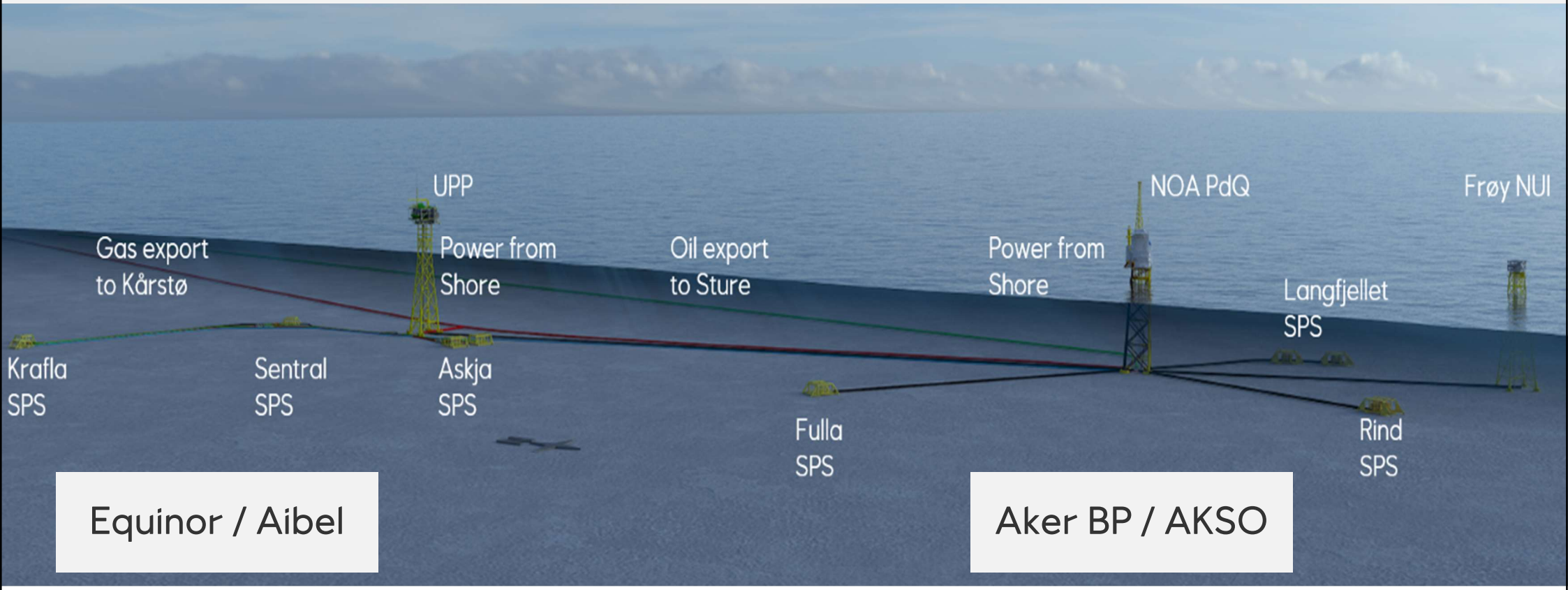
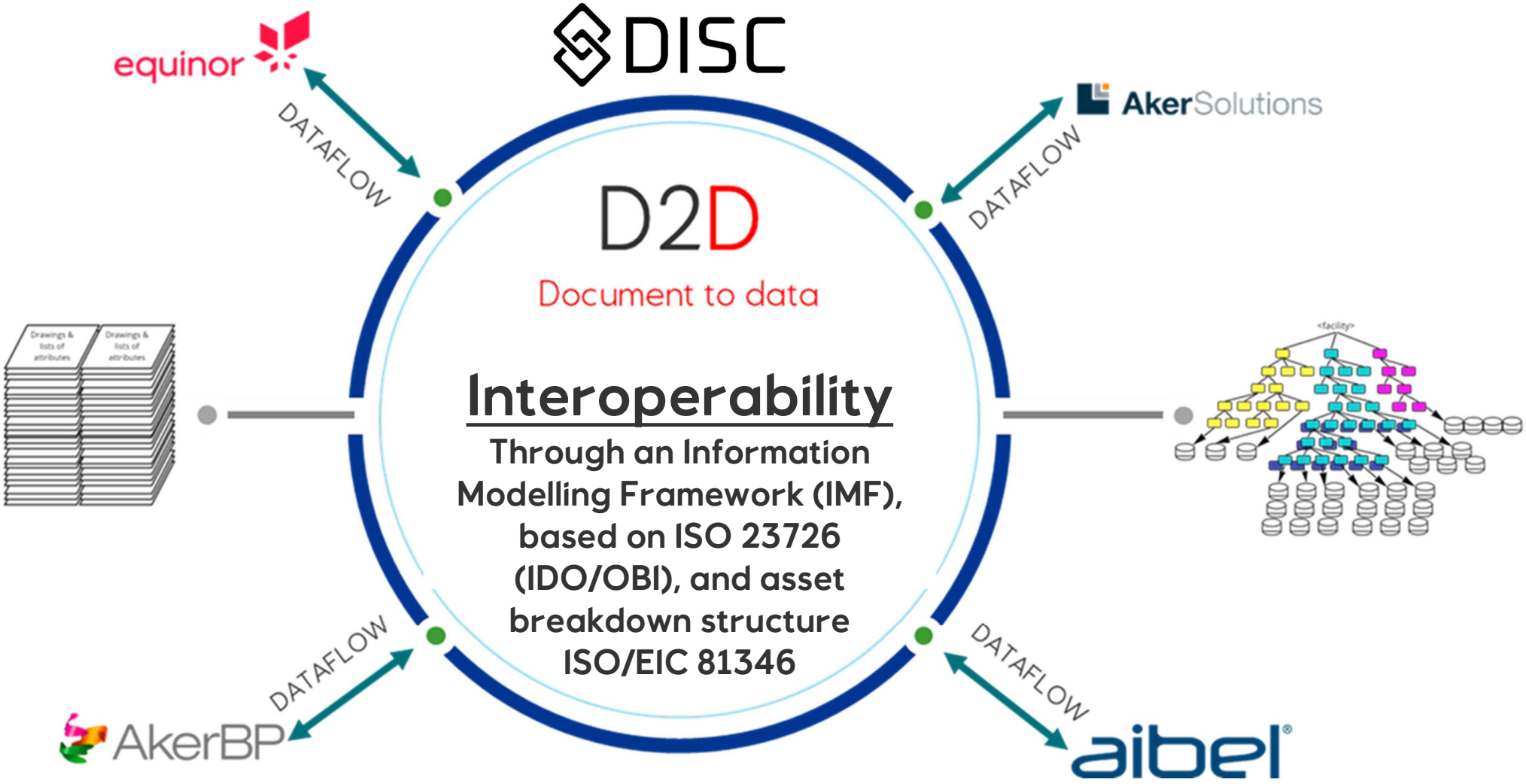
Presented by
HELGE FERDINAND SCHJØTT Aker BP
Equinor Business Center, Stavanger 23-10-2024

