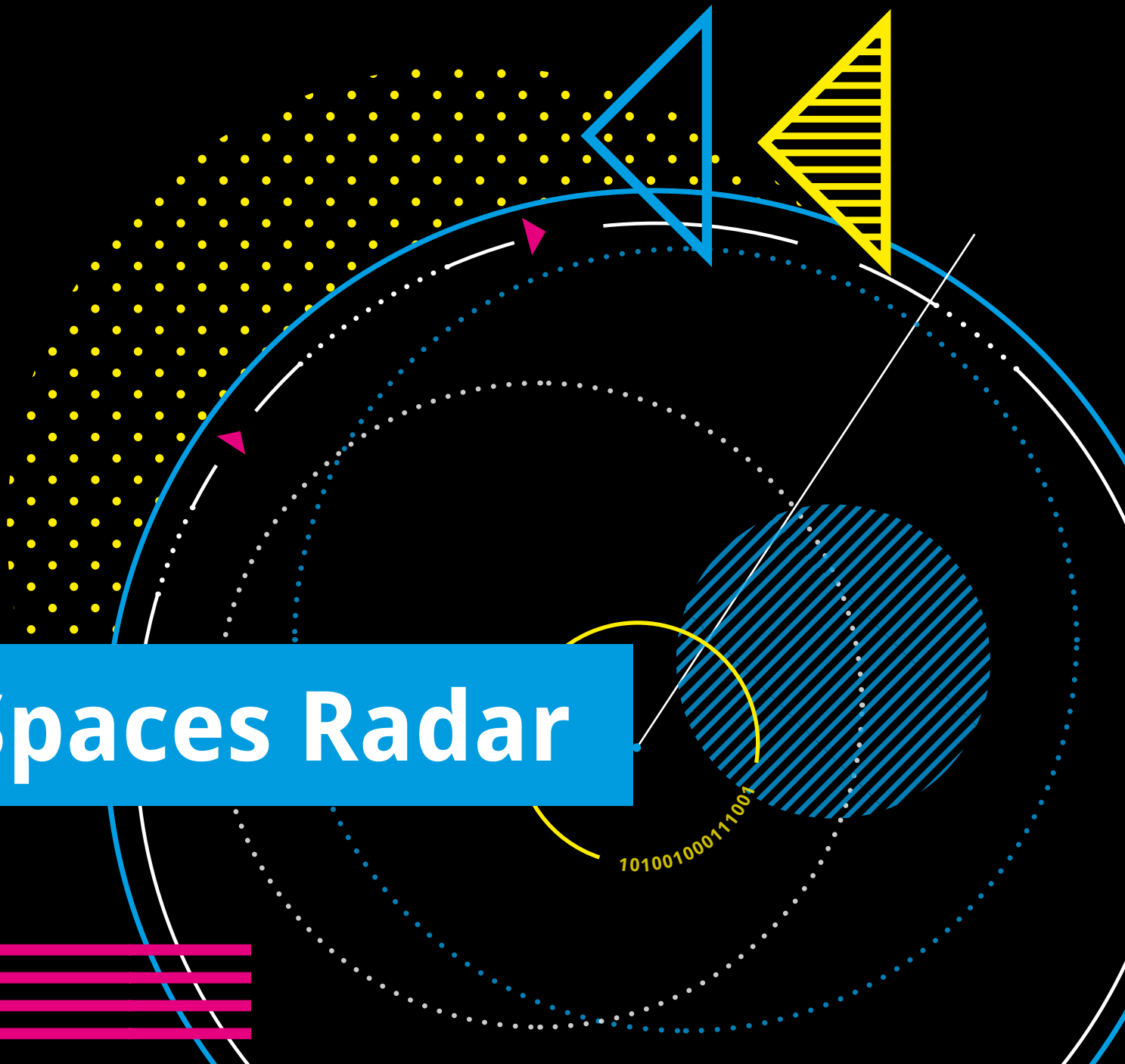
INTERNATIONAL DATA SPACES ASSOCIATION



The Data Spaces Radar

2023 #1

Imprint

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From the margins to center stage: the Data Spaces Radar

Dear reader,

We have been supporting the design and building process of data spaces for more than five years now. We are observers and creators of what companies do. And we have shaped the story of data spaces with research and industry driven projects.

This was important to advance technological readiness and to enable the ideas to mature. Publicly funded project work is still going on. It's even growing. But the dramatic recent change happened in the industry commitment.

You can see it in data space projects like Catena-X (page 20), Mobility Data Space (page 18), and the Smart Connected Supplier Network (page 22), to name a few. We are witnessing how data spaces are reshaping whole industries, how they fundamentally change business and life.

Don't take my word for it. Look at the Data Spaces Radar and the selected examples of this edition of our data spaces report. Look at the convincing usage scenarios and data spaces. And these are only a small part of the total. There are many more. Just look at how people and companies work, how they understand data spaces, how they design data spaces.

Everybody is building data spaces. The Data Spaces Radar is a great way to get an overview of what's happening in the world of data spaces. We believe this report you are holding in your hands will help you to get your first insights into this fascinating world or if you are already an expert broaden your horizon and give you further inspiration for your work. We hope to welcome your data space projects and usage scenarios in the radar soon. And now, please enjoy the reading of this document.

Sincerely yours,
Christoph Mertens
Head of Adoption

Contents

Data Spaces

What are data spaces and how do they work?

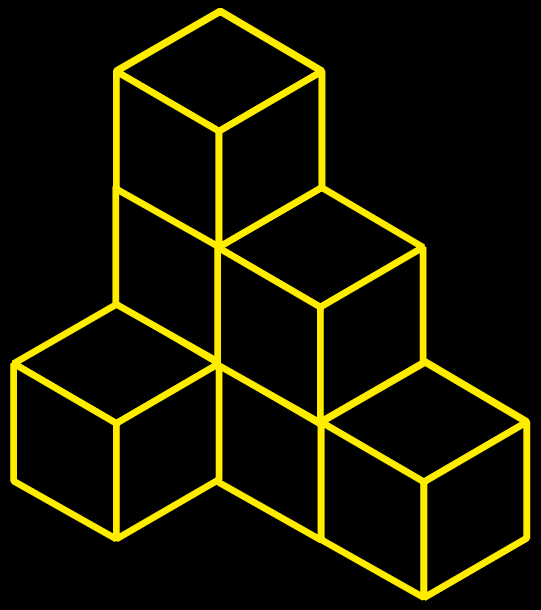
Data spaces represent a paradigm shift: In the traditional understanding data sharing takes place between a limited number of companies on centralized platforms and in closed or strictly controlled networks. In contrast, data spaces are open and flexible, though still regulated by shared principles and standards. And they scale seamlessly as long as the shared principles are respected, and two parties come to an agreement.

To realize data sharing in data spaces, trustworthy technology is required in addition to common principles. This technology must ensure data sovereignty – the ability of data providers to control how and by whom their data is used – across all industries. IDSA's goal is therefore to create a data sharing standard which guarantees data sovereignty and interoperability in and between data spaces.

Data spaces do not require physical data integration but support distributed data stores. They are a federated network, where data can remain with the provider while only metadata is shared – or it may be that data is not shared at all and only algorithms travel. At its core, a data space has several data connectors, an identity provider, complemented by a vocabulary provider, an app store, and a metadata broker. This framework has already become the de facto standard and is revolutionizing the way business is conducted.

