

# Lithuanian-German Workshop on GAIA-X



... we will give some time for others to join, in the meantime...



Please mute yourself when not speaking



Please enter your last name organisation & country (DEU or LTU) when logging in



Please deactivate your video, unless you present slides



For questions or responses, please indicate these in the chat feature



Please always state who you are when you are speaking



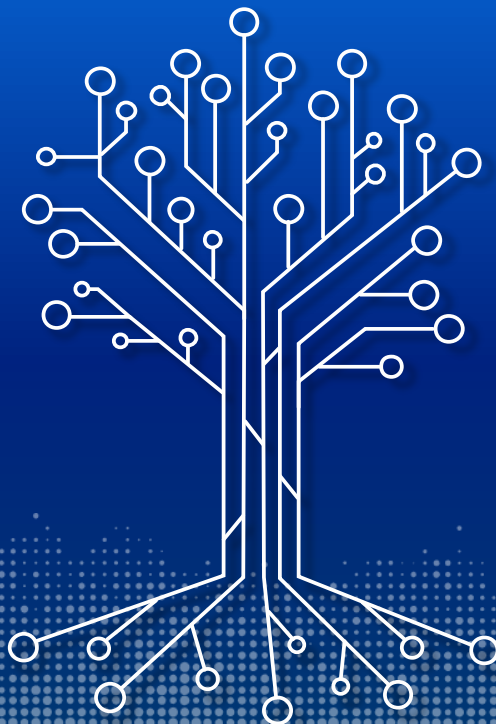
GAIA-X

# GAIA-X

A federated European data infrastructure

**Lithuanian-German Workshop**

2 September 2020



# Agenda

**01** Opening Remarks, Welcome and Introduction of Participants

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**02** Introduction to GAIA-X & why do we need it?

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**03** The users' perspective: Use cases and requirements

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**04** The providers' perspective: Technological view

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**05** Complementarity between GAIA-X and other initiatives

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**06** Participation: How to become part of GAIA-X

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**07** Wrap-up

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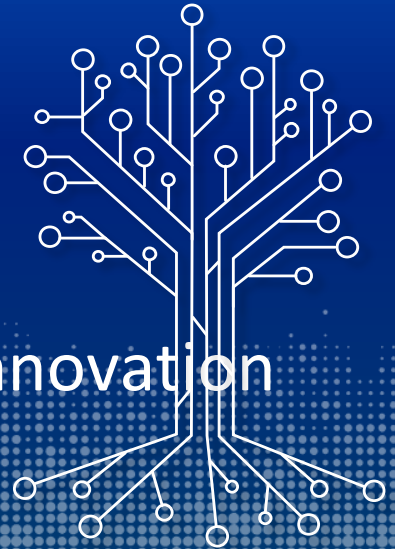


GAIA-X

# Welcome and introduction of participants

Mr. Stöckl-Pukall, Head of Unit  
Digitalisation and Industry 4.0, BMWi

Mr. Cijūnaitis, Director of Digital Agenda  
Department, Ministry of Economy and Innovation



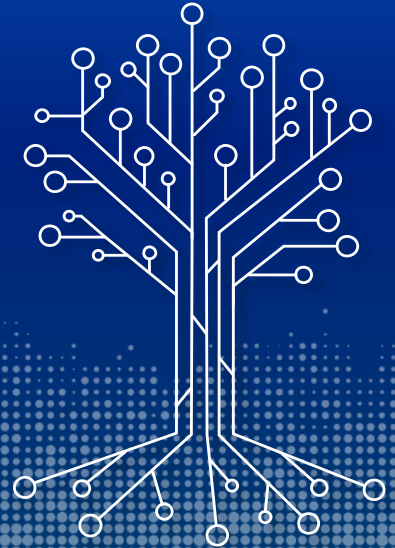


GAIA-X

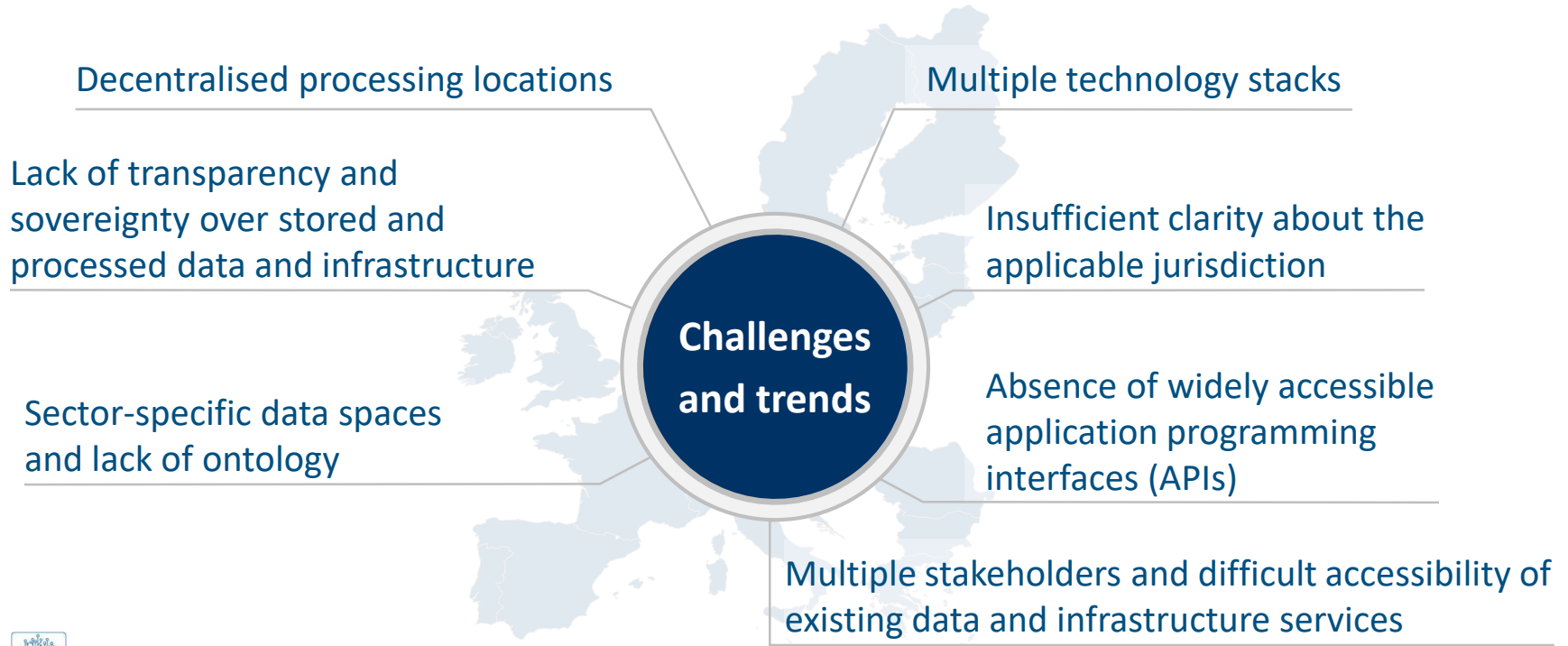
# Introduction

+ General overview

Mr. Stöckl-Pukall, BMWi



# GAIA-X is motivated by challenges to the European digital economy



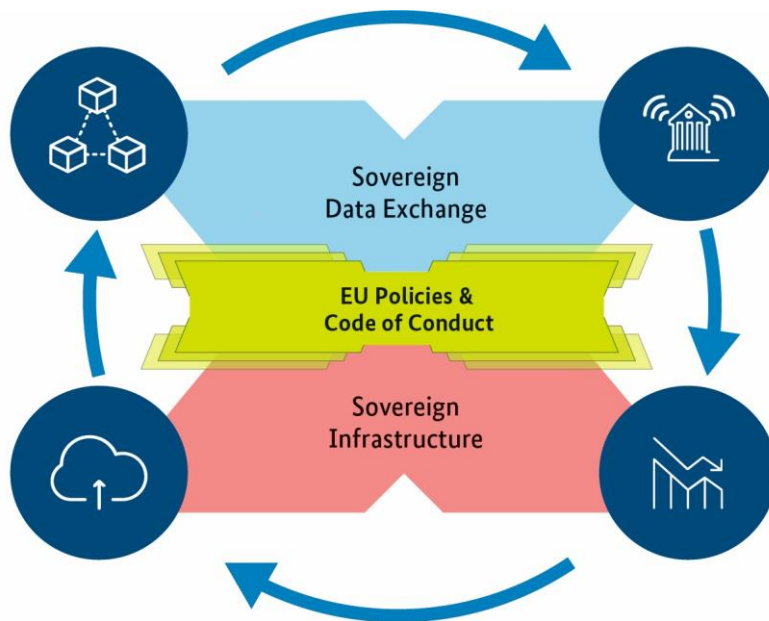
# GAIA-X aims at building a trusted, sovereign digital infrastructure for Europe

## Creation of digital infrastructures and an ecosystem for innovation

Trusted environment between partners and interoperable links between smart service applications and infrastructure services.

## Increasing transparency and attractiveness of digital services

Reduce barriers to compliant service usage; enable the development of new services and products.



## Data sovereignty

Strengthen the digital sovereignty of business, science, government and society.

## Reduction of dependencies

Reduce private and business consumers' dependency of single providers; control over location and regulatory environment of stored data; reduce sector-specific dependencies.

# GAIA-X is a genuinely European project



## European Data Strategy

- GAIA-X is mentioned explicitly in the European Data Strategy and proactively addresses key issues including security, quality of service, data protection and portability as well as energy efficiency.
- Exchange between GAIA-X and the European Commission to identify synergies between GAIA-X and initiatives and programmes such as the European Cloud Federation, CEF 2 and Digital Europe.



## Franco-German cooperation

- GAIA-X has been developed as a Franco-German cooperation of relevant ministries and participating companies.



## Further member states

- Various other member states have been involved in the development of GAIA-X, the aim is now to further Europeanise the project.



# A strong alliance of companies and organisations has joined GAIA-X



**500+** participants from **ca. 300** companies and organisations



**3 out of 4** organisations are private companies, **about half** of which are SMEs\*



Organisations from different industries, such as Mobility, Energy, Manufacturing, Finance etc.



