
THE INDUSTRIAL DATA SPACE: DIGITAL INDUSTRIAL PLATFORM ACROSS VALUE CHAINS IN ALL SECTORS OF THE ECONOMY

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Current Key Challenge: Combination of Data in the »Ecosystem«

Pharma



Personalized Medicine

»Ecosystem«:

- Pharma industry
- Healthcare providers
- Doctors

Data:

- Health data
- Therapy data

Automobile



Traffic routing 2.0

»Ecosystem«:

- Automobile manufacturers
- Traffic control center
- Municipalities

Data:

- Location, destination
- Vehicle data
- Traffic data

Trade



Supply Chain Transparency

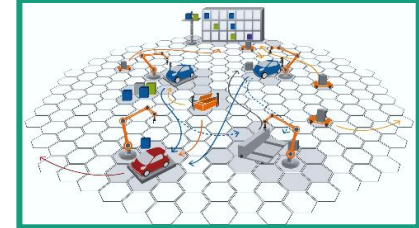
»Ecosystem«:

- Retail
- Consumer goods industry
- Logistics providers

Data:

- EPCIS events
- Transport data
- Condition data

Production



Digitized Factory

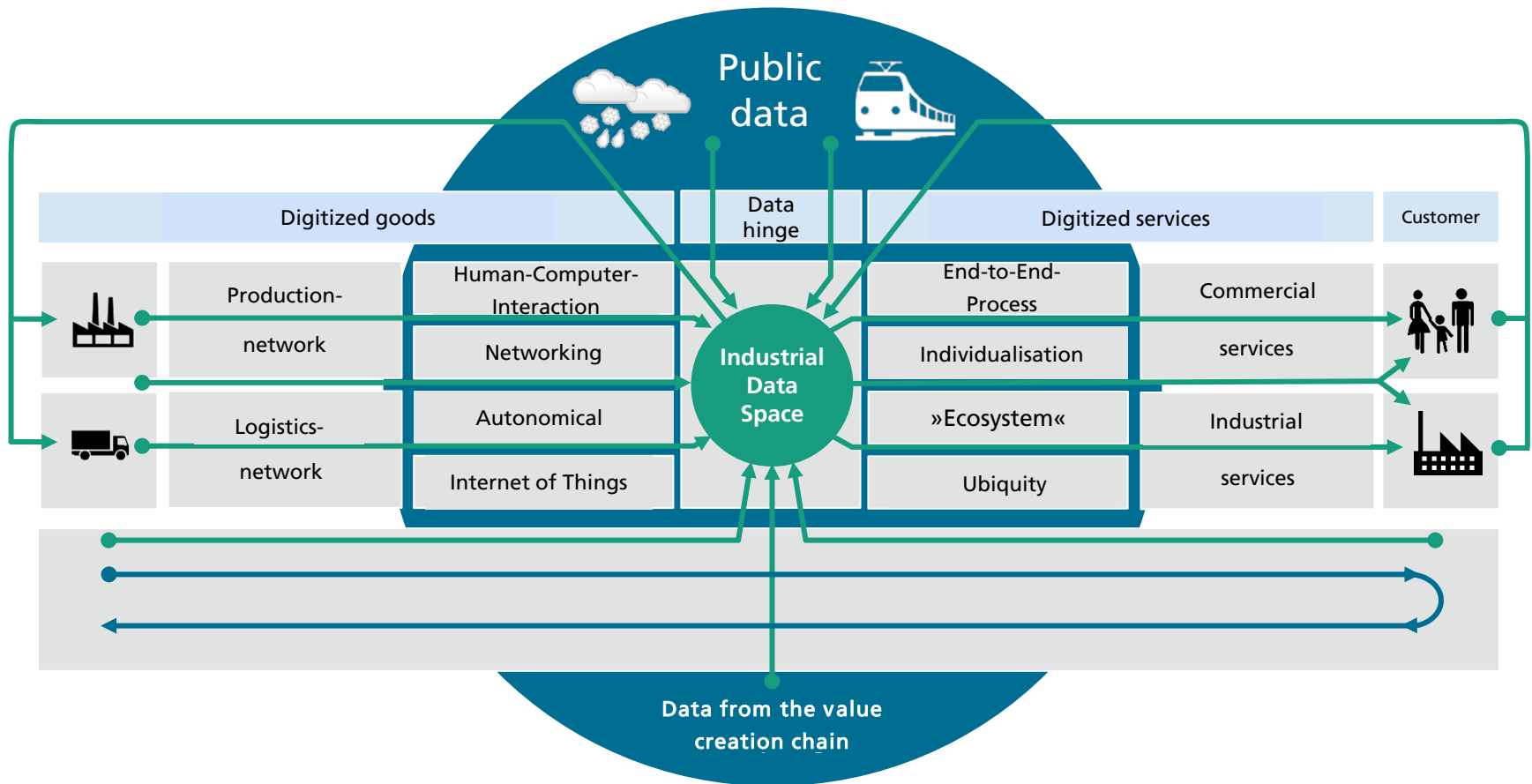
»Ecosystem«:

- Automobile manufacturers
- Suppliers
- Logistics providers

Data:

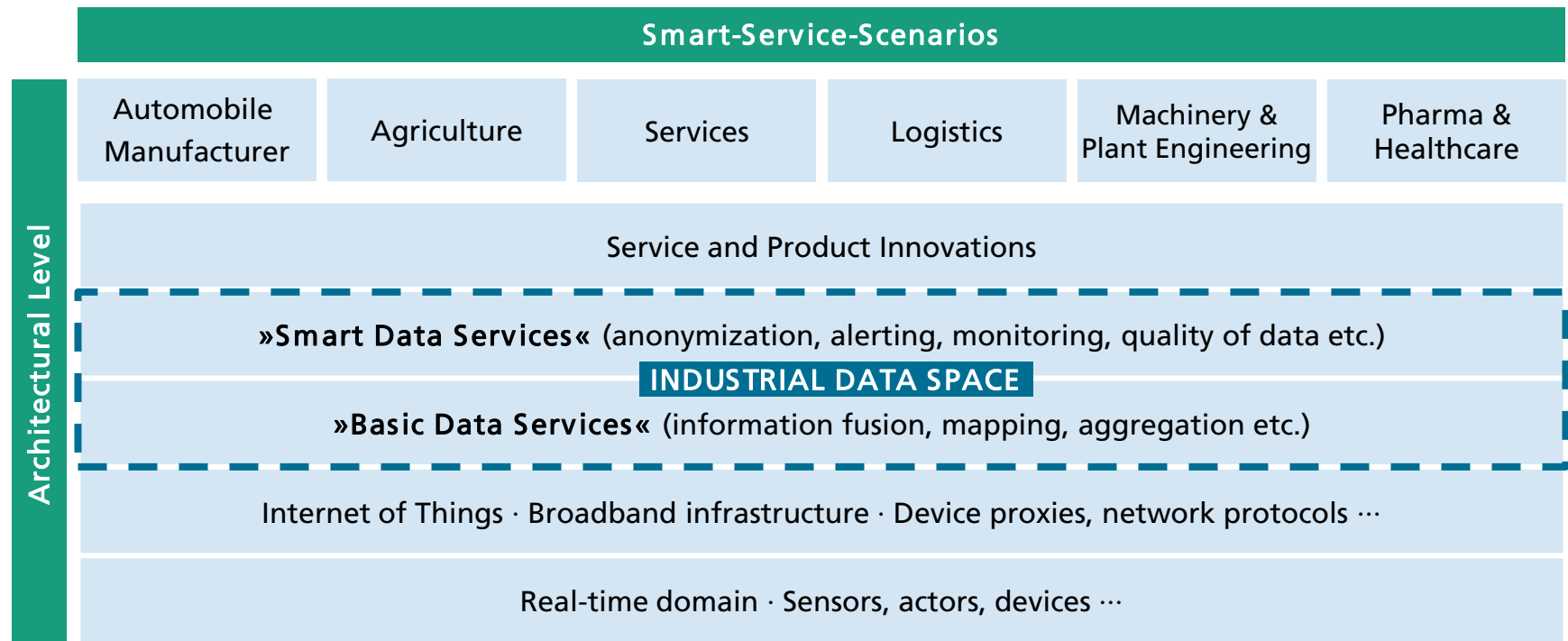
- Product data
- Planning data
- Condition data