Building blocks are the Lego bricks of the digital economy

To foster adoption, companies and ecosystems can use reusable, generic “building blocks” across domains and industries to create data spaces. These building blocks work together and help ensure interoperability and trust. They enable data to gain additional value and data spaces to have a uniform governance structure. In a way you could call them the Legos bricks of the adult world!



Additional components can be used when needed for domain-specific requirements. Existing norms, standards, and best practices ensure the cohesion of building blocks. This allows individual participants to join different data spaces, use data in multiple contexts and scenarios, and be part of multiple data value chains.

Once implemented and brought to life, data spaces can benefit business ecosystems in multiple ways: They can reduce transaction costs and foster data value creation enabling new services, products, businesses and innovations.

All that’s needed now is companies, research organizations, and interested individuals – to join us in building data spaces.

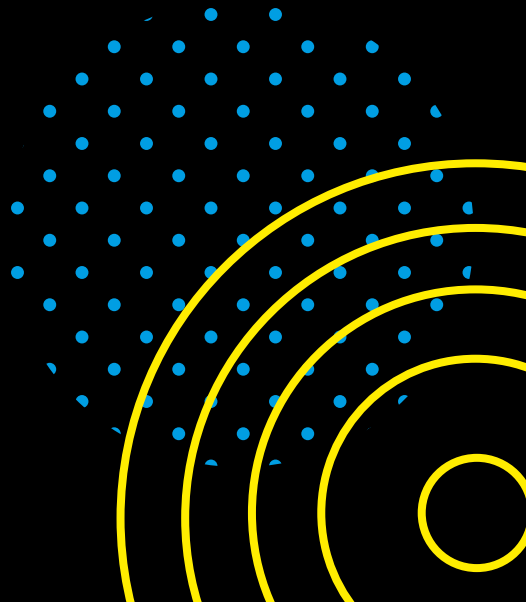
The Data Spaces Radar

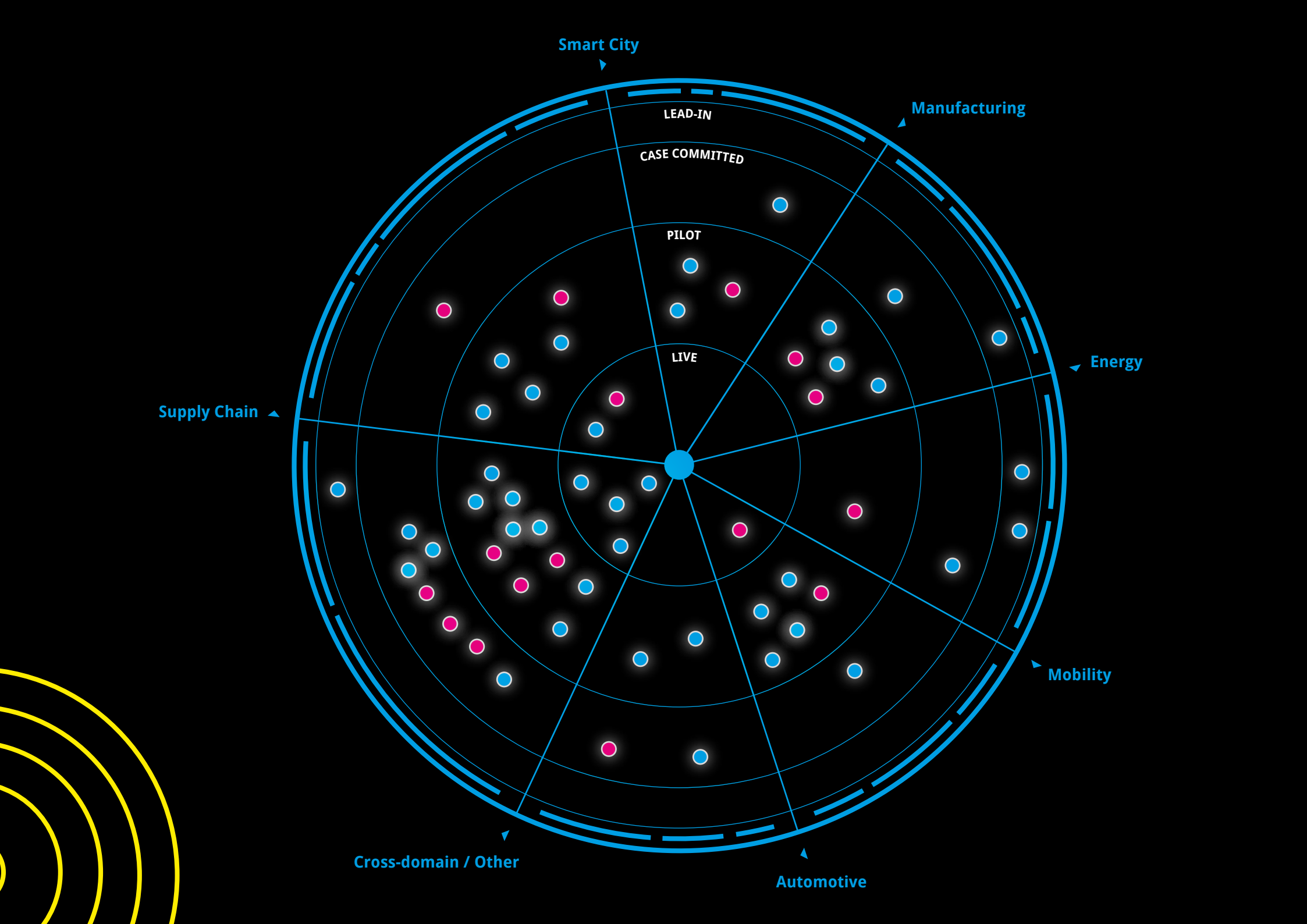
As more data spaces are created, it's critical that companies adopting the IDS standard have a clear understanding of how to progress towards sovereign data sharing.

The Data Spaces Radar tracks companies developing data spaces based on the IDS standard according to their domain and the maturity of the solution. The radar – the only one of its kind – gives a clear overview of who is adopting the IDS standard, and how.

