Gaia-X
General Overview

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Your Fastrack to Trust and Interoperability

Gaia-X in a nutshell

VISION: Enable trusted decentralised digital ecosystems

MISSION: Creating the de facto standard aligned with EU values by developing a set of policies, rules, specifications and a verification framework

A FEDERATED AND SECURE DATA INFRASTRUCTURE

Gaia-X strives for innovation through digital sovereignty.

► Our **goal** is to establish an ecosystem, whereby data is shared and made available in a trustworthy environment.

► Our **intention** is that we give the control back to the users by retaining sovereignty over their data.

► Our **outcome** will not be a cloud. It is a federated system linking many cloud service providers and users together in a transparent environment that will drive the European data economy of tomorrow.

Gaia-X Is

> A single point of definition of Gaia-X architecture & rules

> Making available an open implementation to all

> A qualification authority for Gaia-X compliance

Gaia-X is Not

> A formal standardization body

> A SW or HW product or cloud platform

> A runtime implementation of any Gaia-X service

WHAT DO WE DELIVER?

Gaia-X Digital Clearing House (GXDCH)

SPECIFICATIONS	CODE	LABELS
The specifications describe how Gaia-X works in terms of functional and technical requirements	The above specifications are then translated into source code by our community.	In order to operationalise services and build truly connected and interoperable dataspaces, Gaia-X Association develops governance based on European values.

What is Gaia-X

Gaia-X Abstract

Established in 2021 as a privately funded not-for-profit Association, Gaia-X brings together an international industrial, academic, and political community with the aim of building a common standard for transparent, controllable, and interoperable technologies in order to enable the creation of common data spaces, and in doing so boost the European data economy.

Open to anyone and aligned to the **European values** of human-centricity, transparency, openness, sovereignty, and trust, Gaia-X's ambition is to deliver unprecedented opportunities for innovative data-driven business models reducing the dependency from non-controllable technologies.

Want to learn more about Gaia-X? Click here.
Interested in becoming a member of Gaia-X? Click here!

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Gaia-X Vision & Mission

VISION: Enable trusted decentralised digital ecosystems

MISSION: Creating the de facto standard aligned with EU values by developing a set of policies, rules, specifications and a verification framework

What we are & what we do

WHAT WE ARE

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WHAT WE DO

Gaia-X Digital Clearing House (GXDCH)

Specify	Develop	Qualify
Specs	Code	Labels

The existing Split X Model & Our X Model
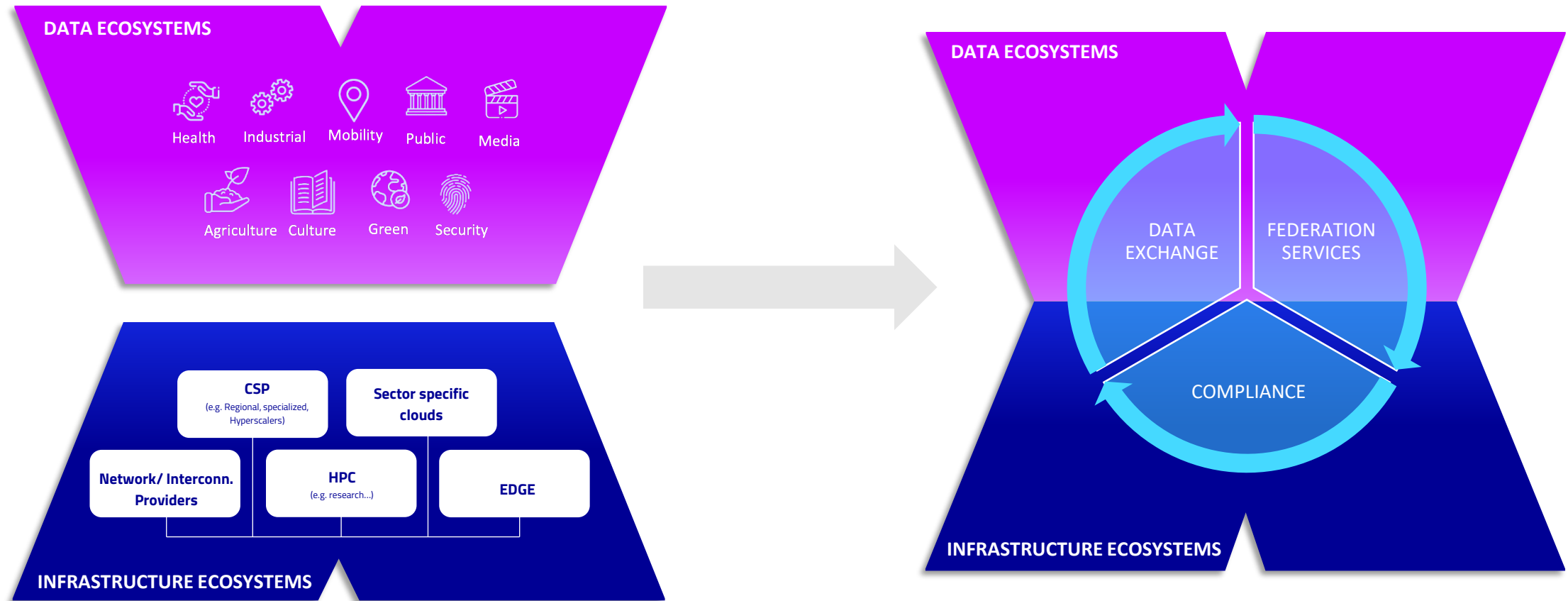
The existing Split X Model
Disjoint Data & Infrastructures Ecosystems

DATA ECOSYSTEM

Health   Industrial   Mobility   Public   Media

Agriculture   Culture   Green   Security

DATA

Untapped, fragmented, disjoint, no secure exchange mechanism

INFRASTRUCTURES

Segregated, non-reversible, non-interoperable, closed architectures, private standards

CSP
(e.g. Regional, specialized, Hyperscalers)

Sector specific clouds

Network/ Interconn. Providers

HPC
(e.g. research...)

