

Nordic interoperability cooperation review

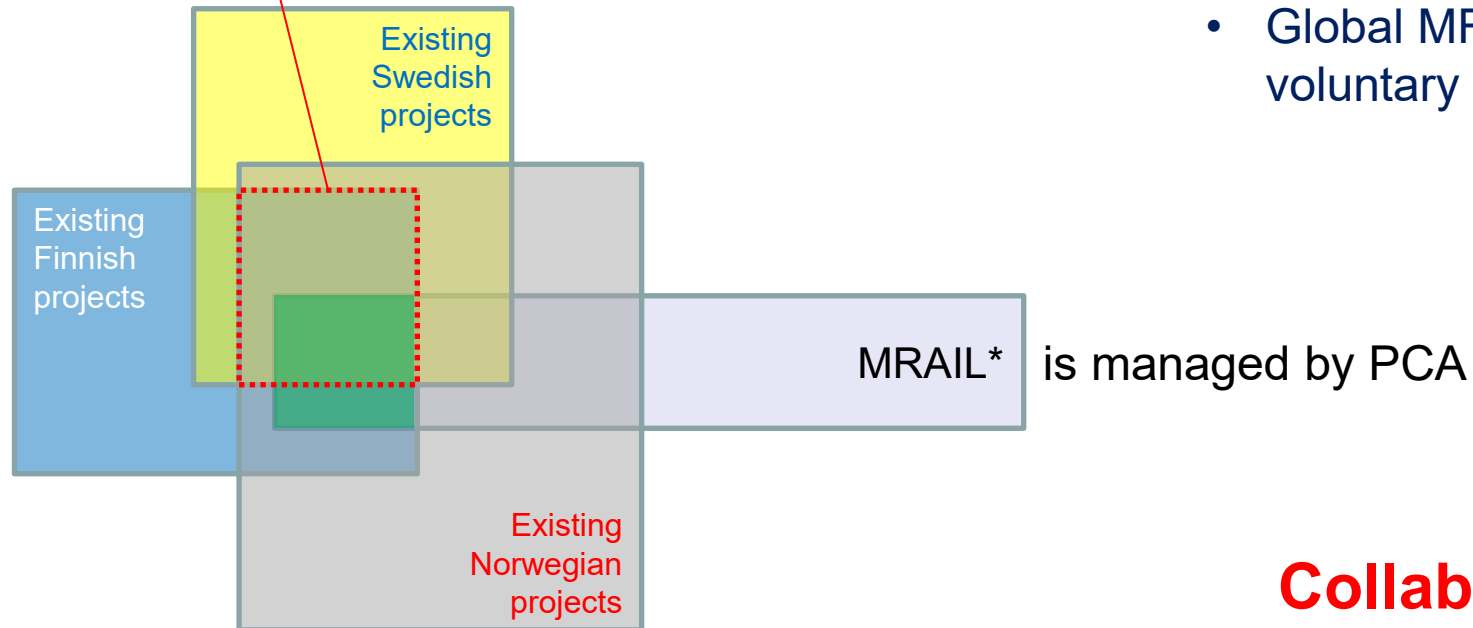
Nils Sandsmark, PCA, Norway

Erik Molin, SEIIA, Sweden

Arto Marttinen, THTH, Finland

Existing situation in Nordic countries

Part of the targets are already the same in all the existing national project plans



Starting point – current situation

- Red dotted-line box – overlapping existing targets
- National funding 50% in Finland and Sweden
- RDL2 already exist – PCA is managing it!
- Global MRAIL team is developing RDL2 on the voluntary basis

Collaborative development!

* MRAIL – a volunteer-based team (Major RDL Action Items List) unifying global standardization activities

PCA and Norwegian projects, Nils Sandsmark

Norwegian viewpoint

POSC Caesar Association (PCA) – Strategy

PCA is:

- A Norwegian based standardization organization that collaborates globally

Purpose:

- PCA improves business efficiency within the industrial energy sector by connecting information
- PCA shall be forerunner on reasoning and automation of work processes in the energy sector

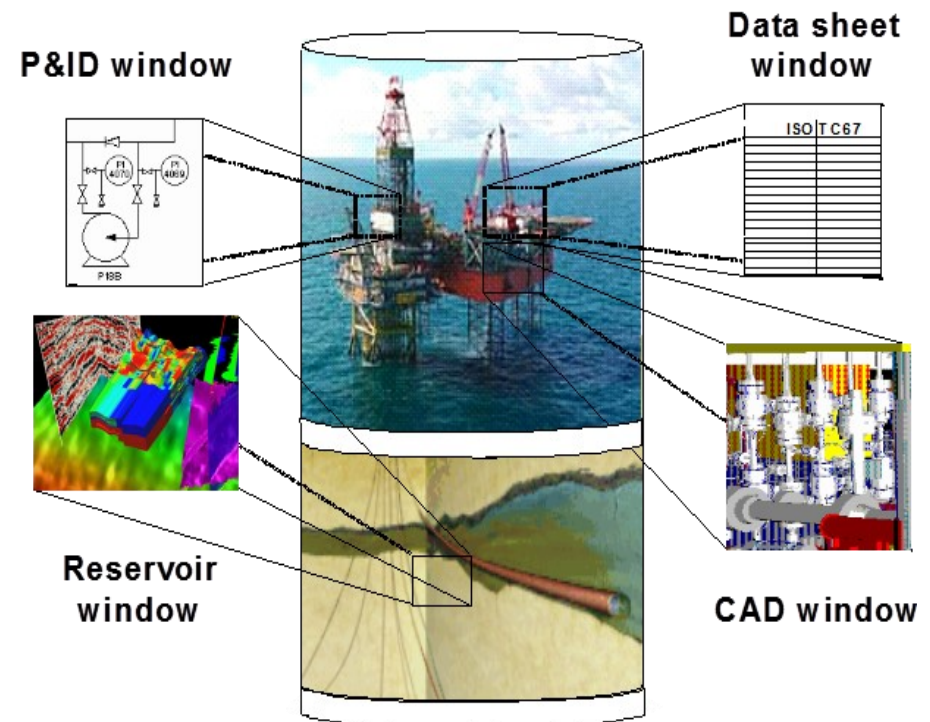
Vision:

- Connecting all information in the industrial energy sector

Value proposition:

