INTERNATIONAL DATA SPACES ASSOCIATION

Next level data spaces:
Making the Dataspace Protocol an international standard

Brussels | September 9, 2024

Making the Dataspace Protocol an international standard

INTERNATIONAL DATA SPACES ASSOCIATION

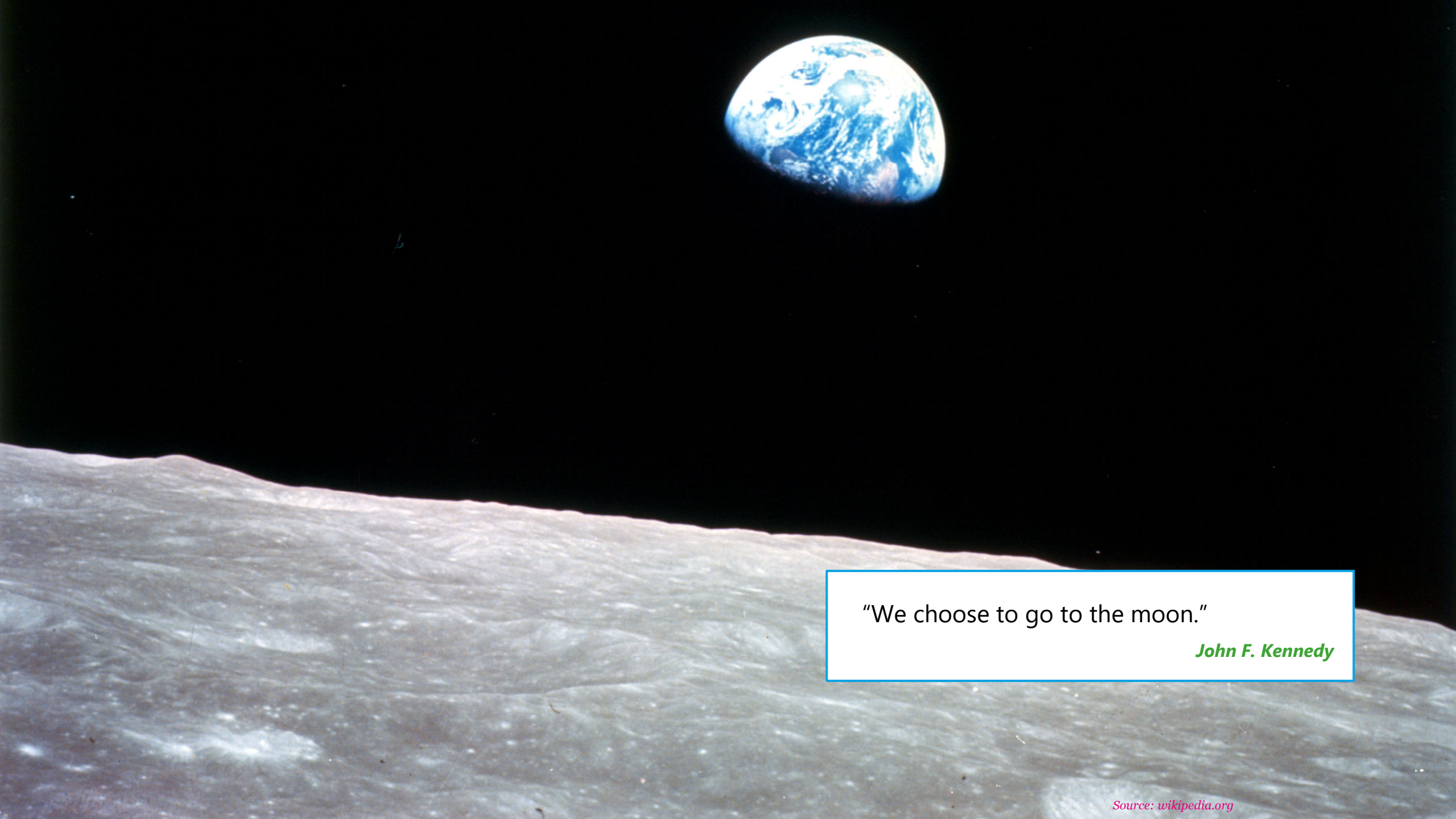
High-level stakeholder event | agenda

16:00	Welcome addresses	Lars Nagel, IDSA | Boris Otto, Fraunhofer ISST
16.15	International standardization in data spaces as an accelerator to the digital economy	Coen Janssen, EC
16:25	Introduction to the Dataspace Protocol (DSP)	Anil Turkmayali, IDSA
16:35	The Path to international standardization	Michael Plagge, Eclipse Foundation
16:45	The DSP in the wild – in projects, in open-source programs, in industries	Anil Turkmayali, IDSA
	» DigiChecks | applying project	Gonzalo Gil, Tekniker
	» Enershare | applying project	Maarten Kollenstart, TNO
	» DIVINE | feedback loop	Marios Paraskevopoulos, NTUA
	» Simpl | DSP as technological foundation	Saulo Sini, Eviden
	» IONOS | DSP's relevance for ICT providers	Arian Firouzbakhsh, IONOS
	» Catena-X | DSP for industrial data spaces	Matthias Buchhorn-Roth, Cofinity-X
17:35	More to do: The DSP in the context of other standardization efforts	Silvia Castellvi, IDSA
17:40	Partners's view: the technologies that complement IDS	Gerard van der Hoeven, iSHARE | Ulrich Ahle, Gaia-X | Lars Nagel, IDSA
17:55	Questions & answers	
18:10	Further discussion with some drinks	

Welcome address

Lars Nagel, IDSA
Boris Otto, Fraunhofer ISST

01



"We choose to go to the moon."

John F. Kennedy

Source: wikipedia.org

Our north star: make data economy happen

Using the data space model is the best solution to unleash data sharing's potential

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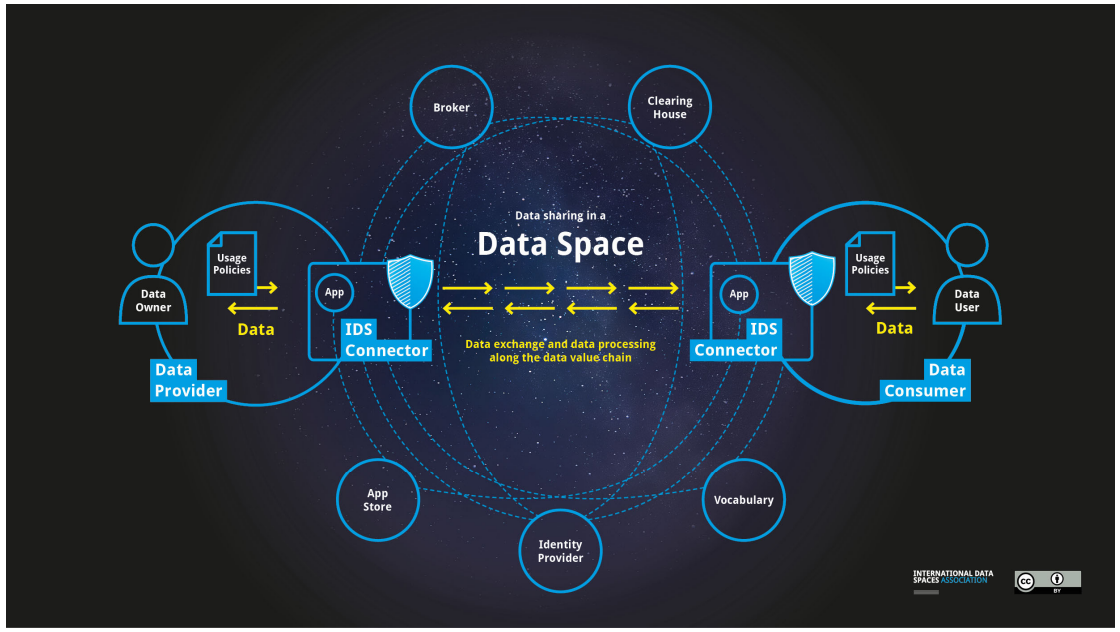
What exactly does "data economy" call for?

- Trusted data sharing in decentralized ecosystems: Trusted parties and components
- Your data, your choice
- Make FAIR principles work
- Understand others: data models
- Process data, remote execution, code2data
- Value creation based on data data
- Usage policies and enforcement



IDS Reference Architecture, Data Space Protocol, IDS Rulebook and IDS-certified connectors guarantee these features

How to make something great happen

Data Spaces as enablers of data economy and our dreams

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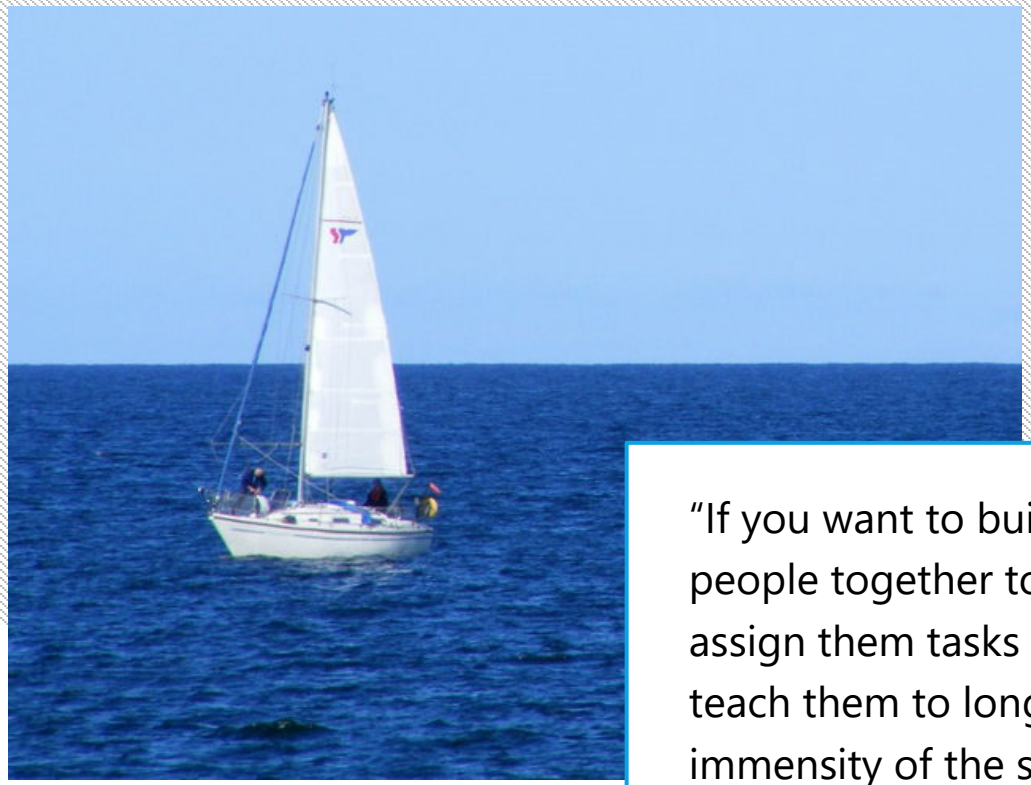

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Source: commons.wikimedia.org

"If you want to build a ship, don't herd people together to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea."

Antoine de Saint-Exupery

A holistic approach to bring data spaces to global scale

IDSA on its way to a global standard

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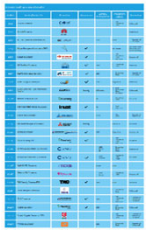
Global Standardization

W3C · IEEE · CEN CENELEC · IEC ISO

Aligning architectures, market proliferation and thought leadership on data spaces

DESIGN PRINCIPLES FOR DATA SPACES + BDV · MyData · European Commission · gaia-x · iSHARE · FIWARE · DATA-EX · DATA SPACES SUPPORT CENTRE



Catena-X Automotive Network · SCSN smart connected supplier network · EDNA-X · Mobility Data Space Data Sharing Community · DATA-EX Data Society Alliance · omega-x

Fostering market adoption: Increasing readiness level and extensive use of IDS concepts

IDSA Rulebook for holistic governance view	**Reference Architecture** as technology-agnostic framework on conceptual model	**Dataspace Protocol** as detailed specification and essence for interoperability	**Certification** for reliable, industry grade components	**Diverse landscape** of usable components **based on OSS** and **radar** as orientation for ecosystem building and future	**Running Data Spaces** as impressive impact stories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SPACES ASSOCIATION
Start your journey
Be a Data Space pioneer
Become a member!

International standardization in data spaces as an accelerator to the digital economy

Coen Janssen, European Commission

02

International standardization in data spaces as an accelerator to the digital economy

IDSA High-level stakeholder event, 09 September 2024

Coen Janssen
Policy Officer at the European Commission
DG Connect - Data policy & innovation

European Single Market for Data

Data legislation

- Data Act
- Data Governance Act
- Open Data Directive
- GDPR
- …

Common European Data Spaces

- Health
- Industrial & Manufact.
- Agriculture
- Finance
- Mobility
- Green Deal
- Energy
- Public Admin.
- Skills
- EOSC
- Tourism
- Cultural heritage
- Media
- Language

High Value Datasets from public sector

European Data Innovation Board

- Facilitate the sharing of best practices
- Prioritisation of cross-sectoral interoperability standards

