INTERNATIONAL DATA SPACES ASSOCIATION

European Cloud Accelerator

Bergamo | October 2025

Lars Nagel

CEO, International Data Spaces Association

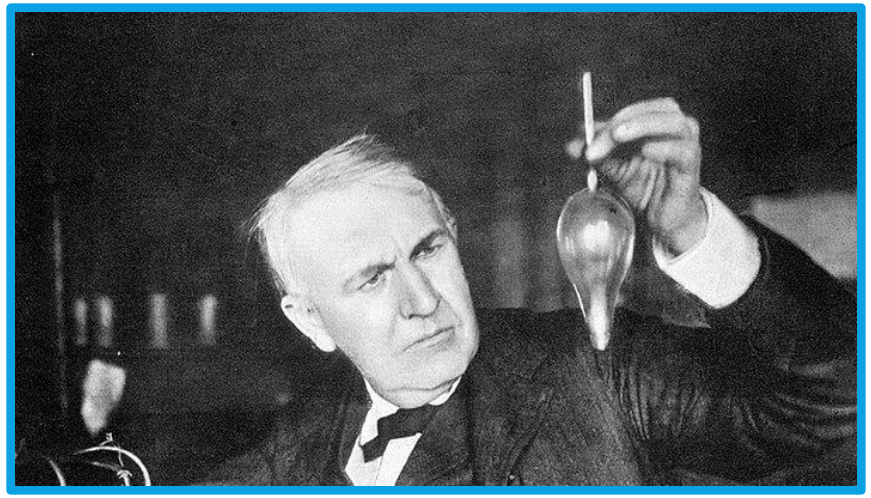
The journey from idea to impact

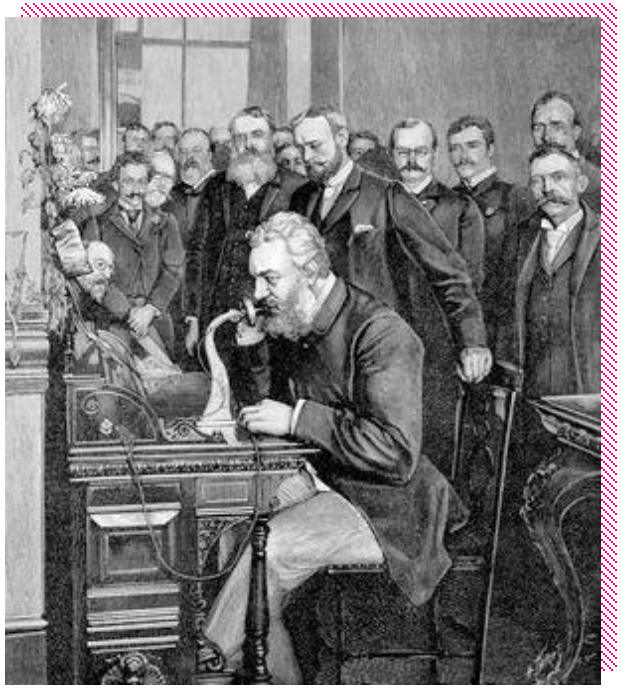
Why data spaces need users to thrive

INTERNATIONAL DATA SPACES ASSOCIATION

Every groundbreaking innovation starts as a concept, with immense potential.

History shows that inventions remain theoretical until embraced by users.





Only through integration into daily operations do innovations drive progress.

The same principle applies to data spaces today, requiring active user engagement.

IDSA's mission: from idea to impact

We embrace data spaces as a holistic endeavor

1

Invention

Technological breakthroughs begin as ideas with potential.

2

Development

Frameworks and standards establish the foundation.

3

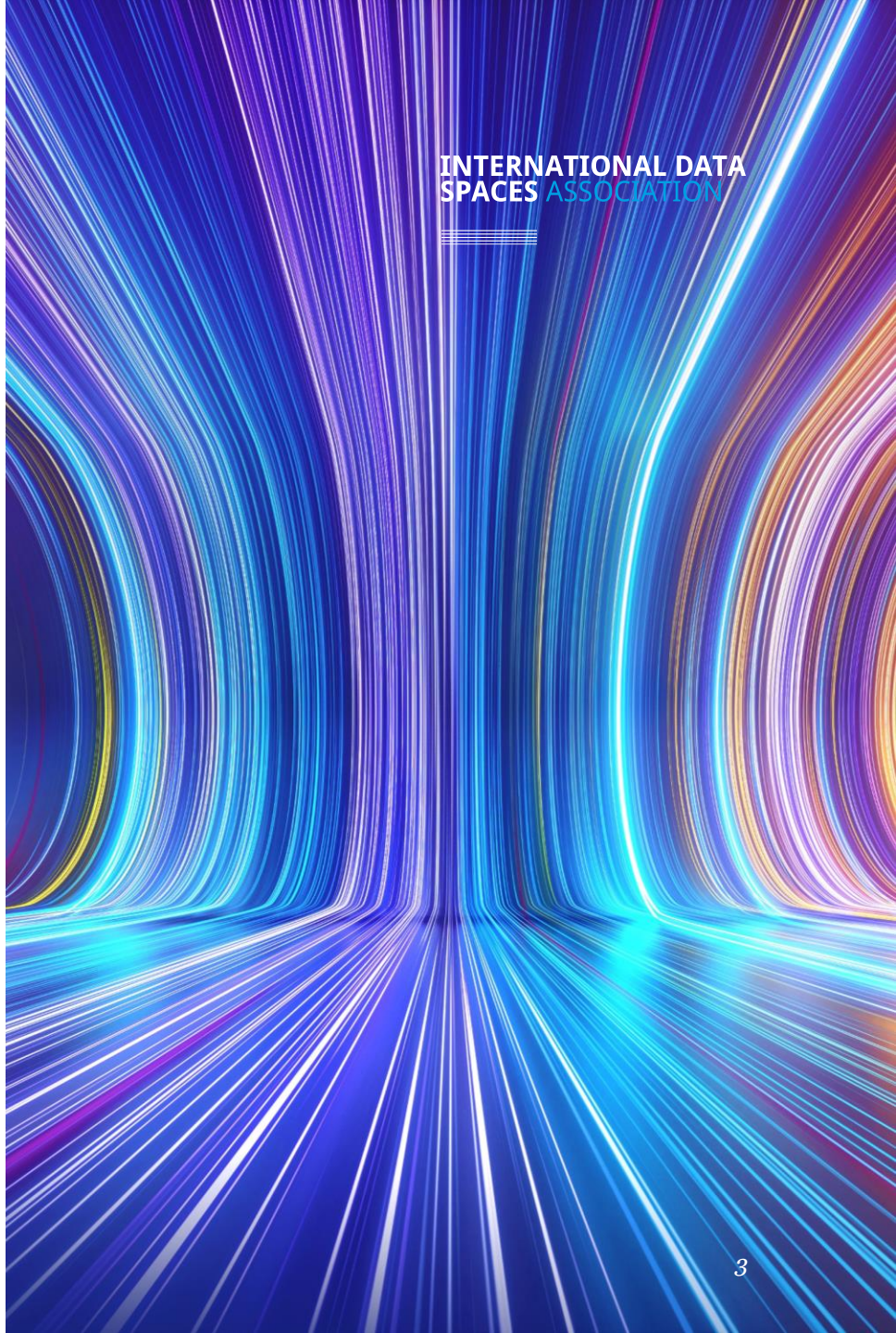
Adoption

Users integrate solutions into their operations.

4

Impact

Wide adoption creates economic and social value.