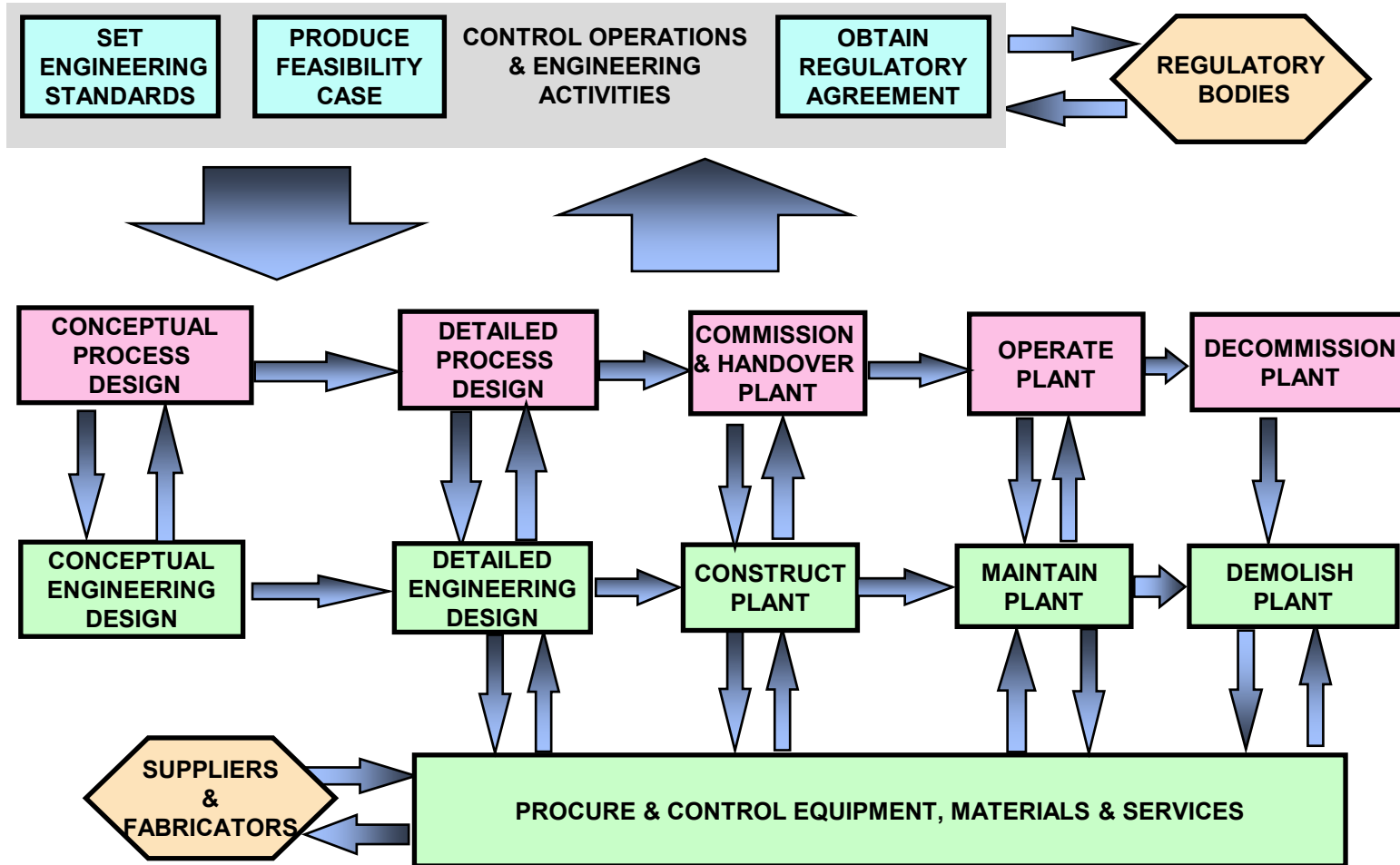
- Information connection will reduce cost by at least 20%

Initiated ISO 15926 for interoperability and life cycle information



ISO 15926 Original Scope and Main Focus Areas

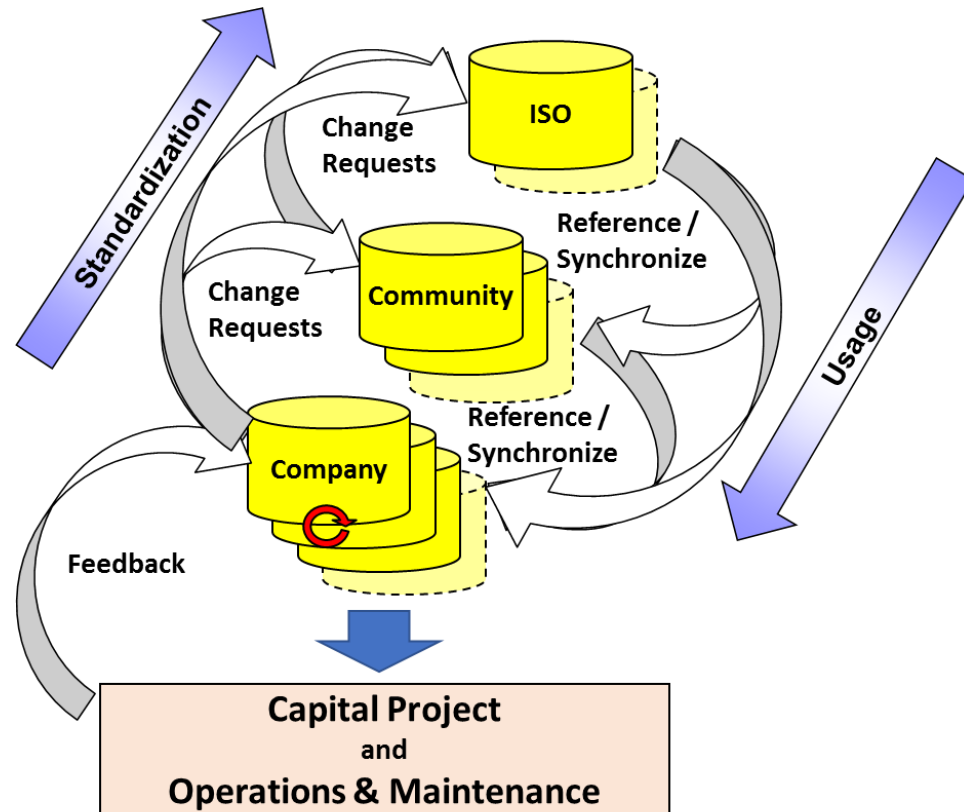
The PISTEP Model for Life Cycle Activities



Main Focus Areas in PCA

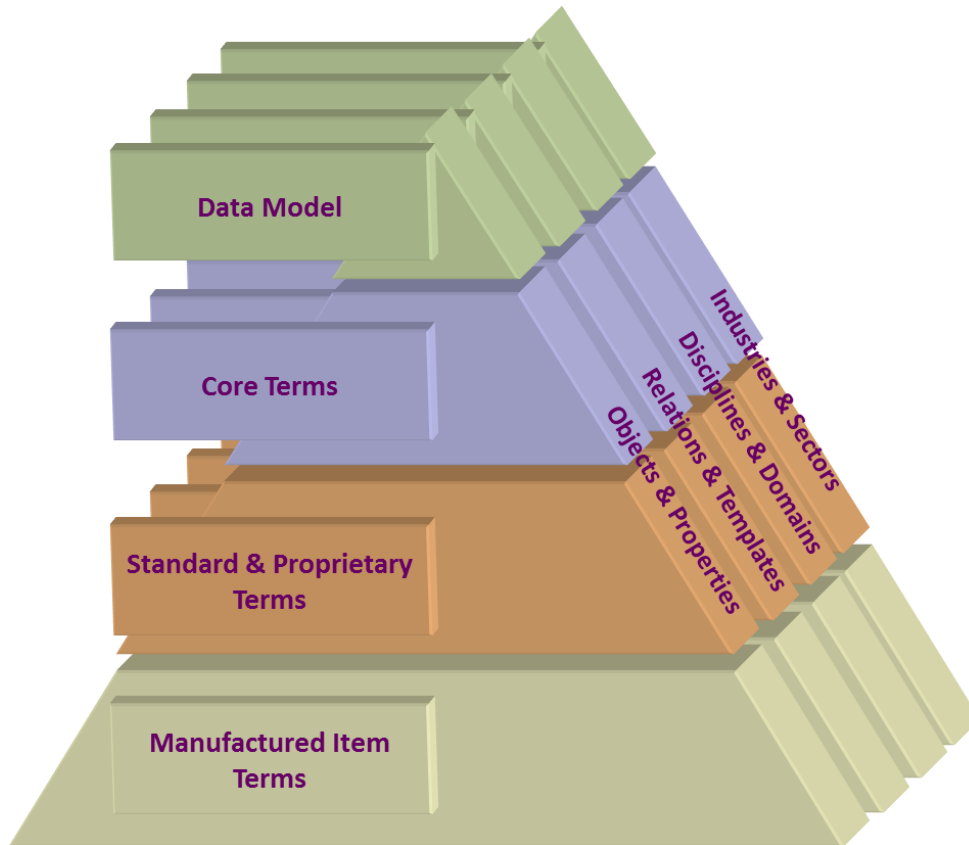
- Started in 1997 with standards for information handover between EPCs and Owners/Operators
- Ontologies for Integrated Operations came in focus 2004
- A few years later Operation & Maintenance and integration between Engineering and Operation & Maintenance became important
- Since 2014 have ILAP (schedules), READI (requirements) and RDL 2 been in focus

