



INTERNATIONAL DATA  
SPACES ASSOCIATION



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

*DEMAND Community event  
Nijmegen, January 27, 2026  
Sebastian Steinbuss*





*Innovation by AI requires ecosystems*

*Data ecosystems require data*

*Semantic interoperability between platforms and ecosystems*

**DATA SHARING**

**IS BETTER THAN PLAYING ALONE**



INTERNATIONAL DATA  
SPACES ASSOCIATION



*Innovation by AI requires ecosystems*

*Data ecosystems require data*

*Semantic interoperability between platforms and ecosystems*

INTERNATIONAL DATA  
SPACES ASSOCIATION



**DATA SHARING**

**IS BETTER THAN PLAYING ALONE**

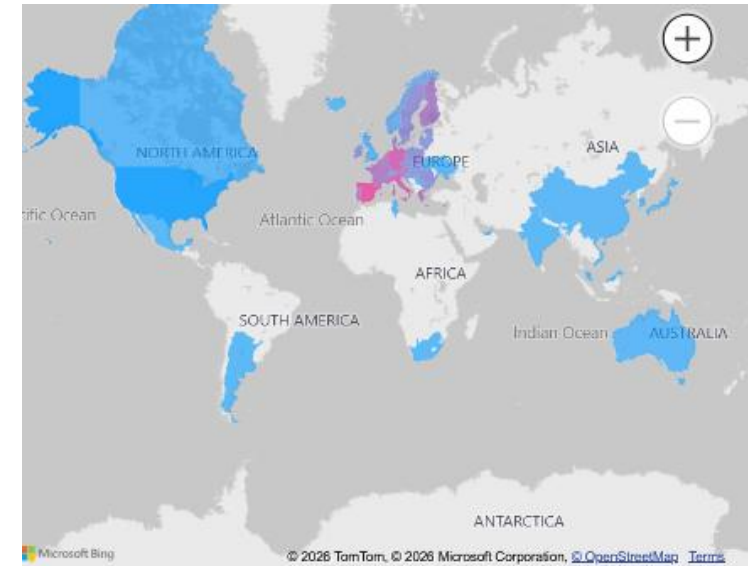
**10 years**

# 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

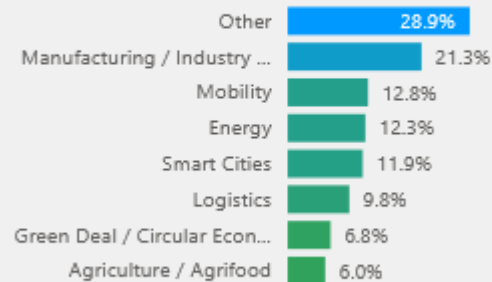