NOAKA Digital Collaboration 2020

Equinor / Aker BP / Aker Solutions / Aibel




equinor
DISC
AkerSolutions
DATAFLOW
DATAFLOW
D2D
Document to data
Drawings & lists of attributes
Drawings & lists of attributes
<facility>
Interoperability
Through an Information Modelling Framework (IMF), based on ISO 23726 (IDO/OBI), and asset breakdown structure ISO/EIC 81346
DATAFLOW
DATAFLOW
AkerBP
aibel

The DISC objective is to achieve

a Seamless, Standardized, Secured and Verified Dataflow

enabled by PCA library services,

to accelerate Project Execution and streamline

Operational Processes for greater efficiency

ORGANISATION

Work Group

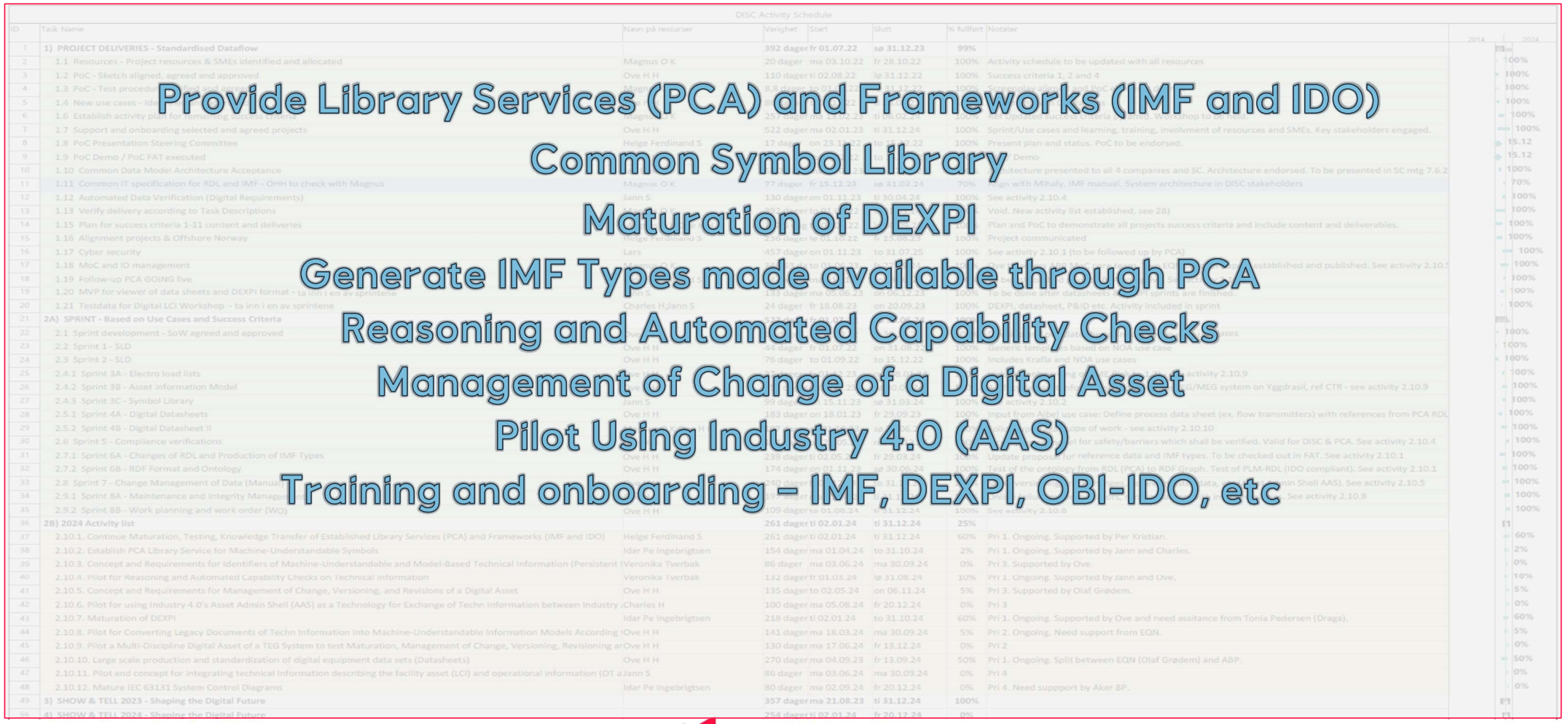
- Charles Halaas – Aibel
- Idar Pe Ingebrigtsen – Equinor
- Jann Slettebakk – Aker Solutions
- Tonje Sandnes Blix – Aker Solutions
- Helge Ferdinand Schjøtt – Aker BP
- Ove Heitmann Hansen – Aker BP
- Veronica Tverbakk – Aker BP

- Lars Dag Berthinussen – PCA
- Fredrik Valde Antonisen – Webstep
- Pål Rylandsholm – DNV

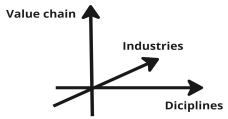
Steering Committee

- Ellen Christine Karlsen – Aibel
- Per Kristian Veiberg – Equinor
- Nina Solie – Aker Solutions
- Steinar Mollan – Aker BP