Large companies



SMEs



Start-ups



Universities



R&D



Associations



Public Sector



\*SME <500 employees

# The “GAIA-X Foundation“ will carry out key tasks in the build-up and operation of GAIA-X

Design principles and ecosystem:

Profit

Data Ecosystems

Users

Providers

Start-ups

Companies

...

industrial green deal mobility financial energy agriculture

Non-Profit

## “GAIA-X Foundation“ – International European non-profit association

- Development of a governance framework
- Definition of core concepts and architectures
- Defining a strategic research, innovation and deployment agenda
- Providing repository (e.g. certified service providers)
- Definition and assurance of quality standards and certification standards
- ...

Partners

HPC

IoT

Security

INTERNATIONAL DATA SPACES ASSOCIATION

CISPE

BDV

BIG DATA VALUE ASSOCIATION

INDUSTRIE4.0

Regional Initiatives

European Data Spaces

Hubs

Open Source

...

Infrastructure Ecosystem

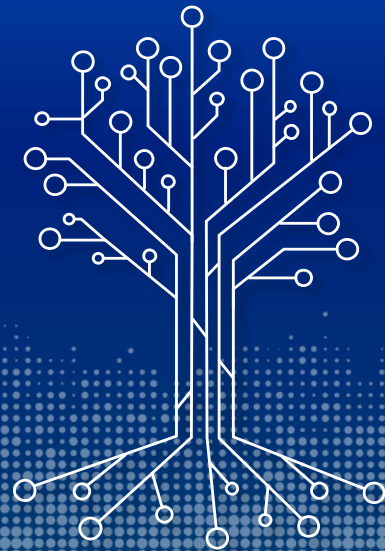




GAIA-X

# Introduction

+ Q&A

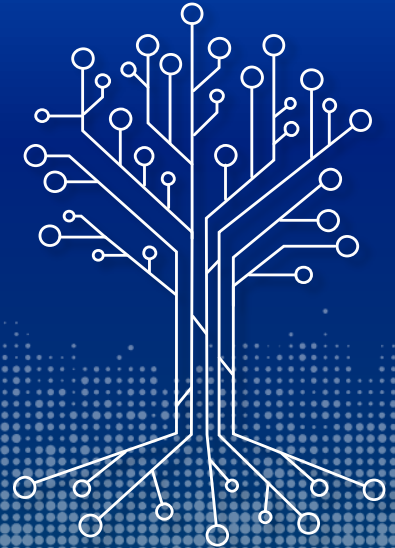




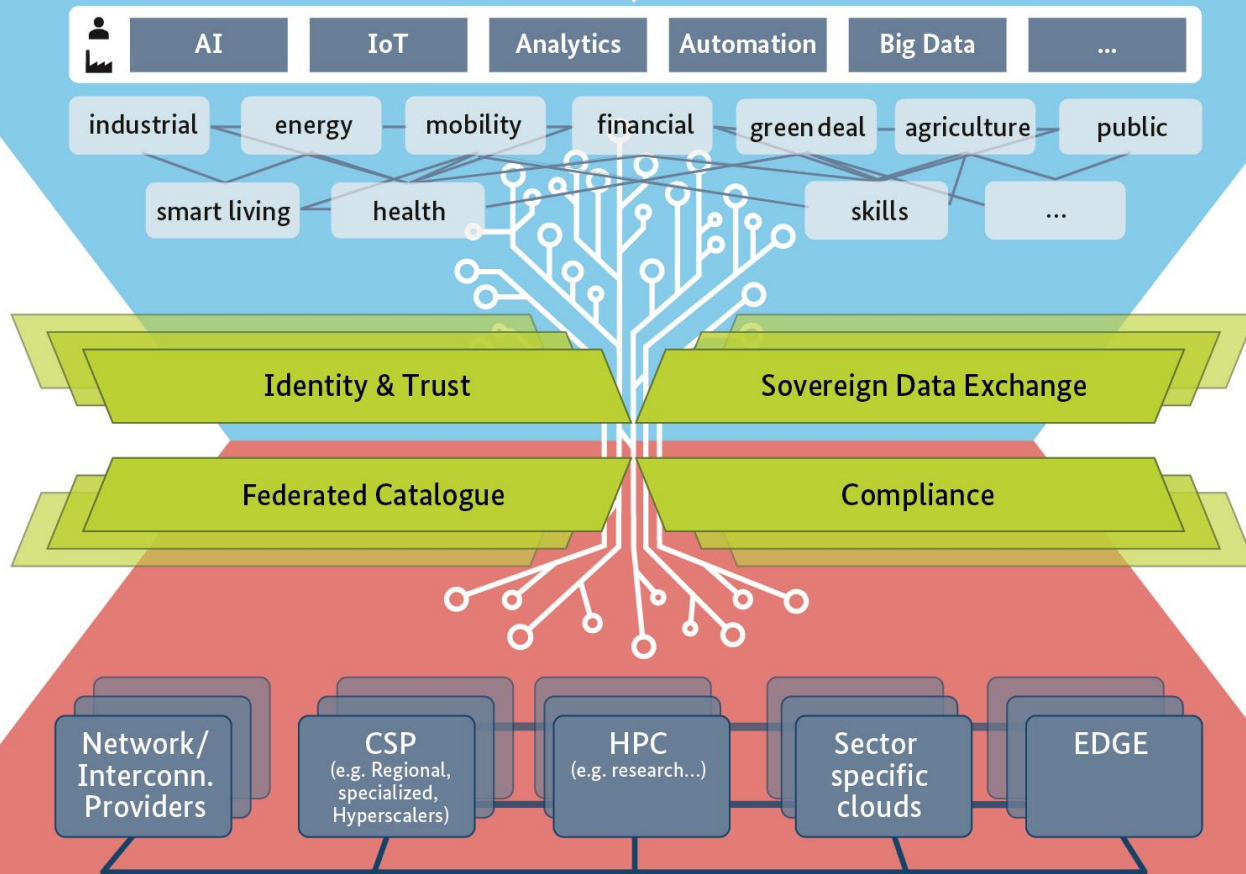
GAIA-X

# The user perspective

Mr. Niessen, Trusted Cloud

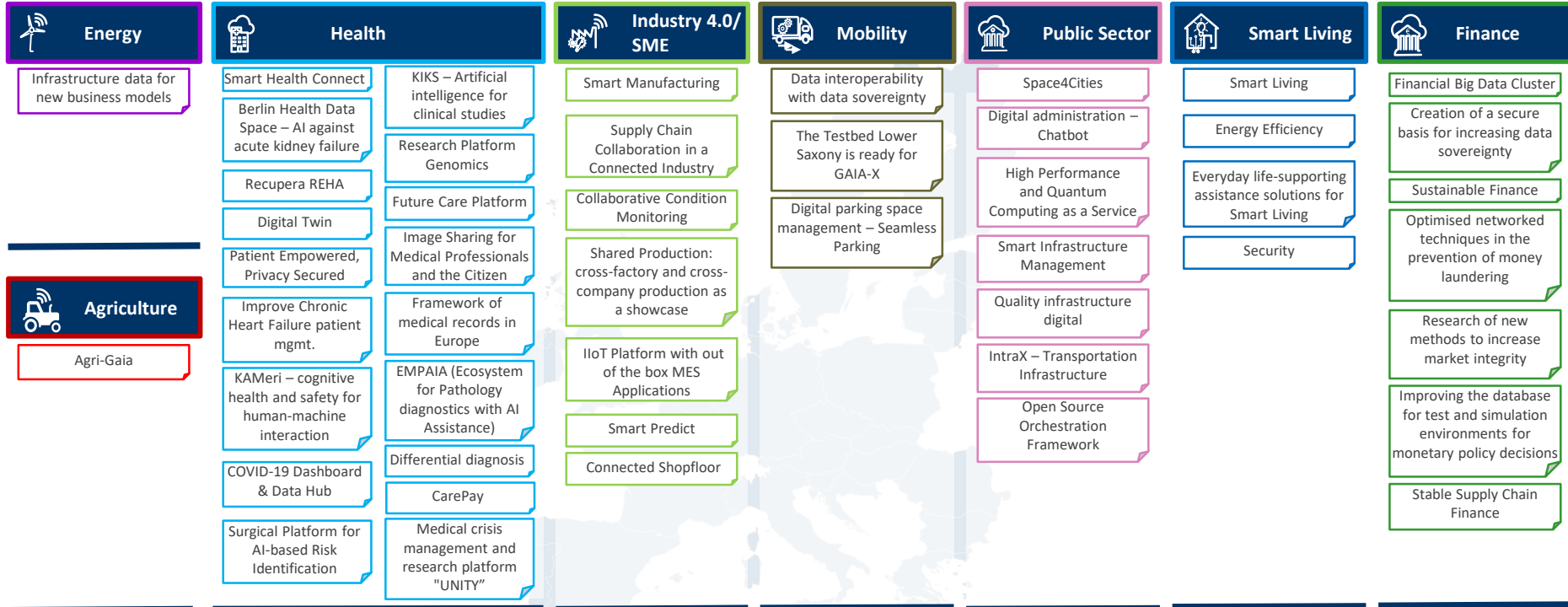


# Data Ecosystem



# Infrastructure Ecosystem

# Embracing eight domains and user perspectives to create data spaces



# Different use cases across domains reveal similar challenges

	Industry 4.0/ SME	Health
Ecosystem	Ecosystem of sensor producers, machine builders and factories that use the machines with its sensors.	Ecosystem of hospitals, health care providers that can use data from.
Data Owner		Patient data, university clinics, research centres
Data Producer	Sensors	Wearables, medical devices, treatment, CIS, processes
Data Hybrid (consumes and produces)	Machines, AI services, CM, asset management	Diagnosis, treatment, therapy, care takers, post-care
Data Consumer	Factory	Patient, hospital, research, care taker

# The analysis of use cases has provided valuable insights

The path from  
use cases  
to GAIA-X

1

Use cases from different domains **face the same challenges**.

2

Based on the consolidation of use cases, we can **identify common cross-domain requirements**, which are **shared by all domains**.

3

**Additional requirements** may be described depending on the domain and use case.

4

Through the synthesis of the use cases we will develop Data Space Demonstrators, which **represent the requirements of users and domains**.

5

We will continue to develop GAIA-X into a **shared solution** and an **enabler within and across domains**.