INTERNATIONAL DATA  
SPACES ASSOCIATION



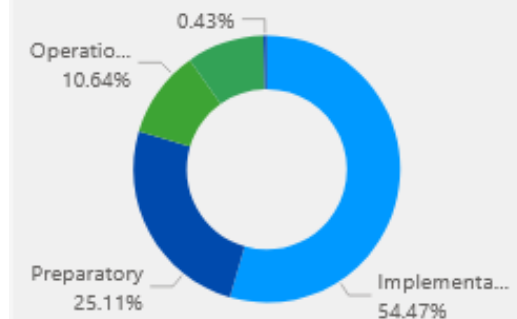
### Business Case Pattern



### Sectors



### Development Stage



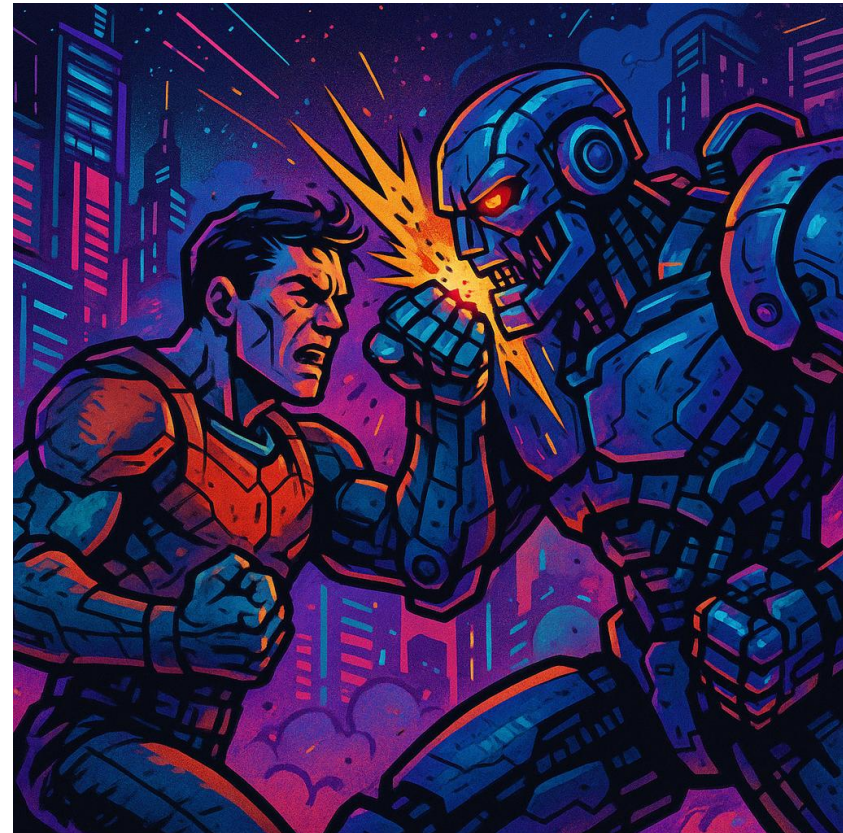


# The everlasting and epic fight between humans and machines

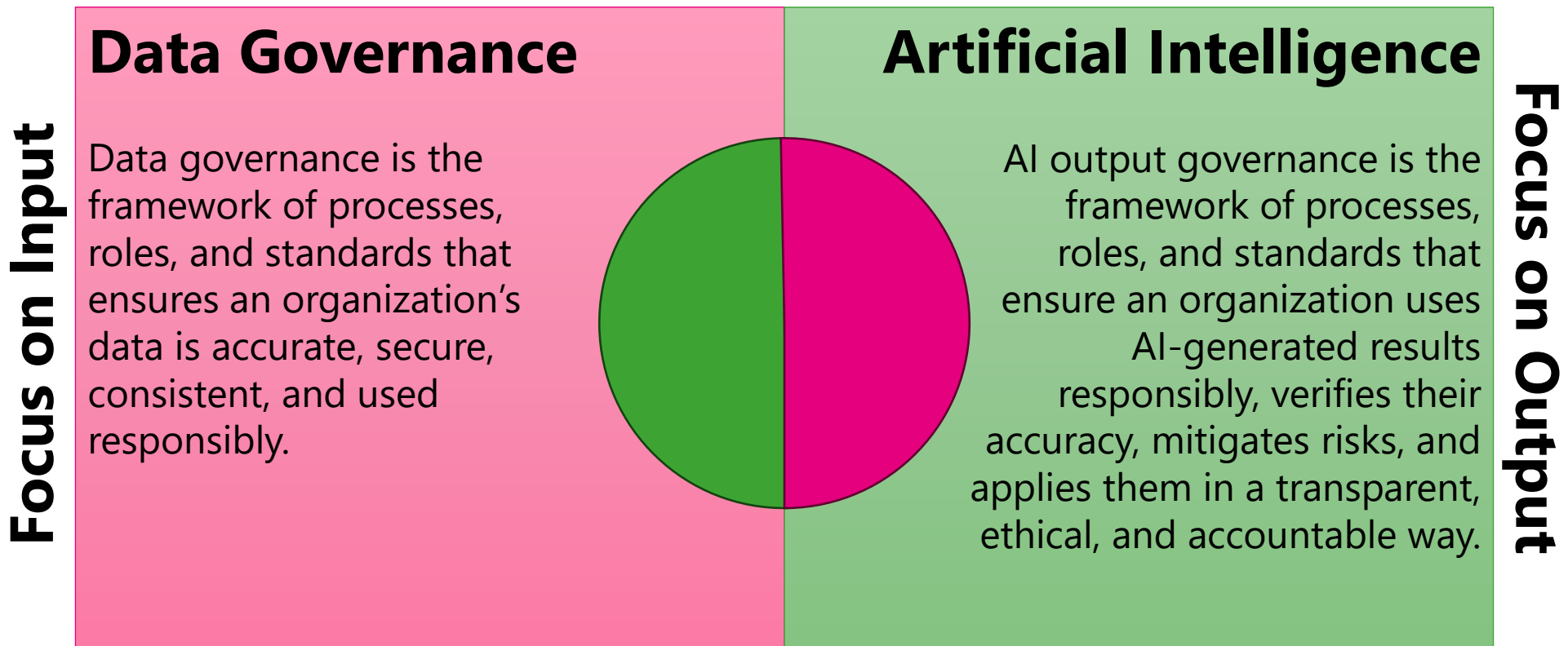


*AI, Trust and Trustworthiness, Data Governance*

- **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