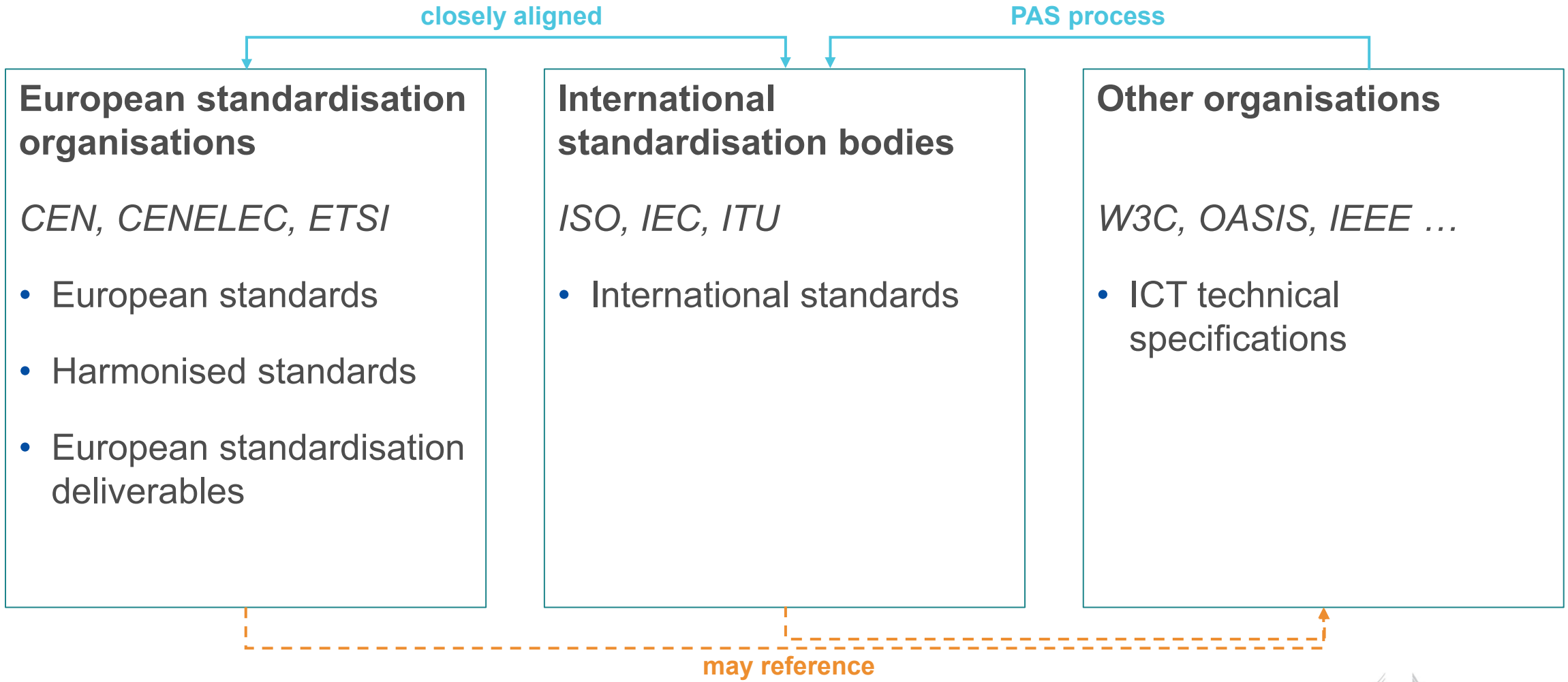
Data Spaces Support Centre

- Development of blueprint, glossary, etc.
- Support of data space projects

Technical infrastructure

- Standards
- Digital identity (eIDAS)
- Smart Middleware solutions (Simpl)
- High-Performance Computing
- Testing and Experimentation Facilities

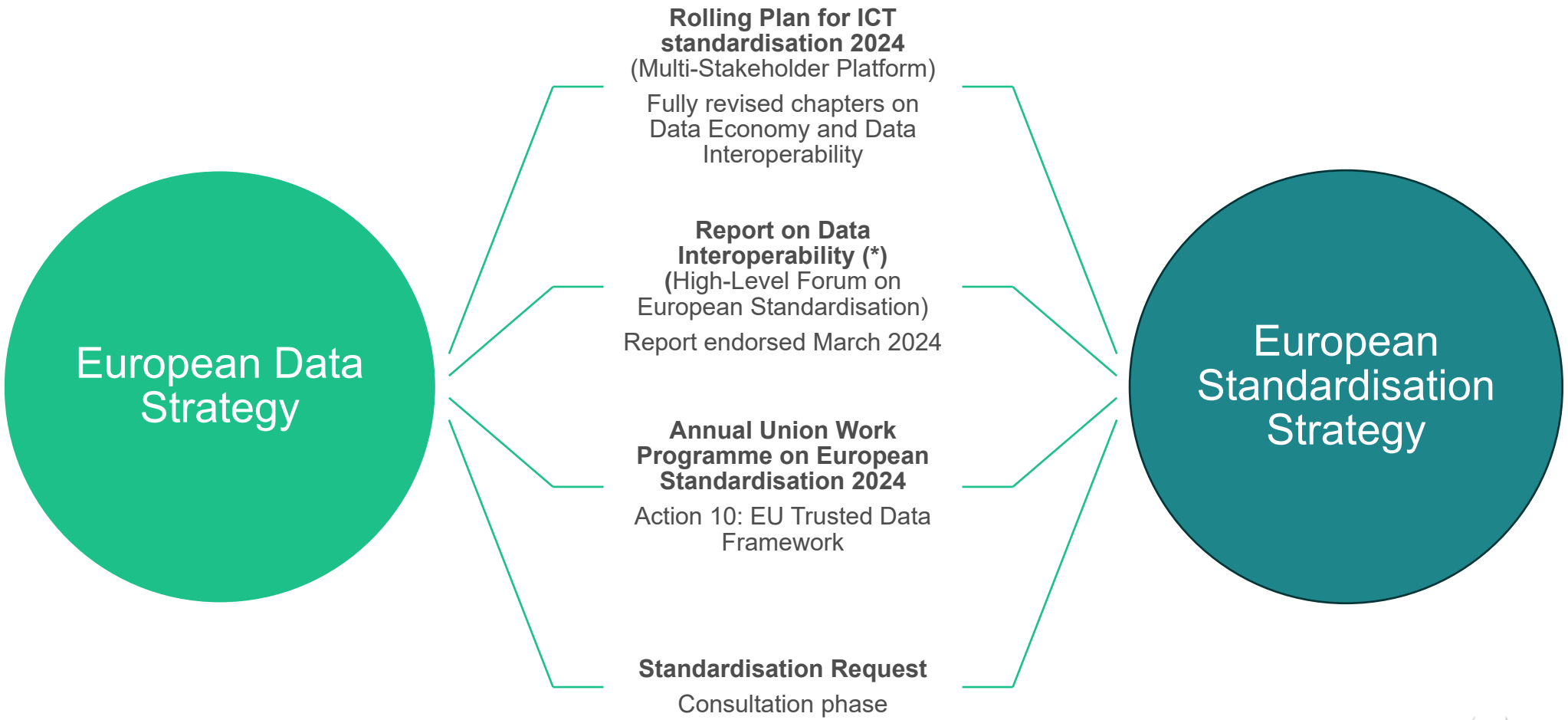
Standards
European approach to ICT standardisation



Regulation (EU) 1025/2012

European Commission

Standardisation status



(*) https://ec.europa.eu/docsroom/documents/58914

European Commission

Standardisation request
European Trusted Data Framework

Includes the following 5 standards / standardisation deliverables:

"Scorecard" for Common European Data Spaces (maturity model)	•Drive convergence and increase transparency •Leverage the work of DSSC, in particular the data spaces blueprint and the data spaces maturity model
Trusted ontologies and data models (implementation framework)	•Quality criteria on the management and maintenance of ontologies and vocabularies •Leverage the work of SEMIC, OP and DSSC
Data catalogue (implementation framework)	•Managing the core profile and domain-specific extensions (DCAT standard) •Leverage the work of SEMIC and OP (data.europa.eu)
Data governance (quality assessment standard)	•Addresses the internal data governance processes of individual organisations (data management, data quality, …) •Approach to be discussed in CEN/CENELEC focus group
Trusted Data Transaction (harmonised standard)	•Addresses the essential interoperability requirements on in Data Act article 33. •CEN pre-standardisation workshop ongoing

European Commission

European Trusted Data Framework
Foundations and ongoing work

SEMIC Support Centre

- Data Catalogue (DCAT)
- Vocabularies
- Ontologies

DATA SPACES SUPPORT CENTRE

- Data Spaces Blueprint
- Data Spaces Maturity Model

CEN CENELEC

- CEN workshop ‘Trusted Data Transaction’
- CEN/CENELEC Focus Group + JTC on Data, Dataspaces, Cloud & Edge

ETSI W3C IDSA

ISO IEC International Electrotechnical Commission

And many more…

European Commission

Thank you

European Commission

Introduction to the Dataspace Protocol: The universal standard for data sharing

Anil Turkmayali, IDSA

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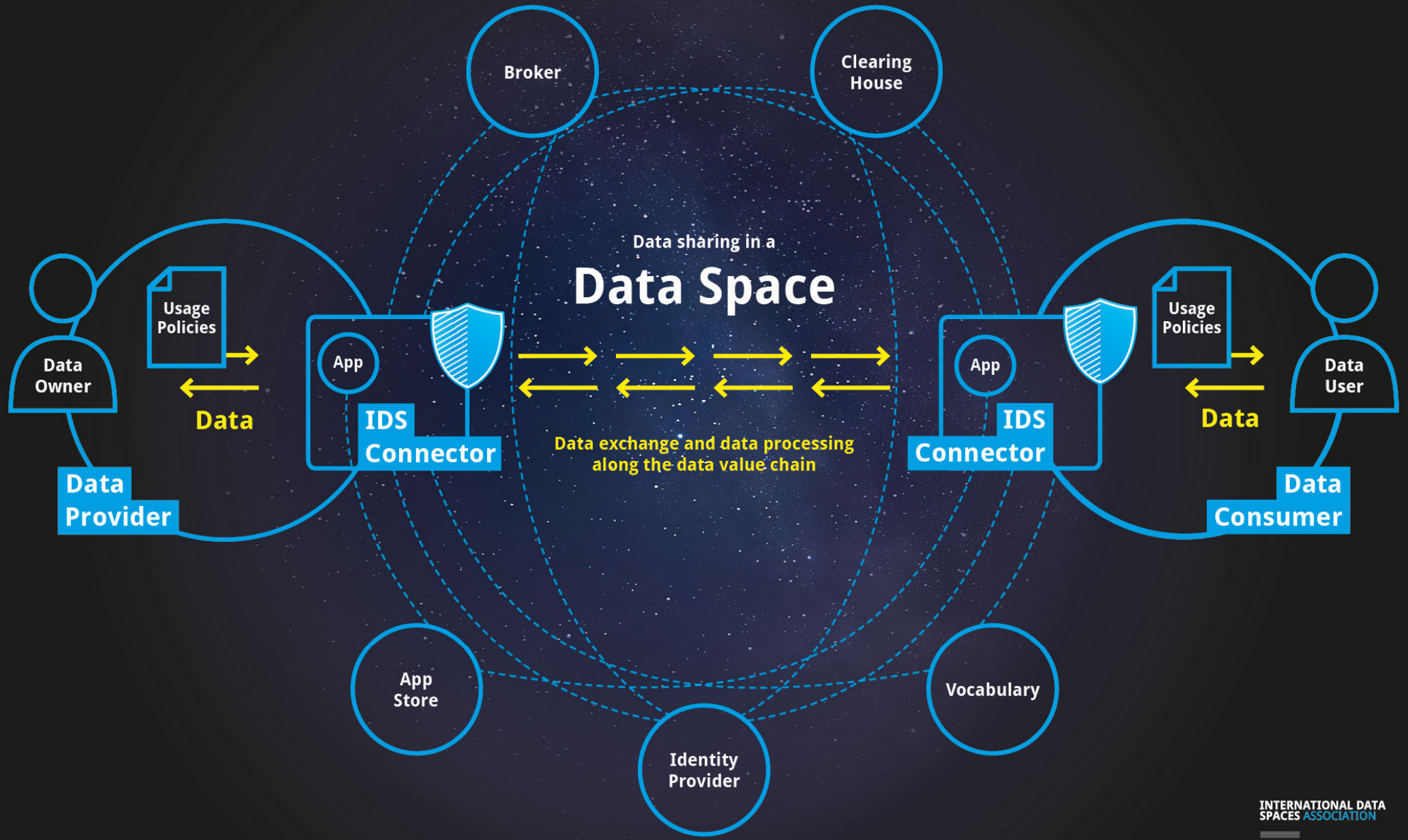

What is the Dataspace Protocol?

The essence for interoperability

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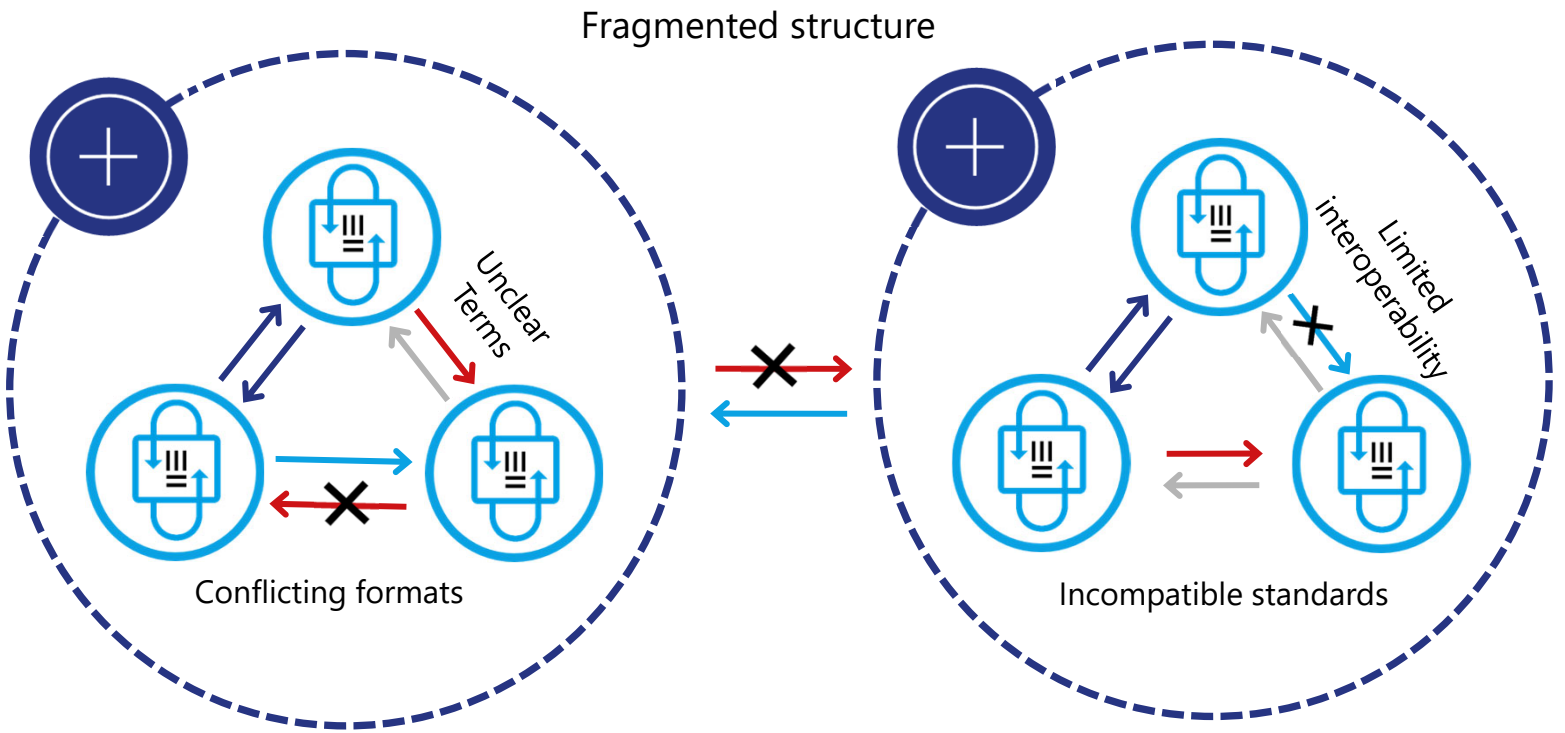

Data Spaces Require:

- Data Sovereignty
- Interoperability
- Scalability
- Trustworthiness

Remember these:

- SWIFT
- HTTP, TCP/IP
- GSM
- Bluetooth

Dataspace Protocol

Protocol's Structure

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Catalog Protocol

- Defines how data is listed and organized by the provider.
- Makes data easy to find and understandable for potential consumers.
- Ensures data is described in a consistent, standard format.
- **You prepare and offer what is available**

Contract Negotiation Protocol

- Facilitates the agreement on data usage terms between provider and consumer.
- Defines how long, for what purpose, and under what conditions data can be used.
- Provides a clear process to negotiate and finalize these terms.
- **You negotiate and agree on how the data will be used**

Transfer Process Protocol

- Manages the actual transfer of data once terms are agreed upon.
- Ensures data is shared securely and follows the negotiated rules.
- Supports different types of data transfers (e.g., one-time or continuous).
- **You execute the data transfer according to the agreed terms**

Driving data spaces innovation

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Collaborators defining and embracing the Dataspace Protocol

Who co-defined it?