ISO 15926 Reference data architecture



- ISO Standards and reference data libraries
 - Generic
 - Technically stable
 - Special procedure for standards in databases – Much shorter development and maintenance cycles
 - Freely available as standards in database form
- Community, e. g. PCA, specifications and reference data:
 - Short development and maintenance cycles
 - Limited to an area, e. g. the Norwegian Continental Shelf
 - Using fast developing technologies
 - Testing for later ISO standardization
- Company specifications and reference data:
 - Company specific specifications and reference data
 - Proposals for standardization

ISO/TS 15926-4 ed. 3: Core reference data

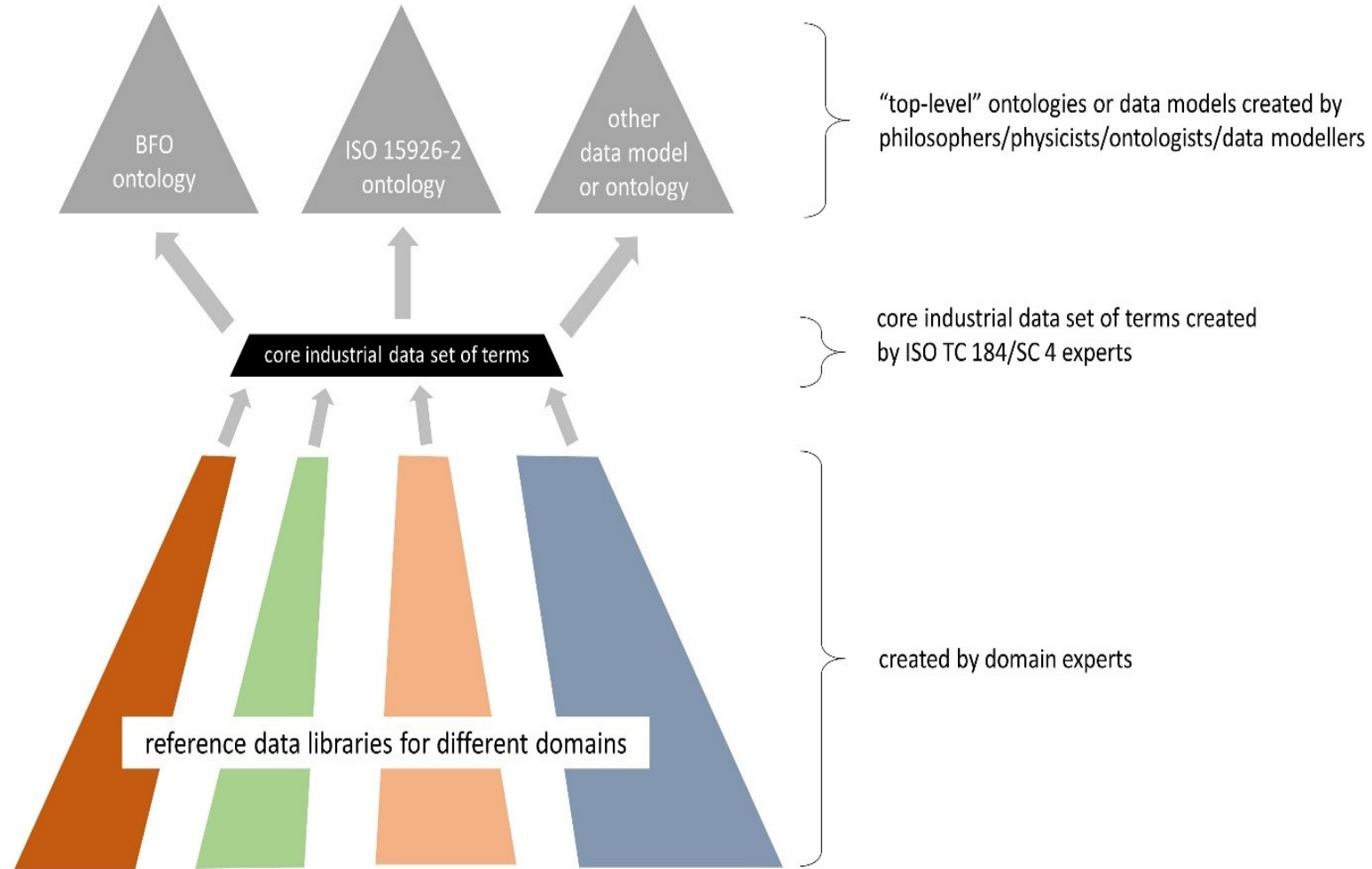


- Improvements in RDL 2 includes results from projects and maintenance activities from 2006 to 2019
 - Consistent naming and definitions
 - Reference to other RDIs in text definition
 - Reference to source
 - Improve specialization and classification
 - Rules for use of entity types `inanimate_physical_object` and `functional_object`
 - Divided the RDL into modules
 - implemented ISO 80000 for UoM (Replace ISO 31)
 - Extended the Part 4 RDL from about 11 000 Reference Data Items (RDIs) to about 20 000 RDIs.
- Alignment with CFIHOS, DEXPI, ISDD (MIMOSA) has been done
 - ISO/TS 15926-4 ed. 3 plan – «ISO improvement of RDL 2»
 - Two-year project
 - Stepwise approach
 - Start immediately, ballot is not necessary. The ISO project was approved by an ISO/TC 184/SC 4 resolution 8 May 2020
 - ISO project team will be established quickly

AHG 01- Core industrial data set of terms

(Common ontology for SC4)

Objective: Making reference data reusable



ISO/TR 15926-14 Data model adapted for OWL2 Direct Semantics

- A high-quality OWL 2 Direct Semantics representation of the ISO 15926-2 Data model
- Follows best practice modelling in the wider industrial community
- Commercial and open source tools widely available
- **Supports efficient, automated reasoning over a large number of classes**
- OWL 2 reasoning support gives ontology developers the ability to discover implicit information and hidden inconsistencies
- Assistance from automated reasoning is crucial for managing the complexity of domains and disciplines, and for building a consistent model that can serve a wide range of applications
- **Will be further developed to an Industrial Top Level Ontology well suited for Digital Twins, etc.**

SEIIA and LCDM2 project, Erik Molin

Swedish viewpoint

Nordic Interoperability Corporation (NIC)

International networking (LCDM2 WP4)



LCDM (phase 2) pilots

Stora Enso

Pilot 1



Setting up AutoCAD P&ID for flowchart drawing based on established standards and the open standard DEXPI, which is a concept with data exchange specifications in the neutral format XML based on Proteus P&ID Profile Schedule 4.0.

SCA

Pilot 2



In a rebuilding (brownfield) project of a plant part of SCA's units in northern Sweden, use the global standard ISO 15926 and the compatible concepts such as CFIHOS alt. Readit. Follow the requirements setting process based on a common reference database. (RDL)

Vakin

Pilot 3



The project is a sewage treatment plant in Umeå. The machines have reached their technical life and must be replaced. The project includes the replacement of machines, adaptation of pipe installations and the replacement of associated electricity and controls. During the procurement, the global standard ISO 15926 and the compatible concept as CFIHOS alt. Readit will be used to ensure a better exchange of information on the systems used in the plant's maintenance management.

