WHEN TRUST MATTERS

Digital samhandling - læring fra industrien

Faglig arena for datadeling og informasjonsforvaltning

Lillian Hella & Karl John Pedersen

02 April 2025

LILLIAN HELLA

DIGITAL TRANSFORMATION CONSULTANT, DIGITAL ASSURANCE

Lillian joined DNV in 2022 and is part of a team aiming to provide continuous, integrated and automated assurance services by harnessing the power of advanced technologies such as artificial intelligence, knowledge graphs and ontologies.

Personally has a focus on supporting the energy industry with project and asset information management, data interoperability, and information quality. Project leader for DNV's recommended practice for asset information modelling framework (DNV RP-0670).

Lillian.Hella@dnv.com
+47 91246864

KARL JOHN PEDERSEN

HEAD OF DIGITAL TRUST

Karl John joined DNV in 2011 and is part of a team who develop requirements, standards and solutions to help industry build trust in and increase the value of digital solutions, covering data quality, data interoperability, AI-based systems, machine learning (ML) and digital twins.

Personally has a focus on data including data governance, management and quality. DAMA Certified Data Management Professional Associate. In addition has a background in GIS with 20 years of industry experience working within analysis and development.

Karl.John.Pedersen@dnv.com
+47 95002061

Agenda

1. Background to presentation
2. Problem
3. Solution and example
4. Putting into context
    1. Application in the public sector

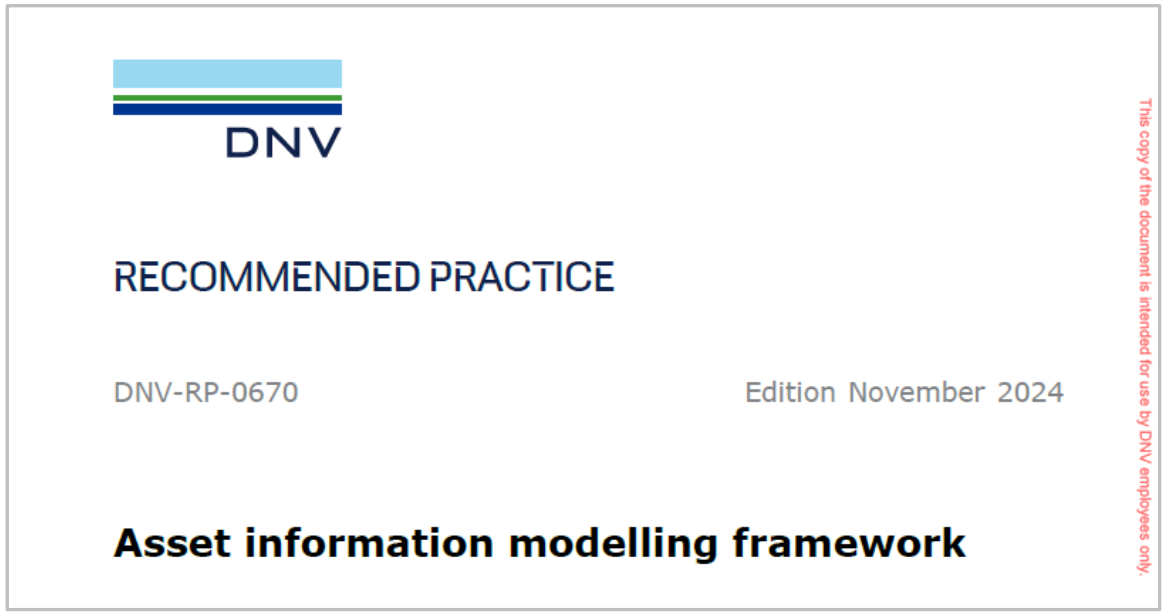
Background to presentation

DNV lanserer retningslinjer for digitalt språk

DNV har publisert et sett med retningslinjer som skal hjelpe energisektoren med mer effektiv og standardisert informasjonsutveksling.

