MATES ED2MIT
Education and Training for Data Driven Maritime Industry

Tutorial DMG01

Industrial Data Spaces,
European Data Governance Policy
International Initiatives

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Data Management and Data Governance

Outline

- Industrial Data Spaces

- European Strategy on Data

  - European Data Governance – Data Governance Act

  - Digitalisation and Data Governance and Management in Horizon Europe 2021-2027 Programme

- IDSA Reference Architecture Model and Data Sovereignty

- Summary and Discussion

Trends and Predictions for 2021+

- By 2023 data literacy will be formal included into all strategies
- By 2022 companies will start formally/monetary assessing the value of their information assets
- CDO role will strengthen, CDO will guide decision makers on effective use of data
-

- The European data space will give businesses in the EU the possibility to build on the scale of the Single market. Common European rules and efficient enforcement mechanisms should ensure that:
  - Data can flow within the EU and across sectors;
  - European rules and values, in particular personal data protection, consumer protection legislation and competition law, are fully respected;
  - Rules for access to and use of data are fair, practical and clear, and there are clear and trustworthy data governance mechanisms in place; there is an open, but assertive approach to international data flows, based on European values.

European Data Governance

The economic value of data sharing

◆ Data access and reuse can generate **social and economic benefits of 1% to 2.5%** of GDP[1].

◆ The new measures could **increase the annual economic value** of data sharing by up to €7-11 billion by 2028[2].

◆ In addition, the new rules will have a **wider impact on the EU economy and society** as a whole:

€ **1.3 trillion** in increased productivity in **manufacturing** through **Internet-of-Things data** by 2027[3]

€ **120 billion** of savings per year in the **EU health sector**[4]

The EU will boost the development of **trustworthy data-sharing systems**:

◆ Empower **Europeans** to decide what happens to their data, and what data they would like to share with whom.

◆ Facilitate **data altruism** to make it easier and safer for companies and individuals to voluntarily make their data available for the benefit of society.

◆ Enhance the **reuse** of public sector data that cannot be made available as open data.

◆ Create **new EU rules on neutrality** to allow novel data intermediaries to function as trustworthy organisers of data sharing.

◆ Set up a **European Data Innovation Board** to steer data governance and prioritise standards.
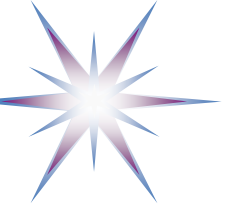
Regulation on European Data Governance (Data Governance Act)

- EU/Parlament Regulation on European data governance (Data Governance Act) SEC(2020) 405 final, Nov 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0767
    - 'data' means any digital representation of acts, facts or information and any compilation of such acts, facts or information, including in the form of sound, visual or audiovisual recording;
- The regulation will also support the set-up and development of common European data spaces in strategic domains, involving both private and public players: health, environment, energy, agriculture, mobility, finance, manufacturing, public administration and skills.
- Facilitate Sharing and Re-use of Data
    - new way of data governance will increase trust in data sharing, strengthen mechanisms to increase data availability and overcome technical obstacles to the reuse of data.

Goal: European Data Governance

- Making public sector data available for re-use, in situations where such data is subject to rights of others.
  - "Data the use of which is dependent on the rights of others" or "data subject to the rights of others" covers data that might be subject to data protection legislation, intellectual property, or contain trade secrets or other commercially sensitive information.
- Sharing of data among businesses, against remuneration in any form.
- Allowing personal data to be used with the help of a 'personal data-sharing intermediary', designed to help individuals exercise their rights under the General Data Protection Regulation (GDPR).
- Allowing data use on altruistic grounds.

European Data Governance – Covered Aspects

- **General aspects**
  - (a) conditions for the re-use, within the Union, of certain categories of data held by public sector bodies;
  - (b) a notification and supervisory framework for the provision of data sharing services;
  - (c) a framework for voluntary registration of entities which collect and process data made available for altruistic purposes.

- **Re-use of certain categories of protected data held by public sector bodies which are protected on grounds of:**
  - (a) commercial confidentiality ;
  - (b) statistical confidentiality;
  - (c) protection of intellectual property rights of third parties;
  - (d) protection of personal data.

- **Requirements to data sharing services and providers**

- **Data Altruism and organisations**

European Data Space

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Key actions

- Propose a legislative framework for the governance of common European data spaces, Q4 2020

- Adopt an implementing act on high-value data-sets, Q1 2021

- Propose, as appropriate, a Data Act, 2021

- Analysis of the importance of data in the digital economy (e.g. through the Observatory of the Online Platform Economy), and review of the existing policy framework in the context of the Digital Services Act package (Q4 2020).
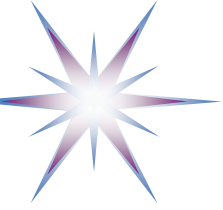
Annex 7. Horizon Europe. Work Programme 2021-2022

- DESTINATION 1 – CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION
Call - TWIN GREEN AND DIGITAL TRANSITION 2021

- DESTINATION 2 – INCREASED AUTONOMY IN KEY STRATEGIC VALUE CHAINS FOR RESILIENT INDUSTRY
Call - A DIGITISED, RESOURCE-EFFICIENT AND RESILIENT INDUSTRY 2021

