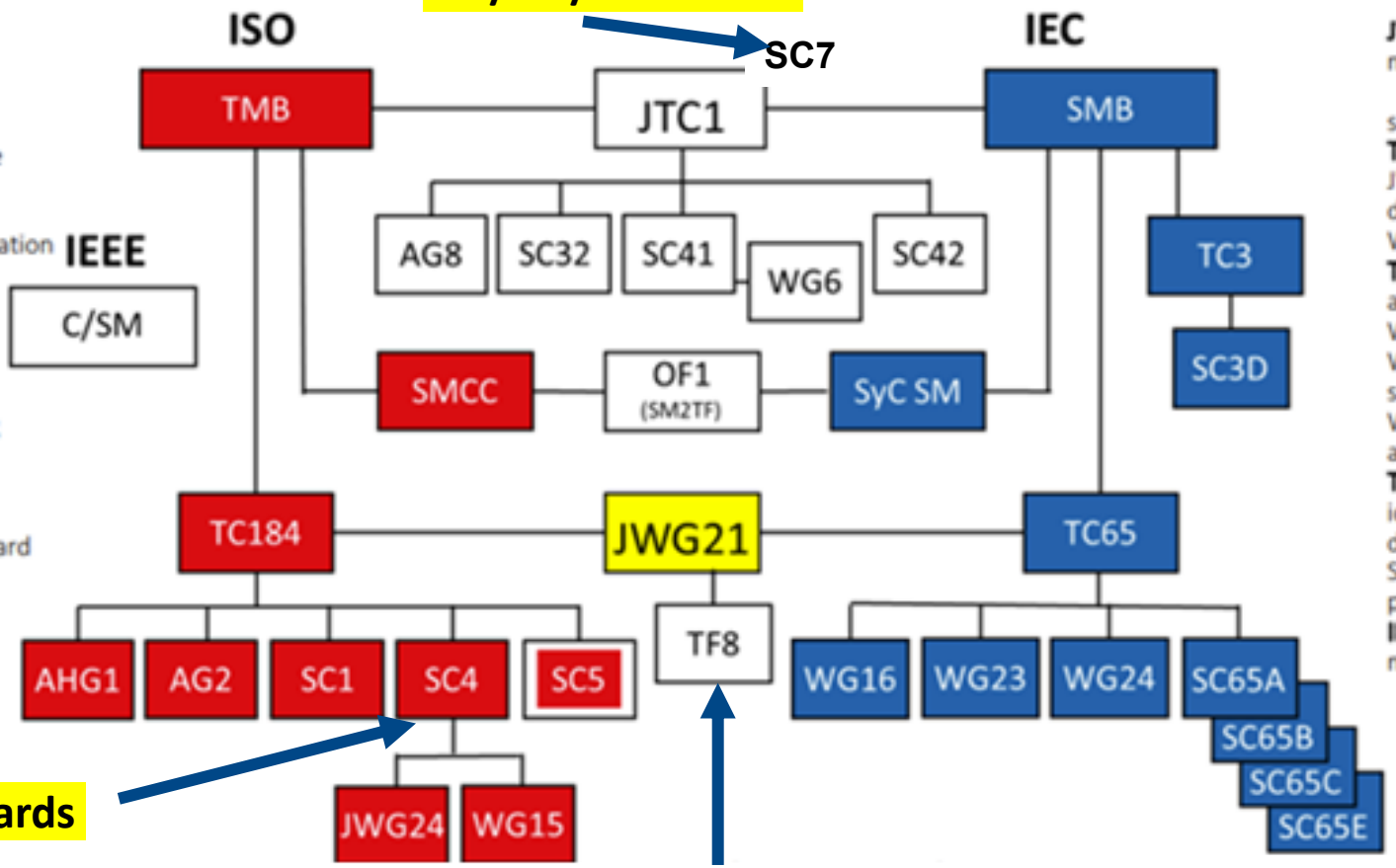
Test Case 2: Ship Lifecycle Information Management

Test Case 1:Unified Reference Model-Smart Manufacturing URMSM and its Model kinds

What is IEC/ISO JWG21

- Create an ISO and IEC Joint Working Group to create a standard Reference Model that makes sense of all the different country, industry, and consortium models

ISO/IEC/IEEE 15288



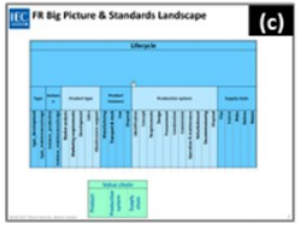
JTC1: Information technology
SC32: Data management and interchange
SC42: Artificial intelligence
AG8: Meta reference architecture and reference architecture for systems integration
SC41: Internet of things and digital twin
WG6: Digital twin
AHG1: Support for smart manufacturing reference model
AG2: Digital twin
SMCC: Smart manufacturing coordinating committee
SyC SM: Systems committee smart manufacturing
OF1(SM2TF): Smart manufacturing standard map

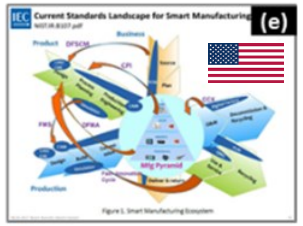
JWG21: Smart manufacturing reference model(s)
TF8: Digital twin and asset administration shell
TC184: Automation systems and integration
JWG24: Use of IEC CDD for ISO data dictionaries and ontologies
WG15: Digital manufacturing
TC65: Industrial-process measurement, control and automation
WG16: Digital factory
WG23: Smart manufacturing framework and system architecture
WG24: Asset administration shell for industrial applications
TC3: Information structures and elements, identification and marking principles, documentation and graphical symbols
SC3D: Classes, properties and identification of products - common data dictionary (CDD)
IEEE C/SM: IEEE computer society smart manufacturing standards committee

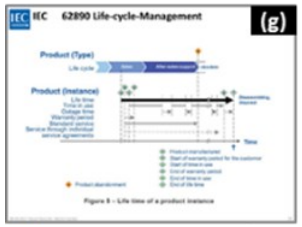
Step Standards and others

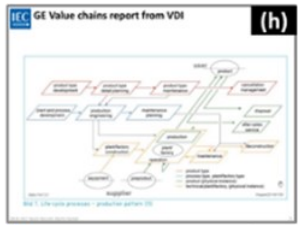
Digital Twin ISO/IEC Standardization Cordination

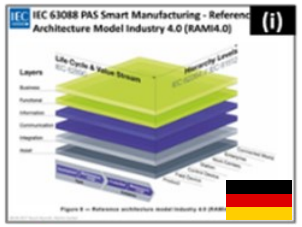
National Reference models contribution to IEC/ISO JWG21
15 countries and
110 standard practioners