# All domains share common requirements

Energy

Finance

Agriculture

Health

Industry 4.0/SME

Mobility

Public Sector

Smart Living

Common  
cross-domain  
requirements



**GAIA-X as enabler**

**Federated Identity Management**

**Algorithms for data monetisation**

**Trusted Relationship Management**

**Data Custodianship** as a business principle

**Open** to adapt of all market participants - and systems

**Authorisation and data usage control** by the data owner

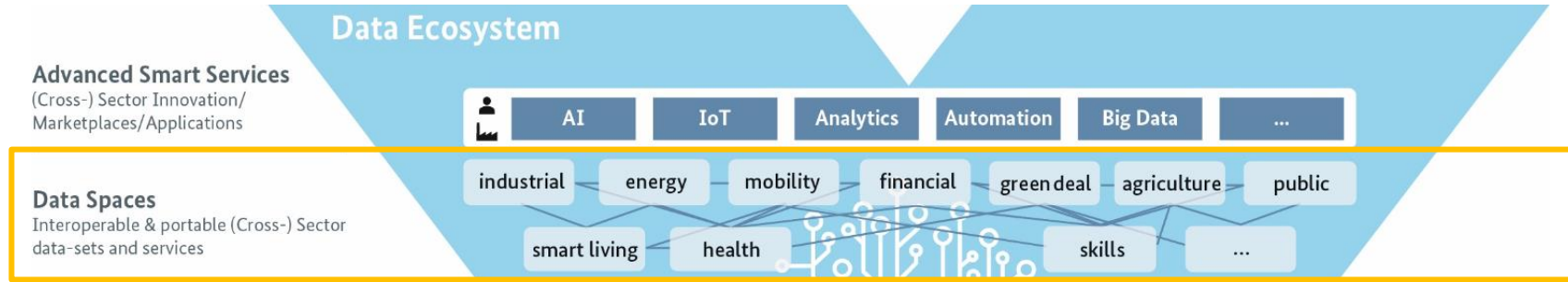
**Uniform definition of protection classes** for data and services for all participants

**Selectable Geography and Legislation** for data storage and service offering (locally/centrally)

**Hybrid Cloud Scenario** through distributed implementation (vertically and horizontally) across many vendors

**Additional domain-specific requirements**

# User requirements are at the core of the development of GAIA-X



- In order to facilitate value creation based on digital services and mechanisms, we need **an architecture in the form of an underlying framework common to all domains.**
- GAIA-X allows the emergence of **Advanced Smart Services** such as **AI, Analytics or Big Data** and fosters **innovation in the GAIA-X Ecosystem.**
- GAIA-X offers ontologies for interoperability and API within and across sector specific **data spaces** according to the EU Data Strategy.
- It promotes the opportunity to collaborate in **data-driven horizontal and vertical value chains.**
- As a result, it encourages the emergence of **sustainable business and innovation ecosystems** for the next generation of digital infrastructure.

# Use cases in different domains are embedded in the GAIA-X Ecosystem

## Collaborative

### Condition Monitoring

(Advanced Smart Service)

### Data Spaces (e.g. Industry 4.0)

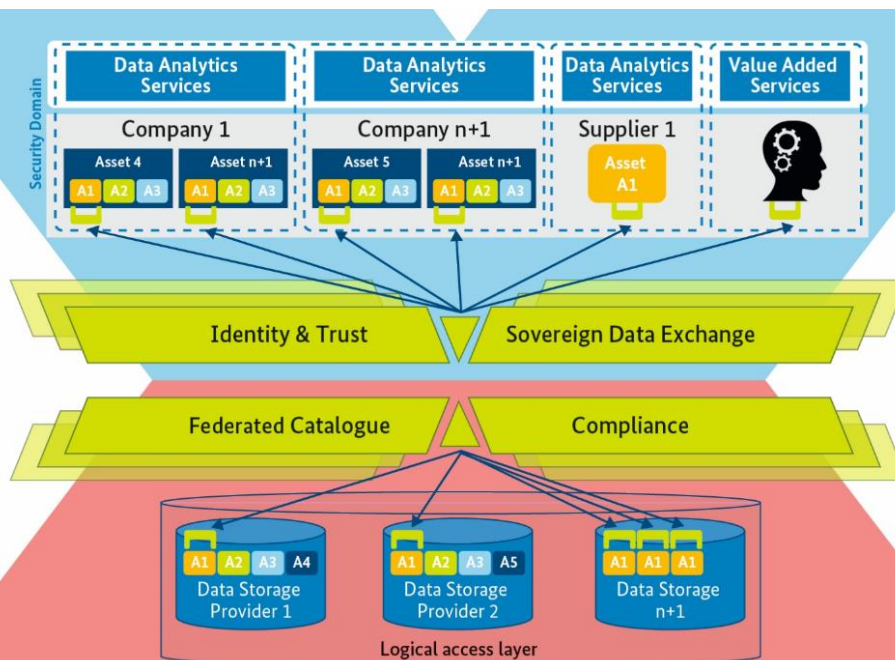
- Own Ontology and Information models
- E.g. eCl@ss
- Reference Architecture Model RAMI 4.0, API, IAM
- Semantic Interoperability Intra- and Inter-Domain

### GAIA-X Federation services

- Authentication & Authorization (SSO)
- Data Connector: Policies & Attributes
- Identity validation
- Access Rights, Usage Controls
- Semantic Interoperability

### Physical Data Storage & PaaS

- Infrastructure, Application & Data Portability and Interoperability



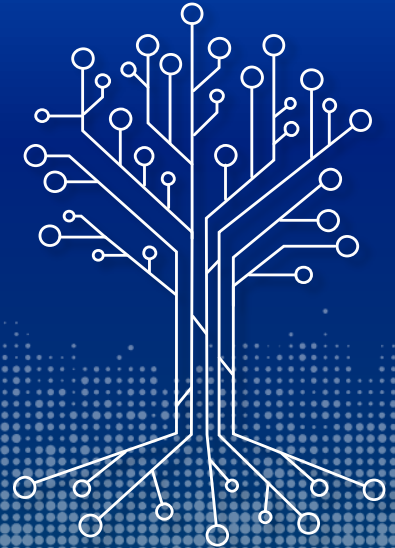
- The GAIA-X use case Collaborative Condition Monitoring (CCM) demonstrates how a framework for collaboration can contribute to develop self-determined business models for the condition monitoring of production processes.
- GAIA-X increases the **added value** and **consistency of services beyond the individual use case**.



GAIA-X

# The user perspective

+ Q&A

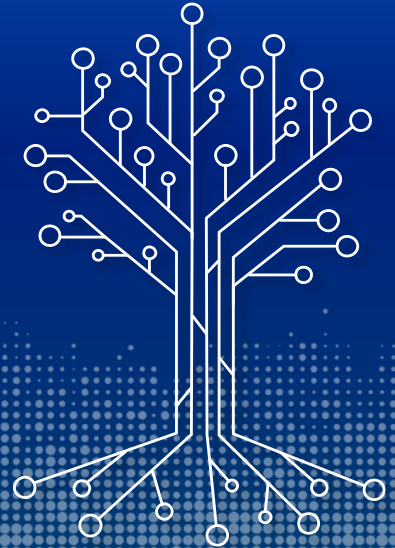




GAIA-X

# The provider perspective

Mr. Niessen, Trusted Cloud



# GAIA-X aligns various providers in an infrastructure ecosystem

- GAIA-X creates an infrastructure ecosystem by establishing **portability** and **interoperability** between **network and interconnection providers**, **Cloud Solution Providers (CSP)**, **High Performance Computing (HPC)**, **sector-specific clouds** and **edge systems**.
- Mechanisms are developed to **find, combine and connect services** from participating providers in order to enable a **user-friendly infrastructure ecosystem**.
- GAIA-X **supports distributed use cases**, spanning from on-premise set-ups, cloud hosted infrastructure through to facility to edge cases.
- GAIA-X has to address the **complete technical stack**, including infrastructure and existing network/ interconnection requirements (Architecture of Standards) of distributed use cases.

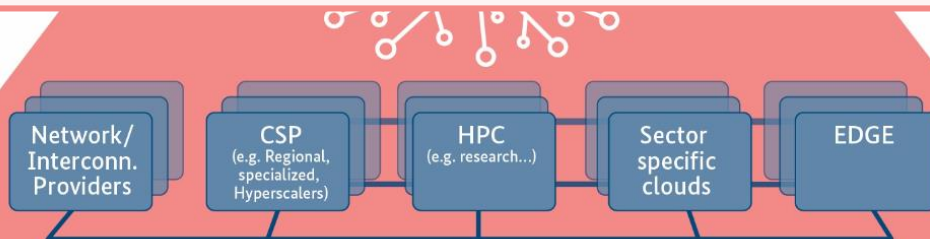
## Portability, Interoperability & Interconnectivity