# 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

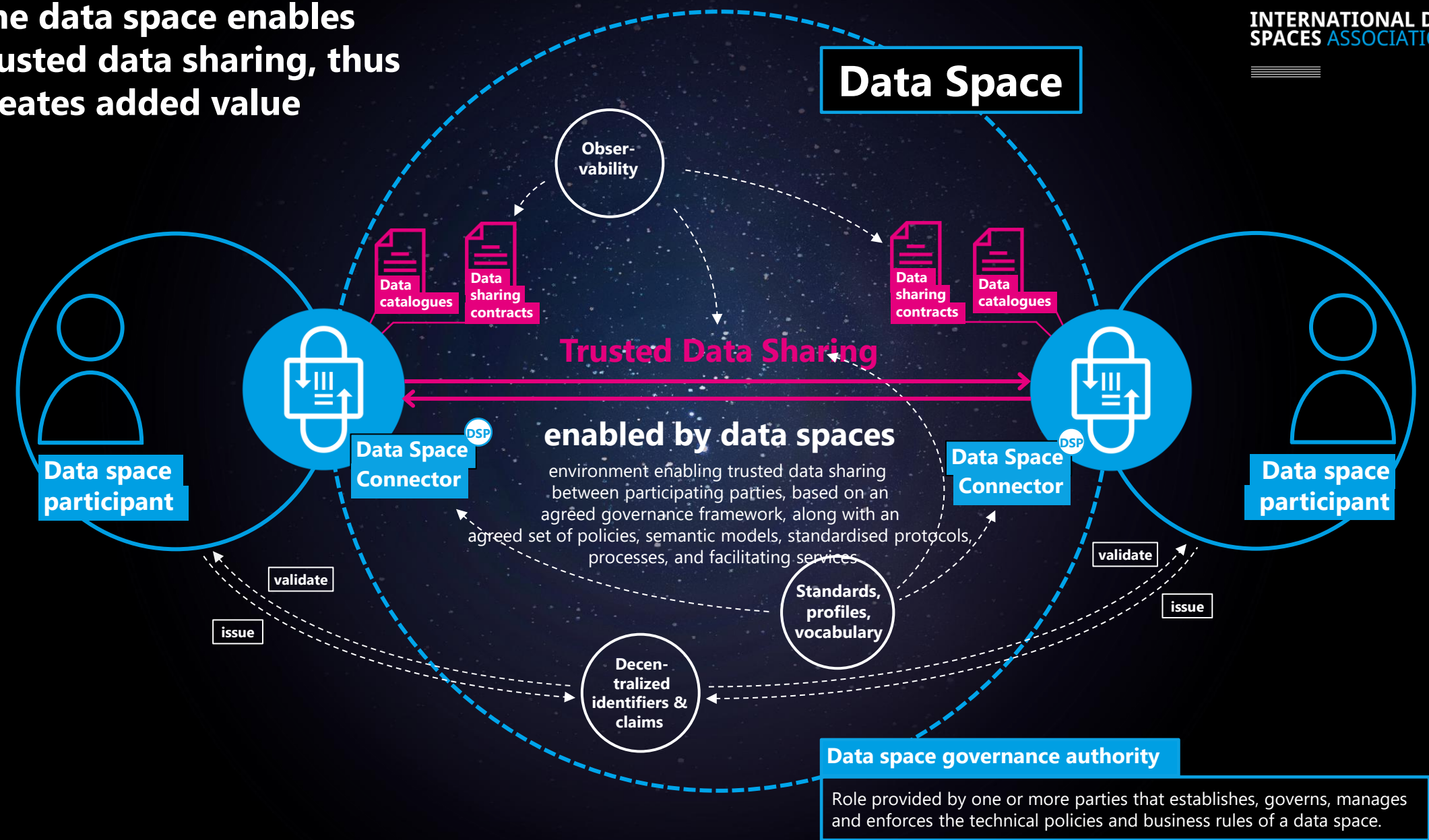
## » **Economic facet**

- » 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





# Data Space

*Dataspace*

INTERNATIONAL DATA  
SPACES ASSOCIATION



- » **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*

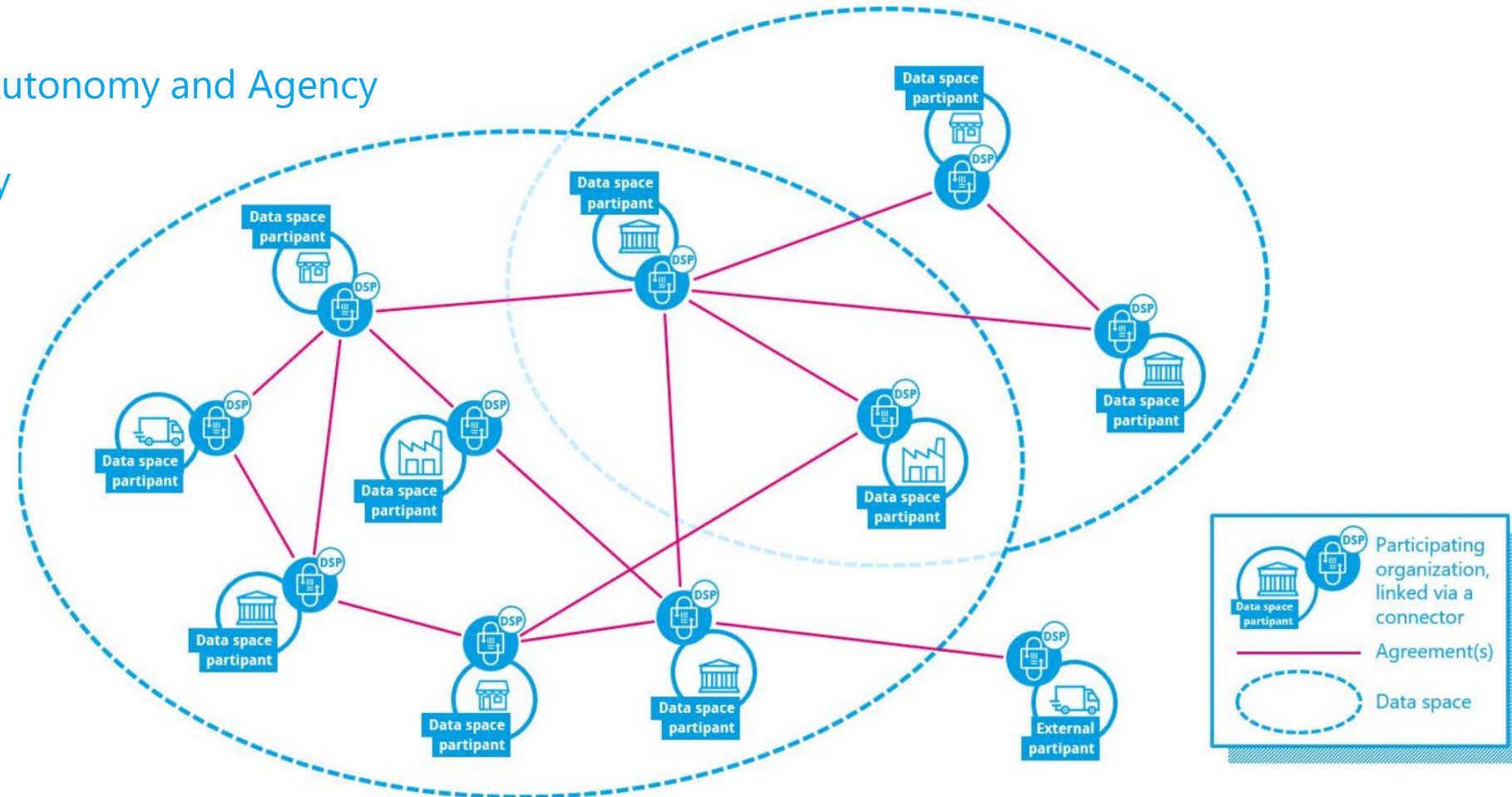
INTERNATIONAL DATA  
SPACES ASSOCIATION



