



Towards a Public Sector Data Space in Luxembourg

Frameworks, services and technologies

Bert Verdonck





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CEO Luxembourg National Data Service

1993 MSc Engineering, KULeuven, Belgium

1996 PhD Medical image processing, ENST Paris, France

1996-2022 Healthcare informatics, Philips, Netherlands

Since 2020 Gaia-X

Since 2022 Data Space Support Centre

Since 2022 Luxembourg National Data Service

Since 2023 Gaia-X board member



Background for the creation of LNDS:

Data reuse is a key enabler for innovation in Luxembourg

2019 – Ministry of the Economy



2020 – Ministry of Research and Higher Education



2023 – Ministry of Digitalisation

4 strategic axes for successfully achieving a digital government

- Developing eGovernment
- Advancing administrative simplification
- Promoting digital inclusion
- Ensuring data governance

The LNDS teams

The diverse team of experts enabling the activities of LNDS

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Technology



Service

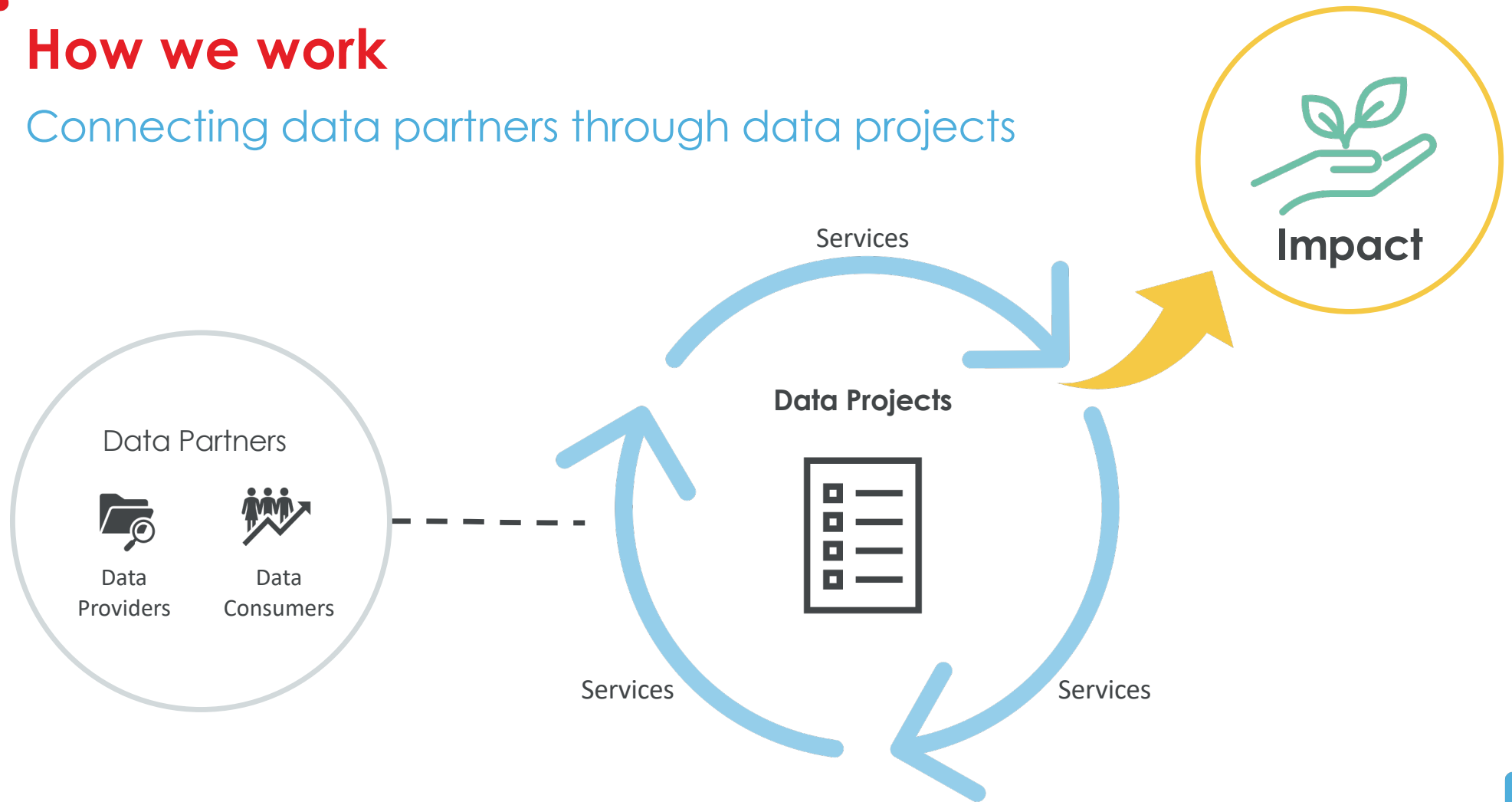


Enabling functions



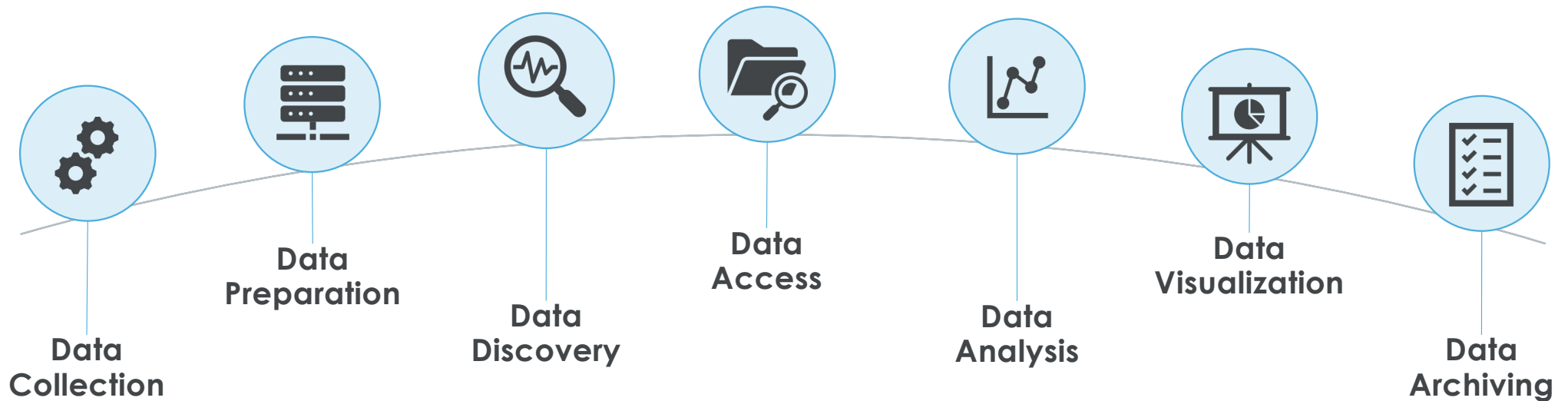
How we work

Connecting data partners through data projects

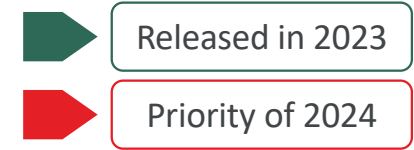


How we work throughout the data journey

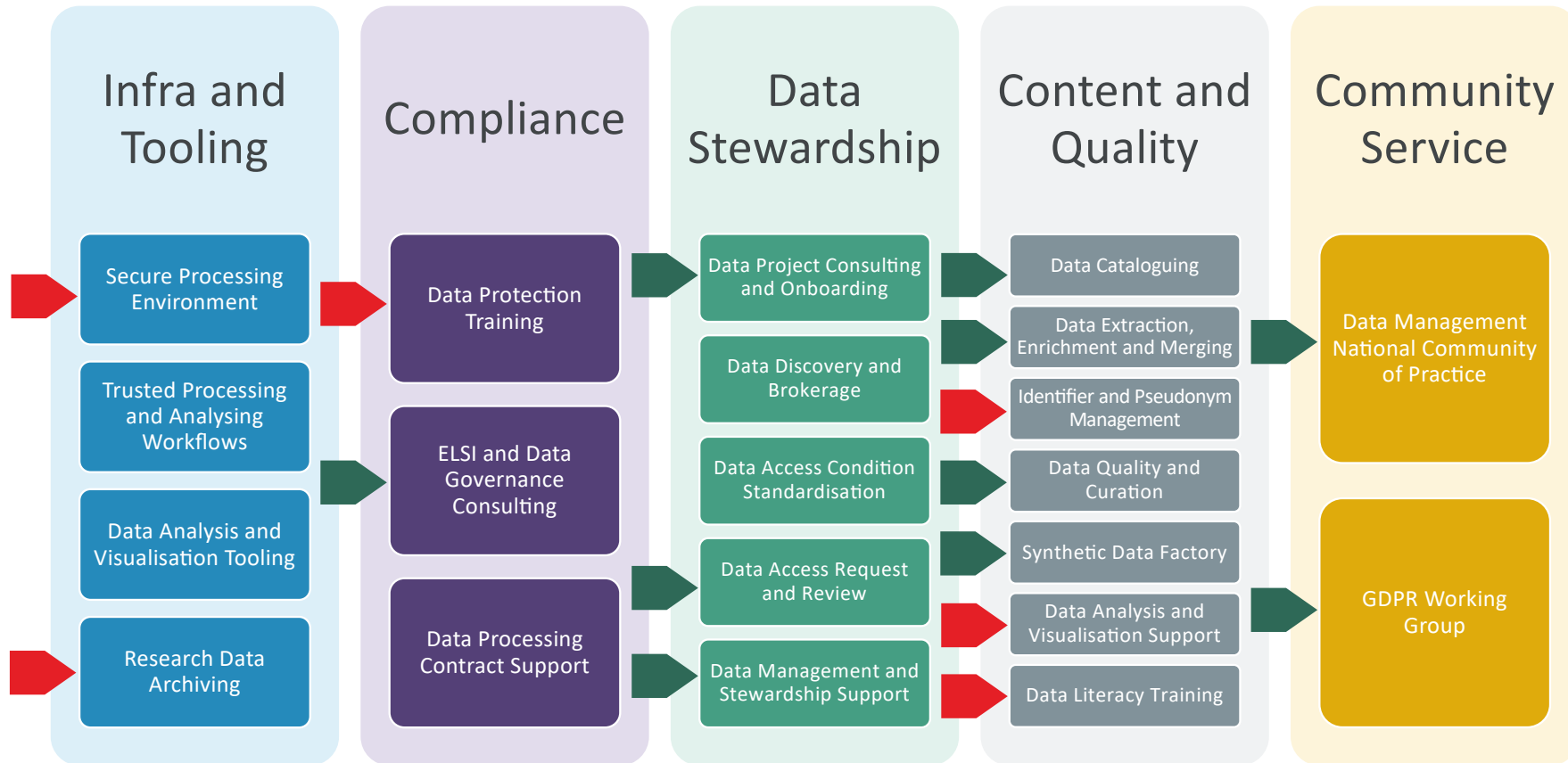
Capacities, tools, processes & knowledge sharing