The makers and the users

A symbiotic ecosystem

INTERNATIONAL DATA SPACES ASSOCIATION

Thorough ground for data spaces

IDSA Manifesto for Data Spaces

INTERNATIONAL DATA SPACES ASSOCIATION

10 Principles of Trusted Data Sharing in data spaces

+

ISO/IEC CD 20151
Dataspaces concepts and characteristics

+

Dataspace Protocol

1. **Dataspaces enable Trusted Data Sharing**
   "Dataspaces are a mechanism of trust"
2. **You shall have full autonomy in deciding with whom you share data with and under what conditions**
   "Your data, your choice"
3. **You shall be responsible for ensuring that you are free to act and can act autonomously**
   "With great responsibility comes great power"
4. **All participants shall be treated equitably in their rights and obligations**
   Dataspaces are decentralized & neutral
5. **Data Sharing is executed on seperate peer-to-peer channels**
   "Data does not flow through the Dataspace"
6. **Dataspaces shall be based on open standards**
   "unity in standards, freedom in implementation"
7. **Dataspaces shall be infrastructure agnostic**
   "there is no single platform to rule them all"
8. **Dataspaces are building blocks for Data Ecosystems**
   "Dataspaces are not data ecosystems"
9. **Dataspaces shall be business model agnostic**
   "the opportunity is boundless"
10. **You shall honor your data contracts and its associated policies and verify adherence by others**
    "act in good faith, but verify"

INTERNATIONAL DATA SPACES ASSOCIATION

USAGE CONTROL IS ESSENTIAL FOR DATA ECONOMY

WHEN REGARDING DATA AS AN ECONOMIC ASSET

www.internationaldataspaces.org

Data space characteristics | ISO/IEC 20151

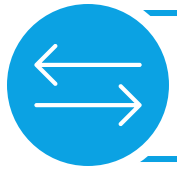
INTERNATIONAL DATA SPACES ASSOCIATION

Maintain control

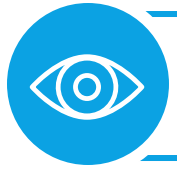
Establish trust

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

ISO/IEC CD 20151
Dataspaces concepts and characteristics

Make the connection and enable data economy

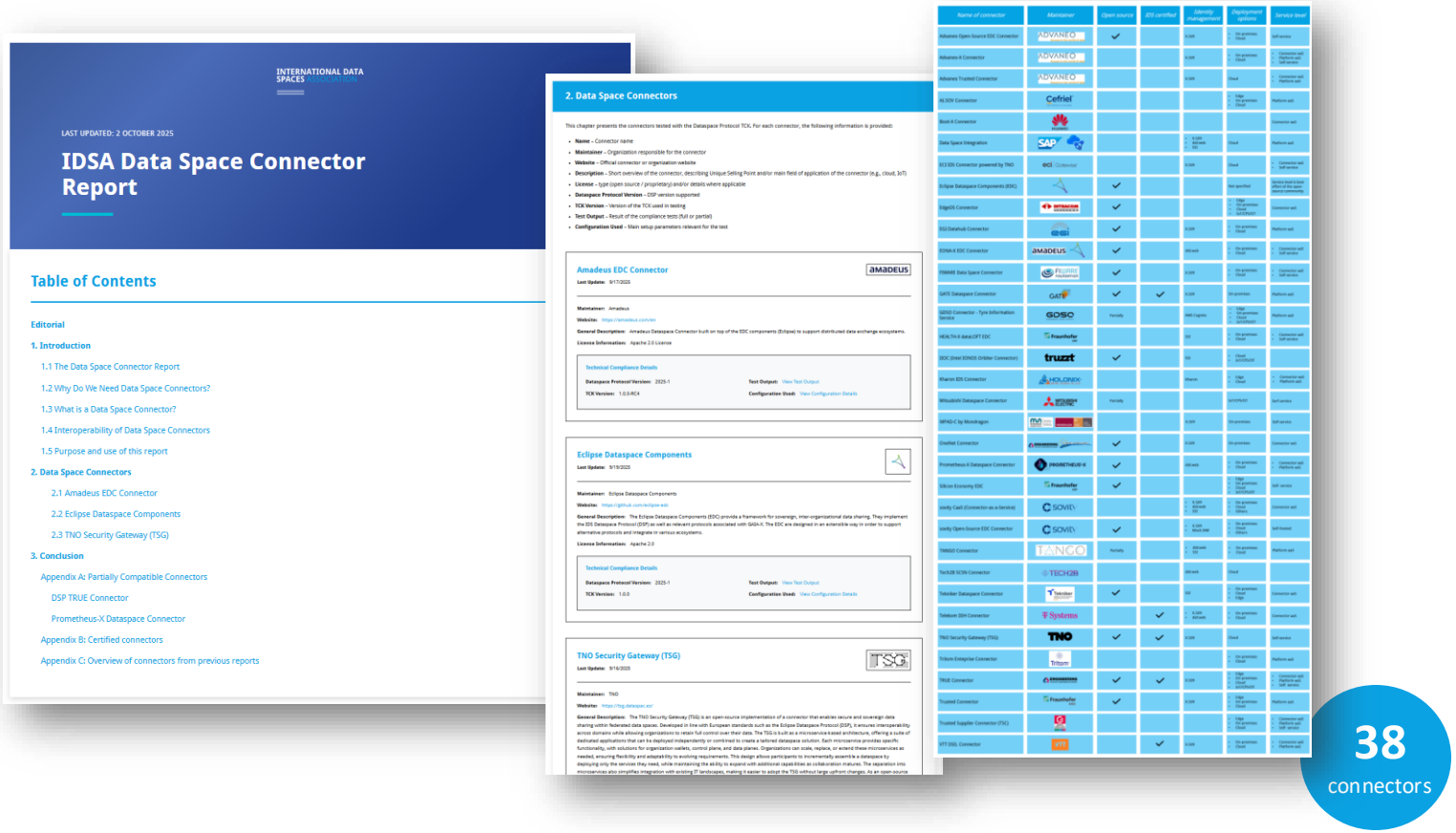
INTERNATIONAL DATA SPACES ASSOCIATION

Data space connectors (participant agents) lay the basis for interoperable trustful data sharing

- **Connects participants in a data space** – to share, utilize, benefit from data.
- Ensures **trust through IDS Certification** and **cyber security** assessment.
- Connects to **trust frameworks** and **identity management**
- Includes **identity & policy management**, ensures **data usage control**.
- Guarantees **interoperability**.
- Understands and enforces **data usage policies**.
- **Neutral master** for other connectors of diverse feature sets.

Data Connector Report

INTERNATIONAL DATA SPACES ASSOCIATION



38 connectors

Why a Data Connector Report?