Technical: Architecture of Standards  
Commercial: Policies

## Compliance

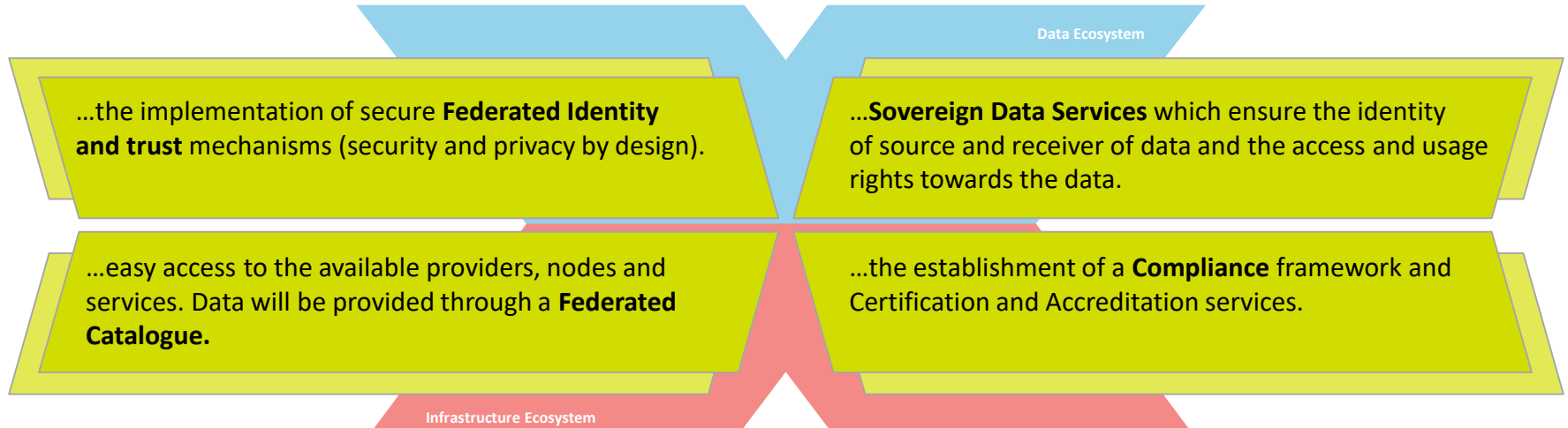
Legal: Regulation & Policies

## Infrastructure Ecosystem



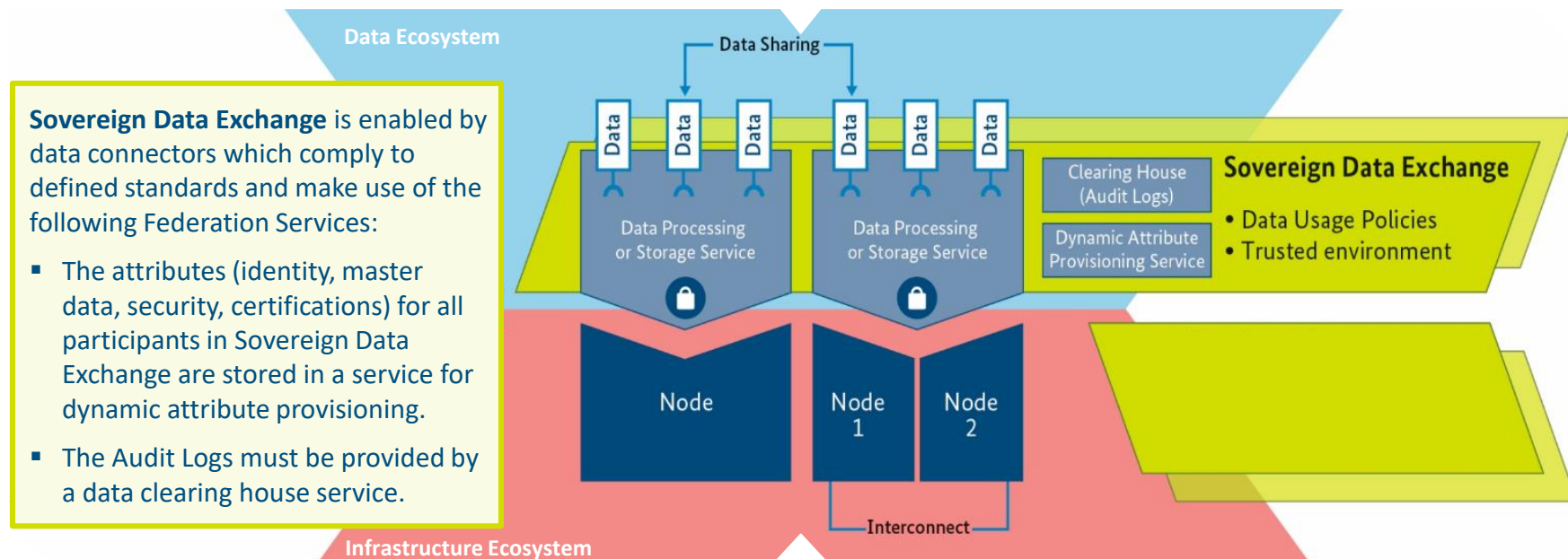
# GAIA-X Federated Services are at the core of the technical infrastructure

The technical implementation of these Federation Services focuses on...



GAIA-X identifies the minimum technical requirements and services necessary to operate **the Federated GAIA-X Ecosystem**. The development of these services will follow the principles of **Security-by-Design** and also include the concept of **Privacy-by-Design**.

# Sovereign Data Exchange allows participants to exercise data usage controls



**Sovereign Data Exchange** is enabled by data connectors which comply to defined standards and make use of the following Federation Services:

- The attributes (identity, master data, security, certifications) for all participants in Sovereign Data Exchange are stored in a service for dynamic attribute provisioning.
- The Audit Logs must be provided by a data clearing house service.

The Federation Services include **Sovereign Data Exchange** Services which allow each Infrastructure ecosystem participant to exercise data usage controls when exchanging data without the need to create individual agreements and technological solutions with each party.

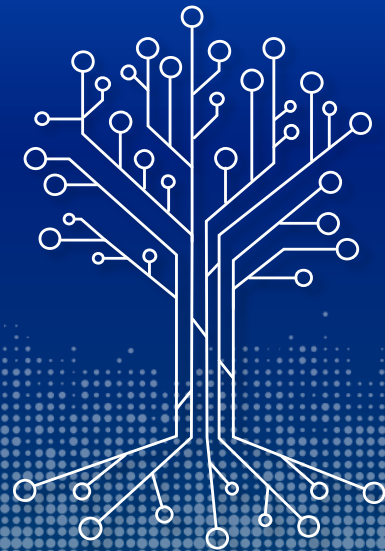




GAIA-X

# The provider perspective

+ Q&A

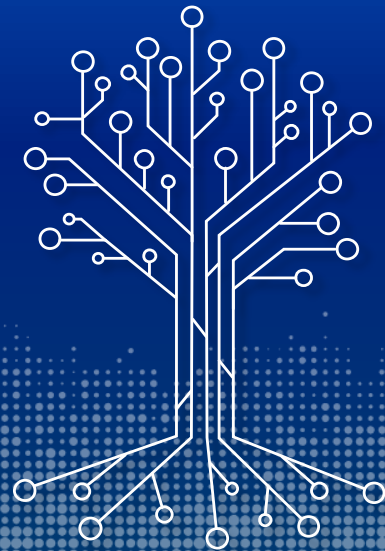




GAIA-X

# Introduction of Lithuanian policy objectives related to data governance and cloud infrastructure

Mr. Mezetis,  
Director of Information Society  
and Development Committee



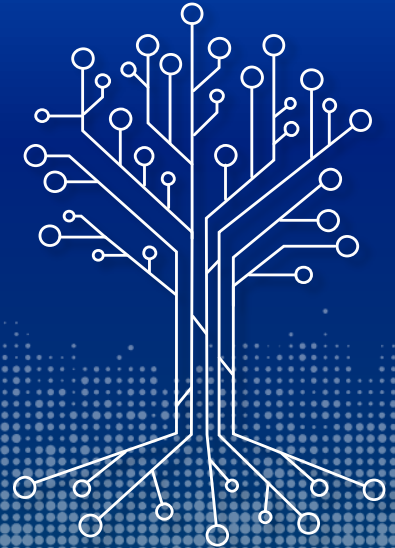


GAIA-X

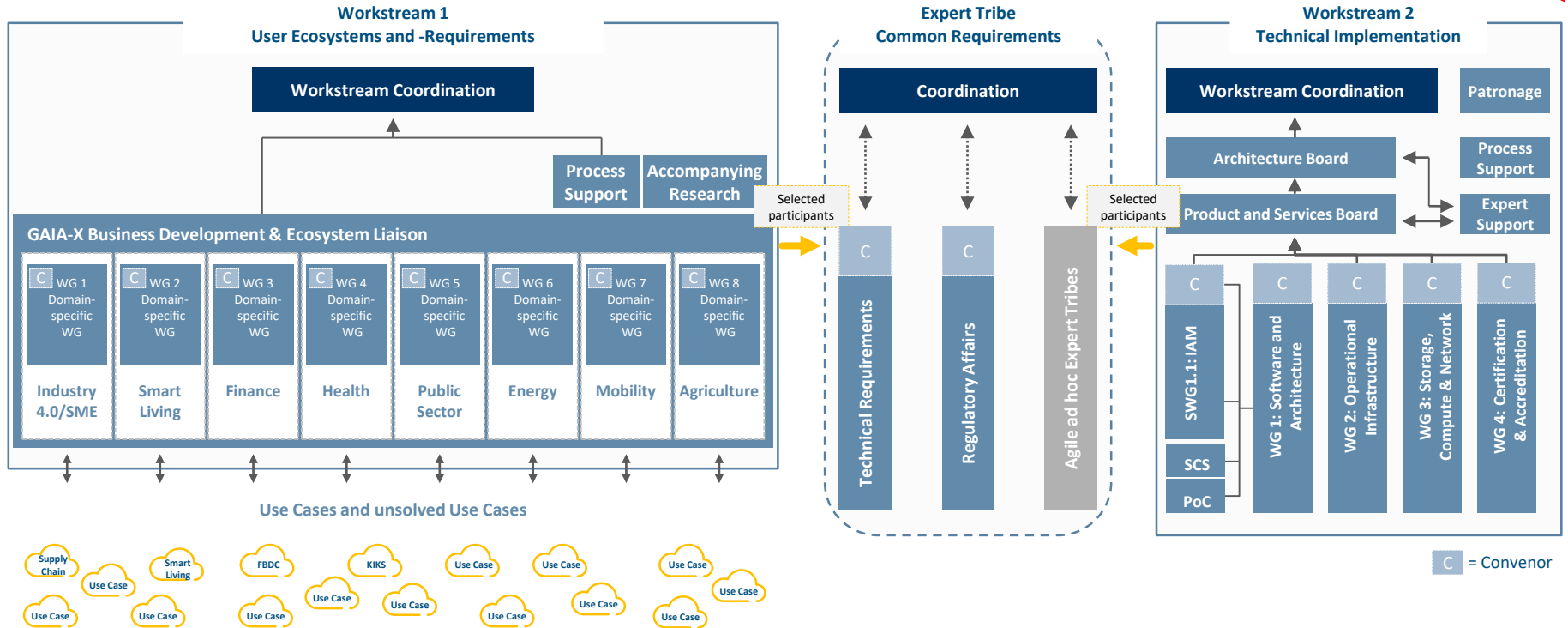
# Participation: How to become part of GAIA-X

Mr. Kraemer, acatech

Mr. Biegel, SAP



# The German GAIA-X Hub structures are flexible and support agile cooperation and exchange *Under construction!*



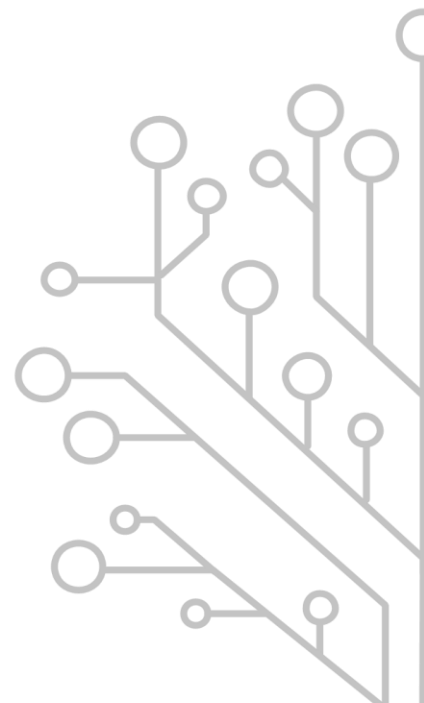
# The “GAIA-X Foundation” is founded as an AISBL