- DESTINATION 3 – WORLD LEADING DATA AND COMPUTING TECHNOLOGIES 169

- DESTINATION 4 – DIGITAL AND EMERGING TECHNOLOGIES FOR COMPETITIVENESS AND FIT FOR THE GREEN DEAL 187

- DESTINATION 5 – OPEN STRATEGIC AUTONOMY IN DEVELOPING, DEPLOYING AND USING GLOBAL SPACE-BASED INFRASTRUCTURES, SERVICES, APPLICATIONS AND DATA
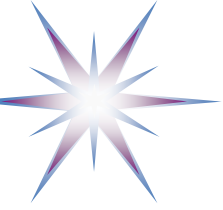
- DESTINATION 6 – A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES

DESTINATION 3 – WORLD LEADING DATA AND COMPUTING TECHNOLOGIES

- Call - WORLD LEADING DATA AND COMPUTING TECHNOLOGIES 2021

- Data sharing in the common European data spaces

- Technologies and solutions for compliance, privacy preservation, green and responsible data operations (RIA)

- **Technologies for data management (IA)**

- Strengthening Europe's data analytics capacity

- Extreme data mining, aggregation and analytics technologies and solutions (RIA)

- From Cloud to Edge to IoT for European Data

- Future European platforms for the Edge: Meta Operating Systems (RIA)

DESTINATION 6 – A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF DIGITAL AND INDUSTRIAL TECHNOLOGIES

- Leadership in AI based on trust
- Verifiable robustness, energy efficiency and transparency for Trustworthy AI: Scientific excellence boosting industrial competitiveness (RIA)
- AI to fight disinformation (RIA)
- An Internet of Trust
- Trust & data sovereignty on the Internet (RIA)
- HORIZON-CL4-2021-Trustworthy open search and discovery (RIA)
- NGI International Collaboration - Transatlantic fellowship programme (CSA)
- eXtended Reality Modelling (RIA)
- Piloting a new industry-academy knowledge exchange focussing on companies' needs (CSA)
- **Workforce skills for industry 5.0 (RIA)**

Industrial Data Spaces and Industry 4.0

- Data monetization and data exchanges today are hot topics on many levels, among others in the Internet of Things. Vendors are looking for <u>IoT data</u> monetization models.
- Data needs to be gathered, combined and shared for particular purposes, among others leveraging advanced analytics and in data-intensive circumstances also leveraging artificial intelligence.
  - Finally, all this data needs to be turned into actionable intelligence, (semi-)automated actions and ideally, *the essence of digital transformation*, into new services, platforms and revenue streams
- Industrial data exchanges for innovation
  - The exchange and sharing of data *(or access to it)* is key for innovation and transformation at scale and in the more mature stages of digital transformation.
- <u>IoT data ecosystem</u> for ecosystem-driven IoT data monetization for IoT device manufacturers and service providers and tackled how IoT data exchanges are the next IoT revolution.
- Probable data sovereignty, control and data security
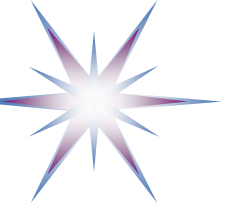
European Data Space – Key Infrastructure Actions for Cloud

- Invest **in a High Impact project on European data spaces**, encompassing data sharing architectures (including standards for data sharing, best practices, tools) and governance mechanisms, as well as the European federation of energy-efficient and trustworthy cloud infrastructures and related services, with a view to facilitating combined investments of €4-6 billion, of which the Commission could aim at investing €2 billion. \
  - First implementation phase foreseen for 2022;
- Sign Memoranda of Understanding with Member States on cloud federation, Q3 2020;
- Launch a European cloud services marketplace, integrating the full stack of cloud service offering, Q4 2022;
- Create an EU (self-)regulatory cloud rulebook, Q2 2022.

- International Data Spaces Association (IDSA) and Industrial Data Spaces Initiative

