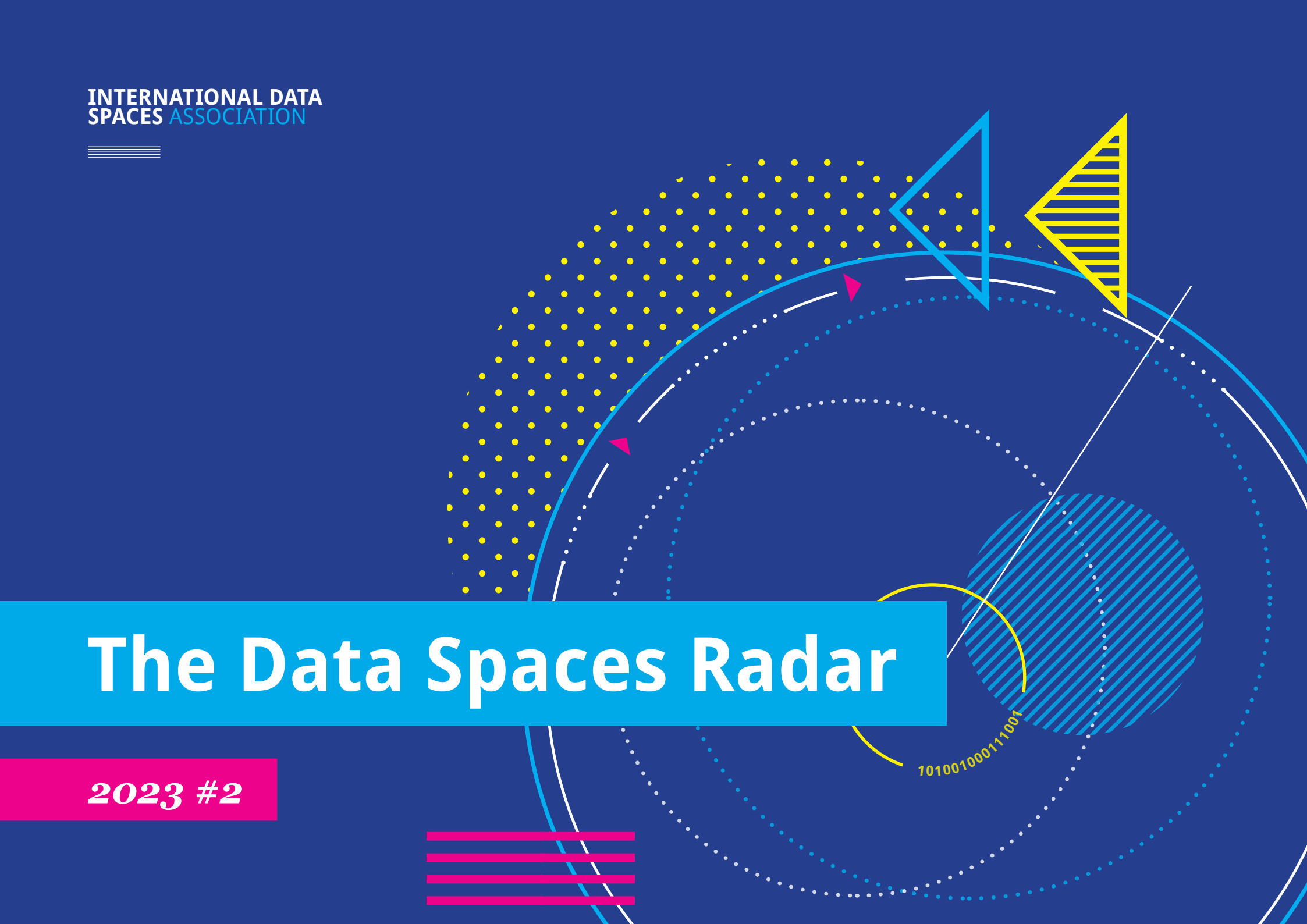
INTERNATIONAL DATA SPACES ASSOCIATION



The Data Spaces Radar

2023 #2

Imprint

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From the margins to center stage: the Data Spaces Radar

Dear readers,

as summer graces us with its warmth, it's time to pause and take a moment to explore some intriguing use cases from our Data Space Radar before we head off for the summer break. Much like the diversity of summer, our chosen examples span a variety of areas such as the green deal, manufacturing, rail, AI, and many more.

I'm fully convinced that data spaces will bring significant changes across all areas of life. Honestly, it's hard to picture an area that wouldn't benefit from data sovereignty.

However, demonstrating the potential of data spaces and motivating people to get involved can be quite challenging. If we drill down into a highly specific example, it might be hard for you to see how it relates to your domain or business case. But if we're too broad, the benefits can seem a bit unclear. It's like walking a tightrope, but we're committed to sharing a wide range of examples so there's a good chance you'll find something that piques your interest.

Now, it's your turn to dive into these examples in our summer edition. I'm eager to hear your thoughts and discuss how these might relate to your specific business situation after the summer. Perhaps you're contemplating building a new data space, or data spaces could be the key to resolving a business challenge. Let's explore the best way forward together.

I'm looking forward to catching up after the summer break. Until then, have a fantastic summer and consider what your role might be in the evolving world of data spaces.

Sincerely yours,
Christoph Mertens
Head of Adoption

Contents

Data Spaces

Data spaces are where sovereign data sharing happens

The IDS standard enables trustworthy data sharing among certified data providers and recipients, based on mutually agreed rules. Data spaces improve cooperation, lower the barriers to entry and enhance innovation.

Certified for trustworthiness

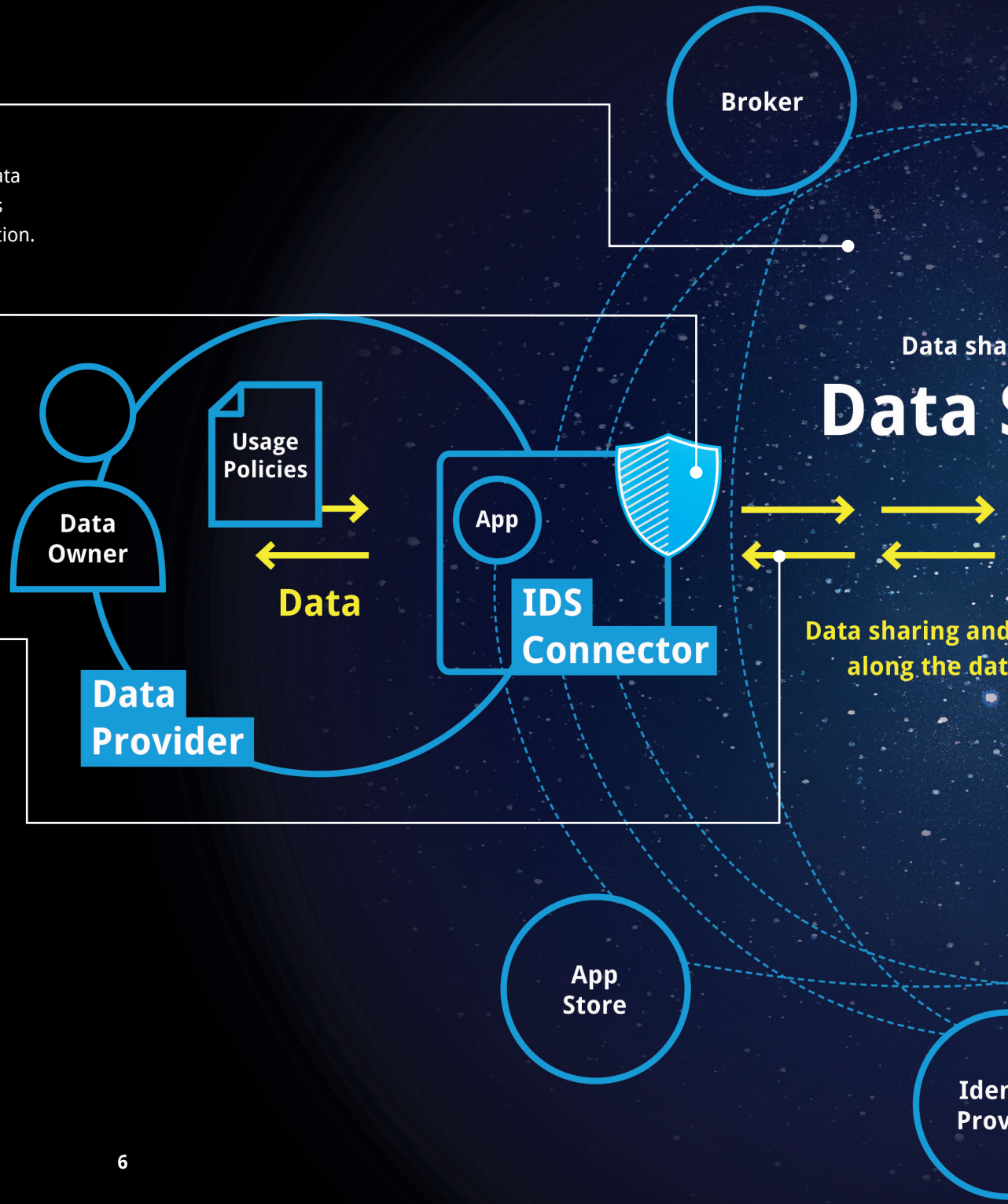
A rigorous, transparent certification process ensures trust of participants and components within the data space.

