IDSA Tech Talk is powered by
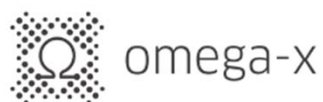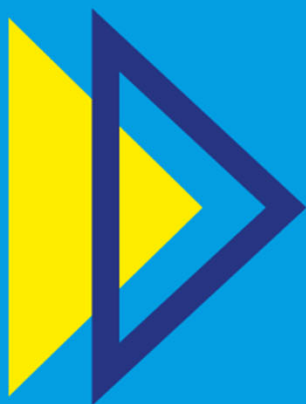
The International Data Spaces Information Model – An Ontology for Sovereign Exchange of Digital Content

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Dataspace

gaia-x
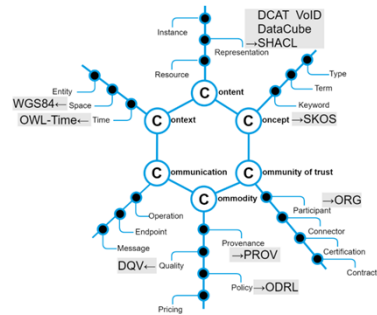
- To build a **Dataspace**, we need:
  - A governance which can be operationalised.
  - Infrastructures adopting the governance.
  - Parties adopting the governance, using the infrastructures *"to access and use data in a fair, transparent, proportionate and/non-discriminatory manner with clear and trustworthy data governance mechanisms."*[1]

- Problems/Opportunities:
  - Sharing data is not new and there are 1000's of existing setups that could qualify as "dataspace"
  - They are not discoverable
  - Governance and infrastructure interoperabilities are hard - if not impossible - to assess
  - Scaling is expensive

[1]: https://joinup.ec.europa.eu/collection/semic-support-centre/data-spaces

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Agenda

(Semantic) Interoperability

The IDS Information Model

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(Semantic) Interoperability

1

Syntactic/technical interoperability:
Data formats &
communication protocols

The ability of entities in a network to connect with each other and carry out their functions

a characteristic of a product or system to work with other products or systems

(Semantic) Interoperability

Semantic interoperability:
Automatically interpret (understand)
the information

The ability of systems to exchange and make use of information in a straightforward and useful way

d = distance(D1, D2)

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Interoperability Layers in Dataspaces

Peter Koen, Microsoft

Are contractual statements legally equivalent?

LEGAL — **IDSA Legal Task Force**

Are business procedures compatible?

ORGANIZATIONAL — **IDSA Rule Book v2**

Do policies and attributes express the same meaning?

SEMANTIC — **Dataspace Authority Policies**

Semantic Models (e.g., IDS Information Model)

