

International developments of data spaces, insights into standards, and open questions for development and research

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Innovation by AI requires ecosystems

Data ecosystems require data

Semantic interoperability between platforms and ecosystems

DATA SHARING

IS BETTER THAN PLAYING ALONE

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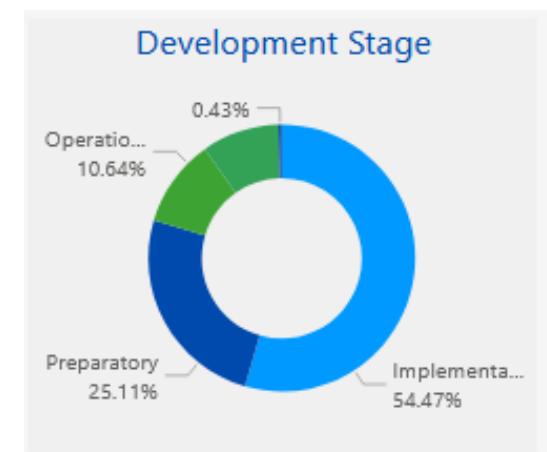
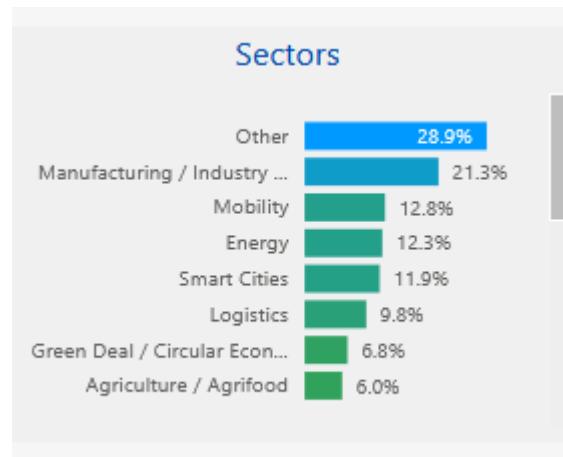
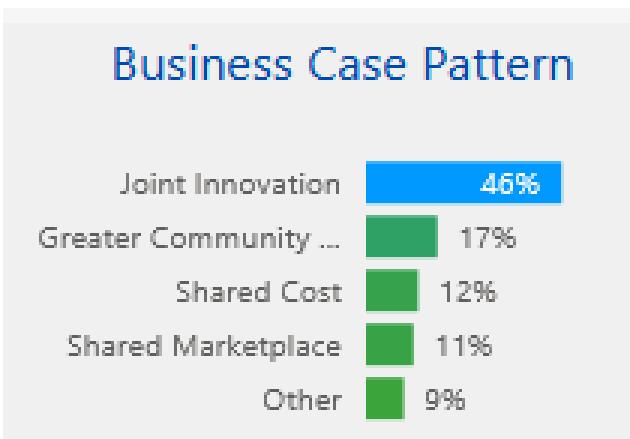
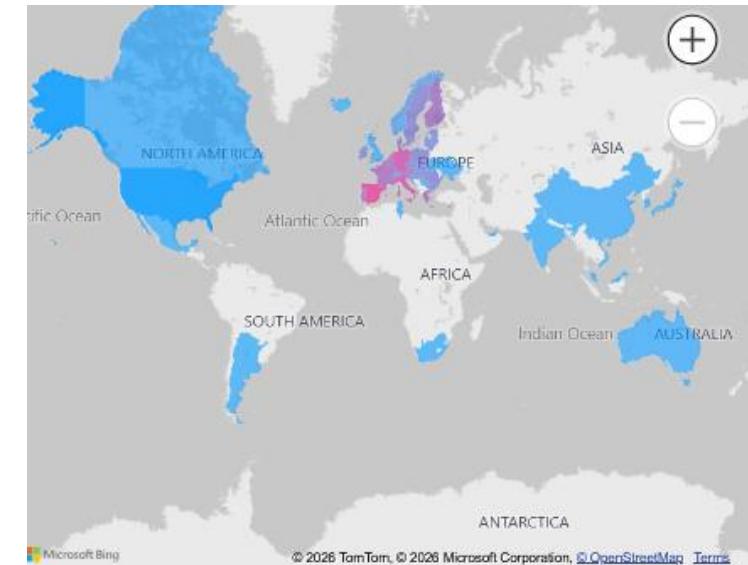
DATA SHARING
IS BETTER THAN PLAYING ALONE

10 years

International Data Spaces

A short overview

- Data Spaces are not Europe only
- Data Spaces are adopted in multiple sectors
- Innovation is a key driver
- Regulatory compliance is a key requirement
 - Multilateral Data Governance
 - Artificial Intelligence