Industrial Data Spaces: Sharing Data

- Sharing and Sovereignty are key to make value of data

- Data Sovereignty achieved by attaching policy and usage conditions to data

- Enabling regulated environment for data processing
  - Enclave computing in modern cloud technology
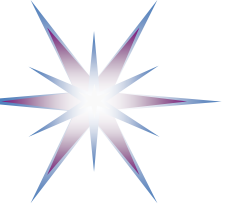
International Data Spaces Association (IDSA)
https://www.internationaldataspaces.org/
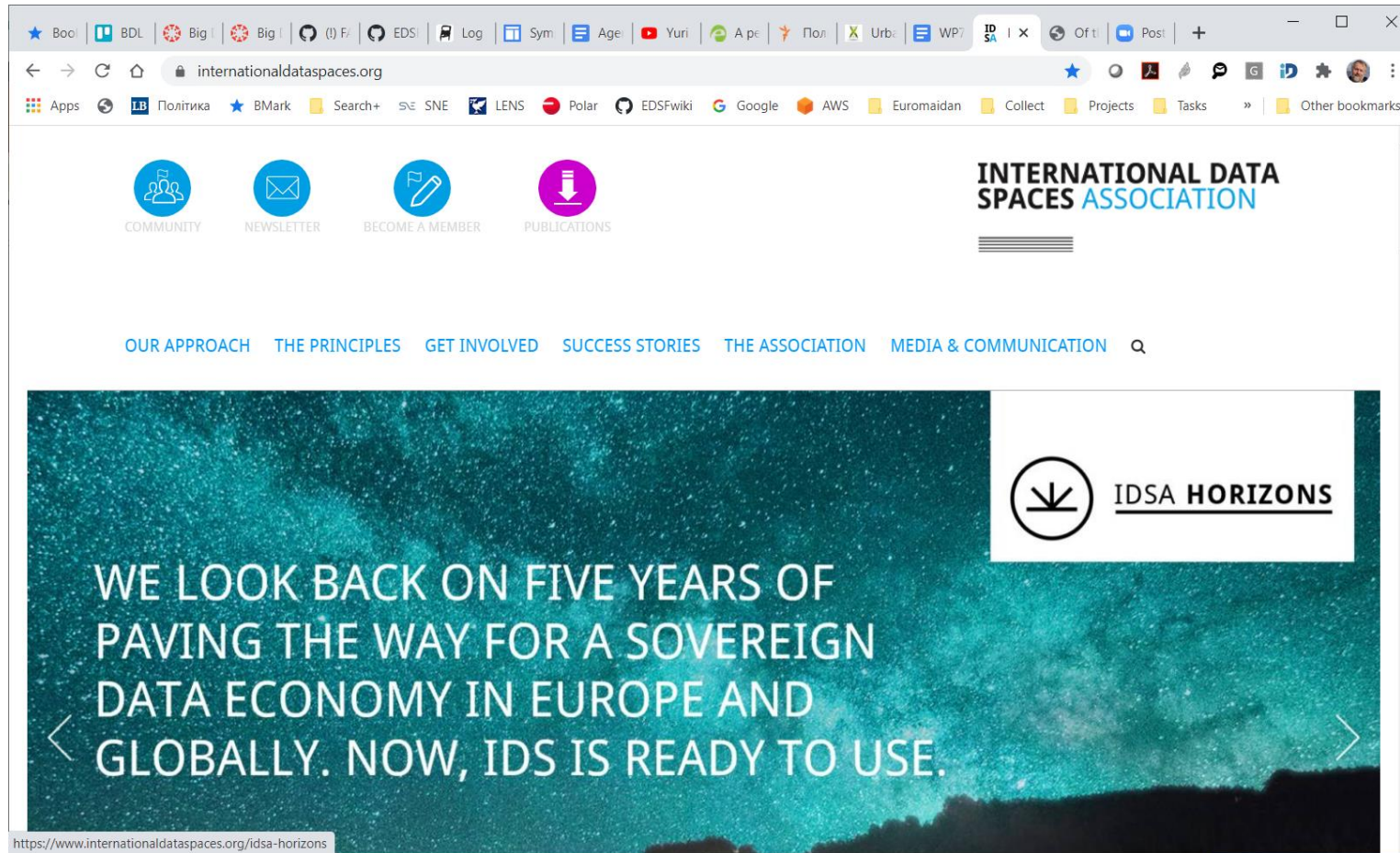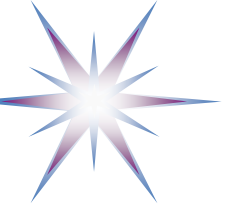
- Industry focused
- IDSA Reference Architecture Model (RAM3.0)
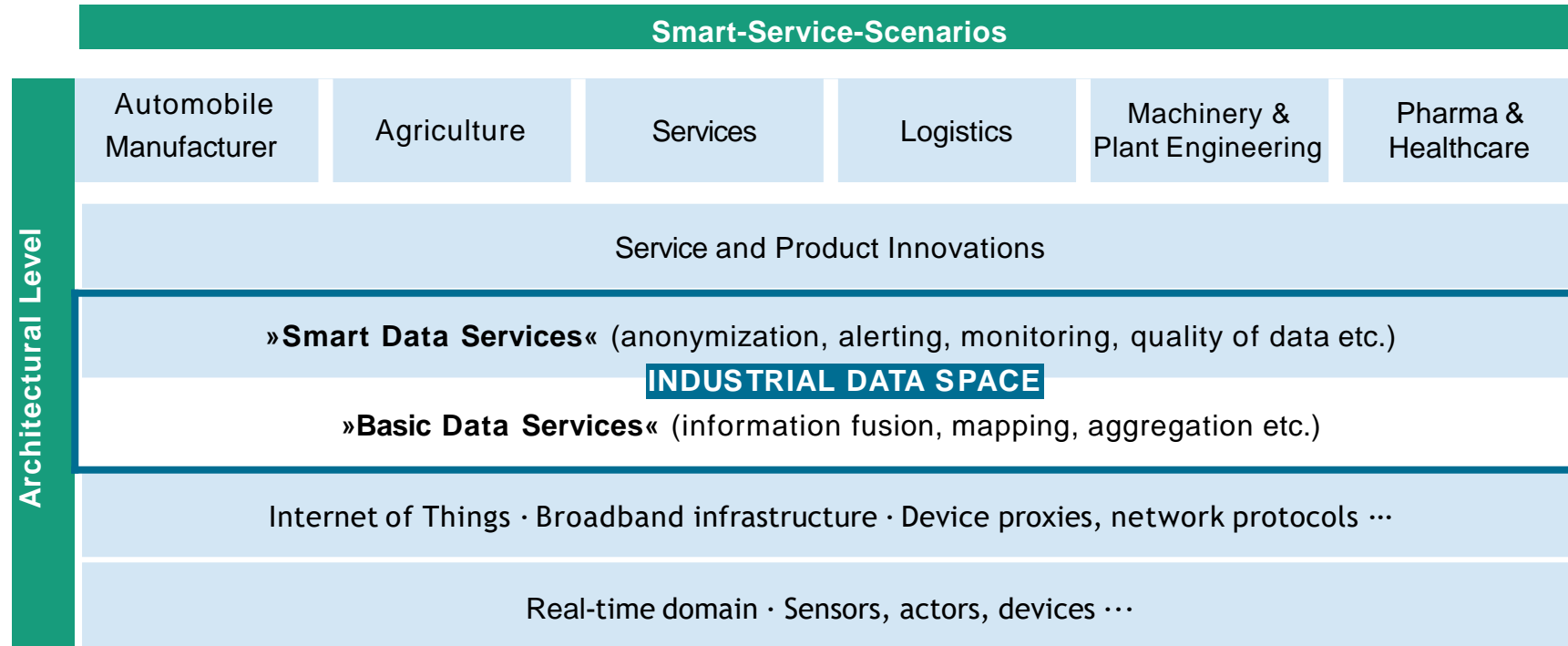
- Key Issue is Data **Sovereignty**