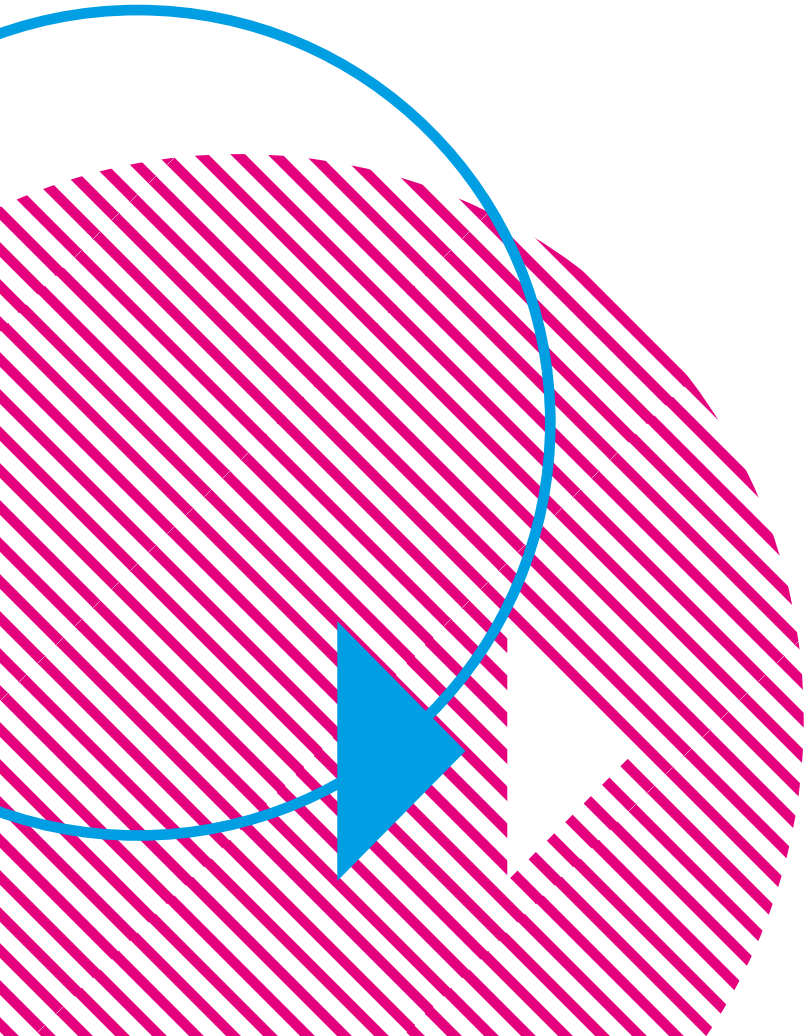
The impact is that companies feel inspired by others' progress and success and also strive to engage with the IDS framework; they learn how businesses are developing their data space solution; and they can connect with experts that support them in the design of their own IDS adoption.

The Data Spaces Radar enables experts to discover and support consortia ready to invest in implementing their solution. These consortia are the IDS standard bearers of the future, exemplifying the new business opportunities of the data economy.



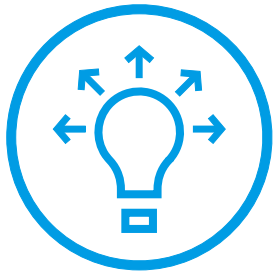

Smart City
Manufacturing
Energy
Mobility
Automotive
Cross-domain / Other
Supply Chain
LEAD-IN
CASE COMMITTED
PILOT
LIVE

Widening the scope: the anatomy of the Data Spaces Radar



The Data Spaces Radar reflects the process that companies follow when adopting innovative technologies – and maps all our data spaces in one easy-to-use tool. The radar covers usage scenarios of different degrees of maturity from the phase of creating a business case to real data spaces. From planned to pilot to fully operational, across industries and functional domains – the usage scenario that aligns with your business goals is on the radar.

Maturity levels



Lead in

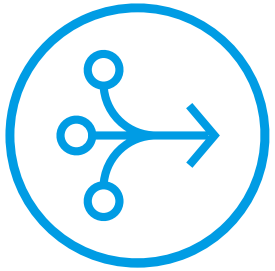
The first maturity level includes a general description of the use case or data space project, there is a consortium of partners, a vision, and a domain, yet it lacks further preparation.

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 Spaces Radar was born out of the wish to inspire companies with real-life examples and track the progress of the IDS adoption in all domains.

At first, cases simply flooded in. Inevitably though, companies became curious how others were moving through the funnel towards going live and wanted to know more about the maturity of each case.

The radar now not only describes others' success in adopting IDS, but it also allows companies to share and network with others to collectively realize the potential of sovereign data sharing.

56
Use Cases

35
Data Spaces

9 Energy

10 Supply Chain

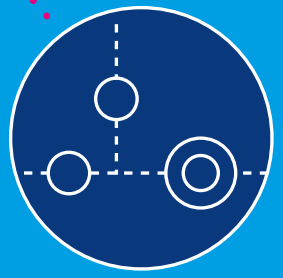
6 Smart City

17 Manufacturing

91
total entries

4 Automotive

6 Mobility



39 Cross-Domain

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

5 steps to build a data space

To accelerate the adoption of sovereign data sharing in data spaces and bring up to speed organizations along the path to embrace IDS, consider the following list. By participating in IDSA companies can see how to implement IDS technology into products and systems.

Gather knowledge and find your role
Get a better understanding of IDS core ideas and identify whether your company needs an IDS solution or wants to support others create data spaces.

Create your data sharing usage scenario
Transform your business needs into an IDS-based data sharing usage scenario and connect with others to co-create or get support.

Build the necessary components for your usage scenario
Identify the specific components needed for your usage scenario and get support to design and develop them.

Find more insights into this process

in our knowledge base

4

Prepare for bringing your usage scenario to life

Go through IDS Certification and finalize the preparation of your components.

5

Adoption

Go live and benefit from secure and sovereign data sharing.

Here to help! The data space experts

To adopt the IDS standard and start sovereign data sharing, a company or project needs some knowledge and understanding of the process. For this complex endeavor they can turn to IDSA's secret superpower: IDS implementation partners.

These experts ensure that every company or group of companies gets the most out of the transition to IDS and data sharing.

In addition to providing technical support, the experts can offer advice on business models to ensure that the business processes behind the technical components are both relevant and effective.

They answer questions like: Where can I find open-source connector implementations? Which are test labs that help get the usage scenario up and running? How do I connect a new connector with my existing IT system and to other companies in a data space? What are the benefits of sovereign data sharing for me and my ecosystem?

With this help you can see whether you are on the right path and where you might need support by the implementation partners – because they have profound insight into the new world of data spaces.

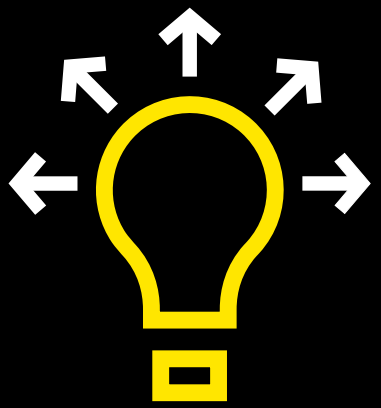
Basically: We know all this is very complex, but we're here to help. Scan the qr code and get in contact with our data space experts.

Enter the world of data spaces

Now that we've taken an in-depth look at the five steps to building data spaces and consulted our data spaces experts, it is time to look at real life cases and spaces! There are different development stages of data spaces, and all of them are of relevance: different maturity levels, focus areas, and technologies. If you want to run a data space, you must know what you can leverage today. That is where this report can be instructive.

Or maybe you created one already and may be wondering, how can I also share my data and leverage its value using IDS based solutions? Contact us and we help you do it. The following are 8 IDS based data spaces and usage scenarios, handpicked based on their innovative solutions, scalability, or visibility in the market. We hope these examples of data sovereignty serve as inspiration for you to start or further develop data spaces! Be sure to find more examples in the next version of this report.