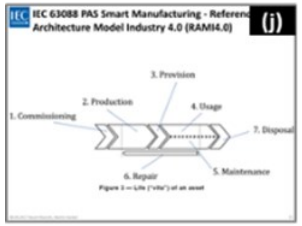


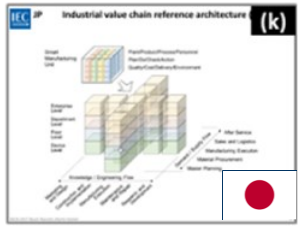


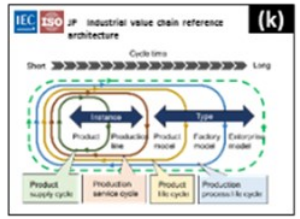


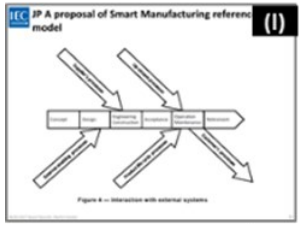






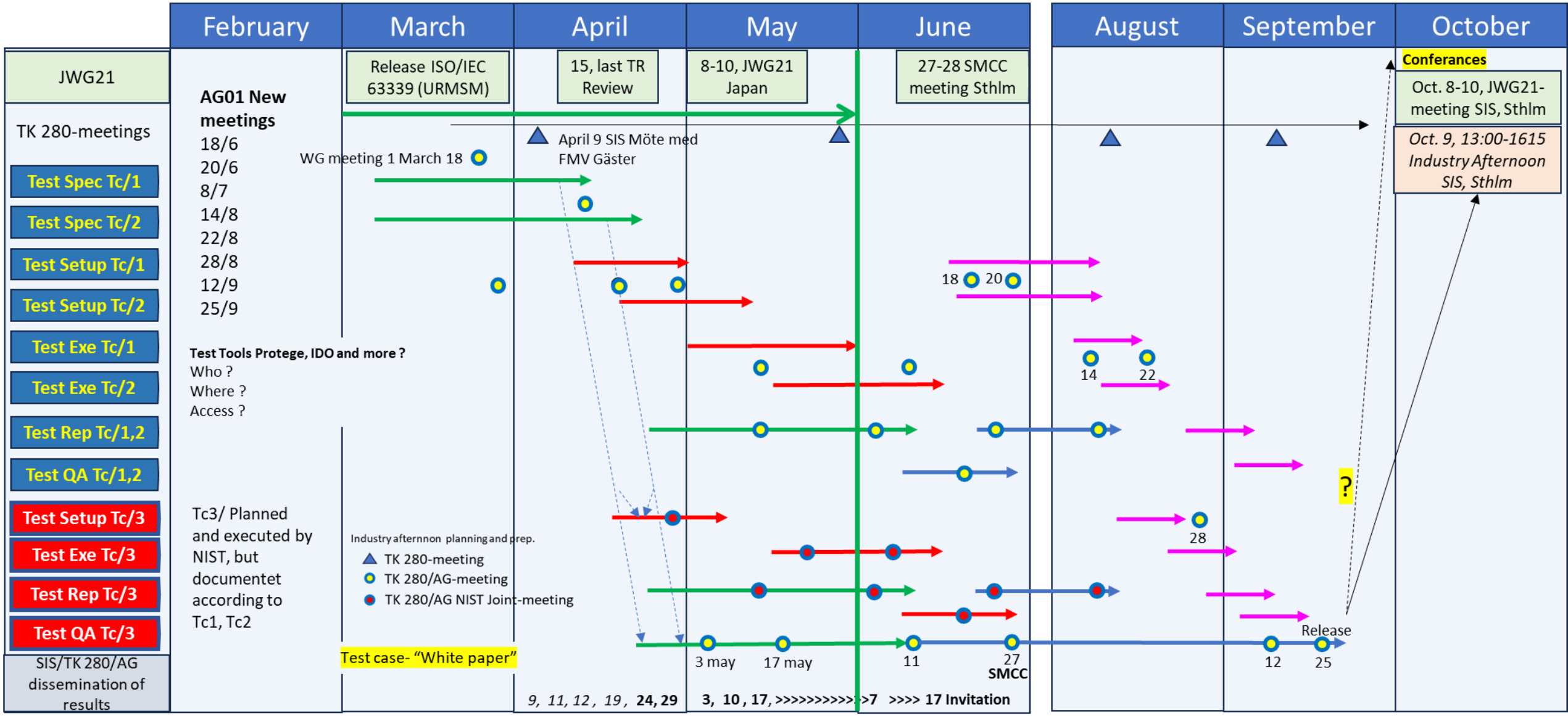






Last JWG21 SIS Tk280 meeting, Okt 2024, *in Stockholm and seminarie*

SIS/TK280/JWG21/AG01 Test scenario Planning



URMSM Test Scenario

24-04-03

Connected Industry

Test Cases of "relevant practices"

- **URMSM Model kinds**
- **What kind of work**
- **Target group**
- **Methodology**
- *Supporting Tools (will always change)*
- **Supporting Tools Standards**

Do this work as URMSM intention ?

Enterprice Capability Development

Tc1

Tc3

Tc2

URMSM
IEC/ISO 63339

URMSM Top Level Concept Model

SMRM

PLCS Concept Model

SMIS

One of PLCS Information model Template

Enterprice Concept Model

SM-Systems

Operational Information

Digital Technology on market

Test Case 2: Ship Lifecycle Information Management

A portfolio of different ship- and IT generations

PDT Europe 2015

Smyge

Proj

Proj

Visby

CAD Tibon
PDM PDB
MMGT MARS

Proj

Proj

Proj

Luleå class

Proj

Göteborg

CAD Paper
PDM ?
MMGT ?