Holmen Paper

Pilot 4

Holmen has a project where SiteBase and Aveva Everything3D will be integrated and they are trying to base this integration on ISO 15926 instead of a traditionally Point To Point solution.



Pump specifikation

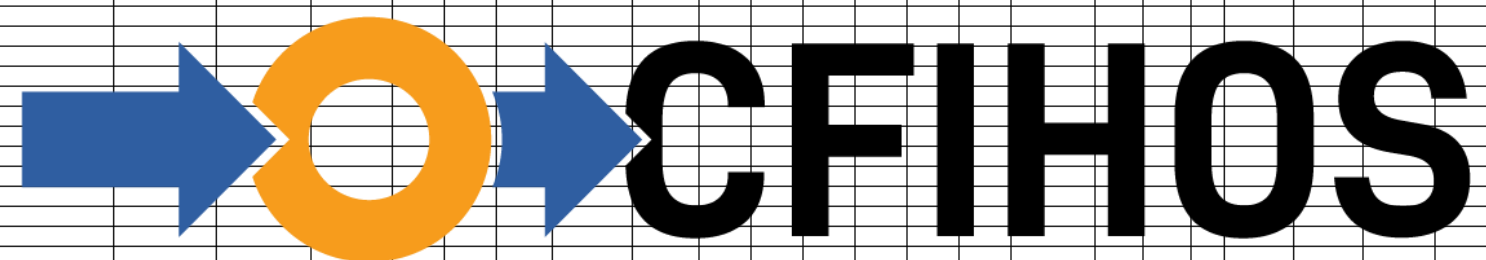
Tekniska Data

Bruk:	CFIHOS-10000006	Plant name	http://data.15926.arq.cfihos/#10000006
Projektnr:	CFIHOS-10000161	Project code	http://data.15926.arq.cfihos/#10000161
Projektamn:	CFIHOS-10000004	Project name	http://data.15926.arq.cfihos/#10000004
Projektledare:	CFIHOS-20000001	Project Management and En	http://data.15926.arq.cfihos/#20000001
Rapportdatum:	2020-05-12		

Information Funktionsobjekt

Objektnummer	Beskrivning	Schema ref.	Tillverkare	Typbeteckning	Serienummer	Mediakod [SSG]	Temp [C]	Konc. [%]	Dens. [kg/m3]	Hjuldiameter [mm]	Flöde [m3/h]		Varvtal [rpm]			Tryckhöjd [m]		Effekt [kW]		Fro	Dimension [mm]		Axeltapp [mm]	Hjultyp	Tätningstyp	NPSHr [m]	Tryckkl. [Bar]	Vikt [kg]	
X	X																												
CFIHOS-10000166	http://data.15926.arq.cfihos/#10000177	CFIHOS-10000154	CFIHOS-10000159	CFIHOS-10000159	CFIHOS-10000163	CFIHOS-40000133	CFIHOS-40000514	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547	CFIHOS-40000547
211PU0001	Rävattenpump 1	SBT-200411		A60-600	100169690	W03	25			525	525	3200		779	31	200	127	500	600	90 m7		Specialöppet		4,0	10				
211PU0005	Brandvattenpump 1 EI-Drive	SBT-210534		A32-80		W23	25			270	330	225		2950	90	90	75	125	80	42 k7		Öppet		4,8	16				
211PU0010	Tätvpump 3 f Renv.tank	SBT-201365		A22-80	100169846	W20	25			238	265	250		2733	75	75	64	125	80	32 k7		Öppet		4,5	16				
211PU0030	Pump 1 Kyltorn	SBT-208420		A63-500	100169794	W03	25			635	635	4800		1036	50	800	697	500	500	90 m7		Specialöppet		7,2	10				

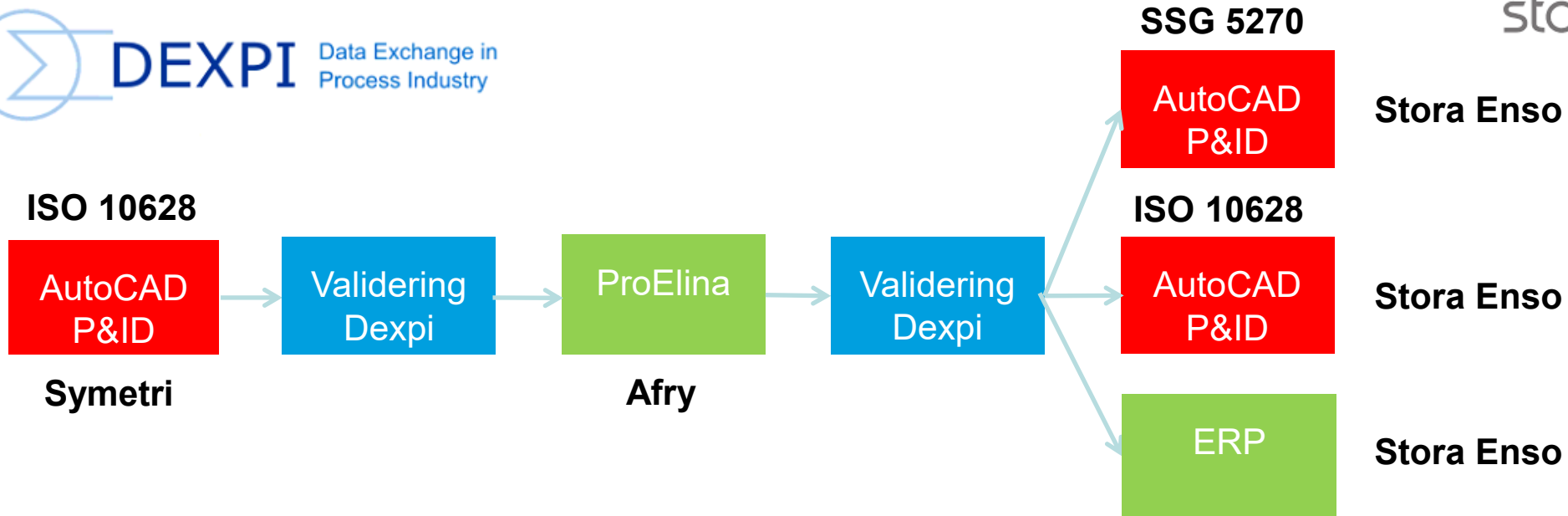
Funktion Komponent Saknas i listan





storaenso

Testfflow after meeting 2020-03-19



Pump per projekt demo 1 - Excel

Arkiv Start Infoga Sidlayout Formler Data Granska Visa Utvecklare Hjälp Sök

B30

	A	B	C	D	E	F	G
1	Pump specifikation						
2	Tekniska Data						
3	Bruk:						
4	Projektnr:						
5	Projektnamn:						
6	Projektledare:						
7	Rapportdatum: 2020-05-12						
8	Information Funktionsobjekt						
9	Objektnummer	Beskrivning	Schema ref.	Tillverkare			
10	X	X					
11	CFIHOS-10000166	CFIHOS-10000177	CFIHOS-10000154	CFIHOS-10000154			
12	http://data.15926.org/cfihos/10000166	http://data.15926.org/cfihos/10000177	http://data.15926.org/cfihos/10000154				
13							
14	211PU0001	Råvattenpump 1	SBT-200411				
15	211PU0005	Brandvattenpump 1 El-Driven	SBT-210534				
16	211PU0010	Tättnpump 3 f Renv.tank	SBT-201365				
17	211PU0020	Pump 4 Kulturb	SBT-208420				