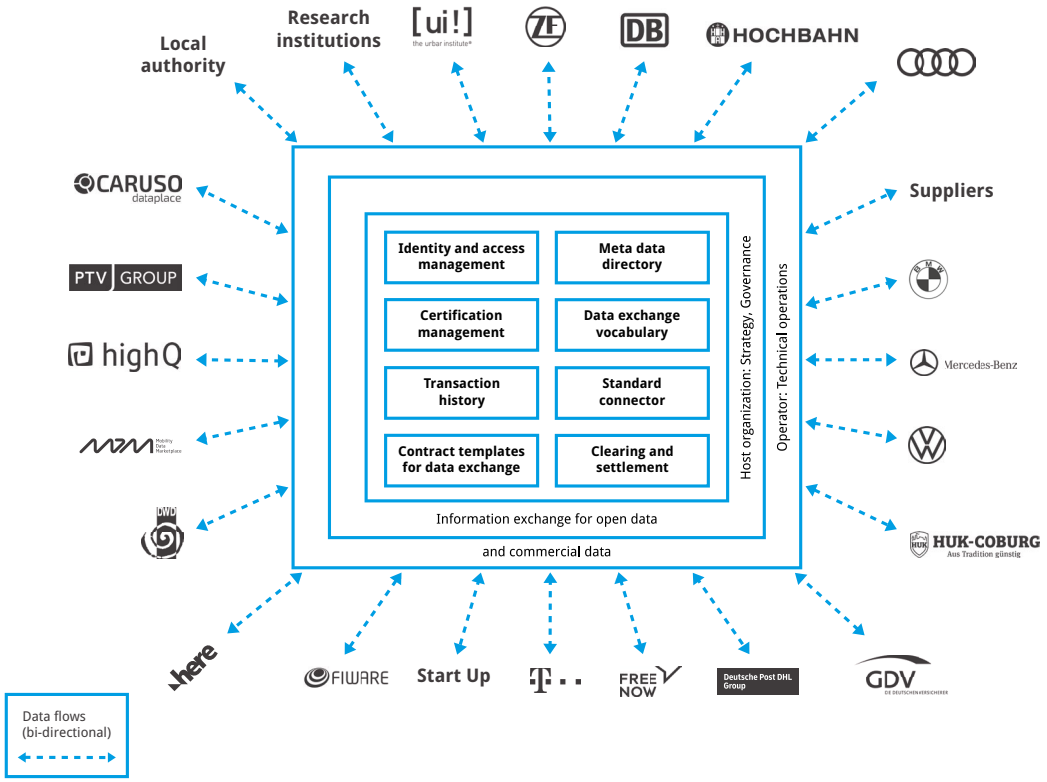
Real data spaces and usage scenarios – *get inspired!*



Data Spaces

Mobility Data Space

Combining data from all mobility actors and relevant real-time information to enable seamless, multimodal mobility for everyone



Mobility
Data Space

Challenge

The lighthouse project focuses on secure data sharing in the mobility sector offering an ecosystem for companies working on innovative, user-friendly, and environmentally sustainable mobility solutions.

Components

- IDS Identity Provider (CA, DAPS, ParIS)
- IDS Metadata Broker
- IDS App Store
- IDS Clearing House
- IDS Vocabulary Provider
- IDS Connectors (not provided by operating company)

Success

The Mobility Data Space is the data sharing community for anyone who wants to make mobility greener, safer and fairer. It brings together companies, organizations and institutions to monetize their data and to use data for innovative mobility solutions.

+ Benefits

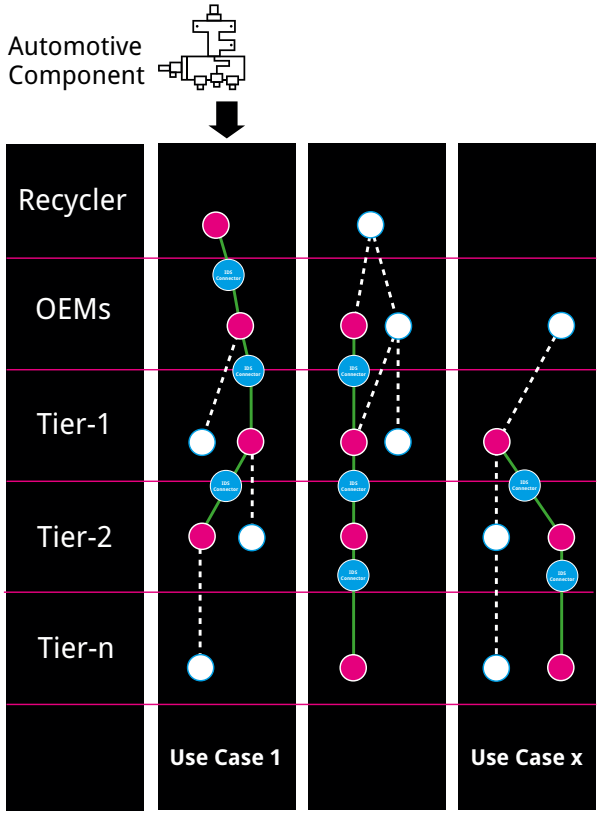
Enables its members to participate in the data economy on equal and fair terms based on shared European values. It guarantees sovereign data sharing for all participants. It is the data space for future mobility.

Scan for more info

Data Spaces

Catena-X

Secure and trustworthy data infrastructure for automotive network



Challenge

In the ambitious Catena-X project partners from the automotive industry set out to digitize their value chains. The purpose of the association is to create a uniform standard for sovereign data sharing throughout this entire industry to increase value and accelerate processes.

Success

Automotive manufacturers, suppliers and dealer associations can all participate equally and securely using the IDS standard as their infrastructure basis. They can communicate with each other easily.

+ Benefits

Catena-X is the first collaborative, open data ecosystem of this industry linking global players simply, securely and independently. Ensuring openness, neutrality and efficiency. Addresses the challenges of digitization through collaboration and standardization.

Components

- IDS Identity Provider (CA, DAPS, ParIS)
- IDS Metadata Broker
- IDS App Store
- IDS Clearing House
- IDS Vocabulary Provider
- IDS Connectors

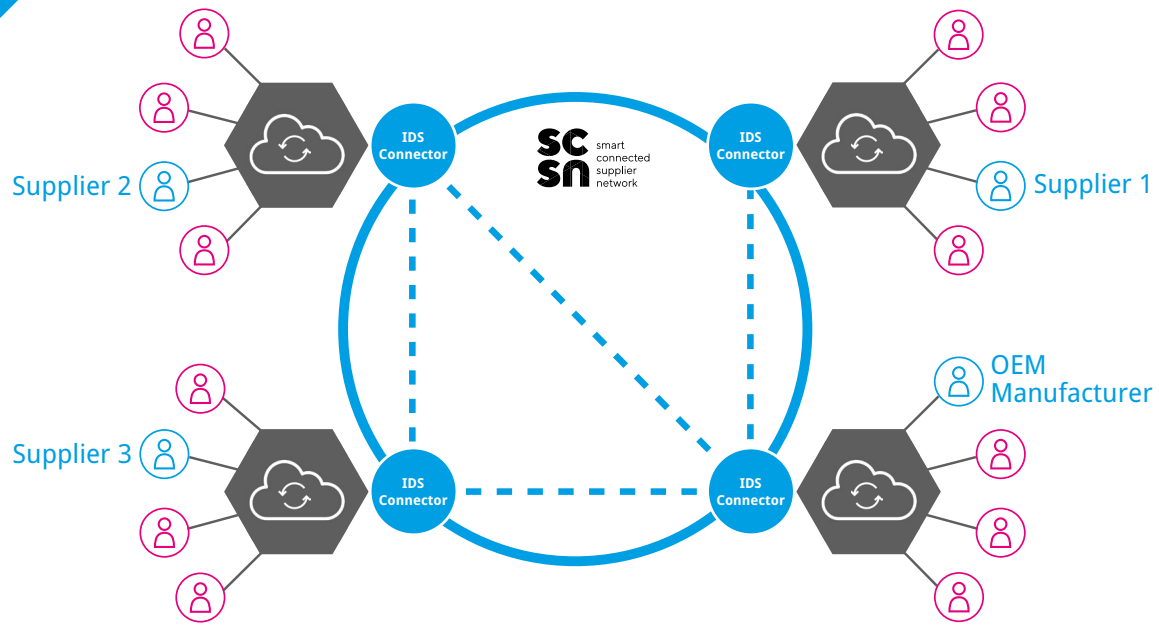
Catena-X
Automotive Network

Scan for more info

Data Spaces

SCSN

Connect once – communicate with everyone



Challenge

The Smart Connected Supplier Network (SCSN) is an initiative of manufacturing companies and their suppliers. It facilitates cross-factory communication and ensures interoperability in an open data ecosystem.