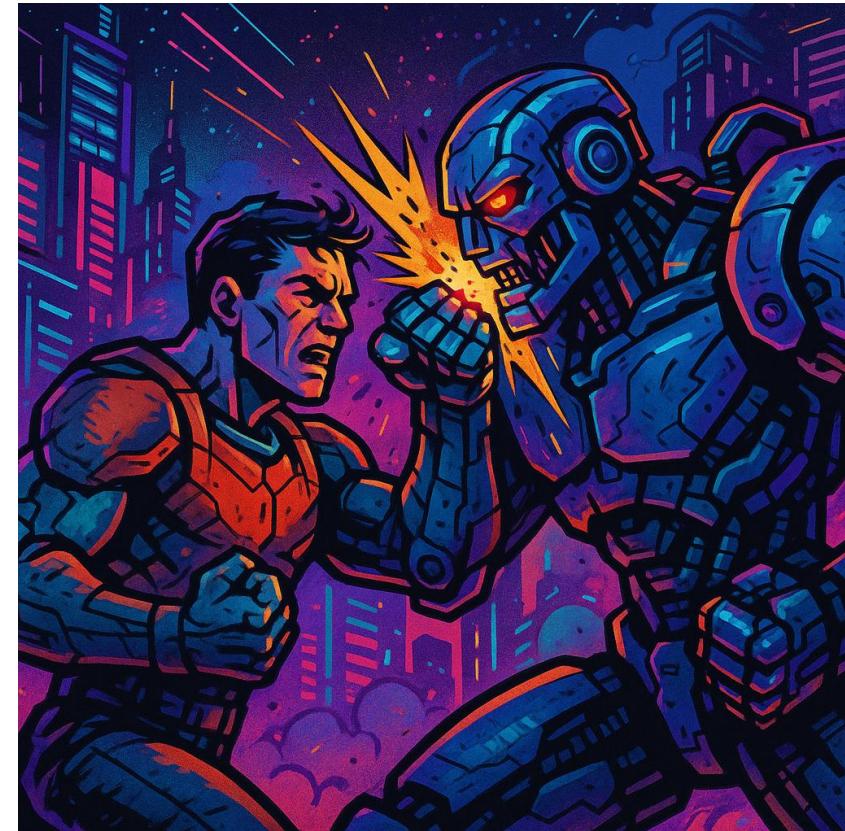


The everlasting and epic fight between humans and machines

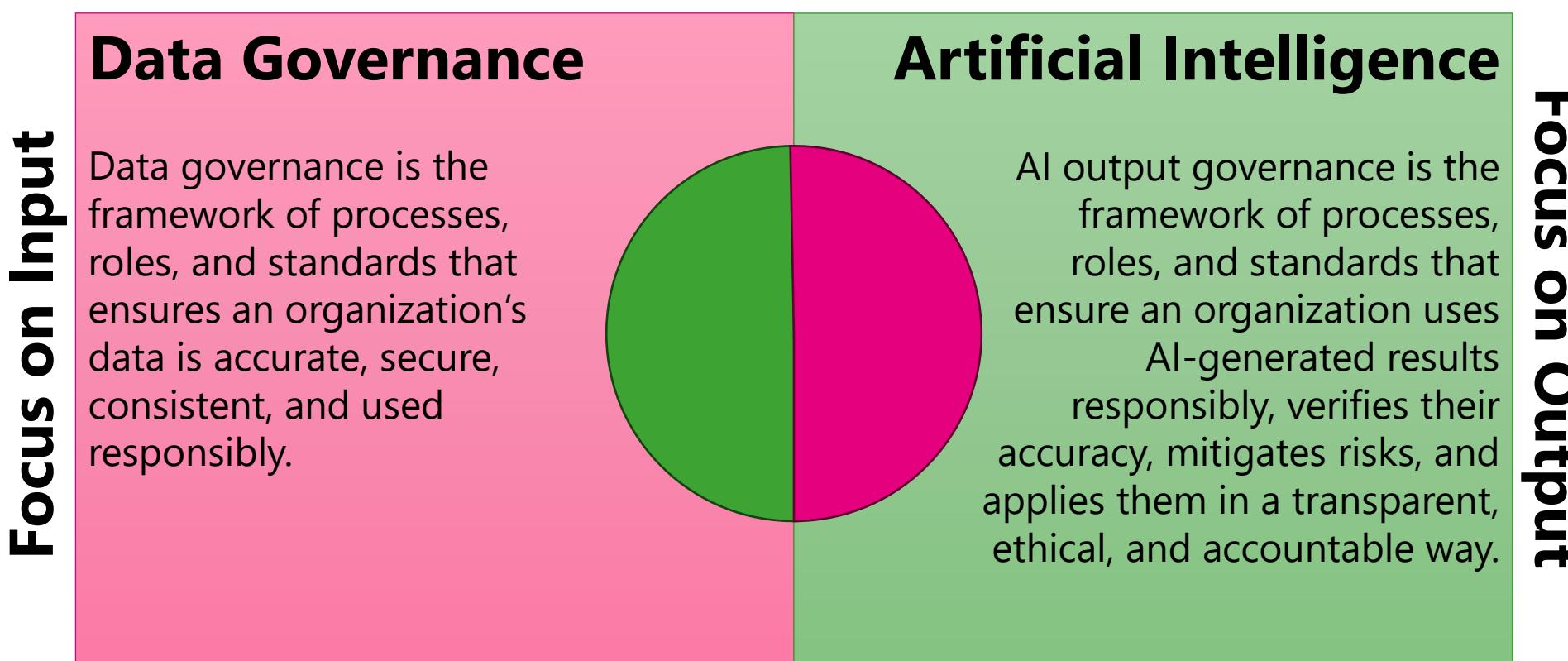
AI, Trust and Trustworthiness, Data Governance