HeadTemplate Template Equipment TAG

CFIHOS-10000006	Plant name	http://data.15926.org/cfihos/10000006
CFIHOS-10000161	Project code	http://data.15926.org/cfihos/10000161
CFIHOS-10000084	Project name	http://data.15926.org/cfihos/10000084
CFIHOS-20000001	Project Man	

Pilot4-lista-attribut-demo.xlsx

Sök eller skriv ett kommando

Seia EM

Arkiv Start Infoga Öppna i skrivbordsapp Berätta vad du vill göra Konversation Stäng

11 F

HOLMEN

	C	D	E	F	G
4	Tag Class	CFIHOS-30000496	http://data.15926.org/cfihos/30000496		
5					
6	Beskrivning	Sitebase	E3D	KOMMENTARER	
7		Rördata, tvåvägs			
8	Tillverkare	I250			CFIHOS-10000158
9	Leverantör	I251			
10	Tillverkningsår	I257			
11	Avdelning	I267			
12	Rörnummer	IPosP			CFIHOS-00000002
13	Flödesschema	I6117			CFIHOS-10000166
14	Rörinjesta	EJ Sitebase			
15	Ventillista	EJ Sitebase			
16	Tillverkningsnorm	EJ Sitebase			
17	ATEX-zon	I7050			CFIHOS-40000009
18	Mediakod (enl. SSG 7650)	I4051			CFIHOS-40000132
19	Mediadeskription	I4050			
20	Fluidgrupp/diagram	I7010			
21	Beräkningstemperatur min	nytt Attribut			CFIHOS-40000503

Isometri CFIHOS

Beräkningsläge: Automatiskt Arbetsboksstatistik

Hjälp till att förbättra Office

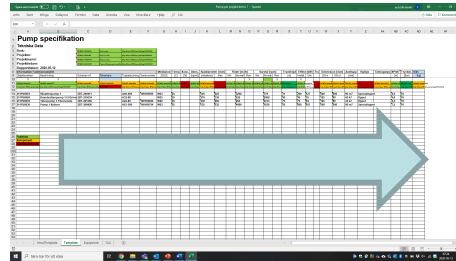
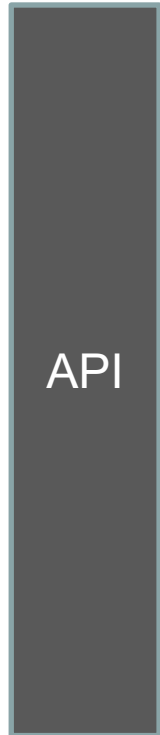


Value For Money (VFM)

ANDRITZ

sitebase

HEXAGON



SCA
HOLMEN

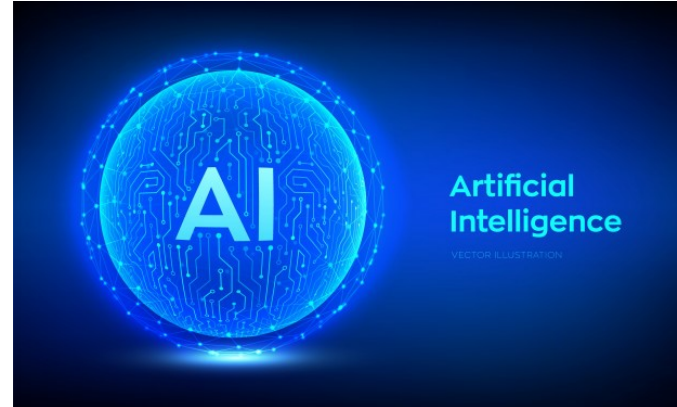
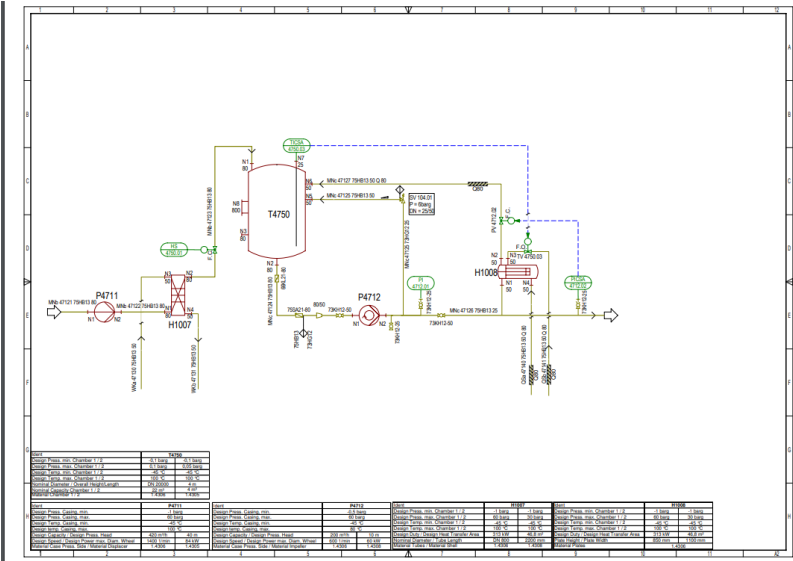
storaenso

SAP

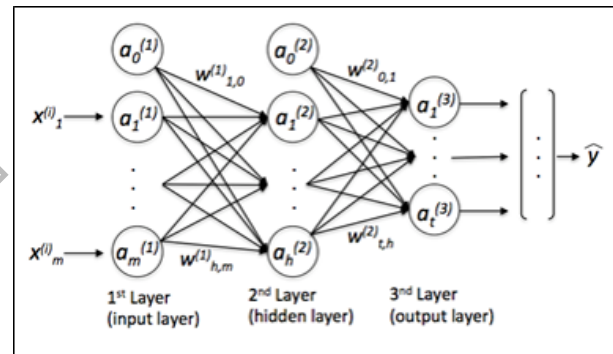
IFS



The Idea to take care of the flowchart inheritance!



Data in the form of existing PI&D / Flow charts




Industrial Interoperability Summit 2020

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6 - 8 OCTOBER 2020
Svenska Mässan i Göteborg [↗](#)

PROCESSTEKNIK

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Industrial Interoperability Award

ProcessTeknik 2020

The trade fair and meeting place for the process industry of the future. 6-8 October 2020 | The Swedish Exhibition & Congress Centre, Gothenburg.

7th October 2020

Together for Sustainable Industry

Industry is undergoing a major change, in which companies are looking for more efficient and more sustainable solutions. Processteknik supports positive development by offering an arena for environmental analysis, knowledge exchange and the presentation of successful