Success

SCSN is a data standard that makes information exchange in the supply chain more efficient, allowing companies to share data more easily, quickly and reliably.

+ Benefits

SCSN allows fast, secure and interoperable data sharing within the high-tech supply chain between companies. This results in increased supplier chain productivity. A company only needs to be registered once with an SCSN service provider, then share data with all other connected companies.

Components

- IDS Identity Provider (Certificate Authority, DAPS, ParIS)
- IDS Metadata Broker
- IDS Clearing House
- IDS Connectors
- Data Apps

smart connected supplier network

TNO · isah BUSINESS SOFTWARE · eci Gatewise · KetenlinK · EDI4STEEL · SUPPLYDRIVE · =exact · TradeCloud · GLOVIA

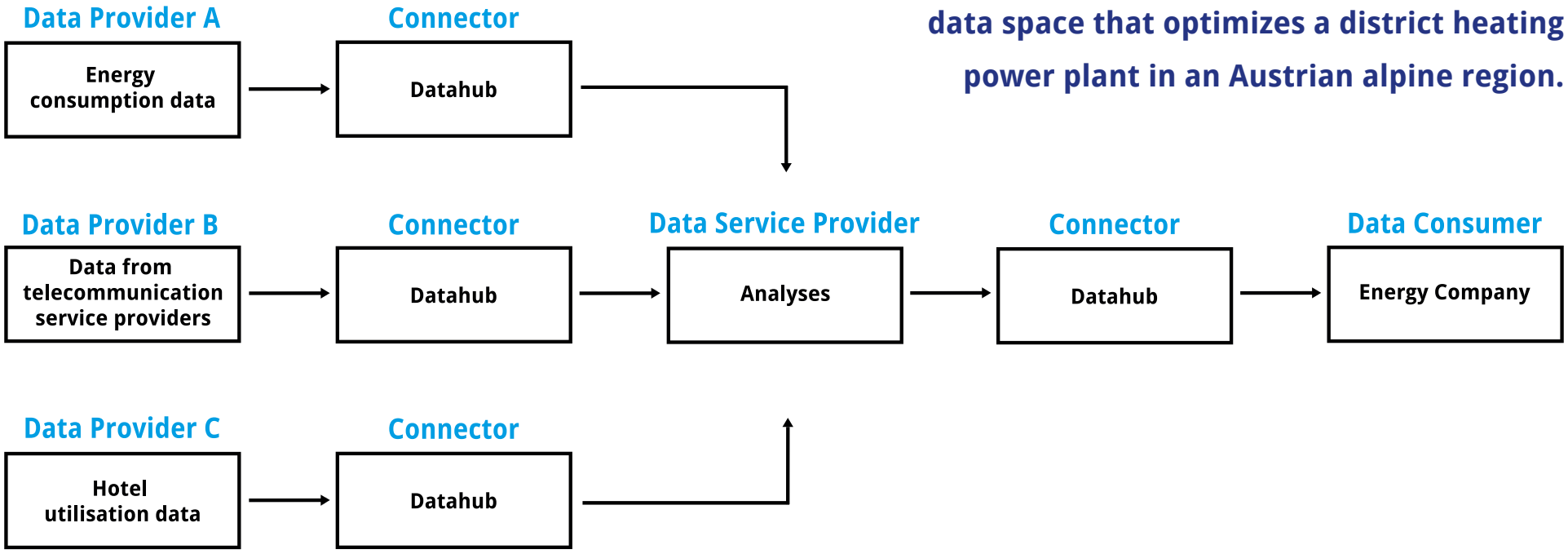
Scan for more info

Data Spaces

Data Intelligence Offensive (DIO): Data Space Energy Transition

Data space accelerating the energy transition in Austria and beyond

Examplary visualization for a use case within the data space that optimizes a district heating power plant in an Austrian alpine region.



Challenge

The Data Space Energy Transition deals with all aspects around the transition from non-sustainable energy sources to renewable energies and improving the efficiency to reduce negative effects. Another challenge is the periodicity of renewable energies. The goal is to develop use cases that bring both economic and socio-ecological added value.

Success

The use case „Optimized drictrict heating power plant“ within the data space combines energy data, data from telecommunication service providers, hotel uti·lization data and calendar data for specific locations to provide a planning basis for energy production. Energy production is improved and optimized by intelligent energy consumption forecasting and distribution.

+ Benefits

The Green Data Hub platform builds a data service ecosystem for green and sustainable data. It optimizes and lowers resource consumption as well as improves storage and distribution.

Components

Use case „Optimized district heating power plant“

- Eclipse Data Space Connector
- Nexyo // Nexyo conforms to the European Gaia-X initiative and IDSA reference architecture as well as IDS Certification