- **Data Governance** is about the **decisions humans take**. (human-based system comprising directing, overseeing and accountability)
- In General, **trust** is about **humans deciding** to trust someone or something, especially in the field of AI.
- But in Data Spaces Trust is a decision based on the **reconciliation of claims and policies**. Machines can decide that too.
[ISO/IEC 20151: decision by an entity to assume that a product, service or entity will behave as expected for a given circumstance]
- **Trustworthiness** is a set of **verifiable evidence** that can be used to form trust.
- data management are functions that provide **access to data**, performs or monitors the storage of data, and **controls input-output operations** all within a data processing system

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A question of the perspective



Facets of a dataspace

Three primary facets, each serving distinct functions

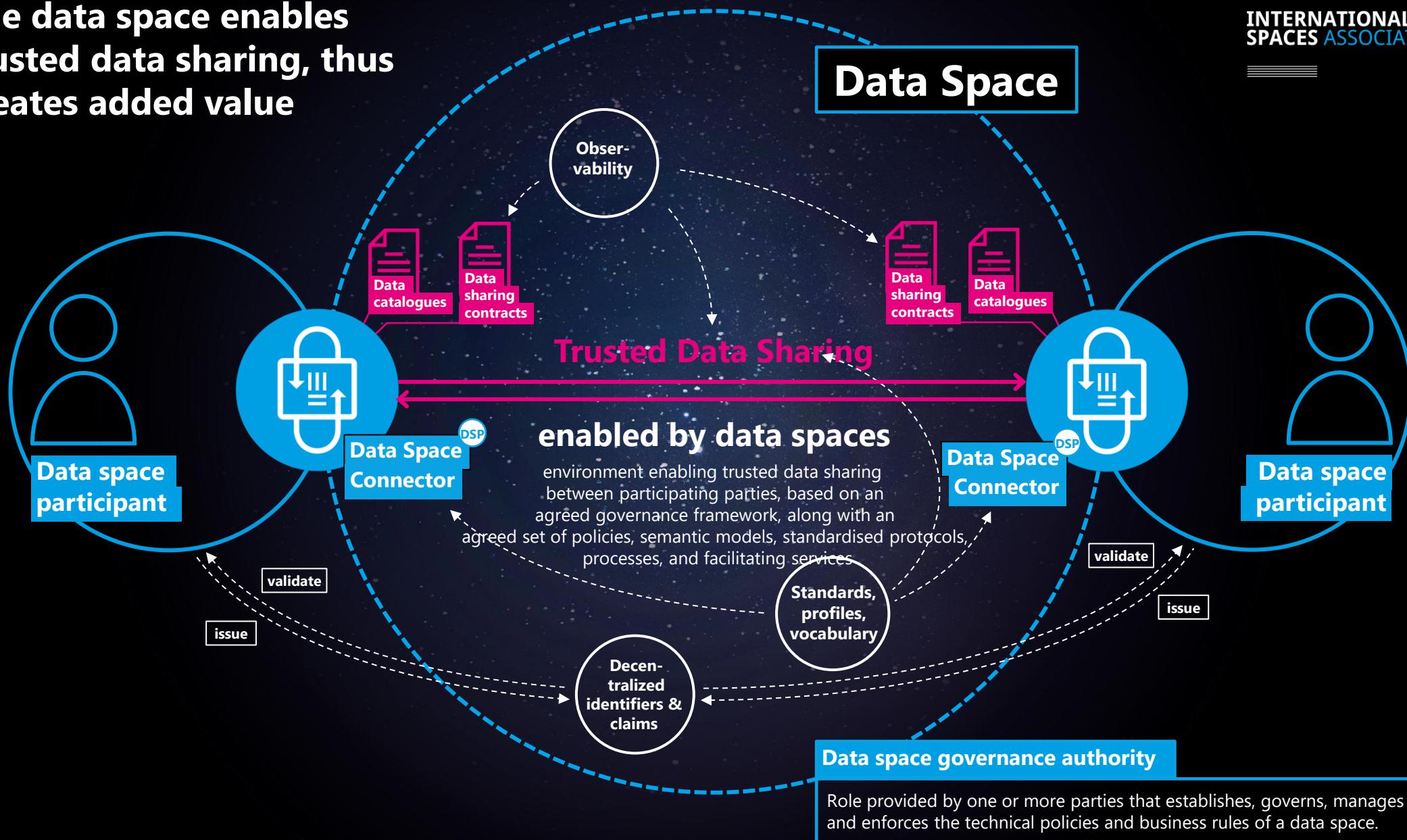
- » **Legal and governance facet**
- » enforces rights, obligations, and regulatory compliance across participants.
- » Roles: Data Rights Holders (EU), Data Subject (EU), Data Intermediation Services (EU), Data Users, Data Recipients

- » **Economic facet**
- » manages the services, interactions, and workflows that enable value generation and marketplace activity. Notably, terms for this facet are also **Business** or **Operational Facet**.
- » Roles: Data Providers, Data Consumers, Observers, Intermediaries, Marketplaces, Individuals, Service Providers

- » **Technical facet**
- » encompasses the architecture and protocols that facilitate secure and interoperable data exchanges.
- » Roles: Data Space Participants

The data space enables trusted data sharing, thus creates added value

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Data Space

Dataspace

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- » **environment enabling trusted data sharing between participating parties, based on an agreed governance framework, along with an agreed set of policies, semantic models, standardised protocols, processes, and facilitating services**