EDGE

INFRASTRUCTURE ECOSYSTEM

gaia-x
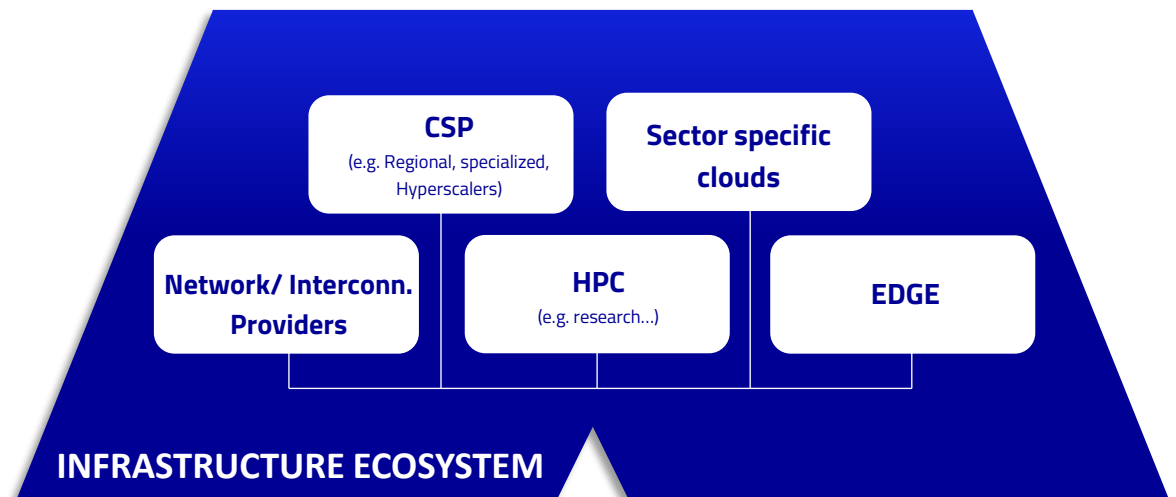
Our X Model
Connecting Data - Infrastructures Ecosystems

ADVANCED SERVICES

New (Cross-) Sector Innovations / Applications build from service composition.

DATA SPACES / FEDERATIONS

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

**DATA EXCHANGE**

Anchored contract rules for access and data usage.

Gaia-X COMPLIANCE

Decentralized services to enable objective and measurable trust.

LABEL FRAMEWORK

Gaia-X and ecosystem specific Labels to ease market adoption through autonomy and self-determination.

DATA ECOSYSTEMS

DATA EXCHANGE

FEDERATION SERVICES

COMPLIANCE

INFRASTRUCTURE ECOSYSTEMS
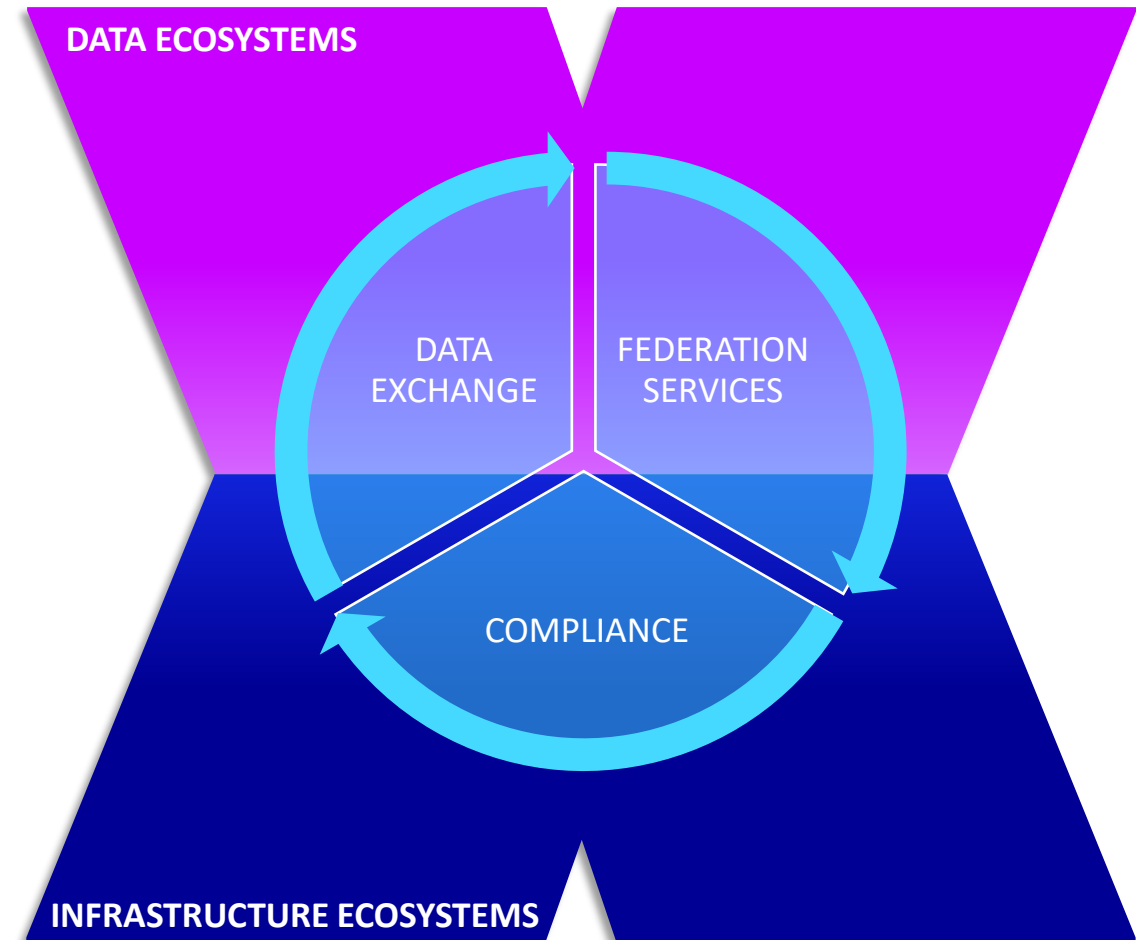
The Why

A (Regulated) Data Economy

➢ There is a myriad of problems that can only be **solved by combining data**

➢ Therefore, **data siloes separate us from truly capitalising** on the value of data

➢ However, silo interconnection is challenging due to cultural, organisational and technical reasons:

  - Thus, the easiest alternative is to **minimise data transfers**

  - How to interconnect data **"at the source"?**

  - There is a need to **understand the data lifecycle** (i.e. its value chain)

  - Related to modern concepts like Data Fabric VS Data Mesh

A Holistic Data Governance

➢ On the other hand, Europe´s new digital regulation:

- Breakthrough yet complex model that will impact organisations' pioneering developments

- Can also be a lighthouse for innovation via a clearer DEV roadmap (investments) + tech exports (*Brussels Effect*)

➢ This gets us into the **data governance** domain, but an innovative version:

- Besides governing just data points, it also considers data storage and transformation tools (infrastructure)

- The goal is to connect symbiotically data ⟺ cloud layers

➢ This is within the core of the *European Data Strategy* (2020)
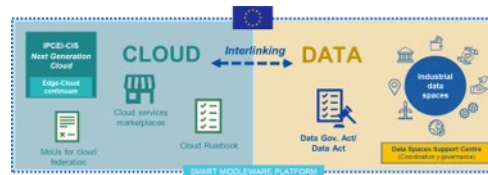
• The definition of said model is the raison d'etre of the *Gaia-X European Association for Data & Cloud AISBL*

for Data + Computing

- ➢ Because said model provides a framework to create different (interconnected–by-design) **ecosystems of offer-demand for data & infrastructure services**

- ➢ These facilitate the **building and operational deployment of digital solutions**, e.g. AI

  - By accessing more and better datasets

  - To specialised computing becomes available by interconnecting infrastructures (this is the "Euro cloud" concept)

  - Also leveraging prior successful ML models

- ➢ Ecosystems heavily **lower entry barriers**

  - Generate **critical mass** of quality datasets

  - Pooling of resources to build more solid technical artefacts (algorithms, models, etc.)