- More than 120 members

International Data Space Association

- Started 2016 as Industrial Data Space initiative (supported by German project)
- Re-defined as International Data Space Association (IDSA)
  - Published International Data Space Architecture Version 2.0 (2018)
  - Whitepaper and use cases
- Associated H2020 projects
  - MIDIH – Manufacturing Industry Digital Innovation Hub (22 partners, 12 countries)
    - Services: technological, business, skills building
    - Open calls
  - Boost4.0 – Big Data for Factories in Automotive Industry (20 Mln (100 Mln private), 3yrs, 50 partners, 16 countries)
  - Close cooperation with FIWARE Foundation (cloud like infrastructure resulted from Future Internet program)
    - Positions itself against IoT and Open-Data solutions in the areas of smart cities, Industry 4.0 and agriculture
- Ongoing active outreach campaign
  - Appearance at FIWARE Global Summit 8-9 May 2018 in Porto
  - Serial of webinars in Sept – Oct 2018

Data Management and Data Governance

Industrial Data Space: Linking Data and Smart Services

Smart-Service-Scenarios					
Automobile Manufacturer	Agriculture	Services	Logistics	Machinery & Plant Engineering	Pharma & Healthcare

Architectural Level

Service and Product Innovations

»Smart Data Services« (anonymization, alerting, monitoring, quality of data etc.)

INDUSTRIAL DATA SPACE

»Basic Data Services« (information fusion, mapping, aggregation etc.)

Internet of Things · Broadband infrastructure · Device proxies, network protocols ···

Real-time domain · Sensors, actors, devices ···

- IDS/IDSA slides courtesy Prof. Dr.-Ing. Boris Otto, Fraunhofer ISST, Industrial Data Space Association, and Prof. Dr. Jan Jürjens Fraunhofer, ISST, University Koblenz-Landau

Industrial Data Space: Core Principles

Decentralised
Federated architecture

Sovereignty
of data and services

Protection of Confidence
Certificated participants

Security
Data exchange

Openness
Neutral and user driven

Governance
Collaborative rules

Scaling
effects on networks

Network
Platforms and services
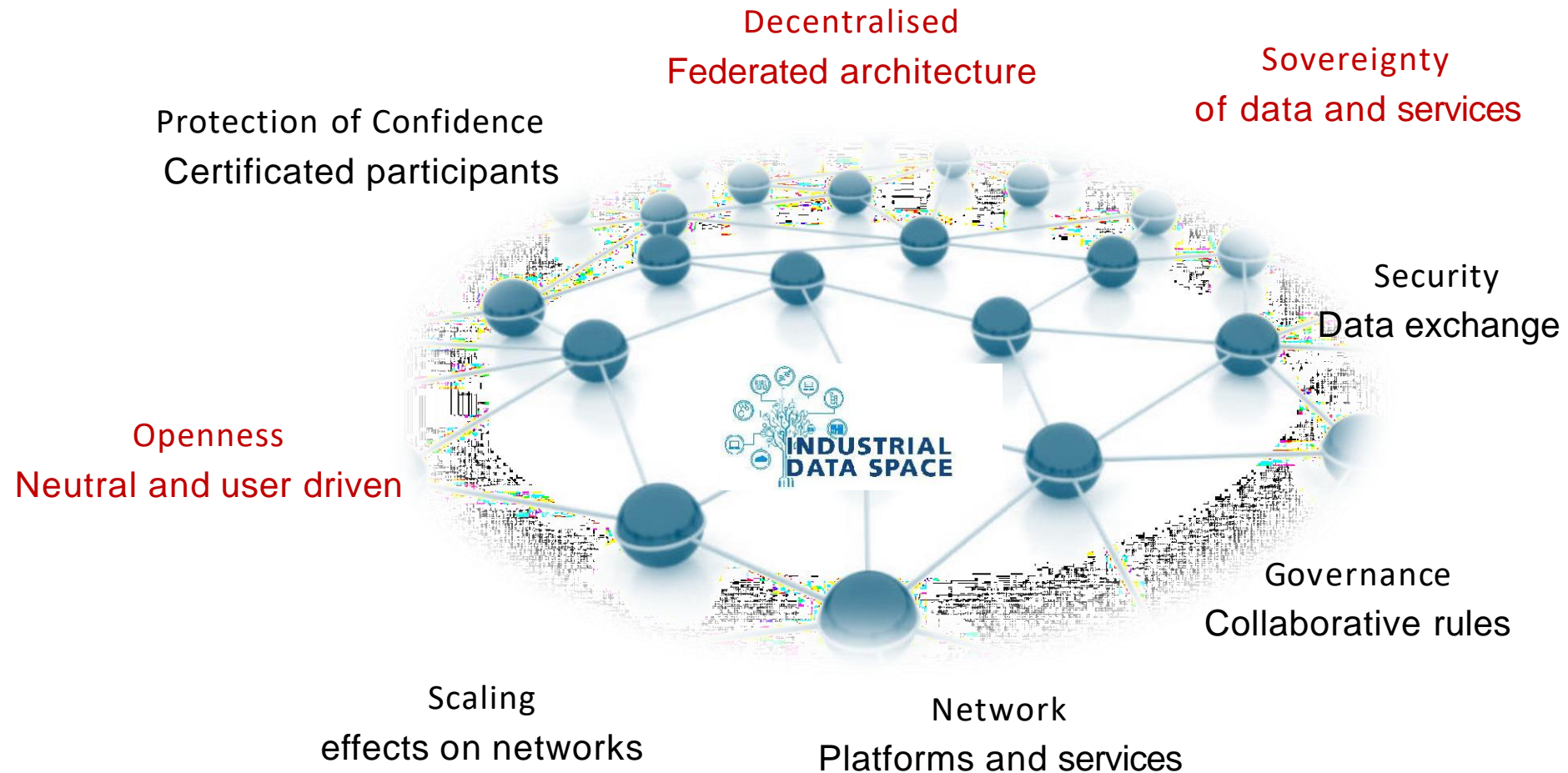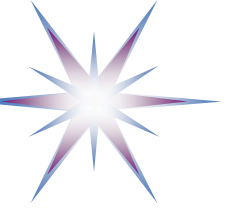
Central: Role of Data is Changing