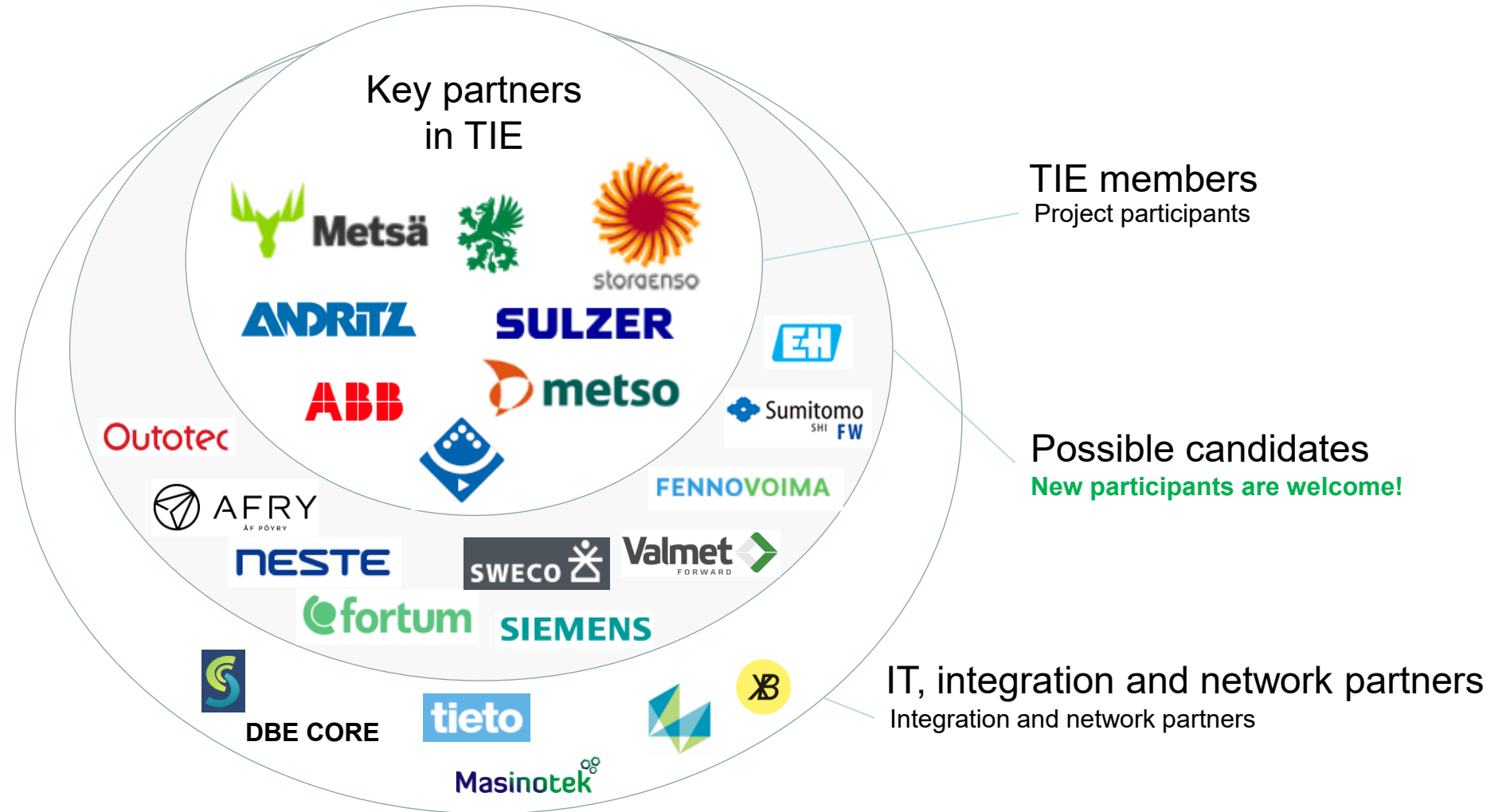
ProcessTeknik, together with Scanautomatic and Nordic Food Industry, provide a cross-industry event with three fairs taking place under the same roof. In 2020 we will focus on three areas – sustainability, smart industry and energy – with the aim of increasing