  - Especially useful for **SMEs**

  - Also boost **digital & economic autonomy**

THE HOW

The Gaia-X Standard

The Gaia-X standard comprises three components:

1. An **architecture** [*GitLab*], composed of:

   – A decentralised identity system

   – A Web 3.0 system including a vocabulary and grammar to describe data and cloud resources

Together, these allow the build graphs across a distributed ecosystem, interlinking resources and pegging them to their owners/users (via the ids)

2. **Documents of rules** over said resources. This is not technology but rather a set of criteria to be met (expressable using the same vocabulary)

3. The ***Gaia-X Digital Clearing House*** is the technical component putting these two elements to work

   – (Since all rules employ the same ontology, and the architecture enables the computation of graphs) The GXDCH **automatizes verifying** if a composable system (made up of distributed elements) fulfill the selected criteria or not
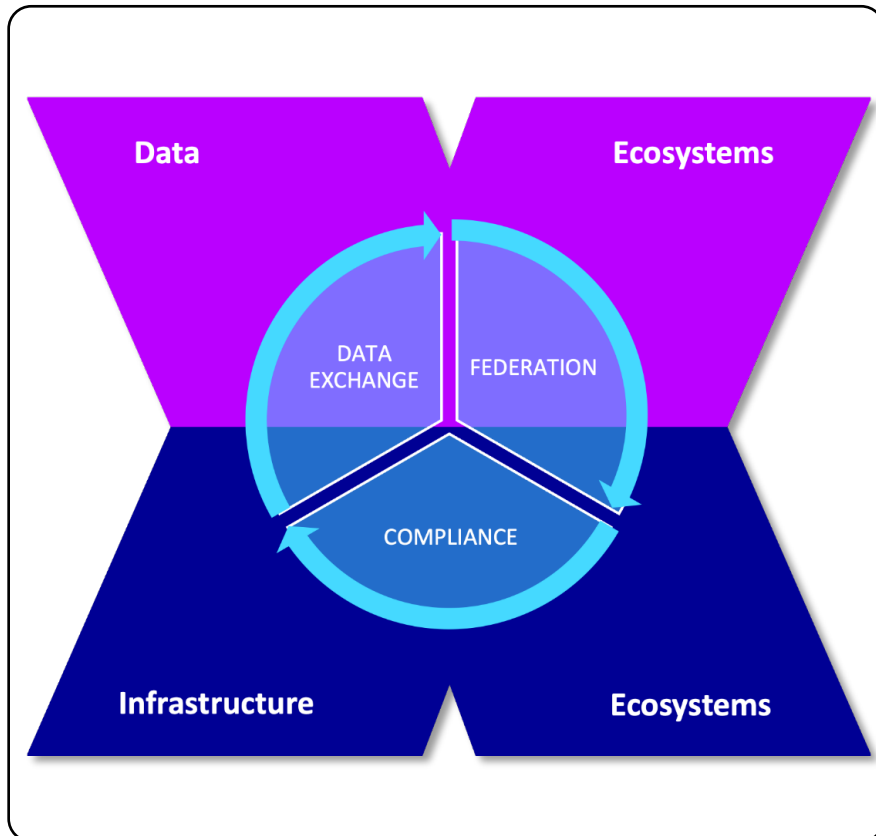
OS for Data Spaces

- In a way, the Gaia-X standard can be thought of as an **Operating System for data spaces**

- Since it solves/aids the **governance layer**
  - The most challenging one for scaling-up
  - Strictly necessary for a multiparty Data Economy