Value

Data as a
result of
processes

Data as an
enabler of
processes

Data as an
enabler of
products

Data as a
product

Time
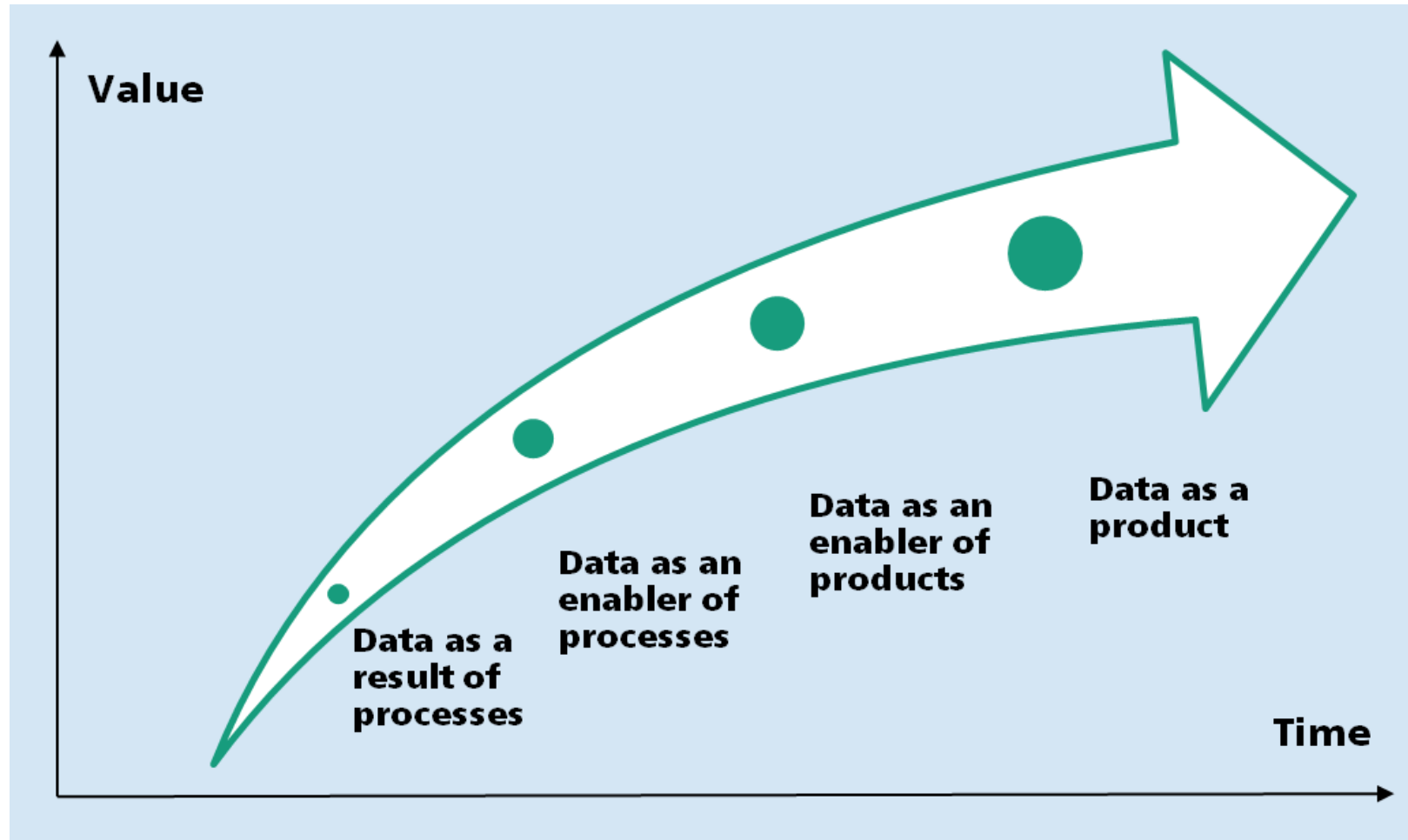
In the "Smart Service Welt" data is a key resource for business model innovation
