



# USE CASE OVERVIEW INTERNATIONAL DATA SPACES

OUR USE CASES MAKE IT HAPPEN!

**2019**

HANNOVER FAIR  
EDITION

The International Data Spaces is an architecture for virtual data spaces leveraging existing standards and technologies as well as accepted governance models for the data economy to facilitate the secure and standardized exchange and easy linkage of data in **A TRUSTED BUSINESS ECOSYSTEM.** It thereby provides a basis for smart service scenarios and innovative cross-company business processes, while at the same time making sure data sovereignty is guaranteed for the participating data owners.

In order to identify the requirements from potential application scenarios of the International Data Spaces on the one hand, and to validate the applicability in real scenarios on the other, the members of the International Data Spaces Association (IDSA) develop different use cases. A use case describes a scenario, in which an individual tries to reach a certain goal by using a system, which is according to **THE INTERNATIONAL DATA SPACES.**



# STRATEGIC INDUSTRY REQUIREMENTS determine the design of the International Data Spaces Architecture



## Trust 1

Trust is the basis of the International Data Spaces. It is supported by a comprehensive identity management focusing on the identification of participants and providing information about the participant based on the organizational evaluation and certification of all participants

## Data markets 6

The International Data Spaces enables the creation of novel, data-driven services that make use of data apps. It also fosters new business models for those services by providing clearing, billing and the creation of domain-specific brokers and marketplaces. In addition, usage restrictions and legal aspects are provided as templates and with methodological support.

## Value adding apps 5

The International Data Spaces enables app injection to connectors to add services on top of the pure data exchange. This includes services for data processing as well as the alignment of data formats and data exchange protocols, but also enables analytics on data by the remote execution of algorithms.

## 2 Security and data sovereignty

Components of the International Data Spaces rely on current security measures. Next to architectural specifications, this is realized by the evaluation and certification of the components. In line with the central aspect of ensuring data sovereignty, a data owner in the International Data Spaces attaches usage restriction information to its data before it is transferred to a data consumer. The data consumer may use this data only if it fully accepts the data owner's usage policy

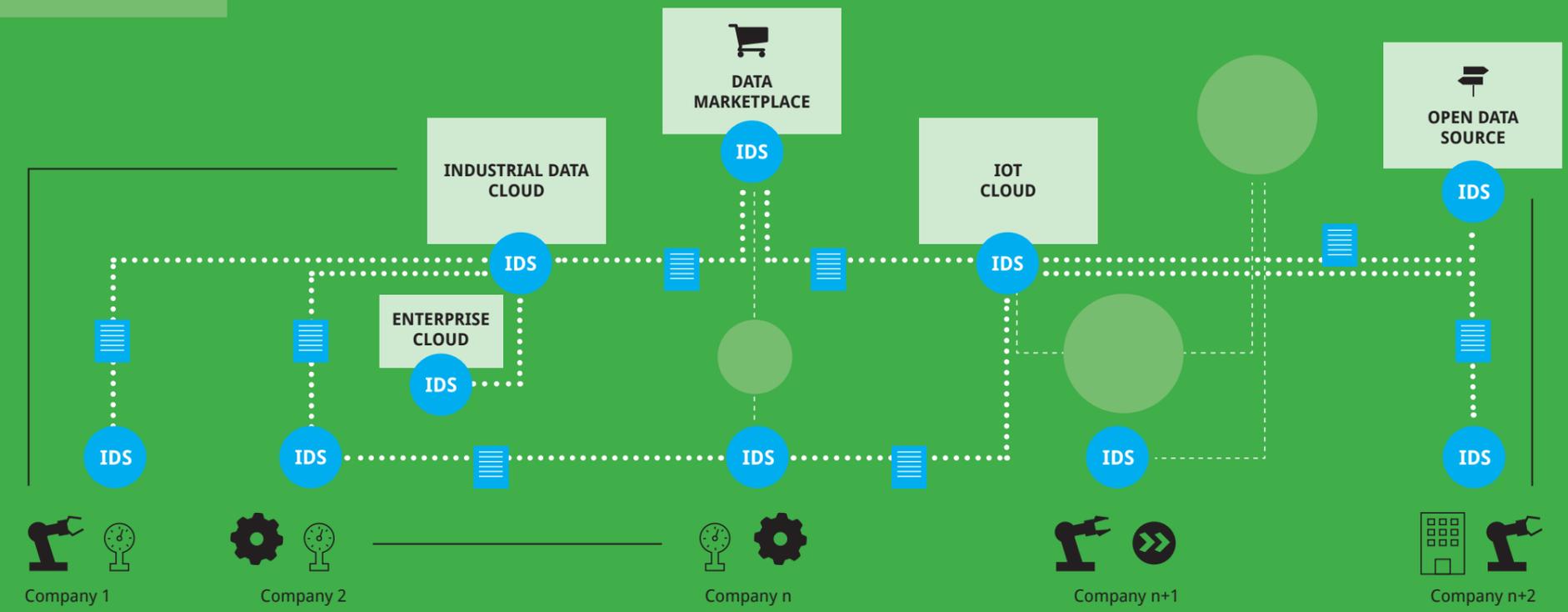
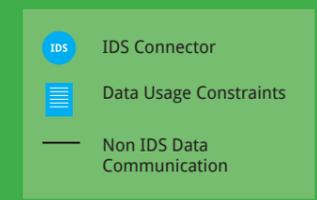
## 3 Ecosystem of data