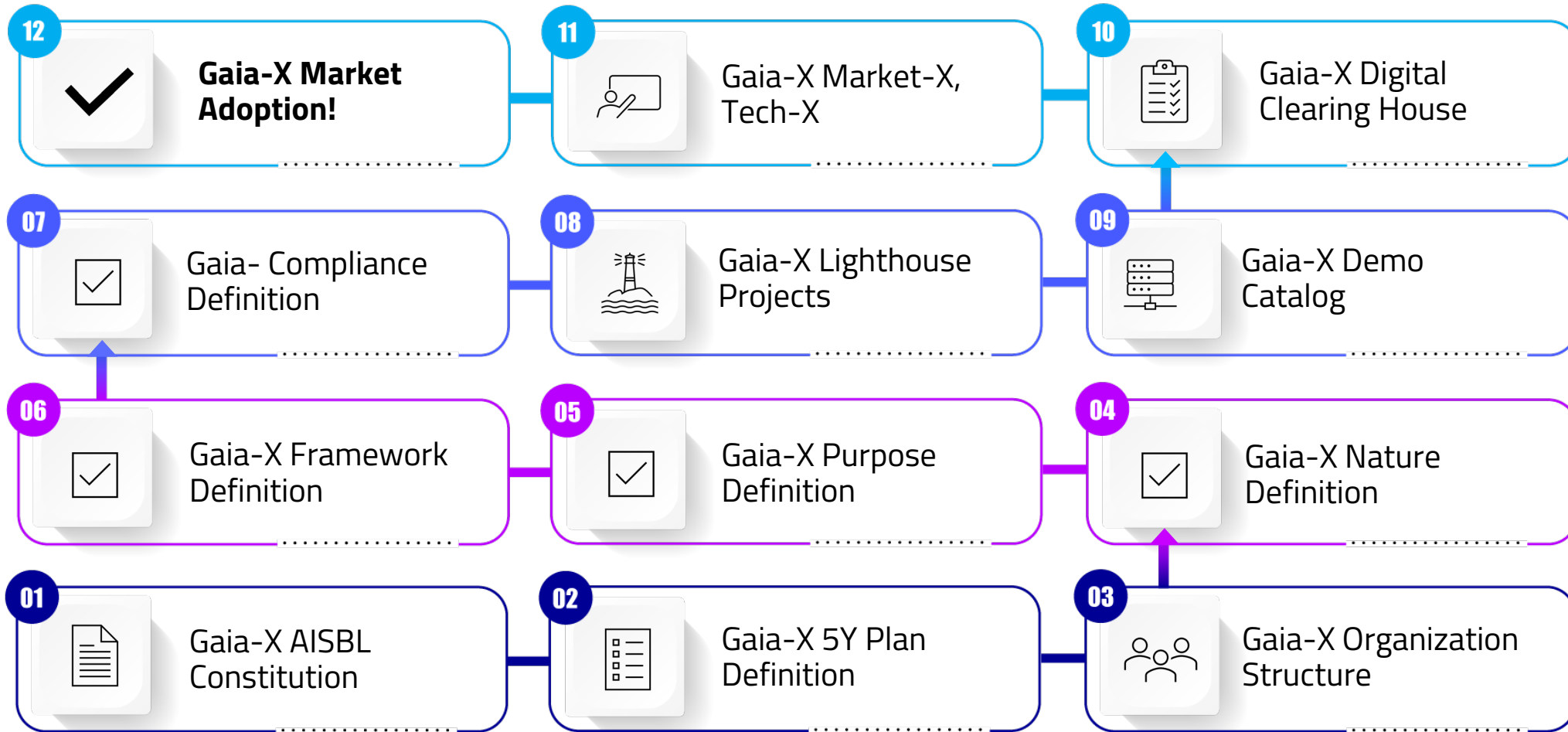- Also facilitates an **integrated regulatory compliance**
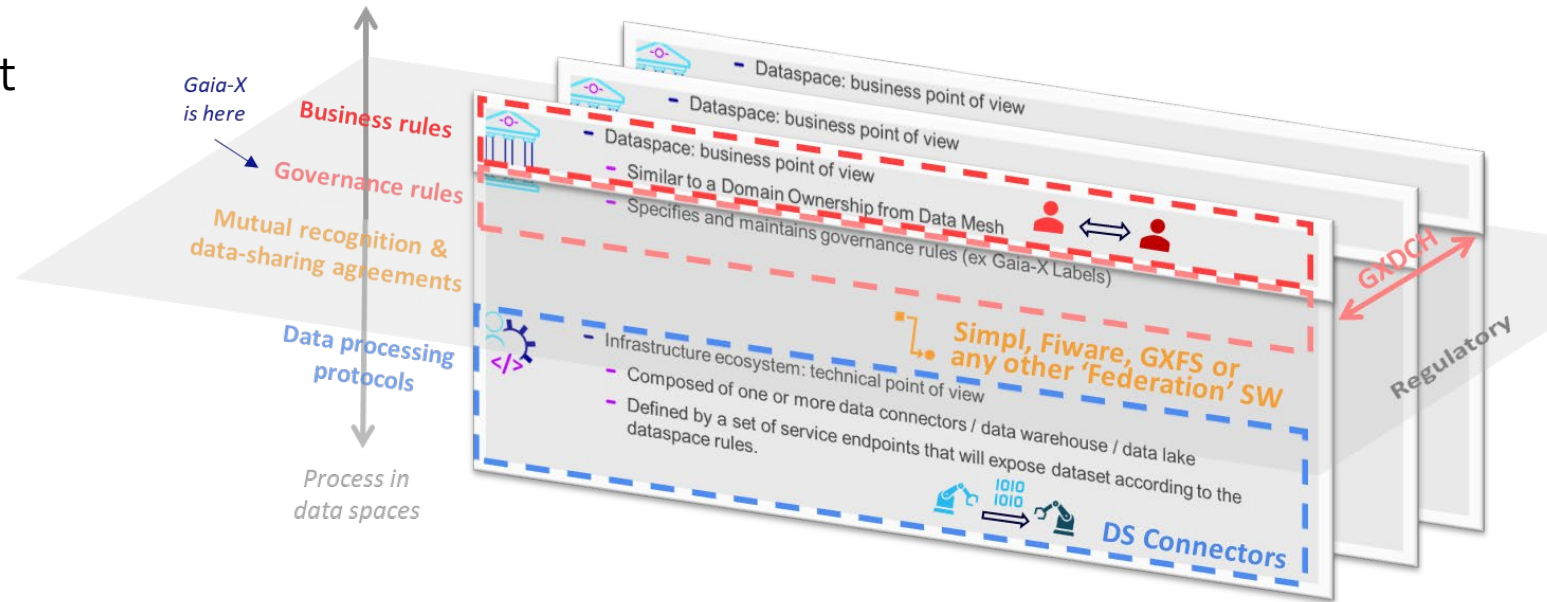
Application to Business

- The Gaia-X model enables the **creation of domain-specific rules** and entending domain ontologies

- A Gaia-X label is an easy way to create & make available (on the *offer* side) and find & use (*demand* side) data resources and services fulfilling business requirements and needs

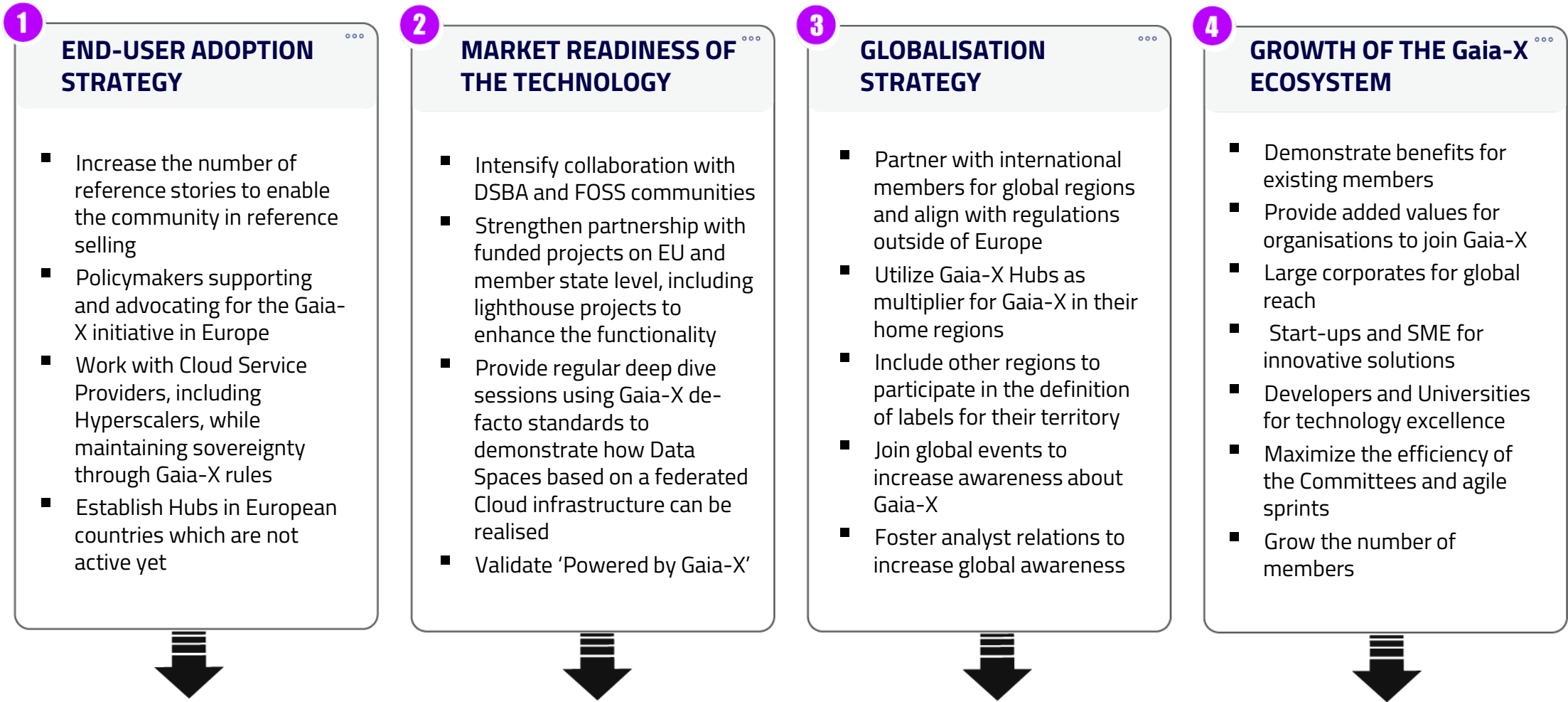 - Without having to study complex governance or regulatory schemes