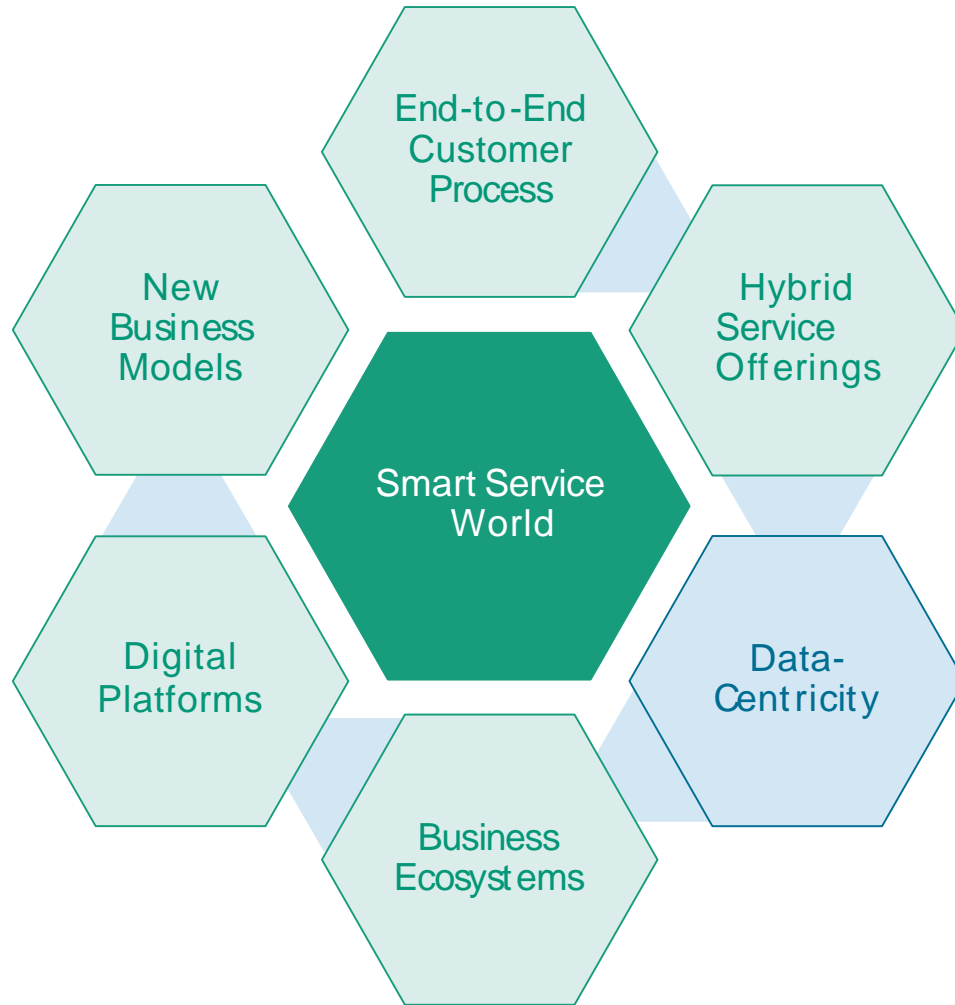
- End-to-End Customer Process
- Hybrid Services Offerings
- Data Centricity
- Business ecosystem
- Digital Platform
- New Business Model
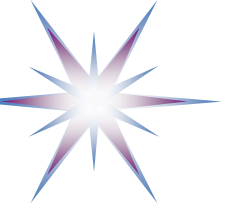