Proj

Proj

Proj

Proj

GÖ / MOD Gävle

CAD AVEVA
PDM AVEVA
MMGT MARS

Proj

Viking

Proj

Proj

Proj

CAD ProE
PDM Intra Link
MMGT MARS

Proj

A26

CAD Creo
PDM PDM Link
MMGT MARS

Proj

Gotland

Proj

CAD Medusa
PDM PDM
MMGT MARS

Proj

Proj

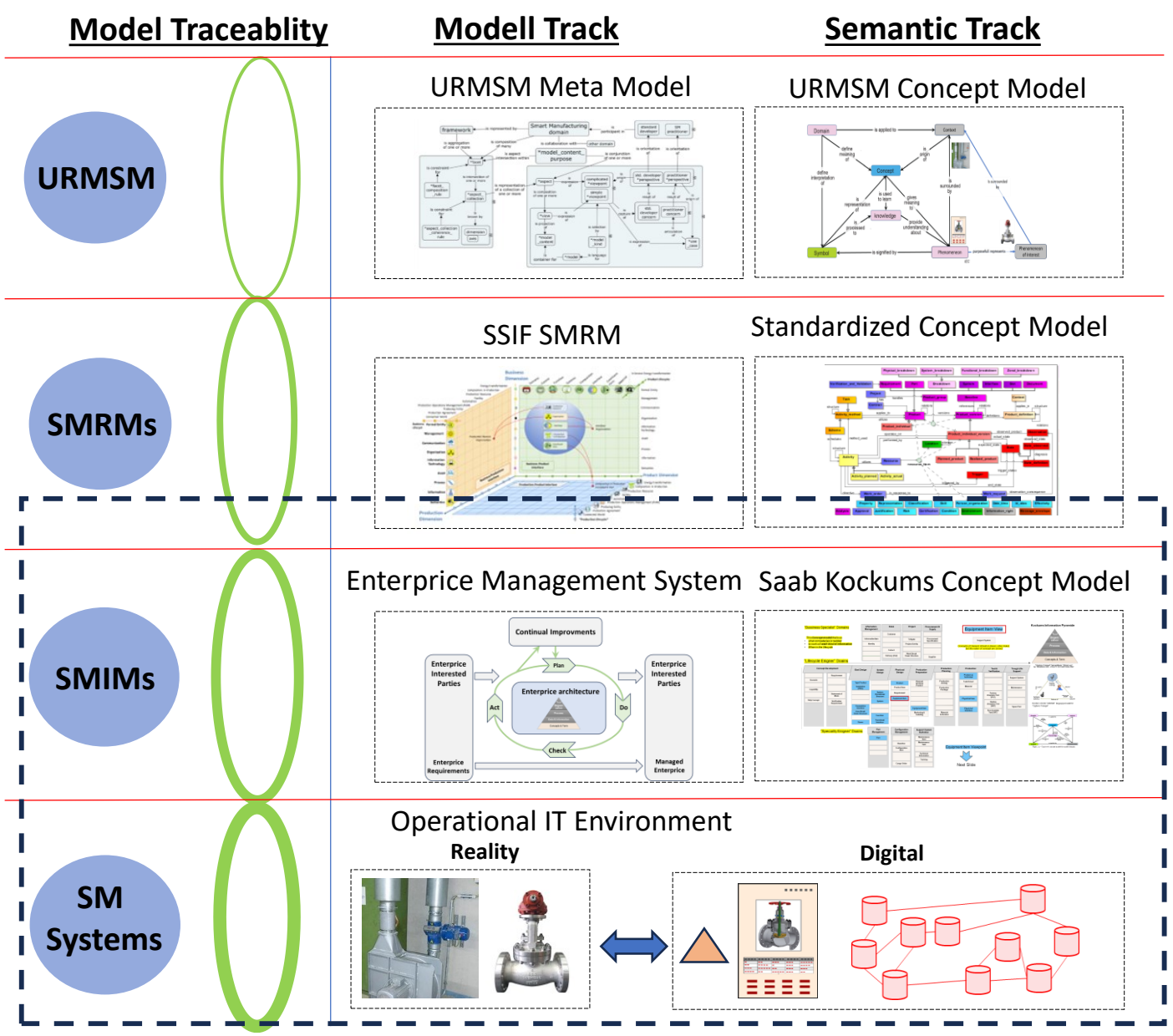
Proj

HTM Gotland

CAD Aveva
PDM Aveva
MMGT MARS

Proj

Test Case 2: Ship Lifecycle Information Management



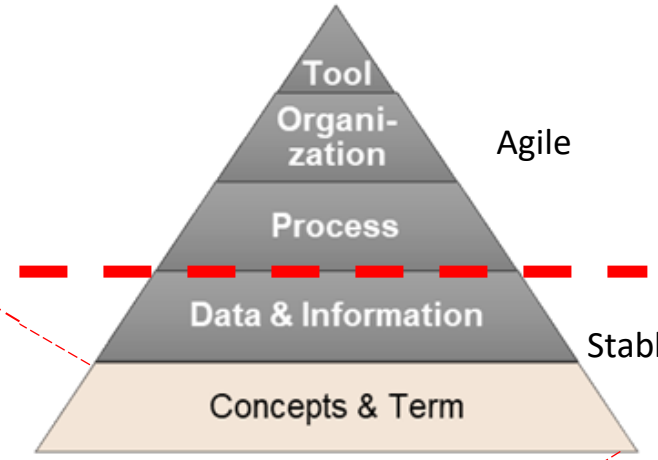
Enterprise Test Case 2 Concept Model

A01_Information Management	A02_Sales	A03_Project	A04_Procurement & Supply
	Customer	Plan	
Information Item			Procurement Specification
Identity		Project Activity	
	Contract		Procurement Order
	Delivery (out)	Work Brealdown Structure	Supplier

B01_Concept Development	B02_Requirements	C01_Conceptual Design	C02_Basic Design	C03_Detailed Design	C05_Production Information Preparation	D01 Production Planing	D02_Production	E01_Test and Verification	F01_Trough Life Support
	Requirement	Type product		Product	Design package	Planned Individual Product	Individual product	Verification	
Scenario	Technical Requirement	Installation (PBS)			EBOM (KSL)		Task_Actual	Physical Properties	Support System
			System Breakdown Structure		MBOM (PSL)	Production activity	Material	Functional Properties	Maintenance
	ILS Requirement		System	Equipment item		Production Package			Maintenance Task Definition
Roles (Operational)				Hull item		Activity Method (Std Activity)	Physical Part		
Ship Concept						Production Resource			
		Area breakdown structure (ABS)	Function	Object Location (xyz)					
		Arrangement	Functional Interface	Design Activity					
		Room	Failure						

G01_Part Management	H02_Configuration Management	I03_Support System Definition (LSA)
Part		Logistic Support Analysis (LSA)
Part assembly	Baseline	Maintenance item (MOBJ)
	Configuration item	Maintenance Task
		Resorce Item (ROBJ)
	Change Order	Spare Part

Test Case 2 Enterprise Architecture



17 "Knowledge" Domains with not more the 10 concepts to be commonly well understood within a context, here Saab Kockums

Test Case 2 “Special cooling media valve” project

sis

Conceptual Development | Basic Design | System Design | Physical Design | Production | In Service and Support

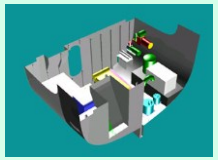
Product Dimension

Product Lifecycle

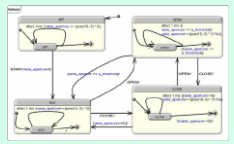
Work Package	Concepts for Information Content
WP 1	Tecnical Requirements
	ILS Requirements
	Type Product
	Installation
	Room (ABS)
WP 2	*Function*
	Functional Interface
	System
WP 3	*Equipment Item*
	Part
	Spare Part
WP 4	*Maitenance Item (MOBJ)*
	Production activity
	MBOM (PSL)