Domain Specific Controls

CONTROLS   TEMPLATES

| AI Act | DGA | DA | … |

EU or legislation specific policies

Basic Data Exchange Policies

Gaia-X CONFORMITY | Gaia-X LABEL 1 | Gaia-X LABEL 2 | Gaia-X LABEL 3

Gaia-X Infrastructure Labels
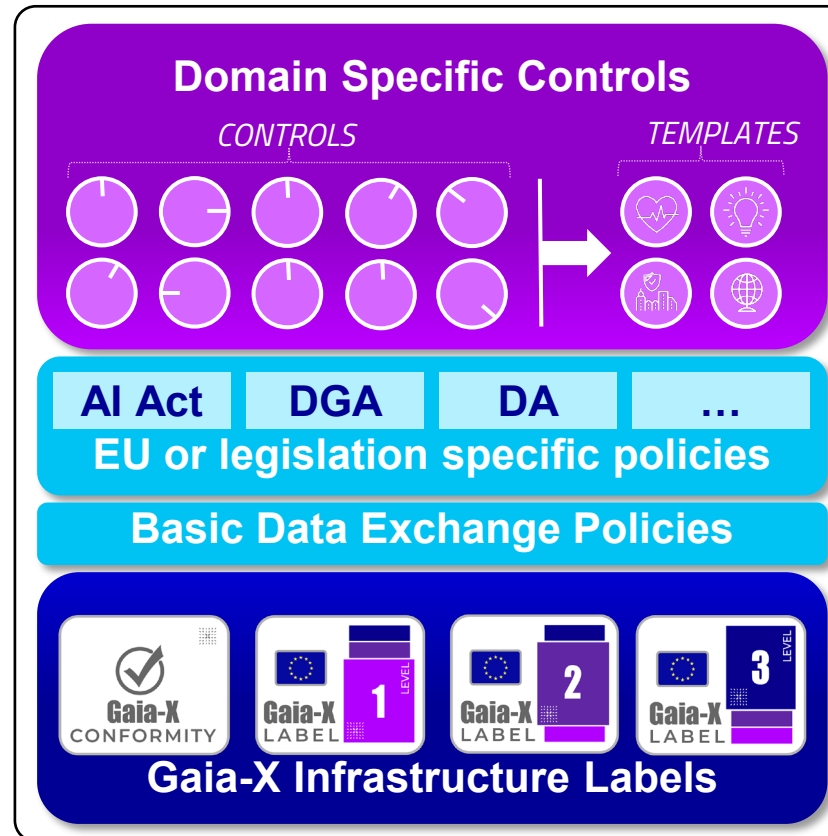
E.g. at infrastructure level, there are already definitions and rules for cybersecurity, privacy, openness & modularity, interoperability & composability, and portability
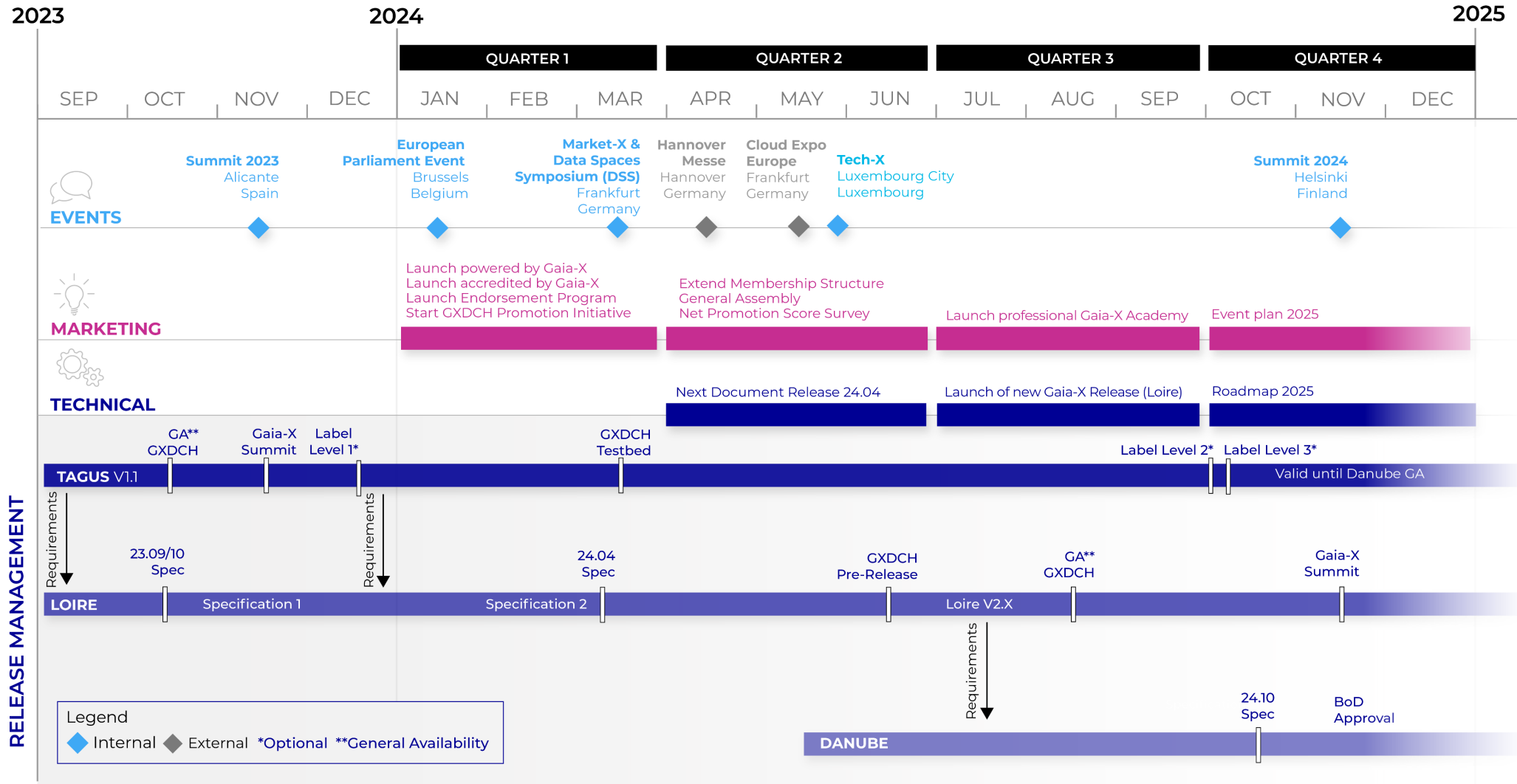
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Gaia-X From Inception to Market