Trusted Data Sharing

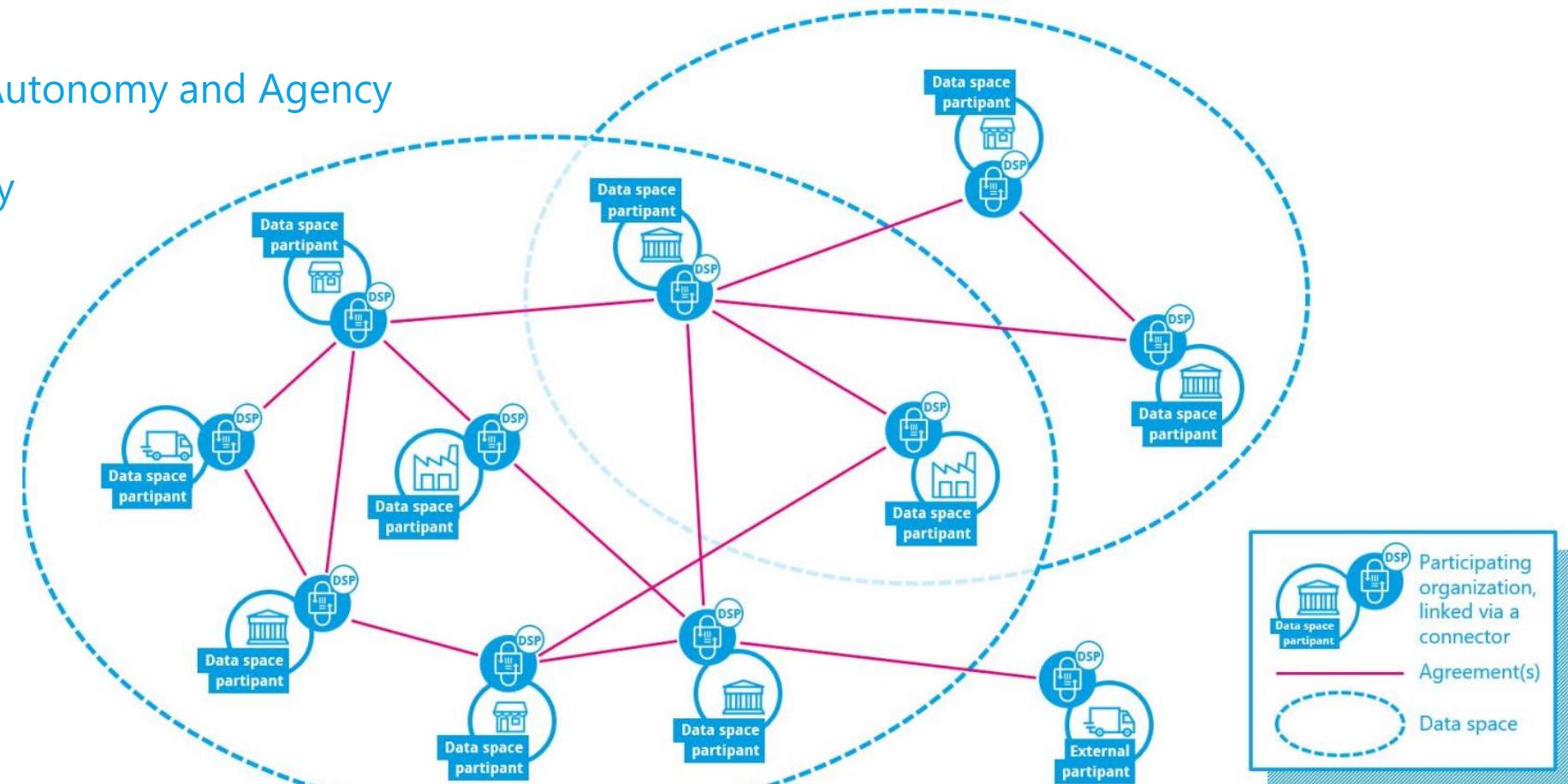
In Data Spaces

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Enabling Organizational Autonomy and Agency