Green Data Hub

Participants in the use case „Optimized district heating power plant“

DIO Data Intelligence Offensive

kelag

nexyo

Österreich Werbung

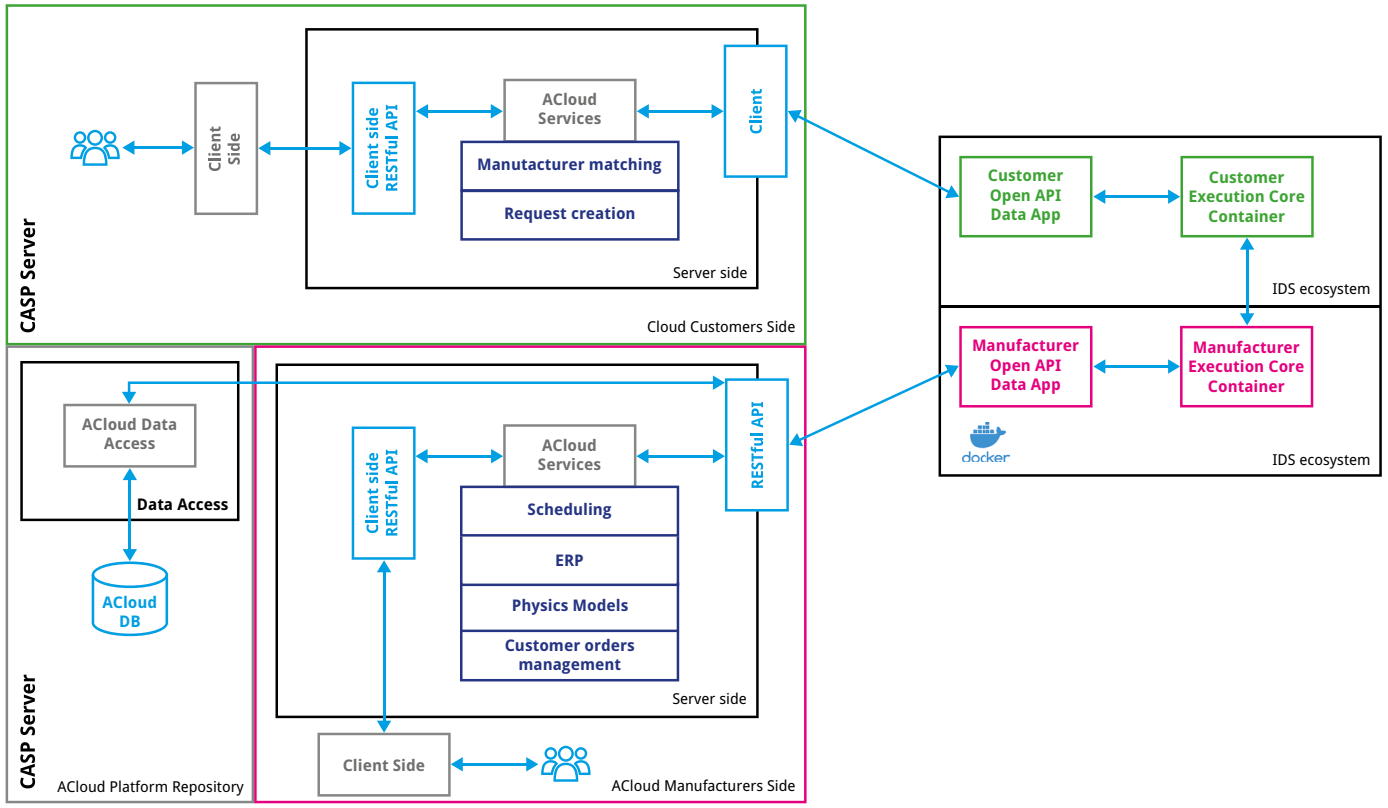
UPSTREAM MOBILITY

Scan for more info

Data Spaces

MARKET4.0: 3DFORM

Connect ACloud 3D printing platform to MARKET4.0 Marketplace



Challenge

3DFORM aims to extend the functionalities of the Market4.0 ecosystem: integrating ACloud platform at the marketplace, providing information regarding 3D printing machines and validating provided solutions. The main target of the ACloud platform is to facilitate communication between producer and customer.

Success

Through the IDS architecture, 3DFORM was able to integrate a secure connection by providing data sovereignty and control between the ACloud platform and service users at the MARKET4.0 marketplace.

+ Benefits

The visibility for 3DFORM partners is increased. A new 3D printing service for the MARKET4.0 ecosystem is made possible. Communication between the producer and the customer of 3D printed parts is facilitated.

Components

- IDS Identity Provider (Certificate Authority, DAPS)
- IDS Clearing House
- IDS Connectors
- Data Apps

MARKET4.0
CONNECT & PRODUCE

MORPHICA

Casp

Funded by the European Union

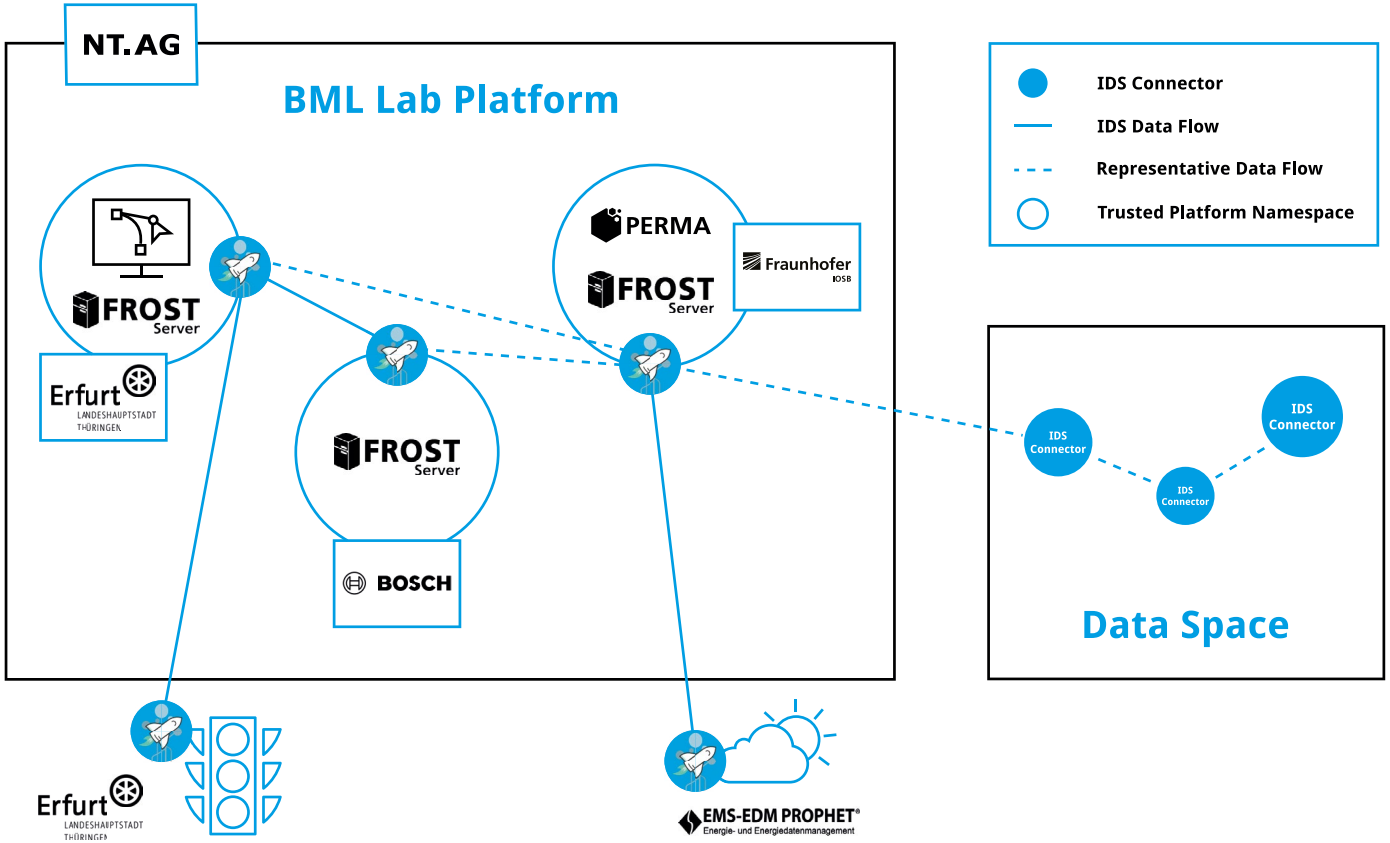
MARKET4.0 receives funding from the European Union Digital Europe Programme under grant agreement n° 822064.

Scan for more info

Data Spaces

Bauhaus.MobilityLab

Data sovereign ecosystem for the development of AI innovations bringing together the mobility, energy, and logistics sectors



Challenge

Increasing digitization and use of AI offers opportunities for today's challenges: climate protection, urbanization and demography. The economically, socially and ecologically sustainable design of cities is becoming particularly important. Key factors are the mobility, logistics and energy sectors. Products and services must be developed in short time intervals - with data sovereignty. Central challenges are the complex and dynamic structure of the systems involved, the management and implementation of data and services.