SAP
Microsoft
IONOS
Fraunhofer
SOVITY
FIWARE
eng
HUAWEI
TNO
Tekniker
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
T Systems
BOSCH
ZF
Catena-X
BMW

Who is currently using it?

Catena-X
Tekniker
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
ONENET
one network for Europe
ZF
AMADEUS
VTT
Cofinity-X
PROMETHEUS-X
T Systems
Boot-X
HUAWEI
SAP
truzzt
TECH2B
X-ROAD
Open

The Path to international standardization

Michael Plagge, Ecplise Foundation

04

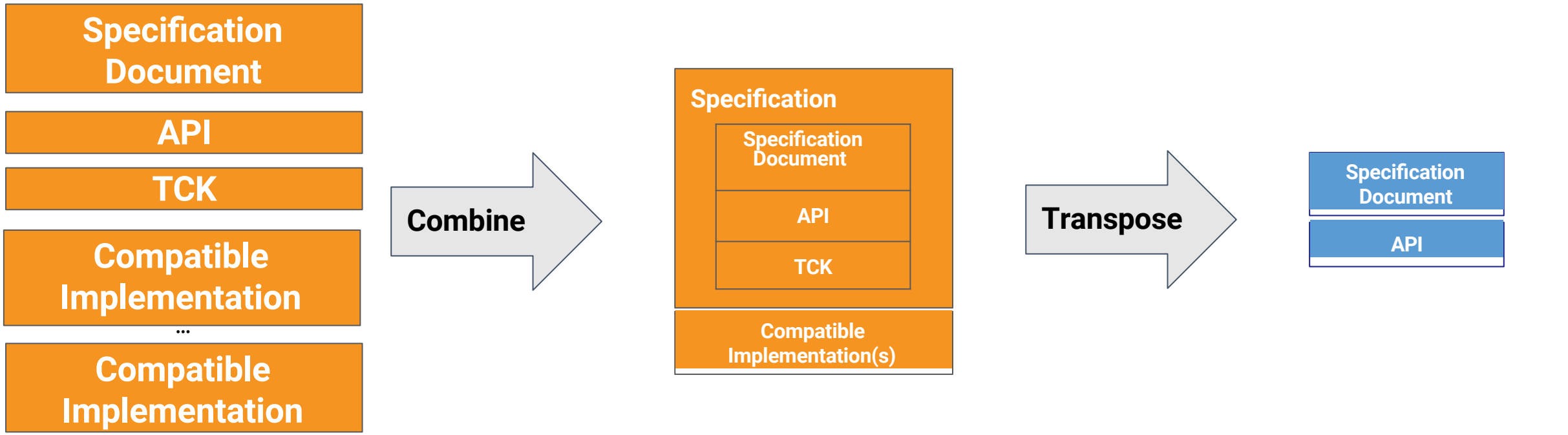
ECLIPSE®
FOUNDATION

The path to international standardization

The Open Source Foundation of choice in Europe
With a global presence, reach, and reputation

Eclipse Foundation AISBL is based in Brussels
Under EU-based laws and regulations, hosting code in Europe

Standards at Eclipse and Beyond



Standards Participation

The Eclipse Foundation possesses category A liaisons with the following ISO/IEC JTC 1 subcommittees

- ISO/IEC JTC 1/SC 38 Cloud computing and distributed platforms (latest liaison report)
  - SC 38/AG 5 Long-term strategy
  - SC 38/WG 3 Cloud Computing Fundamentals (CCF)
  - SC 38/WG 5 Data in cloud computing and related technologies
- ISO/IEC JTC 1/SC 41 Internet of things and digital twin (latest liaison report)
  - SC 41/WG 3 IoT Architecture
  - SC 41/WG 6 Digital twin

We requested a liaison with ISO/IEC JTC 1/SC 27 Information security, cybersecurity and privacy protection yes

About Sparkplug®

- **Sparkplug:** First specification submitted for PAS transposition
  - Relies on ISO/IEC 20922:2016 (MQTT) as a transport protocol
  - Focused on interoperability (payloads, topic structures)
- Created in 2016 by Cirrus Link Solutions
- Contributed in 2019 to the Eclipse Foundation
- Eclipse Tahu: Open Source Implementation
- **V3.0 Transposed as ISO/IEC 20237 (Publication: Oct 2023)**

Standards Participation

The Eclipse Foundation applied for a liaison with CEN/CENELEC on May 29th, 2024

The ballot ended July 26th, 2024

Document type	Related content	Document date	Expected action
Ballot / Reference document	Ballot: Liaison Request Eclipse Foundation (restricted access)	2024-06-27	**VOTE** by 2024-07-26

Our liaison status was confirmed on August 26th, 2024

- We intend to request a liaison with CEN/CENELEC JTC 13 Cybersecurity and Data Protection in case of a positive ballot for the initial liaison request
- We intend to participate in the upcoming standardisation activities around §33 DataAct „Essential requirements regarding interoperability of data, of data sharing mechanisms and services, as well as of common European data spaces”.

EDWG: Data Act, Mission and outcomes

Data Act Chapter VIII

Interoperability - Article 33

- Automatic access & transmission
- Open formats & vocabularies
- Find, access & use
- Smart contracts

Interoperability - Article 36

- Consistency
- Safe termination/interruption
- Robustness & access control

Open Source Specification: Standardization

PROFILE 1 (policy, formats, semantics)

PROFILE N (policy, formats, semantics)

Decentralised Claims (messages for identity and claims)

Transport Protocols

Data Space protocol (catalog, contract, transfer)

TCK

ISO

CEN

CENELEC

Open Source Implementation: Adoption

Tractus X

xfsc

Microsoft T-Systems AMADEUS RWTH gaia-x

Fraunhofer Catena-X tecnalia imec IDSA iSHARE

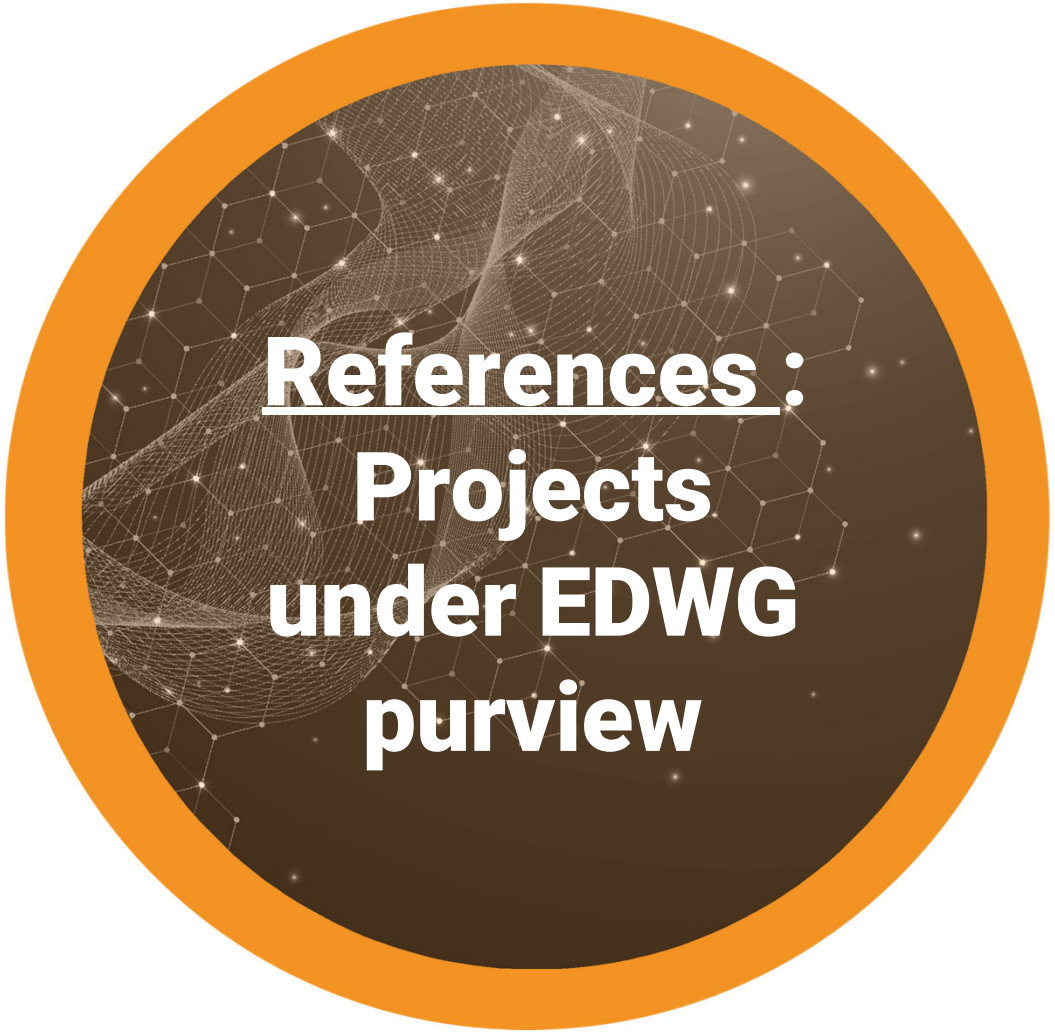
Starter Kit

European Commission

Open

MISSION: "Build and promote **open-source software, specifications, and open collaboration** models needed to create **scalable**, **modular**, **extensible**, **industry-ready** open-source **components** based on open **standards** for dataspaces"

ECLIPSE FOUNDATION



The EDWG focuses on **Open Source interoperable software:**

- Eclipse Dataspace Components (EDC)
- Eclipse Dataspace Protocol TCK

The EDWG produces **Open Source specifications** for standardising Dataspace protocols:

- Eclipse Dataspace Protocol (DSP)
- Eclipse Dataspace Decentralized Claims Protocol (DCP)
- Eclipse Conformity Assessment Policy and Credential Profile (CAP)
- Eclipse Data Rights Policy Profile (DRP)

The DSP in the wild – real-world applications: projects, open-source programs, industries

Anil Turkmayali, IDSA

05

Driving data spaces innovation

Collaborators defining and embracing the Dataspace Protocol

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R&D Projects Adopting DSP

AgriData Value
DIVINE
PLIADES
DISC
RE4DY MANUFACTURING DATA NETWORKS
HEDGE-IoT
omega-x

Who is currently using it?

Catena-X
Tekniker MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
ONENET one network for Europe
ZF
amadeus
VTT
Cofinity-X
PROMETHEUS-X
T Systems
Boot-X HUAWEI
SAP
truzzt
TECH2B
X-ROAD
Open

DigiChecks | project as application example for the DSP

Gonzalo Gil, Tekniker

06

The DSP in the wild – DigiChecks: facilitating the management of building permits in the construction sector

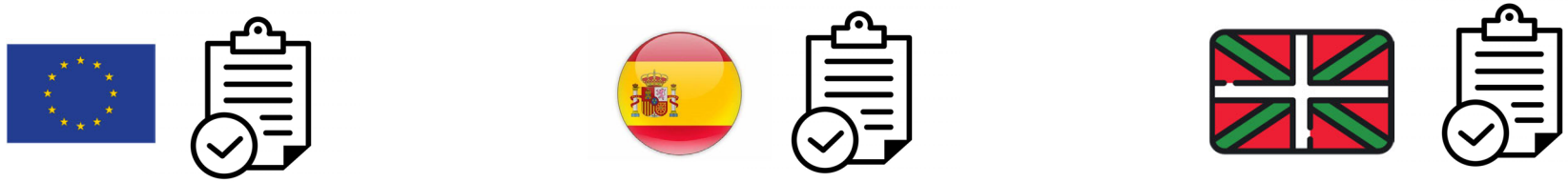
Dr. Gonzalo Gil Inchaurza | Tekniker | 09/09/2024

Tekniker
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

DigiChecks

Problem

- To obtain building permits in the construction domain…
  - For different countries, but also regions or municipalities, there is a need **to check compliance with different regulations**

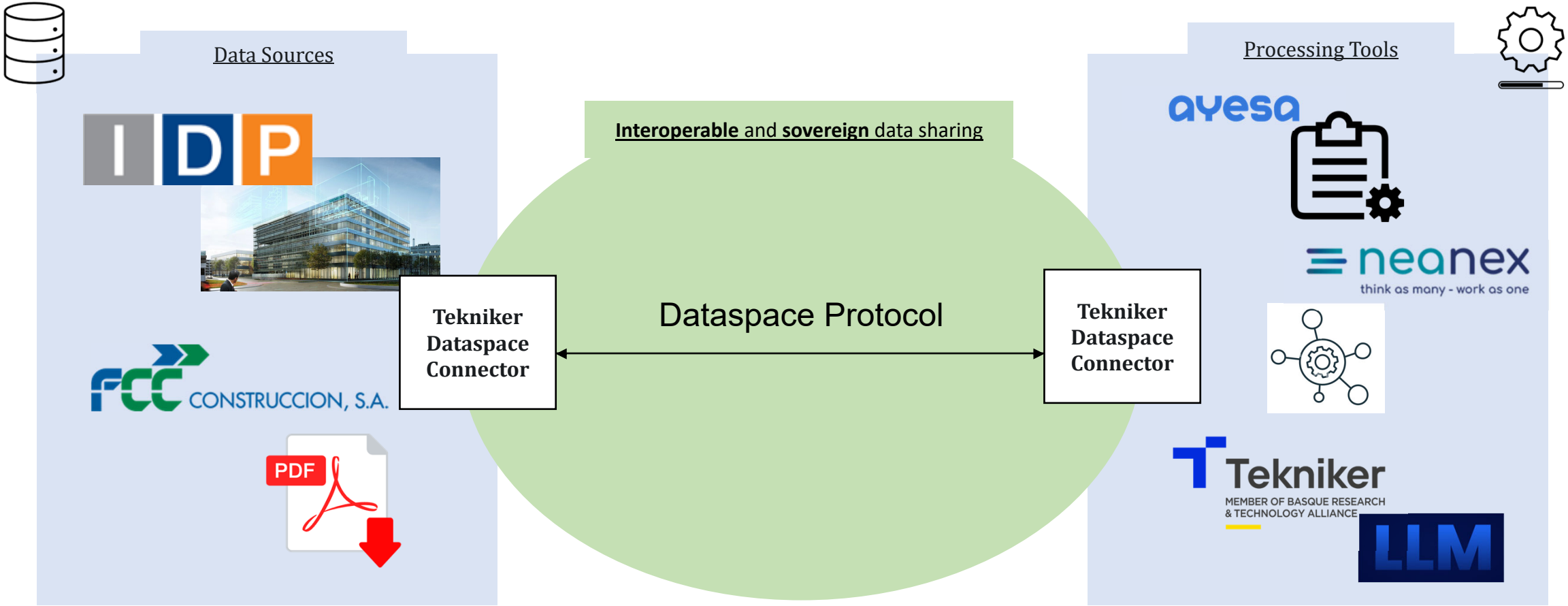


  - To check compliance, coordination issues should be tackled by **sharing** building **data** stored in different **proprietary formats.**