- To explain what data connectors are and why they are crucial in data spaces
- To provide transparency about the number of connector implementations available, their maturity and features, following their evolution over time
- To explain how data connectors can be technically interoperable
- To provide additional insights on related technologies and initiatives

https://internationaldataspaces.org/data-connector-report/

IDSA partners with Eclipse – EDC and EDWG

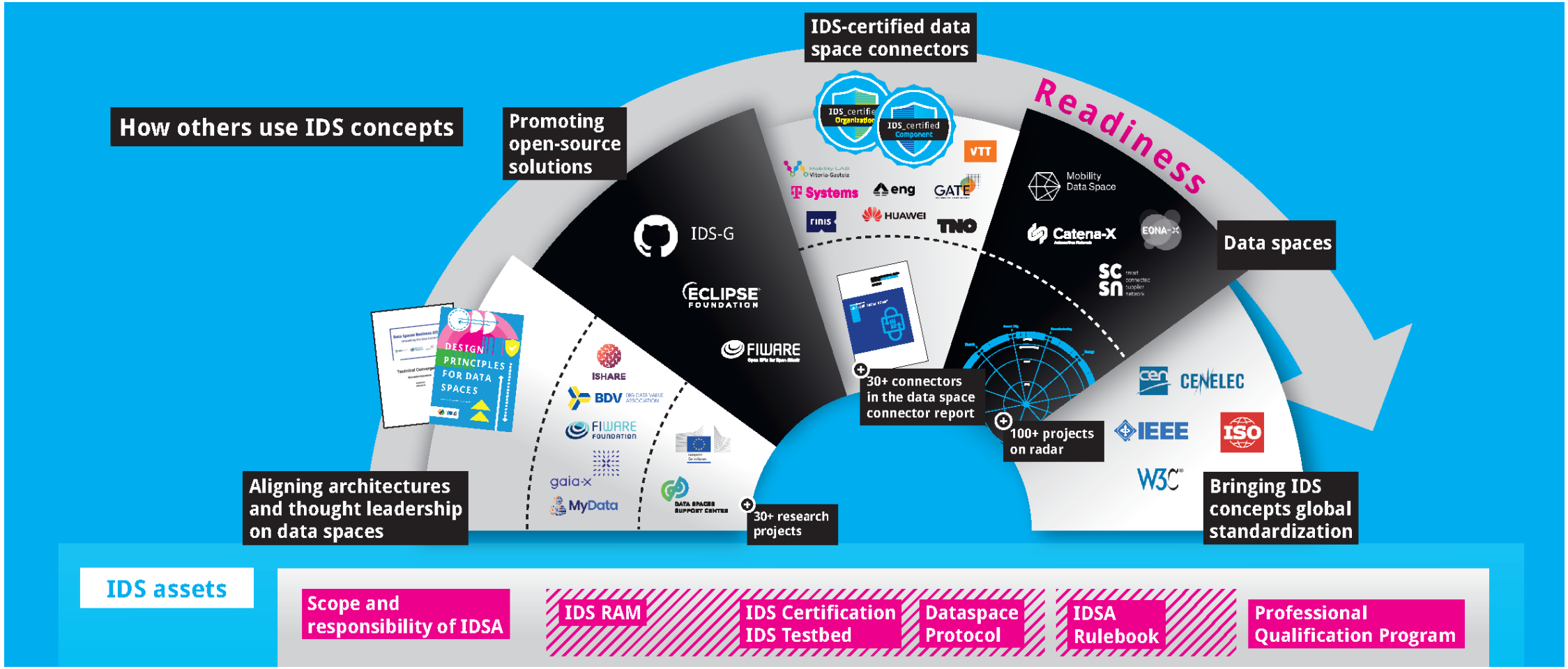
OSS ecosystem for building global standards and software components

INTERNATIONAL DATA SPACES ASSOCIATION

- IDSA and the Eclipse Foundation collaborate to build an **open-source ecosystem**
- The **IDSA Rulebook** outlines organizational interactions, roles, and components in data spaces
- The **IDS-RAM** details the technical implementation
- An Eclipse Specification Project hosts the **Dataspace Protocol**, while IDSA defines functional requirements
- The **Eclipse Dataspace Working Group (EDWG)** will coordinate multiple OSS projects (like DCP, Data Plane Core, Data Plane Signaling)