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

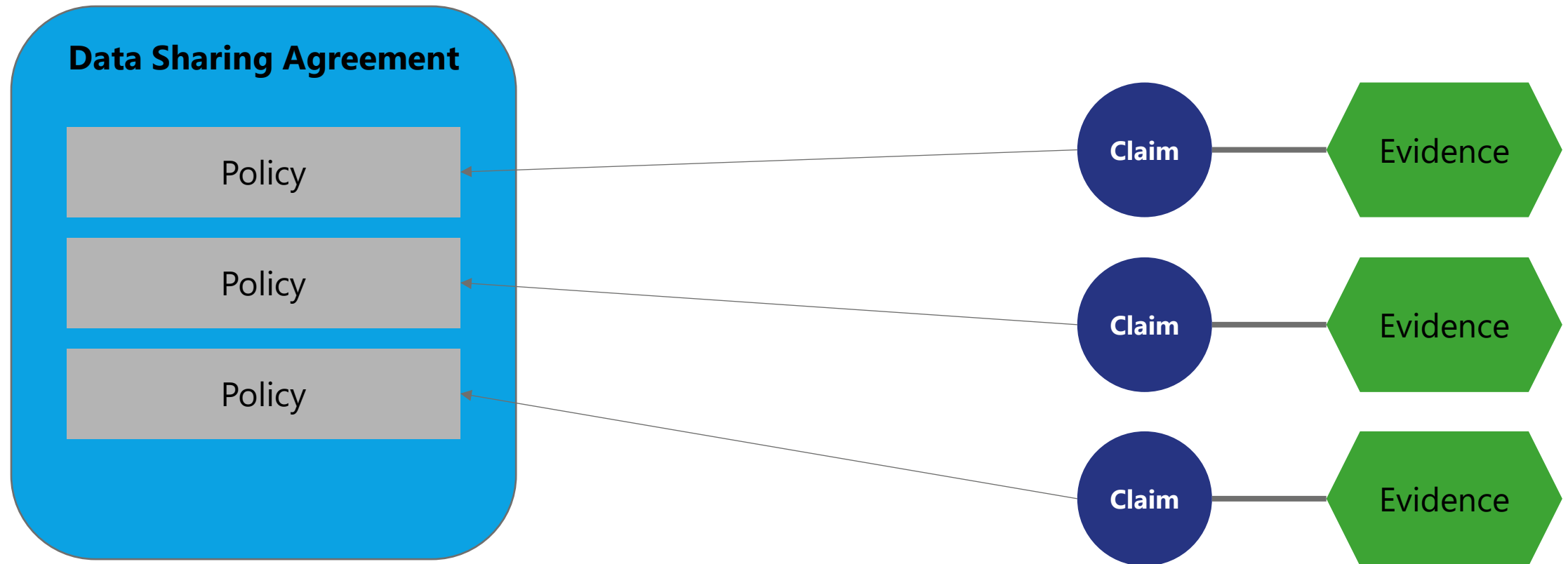
## Functional components

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

# Policy and Claim Reconciliation

*The automated execution of data sharing agreements*

INTERNATIONAL DATA  
SPACES ASSOCIATION

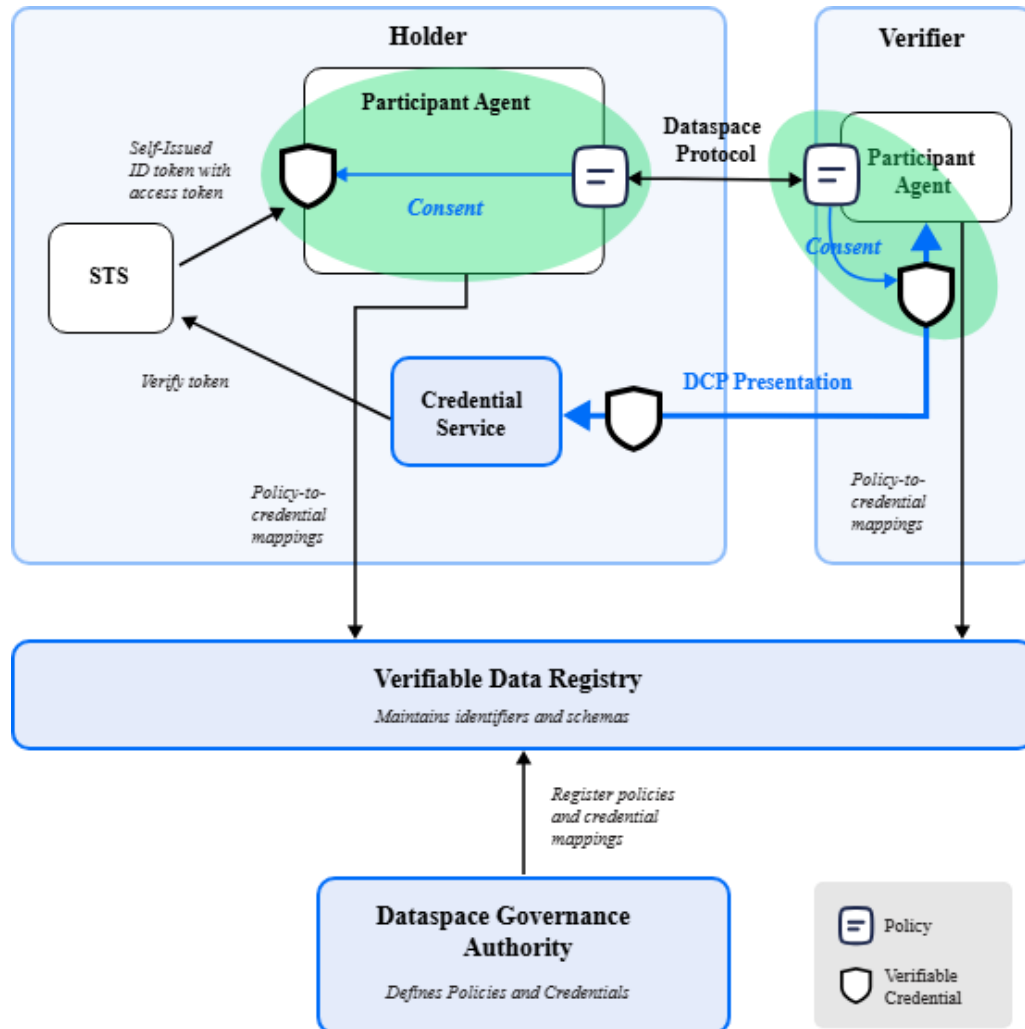
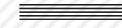