  - To enable data sharing, the **self-determination** regarding **the usage of the data** must be granted

Solution

- Platform of platforms that enable the management of building permits based on:
  - Orchestrarion of compliance checks
  - The collaboration between services from different organizations through a data space



Tekniker Dataspace Connector

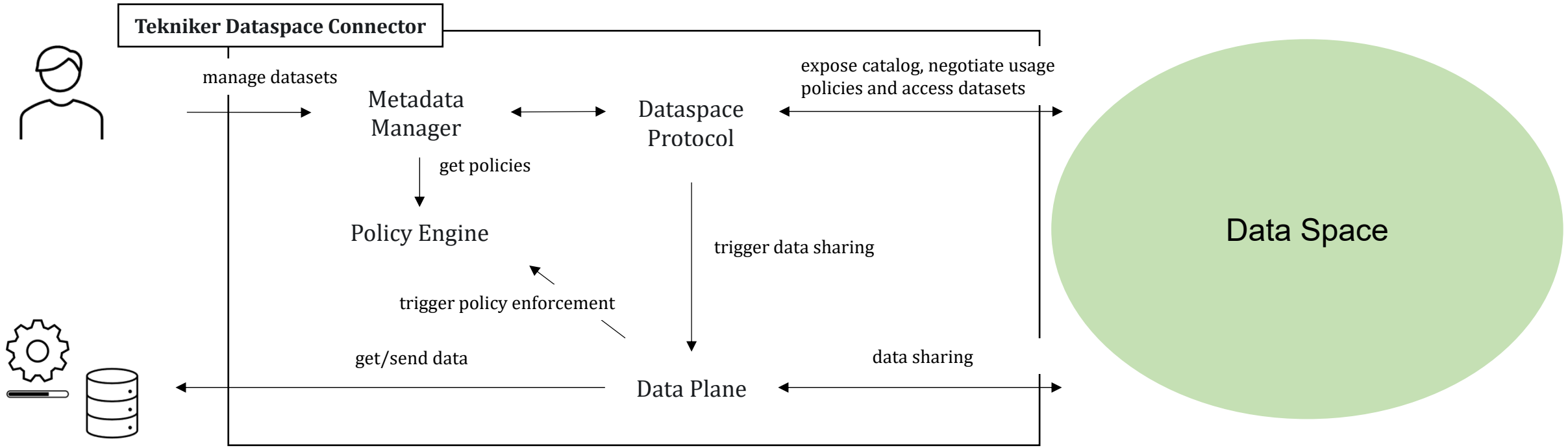
What is it?

Modular solution that allows companies to establish a single point of entry to the data offered and requested through a data space:

- **Interoperability** at data sharing
- **Data Sovereignty** throughout its life-cycle

How does it work?

1. **Metadata Manager:** management of datasets offered and requested through the data space
2. **Dataspace Protocol:** description of catalogs, negotiation of use agreements and standardized access to datasets
3. **Data Plane:** data transfer through different protocols adapted to the requirements of the use cases
4. **Policy Engine:** enforcement of usage control policies



Thank you!

Dr. Gonzalo Gil Inchaurza
gonzalo.gil@tekniker.es

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C/ Iñaki Goenaga, 5
20600 Eibar (Gipuzkoa)
Tel: +34 943 20 67 44
www.tekniker.es

Enershare | project as application example for the DSP

Maarten Kollenstart, TNO

07

Enershare

The Energy Data Space for Europe

Applying the DSP

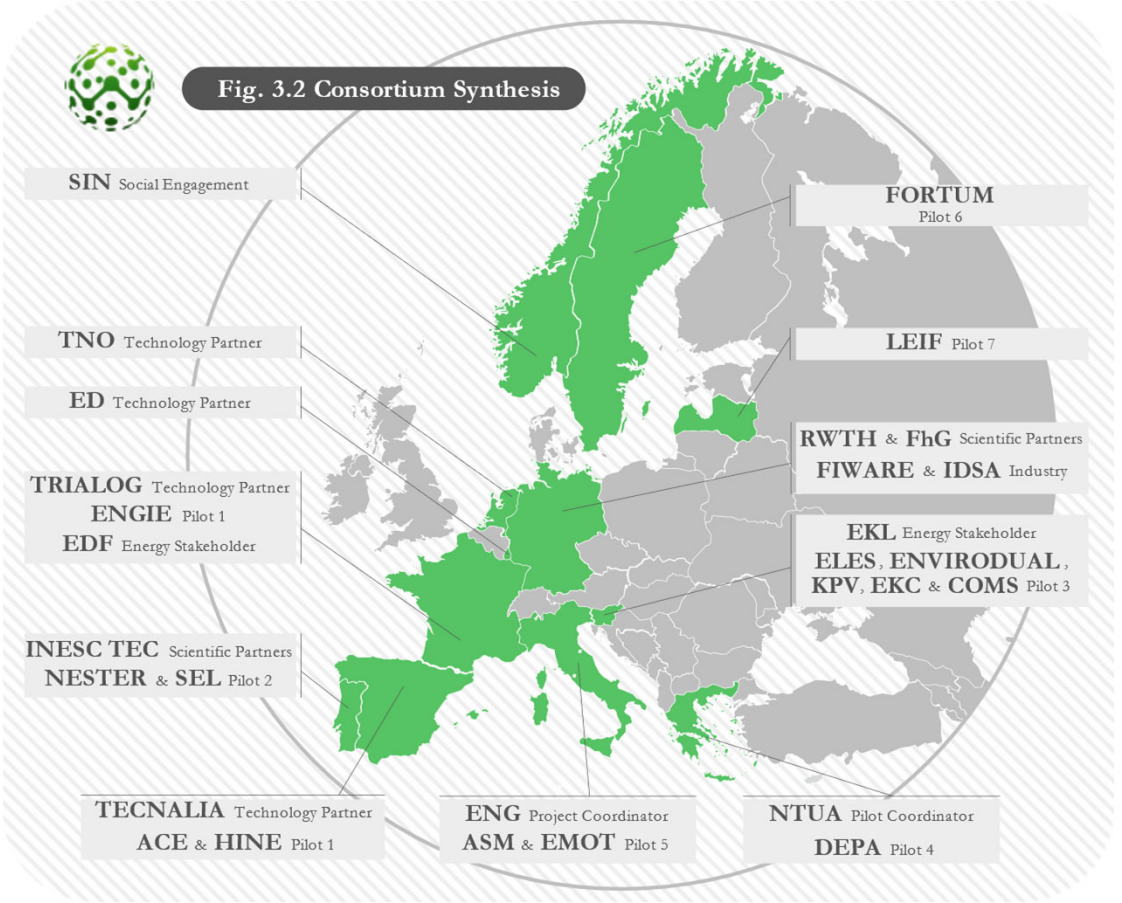
Enershare project example

SPEAKER

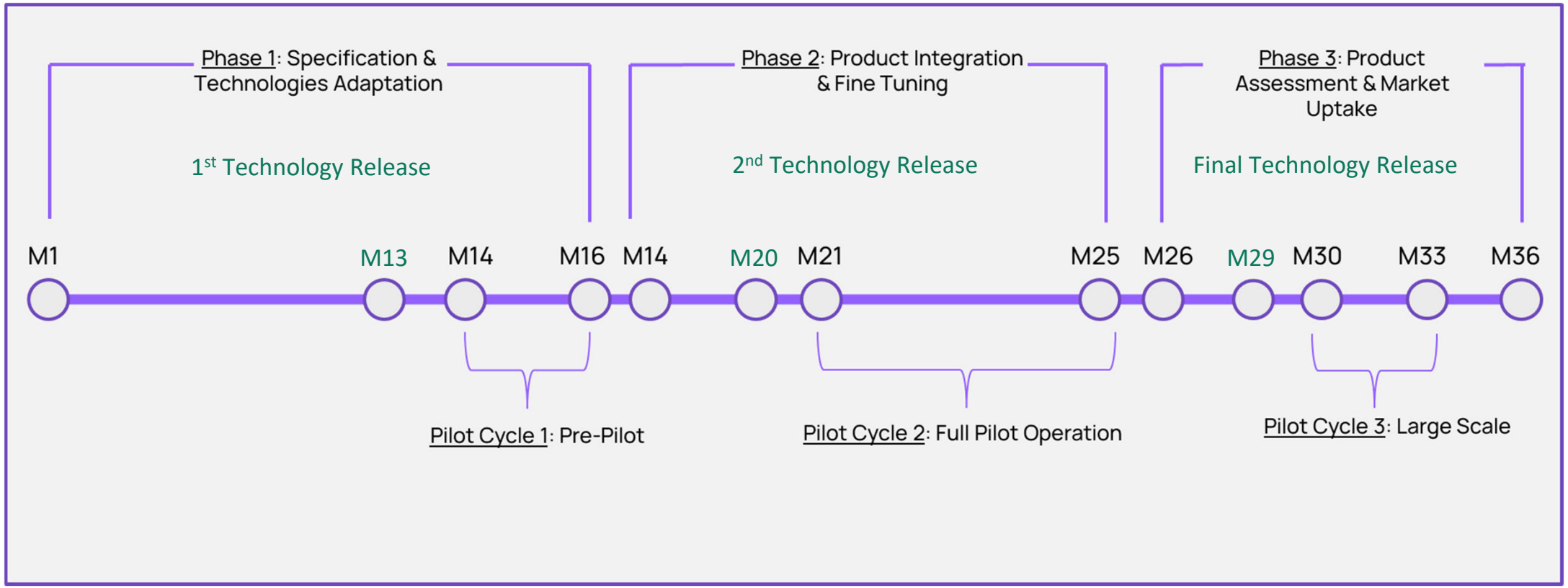
Maarten Kollenstart – Senior Researcher at TNO

Project Identity Card

- ENERSHARE- European Common Energy Data Space framework enabling data sharing-driven across- and beyond- energy services
- **Project Goal** - To develop and demonstrate a European Common Energy Data Space which will deploy an ‘intra-energy’ and ‘cross-sector’ interoperable trusted Energy Data Ecosystem
- Starting Date: 1st July 2022 – Duration: 36 months
- Total Costs: 9.537.658,75 Euro,
- EU contribution: 7.999.712,00 Euro (Innovation Action)
- Partners: **28 + 2 Affiliated Entities** (Linked Third Parties)
- Country Coverage: 11 Countries
  - Italy, Slovenia, France, Greece, Spain, Latvia, Portugal, Norway, Finland, The Netherlands and Luxembourg



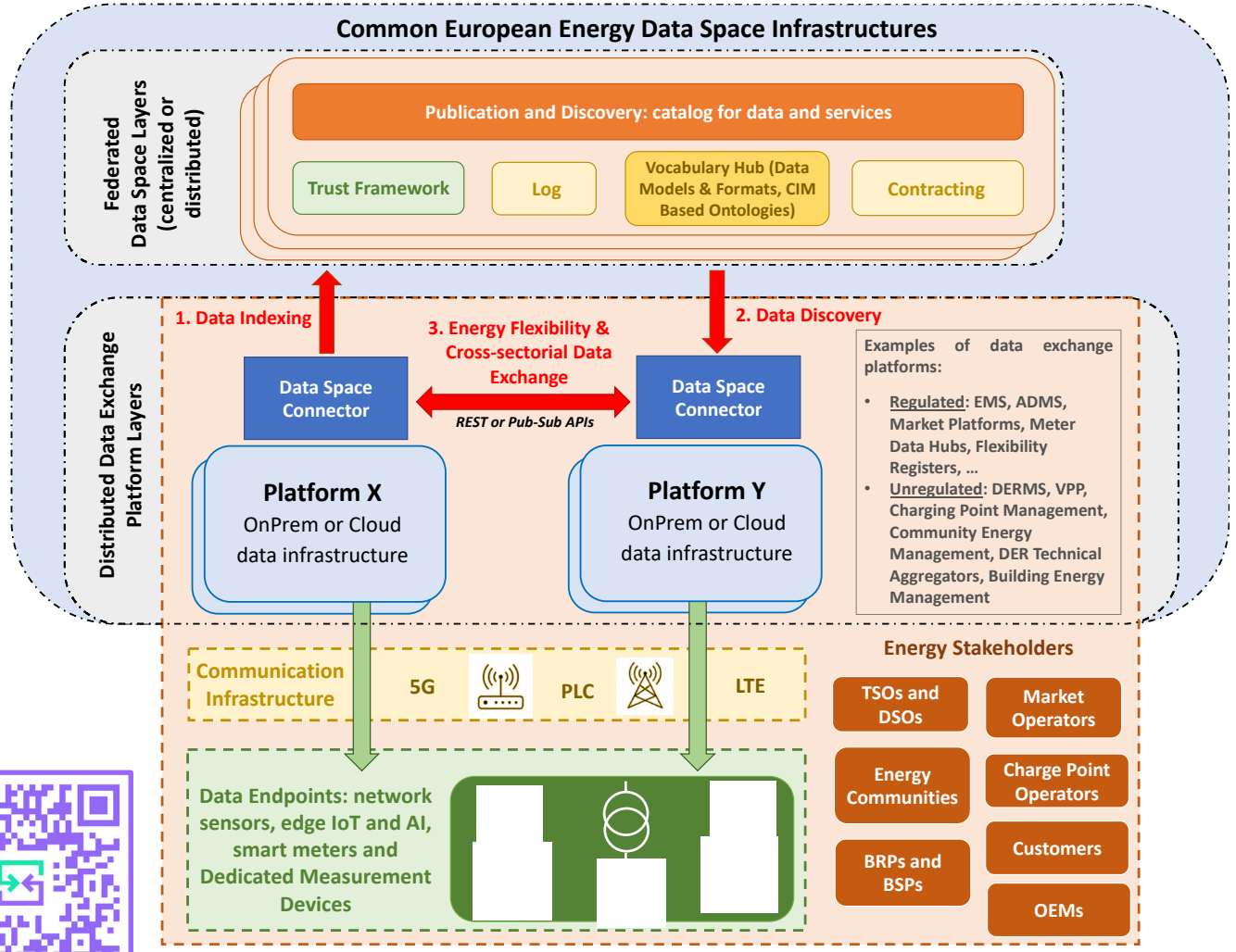
MVP & Three phases Methodology



Energy Data Spaces Cluster

int:net
Interoperability Network for the Energy Transition

- Common European Energy Data Space Blueprint
- 4 System Use Cases
  - Onboarding
  - Discovery
  - Contracting
  - Data exchange and interoperability
- Emphasis on the exploitability and interoperability of solutions across the cluster