Bring the fundamental data spaces concepts to global adoption and standards

INTERNATIONAL DATA SPACES ASSOCIATION

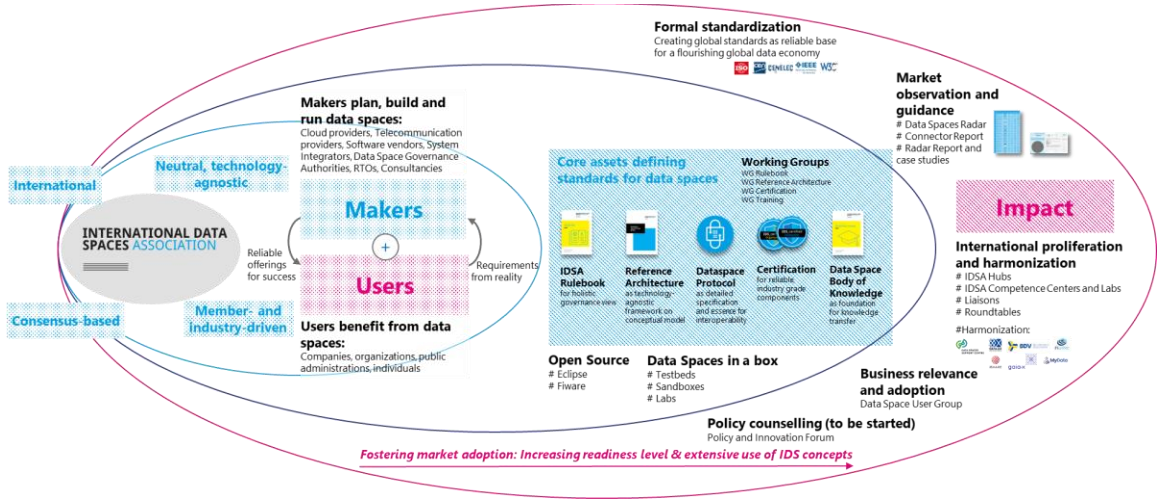


IDSA – State of the union

What we have achieved, where we are

INTERNATIONAL DATA SPACES ASSOCIATION

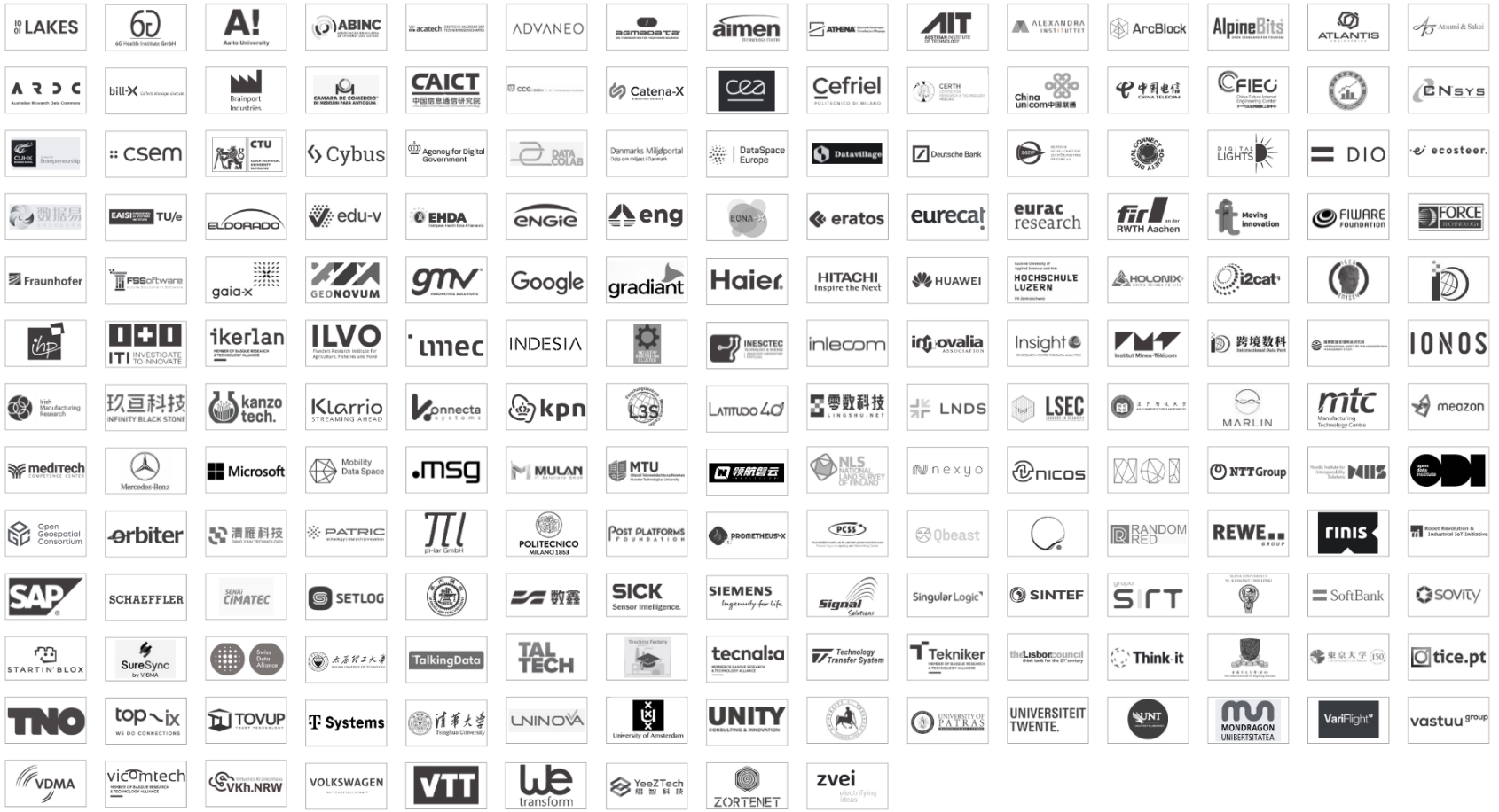
- IDSA is the industry association that set the **foundations for data spaces** across technology and business practices since 2016
- Those foundations concretize in **one consistent, global framework for data spaces** as soft infrastructure for data economy and enabling data-hungry applications like AI
- **IDSA is global and neutral,** and genuinely **driven by our members**
- As of today, **200+ data spaces and use cases across 20 industry sectors are built on IDSA guidance** (see our Radar)
- **All relevant players** are on board (users of data spaces, providers of services, policymakers)
- IDSA is **focused on delivering the next wave of specifications and technology to become international standards**, like our Dataspace Protocol with ISO



Our members are the backbone of IDSA

Be part of the global change

INTERNATIONAL DATA SPACES ASSOCIATION



860+ People contributing

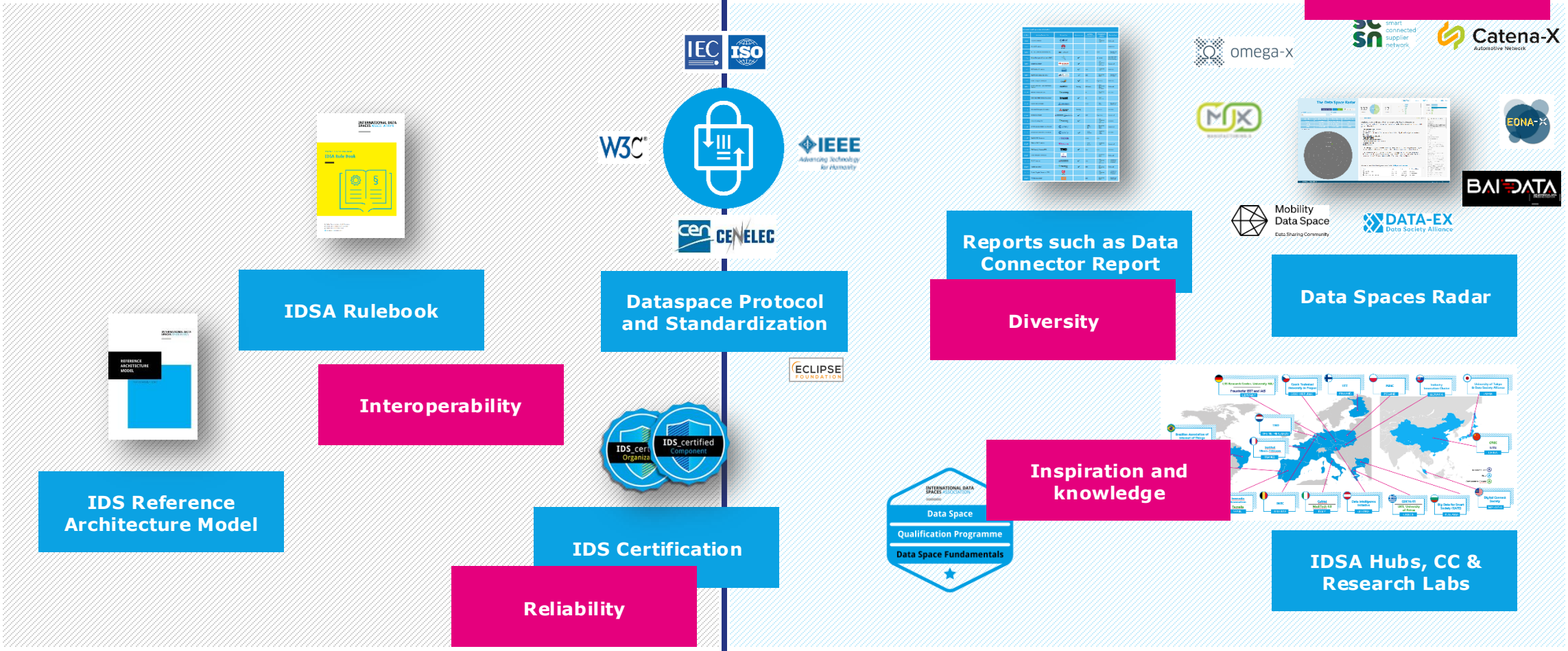
31 Countries

191

IDSA assets – from theory to practice

How we change the way data is shared

INTERNATIONAL DATA SPACES ASSOCIATION



An agnostic baseline for global data spaces

IDSA's efforts of the last 10 years: a holistic perspective on data spaces

INTERNATIONAL DATA SPACES ASSOCIATION

Common governance framework

- describes the **technical, operational, and legal agreements** to enable the IDS ecosystem to be fully working in a real-world scenario.
- outlines **a common governance framework** that all players need to abide to, for a smoothly running future data economy.
- is **industry-agnostic**, and applicable in all verticals as a **horizontal standard**.

Fundamental principles

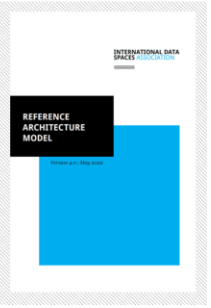
- 10 fundamental principles of trusted data sharing
- It is both a call to action and a vision for a future in which trusted data sharing through international data space concepts is the norm, empowering organizations to responsibly harness the full potential of their data.
- By adhering to these principles, we believe data spaces will catalyze the next wave of innovation, unlocking vast opportunities for organizations, communities, and society as a whole.

IDSA: our mission for data spaces:

- Holistic challenge – from technical complexities, via legal uncertainties to undiscovered business benefits.
- We need to make life easy:
  - Giving guidance, support and best practices.
  - Crafting a common data spaces framework.
  - Stimulating market-ready, usable solutions that just work.

Technology- and policy-agnostic architecture patterns

- is a practitioner-oriented guide to designing and implementing **architectures for data spaces**
- The RAM is both, an introduction to software architecture and a **handbook of well-established best practices**
- The IDS RAM describes **how data spaces should be built**, the blueprint for maintaining data sovereignty in data driven business ecosystems.