ACTIVITIES


Provide Library Services (PCA) and Frameworks (IMF and IDO)
Common Symbol Library
Maturation of DEXPI
Generate IMF Types made available through PCA
Reasoning and Automated Capability Checks
Management of Change of a Digital Asset
Pilot Using Industry 4.0 (AAS)
Training and onboarding – IMF, DEXPI, OBI-IDO, etc

SUCCESS CRITERIA AND ROADMAP



Scalability

SMEs are the users

Gain incremental value

Precision for machine automation

Utilize and contribute to industry commons

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WHAT IS THE IMF (Information Modelling Framework)

The **IMF** is a method, a framework, and a language that allows creating

an engineering friendly description of a Facility Asset,

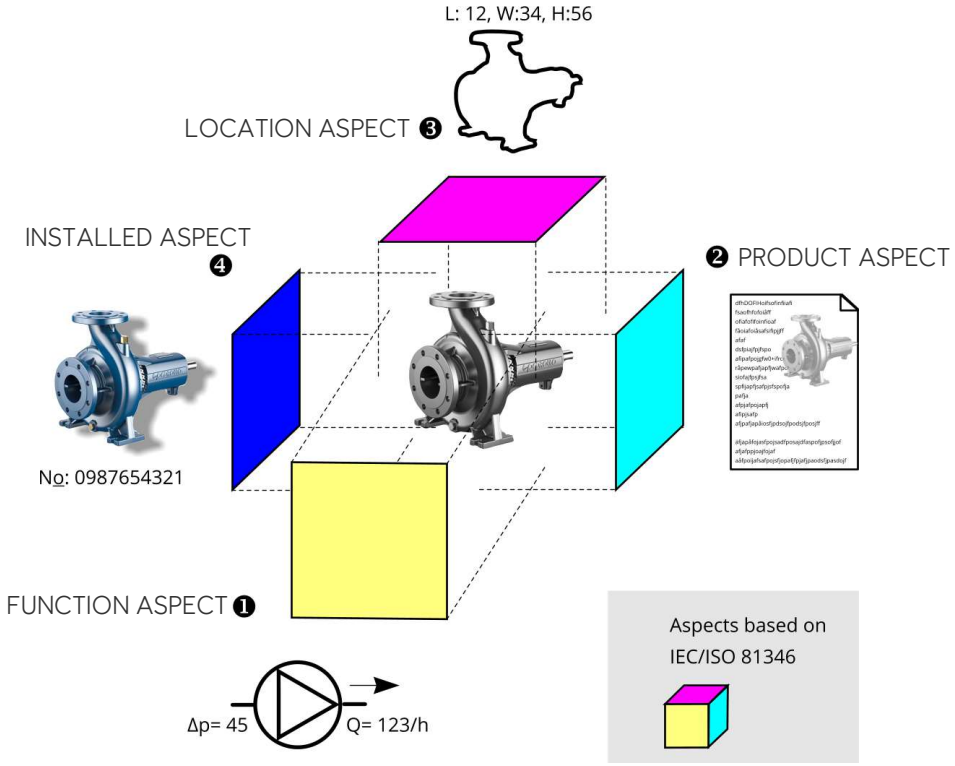
using graphical figures and common industry reference data libraries.