EDDIE
EUROPEAN DISTRIBUTED DATA INFRASTRUCTURE FOR ENERGY

DATA CELLAR

SYNERGIES

omega-x

Blueprint V2.0

Enershare
The Energy Data Space for Europe

enershare.eu

Thank you for your attention

Maarten Kollenstart - Senior Researcher at TNO

Enershare has received funding from European Union's Horizon Europe Research and Innovation programme under the Grant Agreement No 101069831

DIVINE | promoting the further development of the DSP

Marios Paraskevopoulos, NTUA

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Making DSP an international standard [09/09/24, Brussels]

The Dataspace Protocol in the wild – DIVINE

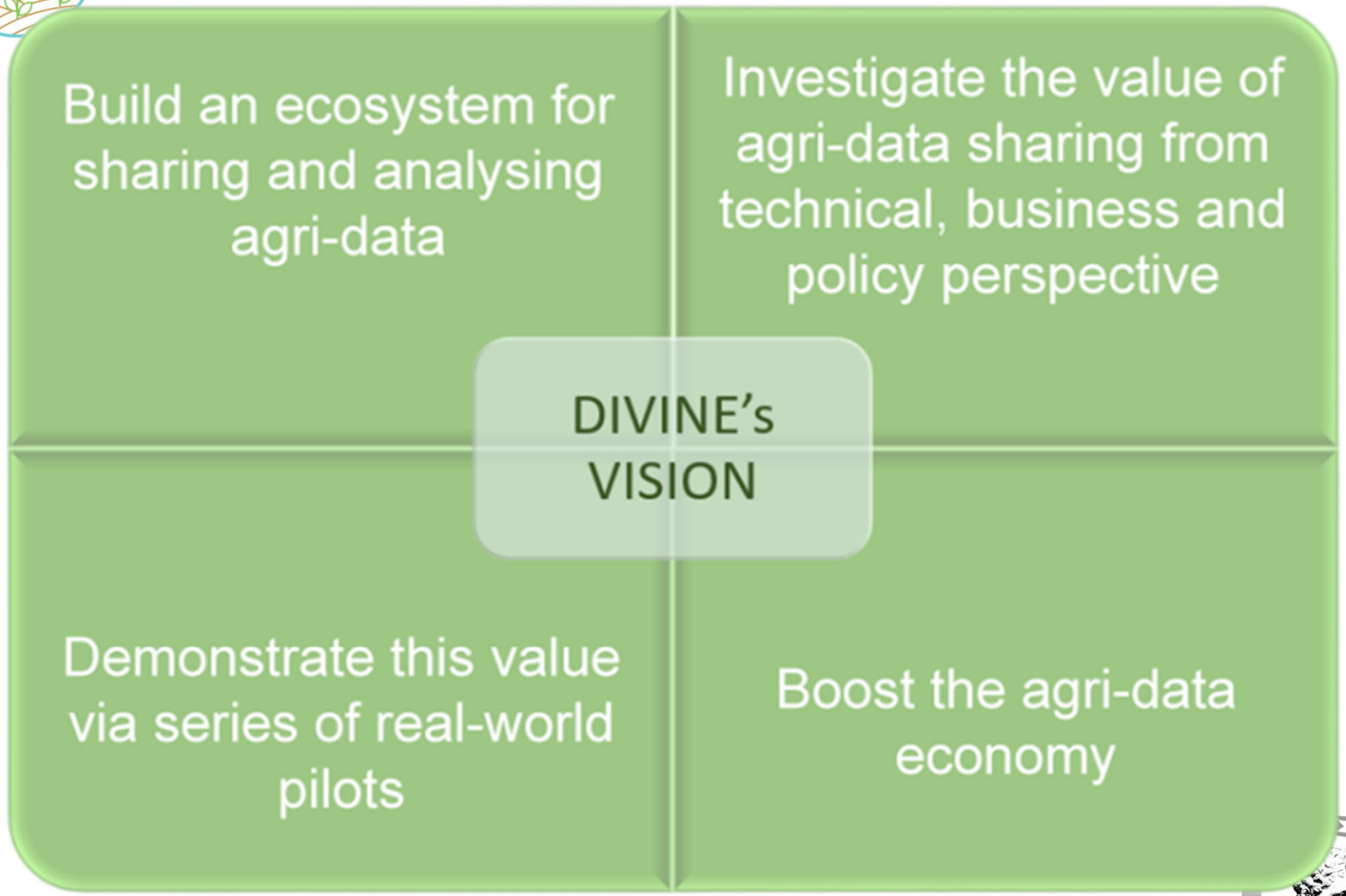
Marios Paraskevopoulos, ICCS-NTUA

DIVINE:

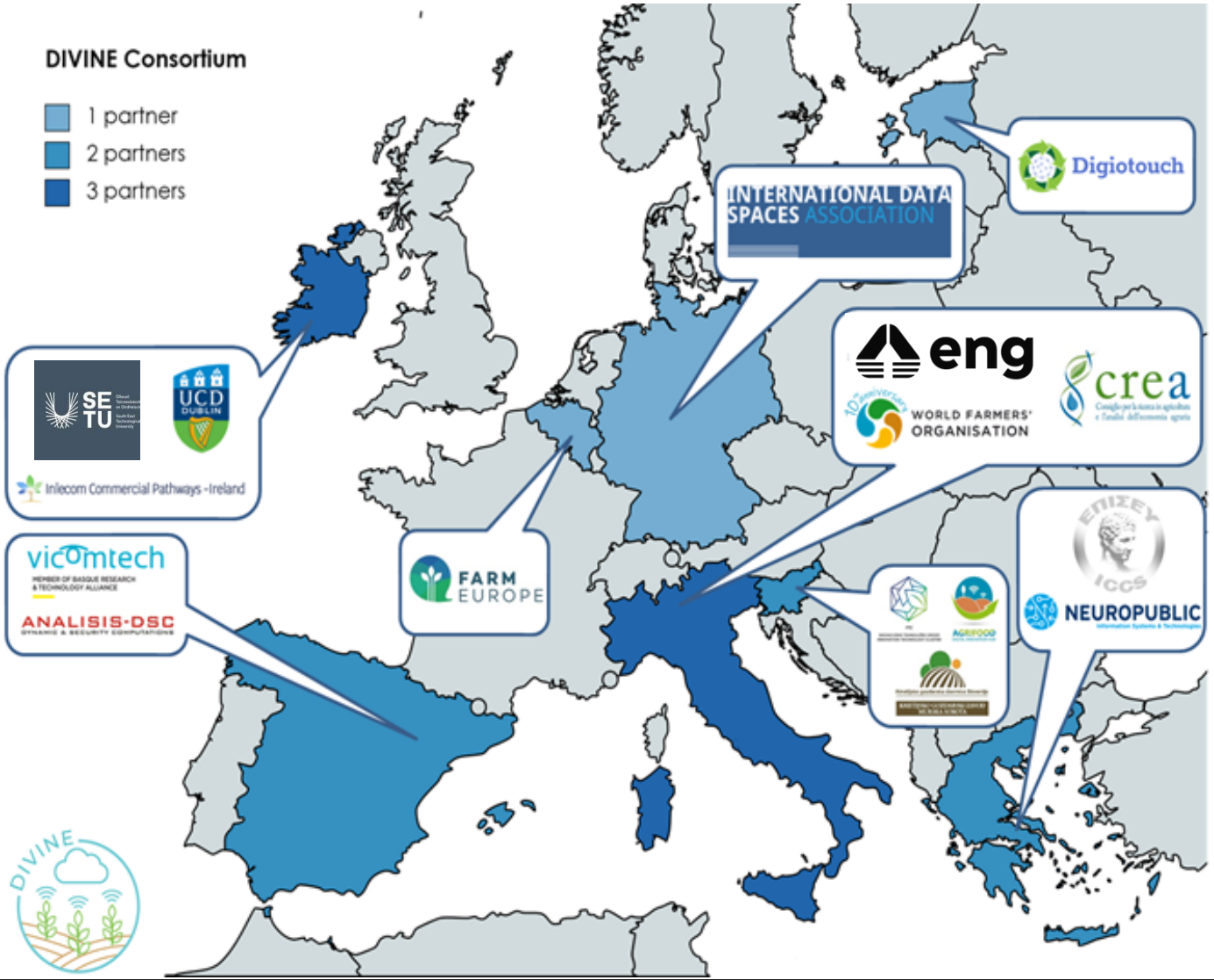
DEMONSTRATING THE VALUE OF DATA SHARING TO BOOST THE AGRI-DATA ECONOMY

Horizon Europe 2021-2027

Making DSP a standard
[09/09/24, Brussels]



DIVINE Consortium



DIVINE objectives (I)

- **Objective 1.** Establish a federated system to aggregate private and public agri data that interconnects existing agri data spaces, thereby enabling the sharing of data among stakeholders.
- **Objective 2.** Analyse and adapt information models in the agriculture sector to enable data interoperability across existing agriculture data spaces, Farm Management Information Systems (FMIS), and Agricultural Knowledge Information Systems (AKIS).
- **Objective 3.** Enhance the ecosystem with facilities ensuring increased transparency in data sharing, data trust & sovereignty, data traceability & usage monitoring.

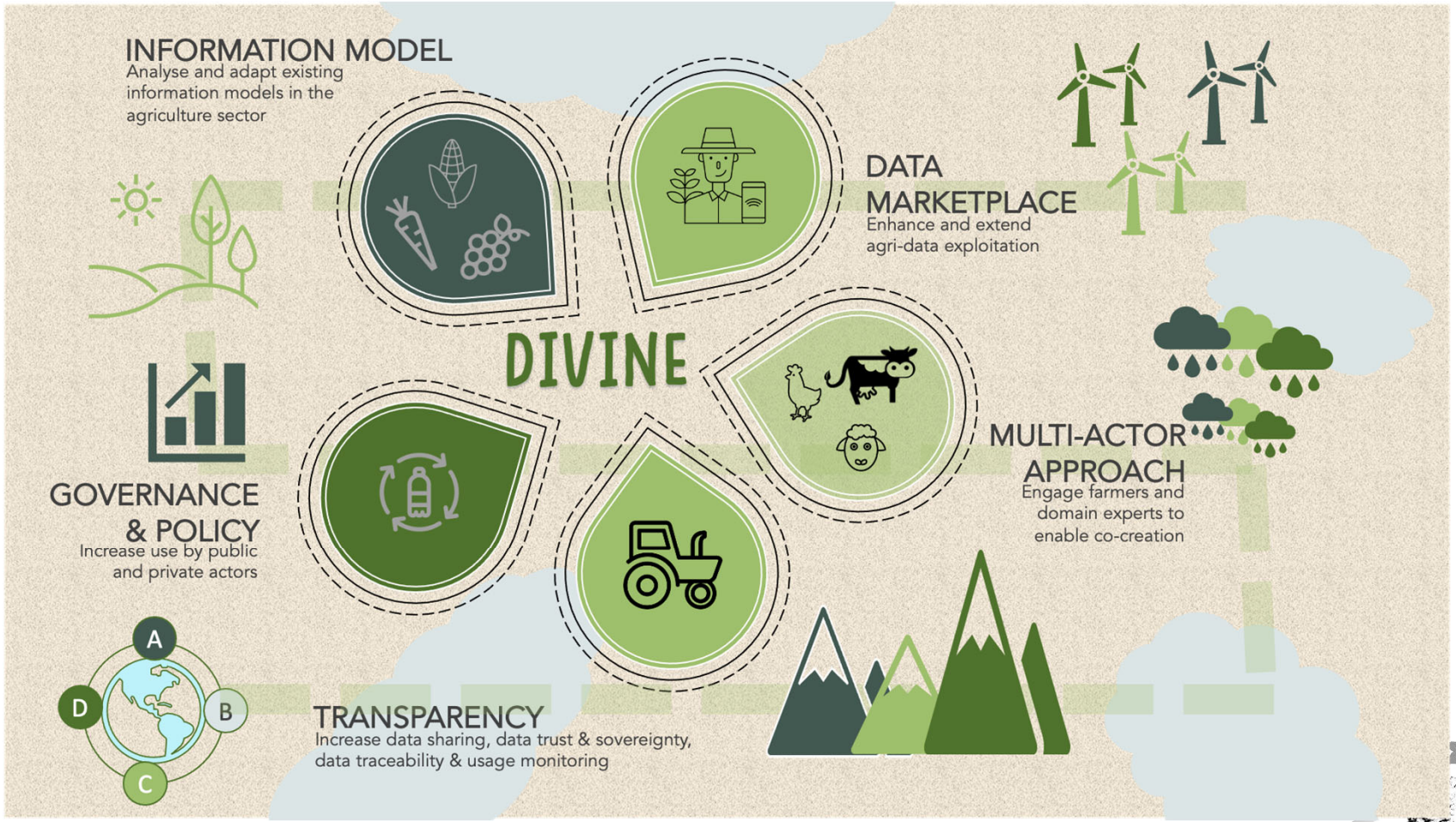
DIVINE objectives (II)

- **Objective 4.** Establish an assessment framework for cost-benefit analysis of agri data-sharing (economic, societal, environmental, climate-related, etc.) and based on these provide transparent awareness and decision support facilities to farmers and other stakeholders in the agriculture sector.
- **Objective 5.** Analyse and adapt agri data-sharing governance models and policies to enable their use by public/ government services; mechanisms to monitor the impact of these models will be built into the ecosystem.
- **Objective 6.** Establish a specific multi-actor approach (MAA) to engage farmers and domain experts in the agriculture sector to enable co-created research design, deployment, and validation.