COMPUTERWORLD 10/02/2025 - 10:15 computerworld

https://www.cw.no/digitalt-sprak-dnv-energisektoren/dnv-lanserer-retningslinjer-for-digitalt-sprak/2379865



DNV

RECOMMENDED PRACTICE

DNV-RP-0670 Edition November 2024

Asset information modelling framework

DNV

A global assurance and risk management company

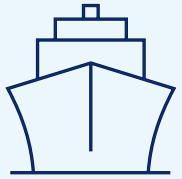
15,000+
employees

100,000+
customers

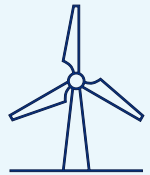
100+
countries

5%+
of revenue to R&D

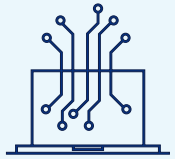
Ship and offshore classification and advisory



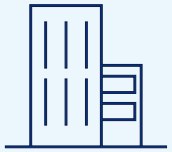
Energy advisory, certification, verification, inspection and monitoring



Software, cyber security, platforms and digital solutions



Management system certification, supply chain and product assurance



We enable our customers and their stakeholders to manage risk and complexity with confidence

Certify, verify and test

against standards, specifications and regulatory requirements

Qualify and assure

new technologies, systems, data, platforms, supply- and value chains

Give expert advice

on safety, technology and commercial risk, and operational performance

Co-create and share

new rules, standards, software and recommended practices, asset management

Themes covered in the presentation

Information Modelling

- Build ontologies based on industry standards for semantic technology
- Create a common digital language and framework which enable efficient flows of information between disciplines and work processes
- Assessments to verifying adherence to industry ontology standards

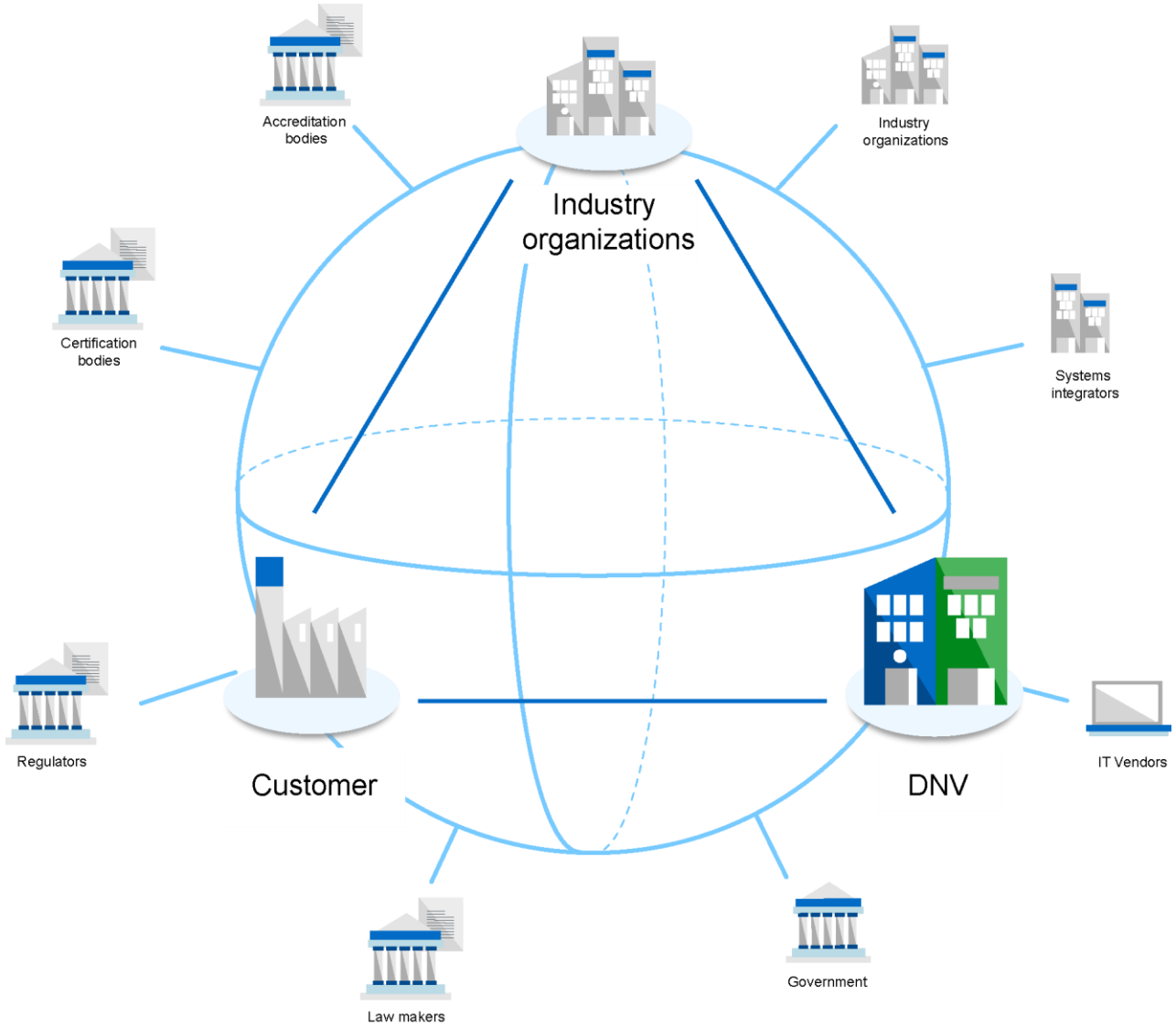
Data Management

- Support in the development of data quality and management practices
- Digital assurance
- Evaluate data quality management capability levels
- Implement robust data governance processes