The architecture of the International Data Spaces does not require central data storage capabilities. Instead, it pursues the idea of decentralization of data storage, which means that data physically remains with the respective data owner until it is transferred to a trusted party. This approach requires a holistic description of the data source and data as an asset combined with the ability to integrate domain-specific vocabularies for data. Brokers in the ecosystem enable comprehensive real-time search for data.

## 4 Standardized interoperability

The International Data Spaces Connector, being a central component of the architecture, is implemented in different variants and from different vendors. Nevertheless, each connector is able to communicate with every other connector or component in the ecosystem of the International Data Spaces.

# THE INTERNATIONAL DATA SPACES APPROACH connects all kinds of data endpoints



When broadening the perspective from an individual use case scenario to a platform landscape view, the INTERNATIONAL DATA SPACES positions itself as an architecture to link different cloud platforms through secure exchange and trusted sharing of data, in short: **through data sovereignty.**

By proposing a specific software component, the International Data Spaces Connector, industrial data clouds, individual enterprise clouds, on-premise applications, and individual connected devices, can be connected.

# OUR USE CASES

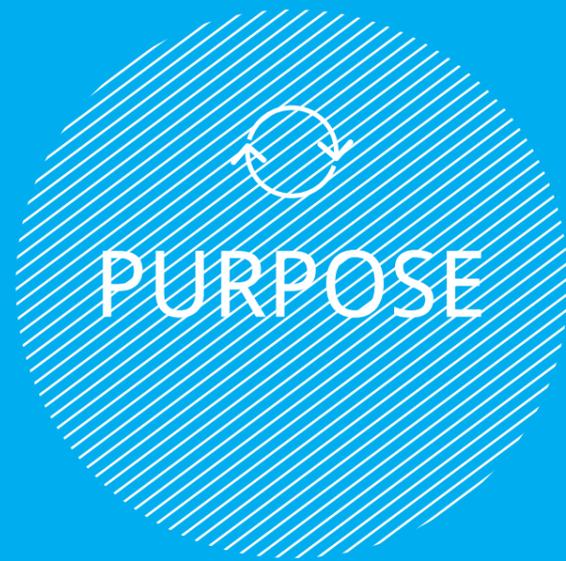
Use cases representing the cross-company business processes modified with the International Data Spaces. The purpose is the identification, analysis and evaluation of requirements of user enterprises to be met by the International Data Spaces. Furthermore, the enterprises demonstrate innovations on the basis of the International Data Spaces and build a potential core of an ecosystem through the integration of additional (also foreign domain) partners and the development of value adding smart services. Use cases were also used to spread the International Data Spaces through different industries and countries.



*Each member of the association realizes its own use case*

Each member of the user association realizes a business driven use case, which demonstrates the innovations based on International Data Spaces and potential core of an ecosystem by integrating further partners (also from different domains).