The Industrial Data Space addresses this Challenge

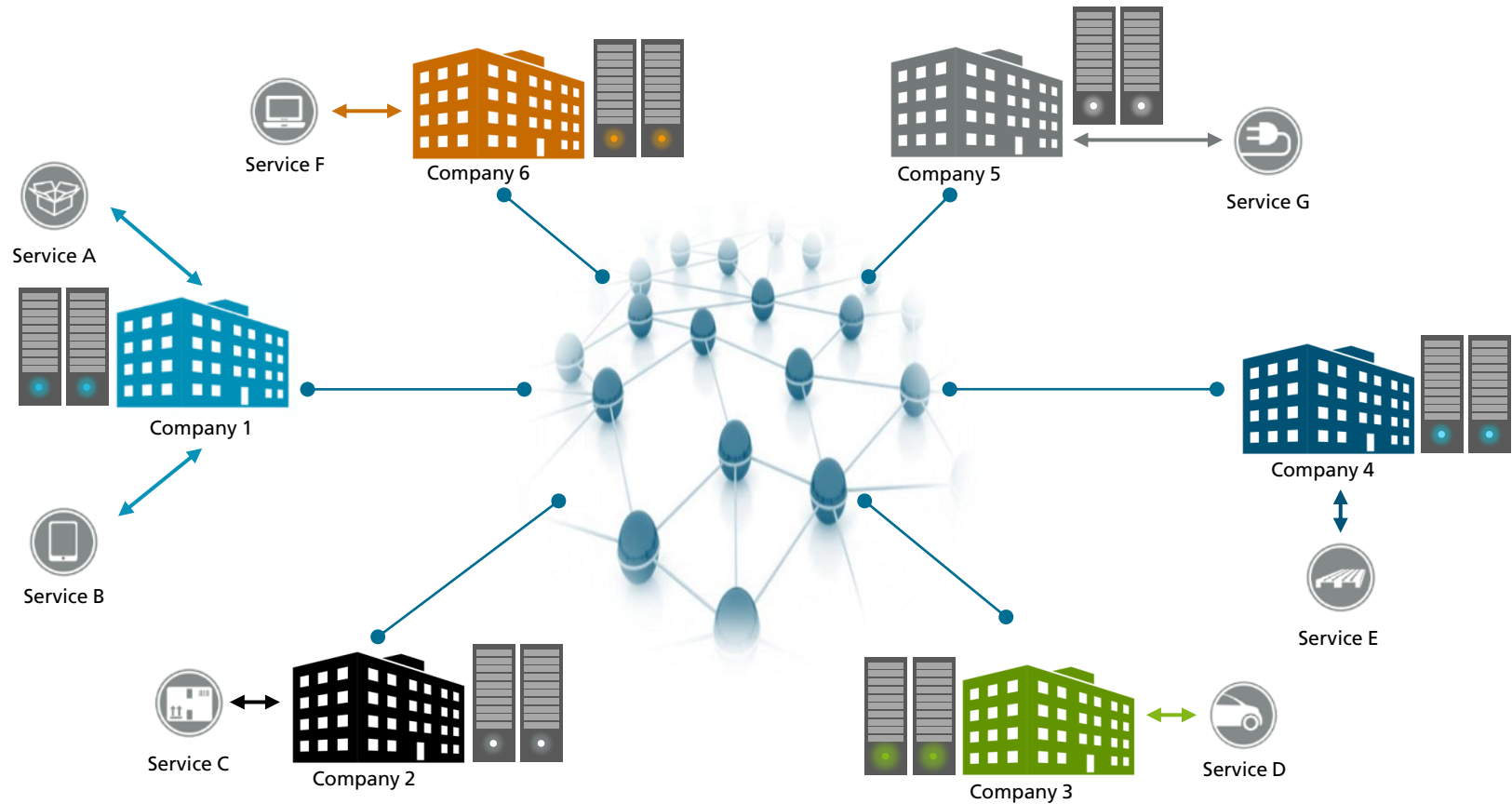


Explanation: Stream of information Stream of goods

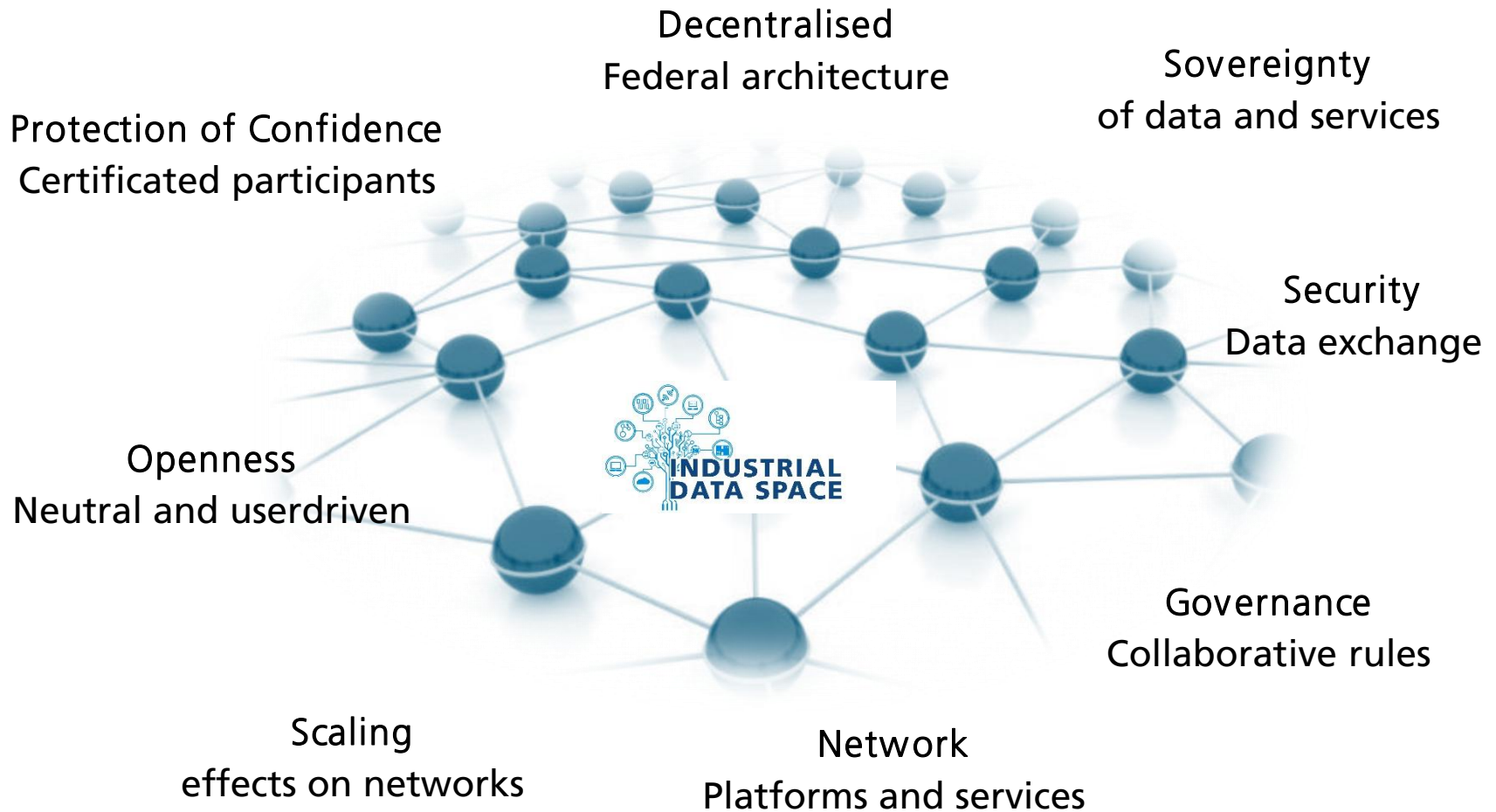
Industrial Data Space: Linking Data and Smart Services



The Industrial Data Space Enables a "Network of Trusted Data"



Industrial Data Space: Core Principles



Industrial Data Space: Four Basic Roles

Data Owner

Provides data

Operates endpoint in Industrial Data Space (or access via service provider).

Defines terms of use and fees of data.

Data User

Uses data for providing **services** or for **internal purposes**.

Satisfies terms for use of data.

Broker

Brings data owner and data user **together**.

Operates »data directory«.

Undertakes monitoring and clearing tasks.

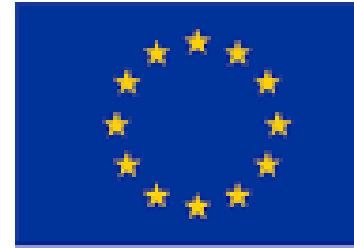
Certification Authority

Certifies **participants** to standards of Industrial Data Space (e.g. security, terms of use, use of standards)

Industrial Data Space e.V.: Current Status



Towards a European Data Space



Consortium of well-known European companies

supporting the initiative (incl. ATOS, PricewaterhouseCoopers (PwC), Santander, Siemens, Telefonica, Banco Santander)

EARTO Working Group: "Towards a European Data Space"

to support the internationalization of the Industrial Data Space.

