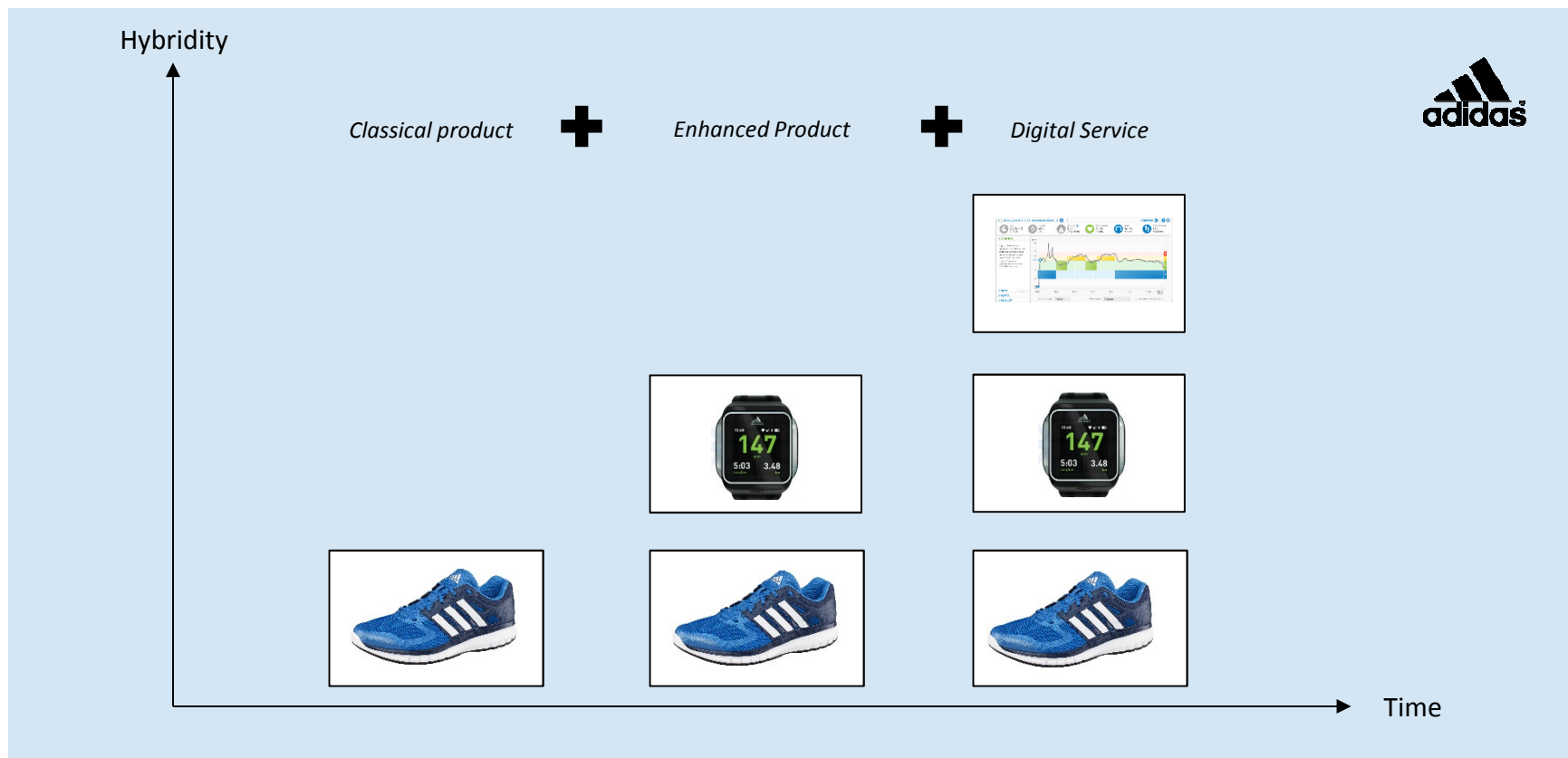# Data Quality Management in Data Exchange Platforms –
An Approach for the Industrial Data Space in Germany