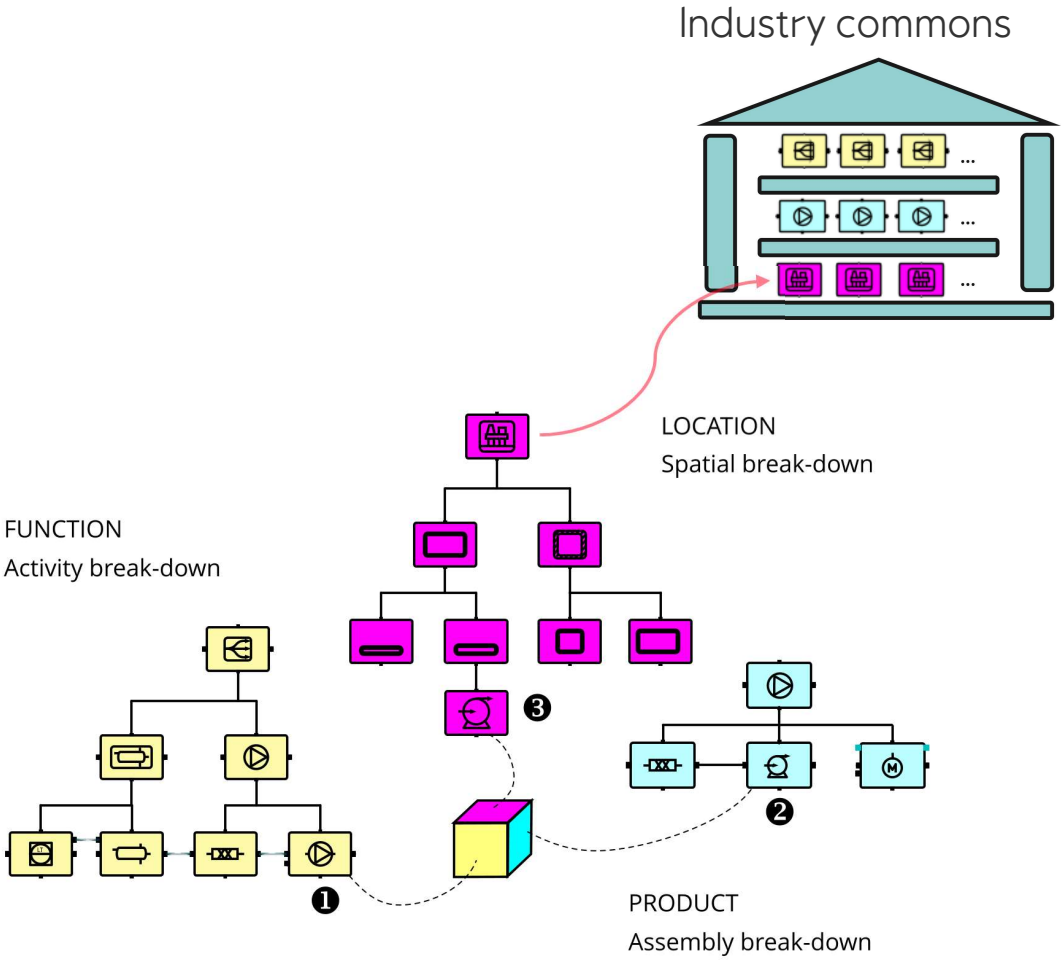
The libraries contains definitions of elements (IMF Types) that are frequently re-used.

The resulting Information Model of the Facility Asset contains information

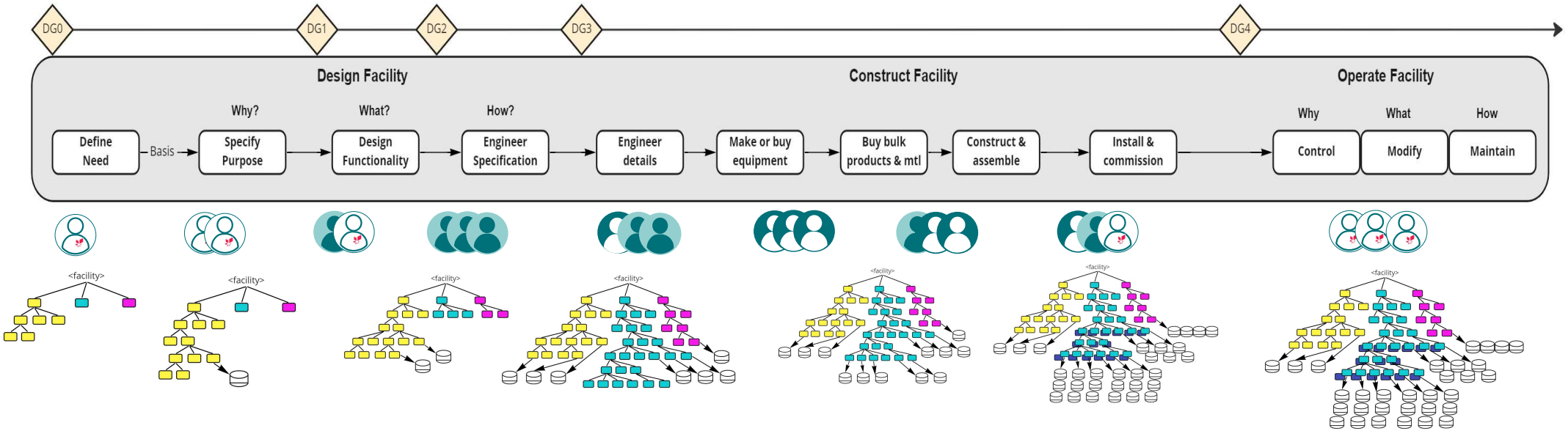
in a format which is **readable to humans as well as to computers**.