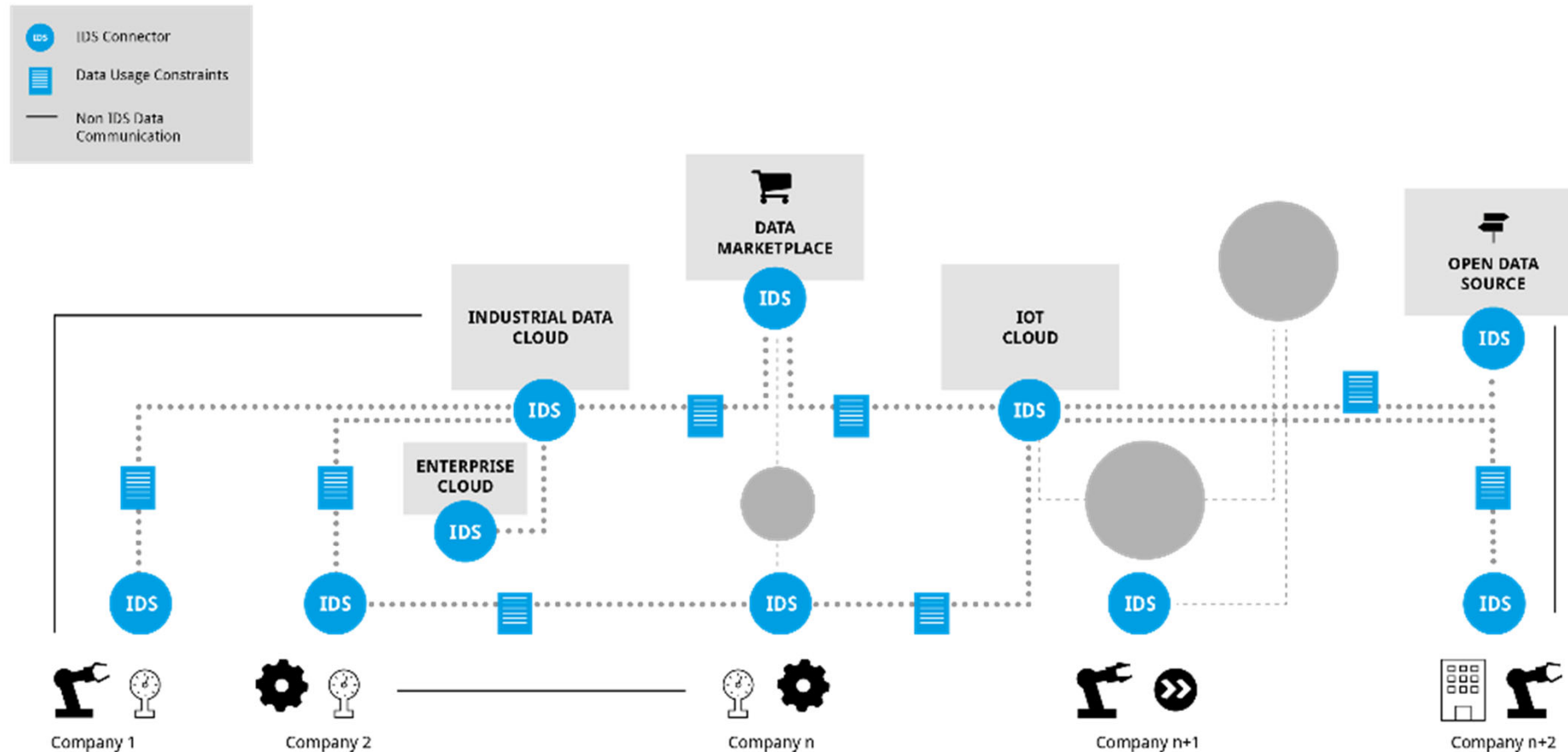Can different connectors communicate with each other?