Cooperations with other international initiatives

(e.g. Pan-European I4MS, Smart Industry platform (NL), European Open Science Cloud, FIWARE, NESSI, BDVA, Industrie 4.0 (DE)).

Integration with the European Open Science Cloud

H2020-INFRADEV-2016-2 project "The European Open Science Cloud for Research Pilot Project (EOSCpilot)":

includes ramp-up activities to integrate with Industrial Data Space

Conclusion:

The Industrial Data Space: Digital Industrial Platform across Value Chains in all Sectors of the Economy

- Value of data is growing by integrating to **value-added services**.
- **Network effects** in market-place between data owner and data user.
- Necessary: **secure infrastructure** that protects sovereignty and trust.
- Next step: Realizing the **European Data Space**.

Interested in getting involved ?

- **Please get in touch !**
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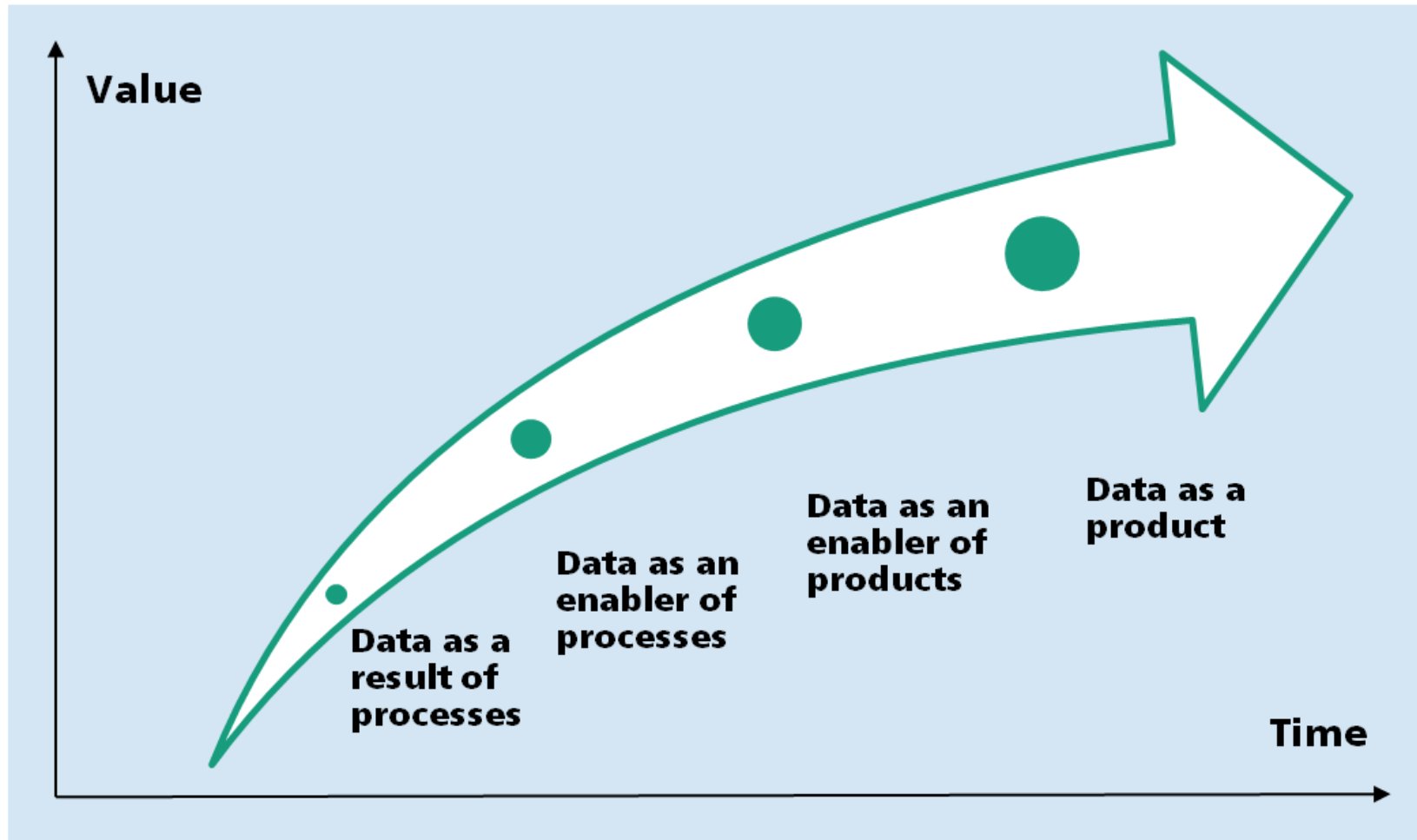
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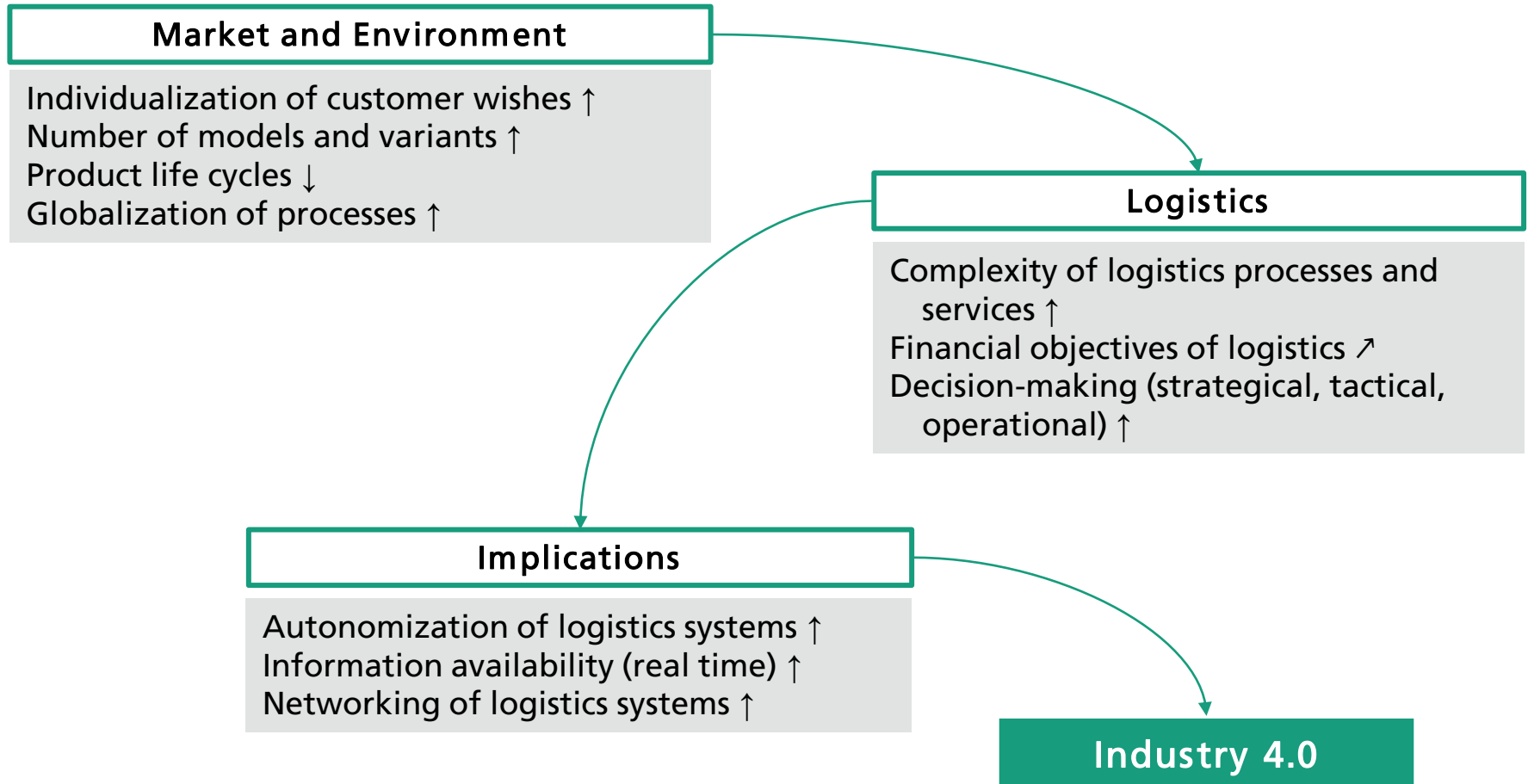
Backup