This leads to ecosystem specific Use Cases that cross Security Domains and apply to the International Data Spaces Governance concerning trust and the respect for data usage policies. The International Data Spaces will show its benefits and value to business especially when Use Cases combine data assets from different ecosystems seamlessly.



## EXCUSE ME: *What exactly do we need IDS for?*



# CEFRIEL OLOGER – i4.0 Smart Logistic

Use Case #01

Manufacturers have to deal with inbound and outbound logistics operations to acquire raw materials or components and to deliver their products. They are often facing issues related to the freight transportation such as when the shipment is in the wrong place, it is delivered late or it is delivered on time but damaged. For these reasons, **it is crucial to know what is going on during transportation** and to detect when and where eventual damages happened, in order to leverage on insurances or work to improve the service in order to and raise and manage the customer satisfaction.

Cefriel developed a **custom outdoor tracker for industry logistic** able to track **position, temperature, humidity, shocks, and vibrations**, called **“OLOGER”** (Outdoor LOGistic trackER), that can be customized for the specific scenario. OLOGER device is battery equipped, and it has been designed to be reused for multiple shipments.

When the device detects any event that has an impact on the quality and time of the shipment, based on custom configuration, data are sent over the cellular network and then immediately shared through FIWARE with logistic and production manufacturing stakeholders involved in the logistic process. All data can be accessed using the Smart Logistic Application.

## TARGETS

- Event-based tracing of the logistic chain
- Early management of production delays due to shipments issues
- Manage and increase customer satisfaction in case of product damages

## ECHNOLOGY/ IDS COMPONENTS

- OLOGER – Outdoor LOGistic tracker
- Web based i4.0 Smart Logistic application
- FIWARE platform components (ORION, CYGNUS, Custom Docker)
- IDS connector

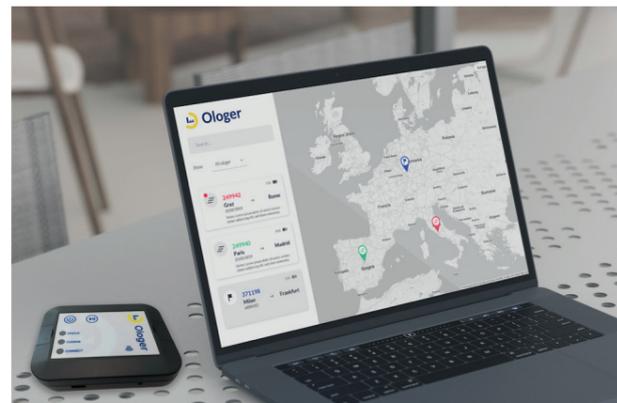
## PARTNERS

- The application scenario, part of H2020 MIDIH project experiments, has been tested in cooperation with project partners Centro Ricerche Fiat - FCA Group and Engineering Ingegneria Informatica
- Target groups for this application include companies that ship or need to monitor the shipment of high value or highly fragile goods, medium-high value components/parts crucial for a manufacturing process or health & drugs shipments with critical environmental parameters to be monitored



## BENEFITS

- » *Geolocalization of logistic chain events impacting timing and quality of the shipments*
- » *Flexible customization of scenario and data based on the stakeholder process and product to be monitored*
- » *Timely and secure sharing of logistic data among all stakeholder*



# DATA AHEAD TWINSTRUCTION: Multi Stakeholder Enablement for Intelligent Construction Site Applications

from Operations to Administrations, Insurance and Finance

Use Case #02



## SOLUTION

We involve digitizing key assets and transactions on construction sites by the most simple and robust means.

- Power Cabinets,
- Check Points,
- Goods traffic,
- Area consumption,
- Staff profiles

provide a huge number of direct views and perspectives on real value streams, making a construction site an open book.

The additional number of indirect views provides free interpretation tools for the new stakeholders of tomorrow:

- Risk scoring
- Financial deviation alerting
- Insurance credibility
- Carbon footprint
- Dynamic asset depreciation
- Pay-per-use models

## PROBLEM SOLVED

Top-down approaches in digitization generally lack raw data availability, leading to costly hardware and interface expenses and high project complexity.

The bottom-up approach provided by **TWINSTRUCTION** family of products is using anyway-there data, and provides transparency where it is needed most.