TECHNICAL — **IDSA Dataspace Protocol**

Eclipse Dataspace Components as a reference framework

Many different Connectors as Products/services

Julia Pampus,
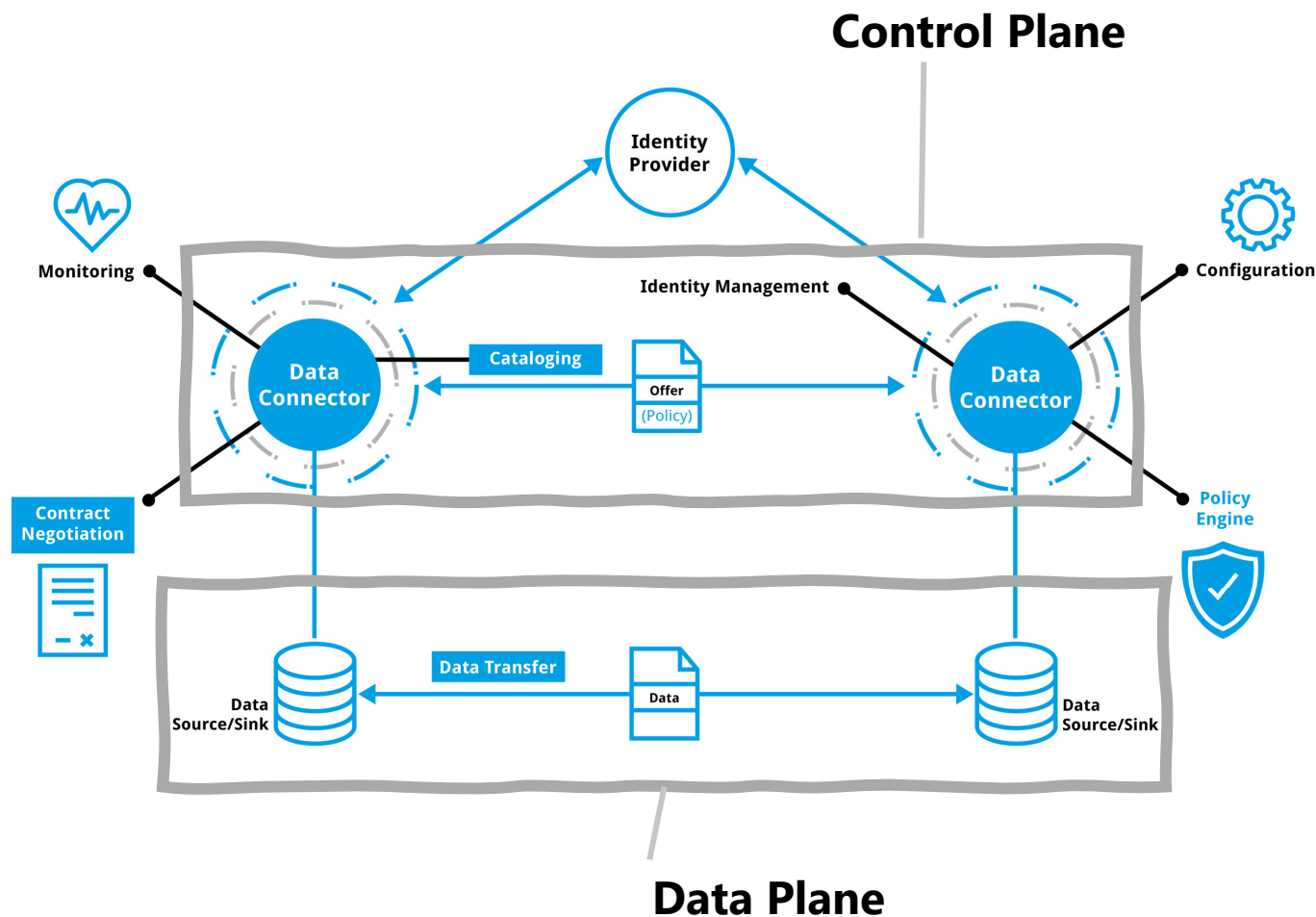Fraunhofer ISST

Dataspace Protocol

Foundation for Technical Interoperability

INTERNATIONAL DATA SPACES ASSOCIATION

Dataspace Protocol V0.8

Providing two Layers

Control Plane

Identity Provider

Monitoring

Identity Management

Configuration

Cataloging

Offer