THE IMF


L: 12, W:34, H:56
LOCATION ASPECT ❸
INSTALLED ASPECT ❹
❷ PRODUCT ASPECT
No: 0987654321
FUNCTION ASPECT ❶
Δp= 45
Q= 123/h
Aspects based on
IEC/ISO 81346


Industry commons
LOCATION
Spatial break-down
FUNCTION
Activity break-down
❸
❷
❶
PRODUCT
Assembly break-down

THE IMF


DG0
DG1
DG2
DG3
DG4
Design Facility
Construct Facility
Operate Facility
Why?
What?
How?
Why
What
How
Define Need
Basis
Specify Purpose
Design Functionality
Engineer Specification
Engineer details
Make or buy equipment
Buy bulk products & mtl
Construct & assemble
Install & commission
Control
Modify
Maintain
<facility>

FROM DATASHEET TO DIGITAL DATASET

28	09	Inlet pressure	bara		190	
16		Design Temperature	°C	Min: -46		Max: 120
17	01	Design Pressure	barg	Min: FV		Max: 400

We give properties like inlet pressure, design temperature and design pressure and their units of measure precise interpretations and publish these to the common industry service (PCA) for public use

```
dsa:82c7d416-2e24-47f0-8c09-8b2ec5e4b2bb
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        rdfs:label              "design temperature max_datum" ;
        lis:quantifiesQuality   dsa:e1e728c0-b872-4c1c-a47f-f13070da2980 ;
        ds:datumValue           "120"^^xsd:decimal ;
        ds:dsFieldAttribute     rdl:design temperature max ;
        ds:dsFieldLabel         "Design Temperature °C" ;
        ds:dsFieldSubject       dsa:C132-KA-P-DS-0008-stream ;
        ds:dsFieldValue         "Max: 120" ;
        ds:dsRevision           dsa:C132-KA-P-DS-0008-02_Rev09 ;
        ds:uom                  rdl:degree Celsius .
```
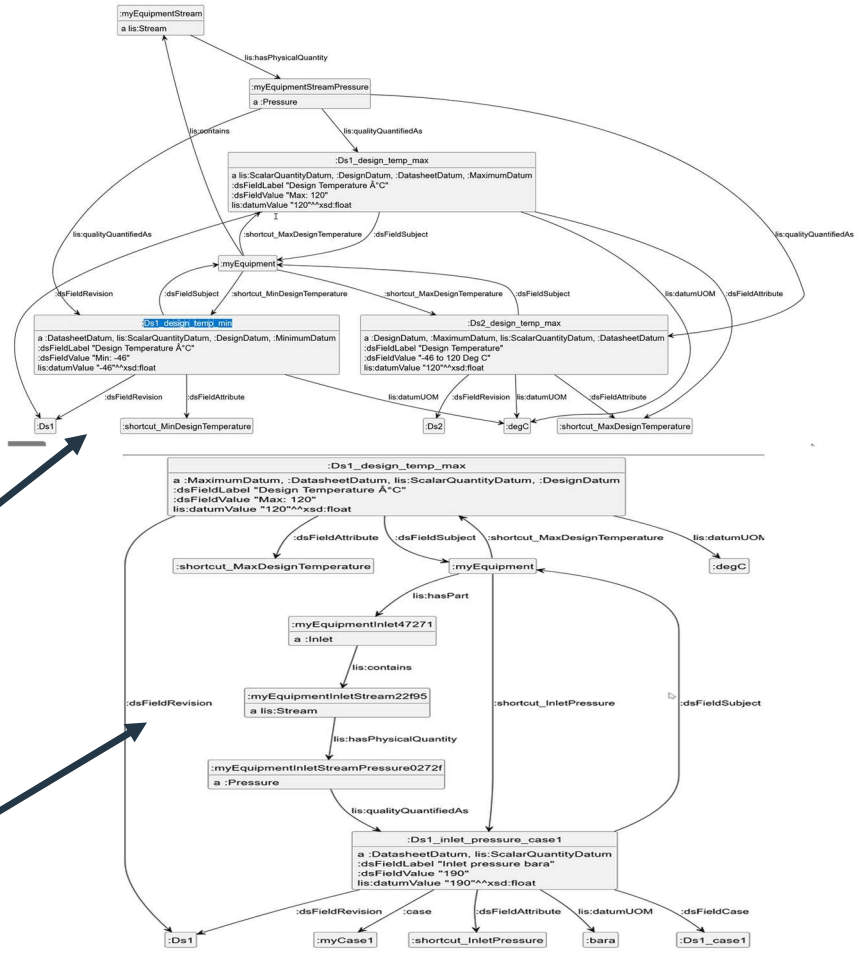

```
dsa:80244475-4367-44a5-9d94-cbe01cba33d0
        rdf:type                ds:DatasheetDatum , ds:QuantityDatum ;
        rdfs:label              "inlet pressure_datum" ;
        lis:quantifiesQuality   dsa:abb65dc0-40b6-4a42-a7d9-67d60afd7a59 ;
        ds:datumValue           "190"^^xsd:decimal ;
        ds:dsFieldAttribute     rdl:inlet pressure ;
        ds:dsFieldCase          dsa:C132-KA-P-DS-0008-case1 ;
        ds:dsFieldLabel         "Inlet pressure" ;
        ds:dsFieldRevision      dsa:exRev09 ;
        ds:dsFieldSubject       dsa:13HCV0330 ;
        ds:dsFieldValue         "190" ;
        ds:dsRevision           dsa:C132-KA-P-DS-0008-02_Rev09 ;
        ds:uom                  rdl:bar absolute .
```