Industry articulated requirements for a networked of trusted data, the Industrial Data Space
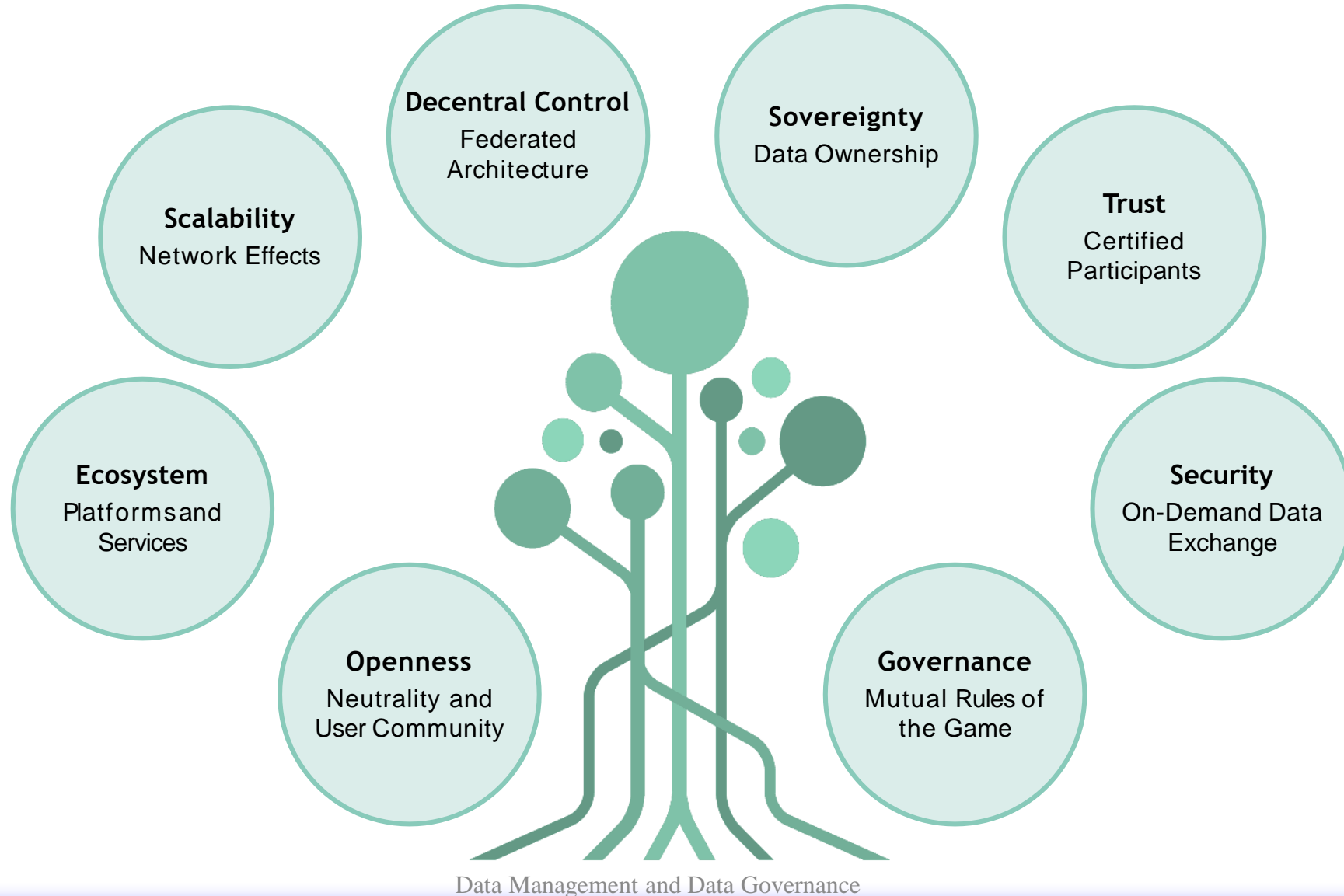
In the extended enterprise, data must be managed in a consistent way
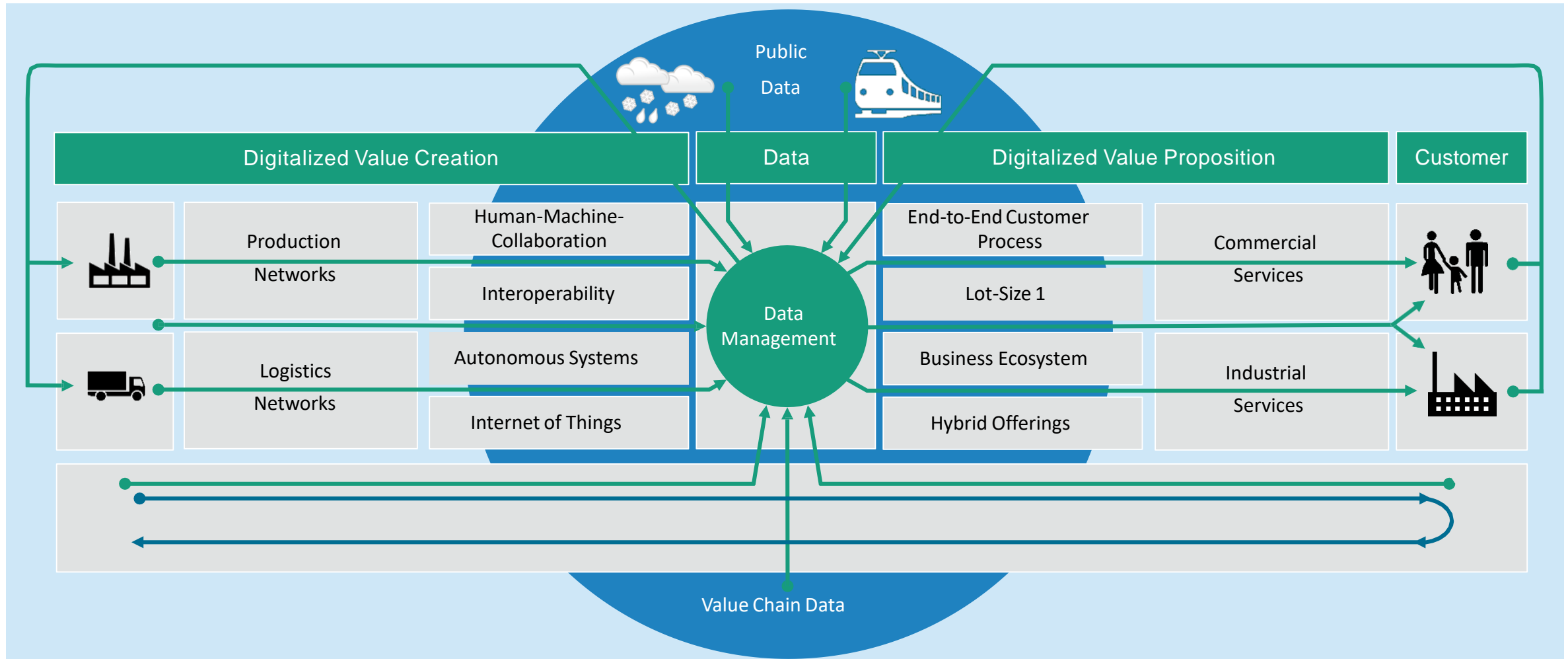
Slides courtesy Jan Jurjens