Central: Role of Data is Changing !



Example Audi: Industry 4.0 - A Means to an End -- Not an End to Itself



Data as Economic Good

Company	Service offer	Country	Class of data	Amount stated	Value per dataset
	Super-market chain	US	Customer data incl. purchasing profile	Market value	1,6 EUR ¹
	Social network	US	User data	Market value	225 USD ^{2,3}
	Automation engineering	DE	Production parts core data	Production cost	500 bis 5.000 EUR ⁴
	Agricultural chemistry	CH	Materials core data	Value of use	184 CHF ⁵

1) <http://www.wsj.de/nachrichten/SB11446175161338053998704580212211843086060>

2) <http://en.wikipedia.org/wiki/Facebook>; 890 million daily active users.

3) <http://www.ft.com/cms/s/0/ecc0f050-37a3-11e4-bd0a-00144feabdc0.html#axzz3RH6OPOTH>; Marktkapitalisierung von 200 Mrd. USD.

4) Vgl. Otto, Boris: Managing the business benefits of product data management: the case of Festo. In: Journal of Enterprise Information Management 25 (2012), Nr. 3, S. 272-297, DOI: 10.1108/17410391211224426; 5.000 EUR per new investment, 500 EUR annual care costs.

5) <http://www.marketwatch.com/investing/stock/syt/financials> (accessed on 9.2.15); Volume: 13,85 Mrd. CHF; Number materials core data: ca. 1.5 Mio; cost reduction potential because of high data quality according to expert interview: 2 percent of volume.

Data Management Needs New Skills

- **Ad-hoc query**
 - Ability to reply **any query at any time**
 - **Example:** Which raw materials did we obtain within a radius of 50 km around the nuclear power plant in Fukushima in the first three days after the accident?
- **Real time transparency**
 - Full transparency about **material and information flow**
 - **Example:** What is the value at risk of our global logistics network at a given moment?
- **Predictive analyses**
 - Use data for **proactive business management** – not for creating problems
 - **Example:** How to use weather and traffic data for controlling the distribution network?

Need for Action in Three Strategic Areas

Interaction with Customers

Customer focus, focus on customer processes, end-to-end support, smart-service-design, ecosystem management etc.