Our service portfolio



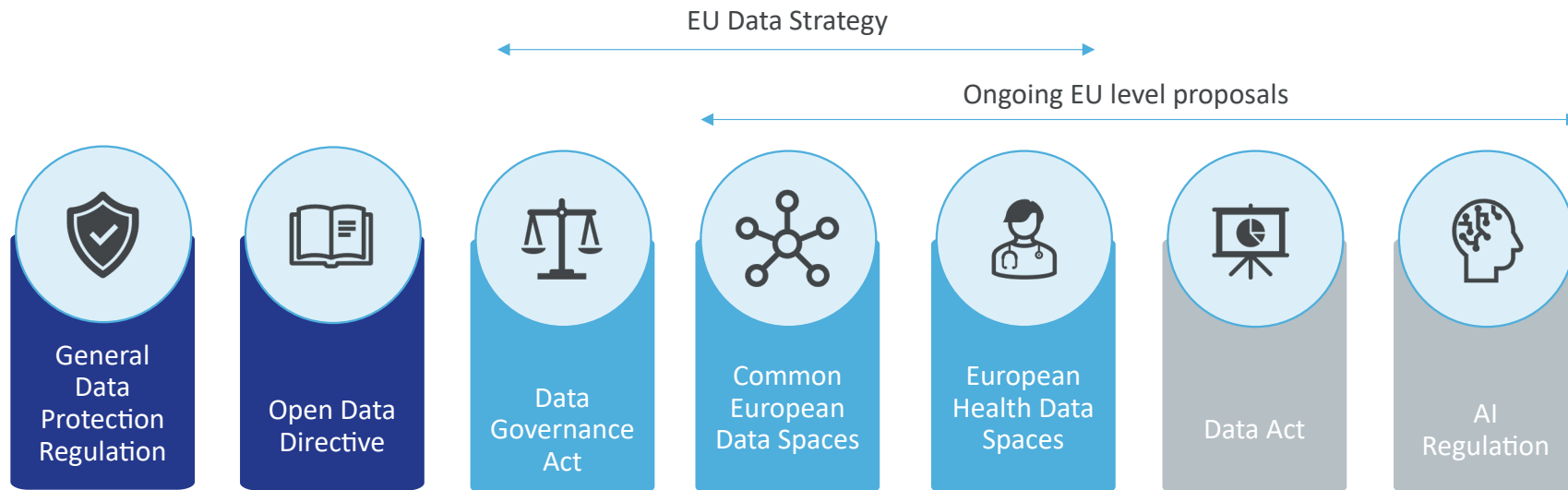
Design and build a service portfolio to deliver value





Background for the creation of LNDS:

Luxembourg contributes to European data space initiatives

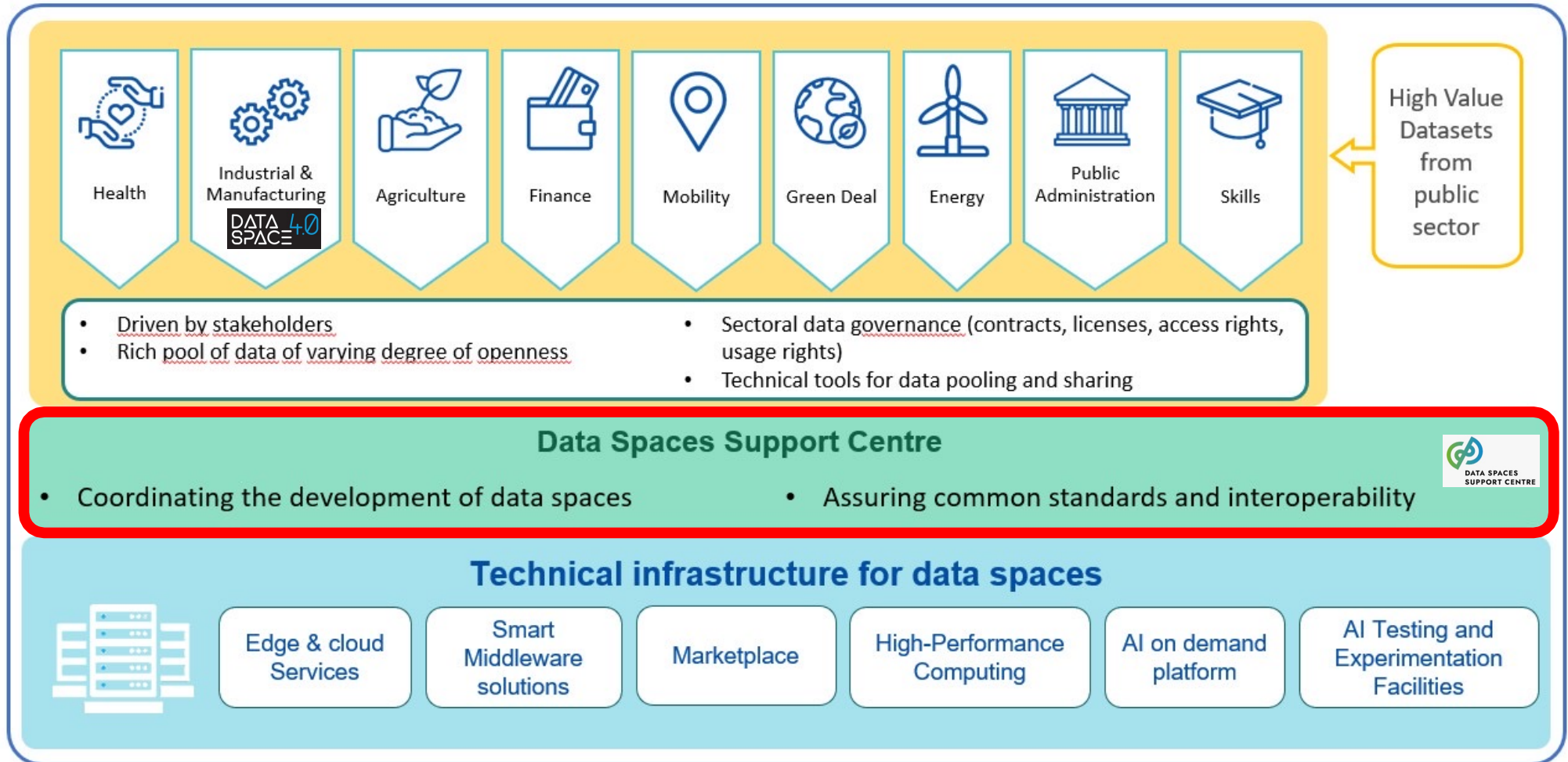


Involvement on European level

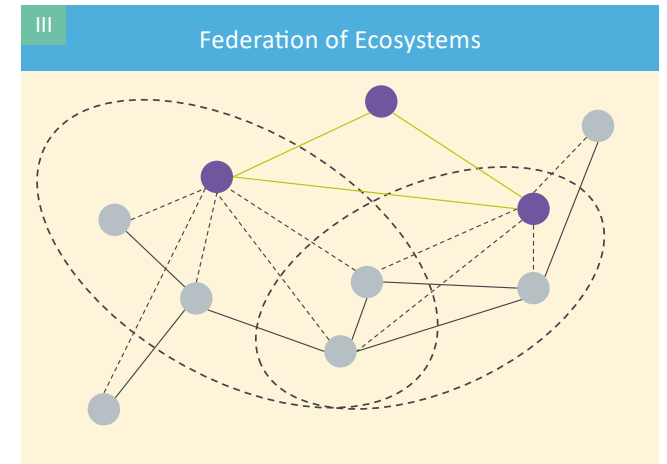
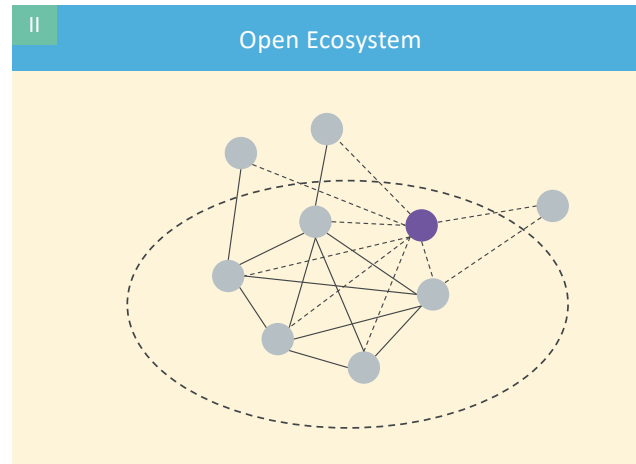
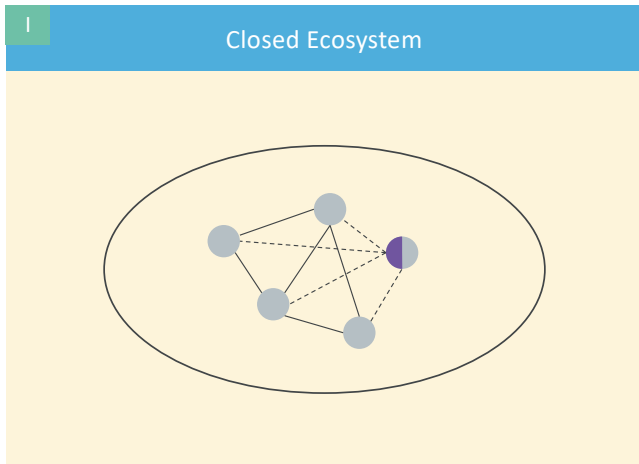
Making an impact also on European and international level