(Policy)

Data Connector

Data Connector

Contract Negotiation

Policy Engine

Data Transfer

Data

Data Source/Sink

Data Source/Sink

Data Plane

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Julia Pampus,
Fraunhofer ISST

Dataspace Protocol Specification

Based on W3C Standards

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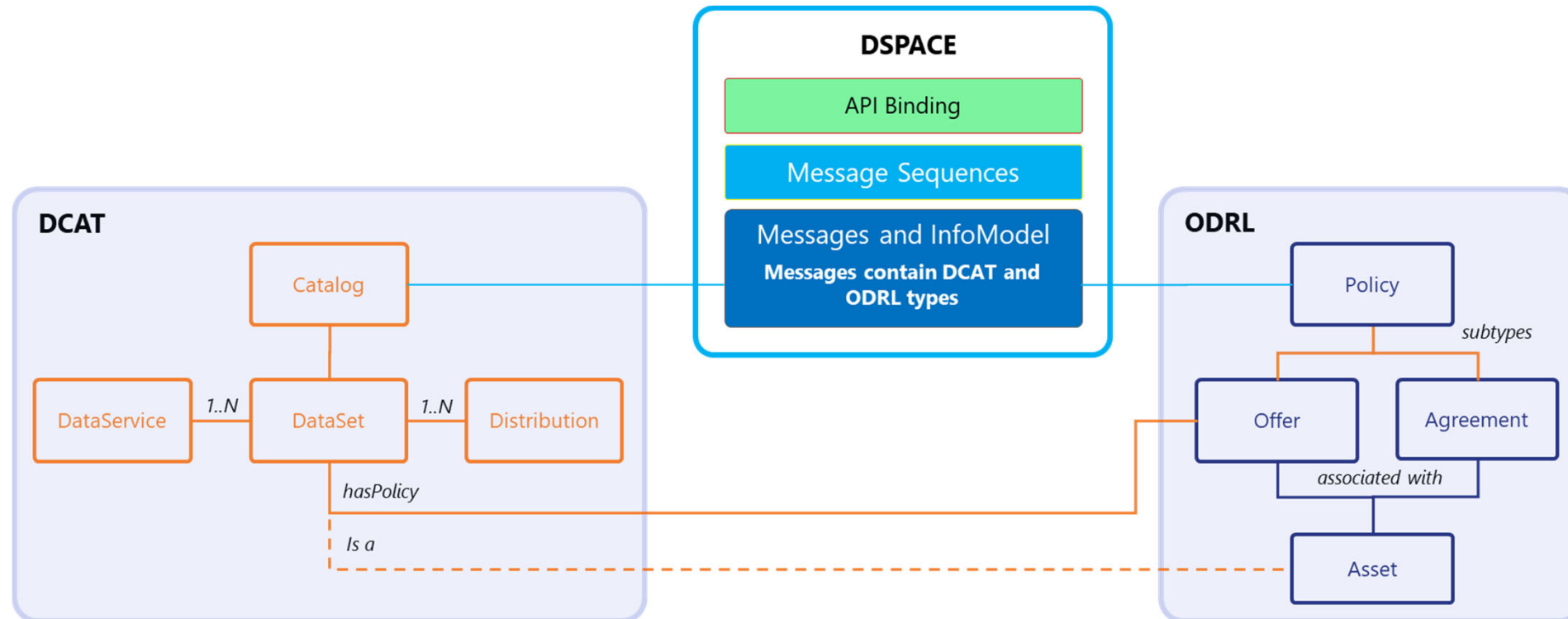
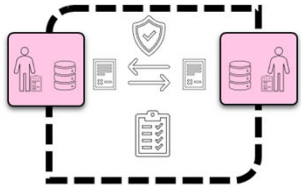# Global Alignment & Interoperability