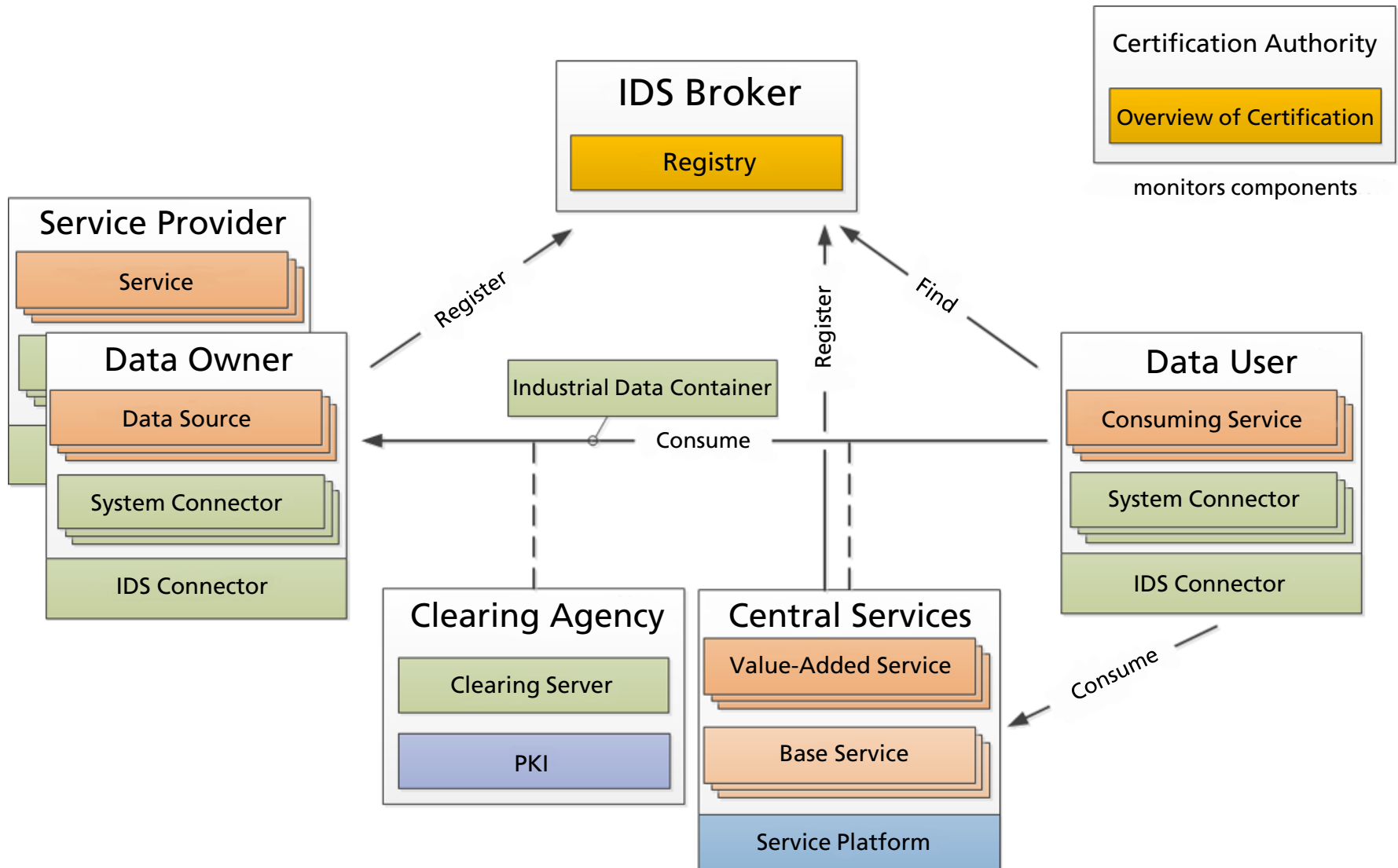
Mastering Complexity of Services

Industry 4.0, Internet of Things, autonomization of fabrication, smart factory etc.

Compliance and Transparency

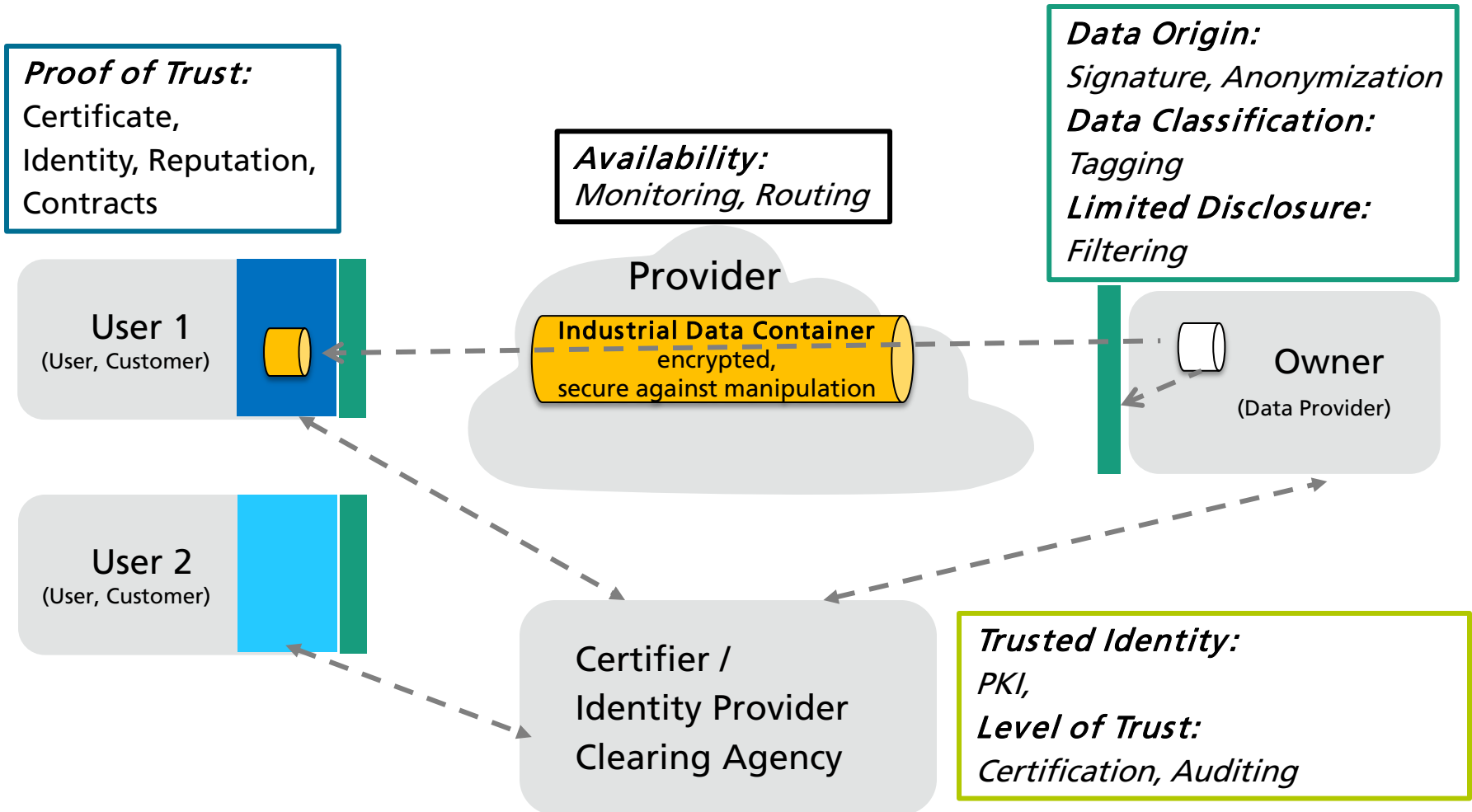
Sustainability, transparency of information, compliance at the push of a button etc.