## Requirements

- Meeting GAIA-X objectives and purpose (“structure follows strategy”)
- Truly European w/ international ambition
- Eligibility for funding on European and member state level
- Well-known legal format

## Incorporation

- AISBL (“association internationale sans but lucratif”) under Belgian law registered in Brussels
- Offices in Brussels will be close to other initiatives (e.g. Data, IoT, HPC) – cooperation
- Targeted starting budget of 1.5 m EUR
- Membership fees reflecting size/nature of members
- Open to legal entities complying with GAIA-X articles, rules and policies
- 22 organisations are driving this process, incl. development of the Articles of Association and bylaws



# Interested parties are invited to shape the “GAIA-X Foundation”



# Drafts

**Articles**

GAIA-X FOUNDATION AISBL ¶

ENGLISH TRANSLATION ¶  
(official text in French)¶

**ARTICLES OF ASSOCIATION¶**

**CHAPTER 1: THE ASSOCIATION ¶**

1. - **Name¶**

The international non-profit association has the name "GAIA-X FOUNDATION", abbreviated "GAIA-X" ("the Association") and has the legal form of an international non-profit organization under Belgian law ("AISBL"). The Association is governed by the provisions of the Belgian Code on Companies and Associations. ¶

2. - **International non-profit purpose and objectives¶**

The Association has as its non-profit purpose, both in Belgium and internationally, alone or in

- CHAPTER 1 – The Association
- CHAPTER 2 – Members
- CHAPTER 3 – General Assembly
- CHAPTER 4 – Board of Directors
- CHAPTER 5 – Secretary General, Adv. Board and WGs
- CHAPTER 6 – Annual Accounts and Budget
- CHAPTER 7 – Dissolution and Liquidation
- CHAPTER 8 – Miscellaneous provisions

**Bylaws**

Draft 2 July 2020¶

**Bylaws of GAIA-X Foundation AISBL ¶**

¶

Pursuant to Article 36 of the Articles of Association of the GAIA-X Foundation AISBL ("GAIA-X") the Board of Directors ("Board") adopted these Bylaws in their resolution dated [\*\*\*] 2020. These Bylaws take effect as of [\*\*\*] 2020 and may be amended by the Board from time to time. ¶

¶

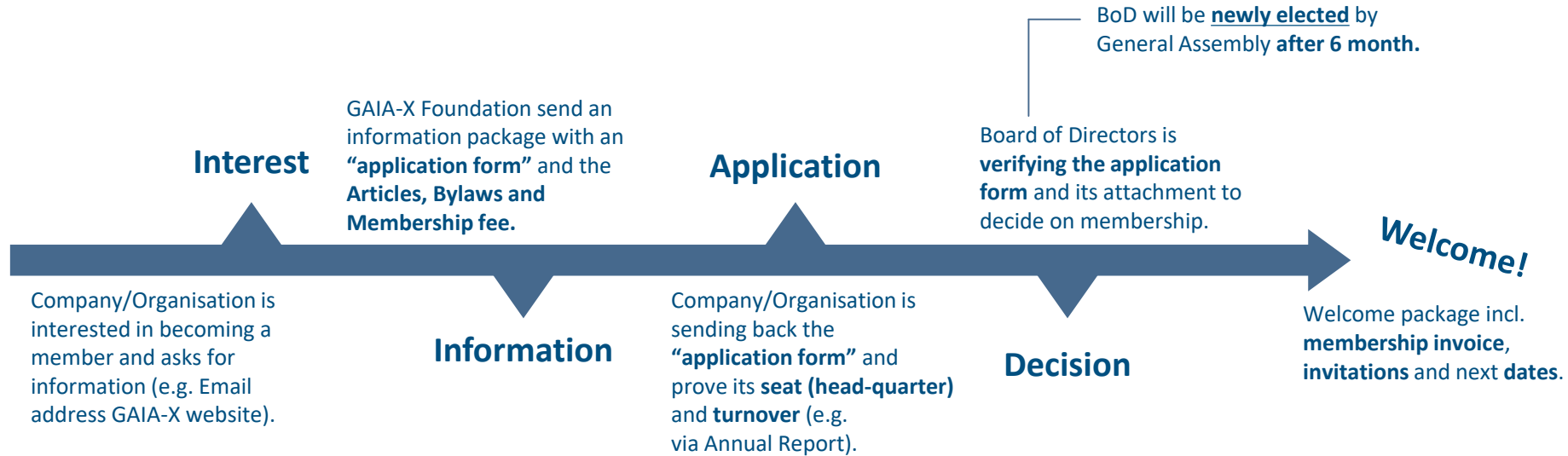
1. - **General Governance Structure of GAIA-X¶**

¶

The association shall be organized in accordance with the governance structure depicted in Exhibit 1 to these Bylaws. Exhibit 1 shall be used as a guideline for the interpretation of the provisions dealing with the governance structure of the:

- CHAPTER 1 – General Governance Structure of GAIA X
- CHAPTER 2 – Secretaries General as the Management Board
- CHAPTER 3 – Cooperation between the Secretaries General
- CHAPTER 4 – Matters which require the Consent of the Board
- CHAPTER 5 – Cooperation with the Board and Reporting
- CHAPTER 6 – Conflicts of Interest and Non-Competition
- CHAPTER 7 – Technical Committee
- [...]

# GAIA-X Foundation: Membership application







GAIA-X



For further information visit us online:  
[www.data-infrastructure.eu](http://www.data-infrastructure.eu)

# GAIA-X

We invite all interested parties to become a part  
of the Federated GAIA-X Ecosystem.



[contact@data-infrastructure.eu](mailto:contact@data-infrastructure.eu)



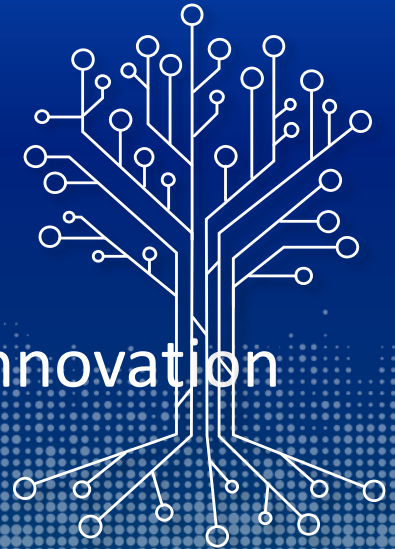
GAIA-X

# Wrap-up

+ Discussion on role of governments  
in GAIA-X

Mr. Stöckl-Pukall BMWi

Mr. Cijūnaitis, Ministry of Economy and Innovation



# The cornerstone has been laid – the next steps aim at quickly bringing GAIA-X to life

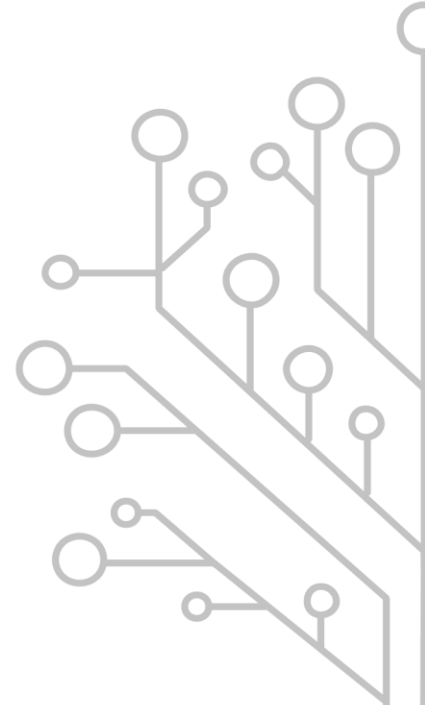
- GAIA-X document-sets serves as basis for a broad based discussion and development of GAIA-X.
- European values are at the core of the project which is open for international participation.
- Integration of the Strategy of the EU on data into GAIA-X. Objectives are fully aligned.
- Establishing a non-profit “GAIA-X Foundation” as AISBL. Interested stakeholders for future membership are welcome to ask for more information.
- Achieve cross industry acceptance by establishing a governance framework for GAIA-X
- Policy Rules and Architectures of Standards: Setting up a process to further update and compile relevant Policy rules and integrate already existing standards.

# The technical implementation of GAIA-X is being driven at full speed

- Realising European data spaces built on the principles of GAIA-X:
  - (i) identifying and developing use cases
  - (ii) specifying domain and cross-domain requirements
- Integration of GAIA-X related use cases or existing projects to develop and establish GAIA-X Federation Services.
- Prototypical implementation of the GAIA-X Federation Services.
- Further development of the Technical Architecture and components (additional Federation Services).

# States should take an active role in the development of the GAIA-X community

- Thinking together GAIA-X and the European Cloud Federation – next step: Joint Declaration to be negotiated, draft to be presented by COM, to be signed at informal council meeting (October 15).
- Fostering a European and international network of GAIA-X-hubs to support international cooperation, awareness and application of GAIA-X across industries.
  - State funding for national hub
  - Engaging national companies with GAIA-X
- State funding for use cases; identifying public use cases
- Advising the GAIA-X Foundation (Governmental Advisory Board)
- Find structure for coordination of community and States at the European level (possible Roundtable)
- Encouraging other EU MS to get engaged with GAIA-X



## Further information about GAIA-X is available on our website



### Information

- Descriptions of the mission, project structure and workstreams
- Overview and download of publications



### Blog

- Publication of blog posts linking to news, developments, discussions and comments on events and articles



### Use cases

- Overview of the current use cases
- Individual one pager with further descriptions and information on each use case



### Glossary

- The glossary is intended to list and explain important terms used in the GAIA- X context



### FAQ

- The FAQ list offers a collection of frequently asked questions and answers about the project and GAIA- X

[www.data-infrastructure.eu](http://www.data-infrastructure.eu)

[contact@data-infrastructure.eu](mailto:contact@data-infrastructure.eu)



GAIA-X



For further information visit us online:  
[www.data-infrastructure.eu](http://www.data-infrastructure.eu)

# GAIA-X – Points of Contact

For membership in Foundation & participation in workstreams:  
[contact@data-infrastructure.eu](mailto:contact@data-infrastructure.eu)

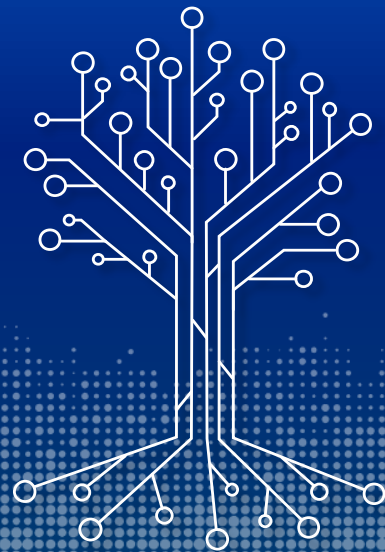
For technical questions:  
Thomas Niessen, [tniessen@innovaberatung.com](mailto:tniessen@innovaberatung.com)

For governmental cooperation  
Carl-Philipp Sassenrath, [carl-philipp.sassenrath@bmwi.bund.de](mailto:carl-philipp.sassenrath@bmwi.bund.de)



GAIA-X

# Backup





# GAIA-X will add value to the European digital economy

## Data-based business models

Enabling self-determined data-based business models from an entrepreneurial perspective.