CM Baseline

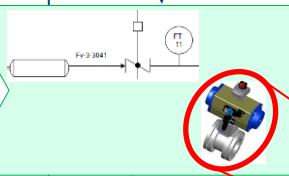
v1



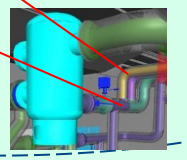
v1



v1



v1



Total Set of System Lifecycle CM Managed Information

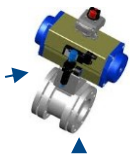
v5

v4

v3

v2

v1



Individual Product Information

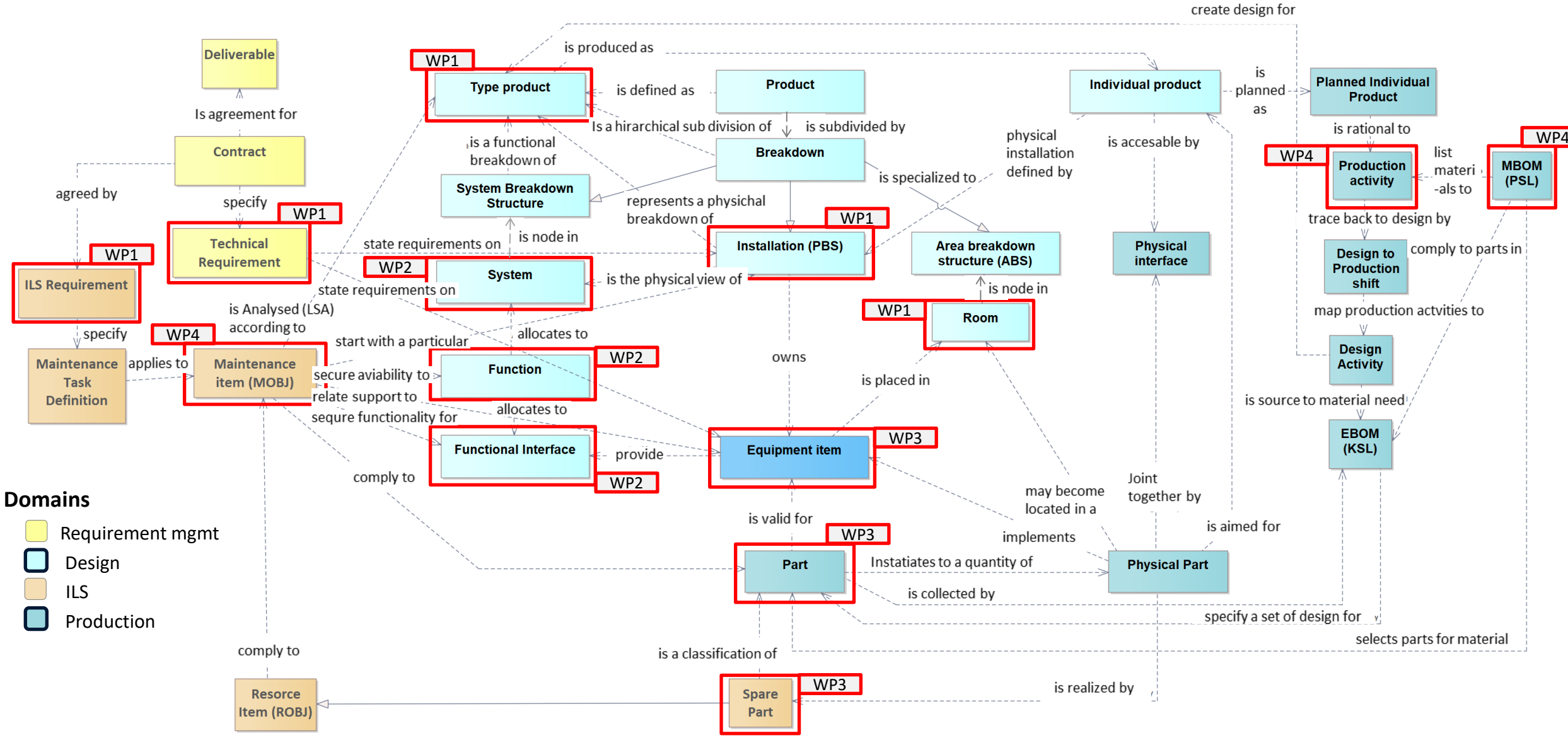
Feedback loops

Domains

- Requirement mgmt
- Design
- ILS
- Production

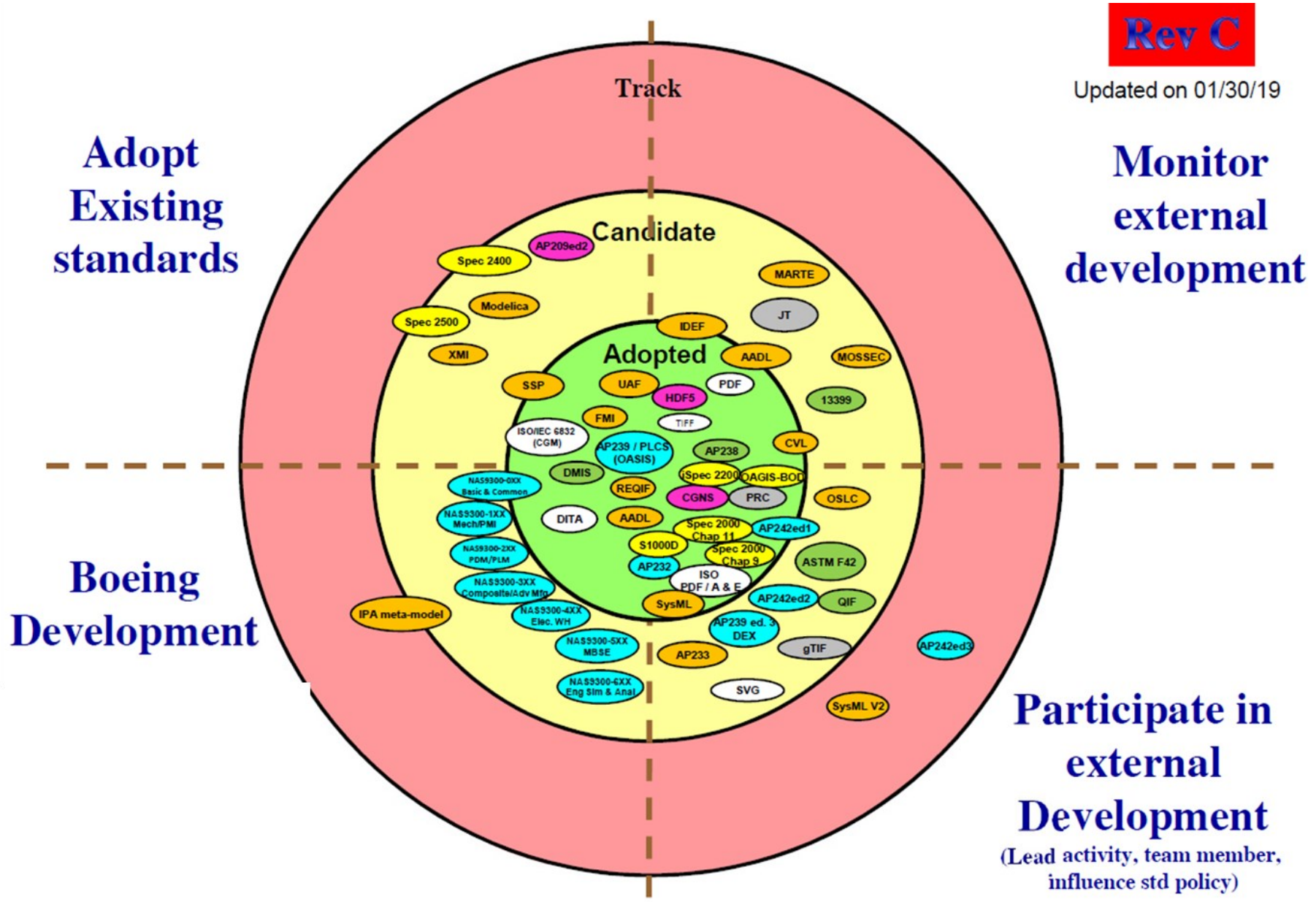
Next Generation

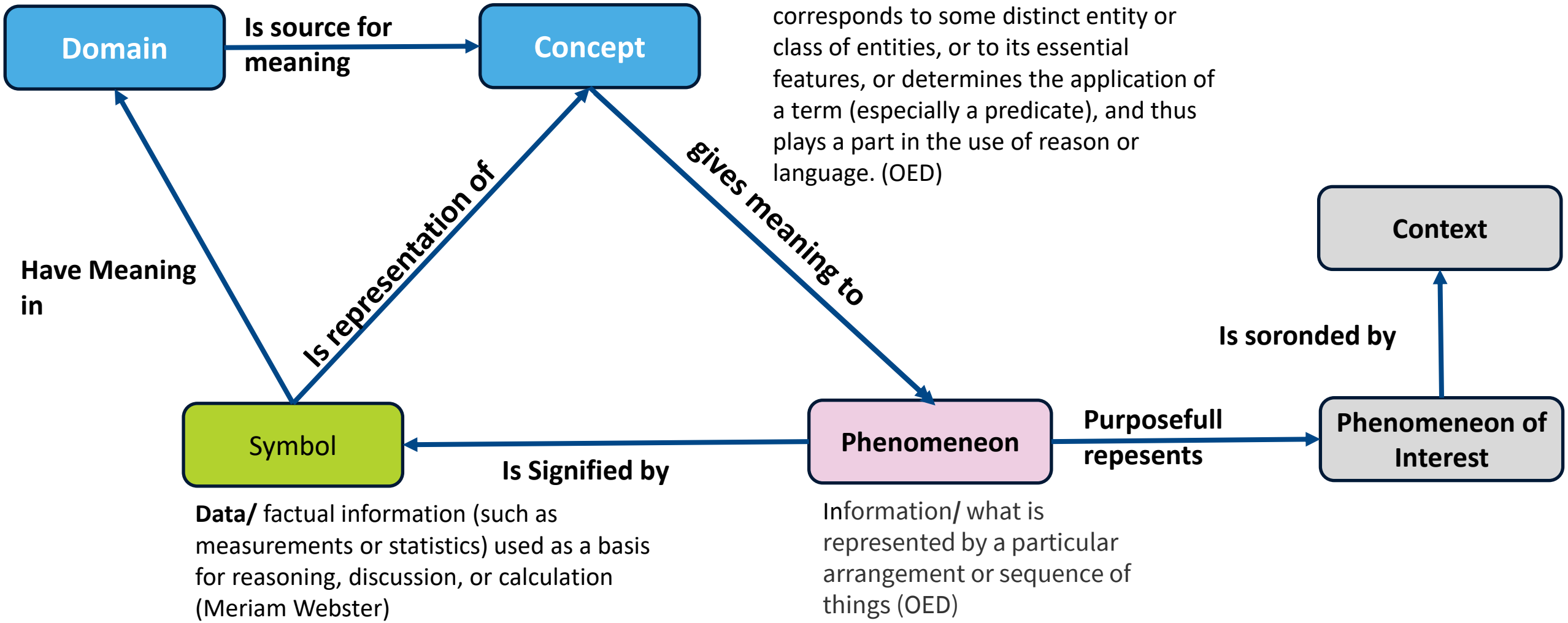
Tc/2 “Concept of Interests ” define WP Information Content



Unified Reference Model-Smart Manufacturing (URMSM)

Företagets urval av standarder, Boeing exempel




Domain
Is source for meaning
Concept
Concept An idea or mental image which corresponds to some distinct entity or class of entities, or to its essential features, or determines the application of a term (especially a predicate), and thus plays a part in the use of reason or language. (OED)
Have Meaning in
Is representation of
gives meaning to
Context
Is soronded by
Symbol
Is Signified by
Phenomeneon
Purposefull repesents
Phenomeneon of Interest
Data/ factual information (such as measurements or statistics) used as a basis for reasoning, discussion, or calculation (Meriam Webster)
Information/ what is represented by a particular arrangement or sequence of things (OED)

URMSM Test Cases, after the Test scenario

sis

Tc/1 Car industry IT-Environment Management

Tc/2 Ship Lifecycle Information Management

Tc/3 Additive Manufacturing Model Prediction Control (MPC)

Connected World

”URMSM” Template (Ontology)

IEC/ISO 63339 ”URMSM”

URMSM
Unified Reference Model Smart Manufacturing

SMRM
Smart Manufacturing Reference Model

SMIM
Smart Manufacturing Implementation Model

SMSY
Smart Manufacturing System

Information Standards

Interrelated levels of abstraction!

Digital Technology on market

Sustainable Pyhysichal and Digital Operation enabled trough Lifecycle sharded knowledge