Coming directly from floor-level data sources, without detours by middleware, directly to the points of useful interpretation.

## MAIN TECHNOLOGY/ IDS COMPONENT

ELASTICGEAR, the high-performance logistics architecture by DATA AHEAD reliably grabs any sources from shop-floor level sensors, ERP data bases, or third-party micro services.

Seamlessly running with IDS connectors, wherever needed, off the shelf ready for the IoT ecosystems of tomorrow.

## PARTNERS/ ECOSYSTEM

DATA AHEAD  
Raw data logistics

STRABAG  
Construction sites

SIEMENS  
MindSphere ecosystem

DELL  
IoT gateways



## BENEFITS

- » *Coming directly from floor-level data sources, without detours by proprietary middleware, directly to the points of useful interpretation.*

*The most effective starting point for monetizing existing raw data*

# IBM / THYSSENKRUPP / FRAUNHOFER ISST

## Industrial Additive Manufacturing Services

Use Case #03

Industrial Additive Manufacturing (AM) technology provides numerous benefits to companies if applied in the right way. This requires dedicated engineering expertise that in many cases is not accessible to small and medium enterprises without high investment in knowledge and equipment. The platform developed in this common project aims to bring together all participants in the industrial Additive Manufacturing process chain and provides easy access to engineering expertise as well as AM equipment to any customer. Utilizing IDS Connectors and Blockchain Technology this platform creates a scalable trustworthy ecosystem in various industries and beyond Additive Manufacturing where Big Data can be exchanged amongst multiple parties and provenance and immutability assure product quality and intellectual property.



### TARGETS

- Creating a trustworthy ecosystem for transfer of valuable and IP-relevant engineering data
- Process industrial AM orders in a fast, traceable and reliable manner
- Protect IP and assure quality

### TECHNOLOGY / IDS COMPONENTS

- IDS Base Connector
- Blockchain: Hyperledger Fabric

### PARTNERS

- IBM
- thyssenkrupp
- Fraunhofer ISST



### BENEFITS

- » *Secure platform for big data exchange and seamless interaction for all participants along the value chain*
- » *Easy access to Additive Manufacturing technology and services for small and medium enterprises*
- » *Intellectual property and product quality ensured through provenance and immutability*



# INNOVALIA

## Digital Feedback and Forward Loops for Manufacturing Excellence

Use Case #04

Machines chained to a shop floor as part of the manufacturing set-up are typically working as information silos. They are 'physically' connected since the part treated by one machine is passed to the next machine but their corresponding systems are not connected. Each of those machines generates a large amount of data, which so far has been used to monitor and improve the processes and tasks each machine performs. However, systems associated to each machine are not designed to exploit data from others.

Improvements can be gained if the data from a Coordinate Measuring Machine (CMM) 'feeds' the systems connected to Milling Machine and vice-versa. All exchanges made in a way that is secure: access control terms and conditions established by each machine provider are preserved and the shop floor operator also controls what is exchanged and goes out of the factory.

Adding sensors to produced parts and analysing their performance in operation using digital twins, the design of the parts can be continuously enhanced and seamlessly provided as input to the CMM quality control programmes in production, adapting the quality control process. This way, creating an excellence process loop across the entire lifecycle of the products.

### TARGETS

- Model-based Zero Defect Manufacturing (ZDM)
- Design for manufacturability
- Digital Thread relying on International Open Standards
- Sovereignty on data across the entire product lifecycle.