12 ✓ **Gaia-X Market Adoption!**

11 Gaia-X Market-X, Tech-X

10 Gaia-X Digital Clearing House

07 Gaia- Compliance Definition

08 Gaia-X Lighthouse Projects

09 Gaia-X Demo Catalog

06 Gaia-X Framework Definition

05 Gaia-X Purpose Definition

04 Gaia-X Nature Definition

01 Gaia-X AISBL Constitution

02 Gaia-X 5Y Plan Definition

03 Gaia-X Organization Structure

2023

2022

2021

19

Gaia-X Strategy

The Gaia-X Strategic Plan in a nutshell

① **END-USER ADOPTION STRATEGY**

- Increase the number of reference stories to enable the community in reference selling
- Policymakers supporting and advocating for the Gaia-X initiative in Europe
- Work with Cloud Service Providers, including Hyperscalers, while maintaining sovereignty through Gaia-X rules
- Establish Hubs in European countries which are not active yet

② **MARKET READINESS OF THE TECHNOLOGY**

- Intensify collaboration with DSBA and FOSS communities
- Strengthen partnership with funded projects on EU and member state level, including lighthouse projects to enhance the functionality
- Provide regular deep dive sessions using Gaia-X de-facto standards to demonstrate how Data Spaces based on a federated Cloud infrastructure can be realised
- Validate 'Powered by Gaia-X'

③ **GLOBALISATION STRATEGY**

- Partner with international members for global regions and align with regulations outside of Europe
- Utilize Gaia-X Hubs as multiplier for Gaia-X in their home regions
- Include other regions to participate in the definition of labels for their territory
- Join global events to increase awareness about Gaia-X
- Foster analyst relations to increase global awareness

④ **GROWTH OF THE Gaia-X ECOSYSTEM**

- Demonstrate benefits for existing members
- Provide added values for organisations to join Gaia-X
- Large corporates for global reach
- Start-ups and SME for innovative solutions
- Developers and Universities for technology excellence
- Maximize the efficiency of the Committees and agile sprints
- Grow the number of members

Driven by a growth and service oriented team providing thought leadership to the market

Gaia-X Strategic Roadmap 2024

2023 | **2024** | **2025**

	QUARTER 1			QUARTER 2			QUARTER 3			QUARTER 4		
SEP OCT NOV DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

EVENTS

- **Summit 2023** — Alicante, Spain
- **European Parliament Event** — Brussels, Belgium
- **Market-X & Data Spaces Symposium (DSS)** — Frankfurt, Germany
- **Hannover Messe** — Hannover, Germany
- **Cloud Expo Europe** — Frankfurt, Germany
- **Tech-X** — Luxembourg City, Luxembourg
- **Summit 2024** — Helsinki, Finland

MARKETING

- Launch powered by Gaia-X
- Launch accredited by Gaia-X
- Launch Endorsement Program
- Start GXDCH Promotion Initiative
- Extend Membership Structure
- General Assembly
- Net Promotion Score Survey
- Launch professional Gaia-X Academy
- Event plan 2025

TECHNICAL

- Next Document Release 24.04
- Launch of new Gaia-X Release (Loire)
- Roadmap 2025

RELEASE MANAGEMENT

TAGUS V1.1

- GA** GXDCH
- Gaia-X Summit
- Label Level 1*
- GXDCH Testbed
- Label Level 2*
- Label Level 3*
- Valid until Danube GA

Requirements

LOIRE

- 23.09/10 Spec
- Specification 1
- 24.04 Spec
- Specification 2
- GXDCH Pre-Release
- GA** GXDCH
- Loire V2.X
- Gaia-X Summit

Requirements

DANUBE

- 24.10 Spec
- BoD Approval

Legend

◆ Internal ◆ External *Optional **General Availability

Who we are

–

Lighthouse Data Spaces

Agriculture
Agdatahub

Automotive Supply Chain
Catena-X

Lighthouse Projects

Manufacturing
Accurate

Infrastructure & Technology
Boot-X

Aeronautics, Space Sector
Cooperants

Manufacturing, Industry 4.0
Data4Industry-X

Mobility, Transport & Tourism
EONA-X

Energy
Energy data-X

Manufacturing, Industry 4.0
EuProGigant

Finance
EuroDaT

Mobility & Transport
Gaia-X4 Future Mobility

Health
HEALTH-X dataLOFT

Mobility
Mobility Data Space (MDS)

Energy
Omega-X

Education
PROMETHEUS-X

Electronics Supply Chain
SCSN

Cloud Services
Structura-X

Health
TEAM-X

Gaia-X Hubs

EUROPE 16

- Hub Austria
- Hub Belgium
- Hub Finland
- Hub France
- Hub Germany
- Hub Greece
- Hub Hungary
- Hub Italy
- Hub Slovenia
- Hub Netherlands
- Hub Poland
- Hub Portugal
- Hub Romania
- Hub Slovakia
- Hub Luxembourg
- Hub Spain

INTERNATIONAL 5

- Hub Japan
- Hub Korea
- Hub California
- Hub Texas
- Hub Washington DC

IN PROGRESS 8

- Hub Africa
- Hub Denmark
- Hub Estonia
- Hub Czech Republic
- Hub Sweden
- Hub Switzerland
- Hub Ireland
- Hub United Kingdom

gaia-x

Gaia-X Members

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.

Mentioned explicitly in the **European Data Strategy** and proactively addressing key issues. Exchange between Gaia-X and the **European Commission** to identify synergies between Gaia-X and initiatives and programs such as the **European Cloud Federation**, **CEF 2** and **Digital Europe**.

Large Companies

SMEs

Start-Ups

Universities

R&D

Associations

Public Sector

Gaia-X Ecosystems

Aerospace

Agriculture

Construction

Education

Energy

Finance

Health

Location

Logistics

Manufacturing

Media

Mobility

Public Sector

Smart Cities

Smart Living

Tourism

How does it work? – Tech Insight

Dataspace

To build a Dataspace, we need:

- ✓ A governance which can be operationalised.
- ✓ Infrastructures adopting the governance.
- ✓ Parties adopting the governance, using the infrastructures "*to access and use data in a fair, transparent, proportionate and/non-discriminatory manner with clear and trustworthy data governance mechanisms.*"[1]

Problems/Opportunities:

- Sharing data is not new, and there are 1000's existing setups that could qualify as "dataspace"

- They are not discoverable

- Governance and infrastructure interoperabilities are hard - if not impossible - to assess

- Scaling is expensive

Gaia-X proposals

➢ Federated catalogues 📚 for Services and Products.

➢ A worldwide-ready 🗺️ governance based on European values   .