# The Decentralized Claims Protocol

ISO/IEC DIS 26451

INTERNATIONAL DATA  
SPACES ASSOCIATION



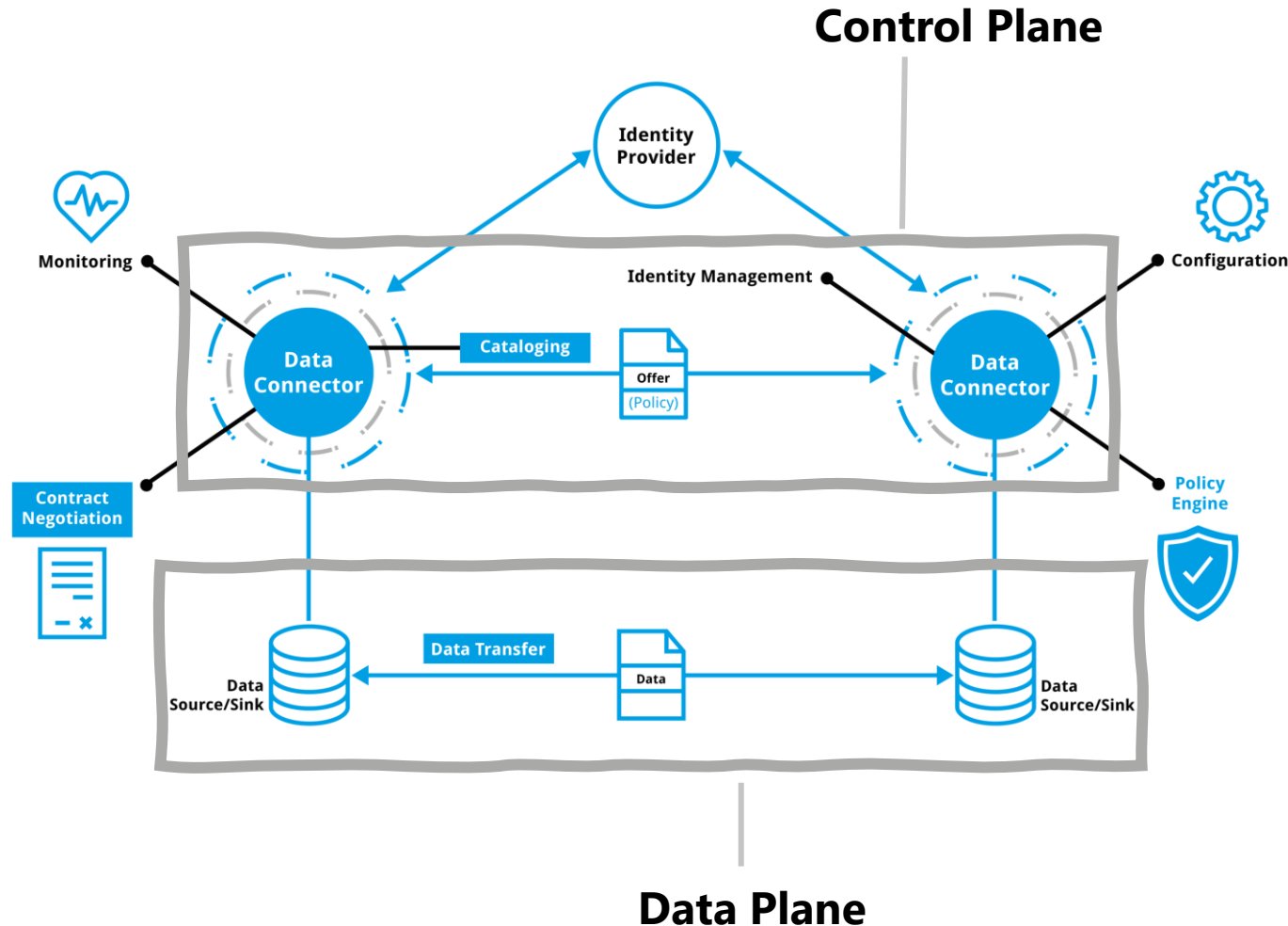
Consent is the process where the Holder approves the release of a Verifiable Presentation and the Verifier agrees to allow access to a protected resource.

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



INTERNATIONAL DATA  
SPACES ASSOCIATION



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

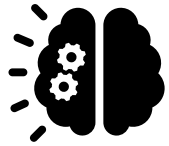


ODRL enables semantic interoperability by providing a standardized, machine-readable language for expressing **usage rights and policies**, ensuring that data access and permissions are understood consistently across systems and organizations.