Success

The living lab is an innovative concept for developing and testing products and services with potential users in a lifelike environment. The test environment Bauhaus. MobilityLab becomes an incubator for change. All the data is used in sovereign data spaces incorporating the principles of IDS and Gaia-X into the design of the lab platform.

+ Benefits

All testing is done in a secure and sovereign data environment. Innovation for city design can be tested with AI support in a fast and effective way.

Components

» IDS Connector (Data-space Connector)

BAUHAUS. MOBILITY LAB

Bauhaus-Universität Weimar

BOSCH

Fraunhofer IOSB

Fraunhofer IOSB

Fraunhofer ITWM

Fraunhofer ISST

highQ

INNOMAN

Ernst-Abbe-Fachhochschule Jena

NT.AG

SIEMENS

Erfurt

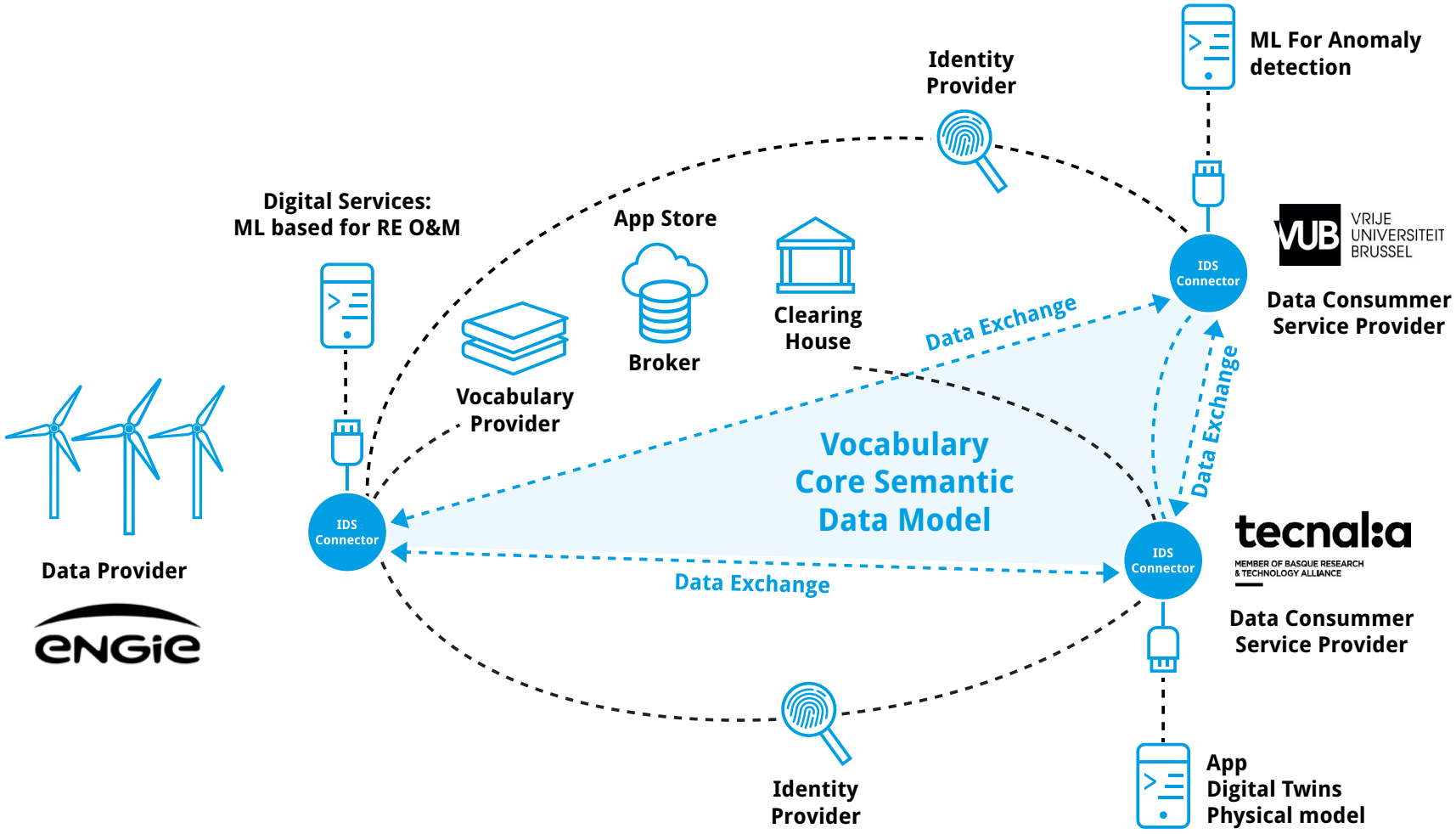
BPM

Scan for more info

Data Spaces

PLATOON: Wind Energy Data Space

Predictive maintenance of wind farms



Challenge

The goal is to provide predictive maintenance of wind turbines focusing on the generator and power converter. Currently, energy data often does not comply with the FAIR principles. Silos are kept within companies; data is hardly reused. Access to data is also partly limited to some influential big companies. But this data is needed to develop new products and services for the energy transition.

Success

IDS is the basis of PLATOON's solution for sovereign data sharing. This enables the development of innovative data analytics tools by combining data from multiple stakeholders from the energy value chain to optimize the sector. PLATOON developed wind turbine dig-ital twins with accurate physical and data-driven digital twins and models with anomaly detection, fault diagnosis and isolation.

+ Benefits

Maintenance costs are optimized, efficiency improved. Data analytics tools allow data providers to access a wide ecosystem of service providers. These innovations accelerate the energy transition.

Components

- IDS TRUE Connector with Data Usage App
- App Store
- Broker
- Vocabulary Provider
- DAPS
- Clearing House

PLATOON
Digital platform and analytics tools for energy

ENGIE · ENGINEERING · Fraunhofer · tecnalia · UDG Alliance · VUB Vrije Universiteit Brussel