DIVINE objectives (III)

- **Objective 7.** Analyse and adapt data-driven business models for increasing and extending agricultural data exploitation, as well promotion of the project to various audiences results via suitable Dissemination and Communication channels.
- **Objective 8.** Demonstrate and assess the impact, efficiency, and performance of the ecosystem and the developed solutions via complementary pilots to be carried out engaging the wide range of related stakeholders and pilot-specific technologies and tools.

What does DIVINE bring together



Key Technical Considerations and Challenges in DIVINE

- Data modelling, sharing & semantic interoperability
- Agri Data Analytics, Fusion & Knowledge extraction
- Transparent Decision Making Support & Benchmarking for agri stakeholders
- Agri Data Security, Transparency, Trust, Sovereignty, Traceability
- Agri Data Sharing Governance Models & Policy making
- Stakeholder Open Collaboration Space
- **Agricultural Data Space Ecosystem**

DIVINE targeted outcomes

- A widespread awareness on economic and societal potential of agricultural data sharing at EU level
- An increase of agri-data sharing activities (private and open data)
- A clear shared vision for EU agri data spaces tackling data interoperability, security, transparency
- An increase of data-driven applications diffusion
- **An increase of policy-making and -monitoring capacities thanks to data-driven solutions**

DIVINE pilots & data

DIVINE example

DIH AGRIFOOD DATA SPACE

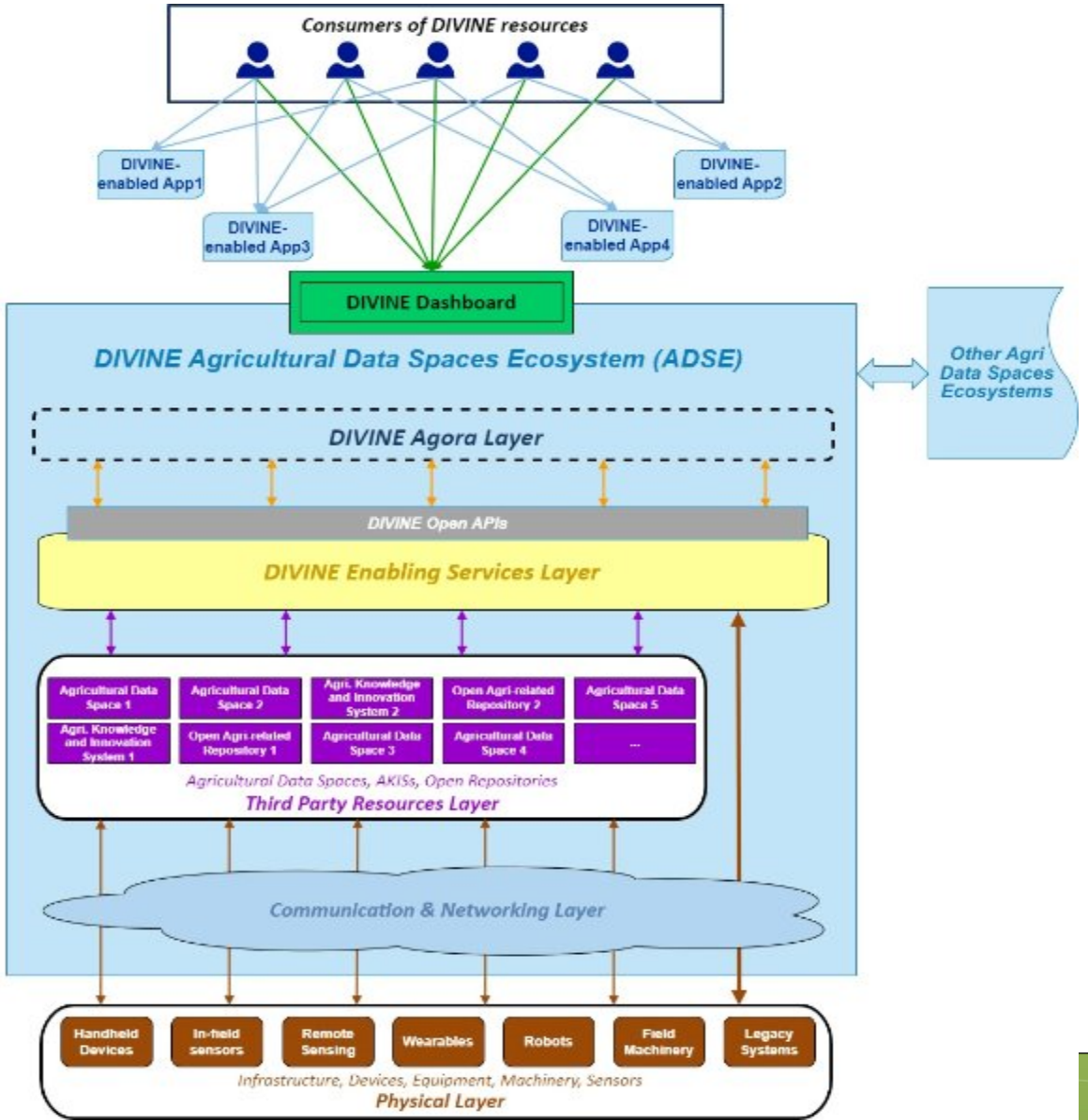
is a federated data sharing platform where sharing data from the Agrifood sector is based on well-known and shared policies and rules defined by a Governance Model.

AGRIFOOD DIGITAL INNOVATION HUB

DATA SPACE

- Governance model based on ethical principles and EU regulation for a fair data economy (Data Act, European Data Strategy).
- Comply with European standards, defined by IDSA.
- Implemented according to OPENDEI definitions.

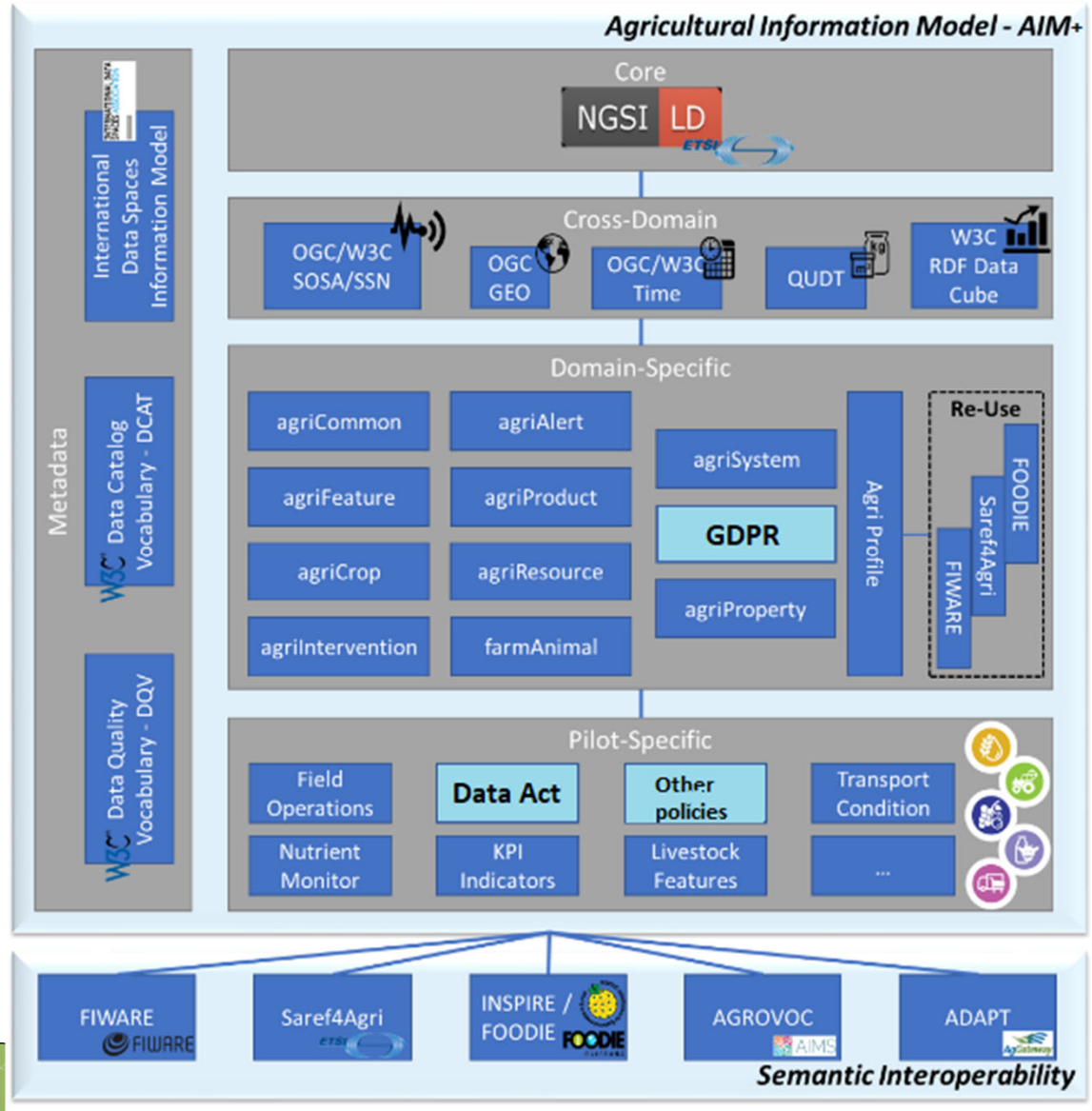
DIVINE Reference Architecture



Dataspace Protocol & DIVINE

- The **Dataspace Protocol provides** specifications for interoperable data sharing between entities, covering **technical and semantic interoperability**
  - necessary for entities to publish data, negotiate agreements, and access data within a Dataspace
- Key points of the Dataspace Protocol include:
  - **Interoperability Support**: Ensures technical, semantic, trust, organizational, and legal interoperability.
  - **Connectors**: Implement specified protocols and manage interactions. They include internal functionalities like monitoring or policy engines.
  - **Identity Provider**: Ensures trust by validating participant identities and claims, with variations across different Dataspaces.

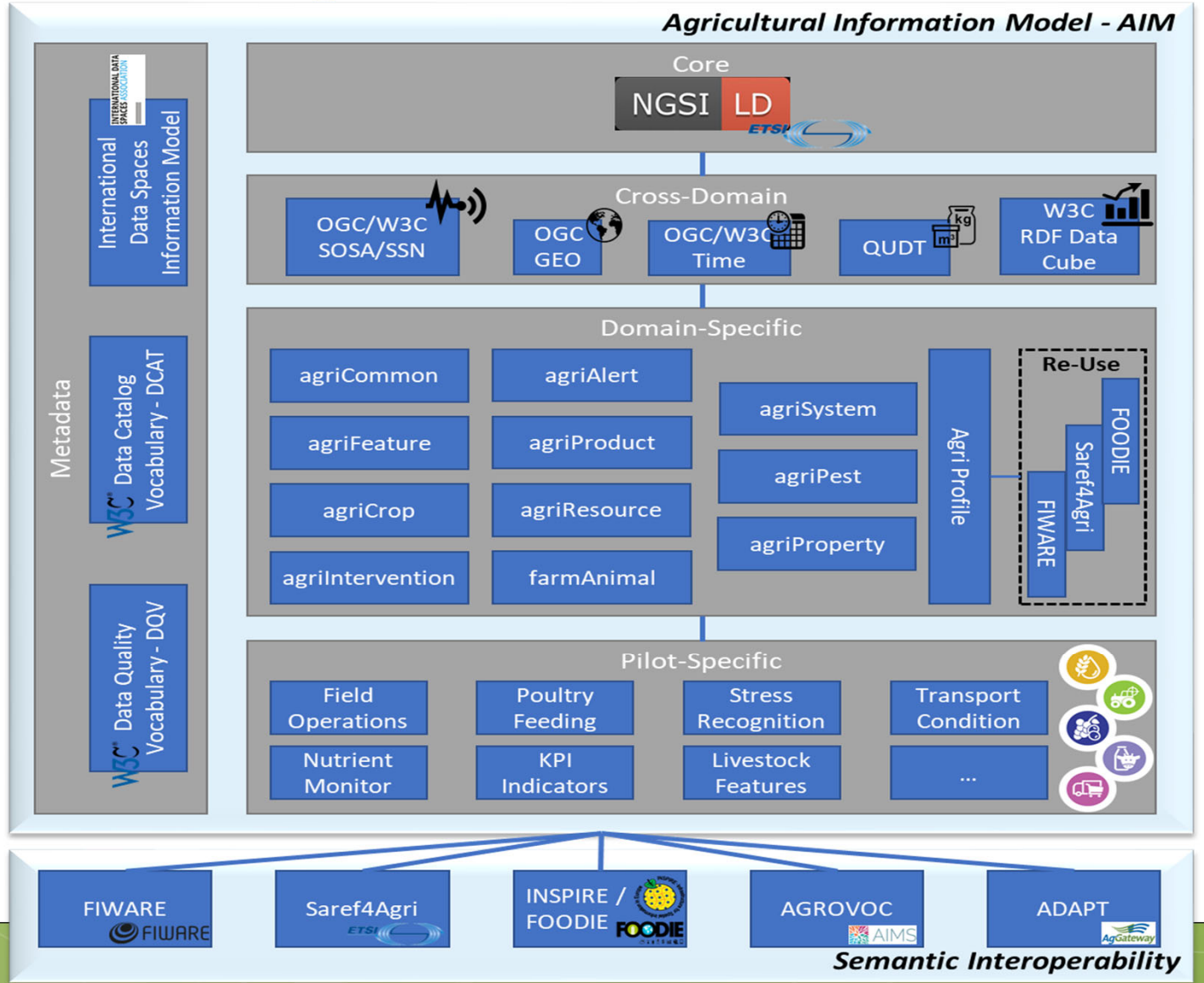
AIM+ high-level view



Thank you very much for your attention

☺

AIM+ high-level view



Data sharing within DIVINE

- Various heterogeneous sources and datasets
  - Benchmarking for comparing economic data
  - Crop yield decision support
  - Policy monitoring (CAP)
  - Analytics for plantation operations optimization and tracking

AIM+ standardization

- Ongoing work to establish AIM as an OGC standard
- Currently working on properly updating the model to fulfill the constraints imposed by existing standards (terminology, namespaces) and harmonizing the respective templates

Simpl | The DSP as technological foundation

Nicolas Auricchio & Saulo Sini, Eviden

09

Simpl – State of Play

09/09/2024

Simpl is made of three products

the open-source smart middleware itself

Simpl-Open

playground environment for Simpl-Open
+
interoperability test for existing data spaces