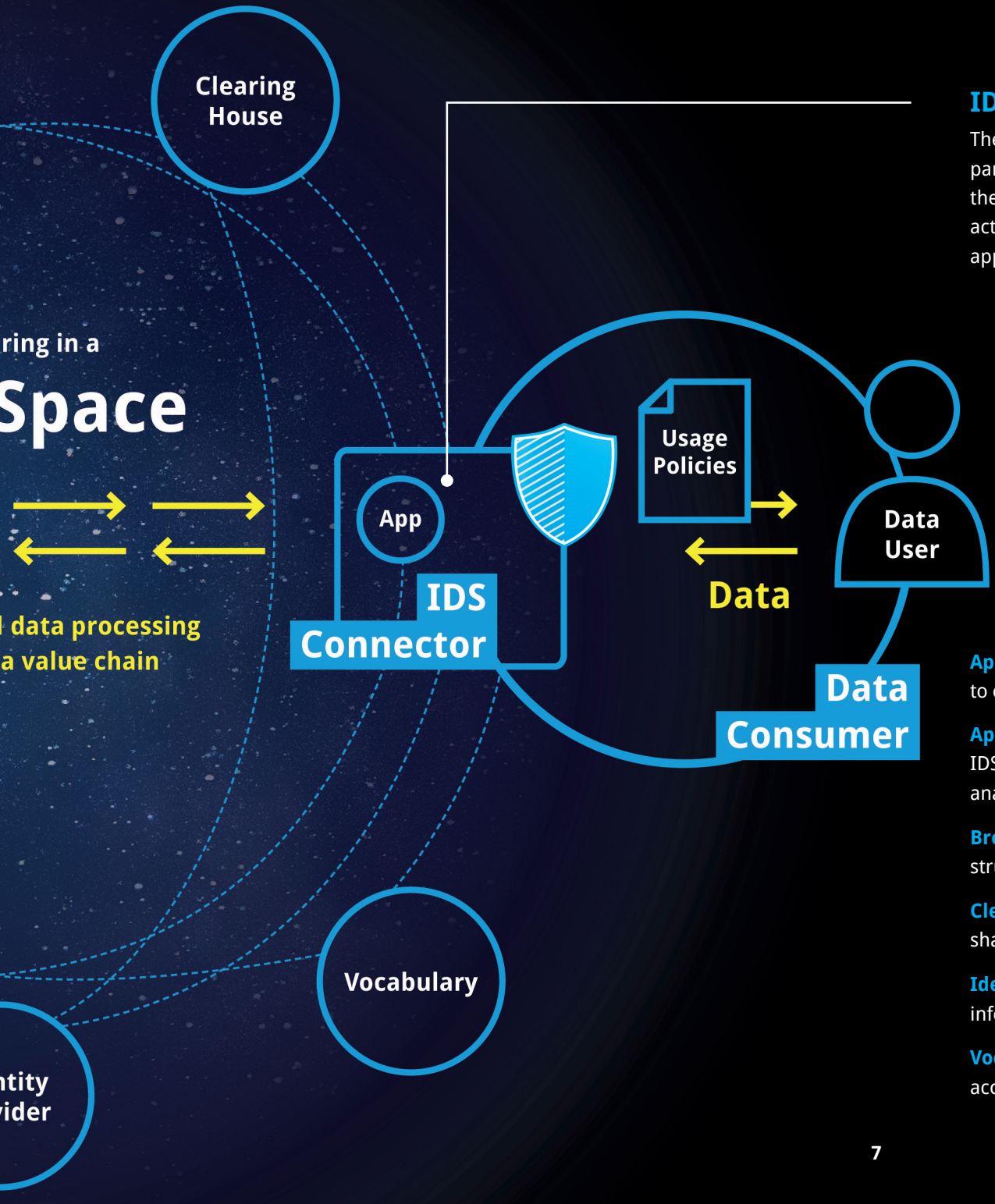
Data sharing and data processing along the data value chain:

Data spaces unlock the value of data.

Data owner and data provider: The data provider is a device that transfers the owner's data to the data space via the IDS Connector. It allows others to use the data while retaining control over who, how, when, why and at what price. This is data sovereignty, the basis for unlocking the value of data.

Data user and data consumer: The data consumer is a device that processes data on behalf of the user. The data is offered by data providers per their usage policies and with confidence in the data's quality and reliability. This is how data delivers its value. This too is data sovereignty.





IDS Connectors are data gateways

The IDS Connector is a dedicated software component that allows participants to attach usage policies to their data in a data space, enforce the usage policies and seamlessly track data provenance. The connector acts as a gateway for data and services and as a trusted environment for apps and software.

App Store provides applications that can be deployed in IDS Connectors to execute tasks like transformation, aggregation or data analytics.

Apps are executed from the App Store in the trusted environment of the IDS Connector. Apps perform tasks such as transactions, aggregations or analysis of the data.

Broker provides information about data sources in terms of content, structure quality, currency and other features.

Clearing House is the clearing and settlement service for all data sharing and financial transactions within the IDS.

Identity Provider creates, maintains, manages and validates identity information of and for participants in the IDS.

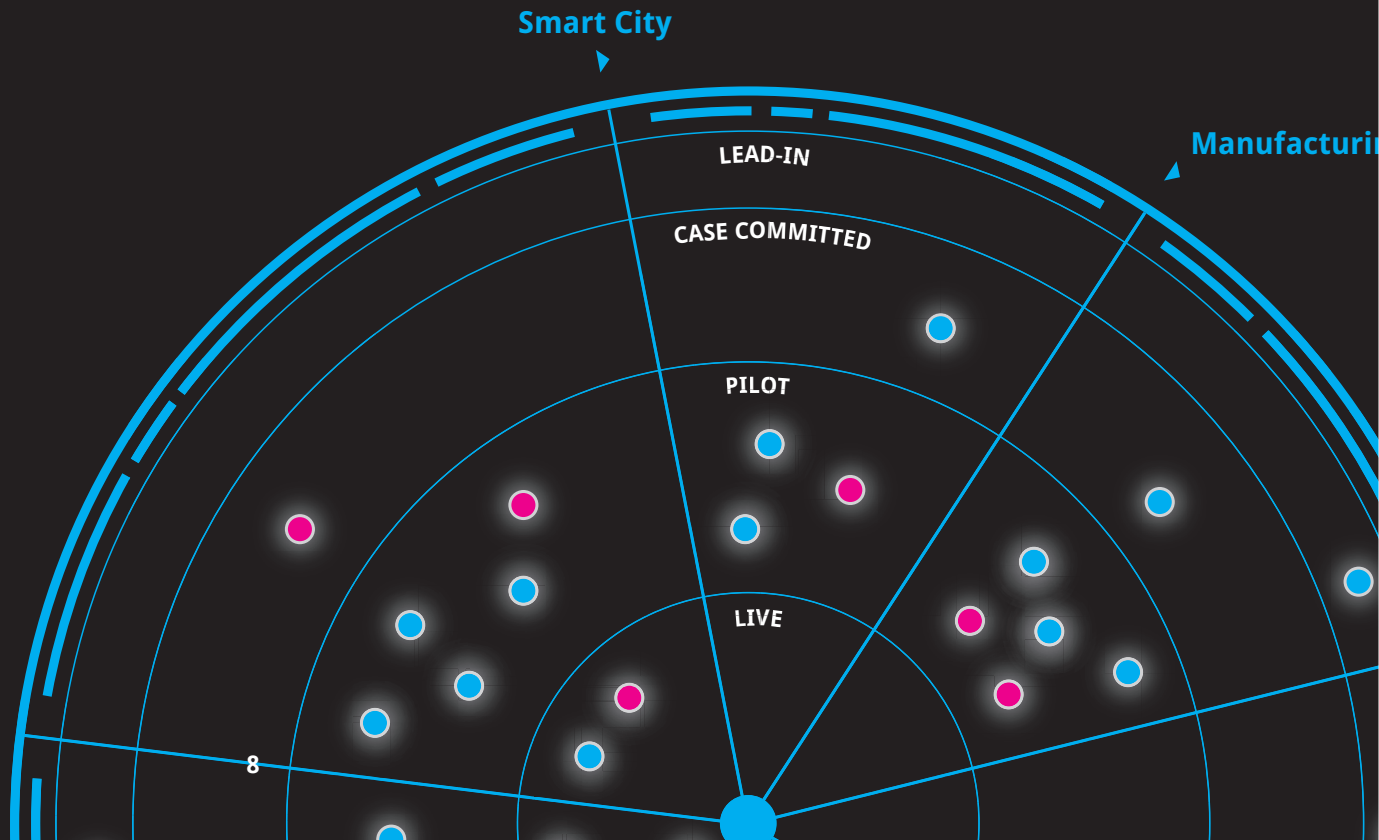
Vocabularies provide standardized descriptors for data based on accepted best practices.