Our context: Common European data spaces



Data sharing ecosystems evolve over time



Legend

Roles: ● Participant (Data Holder | Data User); ● Intermediary.

Data Exchanges: — Shared data incl. metadata between participants; - - - Metadata between participant and intermediary;

- - - Metadata between participant and intermediary;

— Metadata between intermediaries.

Ecosystems: ○ Closed; ○ Open.





Business and organisational building blocks



Business

Business model development

Use case development

Data product development

Data space intermediary



Governance

Organisational form and governance authority

Participation management



Legal

Regulatory compliance

Contractual framework



Technical building blocks



Data interoperability

Data models

Data exchange

Provenance and traceability



Data sovereignty and trust

Identity and attestation management

Trust framework

Access and usage policies enforcement



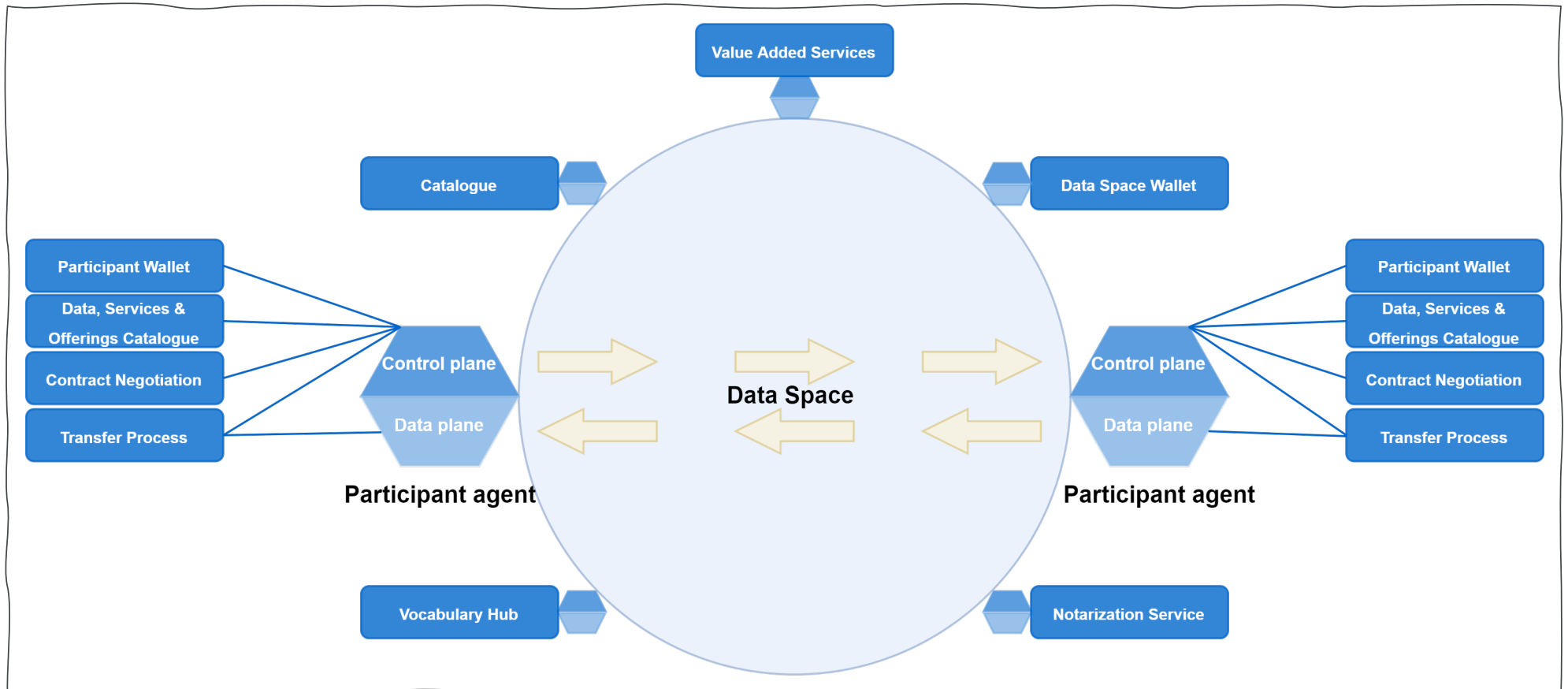
Data value creation enablers

Data services and offerings descriptions

Publication and discovery

Value added services

From building blocks to components



Are our Ecosystems ready?