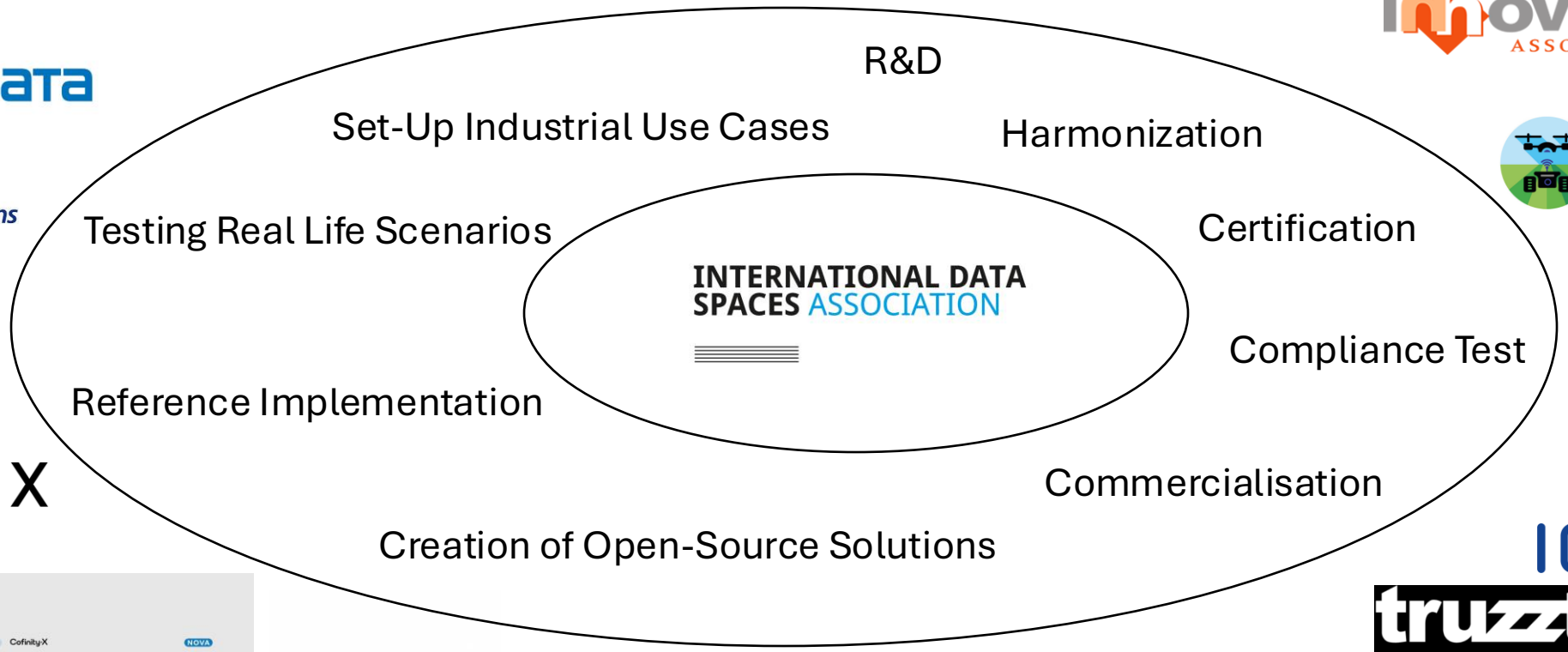


Minimal interoperability

ISO IEC

Dataspace Protocol

Test Beds: One Base – Multi Purpose



INTERNATIONAL DATA SPACES ASSOCIATION

T Systems

東京大学 THE UNIVERSITY OF TOKYO

tecnalia MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

VTT

TNO

innovalia ASSOCIATION

NTT DATA

FLEXIGROBOTS

NTT Communications

kpn

SQS SOFTWARE QUALITY SYSTEMS

Tractus X

IONOS

truzzt ALLIANCE

orbiter

Cofinity-X

ZF

Cofinity-X Dataspace OS NOVA Become Dataspace Ready

IOFDS INTERNATIONAL OPEN FORUM ON DATA SOCIETY

SOVITY

nexyo

EVIDEN

ADVANEO

Testbeds – breeding grounds for data spaces

IDSA and the footprint in the manufacturing sector

An overview of partners and technology

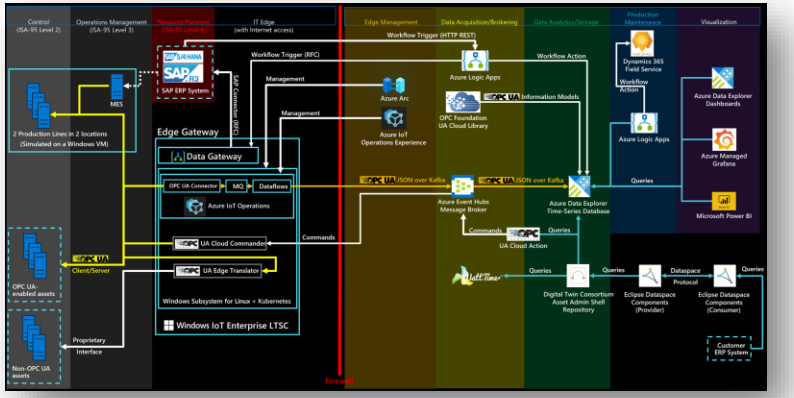
INTERNATIONAL DATA SPACES ASSOCIATION

Partners – strong collaboration via projects and MoUs

- VDMA
- ZVEI
- RRI (Robot Revolution Initiative)
- **OPC Foundation**
- IDTA (Industrial Digital Twin Association)
- DFA (Digital Factory Alliance)
- Our members all over the world which build industrial data spaces and components and services for them
- We pool activities in IDSA industrial community

Projects

- Current EU funded projects: e. g. Smartenance, Cirpass, Underpin, …
- National funding projects of global scale: Manufacturing-X, SCSN, Machinery-X, … - Japenese projects: Ouranos, … - Chinese projects
- Others – see the relevant section on manufacturing in the data spaces radar



*Technology and architecture designs are no longer a miracle. There are **implementation patterns existing of how industrial data spaces can be designed**, encompassing different components, semantic models:*

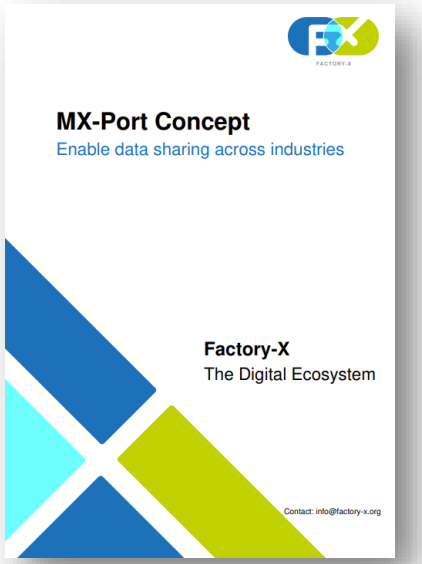
- *Dataspace connectors: EDC, others*
- *Asset Administration Shell*
- *OPC Unified Architecture, Cloud Initiative Reference Architecture and companion specs*

*→ The **dataspace protocol** enables data sharing between data spaces and domains – it opens the door for industrial data spaces to create even more value in larger ecosystems.*

IDSA Dataspace Protocol (DSP) as configuration option for Manufacturing-X

Configuration „Hercules“

INTERNATIONAL DATA SPACES ASSOCIATION



	Layer	MX-Port “Hercules”[3]
L5	Discovery	Data Space Protocol / Decentral Claims Protocol[4]
L4	Access & Usage Control	
L3	Gate	AAS - REST
L2	Converter	AAS Submodels[5]
L1	Adapter	Application specific