## Raise the value of data

Supporting innovative collaborations across industries to aggregate and raise the value of data.

## Fairness and transparency

Promoting fair and transparent business models by providing the rules for such collaborative approaches, including the legally compliant use of data.



## Data commercialisation

Providing common data monetisation schemes, sharing models and respective enforcement rules. As such, the commercialisation of data becomes less complex and costly.

## Interoperability

Enabling collaboration across industries to create federated, interoperable services on the infrastructure layer.

## Data protection

Supporting the detection and preservation of data protection classes and confidentiality rules even in the case of “mixed” data allocations. Hence, the value leakage of enterprise data sets is prevented.

## Infrastructure

Easing access to trustworthy next generation IT infrastructure, which will provide a productivity boost for software engineering teams.

# We aim to activate and represent the user side in order to develop GAIA-X

**Identify suitable use cases** – from both a qualitative and a quantitative perspective

Analyse and evaluate the **requirements of use cases** from different domains to develop **Data Space Demonstrators**

Initiate **further measures** for the **development** of GAIA-X

Define and validate **cross-domain requirements**



Define and validate **domain-specific requirements**

# Looking at Industry 4.0/ SME use cases, we identify challenges parallel to other domains

## Use case from Industry 4.0/ SME

**Ecosystem of sensor producers, machine builders and factories** that use the machines with its sensors

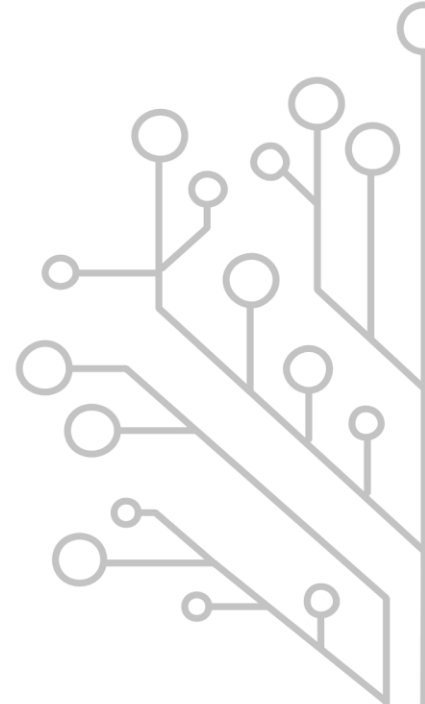
- Data producer = sensors
- Data hybrid\* = machines, AI services, CM, asset management
- Data consumer = factory

**Common usage and utilization of an ecosystem** like GAIA-X allows a **hassle-free** and **smart usage of data**

→ **An ecosystem that is based on these principles is a basis for future business models**



\* (consumes and produces)



# The same applies to Health use cases

## Use case from Health

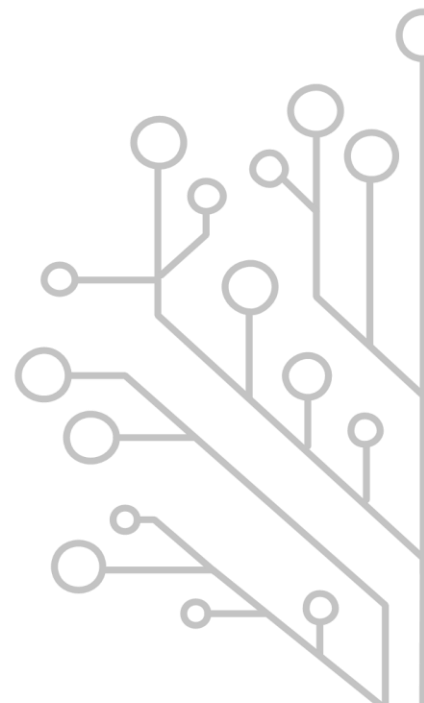
### Ecosystem of hospitals, health care providers that can use data from

- Data owner = e.g. patient data, university clinics, research centres
- Data producer = wearables, medical devices, treatment, CIS, processes
- Data hybrid\* = diagnosis, treatment, therapy, care takers, post-care
- Data consumer = e.g. patient, hospital, research, care taker

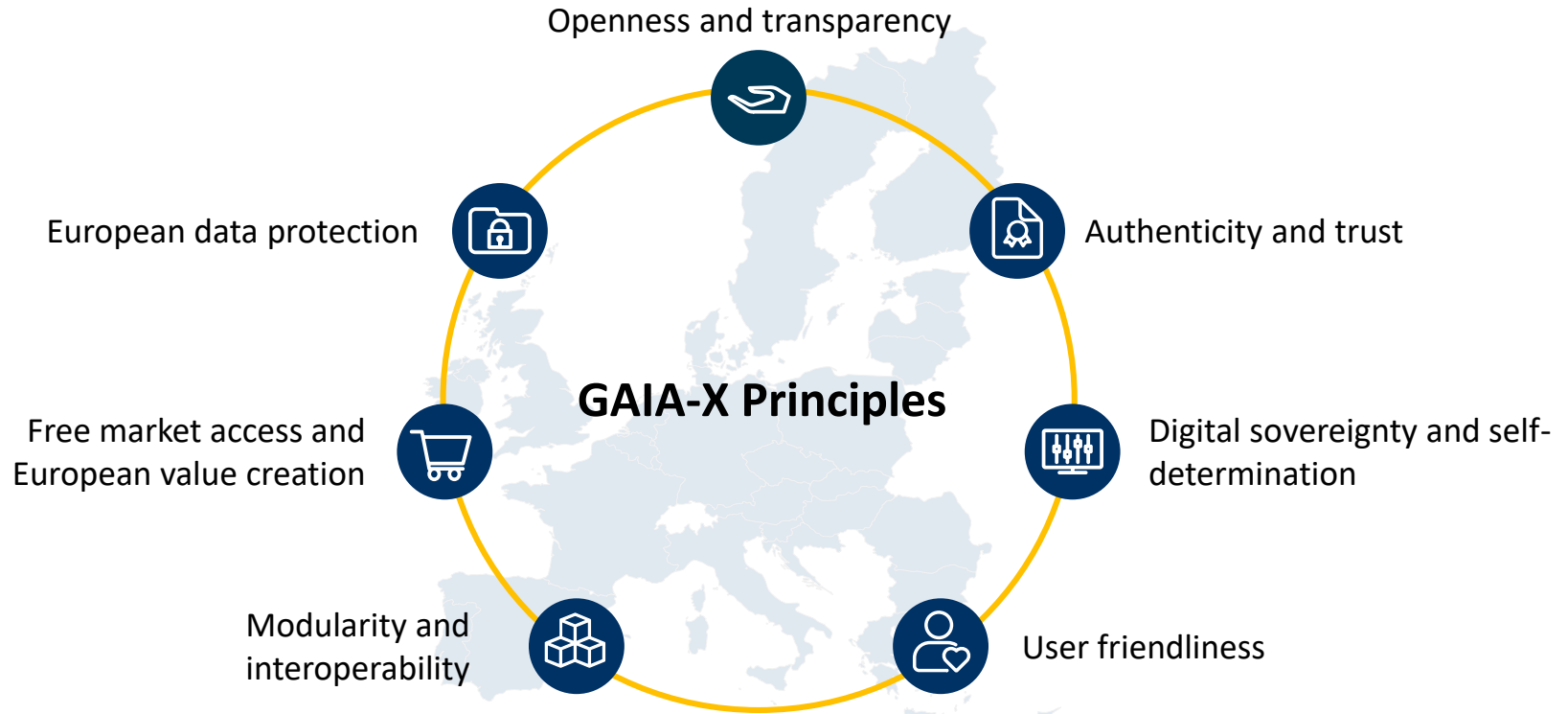
→ Ecosystems for public health data and applications based on existing standards



\* (consumes and produces)



# GAIA-X follows principles based on European values



# Draft Articles



CHAPTER 1 – The Association

CHAPTER 2 – Members

CHAPTER 3 – General Assembly

CHAPTER 4 – Board of Directors

CHAPTER 5 – Secretary General, Adv. Board and WGs

CHAPTER 6 – Annual Accounts and Budget

CHAPTER 7 – Dissolution and Liquidation

CHAPTER 8 – Miscellaneous provisions

Name, Objectives, Registered Office, Term

Members, Categories, Application, Rights, Obligations, Termination, Expulsion, Representation, Organizational structure

Composition, Competences, Meetings, Voting Rights, Majority and Quorum, Convocation, Minutes, Unanimous written decisions

Composition, Competences, Chairperson, Meetings, Convocation and Representation, Voting Rights, Majority and Quorum, Minutes, Unanimous written decisions, Conflict of Interests, Representation of the Association.

Secretary General, General Advisory Board, Governmental Advisory Board, Working Groups and Committees.