AI & ML

- Build AI powered models
- Assurance of AI model, building quality control into the senor system, data quality, and algorithms
- Ensure compliance with the latest regulatory requirements
- Assurance of ML model

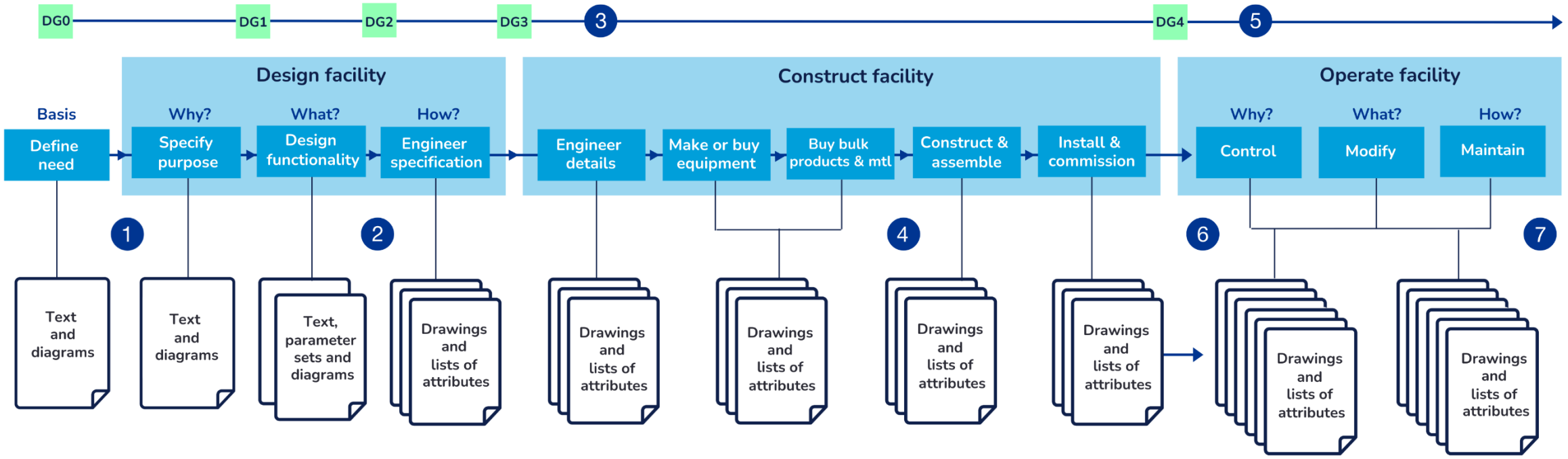
Semantic interoperability between actors