Peter Koen, Microsoft
Sebastian Steinbuss, IDSA

Intra-Dataspace   Inter-Dataspace

Pierre Gronlier, Gaia-X

The use of an ontology for
implementing the governance and
the semantic interoperability of
the descriptions.
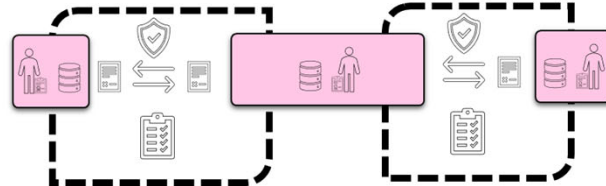
- *Intra data space interoperability,* between the data space authority, processing, and data sharing building blocks within a single data space instance

- *Inter data space interoperability,* between multiple data space instances at each of the functional levels

Small technical footprints based
on existing open standards to
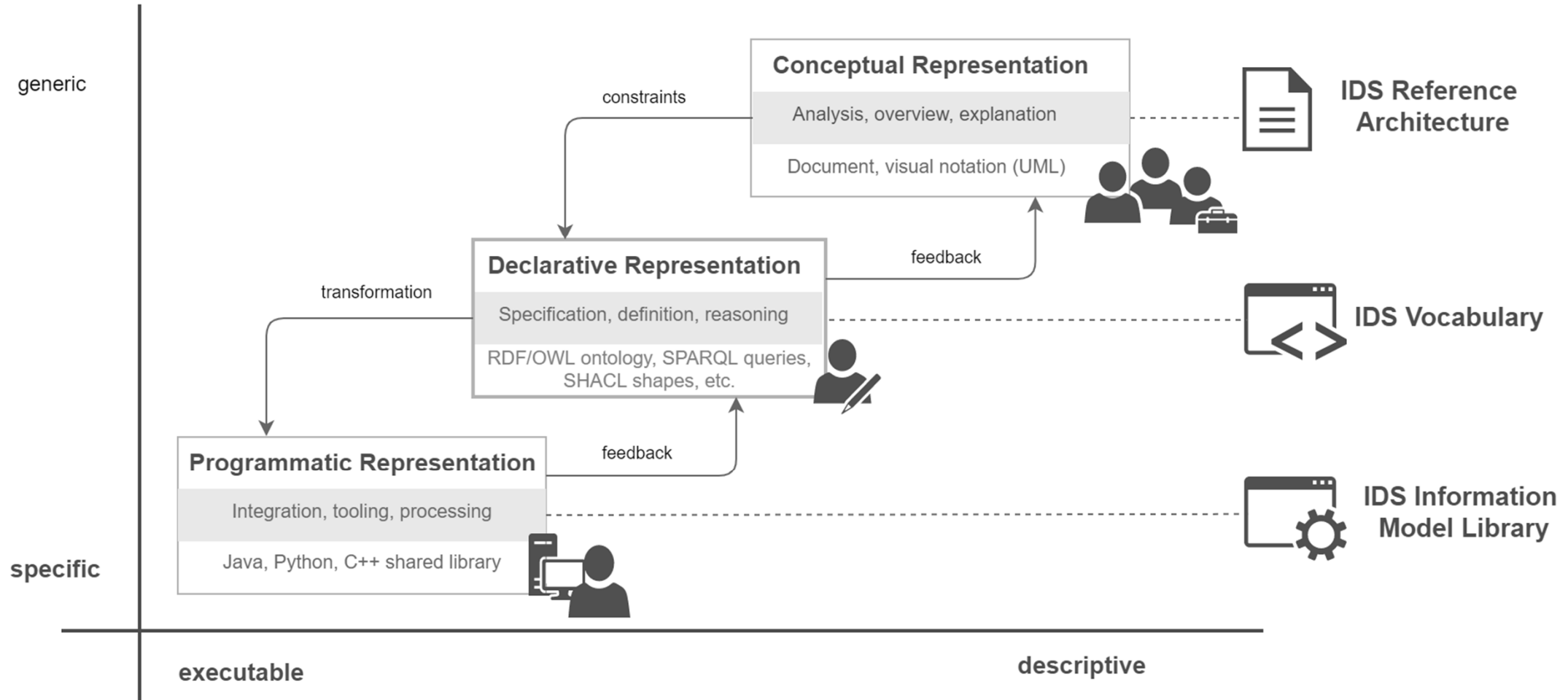implement the exchange across
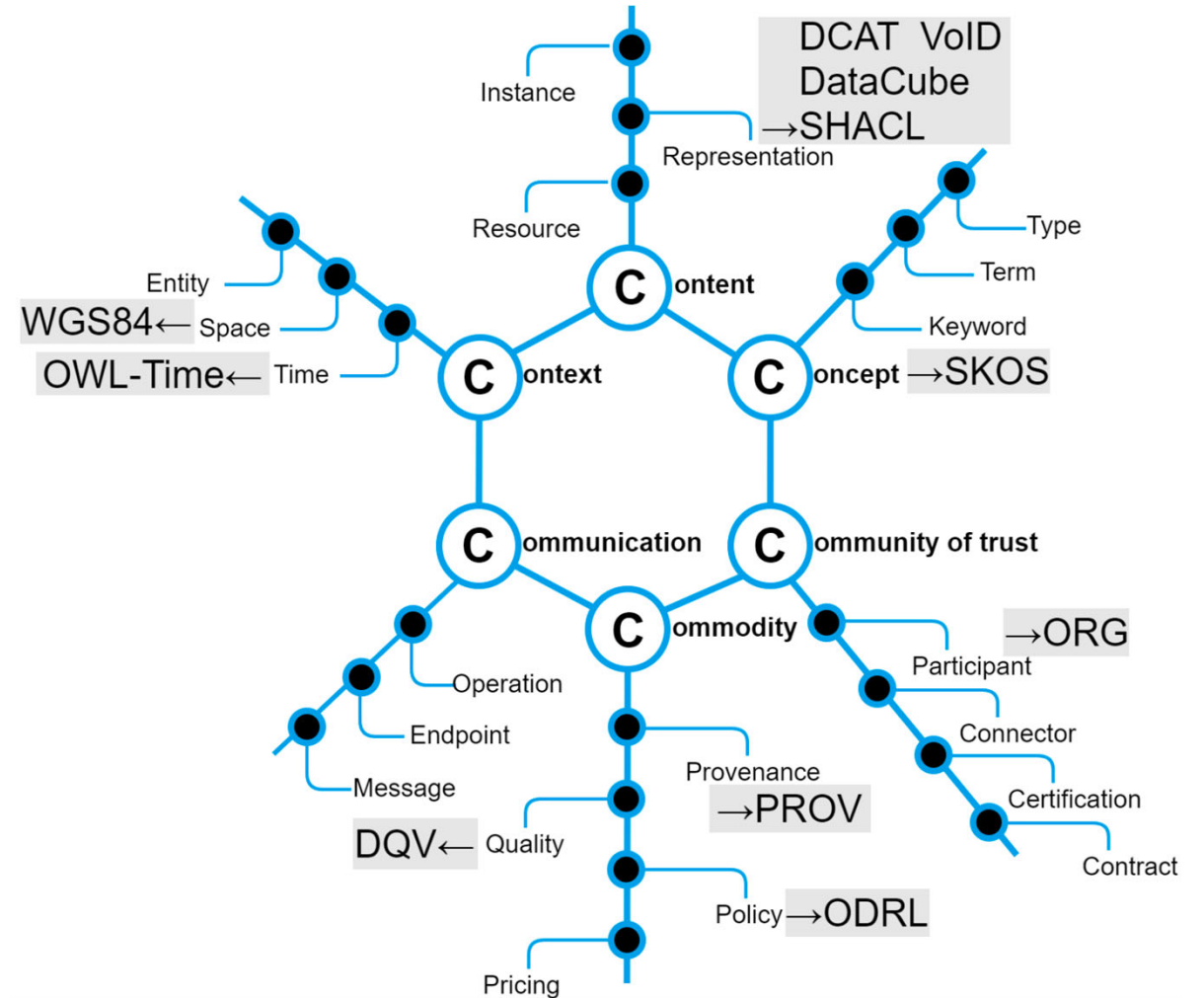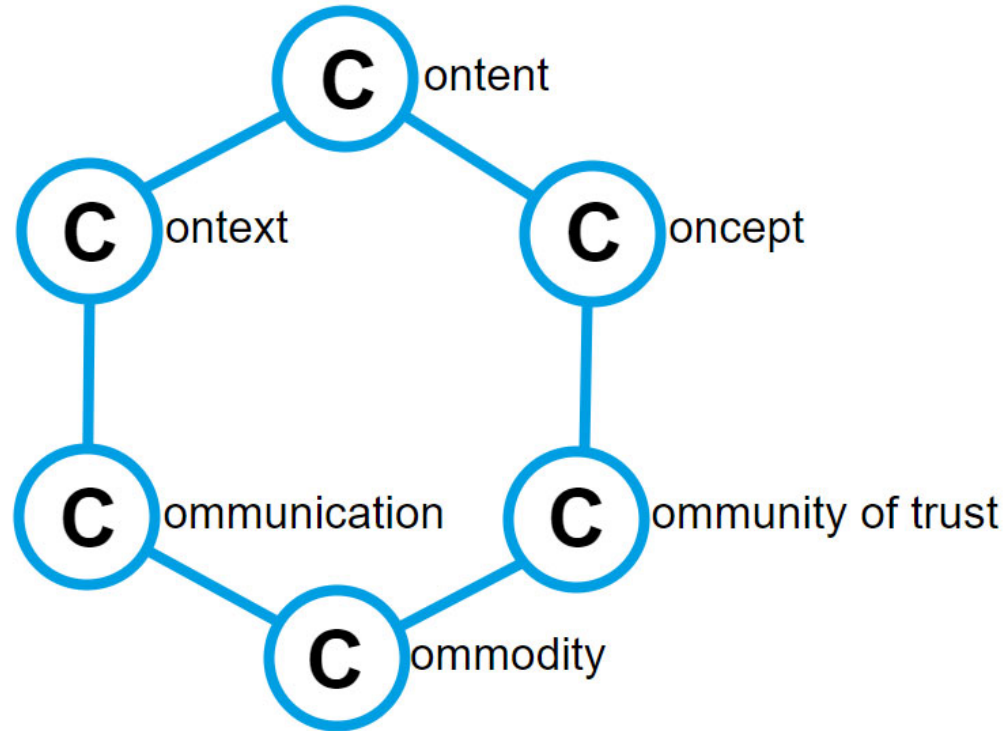dataspaces and federations.