The Data Spaces Radar

The Data Spaces Radar serves as a platform to highlight established data spaces that adopted the IDS standard. As the number of data spaces continues to grow, it's essential for organizations to have a clear understanding of the path towards sovereign data sharing. The radar provides an overview of who is utilizing this standard, listing data spaces categorizing them according to their domain and solution maturity.

Its impact is twofold: First, companies get inspired by the progress of others, motivating them to engage with the IDS framework. Second, businesses gain insights into how data space solutions are being developed, enabling them to learn from best practices. Additionally, the radar facilitates connections with experts who provide guidance in designing their own IDS adoption strategies.

Consortia investing in data space solutions are the vanguards of the IDS standard, showcasing the immense business opportunities of the data economy.



Maturity levels

Lead in

The first maturity level includes a general description of the use case or data space project, there is a consortium of partners, a vision, and a domain, yet it lacks further preparation.

Case committed

This is a more mature use case or data space since it already has a clearly defined technical architecture and the business cases are already documented and accessible. There is already a roadmap, project planning and management, a budget and activities have begun.

Pilot

At this level, technical solutions are already in use and there are trials underway where interoperability and data sharing help to solve the business challenge. The project is nearly at a live stage, but it is not yet market ready.

Live

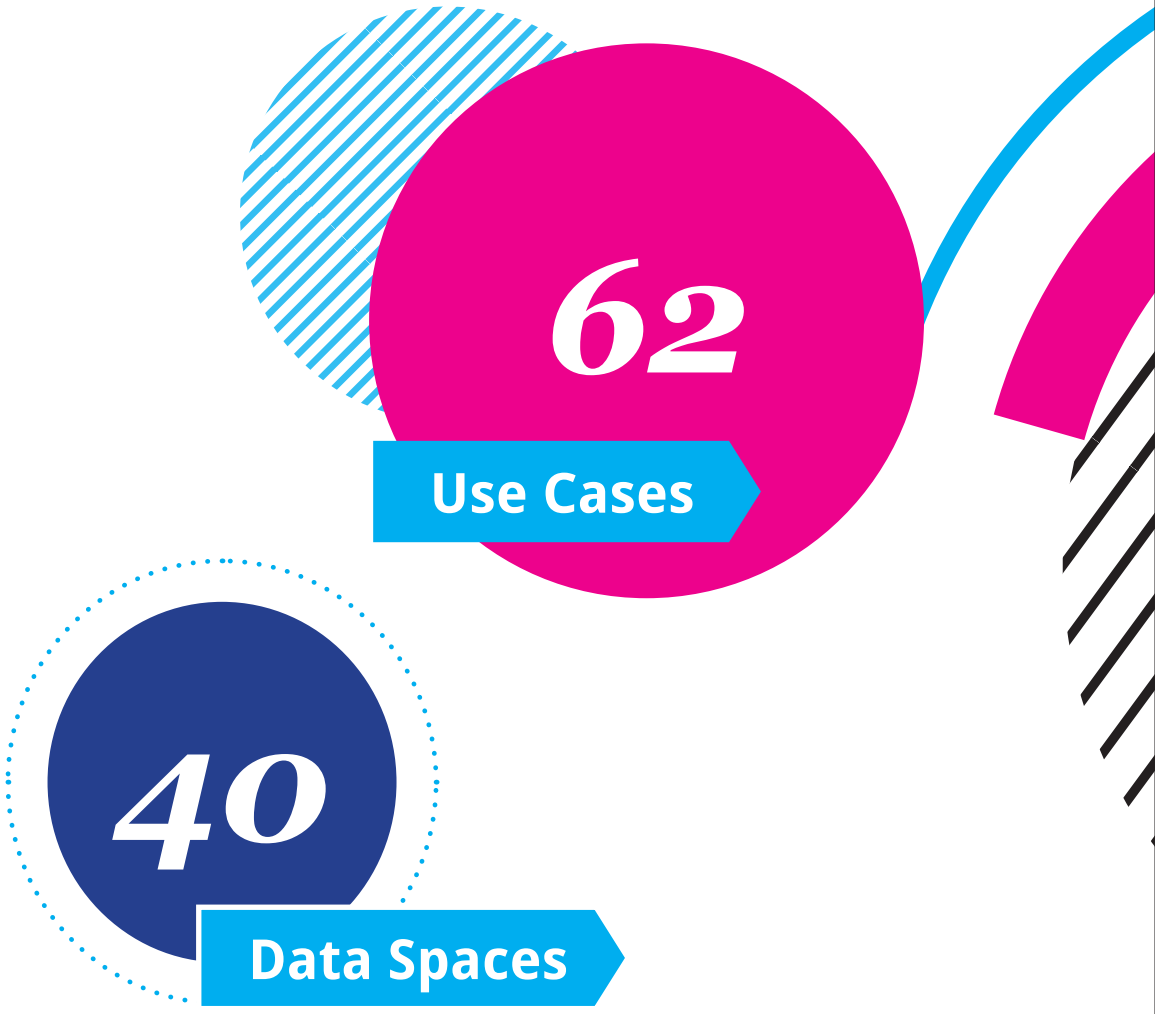
To reach this level of maturity, sovereign data exchange must already be taking place and the technology of the data space must be fully functional. From a product perspective, participants can already access it as a service. From a solution's perspective, it should improve processes or solve an issue, be accessible and adopted within a network.

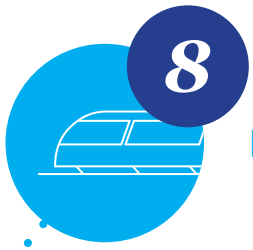
Join the Data Spaces Radar

Why should you join the Data Spaces Radar?

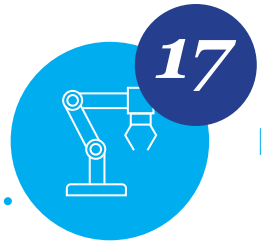
The Data Space Radar connects you with others and creates networking opportunities with organizations, experts, and consortia. This overview of real-life data spaces helps companies to gain visibility. By sharing the progress, continuous improvement within the data space community is fostered.

Experts provide support to optimize data space implementations. By adopting the IDS standard new business opportunities open - with customers, investors, and partners committed to sovereign data sharing. All these pioneers seize a big competitive advantage.

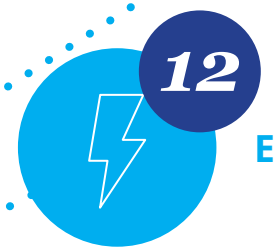




Mobility



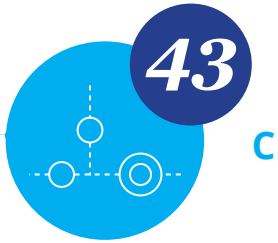
Manufacturing



Energy

Supply Chain

Automotive



Cross-Domain

Smart City

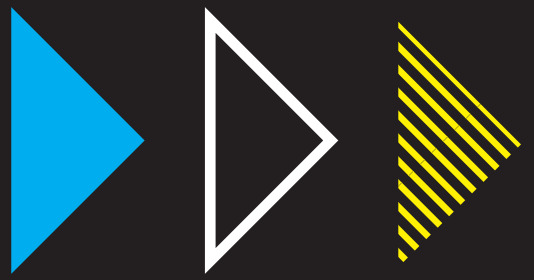
Enter the world of data spaces

Now it is time to look at real cases! We introduce you here to a mix of different data spaces – to show the broad field of possible data space usage. These are at different levels of maturity, in various focus areas, and use a range of technologies, all of which are relevant.

Special attention has been paid to the manufacturing and green deal/energy sectors, as these are currently in a period of immense growth and importance, and therefore attract a lot of attention.