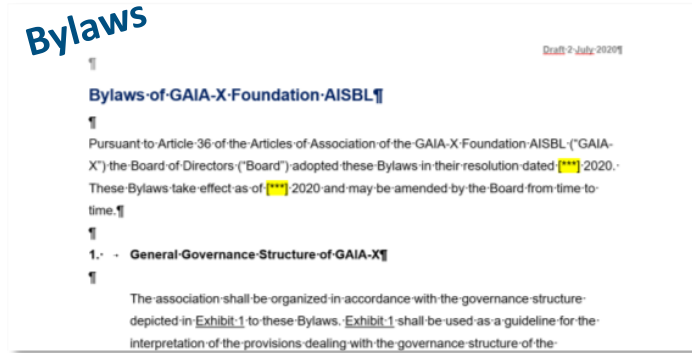
Financial Year, Annual Accounts and Budget

Dissolution, Allocation of the Remaining Balance

Language of the Association, Bylaws, Miscellaneous

1<sup>st</sup> BoD 86-0 month  
 → GA elect (new BoD)  
 → New BoD (2yrs)

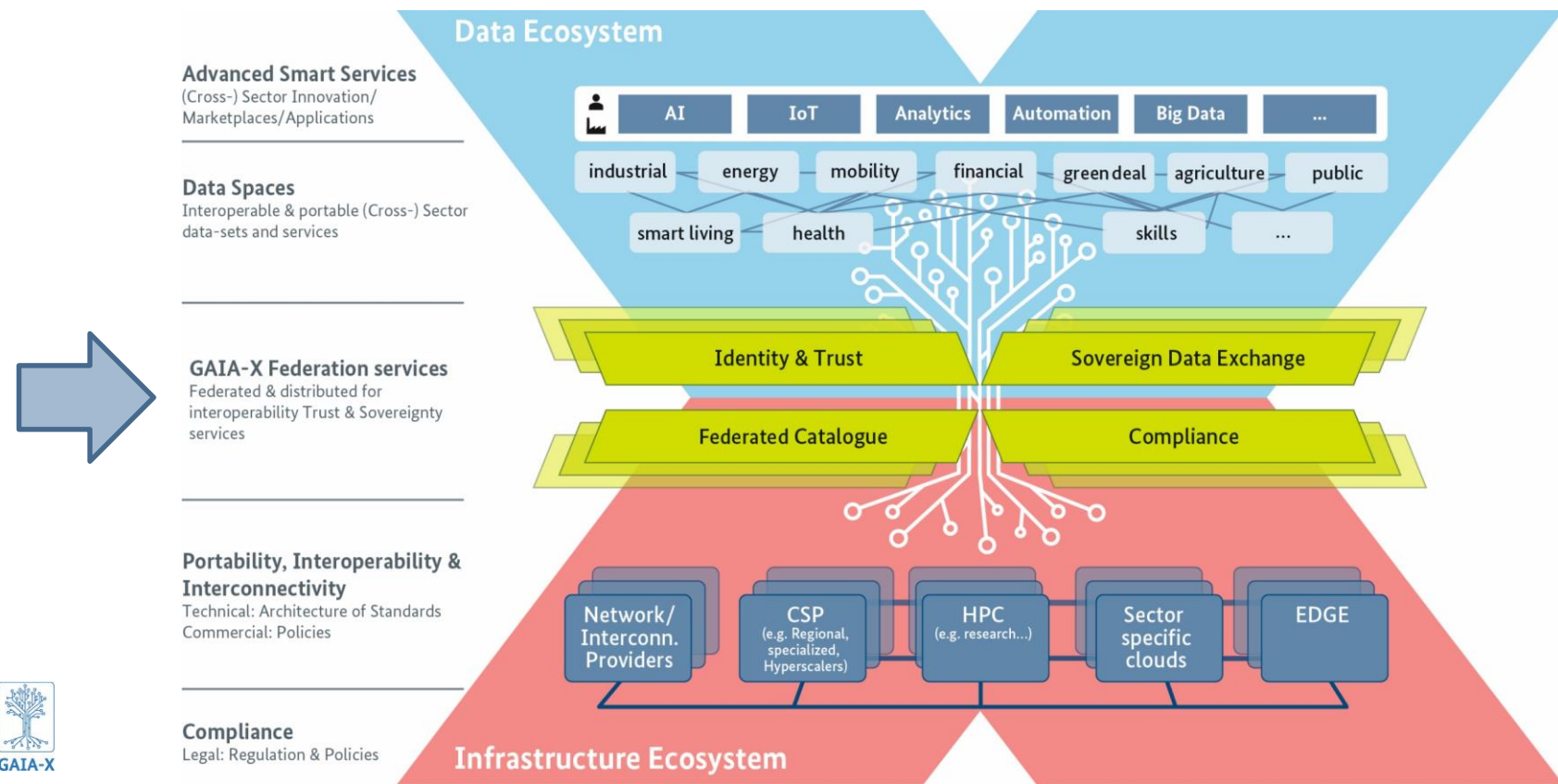
# Draft Bylaws



- CHAPTER 1 – General Governance Structure of GAIA X
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# Overview: GAIA-X provides a user-friendly and homogenous ecosystem of services and data





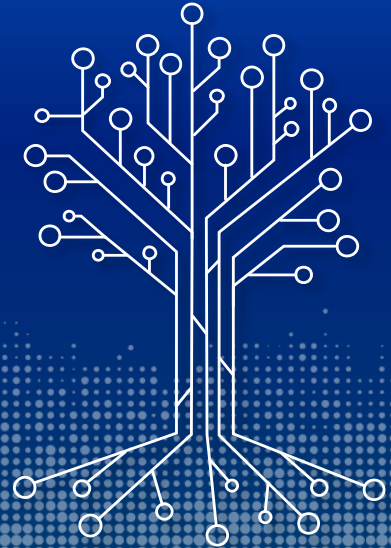


GAIA-X

## Introduction (continued)

- Why do we need GAIA-X from a data and infrastructure perspective?
- Building on existing rules and standards

Mr. Niessen, Trusted Cloud



# Data Ecosystem

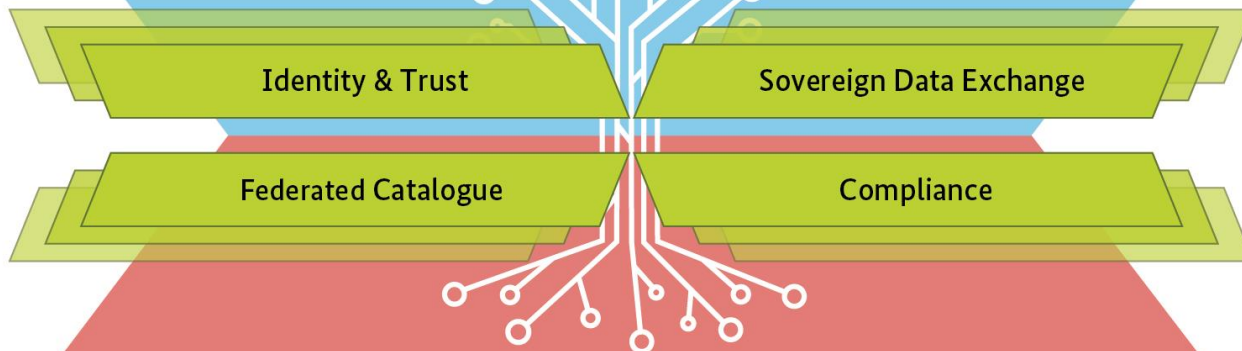
## Advanced Smart Services

(Cross-) Sector Innovation/  
Marketplaces/Applications



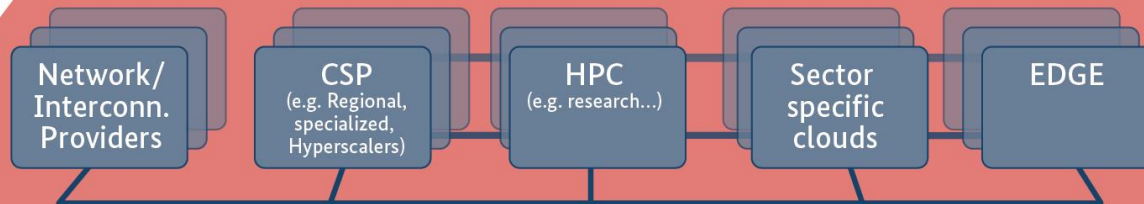
## Data Spaces

Interoperable & portable (Cross-) Sector  
data-sets and services



## Portability, Interoperability & Interconnectivity

Technical: Architecture of Standards  
Commercial: Policies



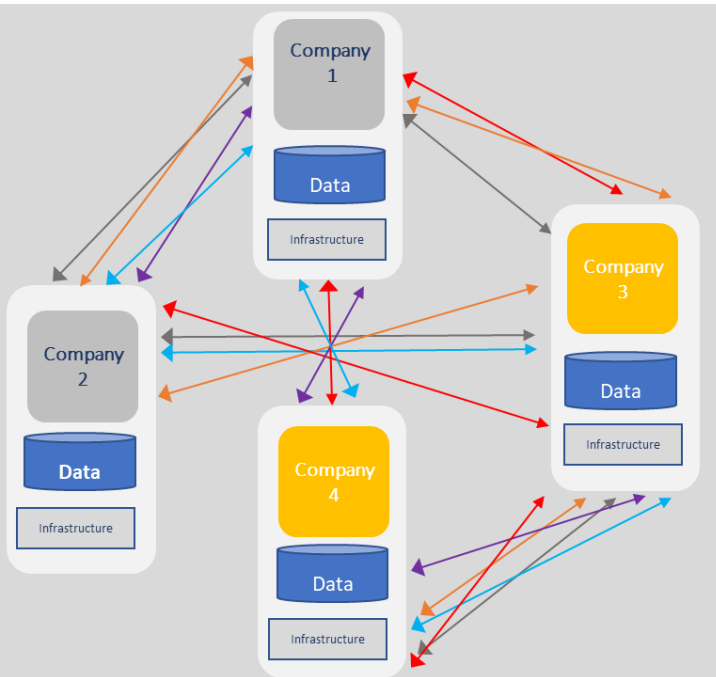
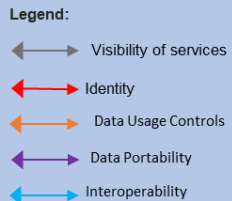
## Compliance