Facilitating interoperability

Creating resilient
and dynamic
Data Value Chains



Picture source: IDSA Data Space Connector Report

Data space characteristics | ISO/IEC 20151



Maintain control



Establish trust



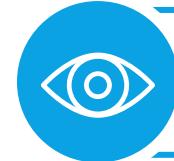
Discover data



Negotiate data sharing contracts



Orchestration of data sharing



Observability of action



Interoperability

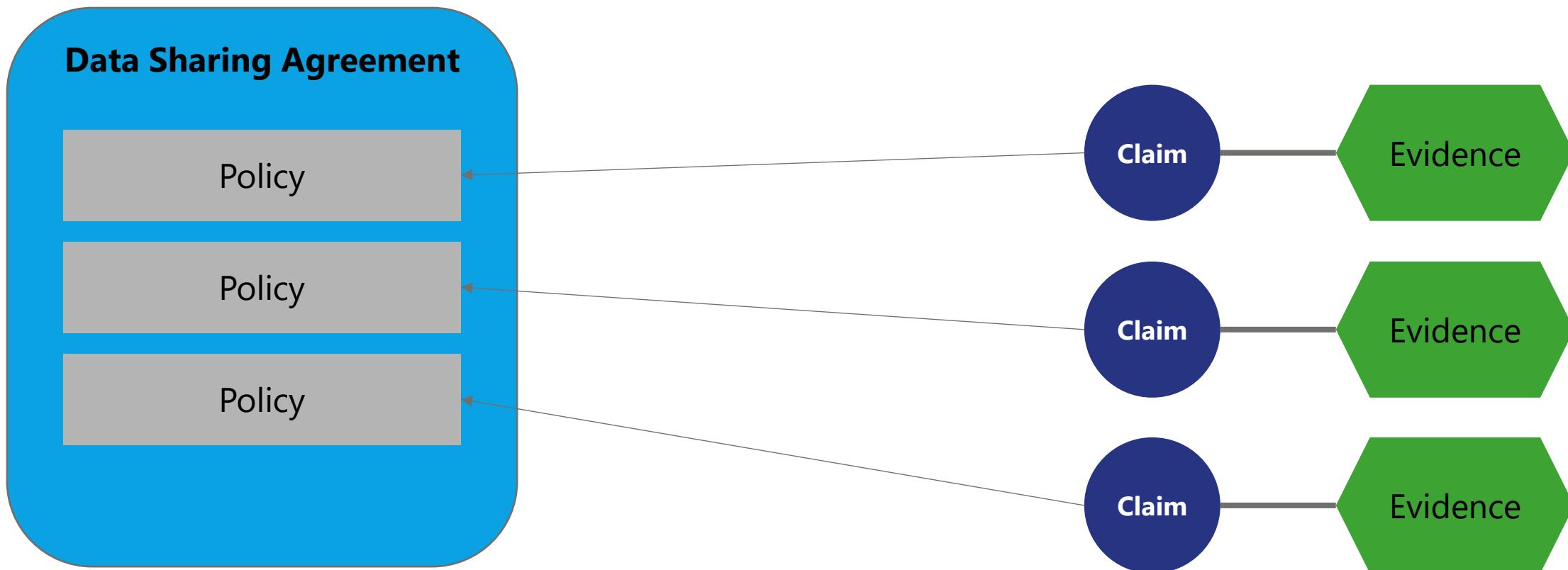
Functional components

- Multi-level policies
- Semantic models
- Communication protocols
- Processes and Rules

Policy and Claim Reconciliation

The automated execution of data sharing agreements

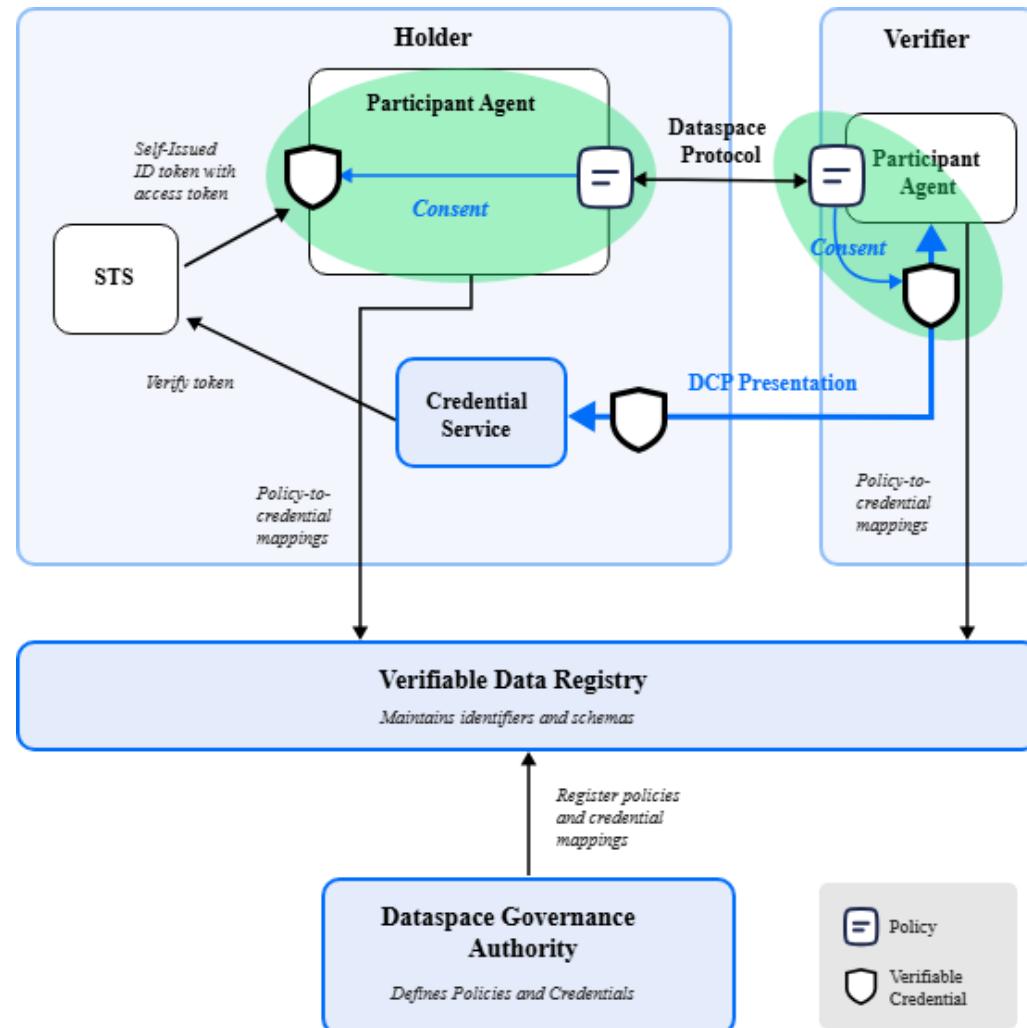
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The Decentralized Claims Protocol

ISO/IEC DIS 26451

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Consent is the process where the Holder approves the release of a Verifiable Presentation and the Verifier agrees to allow access to a protected resource.