Operational Information

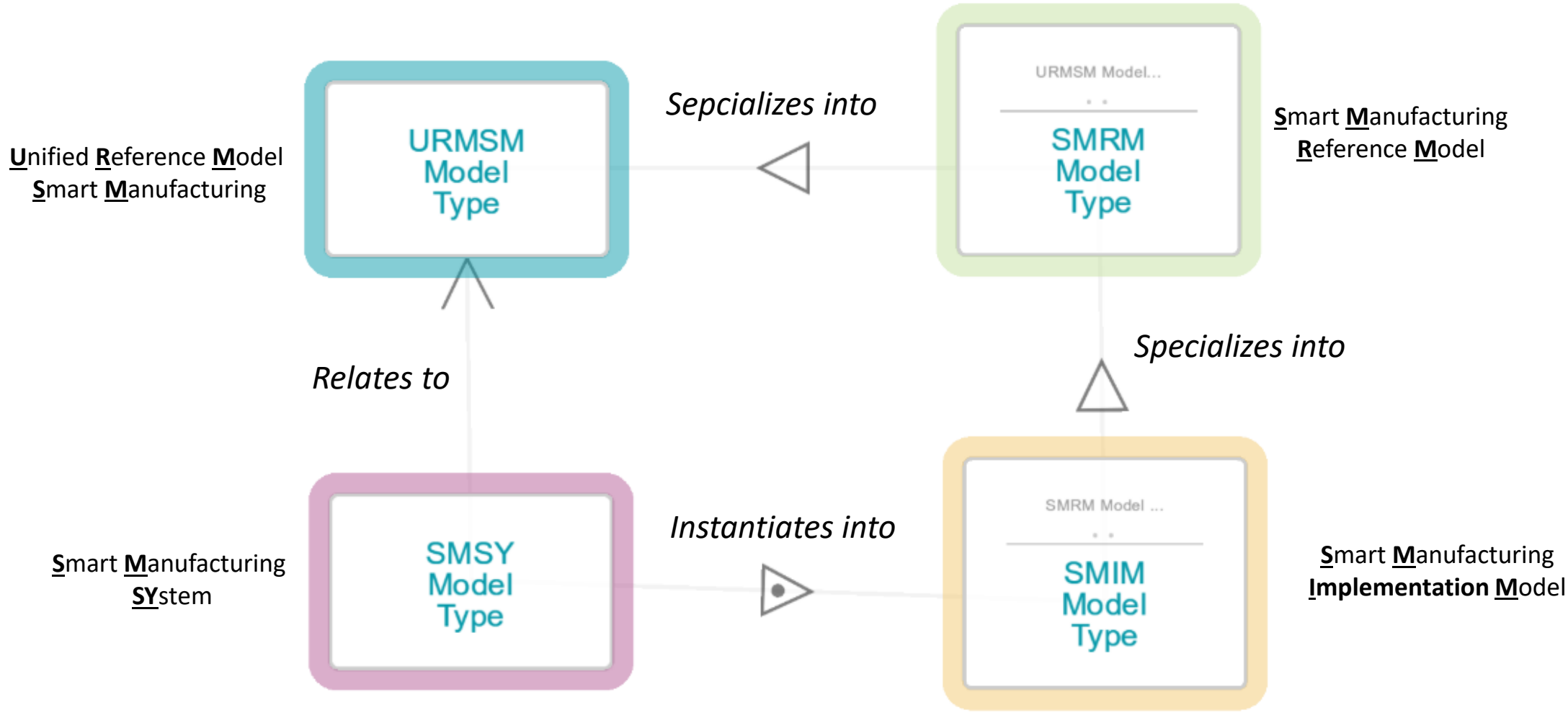
Operational Information

Operational Information

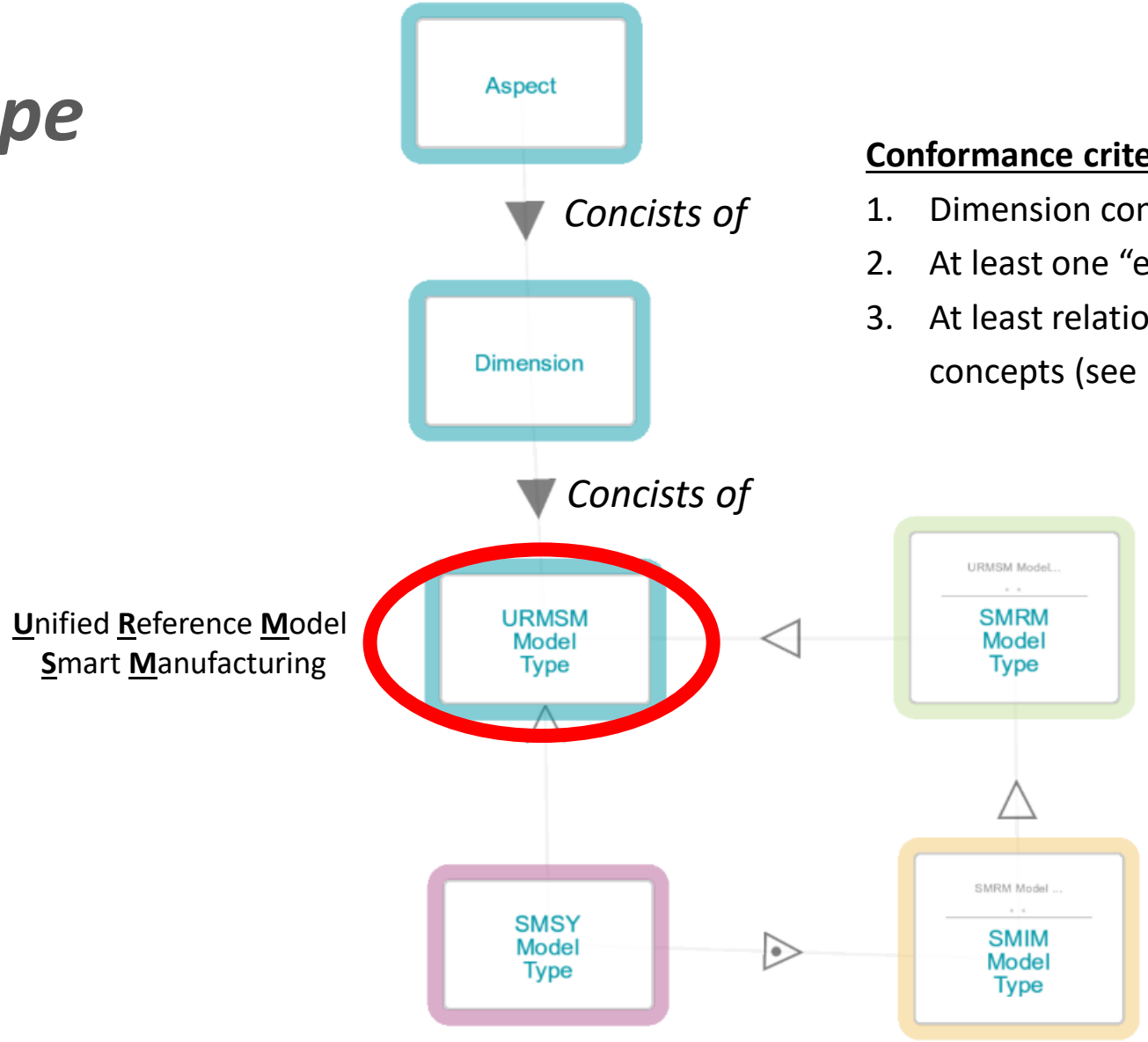
Test Case 1:Unified Reference Model-Smart Manufacturing URMSM and its Model kinds

SM-Systems - the prerequisite for digitalization (means for knowledge graphs)

URMSM with model types (OPM-notation)