THTH and TIE project, Arto Marttinen

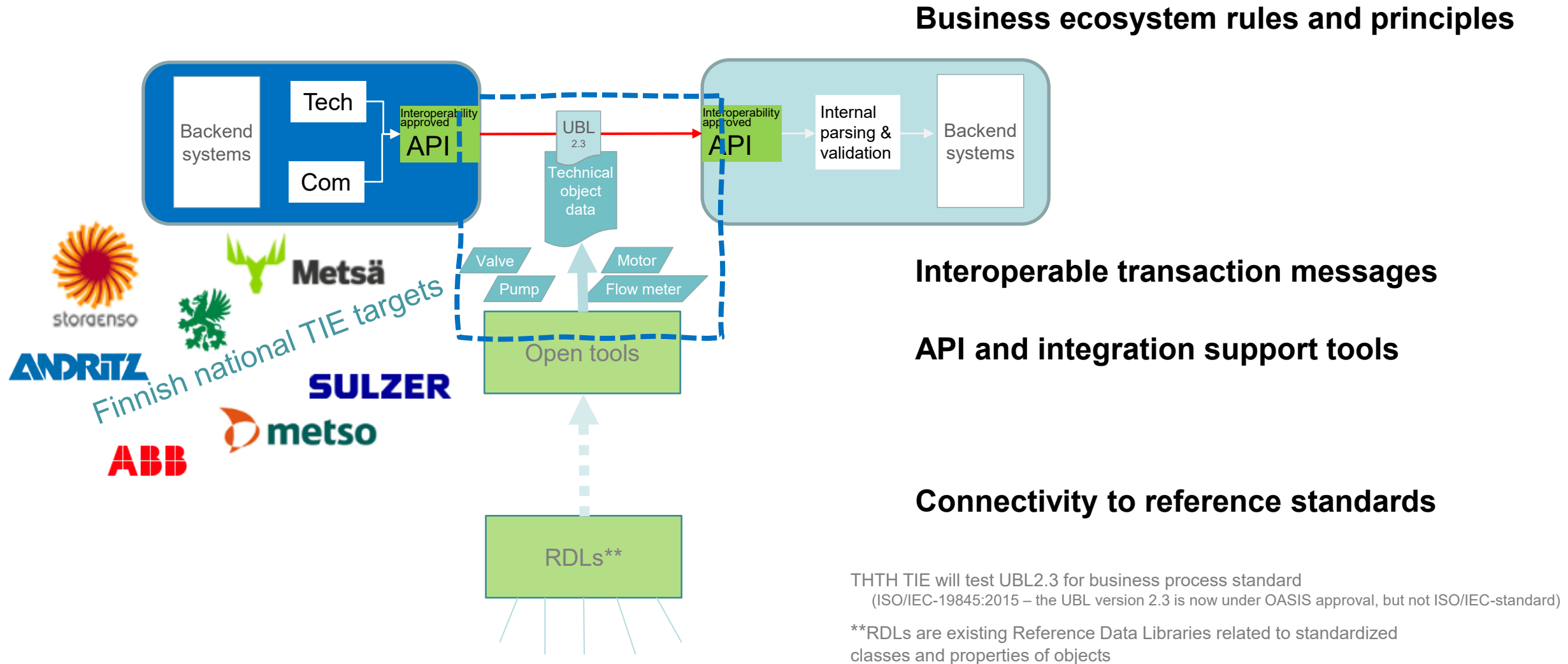
Finnish viewpoint

Finnish TIE companies

TIE 11/2019 – 10/2021



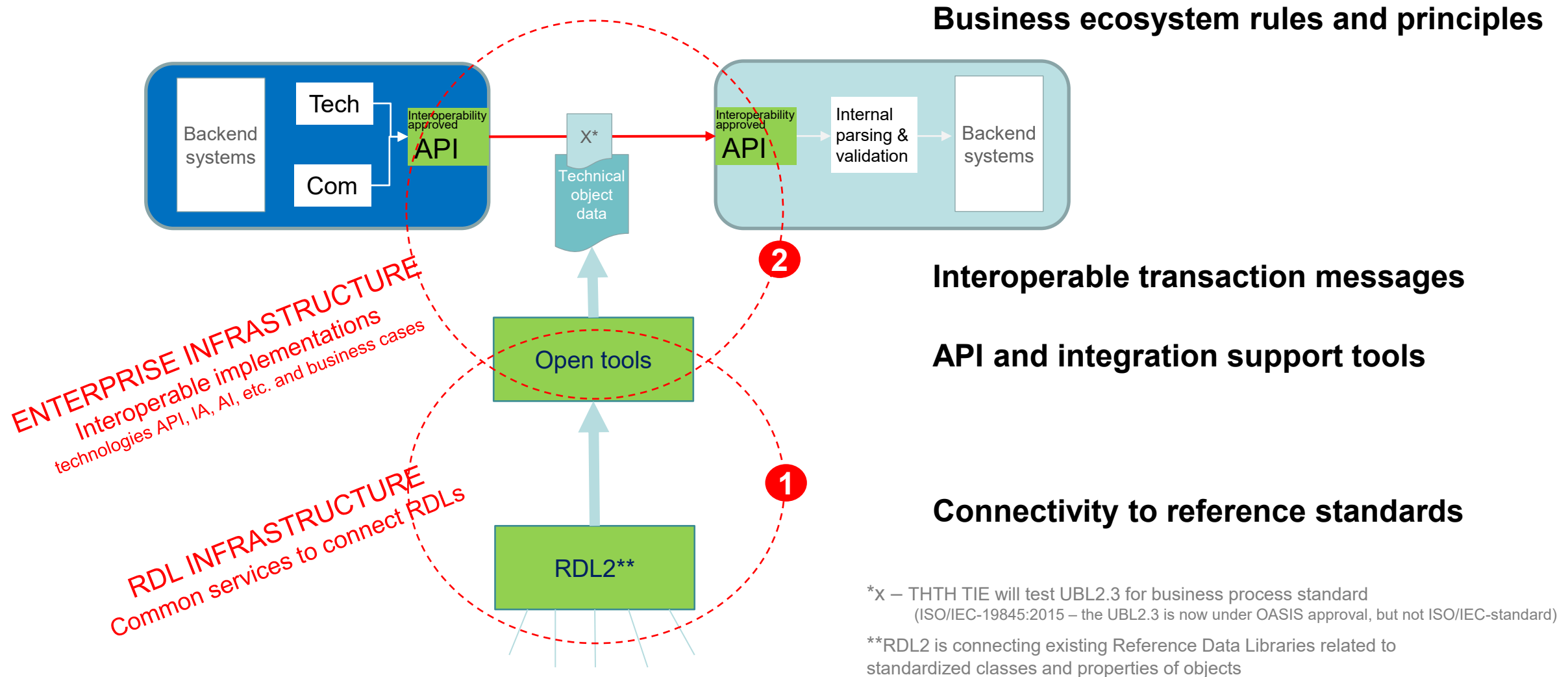
TIE targets in the common framework



Nils Sandmark, Erik Molin, Arto Marttinen

Common targets

Common global targets

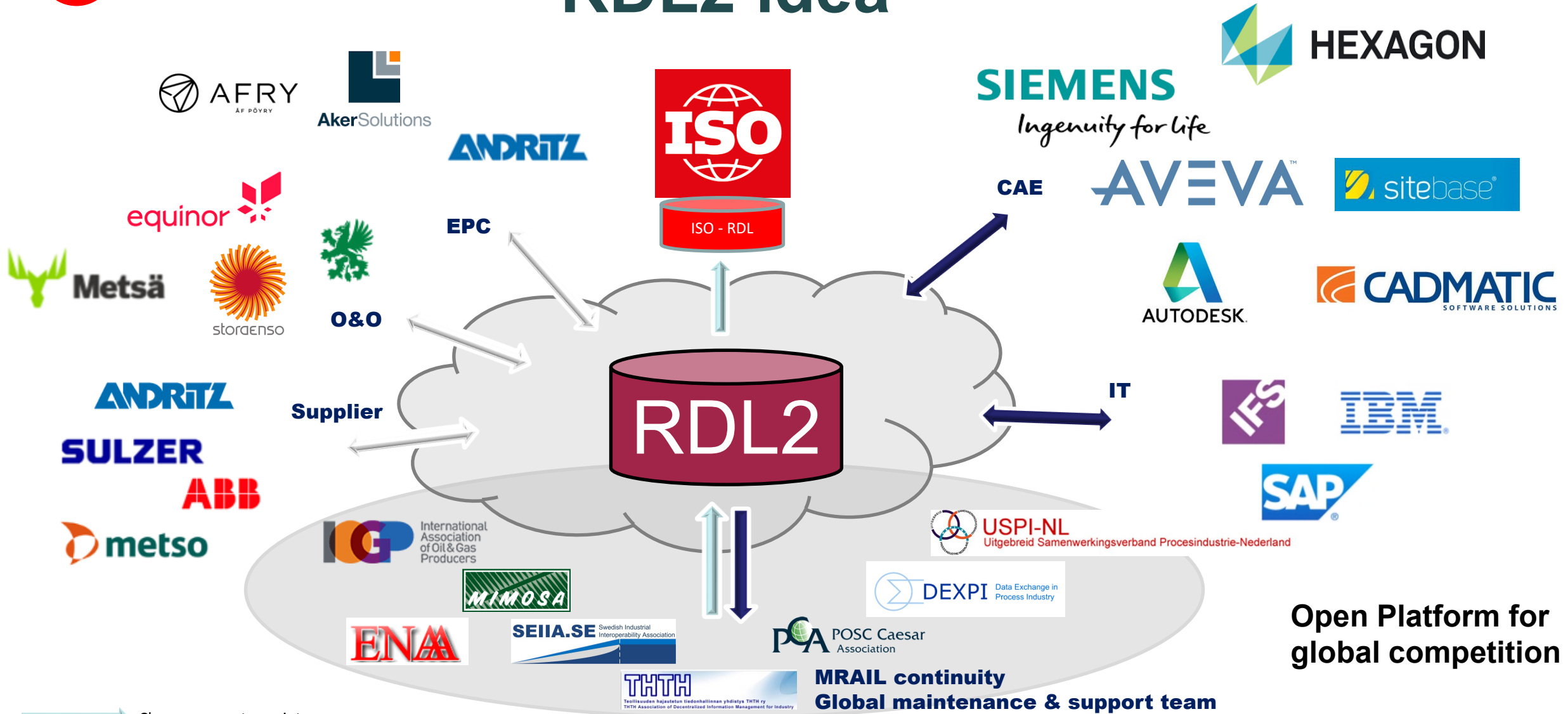


*X – THTH TIE will test UBL2.3 for business process standard
(ISO/IEC-19845:2015 – the UBL2.3 is now under OASIS approval, but not ISO/IEC-standard)