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IDS Information Model

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Information Layer
Different Model Representations

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IDS Information Model

Separation of Concerns and Building on Standards

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IDS Information Model

IDS core classes and their instances in a FinTech example

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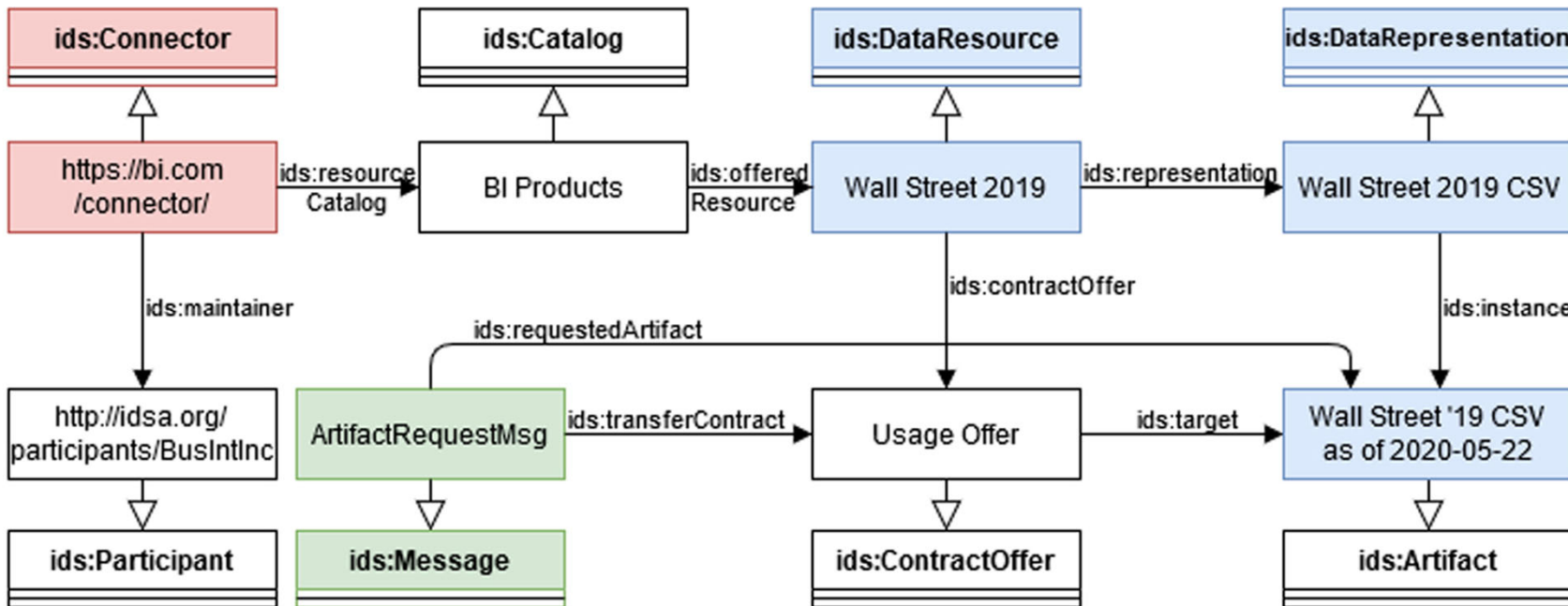
Since 2022: Substitute
ids: with odrl:, dcat:, ...

Bader, Sebastian, et al. "The International Data Spaces Information Model – An Ontology for Sovereign Exchange of Digital Content." *International Semantic Web Conference*. Cham: Springer International Publishing, 2020.

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IDS Information Model

Domain-specific Extensions

- Decide what to model

- Use the IDS Information Model as a basis for describing the different concepts in your domain