Simpl-Labs

instances of Simpl-Open for common European data spaces

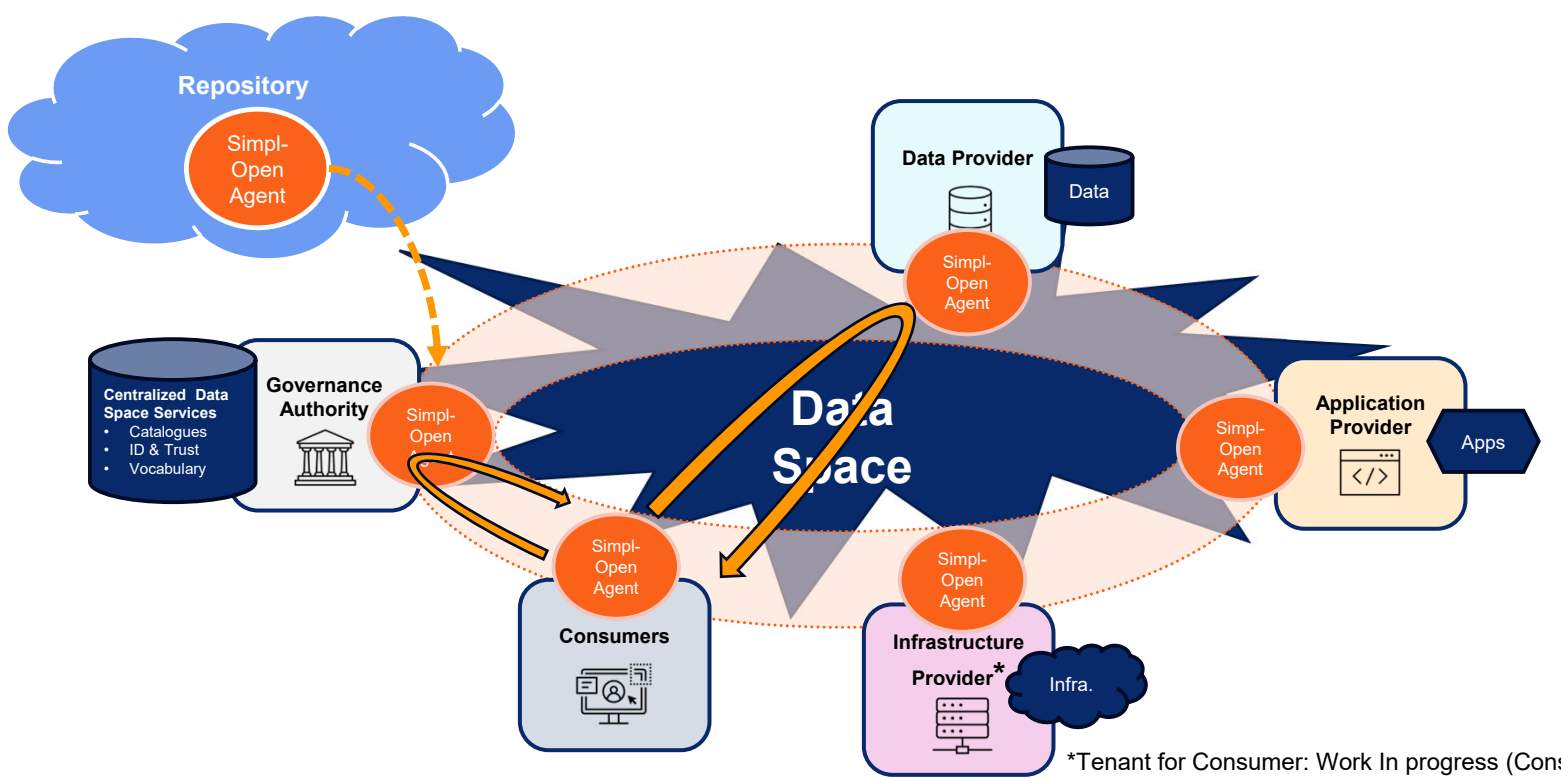
Simpl-Live

- European Health Data Space 2ary
- eosc
- Public Procurement Data Space
- Destination Earth
- Language Data Space
- Smart Communities

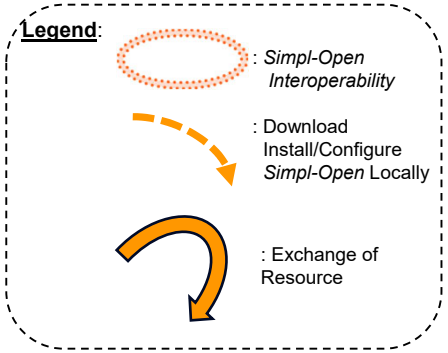
European Commission

Simpl-Open Agent in context (Individual data space/initiative perspective)

Each data space/initiative actor can download the Simpl-Agent from a central repository, enabling interoperability. A DataSpace “Standard” Protocol is a major milestone to enable interoperability across Participants. Each Participants/Dataspace can “Interoperate/Extend” with Simpl - Open Source project with “Capabilities/Connectors” that use the DataSpace Protocol to establish communication between Participant Nodes



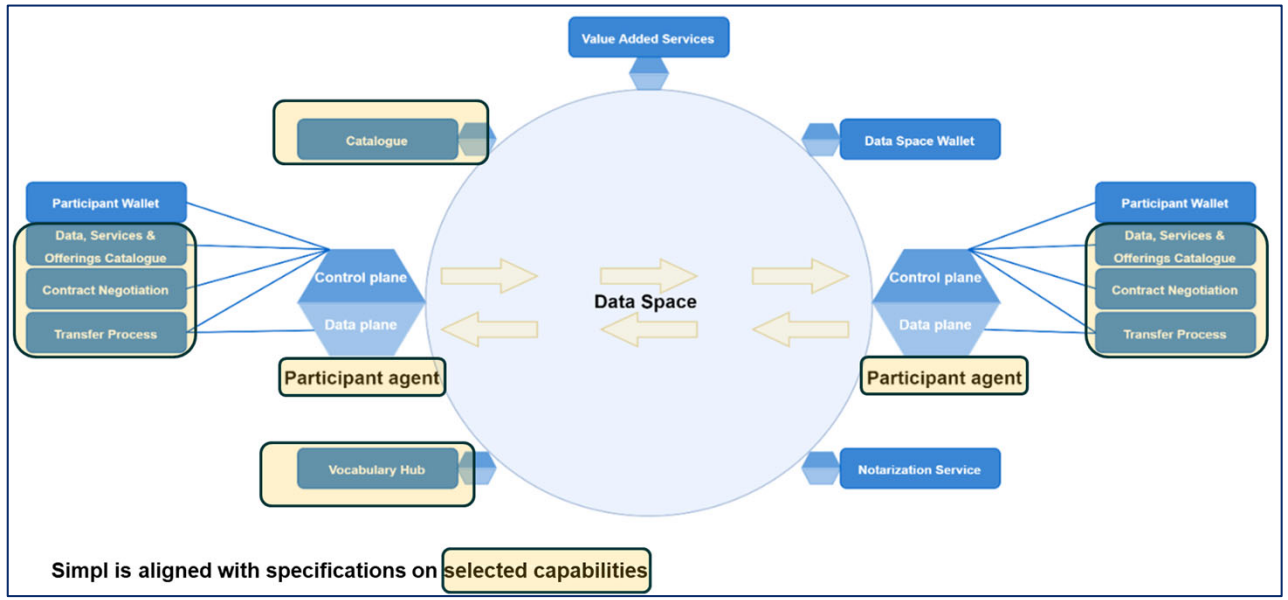
*Tenant for Consumer: Work In progress (Consumption)

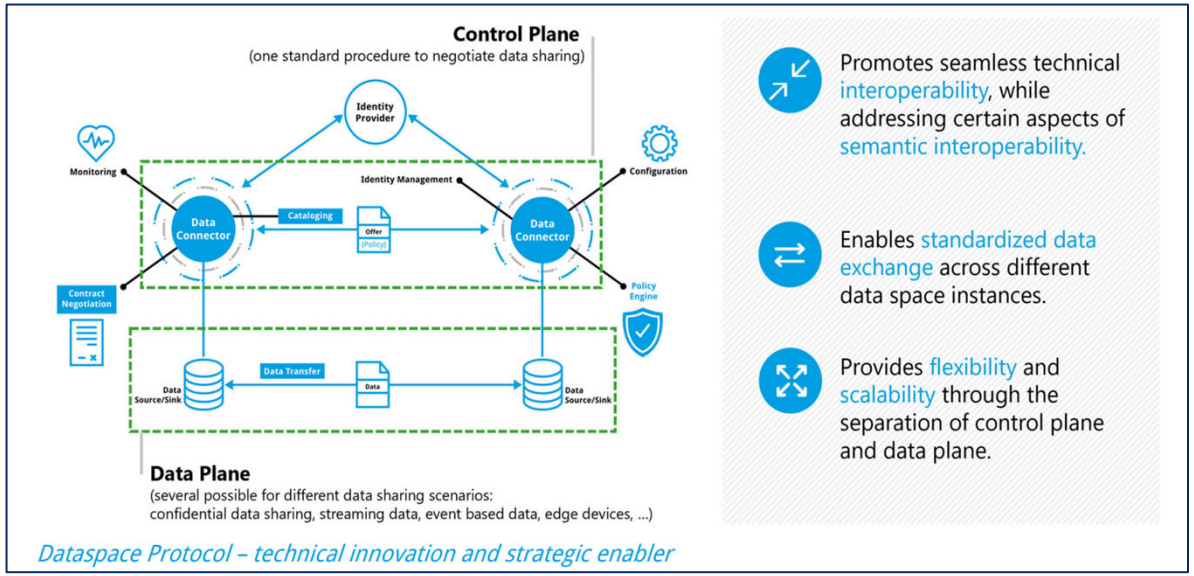


Dataspace Protocol as foundation to enable “Interoperability in Data Exchanges”

European Commission

Simpl – Open Source Project and DSSC Toolbox & DSP





GitLab

https://code.europa.eu/simpl

The DSSC Toolbox and its validation scheme - News - Data Spaces Support Centre

European Commission

Intended scope for MVP (Dec 2024)

The **Dataspace Protocol** defines how this metadata is provisioned:

1. How Datasets are deployed as DCAT Catalogs and usage control is expressed as ODRL Policies.
2. How Agreements that govern data usage are syntactically expressed and electronically negotiated.
3. How Datasets are accessed using Transfer Process Protocols.

Underlined = Q3 Regular = Q4/MVP

Development following Business Processes capabilities:

1) Onboarding of participants

2) **Catalogues**: *Infrastructure and Data Catalogue, Usage Policies,* Quality rules

3) Add to catalogue *(UI and API to be supported): Add Offering to the catalogue, Define access and usage policies,* Extend validation *(Syntax, Semantics,* quality rules)

4) Search on Catalogue: S*earch within a dataspace, through UI and API*

5) **Establish contract**: Select resource and request to retrieve/use it, via a **basic Contract negotiation**

6) **Use/Consumption of the Catalogue Resources**: Infrastructure Deployment ; Dataset, applying rules and performing some type of data processing (e.g. Visualization)

7) Supporting Services: *Secure communication between Simpl-Agents,* Business Monitoring (logging all actions taken by users) – main metrics traced

Annexes

Current On-Going Technologies for MVP

Industry Recognised OSS for MVP

Sovereign-X Proposal

Tool	Description	URL
KEYCLOAK	The credential manager to store the Self Descriptions on organisational side. It also covers signing of Self Descriptions created by a provider, revoking a credential, verification and retrieval of credentials as microservices.	https://gitlab.eclipse.org/eclipse/xfsc/organisational-credential-manager-w-stack
ELK Stack	Reliably and securely take data from any source, in any format, then search, analyze, and visualize. This covers Monitoring, Reporting, Audit and Logging related functionalities.	https://www.elastic.co/
Crossplane	Crossplane is an open-source Kubernetes add-on that allows to define and automate the infrastructure using Kubernetes-style configuration files. It extends the Kubernetes API to allow to provision and manage cloud resources and services from various providers, such as AWS, GCP, Azure, and more, in a unified manner. To manage Infrastructure Provider nodes.	https://www.crossplane.io/

Main guidelines/criteria for choice: **License, Community, Extensibility, Documentation**

Sovereign X Proposal for MVP OSS: 1/2

Sovereign-X Proposal

Tool / Capability	Description	URL	Rationale	Additional Consideration
SD (GaiaX-Trustframework) ***SERVICE OFFERING***	Metadata of Participants and service offerings (App, Data, Infra) described as GAIA-X Self Description using an ontology	https://gaia-x.gitlab.io/policy-rules-committee/trust-framework/	Licence: CreativeCommons Community Support: Gaia-X Functionality Coverage: Covers all aspects and can be easily enhanced for additional ones. Documentation Available: here Extensibility: yes Adoption by Business: Gaia-x Lighthouse, all data space initiatives claiming to be GAIA-X compliant	It can be easily enhanced with sectoral specific parameters. SD are the suitable "specification" for describing Catalogue Objects in Simpl Implementation since they are: • Machine Readable • Allows Issuer to sign them • Allows Consumer (Verifier) to verify them (SSI) • Semantically described (JSON-LD)
XFSC SD Tooling ***SERVICE OFFERING***	Tooling to create and manage meta data to describe the service offerings (Data, App, Infrastructure)	https://gitlab.eclipse.org/eclipse/xfsc/self-description-tooling	Licence: Apache 2.0 Community Support: XFSC Functionality Coverage: full coverage Documentation Available: yes Extensibility: yes Adoption by Business: TrustedCloud (Spec)	No other FOSS tool available to create customized SD. Schemas can be created via LinkML Generator Tool Fully customizable SD definitions possible.
XFSC Federated Catalogue ***CATALOGUE***	Federated Catalogue providing Discovery capability to look up on Self Descriptions of service offerings (Data, App, Infrastructure)	https://gitlab.eclipse.org/eclipse/xfsc/cat	Licence: Apache 2.0 Community Support: XFSC Functionality Coverage: very high coverage Documentation Available: Web, PDF Extensibility: yes Adoption by Business: Gaia-x Lighthouse *XFSC: Gaia-X Federation Services (GXFS) provides a set of OSS software components that assist in operationalizing a Gaia-X compliant federated ecosystem of infrastructure and data*	The only implementation of a FOSS federated catalogue supporting SD. i.e. validation of SD when published and searching for SD providing an internal search engine. It also already support semantic validation. In addition, the search engine is based on NoSQL which provides the base for knowledge search needed for M2M use cases.