CHRISTOPH QUIX
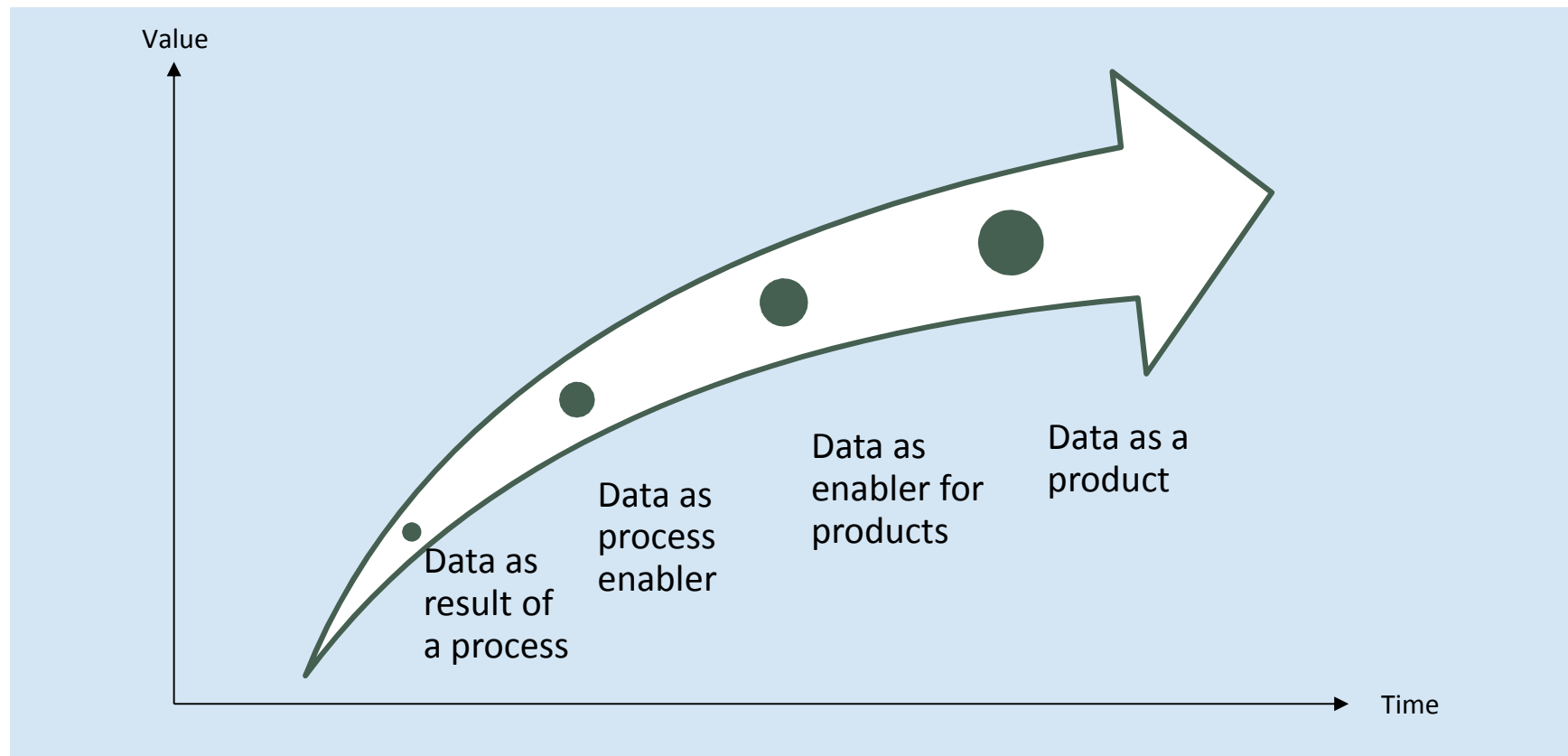
QDB WORKSHOP, SEPTEMBER 5, 2016

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Products are becoming hybrid: Integration of classical & digital services

Role of Data is Changing

Value

Data as a
product

Data as
enabler for
products

Data as
process
enabler

Data as
result of
a process
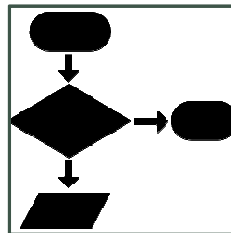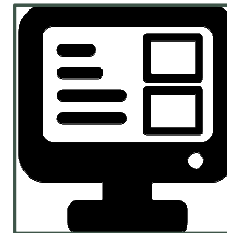
Time

Data Quality Definition

Product-oriented
- Based on features of the product

Application-oriented
- Fulfills requirements of users

Process-oriented
- Compliance of production process with specifications

Value-oriented
- Price-performance ratio

How to measure the value?

- What is the value of a product?
  - Costs of its production
  - Market value (negotiation, auction, …)
  - Usefulness / value of benefit for a specific business process
    - Which additional costs would occur if you do not have that product?