### MAIN TECHNOLOGY / IDS COMPONENT

- FIWARE – IDS Connectors

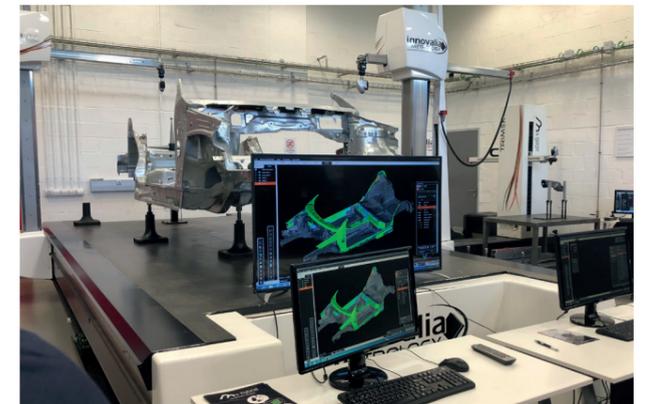
### PARTNERS

- FIWARE data exchange platform
- +GF+ / EPFL Milling Machine manufacturer and Predictive Maintenance platform provider
- INNOVALIA METROLOGY Coordinate Measurement Machine (CMM) manufacturer
- PRO-STEP Product engineering / design platform provider
- INNOVALIA METROLOGY / CAPVIDIA QIF (Quality Information Framework) digital platform providers



### BENEFITS

- » *Enhanced and more robust design based on product performance.*
- » *Manufacturing excellence across the product lifecycle*
- » *Smart defect forecasting and predictive maintenance tasks planning.*



# NICOS

## Management Of Things, Identities and Credentials: motic®-Broker for a Secure Data Room

Use Case #05



### SOLUTION

nicos AG specializes in secure, global data networks. Our high-performance IT infrastructure enables collaboration and secure data exchange between all locations worldwide. It is our goal that the users retain sovereignty over their data.

In production facilities, workpieces communicate with machines and control production themselves. This only works, if all communication partners reliably prove their technical security level. Whether – and if so – which data should be exchanged is defined by policies and based on authentic information about the identity and security level of the connectors.

The motic®-Broker provides self-disclosure mechanisms for inquiring connectors and allows the management of the connectors' domains as well as creating authorization profiles. Connectors that act as data providers gain the right to direct the authorized data flow toward the data consumer.

### PROBLEMS SOLVED

The management of entities is of particular importance: In order to control who may use which data, for what purpose, for what period and under what conditions, uniquely addressed elements are required. The motic®-Broker provides authorization and usage controls based on policies. This valid data basis is the next big step in the direction to machine learning and artificial intelligence.

### MAIN TECHNOLOGY/ IDS COMPONENT

- Broker
- IDS Connector

### PARTNERS/ ECOSYSTEM

International Data Spaces Association



### BENEFITS



» Access and user control management for data providers and data consumers in the IDS ecosystem

» Basis for further data processing like machine learning and artificial intelligence

» Monitoring and logging of secure data exchange transactions in the IDS ecosystem

# ORBITER

## Smart-Mobility Payment Solution

Use Case #06



### SOLUTION

The Orbiter /IDSa use-case is an automated payment solution based on blockchain technology and secure data sharing for smart mobility and IoT applications.

The identity of the car and its legal owner are verified and stored on the blockchain. An embedded low-energy Bluetooth unit transmits this data to 3rd-party service providers (parking, toll-collect, charging stations etc.). An additional chip verifies the information and authorizes an automated payment transaction.

### Key features

- Blockchain
- Verified identities
- Money on ledger
- Authentication process
- Secure payment transaction

### PROBLEM SOLVED

#### Trust through verified identities

Automated business processes need trust. I have to be sure my counterpart is who they say they are and that they can pay for what they want. This case shows how blockchain technology is used to verify identities and enable transactions between these identities in an all-connected environment.

#### Secure trx. authorisation

An Infineon security chip authorizes data- and payment transactions.

#### Transaction speed

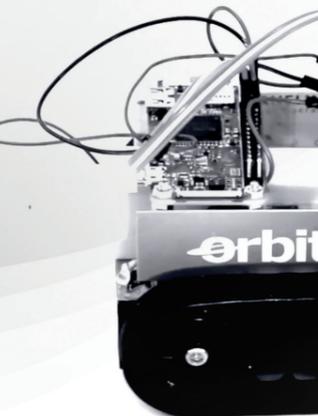
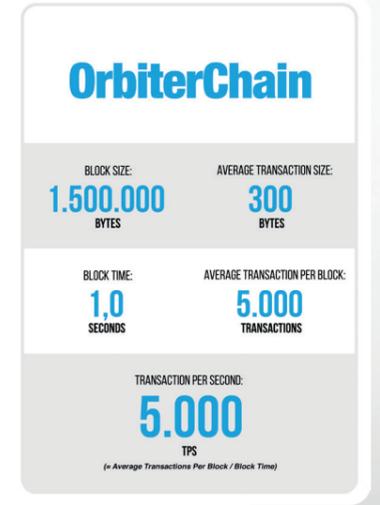
Orbiterchain is a brand new blockchain solution based on a proof-of-work algorithm. Due to its unique features the Orbiterchain can process 5.000 trx/sec and needs less than 1 sec to verify a transaction.