➢ Easy customisation and extension 💼 of the governance per domains, verticals, local markets, …

➢ Interoperability measurement 📏 **across** dataspaces $d = distance(D1, D2)$

Dataspace Domain #2

Dataspace Domain #1

Dataspace Domain #3

Do we share the same rules?

Are our services interoperable?

Do you have data/services of interest?

Gaia-X Digital Clearing House
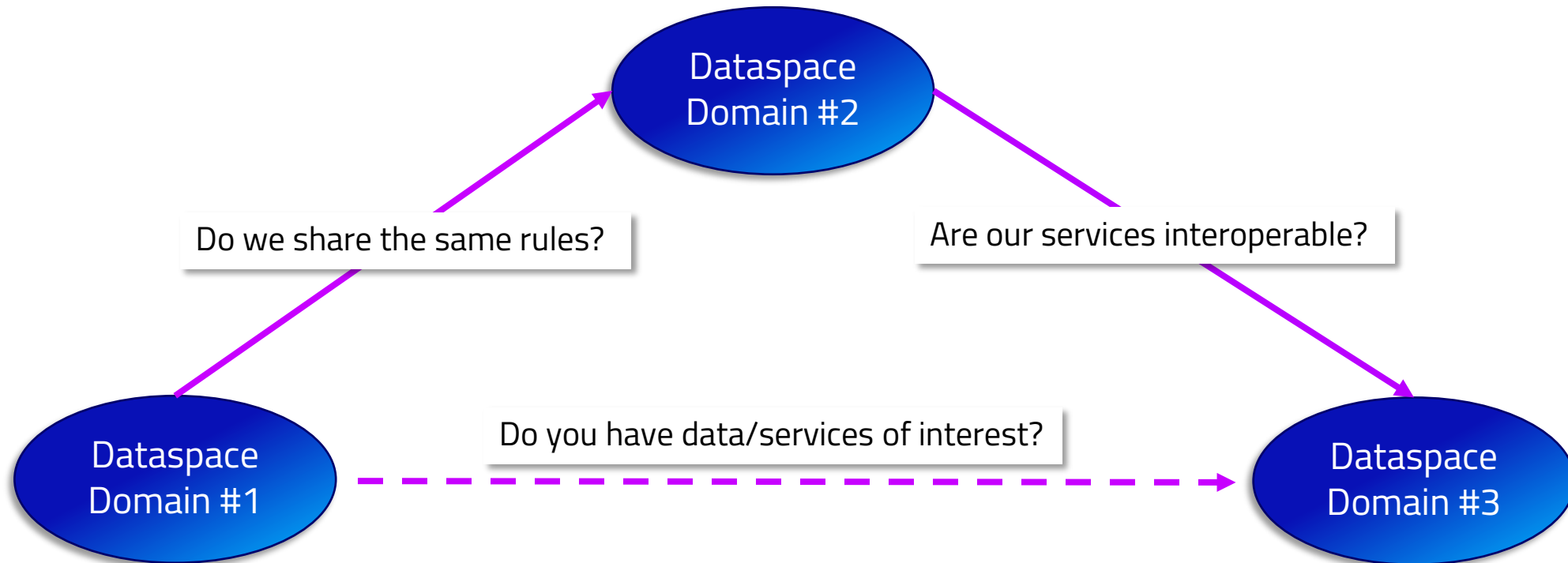
GXDCH Components*

- Gaia-X Registry (compulsory)
- Gaia-X Compliance (compulsory)
- Notary (compulsory)
- Wizard (optional)
- Catalogue (optional)
- Credential Event Service (Optional**)

Gaia-X Digital Clearing House

Node

Gaia-X Conformity and Labels

	C	L1	L2	L3
Declaration of Service or Product	✓	✓	✓	✓
Signed with verified method (eg.eIDAS)	✓	✓	✓	✓
Automated validation by GXDCH	✓	✓	✓	✓
Automated verification by GXDCH*	✓	✓	+	+
Data Exchange Policies	✓	✓	✓	✓
Certified Label Logo		✓	✓	✓
Data protection by EU legislation		✓	✓	✓
Manual verification by CAB			✓	✓
Provider Headquarter within EU				✓

* Current list, may expand in future releases
** CES will become mandatory in Loire (next release)
***not all criteria can be automated, "+" means automated verification if
the evidence issuer (Standard & CAB)

Gaia-X Digital Clearing House in action

How to get started!