Overview of the Components of the IDS



Industrial Data Container

Top Level Security Architecture



Use Cases of Industrial Data Space: Benefits and Strengths



- Linking data of **multiple data sources**
- Integration of **different data types**
(e.g. product data and environment data of production)
- Involvement of at least **two companies**
- Integration of more than two **levels of the enterprise architecture**
(e.g. »shop floor« and »office floor«)
- Foundation for **»Smart Services«**

Large Number of Use-Case-Candidates

**TRANSPARENCY IN THE
AUTOMOBILE LOGISTICS
CHAIN**

**TRACKING AND TRACING FOR
PHARMACEUTIC PRODUCTS**

**COASTER:
ASSISTANCE SYSTEM
FOR WORKERS**

»REAL-LIFE EVIDENCE«

**»SMART PRICING« IN
LOGISTICS**

**INTELLIGENT
CONTAINER**

**PREDICTIVE LOGISTICS FOR E-
COMMERCE**

**VISUALIZATION OF
SUPPLY NETWORKS**

**»COLLABORATIVE
PREDICTIVE MAINTENANCE«**

**INTELLIGENT TRUCK
LOGISTICS**

**SELF-CONTROLLING
LOADING AIDS**

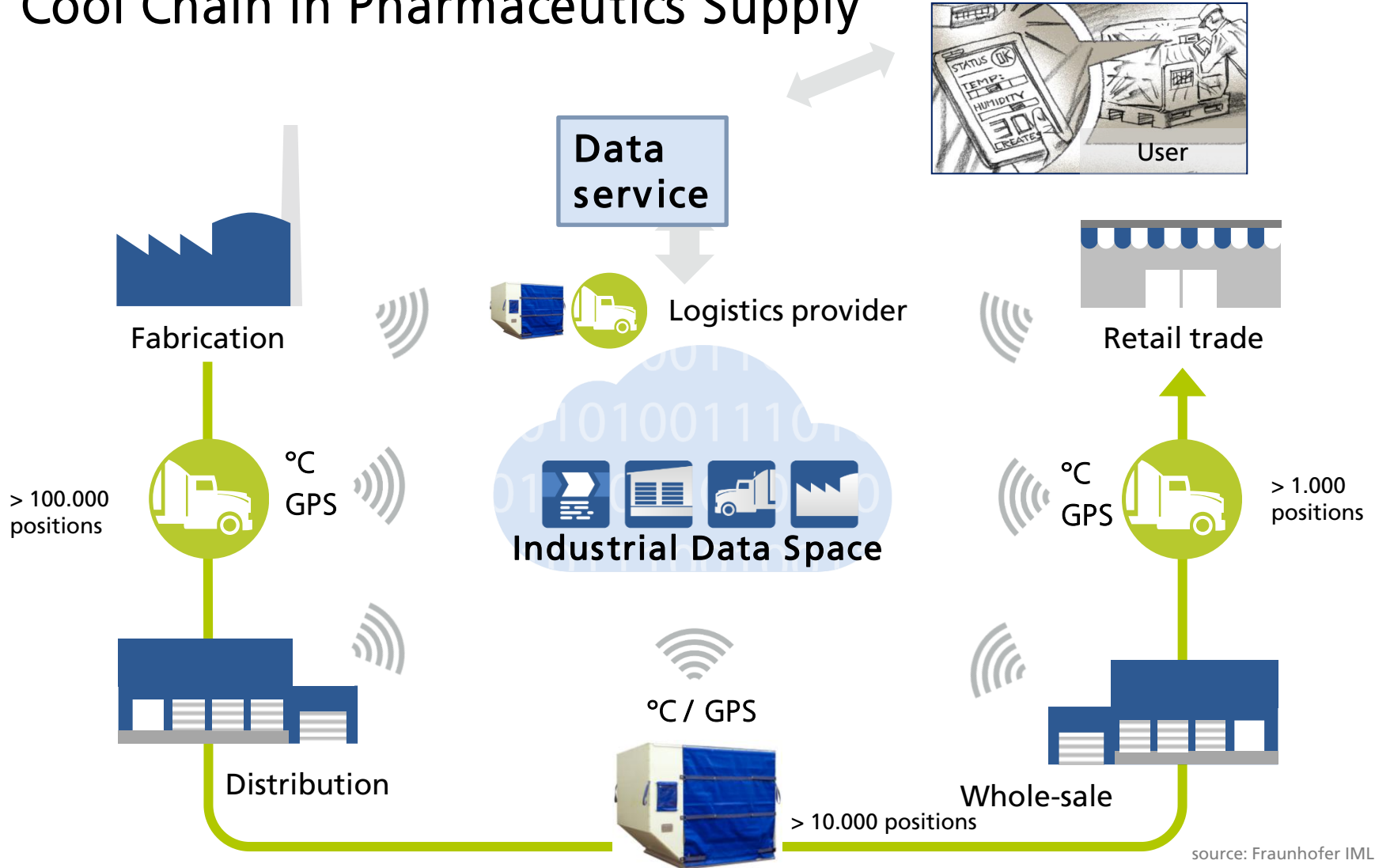
**»COMMUNITY
LOGISTICS«**

Industrial Data Space Application Example: Some Use Cases in Logistics



Application Partner	Use Case
AUDI AG	Transparency in supply network