# Meaningful data

*Semantic interoperability of*



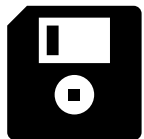
---

Metadata, e.g catalogues



---

Policies & Claims



---

Data and Data Products

---



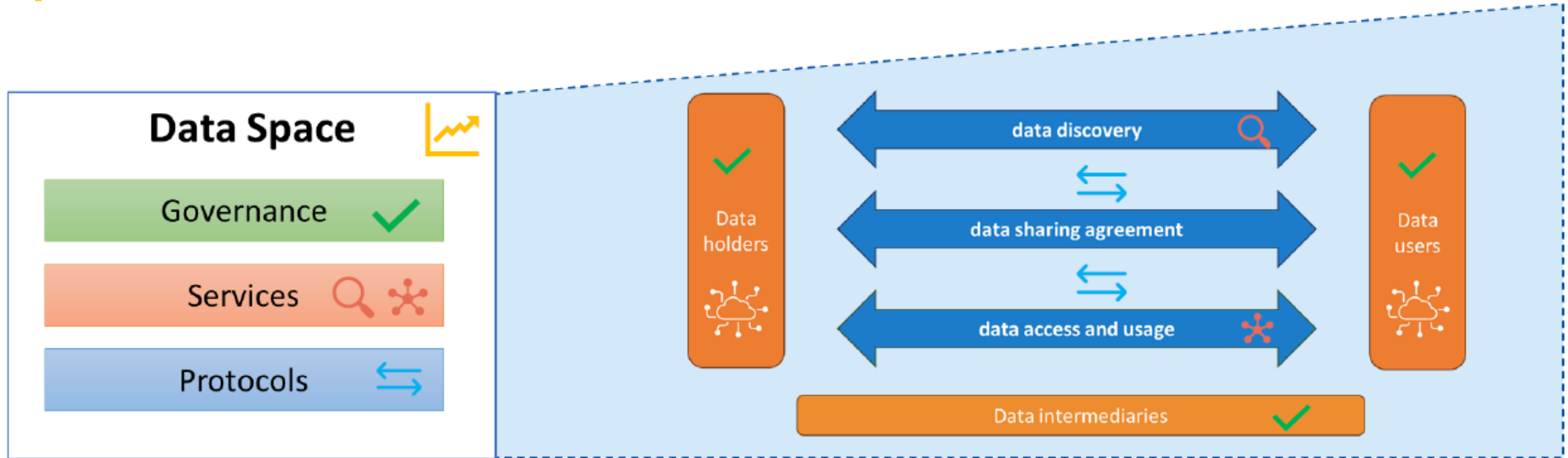
# Compliance with the EU Data Regulation