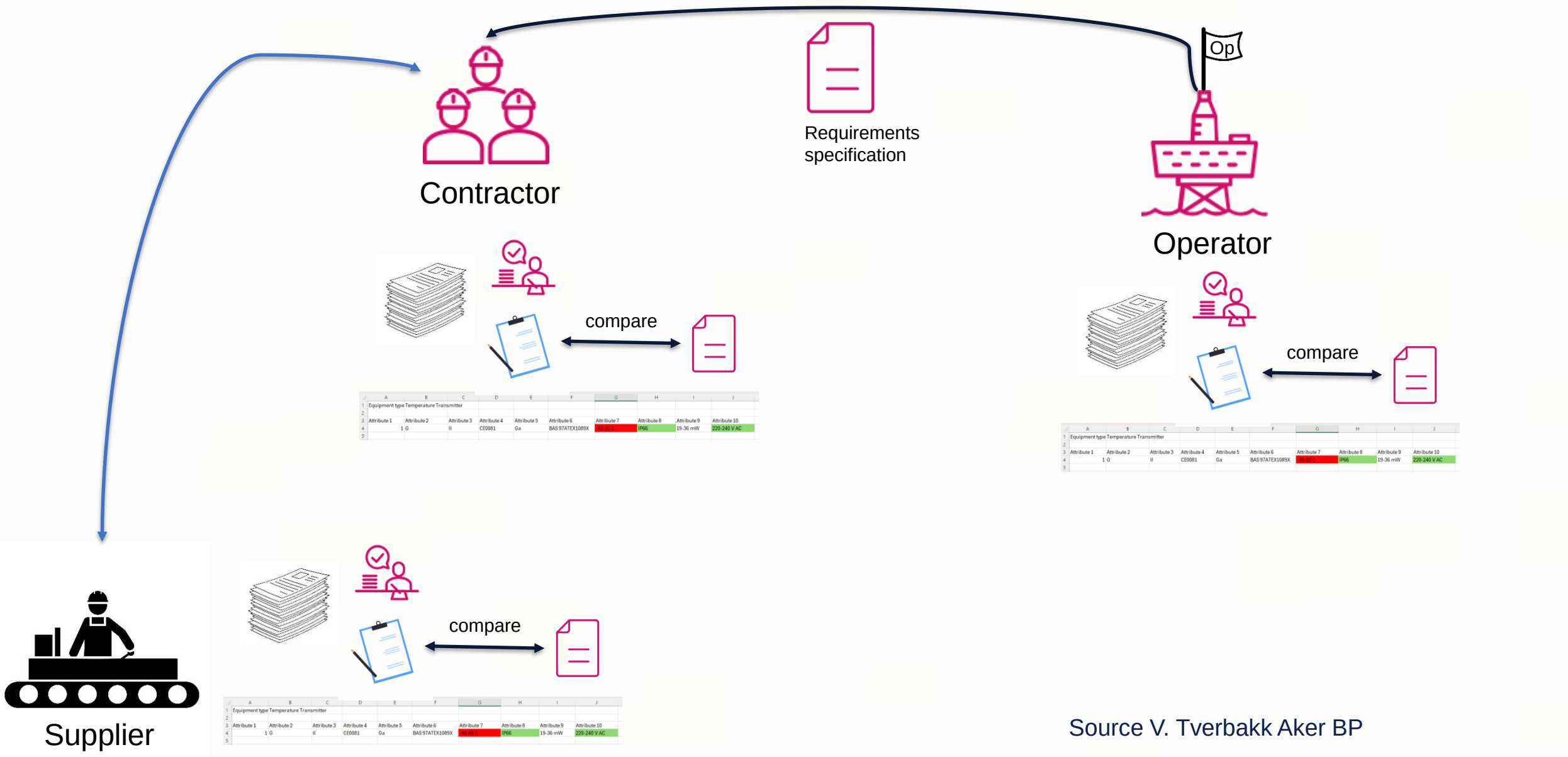


Problem

Typical facility

Document centric way of working





Source V. Tverbakk Aker BP

DISC Reasoning pilot Final presentation Nov 2024

Requirements – procurement example

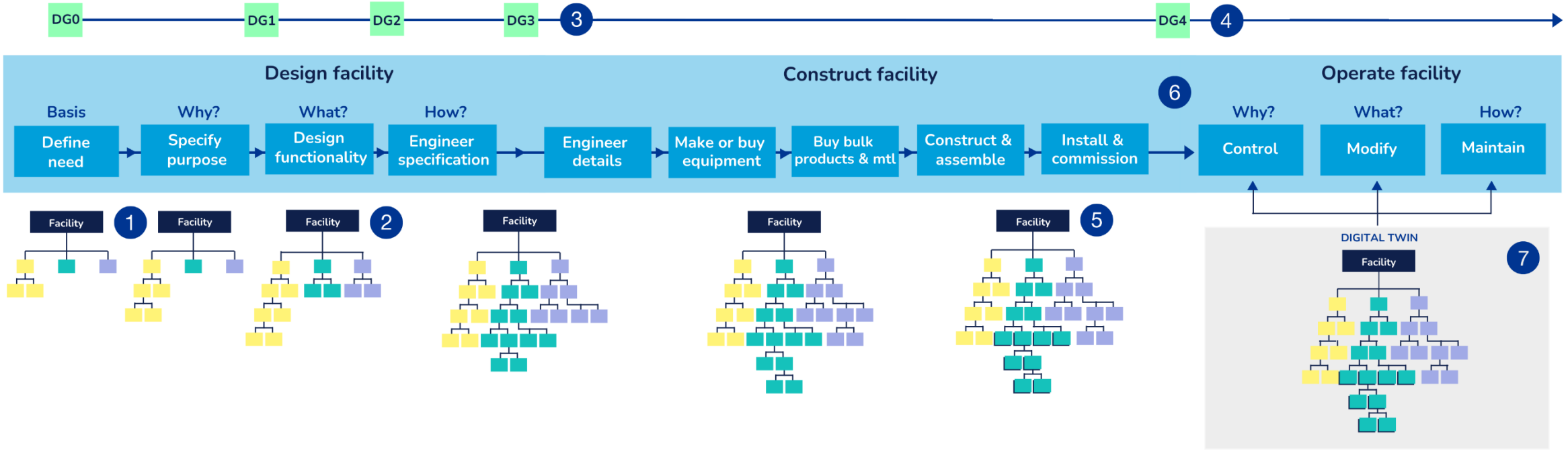
Purchaser requirements

Supplier offering

	A	B	C	G	H	L	M	Q	R
1	Row	IOGP S-718D (1.01) Procurement Data Sheet for Basic Process Measurement Instruments Temperature Transm							Issue
21	20	4.1.6, 6.2.1	Ingress protection :	IP68		IP67		Does not meet requirement	
22	21	4.3.3.1	Ex protection :	Exia		Eixb		Typo	
23	22	4.3.3.1	Hazardous area classification standard :	IEC 60079				Missing value	
24	23	4.3.3.1	Explosion hazard classification :	zone 0		zone 1		Does not meet requirement	
25	24	4.3.3.1	Explosion group :	IIC		IIC			
26	25	4.3.3.1	Temperature class :	T3		T4		Meets requirement	
34	33		Design temperature - maximum :	22	°C				
35	34		Design temperature - minimum :	-10	°C				
46	45		Minimum operating temperature :	-70	°C			Min operating > Min design	
49	48		Maximum operating temperature :	12	°C				
116	#		Temperature element sheath outside diameter :	6 mm		6 mm			
131	#		Thermowell bore diameter (d) :	6,6 mm		1 mm		Does not meet requirement	
139	#		Supply voltage :	24 V DC loop power				Missing value	
140	#		Signal type :	4-20 mA		4-20 mA			
141	#		Power supply type :	hardwired		hardvied		Typo	
142	#		Cable entry :	M20 x 1.5		M20 x 1.5			
143	#		Cable termination :	screwed		screwed			
144	#	4.1.2.2	Communication protocol :	4-20mA HART		4-20mA HART			
149	148a		Calibration min :	0	°F	0	°C	Different UoM	
150	148b		Calibration max :	30	K	30	°C	Wrong UoM	
151	#		Measurement range, minimum :	-50	°C				
152	#		Measurement range, maximum :	50	°C				
154	#		Lower range limit :		select	50	°C	Min value > Max value	
155	#		Upper range limit :		select	30	°C		
157	#	7.3.1, 7.3.2.2, 7.3	Accuracy :	±1	% of span	±4	% of span	Does not meet requirement	