- Extend the IDS Information Model with the local definitions and restrictions from your domain
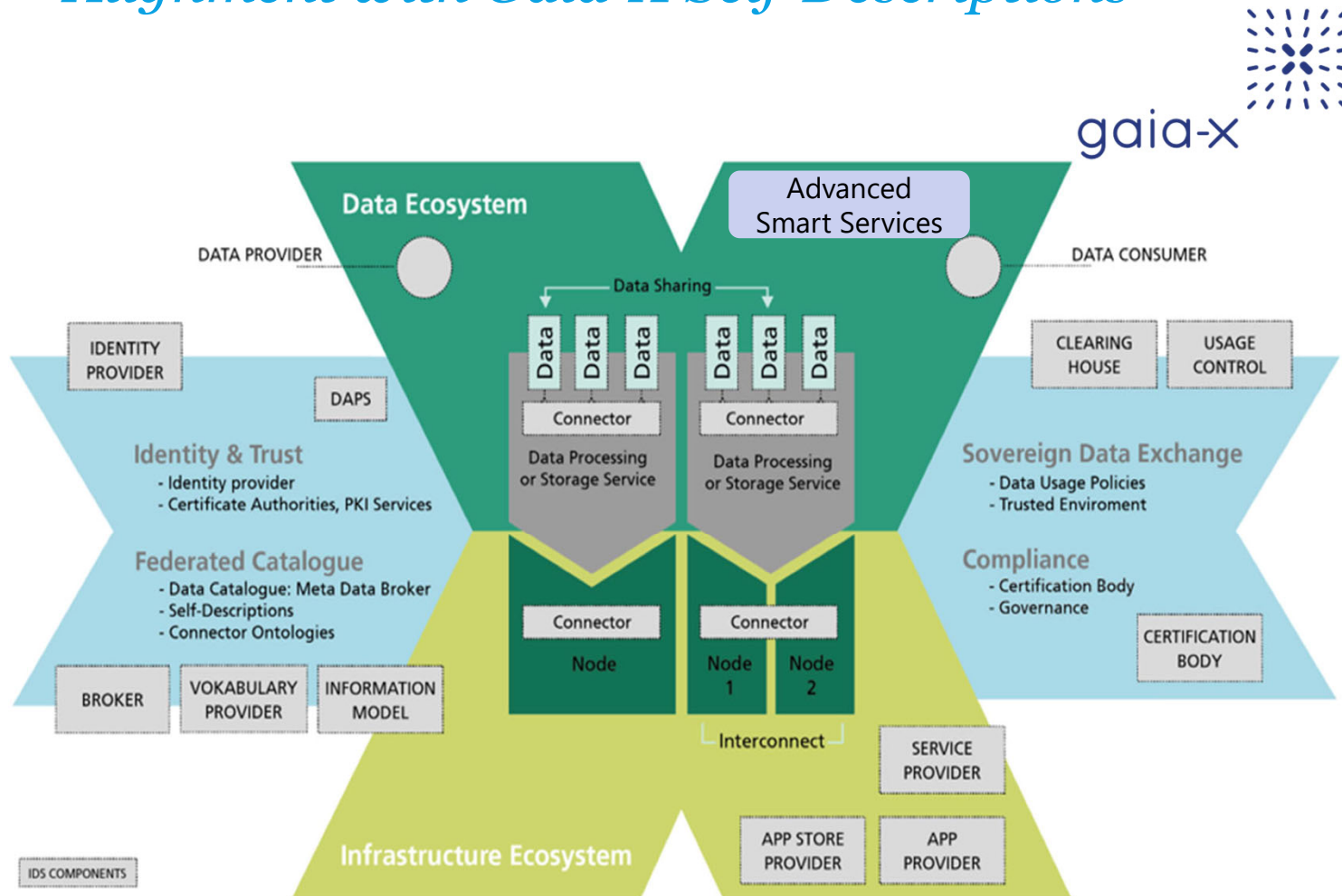 → validate metadata against domain-specific schemas
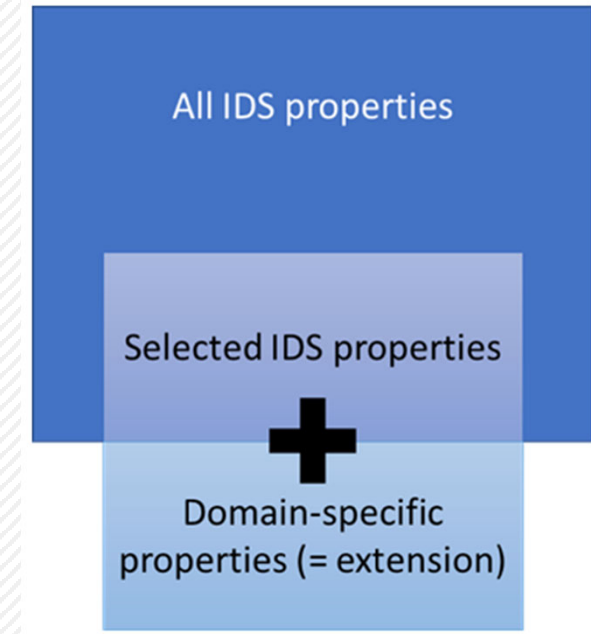
Check the IDS Information model documentation:

https://international-data-spaces-association.github.io/InformationModel/docs/index.html

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IDS Information Model
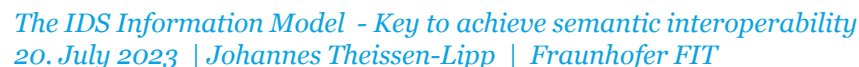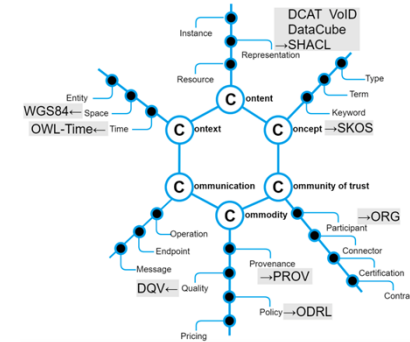## *Alignment with Gaia-X Self-Descriptions*

Please be aware:
IDS Information Model and
Gaia-X Self-Descriptions are
general-purpose and
foundational vocabularies

Check the Position Paper
Gaia-X and IDS:

https://internationaldataspaces.org/wp-content/uploads/dlm_uploads/IDSA-Position-Paper-GAIA-X-and-IDS.pdf

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Conclusion

- Dataspace components must work with each other

- Interoperability = distance(D1, D2)

- Layers of interoperability
  - Technical: Dataspace protocol
  - Semantic: IDS Information Model, ...

- IDS Information Model
  - Layers
  - Concerns & Reuse
  - General-purpose, with domain-specific extensions
  - Alignments

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Thank you for your time

Please reach out to us for any questions

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