No! Disjoint Data & Infrastructures Ecosystems



Data

Untapped, fragmented, disjoint, no secure exchange mechanism



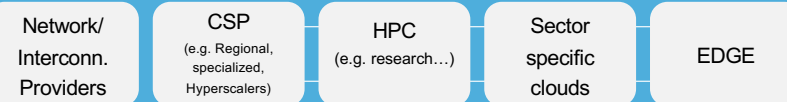
infrastructures

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

Data Ecosystem



Infrastructure Ecosystem



Gaia-X – Connect Disjoint 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.



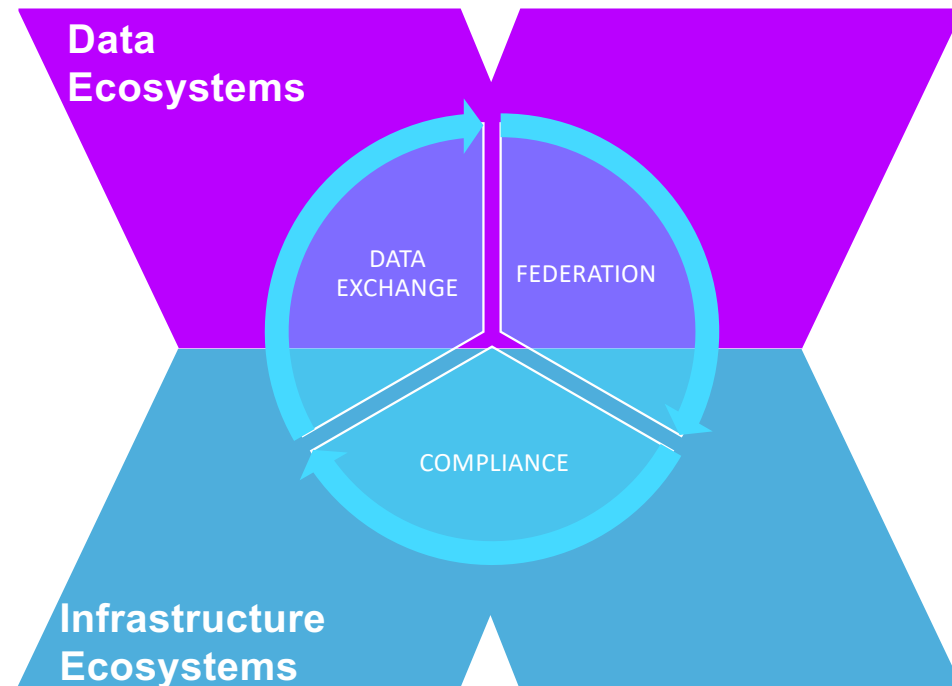
Gaia-X Compliance

Decentralized services to enable objective and measurable trust.

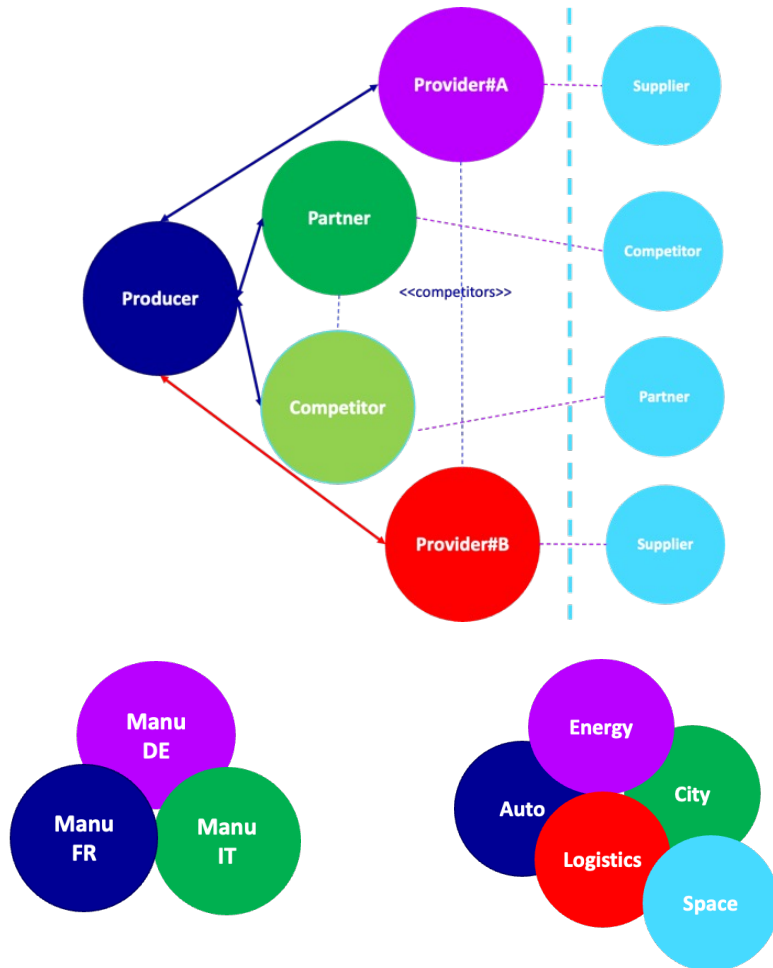


Label framework

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



The Data Space Ecosystem Problem: 'Trust'