*Data Act §33*



# Standardisation request

## European Trusted Data Framework



Trusted Data Transaction standard



Data governance standard for data space participants



Maturity model for Common European Data Spaces



Data catalogue implementation framework

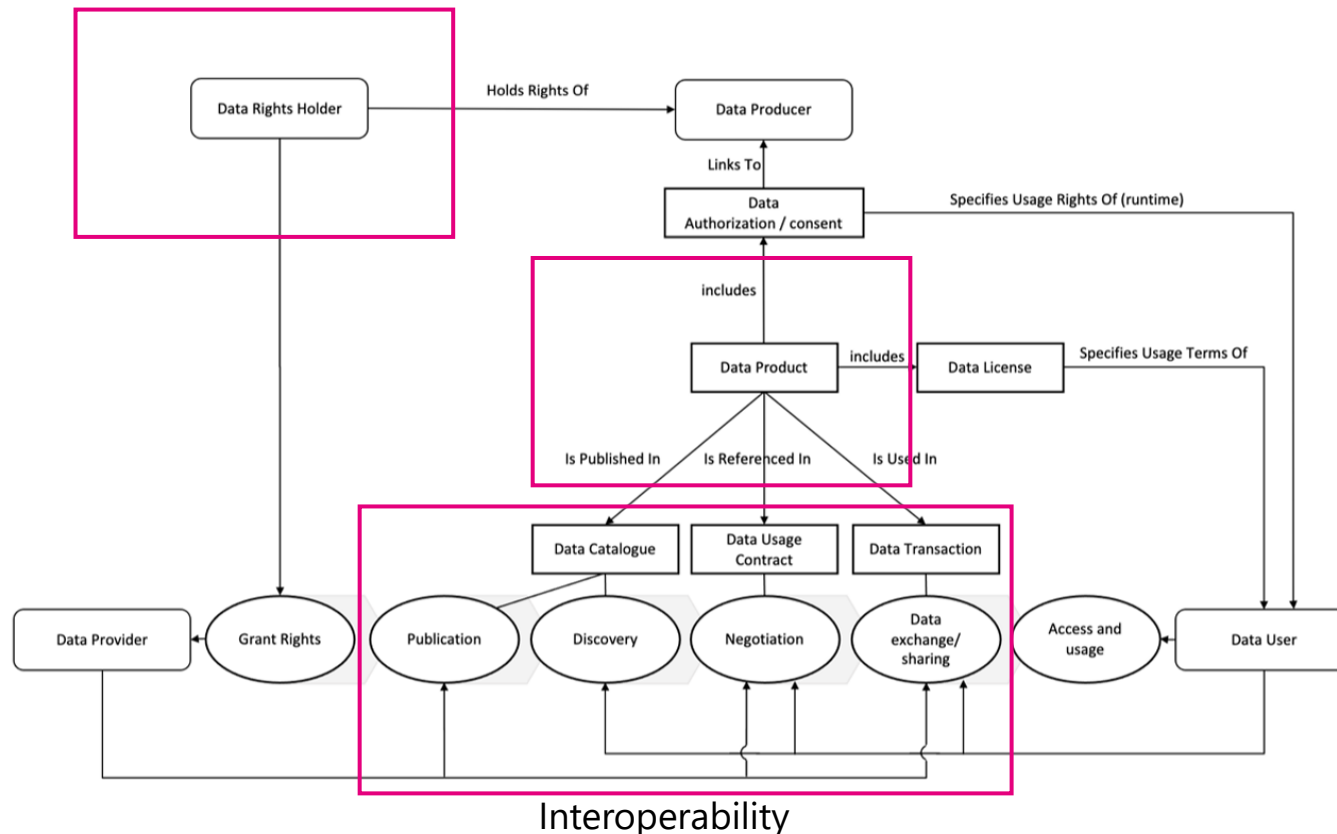


Semantic assets implementation framework



European Commission

# Key result Trusted Data Transaction



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

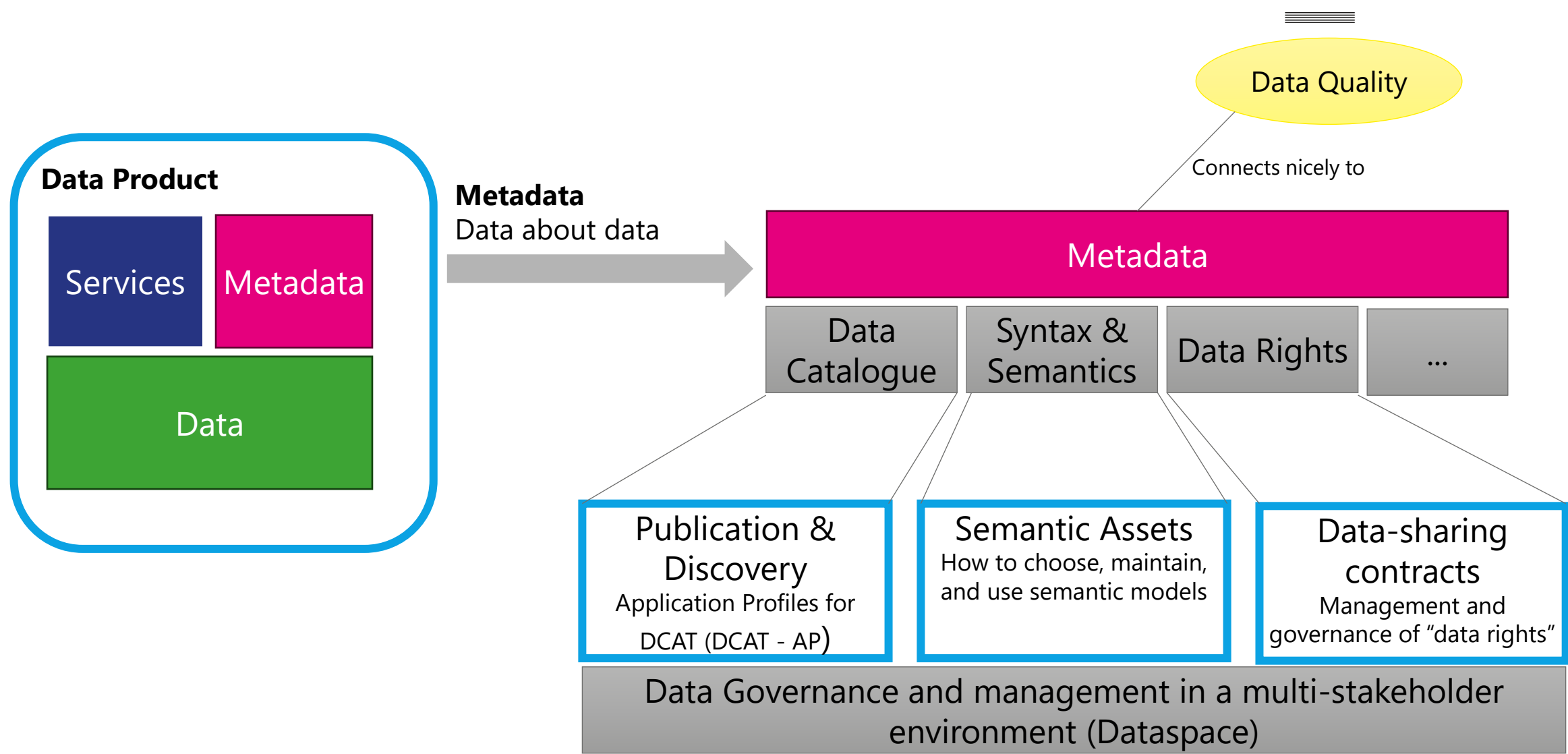
Part 1: Concepts, terminology, and mechanisms,

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



A dramatic photograph of a space shuttle launching from a launchpad. The shuttle is ascending vertically, leaving a massive, billowing plume of white and orange smoke and fire behind it. The launchpad structure is visible at the bottom, and the sky is a mix of blue and white clouds.

INTERNATIONAL DATA  
SPACES ASSOCIATION

**Thanks!**

*Sebastian Steinbuss*