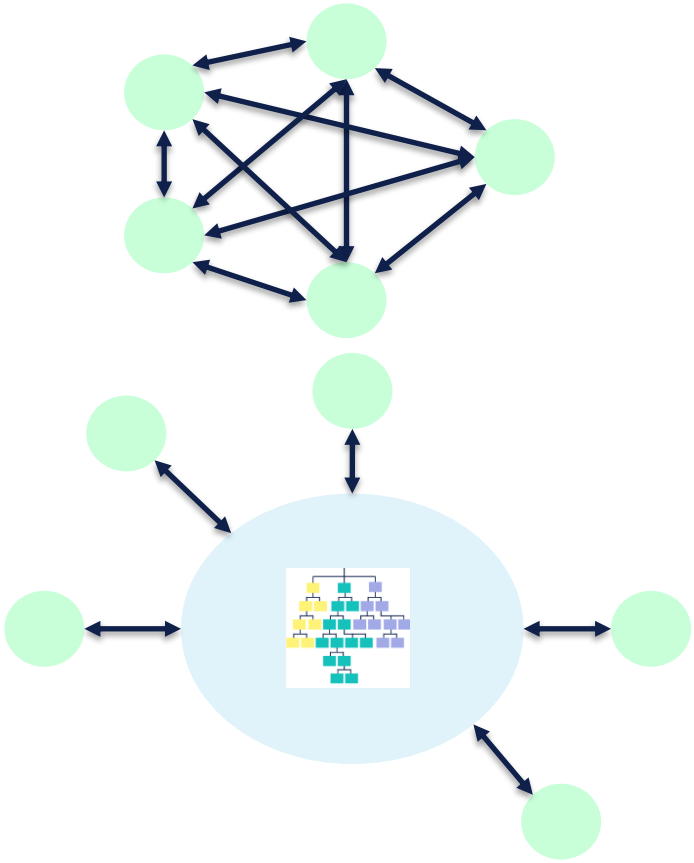
Solution

Data centric way of working

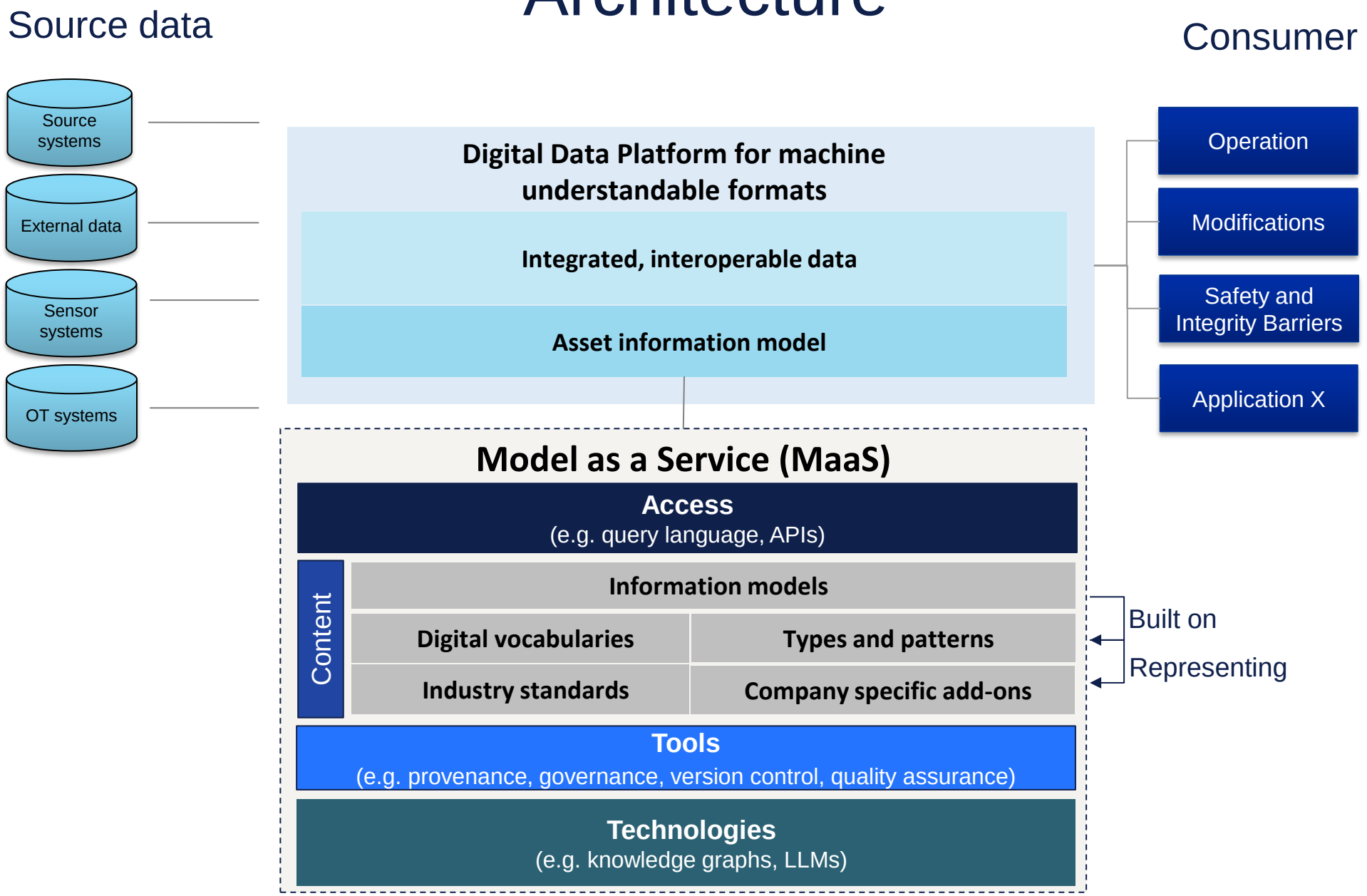


Integration Scenarios

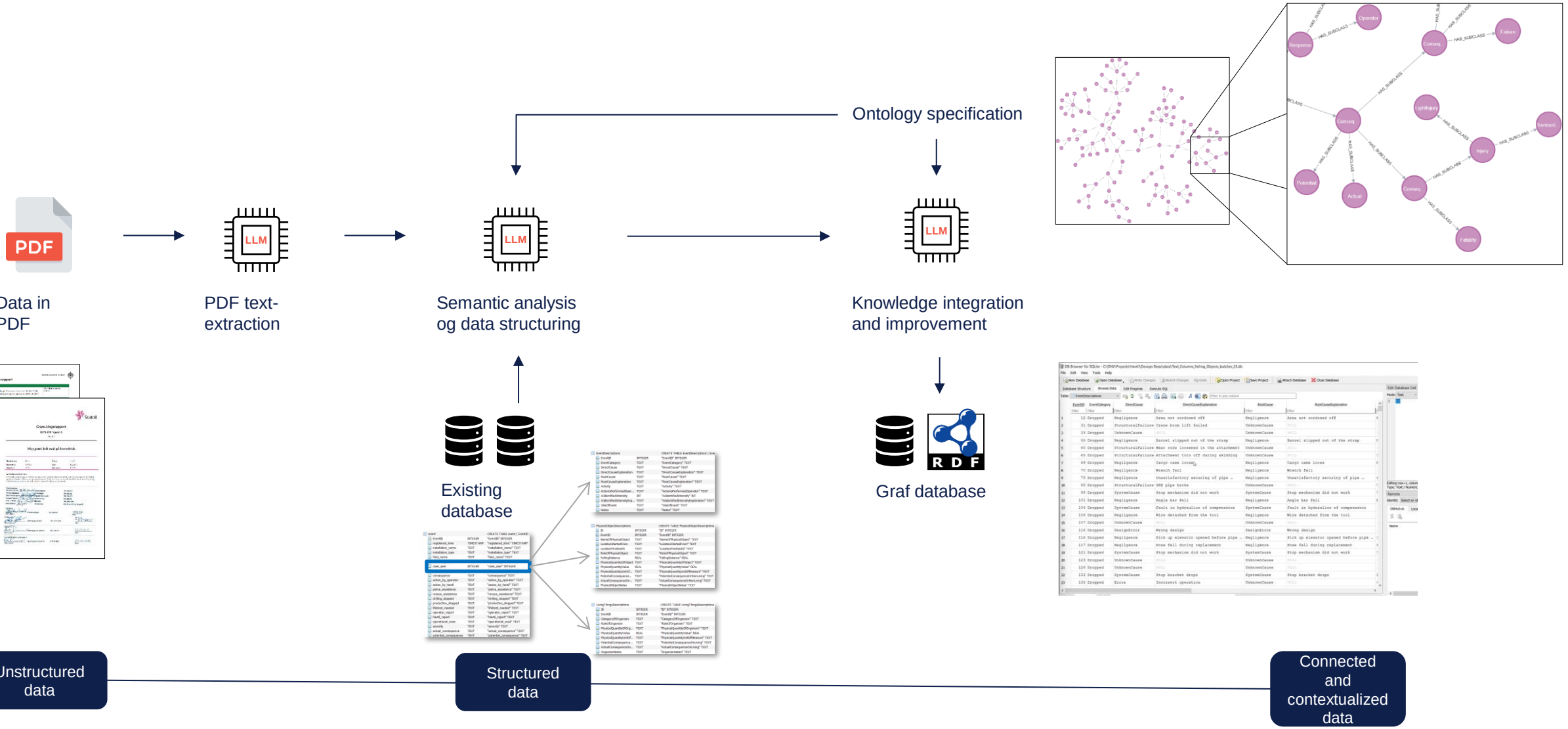
- Interoperability: exchange data correctly and consistently
- Point-to-point integration
  - Direct communication between systems
  - Challenge: maintenance, scalability, lack of flexibility
  - Mappings: data-level interoperability
    - Scope: direct data transformation (format and schema)
    - Example: “Field 1” in System A mapped to “temp_value” in System B
- Star-shaped (hub-and-spoke) integration
  - Indirect communication via a centralised hub
  - Benefit: easier to scale, maintain and modify
  - Alignments: semantic interoperability
    - Scope: Semantic harmonisation of concepts
    - Example: “Sensor” in System A, “Probe” in System B are both types of “Measurement Device”
- Scalability: quadratic vs. linearly many connections