The Business Problem:

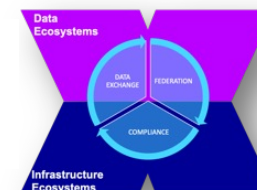
- Identify business use cases
- Sell inside your organization
- Identify potential federation participants
- Build consensus
- Find common business outcomes/interests
- Offer reciprocal and balanced outcomes

The Technical Problem:

- **Trusted** participants identity
- **Trusted** federation services credentials
- **Trusted** federation access and usage mechanisms
- **Trusted** federation extensibility mechanisms
- **Trusted** data-infrastructures
- **Trusted** federation governance
- **Trusted** federator role
- Have one-stop-place for **trust** services

The Solution

Common Trust Framework



Common Trust Engine

Web3 and Gaia-X



Is Gaia-X supporting the web3 and why?

Is web3 important for the future?

It is the decentralized evolution of the web where participants and users can have a true form of ownership and control

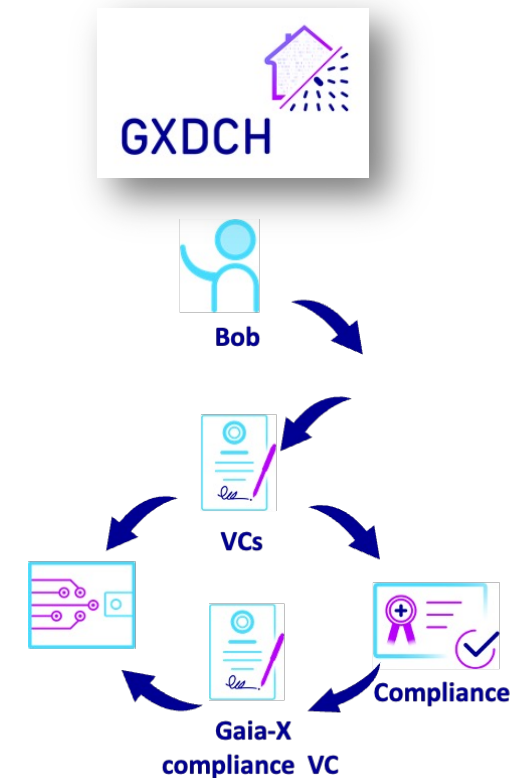
It is driven by architectural principles (decentralization, semantic description, linked data objects, self sovereign identity, digital ledgers), not by adoption of specific technologies

The possibilities are still the early spring phase, whilst crypto is already in a winter phase