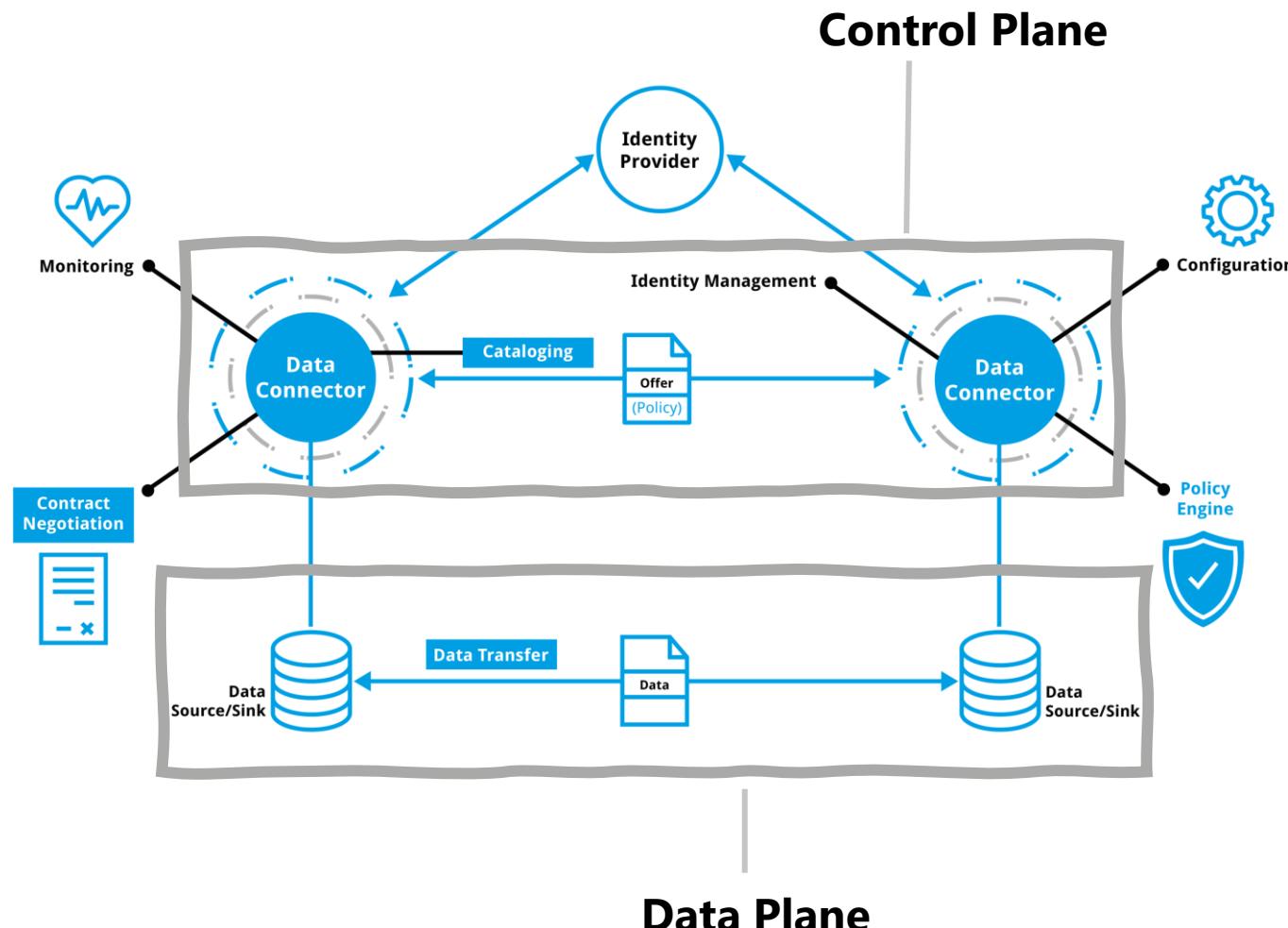
The Dataspace Protocol is built on machine-to-machine message exchange patterns, presentation protocols that rely on end-user (i.e., human) consent are not applicable.

Consent is handled by first mapping Dataspace Protocol Offer and Agreement policies to a set of REQUIRED Verifiable Credentials. ...

The Dataspace Protocol

ISO/IEC DIS 26450

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DCAT enables semantic interoperability by providing a **shared**, machine-readable vocabulary that ensures datasets are **described consistently** across organizations and domains.



ODRL enables semantic interoperability by providing a standardized, machine-readable language for expressing **usage rights and policies**, ensuring that data access and permissions are understood consistently across systems and organizations.