### BENEFITS



» Orbiter provides a ready to use blockchain solution including automated payment and sensor technology for secure exchange of data between IoT objects

» The case bases on the use of IDS connectors and norms for secure data exchange



# SETLOG / DEUTSCHE TELEKOM

## Logistics Cost Reduction based on predicted lead times

Use Case #07

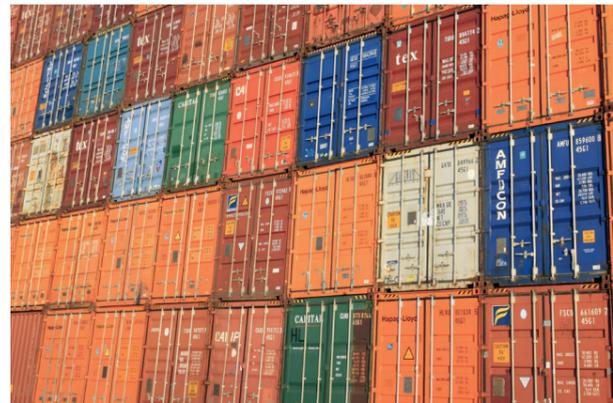
### SOLUTION

It is difficult for companies to predict when goods will actually arrive at their destination, leaving little scope for planning further steps, such as door and warehouse planning or (pre-) order picking. They have to rely on the predicted lead times by forwarders. In the use case "Logistics Cost Reduction based on Predicted Lead Times" companies can inquire quotations and compare prices by forwarders. Once they've decided on one offer, Setlog's system OSCA® uses the Data Intelligence Hub technology to predict a more precise ETA. For this purpose, transport data from the past will be combined with planning data from the MMS, actual data from OSCA® and public data (such as traffic&weather) in order to obtain a precise statement about transport time and delivery time. This will enable the customer to plan their resources and warehouses better.

Due to this technology sea freight will become a steadier transportation and expensive air freight will have to be used less.

### PROBLEMS SOLVED

- Risk management at booking time
- ETA Alert during shipment time
  - Prediction of probable arrival time of a shipment using Data Analytics
  - More transparency in goods transport and delivery
  - Optimized coordination of all related processes
  - Reduced costs, time, effort and resources
  - Avoiding expensive transportation modes
  - On-time delivery ratio will be increased



### TECHNOLOGY/ IDS COMPONENT

Deutsche Telekom Data Intelligence Hub based on IDS Architecture: Broker, Connector, IDM, Certificates Setlog-OSCA® as IDS Connector

### PARTNERS/ ECOSYSTEMS

- Setlog
- Deutsche Telekom
- Weather Data, Marine Traffic Data, Geodata,
- Data wish list: harbour data, suez channel data, shipping company loop data



### BENEFITS

- » *Costs can be reduced due to quote comparison and increased on-time delivery ratio.*
- » *Enablement of an optimized capacity and resource planning for logistics.*

# DATA – the raw material for our economy

Business models develop out of data, values develop out of business models, and growth and prosperity develop out of values. International Data Spaces preserves the digital sovereignty of data ownership and forms the basis for smart services and innovative business processes worldwide. It is an ecosystem in which different participants can play by their own rules so they can implement their business models and protect their own interests – and those of their customers.



### BECOME A MEMBER!

[www.internationaldataspaces.org](http://www.internationaldataspaces.org)

### THE ADVANTAGES:

- ✓ *Implement use cases*
- ✓ *Drive global standardization forward*
- ✓ *Develop architectures*
- ✓ *Design sustainable business models*

OUR MOST IMPORTANT DOCUMENTS:  
[www.internationaldataspaces.org/info-package](http://www.internationaldataspaces.org/info-package)



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