The following IDS based data spaces and usage scenarios are selected based on their innovative solutions, scalability and visibility. You will find additional examples in the next version of this report.

If you wonder, how you can also share your data using IDS based solutions, contact us and we help you do it.



Real data spaces and usage scenarios *– get inspired!*

Green Deal Dataspace

Green Deal Dataspace
Resilience & Sustainability

Federated ecosystem for resilience and sustainability

Challenge

The frequency of global crises such as pandemics, wars, and disasters has increased, and building shared solutions using data connections is crucial to mitigate their impact. The Green Deal Dataspace (GDDS) supports risk and crisis management solutions and offers a platform to build projects and services and provides access to existing ones.

Success

The Green Deal Dataspace is a central projection surface for solutions to strengthen resilience and sustainability. It's a pioneering cross-domain data space that enables participants to showcase their own solutions or explore and discover resources for their projects. The PAIRS and SPELL platforms are examples of prominent use cases of the GDDS.

Components

- IDS Broker
- IDS Connector
- IDS Clearing House
- IDS App Provider
- Advaneos Trusted Data Hub

+ *Benefits*

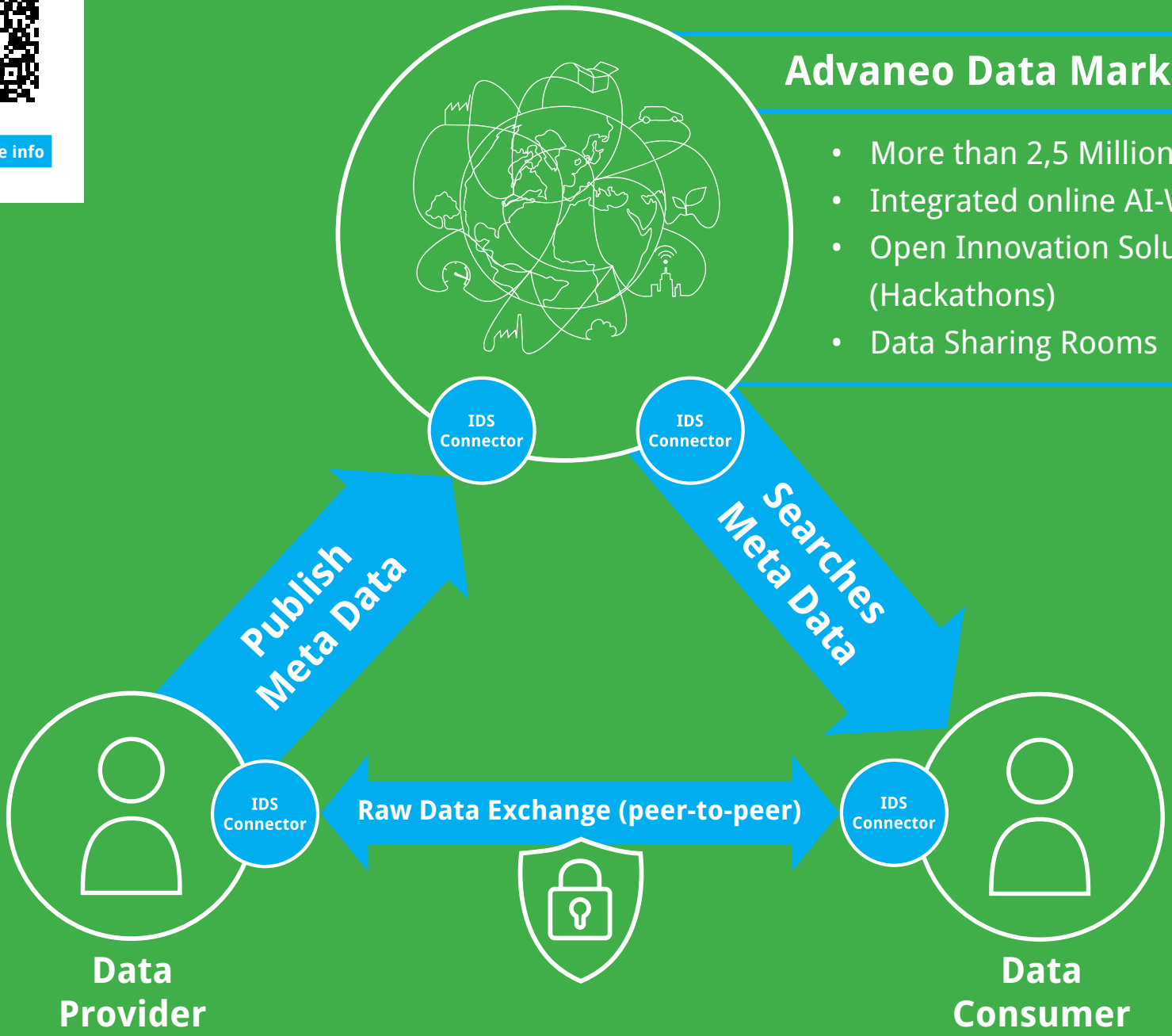
- *Through the transparency of the GDDS crises and their effects can be detected earlier.*
- *An IDS-based solution is implemented, and first prototypes have been tested in a use case.*
- *The data marketplace offers participants access to an extensive compilation of over 2 million open data sets.*

ADVANEO · FUNK STIFTUNG · INTERNATIONAL DATA SPACES ASSOCIATION · PAIRS · SPELL

Scan for more info

Advaneo Data Marketplace

- More than 2,5 Million Datasets
- Integrated online AI-Workbench
- Open Innovation Solution (Hackathons)
- Data Sharing Rooms



Resilience Data Space (HERAKLION)

Heuristic resilience analyses for municipalities using data space functionalities

Challenge

The complexity of our world and the associated unpredictability demands to be better prepared. Crises such as climate change require an increased resilience and cross-community cooperation in highly interconnected societies and economies. Municipalities face the challenge of evaluating a growing amount of heterogeneous data from various institutions for data-driven and trustworthy decision support.

Success

Information plays a growingly important role in the management of any critical situation. In the HERAKLION project, Fraunhofer EMI, supported by Fraunhofer ISST and the University of Freiburg, is developing a scalable resilience data space to make crisis preparedness and response data more accessible and usable. The project will open new IDS based use cases.

Components

- EDC-Connector using Dataspace Protocol
- Identity Provider
  - Dynamic Attribute Provisioning Service (DAPS)
  - Dynamic Trust Monitoring (DTM)
  - Participant Information Service (ParIS)
- Metadata-Broker
- Appstore
- Vocabulary Hub

+ *Benefits*

- *The resilience data space ensures secure data sharing because it is based on the IDS Reference Architecture Model.*
- *Municipalities will be better prepared for crisis situations through the heuristic resilience analyses using data space functionalities.*

Scan for more info

Metal Domain Data Space from Market 4.0

MARKET4.0
CONNECT & PRODUCE

Optimizing equipment selection in the metal manufacturing domain

Challenge

Selecting new manufacturing equipment is a time-consuming challenge. Customers must attend trade shows, search the internet and talk to multiple experts to make an informed decision. Data spaces can help integrate and streamline this process.

Success

The MARKET 4.0 Metal Domain Data Space describes a robust and efficient solution for linking the catalogues of different equipment manufacturers to a MARKET 4.0 service that analyses the customer's requirements and delivers the most appropriate equipment options. It operates in the metal domain manufacturing process and is based on the IDS RAM.