DATA ECOSYSTEMS

gxDCH

INFRASTRUCTURE ECOSYSTEMS
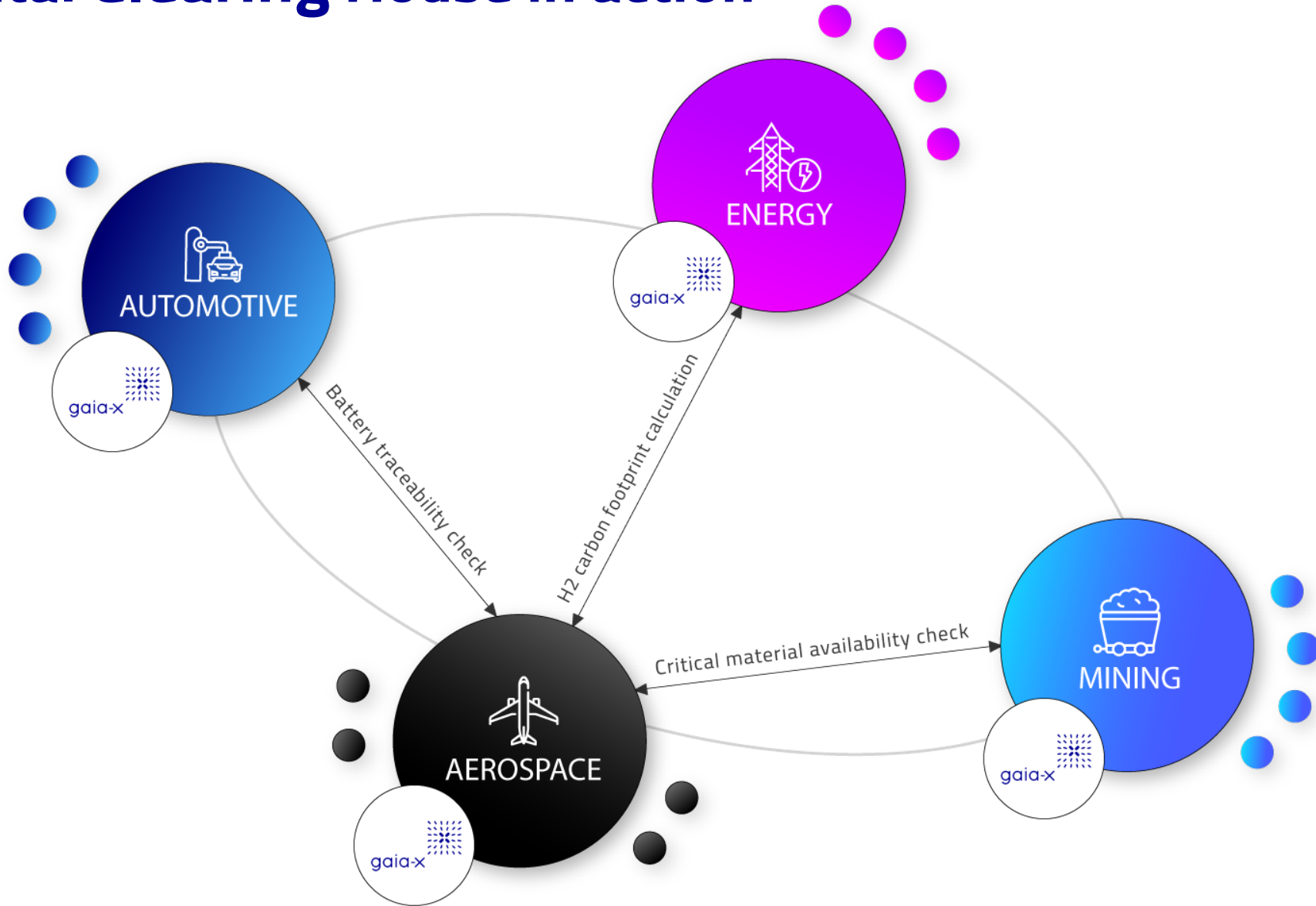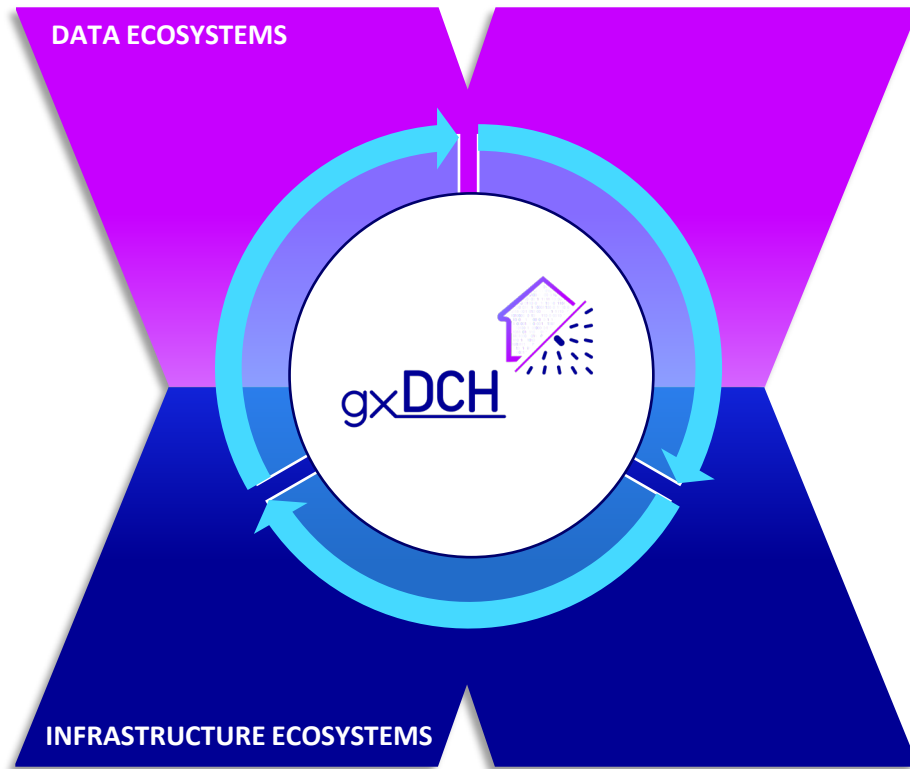
➢ Request a Legal Registration Number credential**.

➢ Create and sign my Legal Participant credential.

➢ Create and sign the Gaia-X Terms & Conditions credential.

➢ Create and sign my Service Offering credential.

➢ Send credentials for validation and request proof of Gaia-X Compliance.

➢ Publish my Service Offering in the network of catalogues.

*All actions done in the wizard are also available via API.

Each step could be done on a different GXDCH instance.

**Credentials are equivalent to digitally signed attestations.

What's in for me– Business Insight

Gaia-X Benefits for Users & Providers

BENEFITS FOR USERS

1. Build and implement common rules in order to be able to exchange data in a trusted way.

2. Accelerate sovereign data driven EcoSystems.

3. Enable global data driven value chains through federated trust and interoperability.

BENEFITS FOR PROVIDERS

1. Expand reach, visibility and market share by delivering services which are certified as compliant with Gaia-X.

2. Become one stop shop as a GXDCH Provider, for your existing and new customers utilising the Gaia-X EcoSystem.

3. Deliver DataSpace as a Service (DSaaS) to enable fast, cost efficient, transparent and reliable data driven Business Application.

User Life cycle

JUMP START
Interoperability
Trust
Data Exchange Policy
Vertical & HuB Network

SECURE INVEST
Interoperable Dataspace
Time to market
Reduce transaction cost

GET STARTED
enabled by GXDCH
Powered by Gaia-X logo

**ACCELERATE DIGITAL
BUSINESS MODEL**
Virtual Stack
DSaaS

**USER
Life cycle**

GOVERNANCE MEMBER
WG, Sprints, BoD, OGA

NEW BUSINESS (PARTNER)
Expand Data Space
Network
New customers
Globalisation possible due to the label levels

Provider Life cycle

ONBOARD NEW BUSINESS
Participants
New data spaces
New apps
interoperability

GOVERNANCE MEMBER
WG, Sprints, Bod, OGA

DATA SPACE AS A SERVICE
Data Space Stack
Infrastructure & Capabilities

BUSINESS OPPORTUNITIES
Trust
Infrastructure for data services
Support for SME
next generation PaaS

VERIFIABLE CREDENTIALS
Self/service description
VCs for provider services
Uplift price

GXDCH PROVIDER
Become One-Stop-Shop
Advertised by Gaia-X
Gaia-X accredited logo

05
06
04
01
03
02

PROVIDER
Life cycle

Where User and Provider Connect

JUMP START
Interoperability
Trust
Data Exchange Policy
Vertical & HuB Network

SECURE INVEST
Interoperable Dataspace
Time to market
Reduce transaction cost

ONBOARD NEW BUSINESS
Participants
New data spaces
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interoperability

GOVERNANCE MEMBER
WG, Sprints, Bod, OGA

GET STARTED
enabled by GXDCH
Powered by Gaia-X logo

USER
Life cycle

**ACCELERATE DIGITAL
BUSINESS MODEL**
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DATA SPACE AS A SERVICE
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VERIFIABLE CREDENTIALS
Self/service description
VCs for provider services
Uplift price

GXDCH PROVIDER
Become One-Stop-Shop
Advertised by Gaia-X
Gaia-X accredited logo

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www.youtube.com/@gaia-x5188

Thank you!

Gaia-X Association