DB Mobility Logistics AG / DB Schenker	Transparency in supply chain – reinforced structured / automatized exchange of information between all involved parties along the supply chain
KOMSA AG	From shipment to customer and consumer behaviour
REWE Systems	Autonomous transparency in the logistics chain
Robert Bosch GmbH	High performance supply chain – accumulation and exchange of relevant events along the supply chain
Robert Bosch GmbH	Luggage Control – support from traveling salesman
SICK AG	Coaster – Assistance system for workers
ThyssenKrupp AG	Transport logistics – Optimization of efficiency and observability of truck transport processes
ThyssenKrupp AG	Energy supply for flexible manufacturing plants
Wacker Chemie AG	Tracing of consignment of goods and alerting in case of deviation

Industrial Data Space Application Example: Cool Chain in Pharmaceuticals Supply



Industrial Data Space Application Example: Enables Logistics Chain of the Future

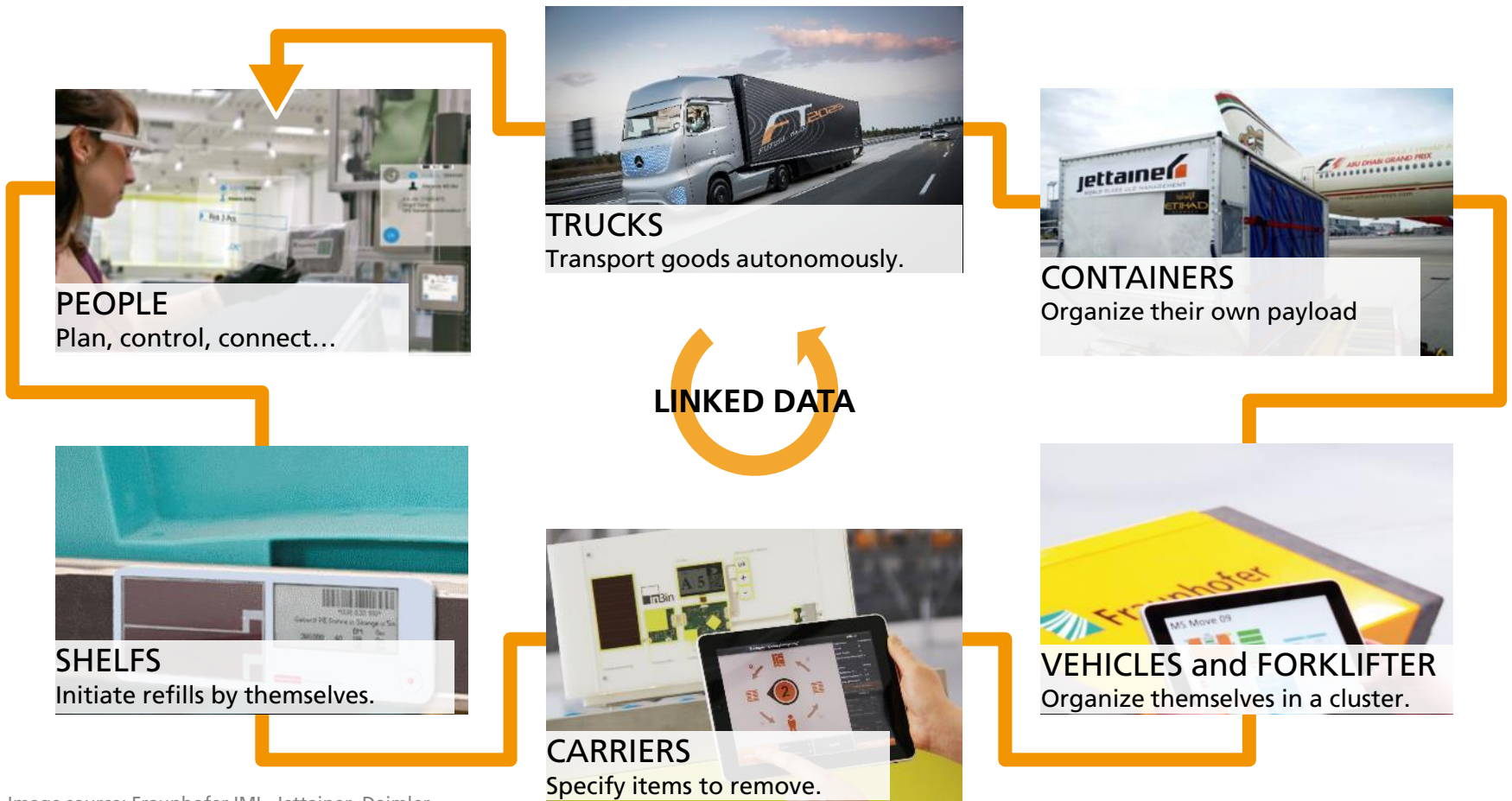


Image source: Fraunhofer IML, Jettainer, Daimler

Industrial Data Space Application Example: Enables new Services for Automobility

enabling new services for automobility



Image source: Istockphoto