URMSM
Model Type

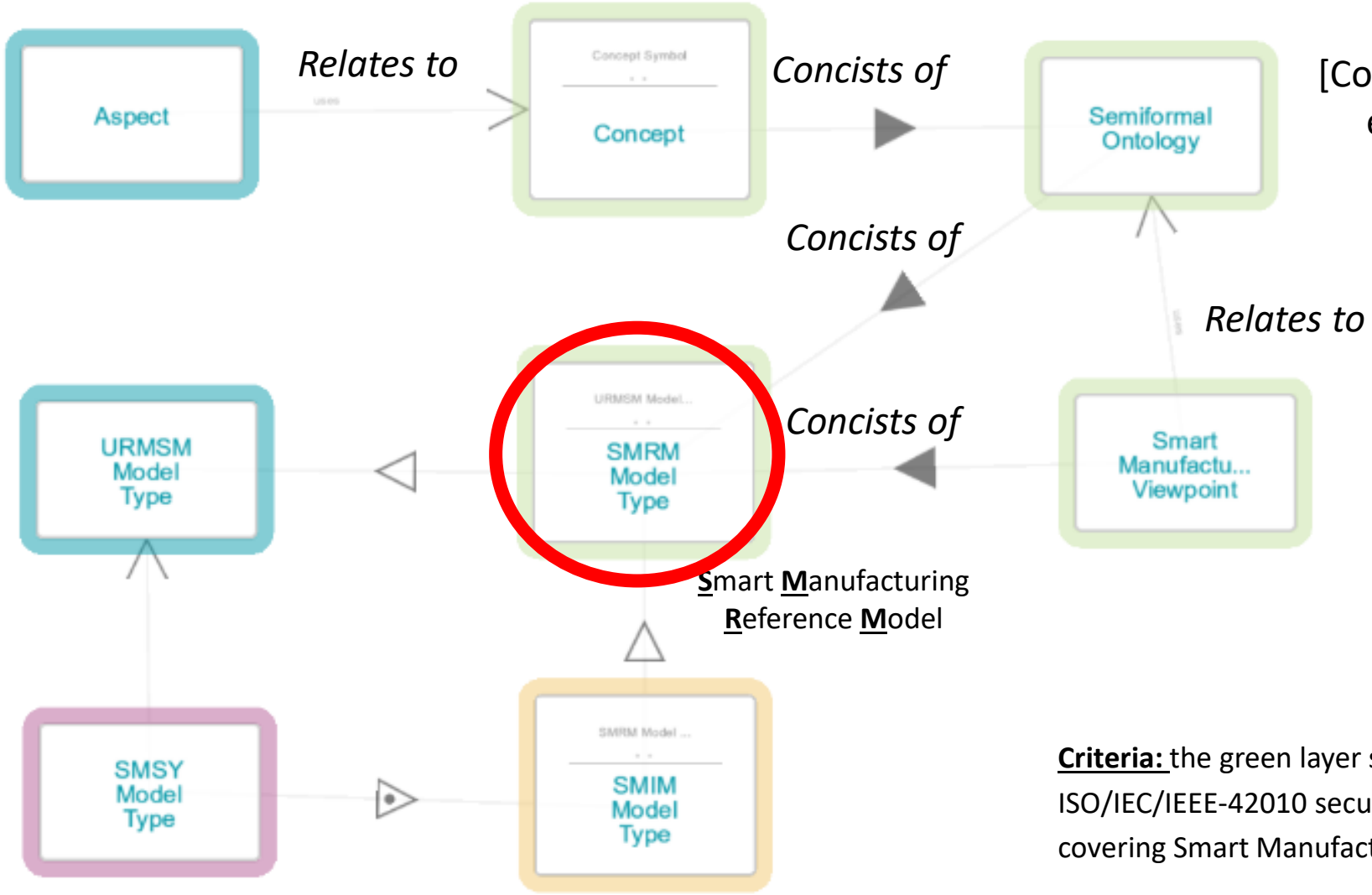


Unified Reference Model Smart Manufacturing

Conformance criteria:

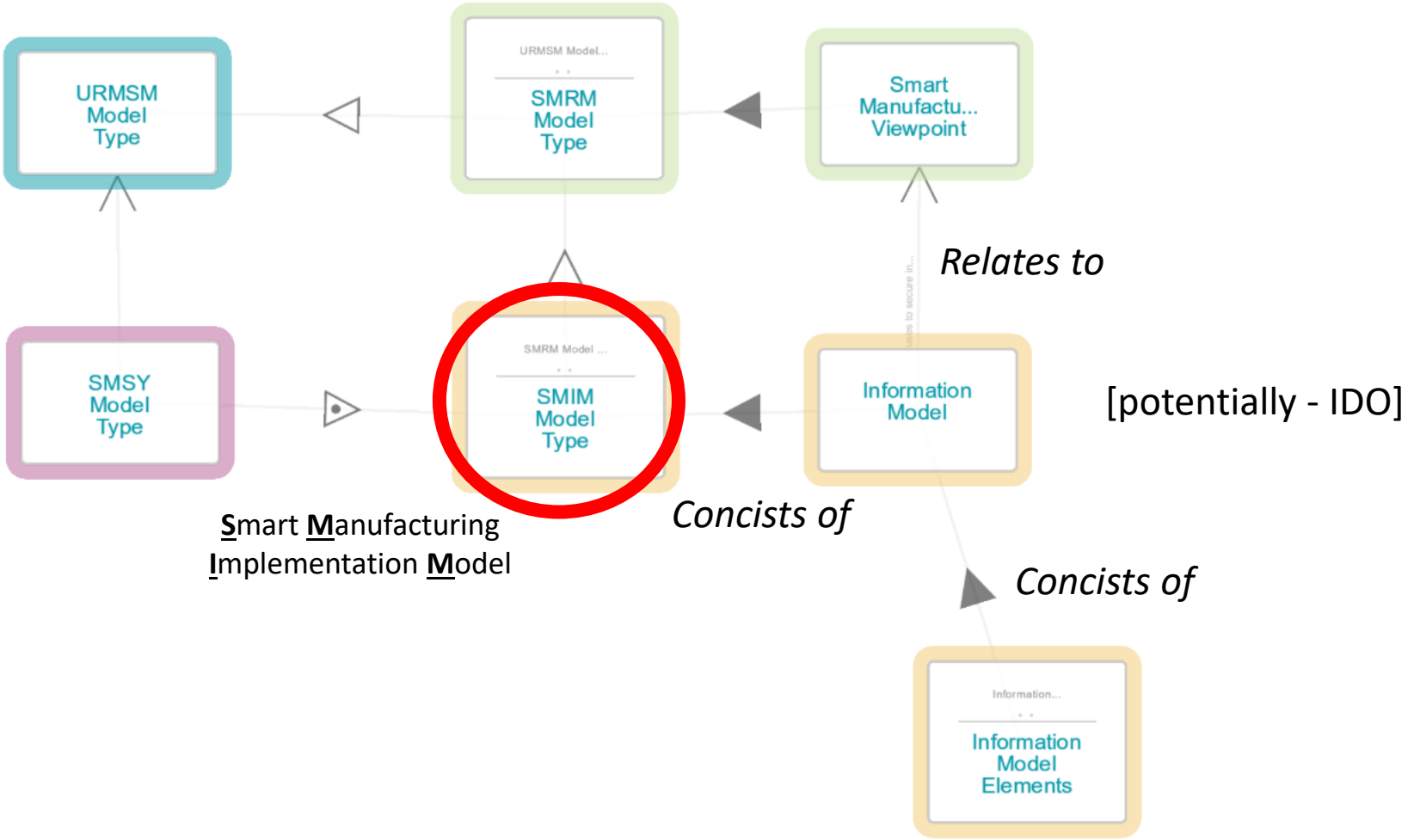
1. Dimension consists of Aspects
2. At least one “essential” dimension e.g. “lifecycle”
3. At least relation between aspects over “shared” concepts (see next slide)