Architecture



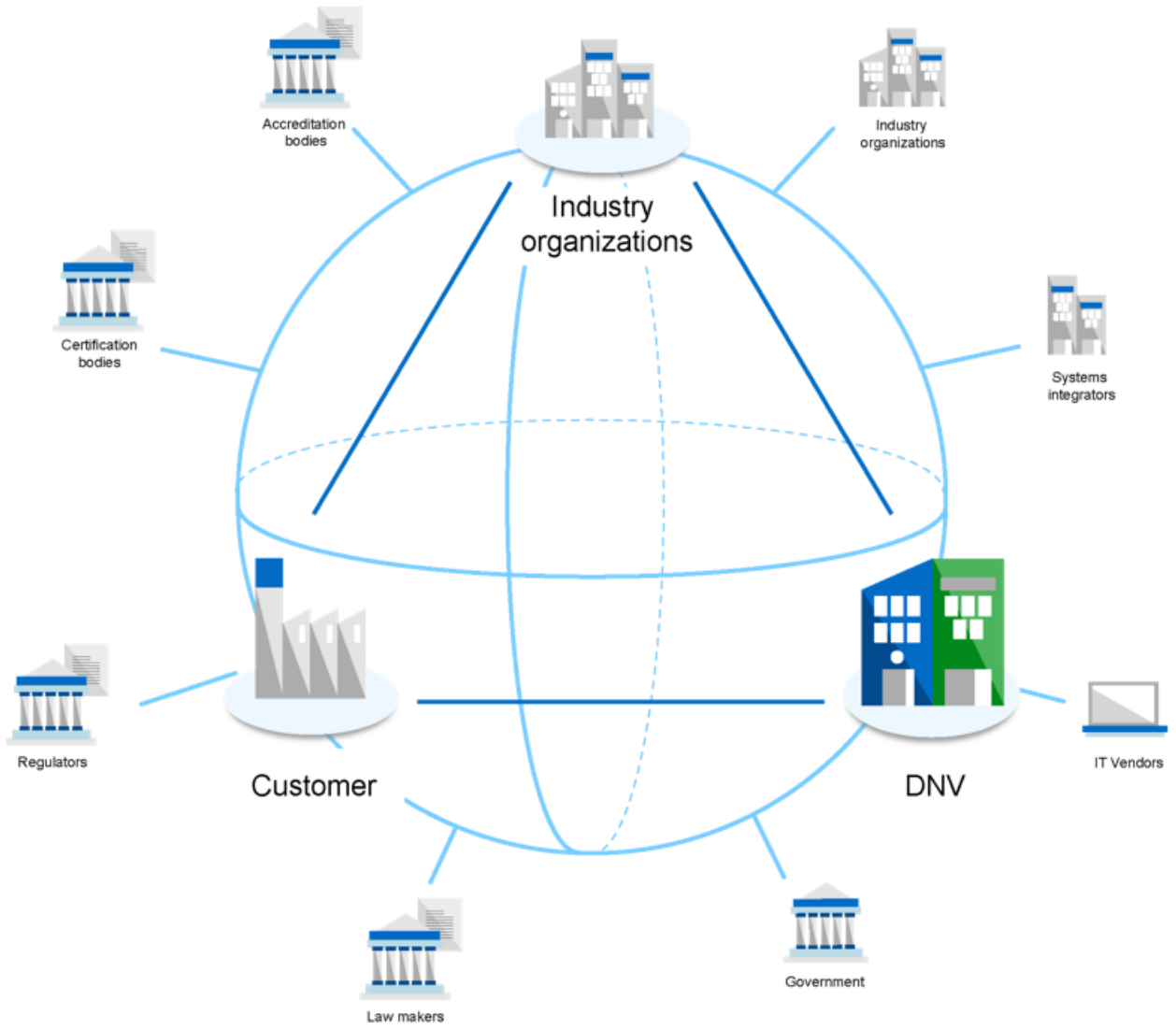
The Havtil pilot – from unstructured to contextualized data



Putting this in context

Application in the public sector

Semantic interoperability between actors



‘Samhandlingshjulet’ – success factors

- Every actor must be digital
- It is not possible to share data to an actor that is not digital
- Get your own house in order first.
- You can then focus on working together digitally

The interoperability challenge

- Are data fit for use - exchange data correctly and consistently
  - Standardised digital language and information model
  - Is it possible to show, understand and interpret data automatically?

Semantic interoperability

- Procedures, business and payment model which is suitable for both parties

Process and business interoperability

- Right to share, allowed to receive?
  - IPR, licence, GDPR, lawful etc.
  - Need for data Service Level Agreement

Legal interoperability

- Do you have the technical and security ability to share according to your own and the recipient's requirements?

Technical interoperability

Rammeverk for digital samhandling: digdir.no/digital-samhandling/rammeverk-digital-samhandling/2148

Spørsmål?

Lillian.Hella@dnv.com
+47 91246864

Karl.John.Pedersen@dnv.com
+47 95002061

www.dnv.com