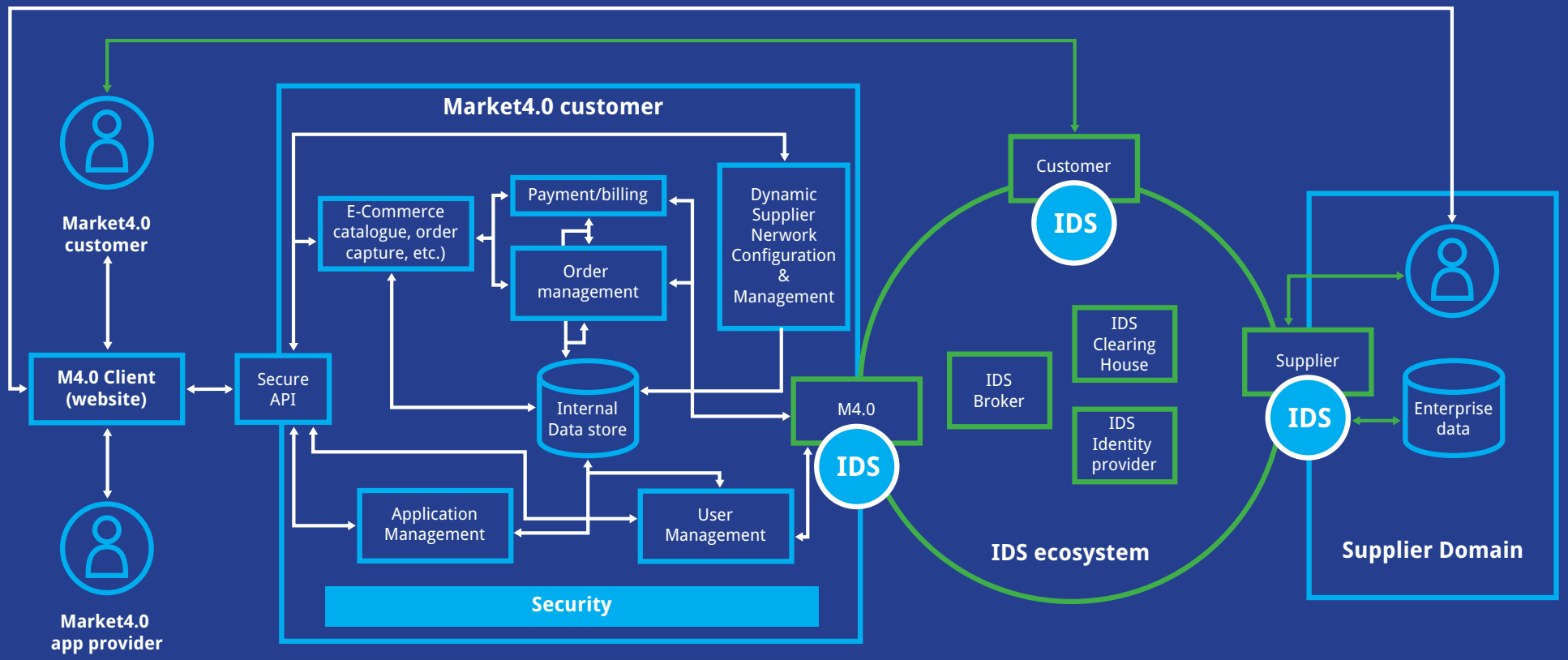
Components

- IDS Connector
- IDS Clearing House
- IDS Metadata Broker
- Special Applications
- Central IDS compliant platform

+ *Benefits*

- *The MARKET 4.0 Metal Domain Data Space makes the selection of manufacturing equipment simpler and more efficient.*
- *The inventories and services include essential IDS modules that guarantee a trusted data sharing.*

Scan for more info



MARKET4.0 receives funding from the European Union Digital Europe Programme under grant agreement n° 822064.

dena-ENDA (Energy Data Space)

dena Deutsche Energie-Agentur

Future Energy Lab

Sovereign data sharing to predict energy generation and consumption

Challenge

The energy system must guarantee supply security for industry and households. To accomplish this while enabling the transition to renewable energy supply, data sharing between the large number of actors is a necessity. This is the only way to ensure grid stability and efficiency.

Success

dena-ENDA is a data space that enables sovereign data sharing to support more flexible and efficient renewable energy systems. With dena-ENDA, it is possible to access energy data from multiple sources in one place and better predict and manage energy production and consumption in DSO grids. The first use case of the project is Redispatch 3.0, which provides forecasts of energy injection and usage.

Components

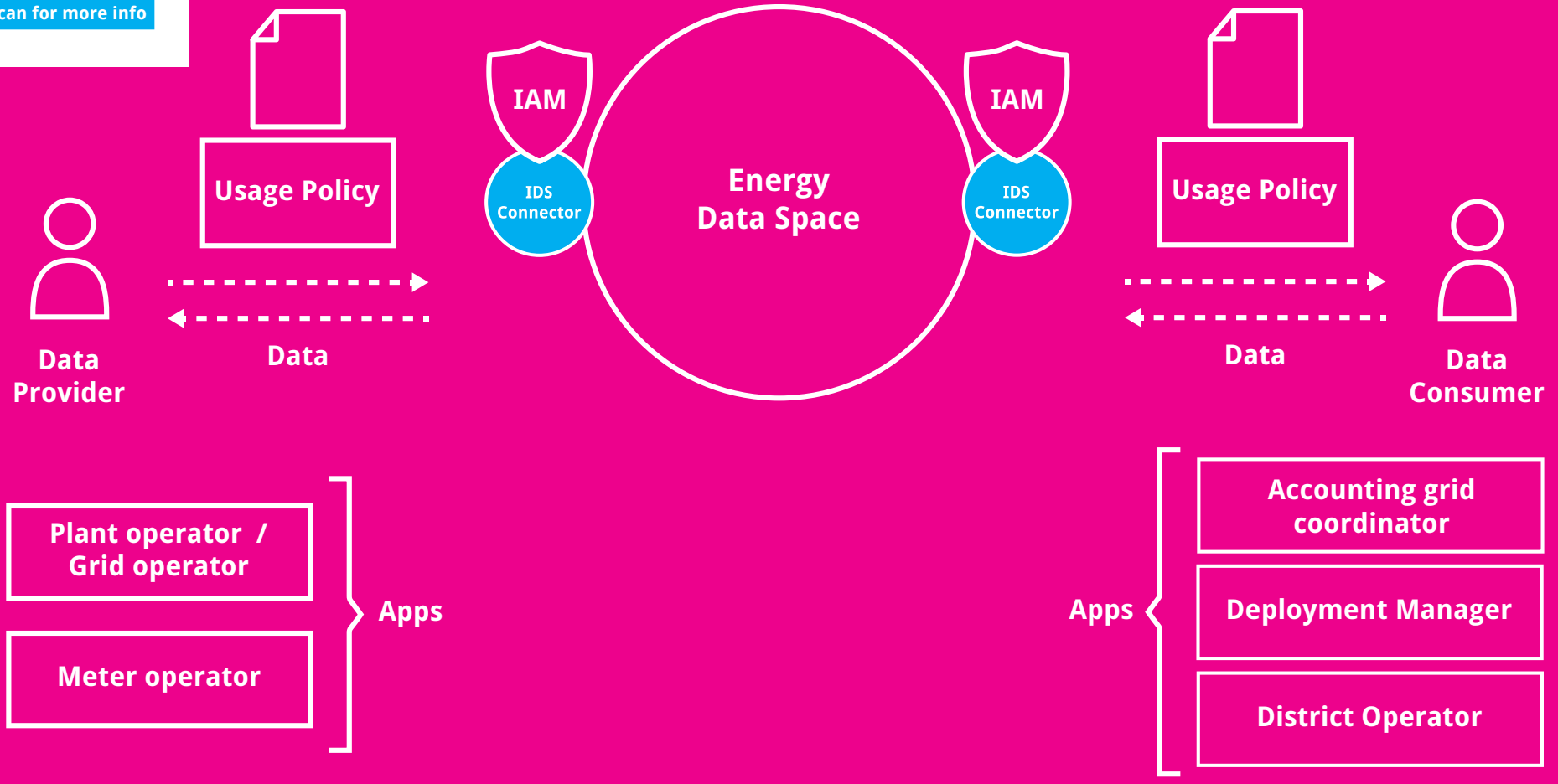
- IDS Connector
- IAM Layer
- Semantic Data Model

+ *Benefits*

- *An energy data space enables informed decision-making by providing real-time and historical data on energy production, consumption, and distribution.*
- *By accessing and analyzing comprehensive energy data from various sources, stakeholders can gain valuable insights. This leads to improved energy efficiency, reduced waste, and cost savings.*

ifok. A CADMUS COMPANY | Fraunhofer FIT | Bonn Consulting | innogence business consulting (ibc), Prof. Dr. Michael Laskowski

Scan for more info



Manufacturing as a Service

Manufacturing as a Service Operation for remote production

Challenge

A trusted service to execute remote production jobs is needed. A Manufacturing-as-a-Service system could be built on the implementation of the latest Asset Administration Shell (AAS) developments and IDS connectors. Such a solution should also facilitate interoperability and scalability.

Success

MONDRAGON Corporation Group, with the support of Mondragon University, IKERLAN and IDEKO Research Center, has developed such a system for the remote execution of production orders. Static and dynamic information of industrial assets is modeled, and the result is stored in an AAS manager. A production orchestrator executes the production orders.