Data sharing is a key prerequisite for successful business ecosystems

Data Sharing

	Material Sciences	Sharing of material information along the entire product life cycle
	Energy	Shared use of process data for predictive asset maintenance
	Manufacturing and Logistics	Sharing of master and event data along the entire supply chain
	Healthcare	Anonymized, shared data pool for better drug development
	»Smart Cities«	Shared use of data for end-to-end consumer services

IDSA Use case: Marine Data

Involve partners

- DNV-GL
- EMSA – European Maritime Safety Agency
- SINTEF Digital
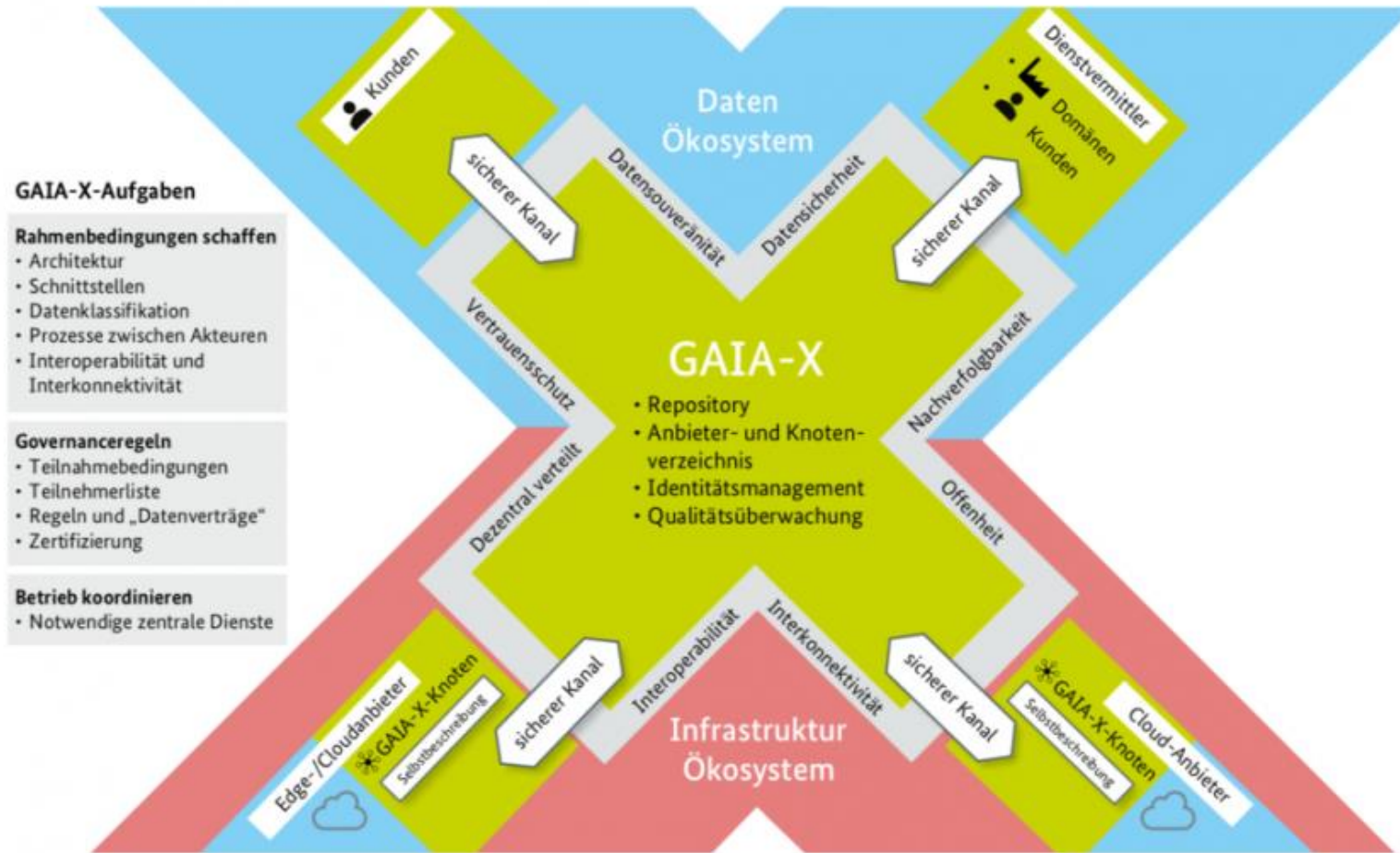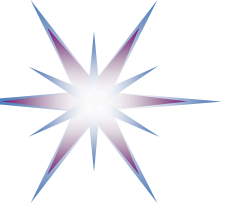- Use case 1: MRV – Monitoring, Reporting, Verification

GAIA-X – A Federated Data Infrastructure for Europe

Quelle: BMWi

- GAIA-X – A Federated Data Infrastructure for Europe
- Currently cooperative initiative by Germany, France, Netherlands and 22 companies
- Accepts IDSA Data Sovereignty Model
- Very interested in EOSC and BDVA experience

Discussion and Questions

- Importance of Data Governance at policy level and organisational level

- Industrial Data Spaces Initiative - Strong Industry support and on way to standardisation

- GAIA-X Initiative: A Federated Data Infrastructure for Europe

Acknowledgement

- This work is supported by the ERASMUS+ MATES project
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