Figure 5: MX-Port configuration "Hercules" (Source Factory-X)

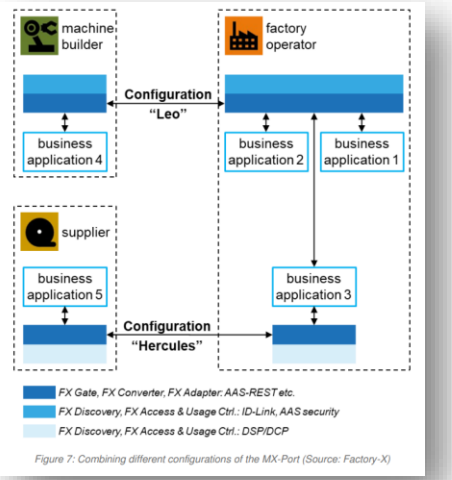


Figure 7: Combining different configurations of the MX-Port (Source: Factory-X)

Scaling data spaces – a joint and global endeavor

Why standardization mattters

INTERNATIONAL DATA SPACES ASSOCIATION

Interoperability: Connect seamlessly with partners across industries and regions.

Trust: Ensure sovereign and secure data sharing with verified partners.

Scalability: Grow your data sharing ecosystem without technical limitations.

Compliance: Meet global regulatory requirements.

Stability: Avoid costly rework and secure long-term ROI

- Standards may appear abstract, but they are what makes collaboration possible at scale.
- Think of how container sizes transformed global trade, or how GSM made mobile networks interoperable across borders.
- Data spaces need the same kind of common understanding if they are to grow beyond isolated pilots.

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

Integrating global standards

INTERNATIONAL DATA SPACES ASSOCIATION

Align with European Standardization Bodies

- CEN\CENELEC JTC 25 Data management, Dataspaces, Cloud and Edge – workinggroups 1 - 4
- Harmonized standards on European Trusted Data Framework

Alignment with legal and regulatory requirements

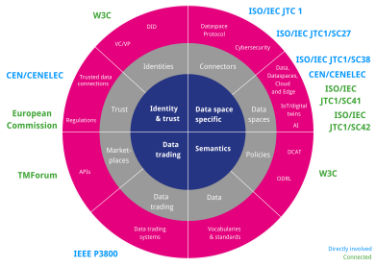
- DATA ACT, Data Governance Act
- AI ACT
- PIPL/GDPR
- …

International Standardization Efforts

Ensuring global applicability and adoption:

- ISO/IEC AWI 20151 Dataspace Concepts and Characteristics – is now DIS!
- ISO/IEC TS 10866 Digital Sovereignty and organizational autonomy
- NEW PWI in ISO/IEC JTC1 SC38: use-cases for data spaces
- NEW PWI in ISO/IEC JTC1 SC38: Dataspace Trust Frameworks
- Ongoing :Support for semantic interoperability (W3C) DCAT and ODRL policy model

Holistic Standardization



Asian Standardization efforts

- China: TC609 – trusted data spaces, collaboration with CESI
- Japan: ODS RAM – collaboration with DADC
- Japan: IEEE P3800, 3800.1, 3800.2
- …

Open-source specification projects

Eclipse Foundation:

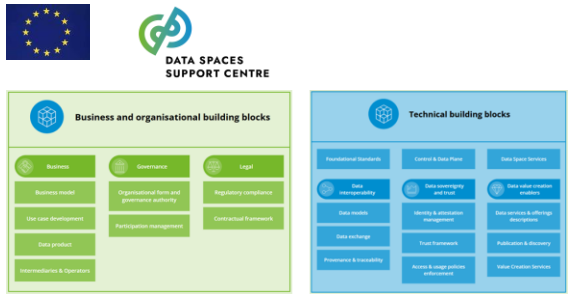
- Dataspace Protocol
- Decentralized Claims Protocol
- NEW: Data Plane Signaling
- NEW: Data Plane Core

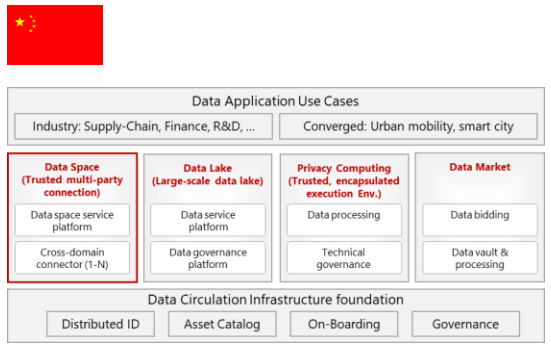
International. Data Spaces. Association.

We know what is going on and can help.

INTERNATIONAL DATA SPACES ASSOCIATION

Harmonization of frameworks and data strategies on global level





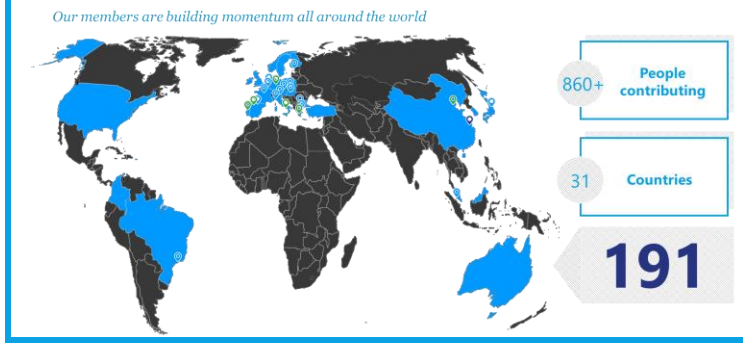
...and much more...

IDSA is the only **true international** organization about data spaces.

Driving global standards

IEC ISO IEEE W3C CEN CENELEC

Strong link to relevant economic areas



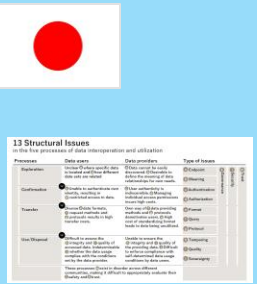
Global players to provide data space solutions globally

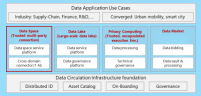
INTERNATIONAL DATA SPACES ASSOCIATION

A global soft infrastructure for data spaces – like GSM for mobile telecommunication

One baseline for global success

INTERNATIONAL DATA SPACES ASSOCIATION

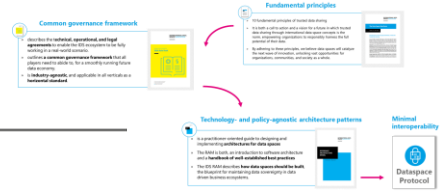




…more countries

National and domain-specific governance frameworks and operationalization

We align with, co-operate with and consult organizations and governments to design this layer based on global standards for maximum acceptance and value of data sharing.



~30 % global standards – and globally available services and software components

We partner with organizations to jointly build and define this layer.