SMRM
Model Type

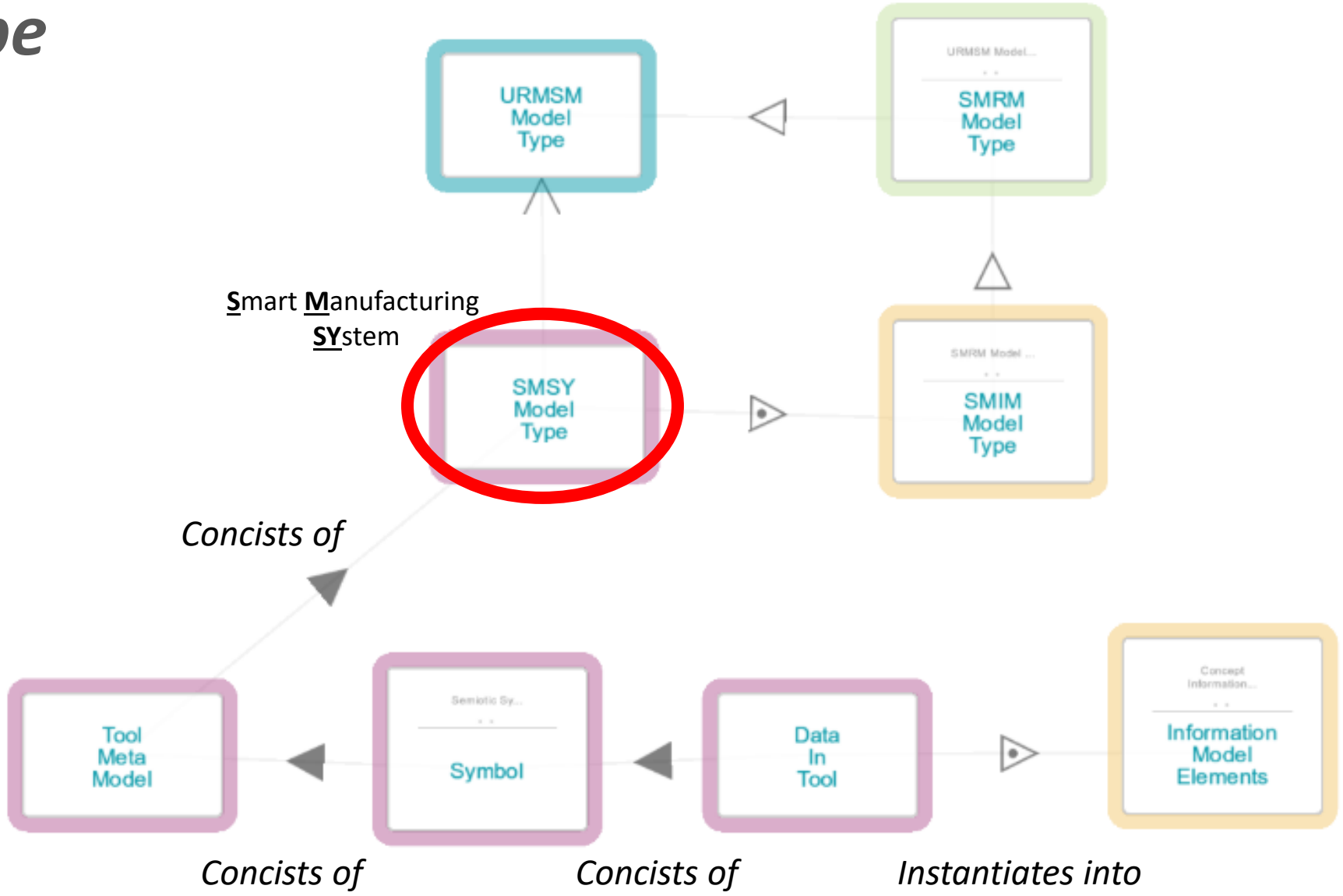


Criteria: the green layer shall over ISO/IEC/IEEE-42010 secure *viewpoints* covering Smart Manufacturing *concerns*.

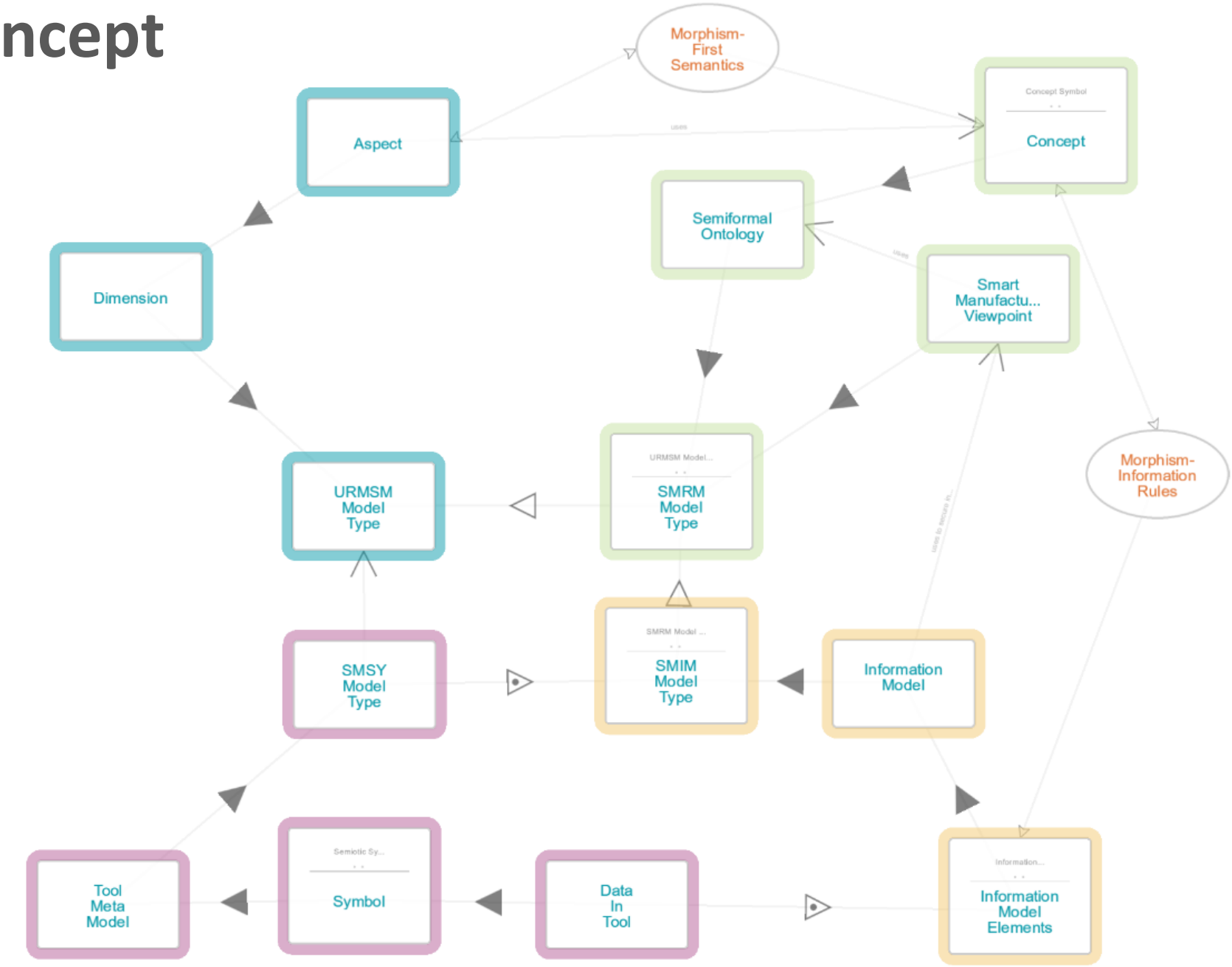
SMIM
Model Type



SMSY
Model Type



The whole concept



Thank you!

IEC 63339:2024 URMSM at ISO https://www.iso.org/standard/82374.html.

SIS seminar on October 9th: Smart manufacturing standards – from semantics to practical use

The target group for the seminar was participants of ISO/IEC JWG 21 Smart manufacturing reference model (s) and participants of SIS/TK 280 Industrial data and interoperability and others by invite

The recordings of the seminar are now available in the form of eight youtube videos reachable via links in the top right column of: Standardutveckling - Industriell data och interoperabilitet SIS/TK 280 - Svenska institutet för standarder, SIS

Standardization will continue in the working group AG 01: If you interested to join our standard work contact us at:
SIS/TK 280 Industrial data and interoperability,

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