**RDL2 is connecting existing Reference Data Libraries related to
standardized classes and properties of objects

1

RDL2 idea

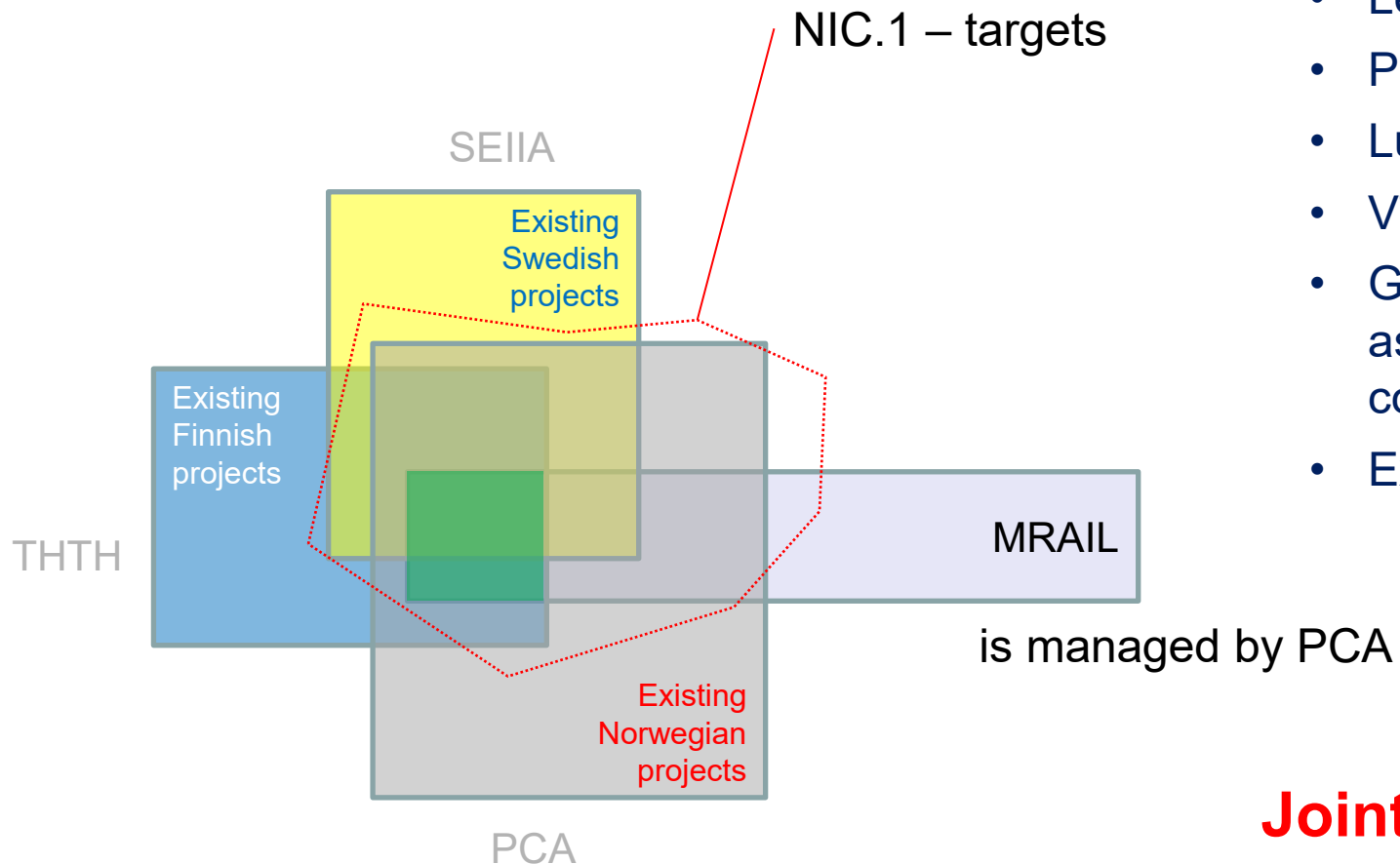


Open Platform for global competition

-  Change requests, maintenance resources
-  Handle subscriptions for a local network / area, translations, education and local support, empower own solutions with RDL references (Dexpi, CFIHOS)
-  Developer license and a possibility to deliver functionality based on RDL/RDS
-  User license/subscription for an online update and support

MRAIL continuity
Global maintenance & support team

Preparation phase – intermediate target

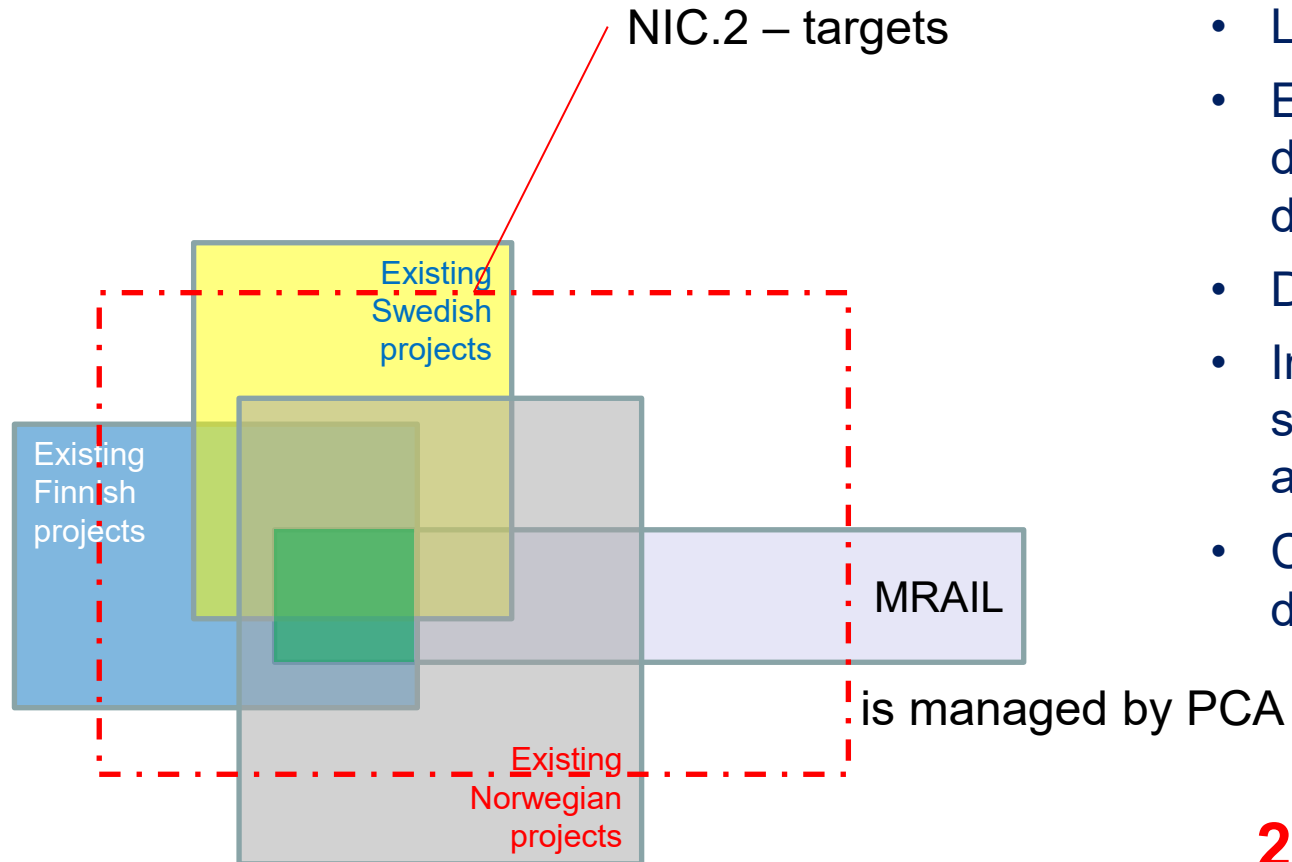


NIC preparation – intermediate phase

- Less than one year preparing project 2020 - 2021
- PCA and Oslo University to lead Norwegian part
- Luleå University to lead Swedish part
- VTT and TUNI to lead Finnish part
- Goal to define development targets for ① and ② as well to bring together a wider consortium of companies for the EU phase
- Existing projects as parts of preparation

Joint Nordic-led preparation phase

Final project phase



NIC final – final development project

- Large EU consortium with external global partners
- EU funding for infrastructure (platform) development and for companies own pilot development projects
- Development work based on the NIC plan
- Infrastructure development includes common services for RDL2 **1** and common tools for API and integration **2**
- Companies to provide business demonstrations/pilots

2. European level project – deploying the concept globally

Conclusions

- The existing projects in Norway, Sweden and Finland continue
 - Focus on the existing targets
 - New participants are welcome to join the development!
- The joint Nordic preparation is starting
 - Joint Nordic team preparing an EU level project
 - Industry requirements are needed!
- The European level industry project
 - Focus on industry deployment
 - Starting at the end 2021 – continuation to the existing projects

Thank you!