Meaningful data

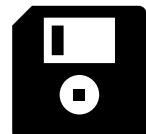
Semantic interoperability of



Metadata, e.g catalogues



Policies & Claims

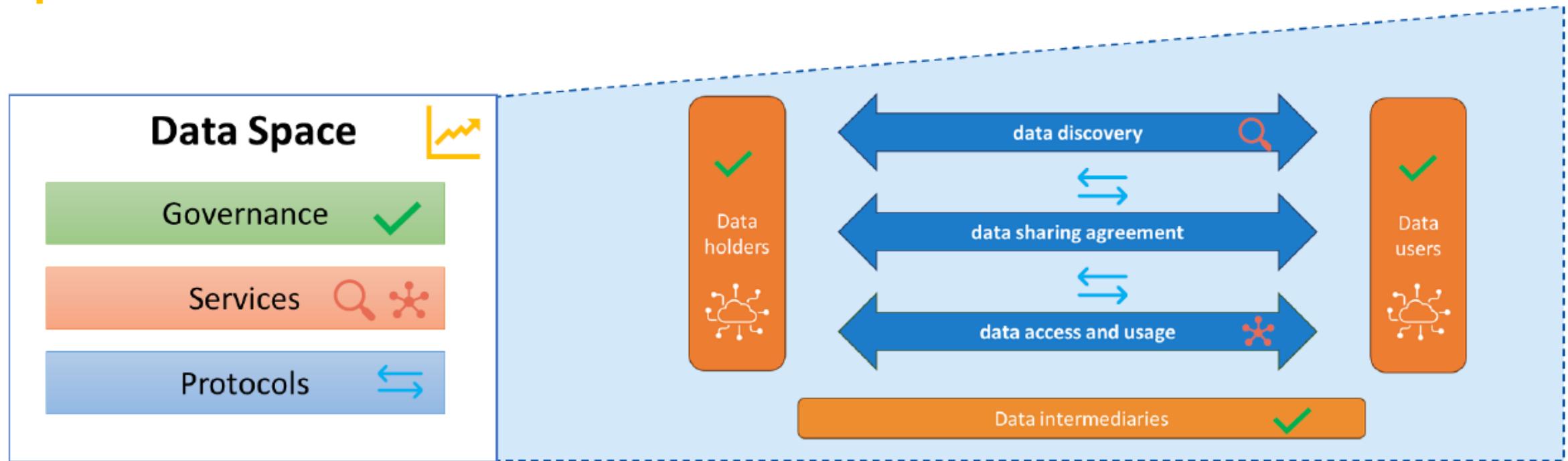


Data and Data Products

Compliance with the EU Data Regulation

Data Act §33

Standardisation request European Trusted Data Framework



↔ Trusted Data Transaction standard

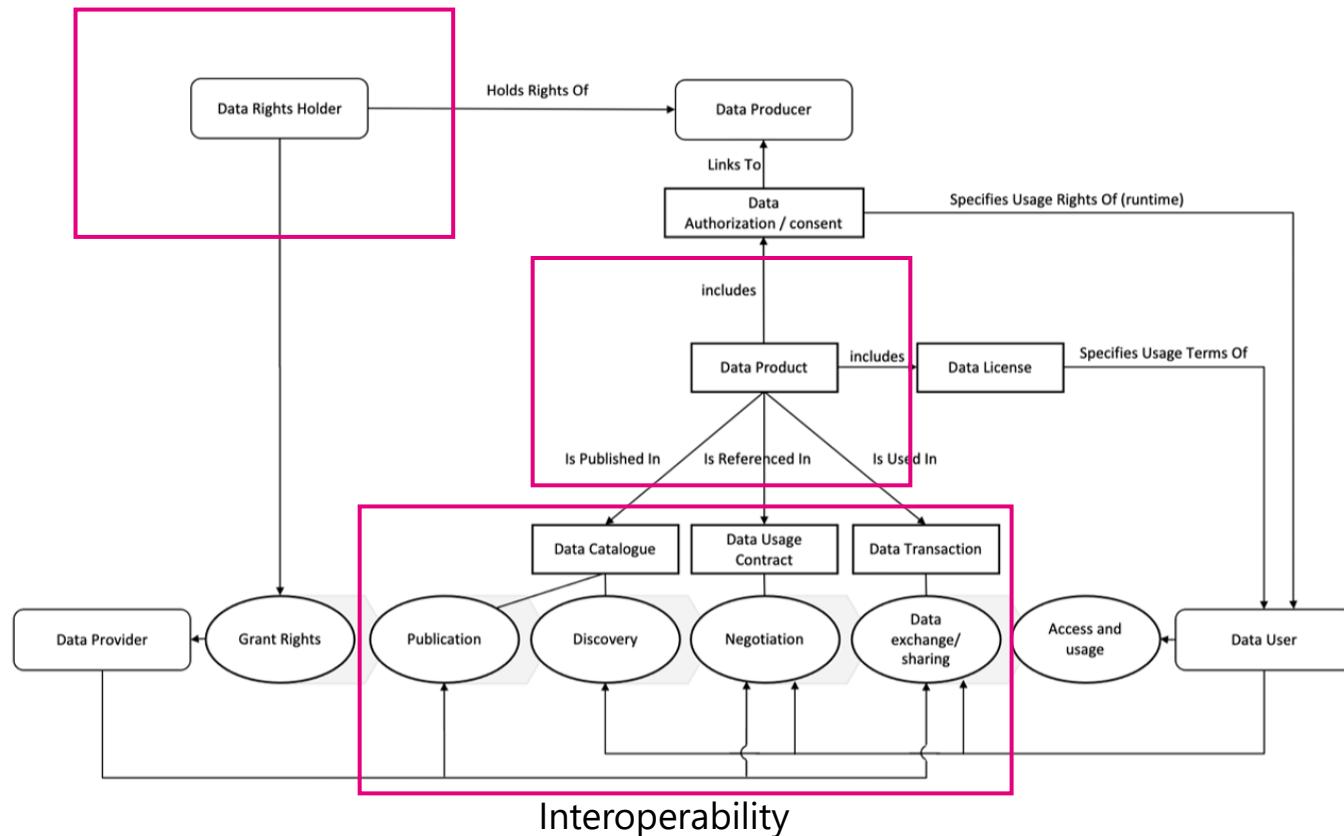
🔍 Data catalogue implementation framework