Datasheets (Excel) in pdf, implicit information and underspecified fields

Each line/item in the datasheet becomes a graph

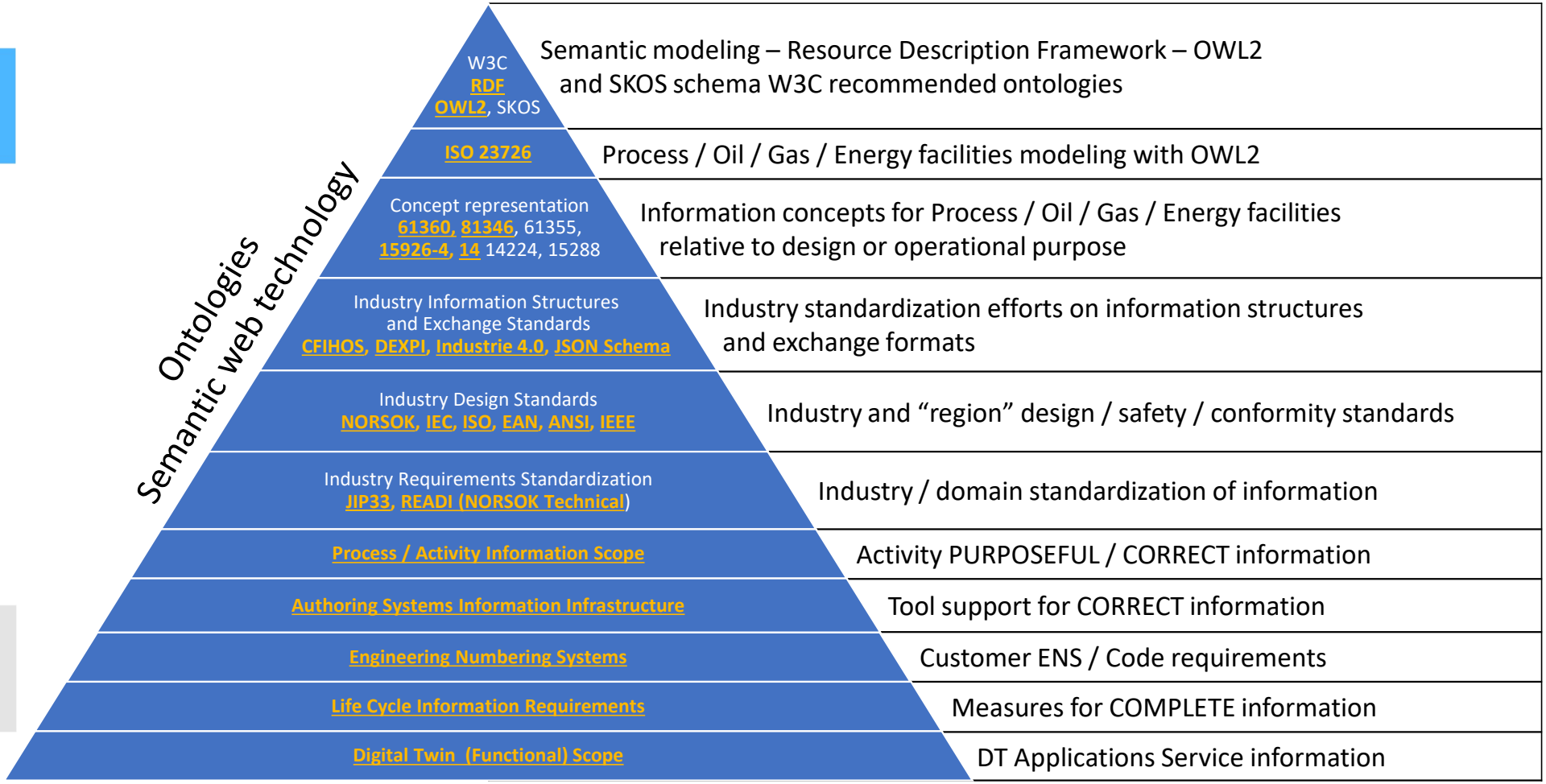
The whole datasheet becomes a graph/model/IDO ontology for the equipment and processes that the datasheet describes

IMF RELEVANT STANDARDS (orange and underlined)

Abstract and generic

Detailed, company specific

Ontologies
Semantic web technology



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BUSINESS VALUE EXAMPLE FOR DIGITAL GREENFIELD (Johan Castberg)

- 7 000 000 engineering hours in DG3-DG4 (construction phase)
- 2 100 000 hours estimated to be manually tasks
- Human error rate set to 2%, giving 50 000 errors (P&ID, PFD, SLD, SCD, ELL, etc)
- Time to correct each error set to 10 hours
- Time needed to correct errors 500 000 hours

✓ Approximate cost associated with correcting human errors (updates, alteration and modifications) estimated to **$100 million**

✓ The DISC collaboration project are aiming to demonstrate that by going from **document to data**, we can reduce human errors by at least 50% = **$50 million.**

USE CASE PRESENTED AT DISC SHOW & TELL September 4, 2024

«The Broken Pump»

a WEBSTEP presentation

https://www.youtube.com/watch?v=5nEIXZIkzy4

Opportunities given by structured data
Munin TEG/MEG pump replacement

by
Bård Henning Tvedt & Martin Ulvesæter

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USEFUL LINKS

PCA (POSC Caesar Association) Library Services https://www.posccaesar.org/

PCA on YouTube https://www.youtube.com/@POSCCaesarAssociation/videos

DISC Show & Tell September 4th 2024 https://www.youtube.com/watch?v=W4Qyf0lGLt0

IOGP Standards https://www.iogp.org/bookstore/product-category/standards/

EqHub Vendor Documentation https://collabor8.no/services/eqhub/

TIRC Z-018 Requirement Catalog https://tirc.collabor8.no/#/navigator

CFIHOS 1.5.1 Data Model https://www.jip36-cfihos.org/datamodel/v1.5.1/

DEXPI Data Exchange https://dexpi.org/


DISC