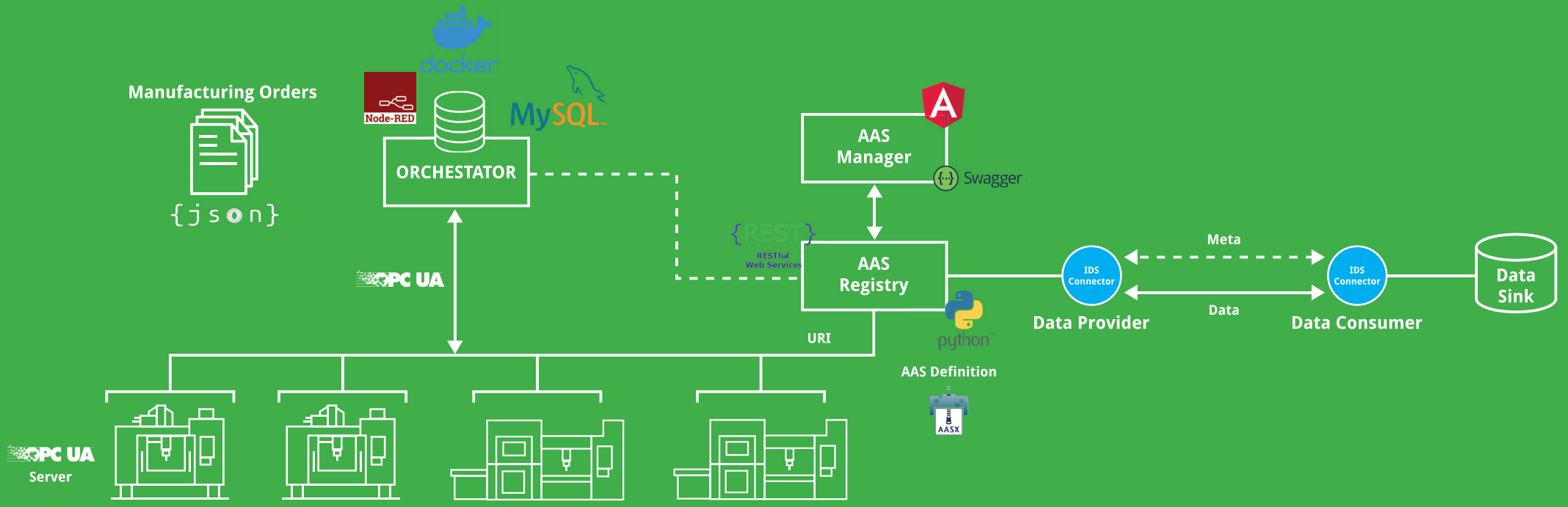
Components

- IDS Connector
- IDS Metadata Broker
- AAS Manager and Registry System
- Special Applications (IDS middleware adaptors and Active AAS orchestrator)

+ *Benefits*

The AAS registry allows the selection of assets with capabilities to perform tasks and releases the AAS catalog available in the system. The catalog is shared with external parties via data space connectors to make it easier for third-party companies to launch production jobs remotely.

Scan for more info



AI.SOV

Sharing of AI results and information among trusted supply chain partners

Challenge

Supply chains are vulnerable, and industries rely on them. Therefore, it is necessary to combine new technologies for manufacturing and other industries with an industrial data space ecosystem to share AI results faster which will help stabilize the flow of supplies.

Success

The AI.SOV project created a secure platform that has been designed to support industries in Europe by enabling them to share AI-generated results, including predictive maintenance, spare parts production, and new business opportunities across the value chain. The project has successfully deployed a B2B application that facilitates data-sharing among manufacturers and suppliers within industrial ecosystems.

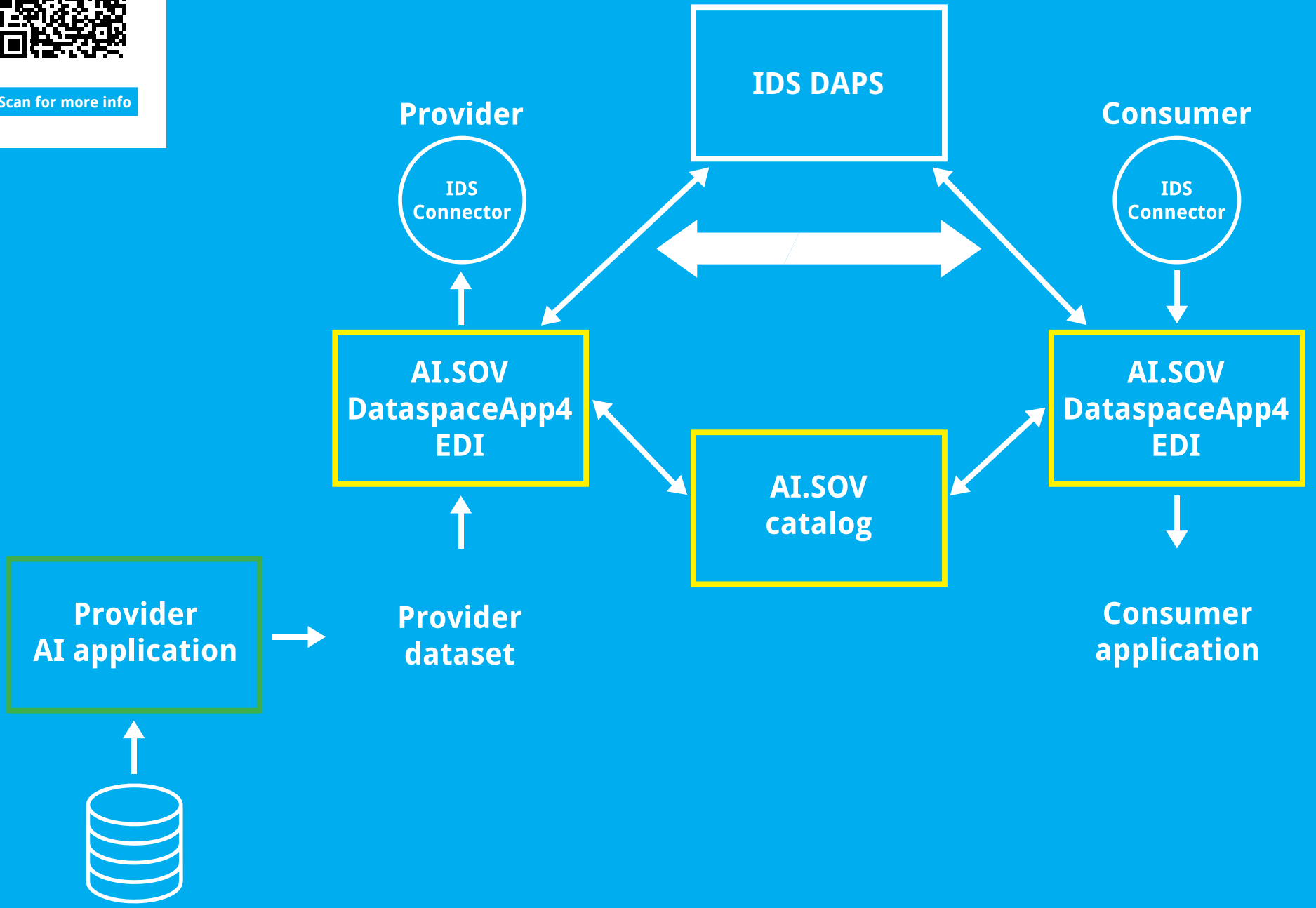
Components

- IDS Connectors
- Dynamic Attribute Provider Service
- Governance Layer
- User Agreement Layer

+ Benefits

- *New insights on the use of data sharing platforms in the industrial supply chain are gained.*
- *An educational module focuses on data sovereignty in the supply chain and provides real-world industrial use cases.*
- *Stakeholders across supply/value chain share data based on self-defined data use policies.*

Scan for more info



EdgeDS

Data spaces enabled multi-access edge computing

Challenge

Data spaces have been identified as a solution to open the currently fragmented edge computing environments, to promote data interoperability in a secure manner. Nevertheless, there is still a lack of practical instructions for the merging of data spaces and MEC components to support scenarios in impactful application domains such as autonomous driving and Industry 4.0.

Success

EdgeDS presents a novel approach to integrating mechanisms for sovereign data sharing, into multi-access edge computing (MEC) environments. Its architecture extends the ETSI MEC Architectural Framework with artifacts from the IDS RAM. The approach introduces the IDS-Connector-as-a-service model, extending the ETSI MEC architecture with data space capabilities that are directly instilled into the mechanisms of MEC platforms.