- Can this also be applied to data?
  - Data is a digital product, it can be copied easily

Data Items are Goods with a Value

Company	Service	Ctry	Data Type	Valuation	Value per Data item
Kroger	Super Markets	US	Customer profiles incl. Buying profile	Market value	1,6 EUR[1]
facebook	Social Network	US	User profiles	Market value	225 USD[2,3]
FESTO	Automation technology	DE	Parts master data	Production costs	500 to 5.000 EUR[4]
syngenta	Agro chemicals	CH	Parts master data	Value of benefit	184 CHF[5]

1) http://www.wsj.de/nachrichten/SB11446175161338053998704580212211843086060
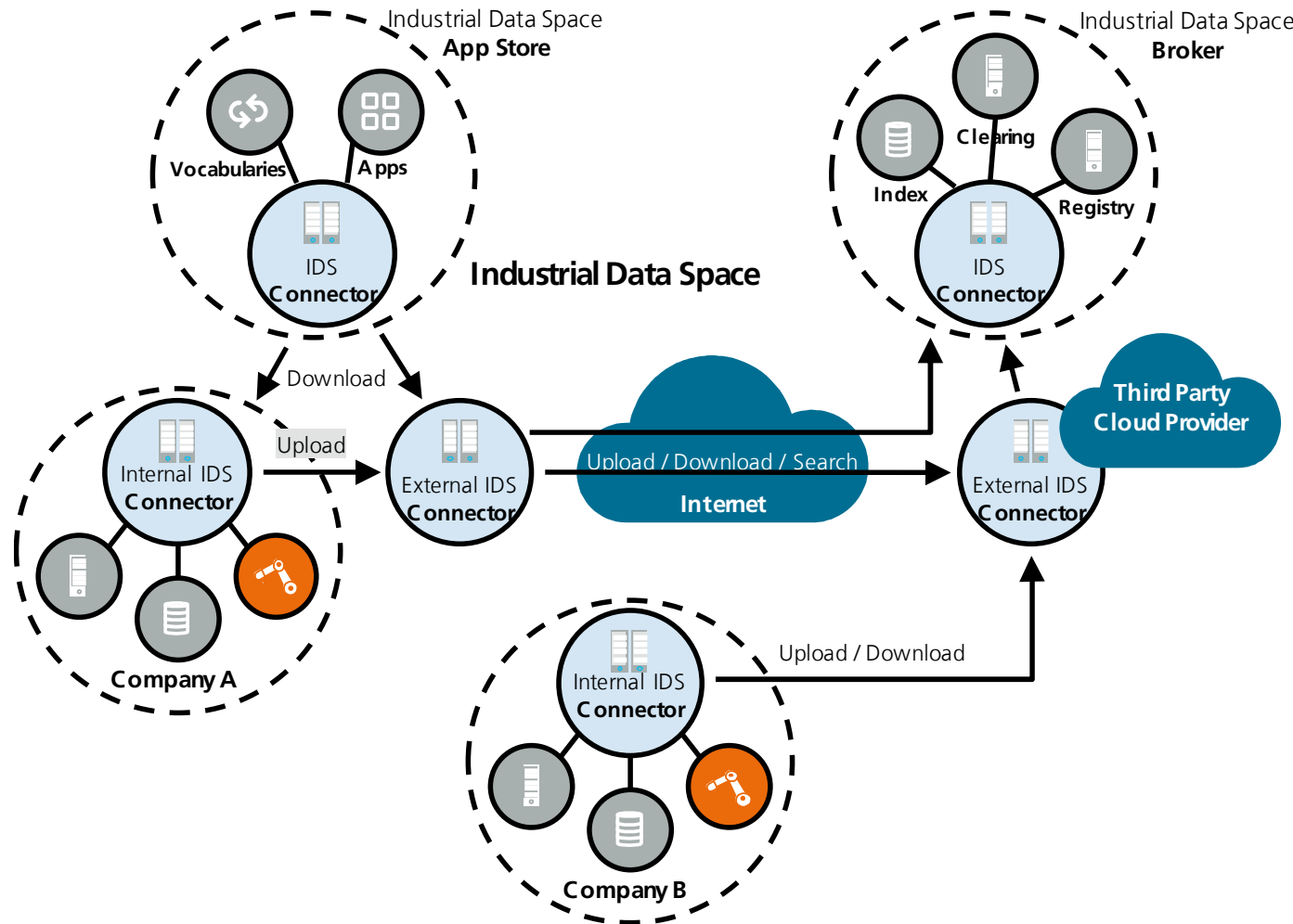2) http://en.wikipedia.org/wiki/Facebook; 890 million daily active users.
3) http://www.ft.com/cms/s/0/ecc0f050-37a3-11e4-bd0a-00144feabdc0.html#axzz3RH6OPOTH; Marktkapitalisierung von 200 Mrd. USD.
4) Vgl. Otto, Boris: Managing the business benefits of product data management: the case of Festo. In:Journal of Enterprise Information Management 25 (2012), Nr. 3, S. 272-297, DOI: 10.1108/17410391211224426; 5.000 EUR pro Neuanlage, 500 EUR jährliche Pflegekosten.
5) http://www.marketwatch.com/investing/stock/syt/financials (Abruf am 9.2.15); Umsatz: 13,85 Mrd. CHF; Zahl Materialstammdaten: ca. 1.5 Mio; Kostensenkungspotential durch hohe Datenqualität gemäß Experteninterview: 2 Umsatzprozent.