A global soft infrastructure for data spaces – like GSM for mobile telecommunication

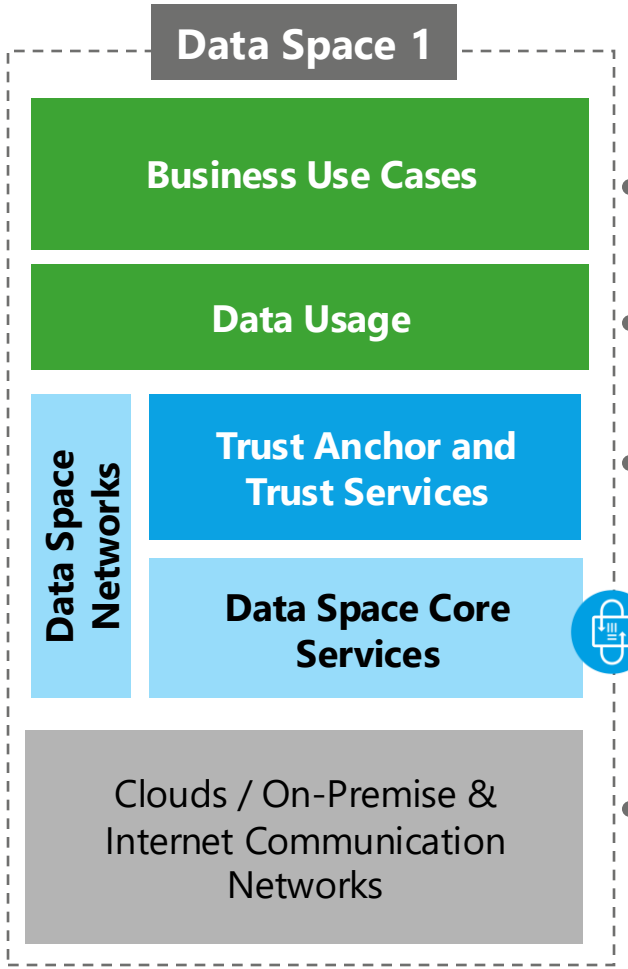
National flavors and power by using global standards

INTERNATIONAL DATA SPACES ASSOCIATION

Specific data strategies and standards in different economic areas and domains

Global standards to ensure global value creation

Companies (Telco operators, CSPs, SW vendors) provide the new soft infrastructure for data spaces



Generate economic value and revenue

Data Processing and data refinement

Establish trust between participants

Data contract negotiation, data discoverability, providing of vocabularies and semantic models, observability (Dataspace Protocol)

Provide secure, neutral connectivity over 5G, fiber networks with privacy and confidentiality

Provide the foundational compute, storage, and data processing power

A global soft infrastructure for data spaces – like GSM for mobile telecommunication

National flavors and power by using global standards

INTERNATIONAL DATA SPACES ASSOCIATION

Specific data strategies and standards in different economic areas and domains

Global standards to ensure global value creation

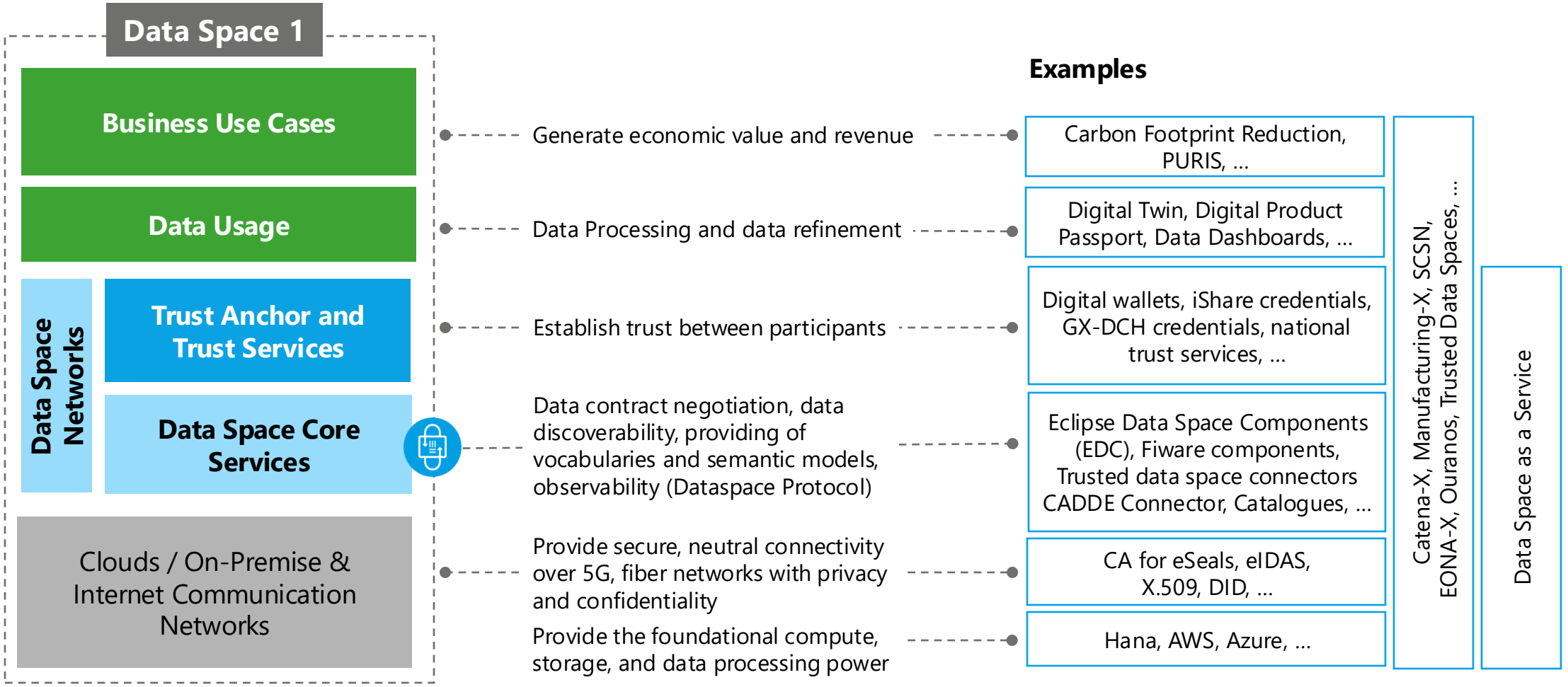
Interoperability – while complying with national data strategies, national standards, regulation and infrastructure

Companies (Telco operators, CSPs, SW vendors) provide the new soft infrastructure for data spaces

A global soft infrastructure for data spaces – like GSM for mobile telecommunication

National flavors and power by using global standards

INTERNATIONAL DATA SPACES ASSOCIATION



The IDSA Telco Provider Community

A step towards standards for trusted network services

INTERNATIONAL DATA SPACES ASSOCIATION

The goal:

We establish **international de-facto standards for trusted network and interoperability services** mainly in the B2B area, ensuring fair, secure, and interoperable data sharing on global scale.

The vision:

To become the leading provider of global **data space connectivity services**, enabling companies to seamlessly and securely access data spaces with the **simplicity and reliability** of a phone call - leveraging the existing infrastructure of national telecom carriers to drive digital transformation and collaboration worldwide.