Funded by the European Union

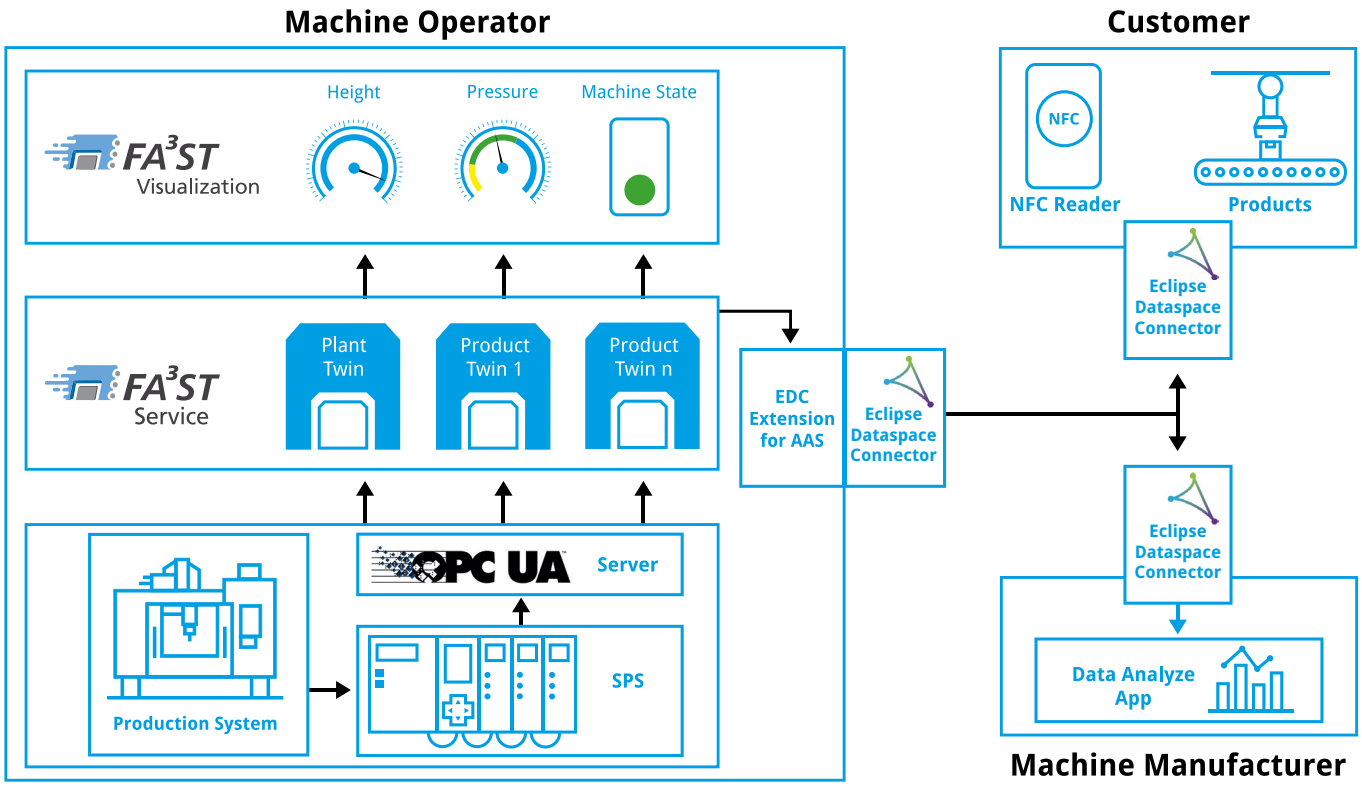
PLATOON receives funding from the European Union Digital Europe Programme under grant agreement n° 872592.

Scan for more info

Data Spaces

FA³ST ecosystem for I4.0-compliant and data-sovereign digital twins

Use cases for digital twins with FA³ST, an ecosystem for Asset Administration Shell (AAS)-compliant digital twins



Challenge

Digital twins are increasingly used in industry along the entire value chain. The dissemination of digital twins requires the integrability of their data and services across company boundaries. The Industry 4.0 platform proposes the Asset Administration Shell (AAS) specification for the digital representation of all assets.

Components

- Eclipse Dataspace Connector 0.0.1-milestone-7
- EDC Extension for AAS 1.0.0

FA³ST
Fraunhofer Advanced AAS Tools for Digital Twins

Fraunhofer IOSB

Success

By combining the AAS with the IDS, interoperability across company borders is created. Product and production data is represented in AAS digital twins and shared via IDS Connectors. The data sovereignty challenges are addressed by the IDS ecosystem. The FA³ST service fully implements the specification and can al-ready be used.

+ Benefits

The AAS can describe all types of products and production equipment while linking data elements to semantic descriptions. Sharing such data enables use cases like the Platform Industrie4.0 Collaborative Condition Monitoring or the Catena-X automotive network.

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 DMP	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
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
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
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
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

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.

DATA SPACES SUPPORT CENTRE

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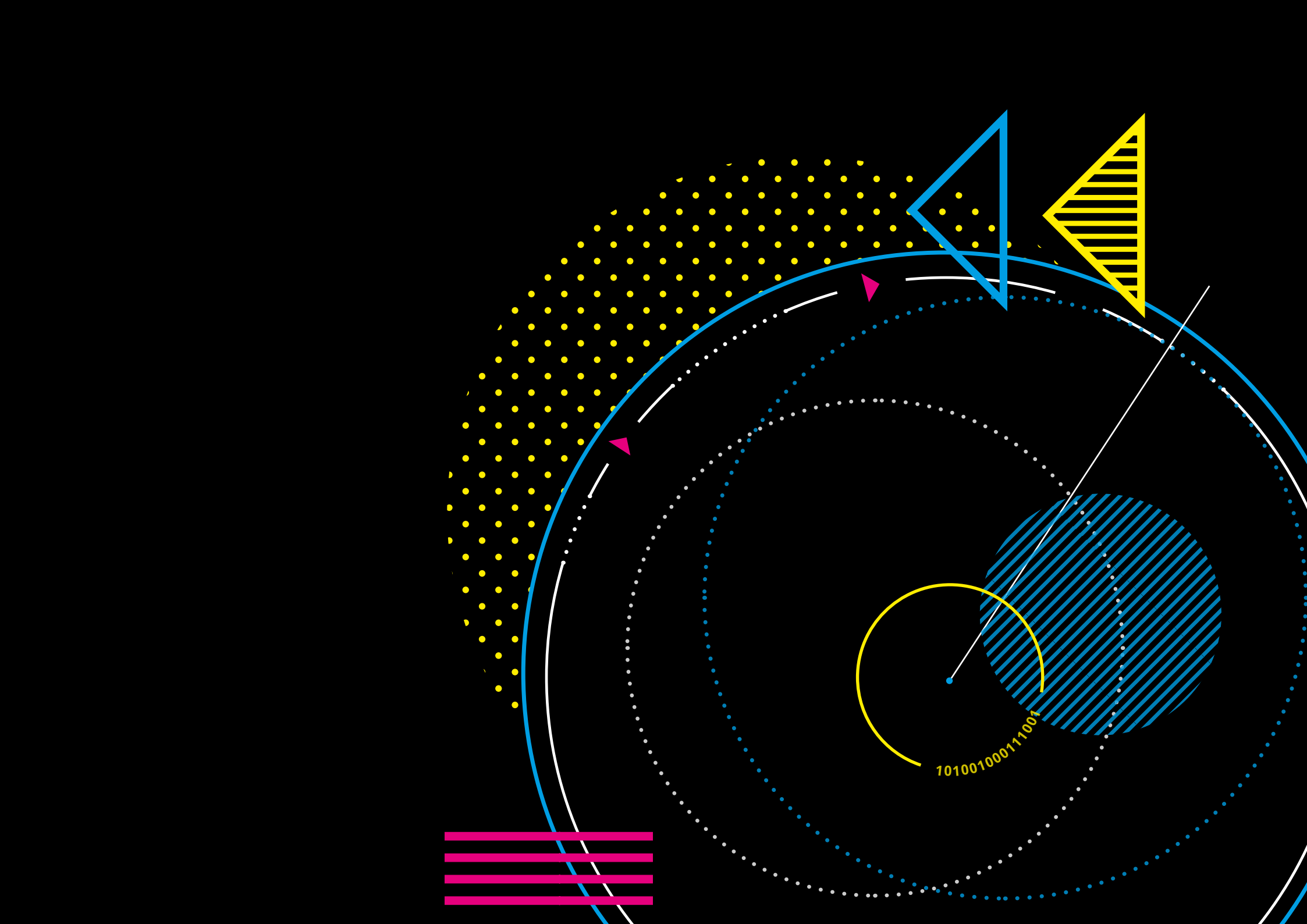
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