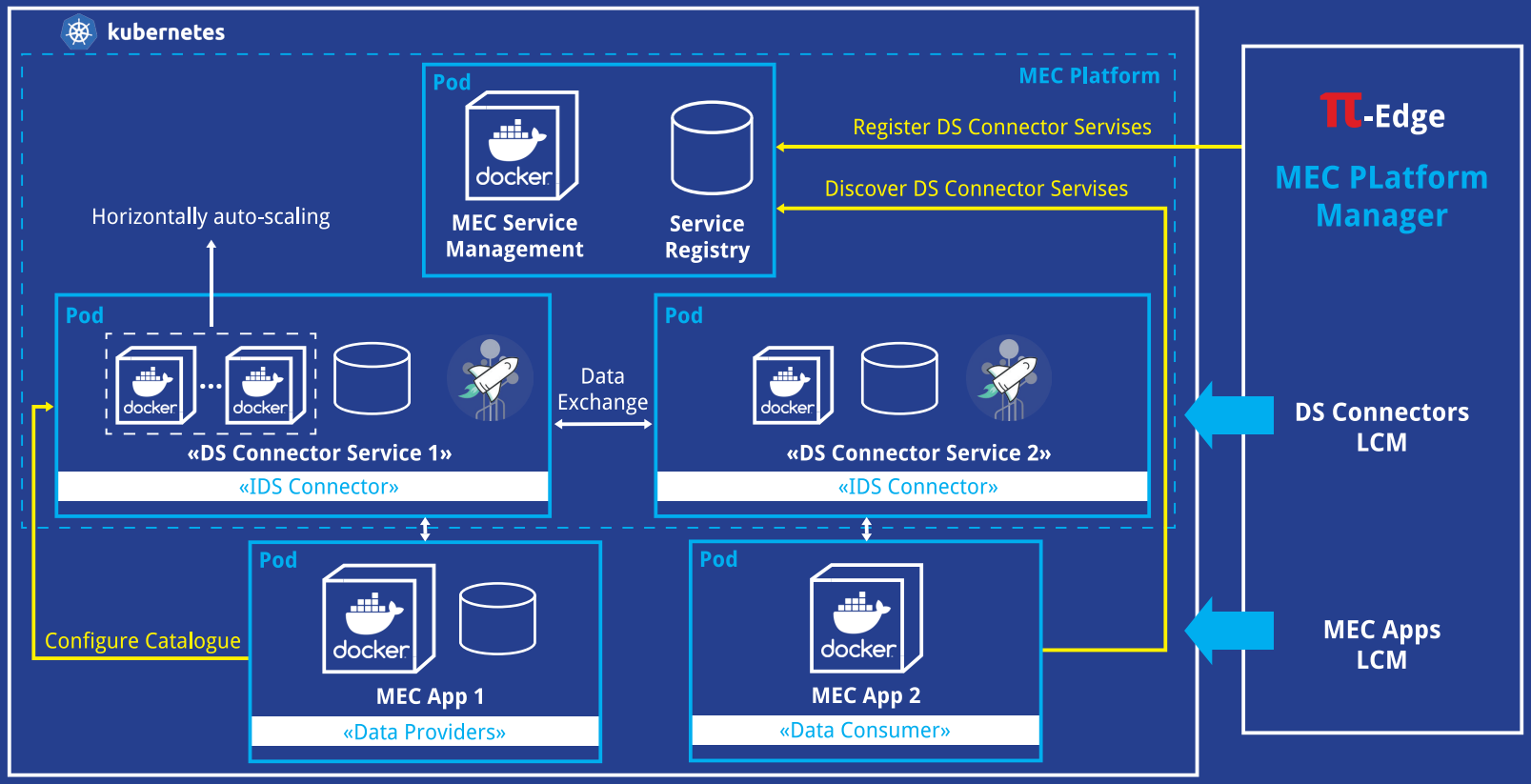
Components

- IDS Connector
- MEC Service Management
- Service Registry
- MEC Apps

+ *Benefits*

- *This is one of the first concrete architectural specifications for enabling data space features in MEC systems. It allows multi-party and cross-domain sharing of data services.*
- *An open-source prototype showcased its functionality and scalability - enabling data space features in MEC systems.*

Scan for more info



- **Successful data exchange**
- **Autoscaling capabilities**

European Rail Data Space

Europe's entire rail community is joining forces to create a data ecosystem for the track. Watch out – it's fast!

Challenge

The focus of the Rail Data Space (RDS) is on creating an interoperable and secure federated Data Space for Rail that can be trusted by all partners. On the long run RDS is a data space for the entire rail community.

Success

The Rail Data Space is one of the key "digital enablers" for the digitalization of the European Rail System. It is developed within the Europe's Rail Joint Undertaking's MOTIONAL Flagship Project, which focuses on innovative solutions for European Rail Network and Mobility Management, providing at the same time a common data sharing capability to all other Undertaking's projects.

Components

- From the Eclipse Data Space Components project:
  - EDC Connector
  - Certificate Authority
  - Federated Catalogue
  - Self-Sovereign Identity
- DIH Digital.ID based on the GAIA-X Trust Framework 22.10
- Clearing House

+ Benefits

- *Enhancement of competitiveness and sustainability for the rail industry*
- *Providing of opportunities to create new services and products through shared data assets*
- *Integration of rail transportation into a comprehensive mobility system*
- *100% driven by industry needs*
- *Accommodation of widely accepted data models*
- *Complying with and utilization of open-source architectures*

Scan for more info

This project has received funding from the Europe's Rail Joint Undertaking under the European Union's Horizon 2022 research and innovation programme under grant agreement No 101101973.

I4.0 data space and app marketplace

IDS-compliant Industry 4.0 data app ecosystem for connected factories & third-party service providers

Challenge

Factories collect IoT sensor data to optimize production processes using data analytics, AI, and machine learning. This includes predictive maintenance, reducing operational costs, and improving energy efficiency. Often, factories lack the necessary digital skills to implement these techniques internally, leading to the need to share data with external service providers.

Success

The i2CAT Foundation implemented an IDS-compliant data space and marketplace prototype in the Looming Factory project. It securely connects factory machinery to predictive analytics services, offers an IDS App Store for third-party providers, and includes various third-party predictive analytics services for the marketplace proof of concept.

Components

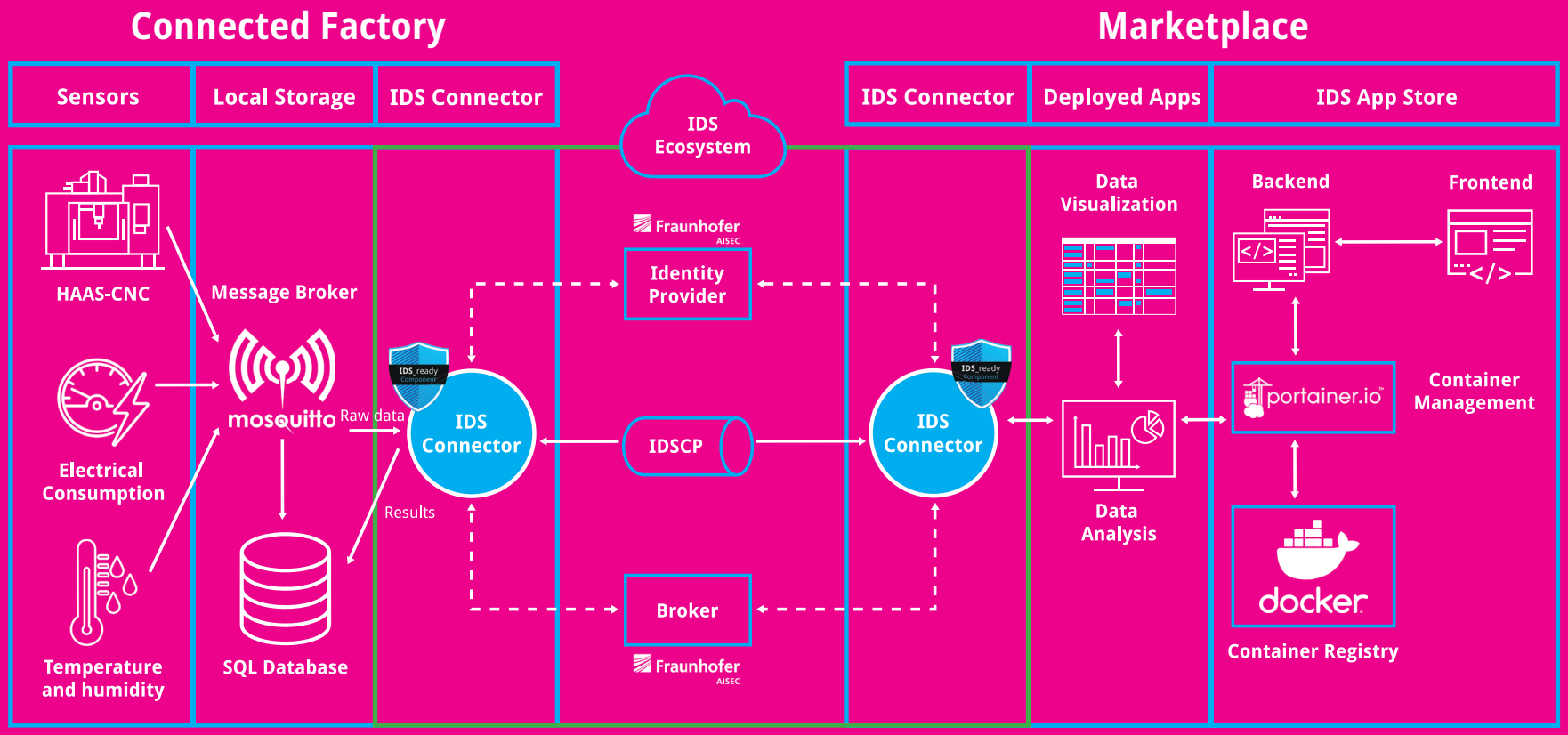
- Dataspace Connector v8.0.0
- App Store v2.0.0
- DAPS: the Fraunhofer test certification authority. Specific digital certificates for the pilot were previously requested and issued.