Legal: Regulation & Policies

# Infrastructure Ecosystem

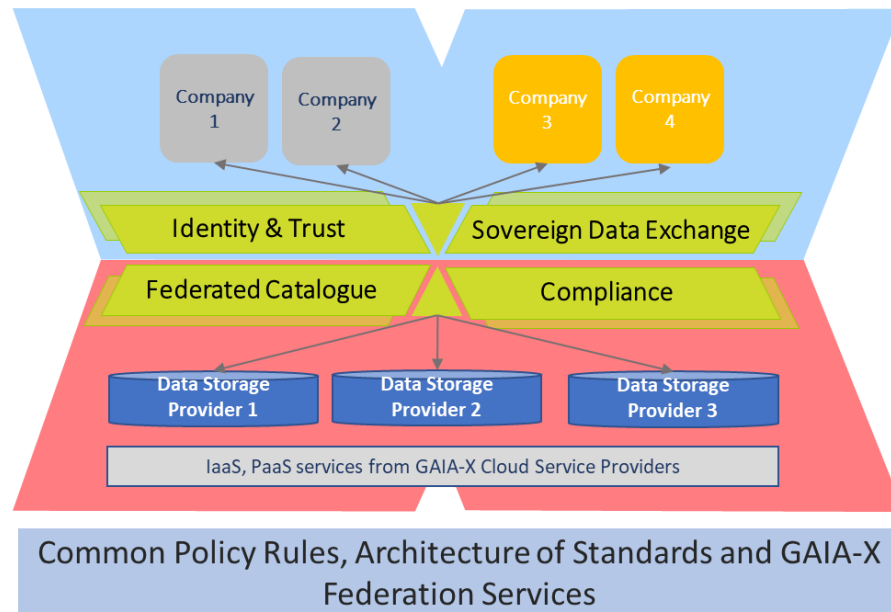
# Collaboration today

Today: Creation of multi-party services and data spaces requires high level of individual adaptations and agreements



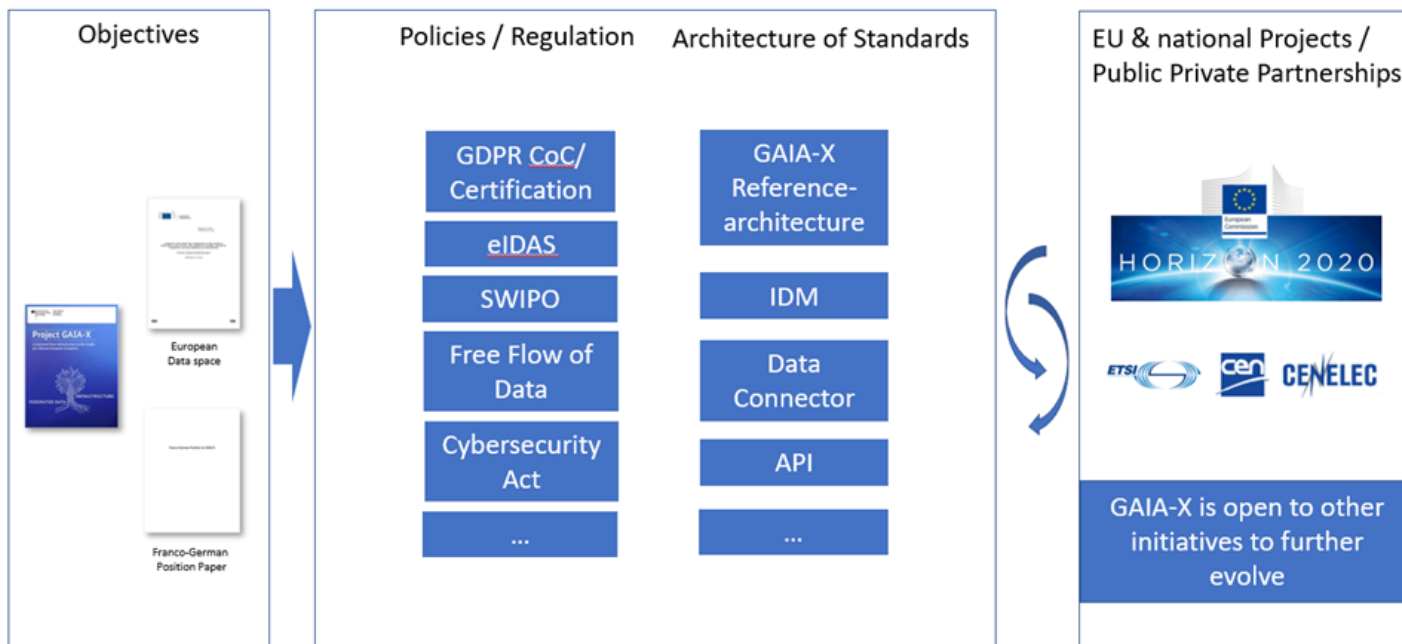
# GAIA-X Eco-System

GAIA-X: Federation services and common Policy Rules and Architecture of Standards accelerate the creation of advanced smart services



# Translating the objectives to the GAIA-X blueprint

## Foster Adaptation & Innovation



# GAIA-X Policy Rules

- Defines mandatory rules which providers need to fulfill to join the GAIA-X Community and declare services. Additional optional rules
- Adherence to rules are demonstrated by self-declaration or third party certification depending on agreement within the GAIA-X governance. Existing tools (e.g. Codes of Conduct, ISO Standards, etc.) may be used to demonstrate effectiveness.
- Rules are based on market existing good practices or additional GAIA-X rules useful to address GAIA-X objectives
- 2 set of rules proposed from joint FR/DE working group (under discussion):

A thumbnail image of a document titled 'GAIA-X Infrastructure Policy Rules'. The document is a table with multiple columns and rows, containing detailed technical specifications and requirements for infrastructure providers.

Infrastructure Policy Rules

A thumbnail image of a document titled 'GAIA-X Data & Software Policy Rules'. The document is a table with multiple columns and rows, containing detailed technical specifications and requirements for data and software providers.

Data & Software Policy Rules

# GAIA-X Policy Rules

## Areas covered

### Area covered are:

- Data Protection / GDPR
- Security
- Reversibility
- Company Policies
- Location
- Contract
- Reporting
- Service Continuity
- Data Sharing

Items linked to the areas are distributed within the 2 documents, regarding relevance to the topics



Infrastructure Policy Rules



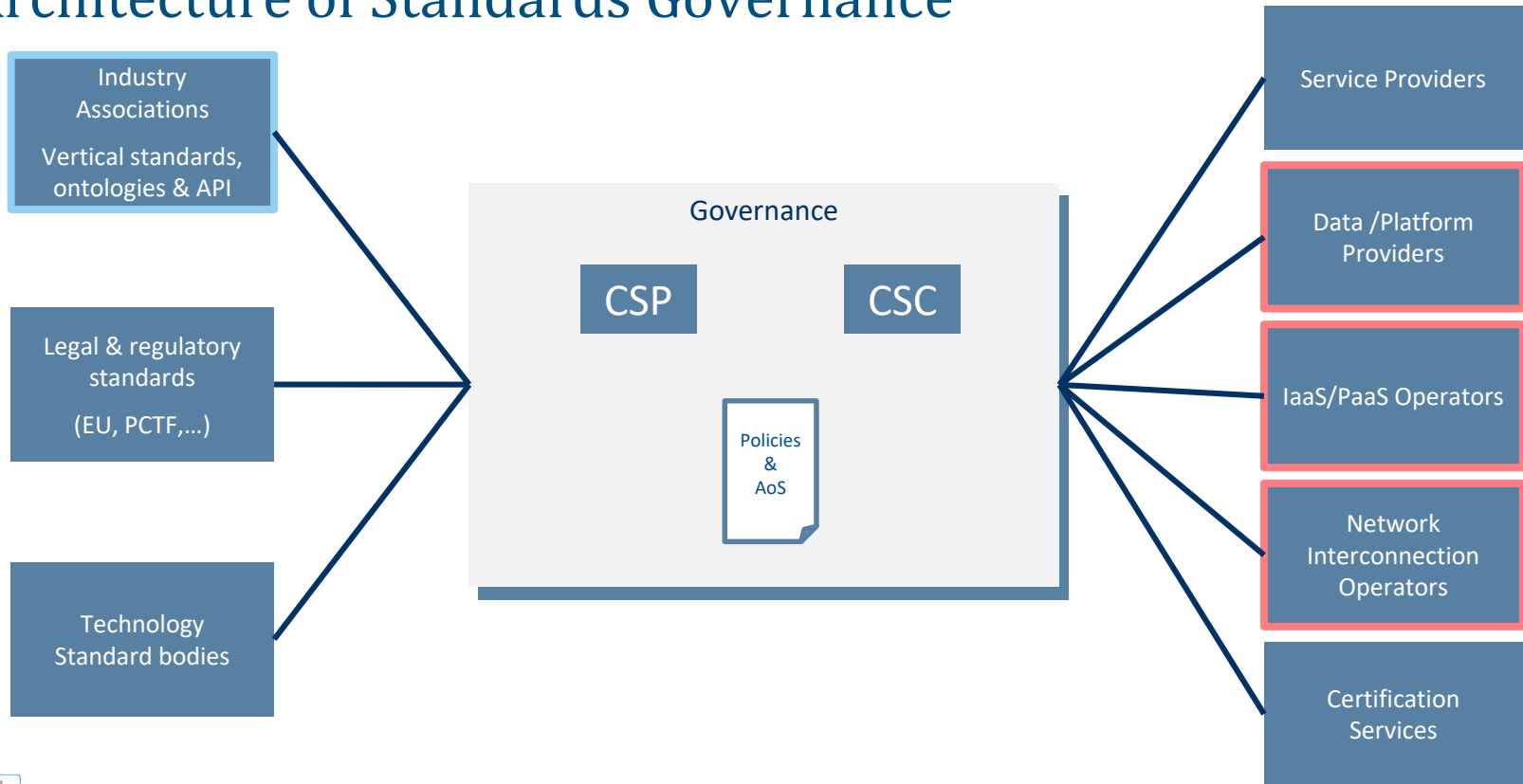
Data & Software Policy Rules

# Architecture of Standards

## Guiding principles for proposed “Technical Standards”

- The “Architecture of Standards” (AoS) defines the list of technical and regulatory standards which are relevant for GAIA-X objectives
- For a technical standard to become part of the AoS it has to have a governing community which is open to all Cloud Service Providers and –customers (e.g. CNCF, ISDA...) or facing a regulatory Authority (e.g. ENISA, EDPB, etc...)
- Does not enforce dependencies to provider specific services
- Standards are not exclusive (e.g. it shall remain possible to use and integrate with other PaaS, SaaS, Databases from the same provider) however usage of such services may impact the compliance level
- Cloud service providers or –customers are not obliged to implement the full set of services defined in the AoS, the selection may impact the compliance level
- The Architecture of Standards will be subject to a lifecycle and governance process

# Architecture of Standards Governance







GAIA-X

# Outlook: Roadmap

Dr. Weiss, Deutsche Telekom

# Outlook