✓ Data governance standard for data space participants

❖ Semantic assets implementation framework

↗ Maturity model for Common European Data Spaces

Key result Trusted Data Transaction



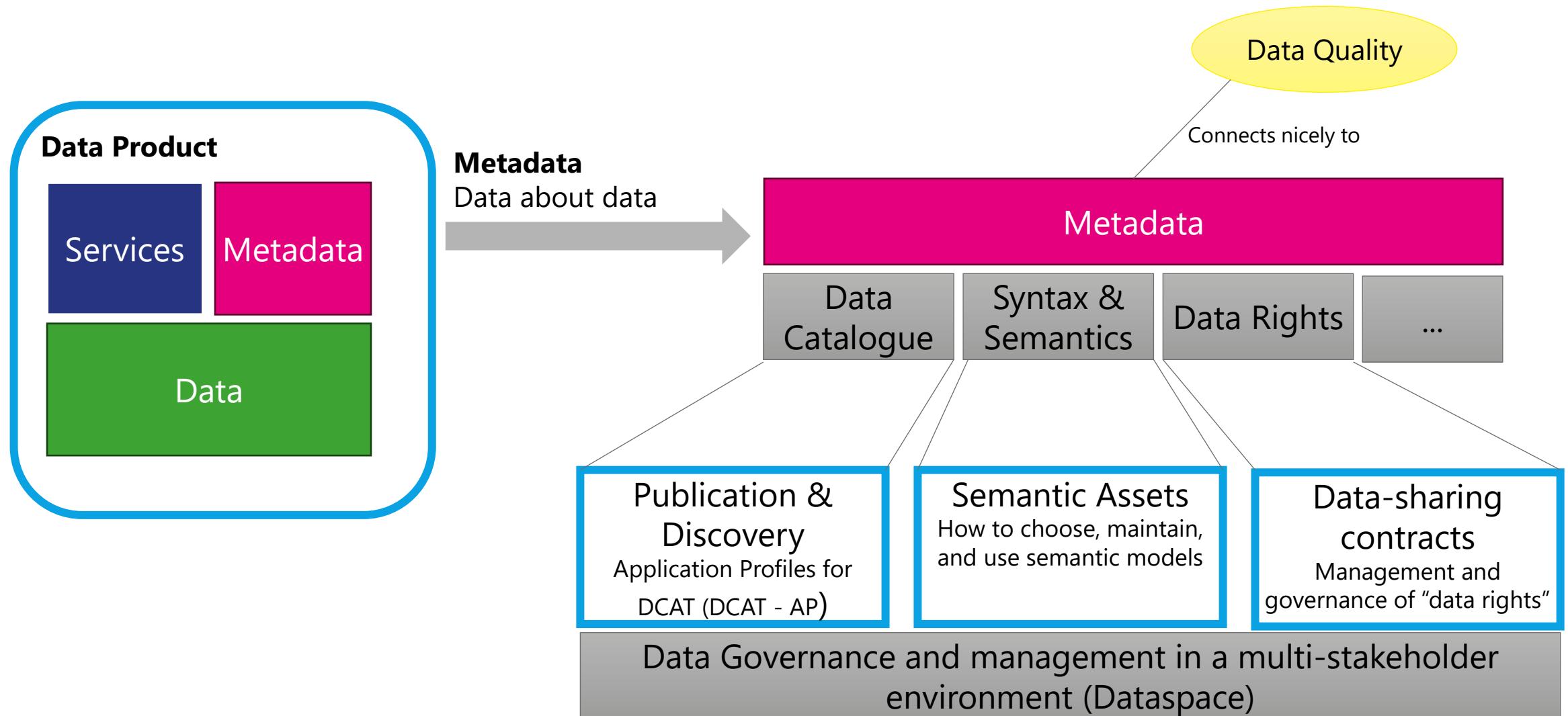
Trusted Data Transaction is a multipart harmonized standard to fulfill the requirements of the EU Data Act §33

Part 1: Concepts, terminology, and mechanisms,

Part 2: Trustworthiness requirements

Part 3: Interoperability requirements

Data Product in JTC 25



Are we already done?

What is left on our to do list?

- Creation of Data Products
 - Meaningful and interoperable data products
 - Fit for purpose
 - Balancing availability and control
- Business Models
 - Maturity of Data Products
 - Digital Maturity of organizations
 - We are not yet in the data economy
- Tools to enable organizations of all types and sizes, including
 - Open Source
 - Methodological approaches
- Shared governance in a multilateral environment (Rulebooks)
- Education and enabling of (human) decision making
- Applied regulation and digital sovereignty concerns



Thanks!

Sebastian Steinbuss