+ Benefits

- *The factory connects to third-party data services for process optimization, promoting efficiency and cost reduction.*
- *Factories have options from competing solutions, while SMEs can use the AppStore to provide services within an expandable data space.*
- *I4.0 data service providers can deploy solutions within an IDS-framework, adapting to future regulations and market dynamics.*

The Looming Factory project was co-funded by the European Regional Development Fund of the European Union in the framework of the ERDF Operational Program for Catalonia 2014-2020.

Scan for more info



Take a closer look on what's on the radar: successful usage scenarios and inspiring data spaces

From manufacturing's supply chain to the automotive infrastructure, from energy transition to AI application – the wide range of data spaces enriches all companies involved across many ecosystems.

Name	*Domain*	*Maturity Level*
Collaborative Warranty and Quality Management	Automotive	Case Commited
Catena-X	Automotive	Case Commited
Supply Chain Manager	Automotive	Pilot
Light Commercial Vehicles	Automotive	Pilot
PwC Data Ecosystem	Cross Domain / Other	Lead In
Green Data Hub – DIO: Data Space Digital Climate Twin	Cross Domain / Other	Lead In
IDSA Data Space - Kubernetes deployment scenario	Cross Domain / Other	Lead In
Würth C-Part Supply	Cross Domain / Other	Lead In
Green Data Hub – DIO: Data Space Tourism	Cross Domain / Other	Case Commited
SCUNY (SChool UNited EconomY)	Cross Domain / Other	Case Commited
FAIR Data Spaces	Cross Domain / Other	Case Commited
Gaia-X - MERLOT	Cross Domain / Other	Case Commited
HEALTH-X dataLOFT	Cross Domain / Other	Case Commited
Gaia-X - A Federated Secure Data Infrastructure	Cross Domain / Other	Case Commited
NL AI Coalition - Oncology Research	Cross Domain / Other	Case Commited

Name	Domain	Maturity Level
Privacy-Aware, intelligent and Resilient Crisis Management (PAIRS)	Cross Domain / Other	Case Commited
DataPorts	Cross Domain / Other	Case Commited
Macau-EU Cross-Border Flow of Scientific Research Data	Cross Domain / Other	Case Commited
Data Sharing Coalition - Green Loans	Cross Domain / Other	Case Commited
EUHubs4Data (EUH4D)	Cross Domain / Other	Pilot
Orbiter/idento.one	Cross Domain / Other	Pilot
PLATOON: Smart Buildings	Cross Domain / Other	Pilot
Maritime Data Space	Cross Domain / Other	Pilot
Ö-Cloud Initiative: Trust in standards and services	Cross Domain / Other	Pilot
Defense Data Space	Cross Domain / Other	Pilot
Trusted Exchange for Aeronautics	Cross Domain / Other	Pilot
KI Marktplatz [AI Marketplace]	Cross Domain / Other	Pilot
Intelligent Washing Machine	Cross Domain / Other	Pilot
Wind Energy Generation Data Space	Cross Domain / Other	Pilot
Medical Data Space MedDS	Cross Domain / Other	Pilot
MARKET4.0 Marketplace	Cross Domain / Other	Pilot
Bauhaus.MobilityLab	Cross Domain / Other	Pilot
Deutsche Telekom - Data Intelligence Hub	Cross Domain / Other	Live
Truzzt Port	Cross Domain / Other	Live
Truzzt box	Cross Domain / Other	Live
Advaneo Data Marketplace	Cross Domain / Other	Live
Open Access Book Usage Data Trust (OAeBU DT)	Cross Domain / Other	Case Commited
Vehicle Charging	Energy	Lead In
H2 Metaverse	Energy	Lead In
Wind and Solar Assets modeling	Energy	Lead In

Name	Domain	Maturity Level
Offshore Energy Data Trust	Energy	Pilot
Carbon Capture Audit Trail (CAST / Trust Trail)	Energy	Case Commited
Data spaces for smart energy	Energy	Lead In
Solar Charge API	Energy	Case Commited
Green Deal Dataspace	Energy	Live
Basque Energy Cluster	Manufacturing	Lead In
Green Data Hub – DIO: Data Space Energy Transition	Manufacturing	Case Commited
PLATOON: Wind Energy	Manufacturing	Case Commited
PLATOON: Smart Grids	Manufacturing	Pilot
Energy Data Space (EnDaSpace)	Manufacturing	Pilot
Logistics and Product Life Cycle Management	Manufacturing	Pilot
EuProGigant - European Production Giganet	Manufacturing	Pilot
Smart Factory	Manufacturing	Pilot
Brainport Industries Smart Factory	Manufacturing	Pilot
Qu4lity - Manufacturing Process Anomaly Detection for Capital Goods in Automotive and Railway Sectors	Manufacturing	Pilot
FA³ST ecosystem for I4.0-compliant and data-sovereign digital twins	Manufacturing	Pilot
NTT Testbed on Data Governance and Sovereignty Across Countries and Companies	Manufacturing	Pilot
Smart Factory Web	Manufacturing	Pilot
MARKET4.0: ENTER Experiment	Manufacturing	Pilot
MARKET4.0: 3DFORM	Manufacturing	Live
ManuSpace	Manufacturing	Case Commited
aiXia	Manufacturing	Case Commited
AluTrace	Mobility	Lead In
Plastic Domain Data Space - Market 4.0	Mobility	Case Commited
European Industrial Data Space	Mobility	Pilot
Metal Domain Data Space - Market 4.0	Mobility	Pilot

Name	Domain	Maturity Level
ECI Gatewise	Mobility	Live
Green Data Hub – DIO: Data Space Mobility Transition	Mobility	Lead In
Rail Data Space	Mobility	Case Commited
Kiel Mobility Digital Twin	Mobility	Pilot
RealLab Hamburg	Mobility	Pilot
Mobility Data Space	Mobility	Live
Mobilithek	Mobility	Live
Data Space for Multimodal Passenger Mobility	Mobility	Case Commited
EdgeDS	Mobility	Lead In
GATE Urban Data Space	Smart City	Lead In
MyData for Cities	Smart City	Case Commited
Trusted Data Sharing in Smart Cities	Smart City	Pilot
Smart Parking	Smart City	Pilot
City Dataspace	Smart City	Pilot
Tidy City	Smart City	Case Commited
The Smart Building Dataspace	Smart City	Case Commited
IDEAS - IntegrateD Engineering dAta Sharing	Smart City	Case Commited
Green Data Hub – DIO: Data Space Circular Economy	Supply Chain	Lead In
Silicon Economy	Supply Chain	Case Commited
DASLOGIS - Dutch Data Spaces for Logistics	Supply Chain	Pilot
AI.SOV	Supply Chain	Pilot
Horizontal Supply Chain Collaboration	Supply Chain	Pilot
Industrial Additive Manufacturing Services	Supply Chain	Pilot
ONCITE	Supply Chain	Pilot
Smart Connected Supplier Network - Market 4.0	Supply Chain	Live
GlobShare	Supply Chain	Case Commited

The heart of the matter

You'll find all of the most mission-critical documents and other information about IDSA's work and partner projects here.

#DataSpacesTuesday

Every Tuesday, check out the latest data spaces and usage scenarios on our LinkedIn account.

What's in it for me?

- You increase your visibility and reach out within and across your domain
- You get an overview of the cases and representatives of your industry domain
- You can network with others and exchange experiences
- You can track your path to success and learn how others reached their goals

How to become part of the Data Spaces Radar?

Register here

DATA SPACES SUPPORT CENTRE

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