It promotes digital democratization

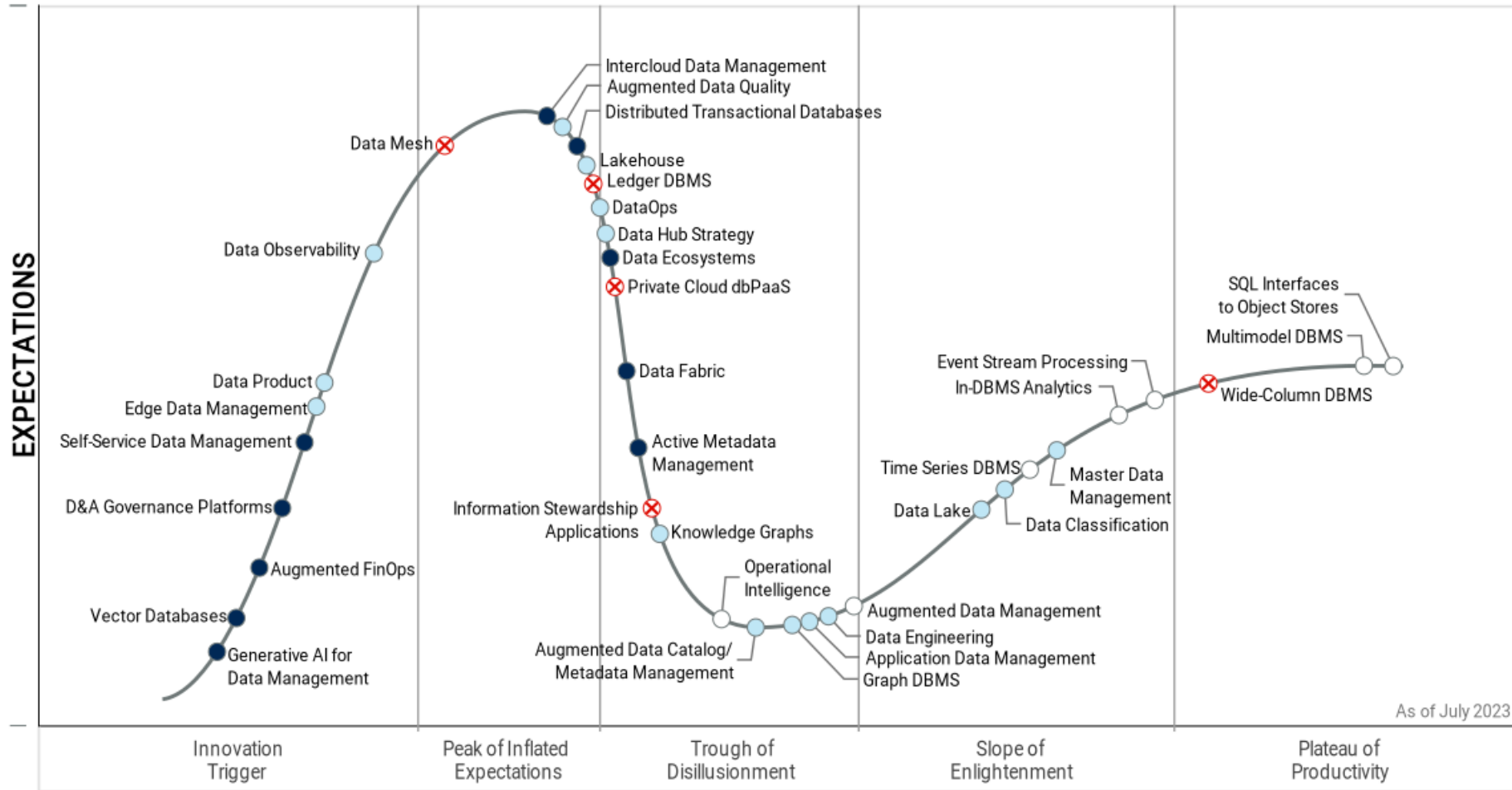
Gaia-X defines a new standard to qualify and verify (trust) participants & resources in a digital collaboration

Gaia-X use and extend web3 principles in its Framework to promote Digital Trust as foundational for Digital democratization



Hype Cycle for Data Management, 2023

Note: Personal Data Stores: not even on here!?



As of July 2023

Plateau will be reached: ○ <2 yrs. ● 2-5 yrs. ● 5-10 yrs. ▲ >10 yrs. ⊗ Obsolete before plateau



Data? Data!

What is valuable data?

- Personal versus non-personal
- Open versus restricted
- Static/historical versus real-time/streamed
- Linked data / APIs
- For primary use versus secondary use (internal/external)
- Data Products
- Separate Data from Applications/Code





Primary vs Secondary use

- Primary
- Secondary internal
- Secondary external





Data intermediaries: oil for the engine?

Services of different kinds

- Data space enabling services
- Personal data intermediaries, data operators, PIMS
- Data Governance Act: data intermediation services

- Governance and business models still vague at this stage





Regulatory technology

Can we achieve automated compliance?

- Cookie notices: great, but we should do better
- Smart contracts: pending breakthrough
- Gaia-X trust framework: from concept to production
- Solid project: from concept to production
- Data Act and AI Act bring new challenges
- Enable the user to stay in control, in balance with economies of scale and speed of innovation





Ethical dilemmas?

Many come from lack of education/information, some are real

- Citizen information portals
- Optimise consent management
- Optimise data request management
- Reduce variation in legal interpretation
- Then a smaller set of real dilemmas will remain...



┌ Citizen Portal specification process has started – inviting interested parties to co-create with us

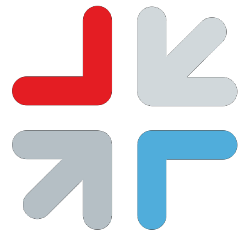
- Initially: a prototype and proof-of-concept of a citizen information portal to ease the data subject's rights according GDPR
 - For data subjects: to be informed and to exercise their rights in a simple and consistent manner
 - For data users: to inform about the categories and scope of data used
- Optionally: extend with a generic consent management service – consent management as a service
- Eventually: a citizen information portal for information on all secondary use of personal data, accessible and configurable in one place, to be integrated with Guichet.lu



┌ Citizen Science Project specification and design have started – inviting parties to co-create

- A playground for experimenting with citizen involvement in personal data sharing and processing.
- It engages with volunteers only: adult residents with an interest in the objectives of the project and a willingness to consent with our terms.
- It also serves as an experimentation ground for the Citizen Portal project, allowing for co-creation by interested citizens.
- MVP: create a portal for volunteers to join the project, authentication using LuxTrust, ask a minimal personal dataset (age, sex, shoe size), ensure secure pseudonymised storage of data, extract data for statistics, publish results back to the community.





LNDS

LUXEMBOURG NATIONAL DATA SERVICE