Discover more

Community Founders

T · · Systems ·

NTT

kpn

New Members

中国电信 CHINA TELECOM

NEW

SoftBank Group

Interoperability in Data Spaces by the IDSA Telco Provider Community

INTERNATIONAL DATA SPACES ASSOCIATION

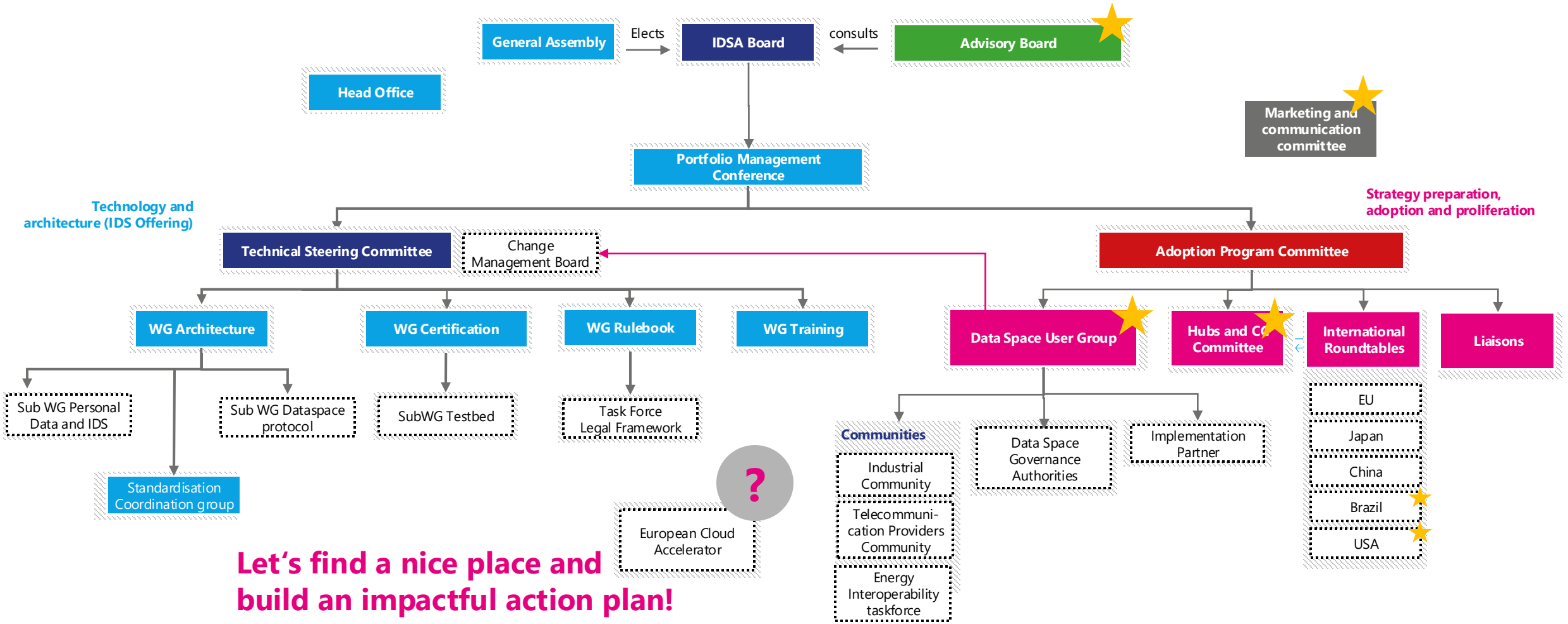
New position paper:

- **Telcos as Key Enablers**: Their expertise in global networks positions them to drive data space development.
- **Lessons from GSM**: Collaboration and standardization can ensure interoperability in data spaces.
- **Interoperability Model**: A structured framework addresses technical, semantic, organizational, and legal layers.
- **Case studies** from major telcos showcase successful implementations and collaborations

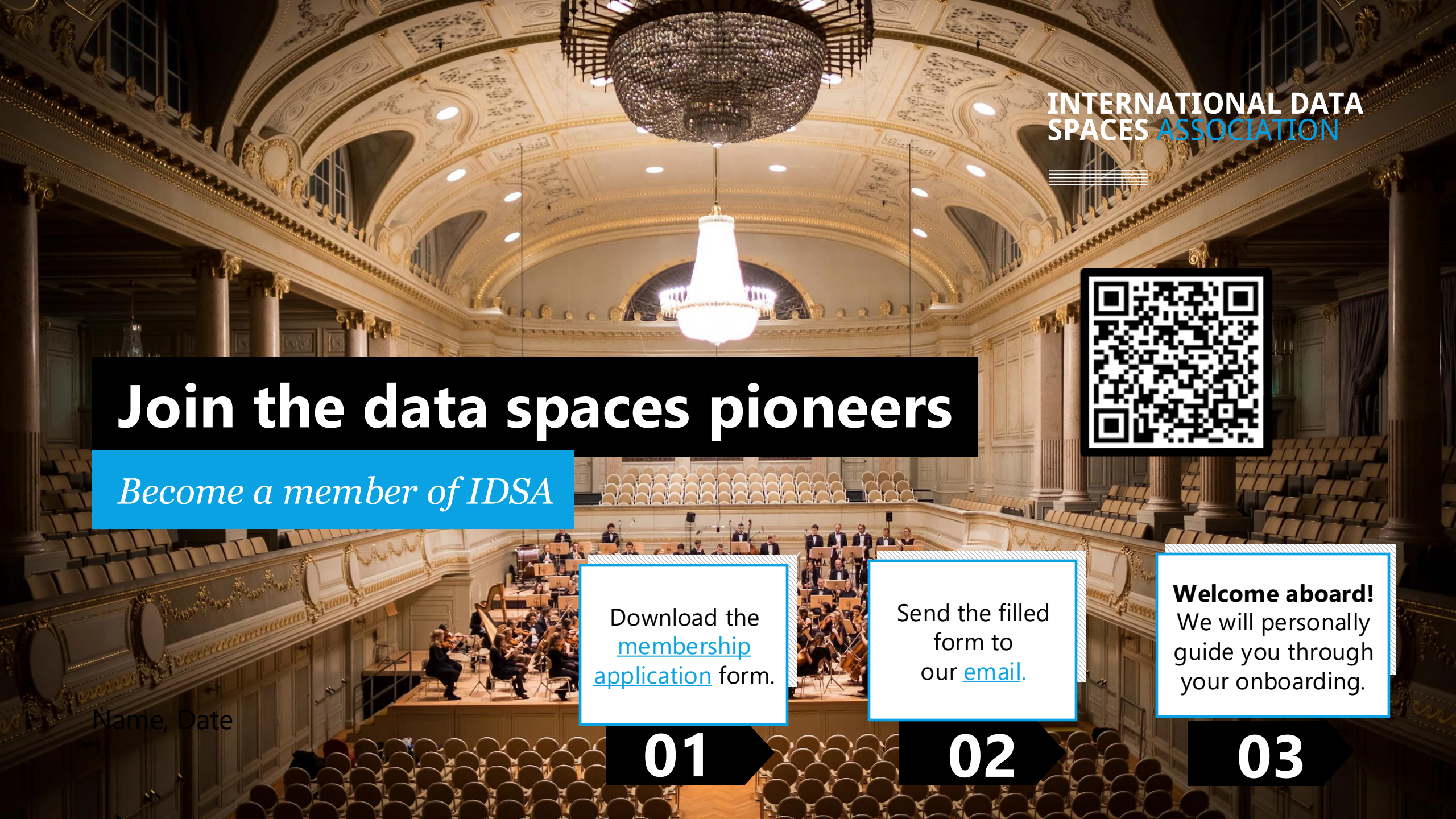
Take a look inside!

Happy to give „European Cloud Accelerator“ a home for further acceleration

INTERNATIONAL DATA SPACES ASSOCIATION



Let‘s find a nice place and build an impactful action plan!



INTERNATIONAL DATA SPACES ASSOCIATION

Join the data spaces pioneers

Become a member of IDSA

Download the membership application form.

01

Send the filled form to our email.

02

Welcome aboard! We will personally guide you through your onboarding.

03

Name, Date

INTERNATIONAL DATA SPACES ASSOCIATION

Lars Nagel

CEO

www.internationaldataspaces.org

+49 173 2929140

lars.nagel@internationaldataspaces.org