Sovereign X Proposal for MVP OSS: 2/2

Sovereign-X Proposal

Tool /Capability	Description	URL	Rationale	Additional Consideration
XFSC OCM ***SERVICE OFFERING*** 	The credential manager to store the Self Descriptions on organisational side. It also covers signing of Self Descriptions created by a provider, revoking a credential, verification and retrieval of credentials as microservices.	https://gitlab.eclipse.org/eclipse/xfsc/organisational-credential-manager-w-stack	Licence: Apache 2.0 Community Support: XFSC Functionality Coverage: high Documentation Available: Web Extensibility: yes Adoption by Business:	They are created as part of XFSC matching the needs best. Can be easily replaced with any other wallet solution providing the same protocols in exchanging credentials (OIDC4VP and OIDC4VC)
EDC Connector ***SERVICE CONSUMPTION*** 	The data exchange service implementing the negotiation protocol (data space protocol)	https://projects.eclipse.org/projects/technology.edc	Licence: Apache 2.0 Community Support: Tractus-X and EDC. Functionality Coverage: Dataspace Protocol, Data&Control-Plane, Policy-Engine, Contract Negotiation Documentation Available: Tractus-X and EDC Extensibility: well structured interfaces to customize component Adoption by Business: Catena-X, Eona-X, several other data initiatives using forks of it.	Can be replaced with any other IDS connector implementing the IDSA Dataspace Protocol and using ODRL expressions for policy . The EDC connector is chosen because it has a good documentation, provides good interfaces and can be easily customized. Second there are two joined active communities to drive the development: Tractus-X and EDC. In addition, the first IDS connector passing the IDSA certification (RAMv4) was the TSI connector (Not open-source) based on EDC. Another interesting package IDSA compliant is the True-Connector https://github.com/Engineering-Research-and-Development/true-connector?tab=readme-ov-file

Areas that require new developments for the MVP

Sovereign-X Proposal

Domain of new development	Tools and Open Source
Infrastructure Services Offering (IaaS and Paas) multi-cloud providers	Crossplane / and adaptation / extension of the current definition of SD
2 Tiers Identification, Authentication, Authorization for Machine and Human Users	Keycloak + Custom Development
Extensible Observability (Logging, Monitoring, Reporting, Audit)	ELK stack
Billing / Invoicing related implementation	Custom development
Contracts related implementation	EDC Connector + Custom development
Dataspace specific needs	Under investigation
Consent Management	Potential Custom development
…	…

A0

Thank you

Engage with us

Read more about Simpl, fill in our survey and follow us on social media!

Open

IONOS | View on the DSP's relevance for ICT providers

Arian Firouzbakhsh, IONOS

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Standardization: Similar to how HTTP standardized web communications.

Improved Support and Maintenance: DSP Simplifies troubleshooting and maintenance processes.

Scalability: DSP facilitate scalable solutions, as services can be easily adapted or expanded without requiring significant changes to the underlying tech stack, allowing providers to grow alongside market demands.

Increased Market Access: Integrate and communicate with various data sources.

Catena-X | The DSP is key for industrial data spaces

Matthias Buchhorn-Roth, Cofinity-X

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Making the Dataspace Protocol an international standard

Catena-X | *industry implementation example*

September 09, 2024 at IDSA Event in Brussels

Matthias Buchhorn-Roth
Cofinity-X Product Lead
Catena-X e.V. Network Services Committee Lead

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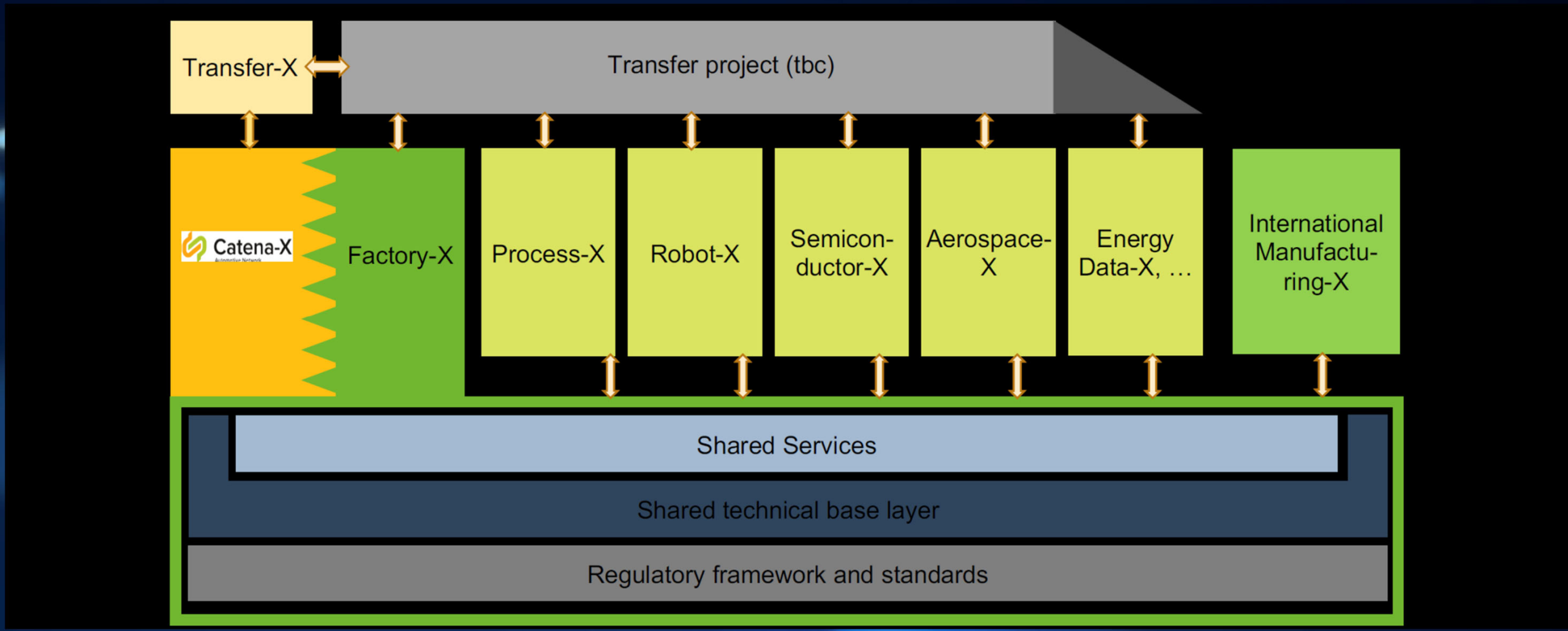
SCAN ME

Data Space Protocol Enables Interoperability Between Industries



Standards

Our Catena-X Standards serve as the foundation for certification, ensuring technical compatibility and interoperability between independent implementations by providing uniform rules and requirements used for conformity assessment.

Regulatory Framework

Our Regulatory Framework for data space operations includes detailed information on data sovereignty, mandatory use case requirements, and other legal considerations that are relevant to all of our activities.

Operating Model

Our Catena-X Operating Model describes the entire Catena-X ecosystem, focusing on a comprehensive definition of our operating environment and its roles, processes, and solutions, and how they interact.

1.2 CONTEXT AND ARCHITECTURE FIT

> *This section is non-normative*

The connector is the main technical component that implements dataspace connectivity including data sovereignty and interorganizational interoperability. It is part of the enablement services, which are intended to enable participation in the Catena-X ecosystem. More information about the Enablement Services can be found under the Whitepaper Enablement Services.

The following figure shows how the connector fits into the overall framework of Catena-X to exchange data.

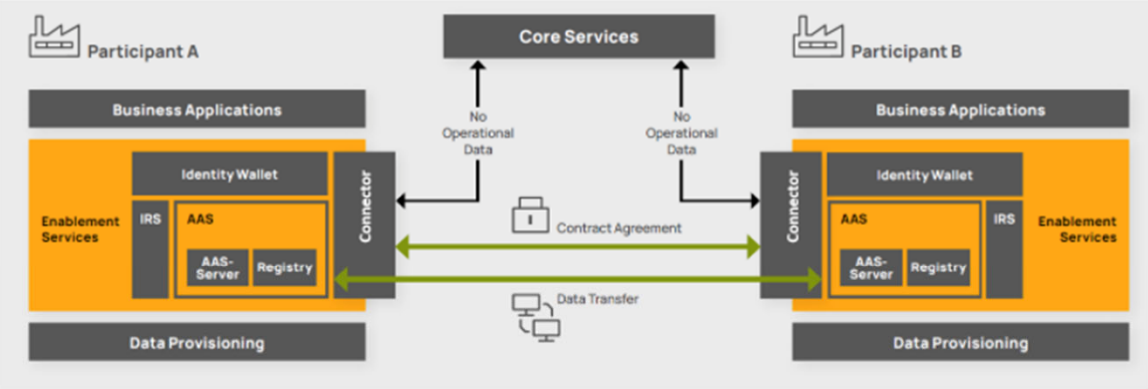


Figure 1: Framework of data exchange

> Note: At time of the release, the Identity Wallet solution is not decentralized yet. However, this standard already provides most of the infrastructure to operate Wallets (IATP-Credential-Services) in a distributed manner. More information about the SSI-infrastructure can be found in the relevant standards.

SCAN ME

s://catenax-ev.github.io

Dataspace Protocol Adoptions on the Marketplace

Cofinity-X

- HOME
- MARKETPLACE
  - App Marketplace
  - Service Marketplace
- APP MANAGEMENT
  - App Maintenance
  - App Subscription
- SERVICE MANAGEMENT
  - Service Maintenance
  - Service Subscription
- USER MANAGEMENT
  - App User Management
  - Portal User Management
- TECHNICAL INTEGRATION
  - EDC Integration
  - Technical User Management
  - Identity Provider Configuration
- DATA HUB
  - Semantic Hub
- USECASES
  - Usecase Participation

App Marketplace

Solutions for Automotive Digital

The Gateway To The Automotive Digital Network

Technical Enablement

Explore More

CERTIFIED

T-Systems International GmbH

Connect & Integrate

Connect & Integrate is the all-in-one package for participation in the Catena-X Data Ecosystem

Other

Details > Contact sales

CERTIFIED

Cofinity-X

Dataspace OS

Dataspace Operating Suite (DOS) is a platform that enables you to use and manage the Catena-X data space.

Others

Details > Contact sales

CERTIFIED

sovity GmbH

soviCore Connect

Connect to Catena-X with sovity's easy-to-use Enablement Services and exchange data with your partners.

Other

Details > 50 €

CERTIFIED

Robert Bosch Manufacturing Solutions GmbH

Digital Twin Registry

The first Catena-X certified Digital Twin Registry

CERTIFIED

SAP SE

SAP Data Space Integration

Data Space Integration, a new BETA capability of SAP Integration Suite, enables self-sovereign data...

CERTIFIED

DatafabriQ UG

DataQ

Transform products into digital twins, enhance them with use case capabilities, and connect them to...

Cofinity-X

Thank you for your attention

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Managing Director
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SCAN ME

More to do: The DSP in the context of other standardization efforts

Silvia Castellvi, IDSA

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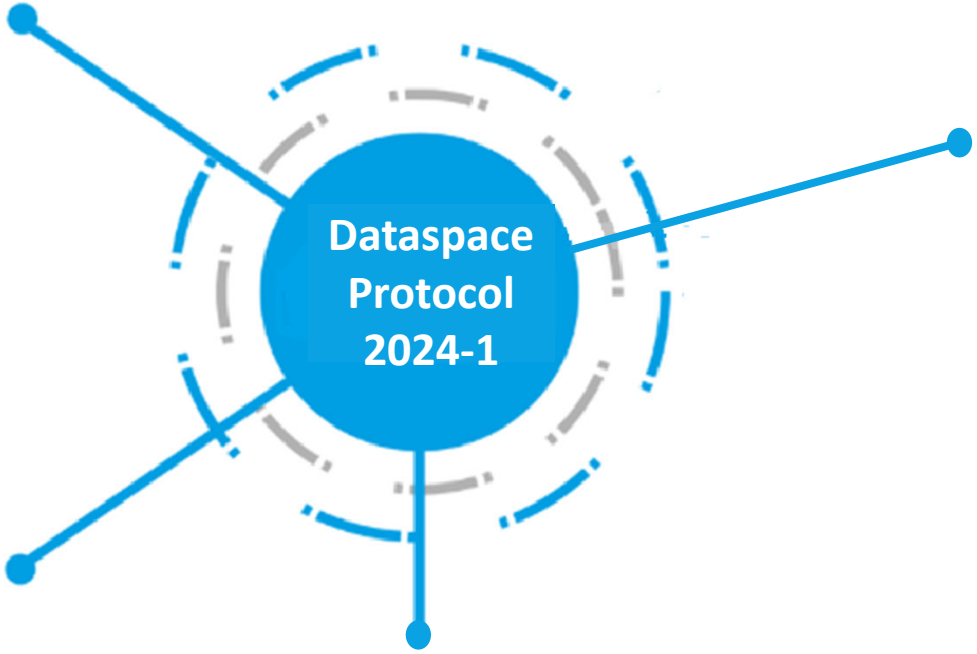

INTERNATIONAL DATA SPACES ASSOCIATION

More to do: The Dataspace Protocol in the context of other standardization efforts

More to do: The DSP in the context of other standardization efforts

Integrating global standards through the Dataspace Protocol

INTERNATIONAL DATA SPACES ASSOCIATION

Dataspace Protocol serves as a bridge between various standardization efforts, ensuring interoperability, compliance, and innovation in data sharing and AI governance.

Align with European Standardization Bodies

- CEN-CLC JTC 25,
- CEN-CLC FG DDCE,
- CEN-CLC WS Trusted Data Transactions (pre-standardisation)

Related International Standards

- ISO/IEC AWI 20151 Dataspace Concepts and Characteristics
- ISO/IEC TS 10866 Digital Sovereignty and organizational autonomy

Support for Semantic Interoperability (W3C)

- DCAT Vocabulary Mapping and profiles for data catalogs
- ODRL policy model

Alignment with legal and regulatory requirements

- DATA ACT
- AI ACT

National and Regional strategic activities

- EDIB
- EDIC
- EMDS
- EEDS

International Standardization efforts

Ensuring global applicability and adoption:

- International standard promotion: Europe, America, Asia,….

How the Dataspace Protocol interacts with standards and supports interoperability

Creating a common foundation for interoperability

INTERNATIONAL DATA SPACES ASSOCIATION

ISO 20151 – data space concepts and characteristics

What is a data space? Do I have a data space or not?
Am I compliance with the standard?

Framework for data spaces

Trusted Data Transactions happen in Data Spaces

Dataspace Protocol

Specifications including compatibility testing

Serves as the central mechanism for implementing data exchange, ensuring trust, efficient and ***interoperable communication between the data spaces***.

Participant perspective

Am I, as a participant, complying with the data space? Can I join the data space?.

Interoperability standards

Trusted Data Transactions

National standards and regulations.
Data space can provide a framework for national standards. And data spaces show interoperability of national standards with DSP

DSP provide measures to comply to interoperability

The view from partners: the technologies that complement IDS

Gerard van der Hoeven, iSHARE |
Ulrich Ahle, Gaia-X | Lars Nagel, IDSA

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Questions, answers, discussion

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INTERNATIONAL DATA SPACES ASSOCIATION

Next level data spaces:
Making the Dataspace Protocol an international standard

Thanks for joining us in Brussels