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Industrial Data Space – An Initiave in Germany

Key Features of the IDS

Decentralized
P2P Architecture

Sovereignity
Data as Goods

Trust
Certified Participants

Security
Data Exchange

Open
neutral and user driven

INDUSTRIAL
DATA SPACE

Governance
Collaborative Rules

Scalability
Network

Network
Platform and Services

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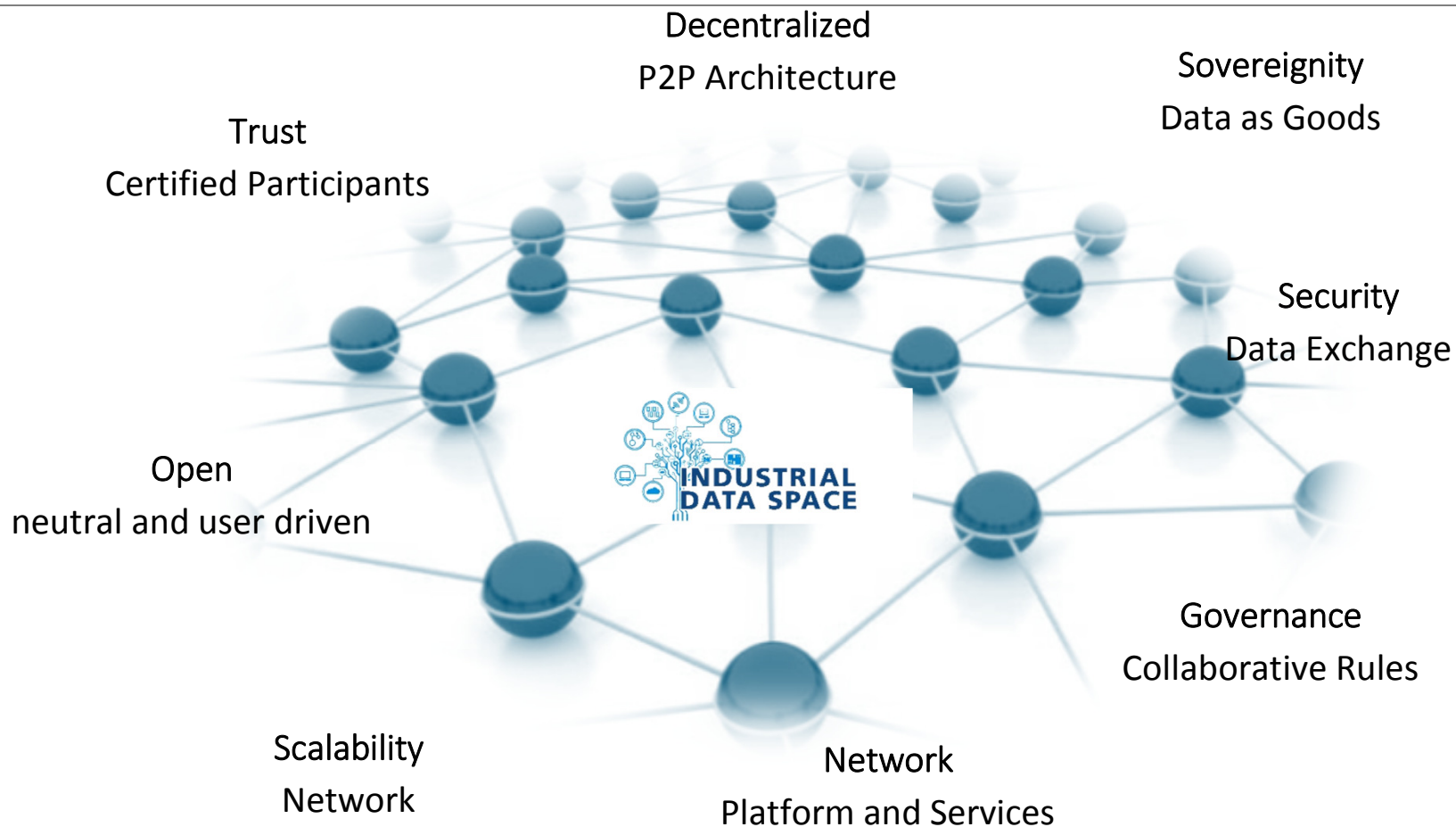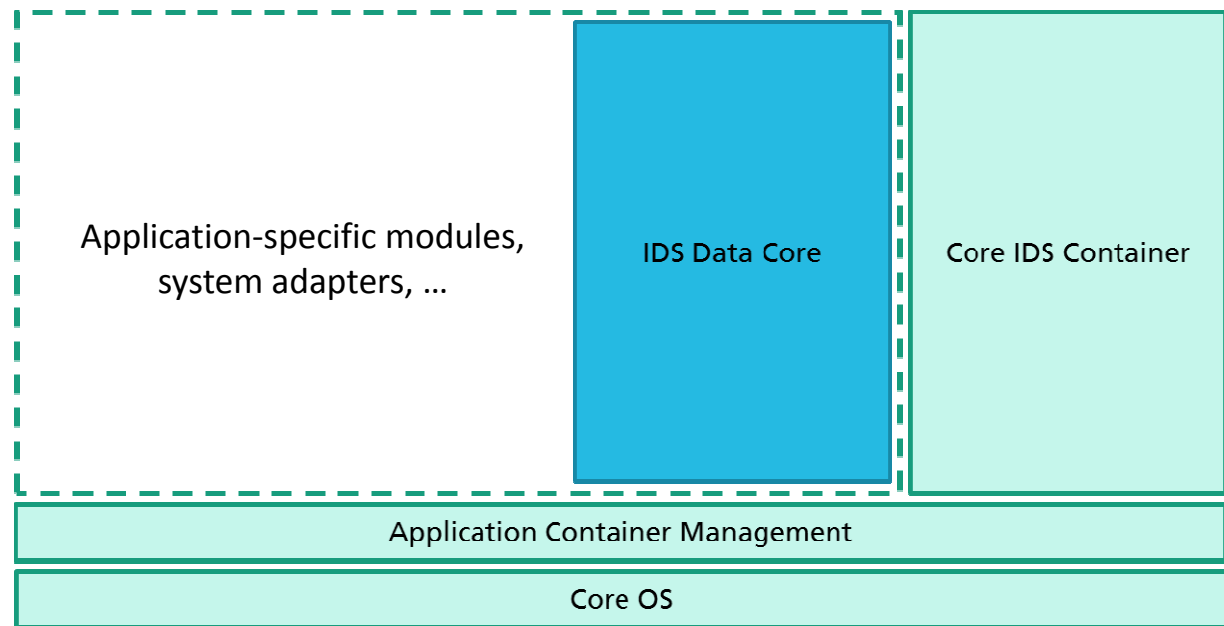
Technical Architecture of an IDS Connector

- Connectors provide a controlled environment for the basic functions and data exchange

- Control is guaranteed by a virtualization concept with specific security functions (application container technology, e.g., Docker)

- There are different levels of security

Application-specific modules, system adapters, …

IDS Data Core

Core IDS Container

Application Container Management

Core OS

Data Quality in the IDS

- Data is traded like a product

- Does it need quality control like for regular products?
  - Who will perform the quality checks?
    - Provider
    - Consumer
    - Some trusted third party

- Data quality control needs to be integrated into the data exchange process

- Quality of the process
  - Certification of software
    - Can only guarantee basic functionality, compliance with rules, but not the quality of the data management processes
  - Certification of participants

Conclusion

- Digital services are being integrated into classical products
  - Features of the classical product become less important

- Data is a product and has a value

- Industrial Data Space provides an infrastructure for data exchange in a secure environment with certified software and certified participants

- Challenges
  - Valuation of data
  - Data quality control
  - Value-oriented and quality-oriented data integration

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