DSSC Insight Series

How to build data spaces

16 November 2023 | 16:00 to 17:30 CET | online

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DATA SPACES SUPPORT CENTRE

Funded by the European Union

The Data Spaces Support Centre receives funding from the European Union Digital Europe Programme under grant agreement n° 101083412.

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DATA SPACES SUPPORT CENTRE

Open APIs for Open Minds

How to build Data Spaces

Cristina Brandtstetter, Member of the Board of Officers & CMO, FIWARE Foundation

Data Spaces Support Centre
Insight Series Webinar, November 16, 2023

FIWARE

Unlocking the value of Data Spaces - in a nutshell

- **Data Spaces have the potential to transform** the way data is shared, operationalised and even monetised between different organisations.
- Given the complexity of **ecosystems** - today mostly sector-specific: they will be critical to also be or become interoperable.

Also a **citizen-centric approach** is key to realize the 'European idea' of a sovereign European single market for data. That's why **DSSC invites stakeholders of all kind** to participate in and use the results of DSSC.

Find out more: [A European Strategy for data | Shaping Europe's digital future (europa.eu)]

What drives us
The “European Idea” on Data Spaces

In 2021 already, the European Commission describes the European idea this way:

Commission welcomes political agreement to boost data sharing and support European data spaces

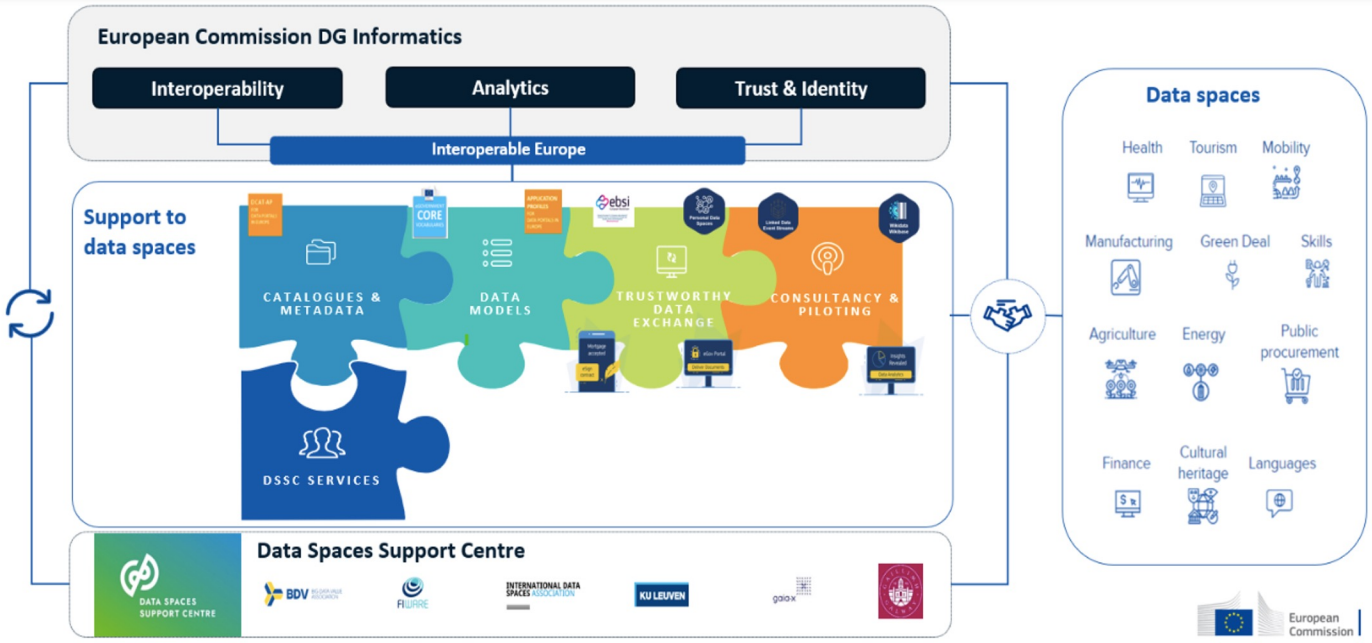
The Commission welcomes the political agreement reached between the European Parliament and EU Member States on a European Data Governance Act. Trilogue negotiations have now concluded, paving the way for final approval of the legal text by the European Parliament and the Council.

> This **Regulation is a first building block for establishing a solid and fair data-driven economy**. It is about setting up the right conditions for trustful data sharing in line with our European values and fundamental rights. We are creating a **safe environment in which data can be shared across sectors** and Member States for the benefit of society and the economy.
>
> *Executive Vice-President for A Europe Fit for the Digital Age, Margrethe Vestager*

> With the **Data Governance Act** agreed today, we are defining a common approach to data sharing – the European way. We are facilitating the flow of growing industrial data across sectors and Member States to help Europe become the world's number one data continent. We are doing so by building trust, putting the individuals and companies who generate data in the driving seat so they **remain in control of the data they create**. In a nutshell: an **open yet sovereign** European Single Market for data.
>
> *Commissioner for Internal Market, Thierry Breton*

FIWARE

Data Spaces in Europe: using the DSSC for the successful and fast realization of Data Spaces



The **European strategy for Data** aims **to speed up the development of the European data** ecosystems and economy to harness the societal value of data, and to ensure Europe's global competitiveness and data sovereignty.

Common European data spaces shall **follow specific design principles** which include a common technical infrastructure and building blocks, as well as interconnection and interoperability.

Source and more info: [Data Spaces | Joinup (europa.eu)]

What do we understand by a “Data Space”?

A data space is….

- a distributed system defined by a **governance framework**
- that enables trustworthy **data transactions** between **participants**
- while supporting trust and **data sovereignty**.

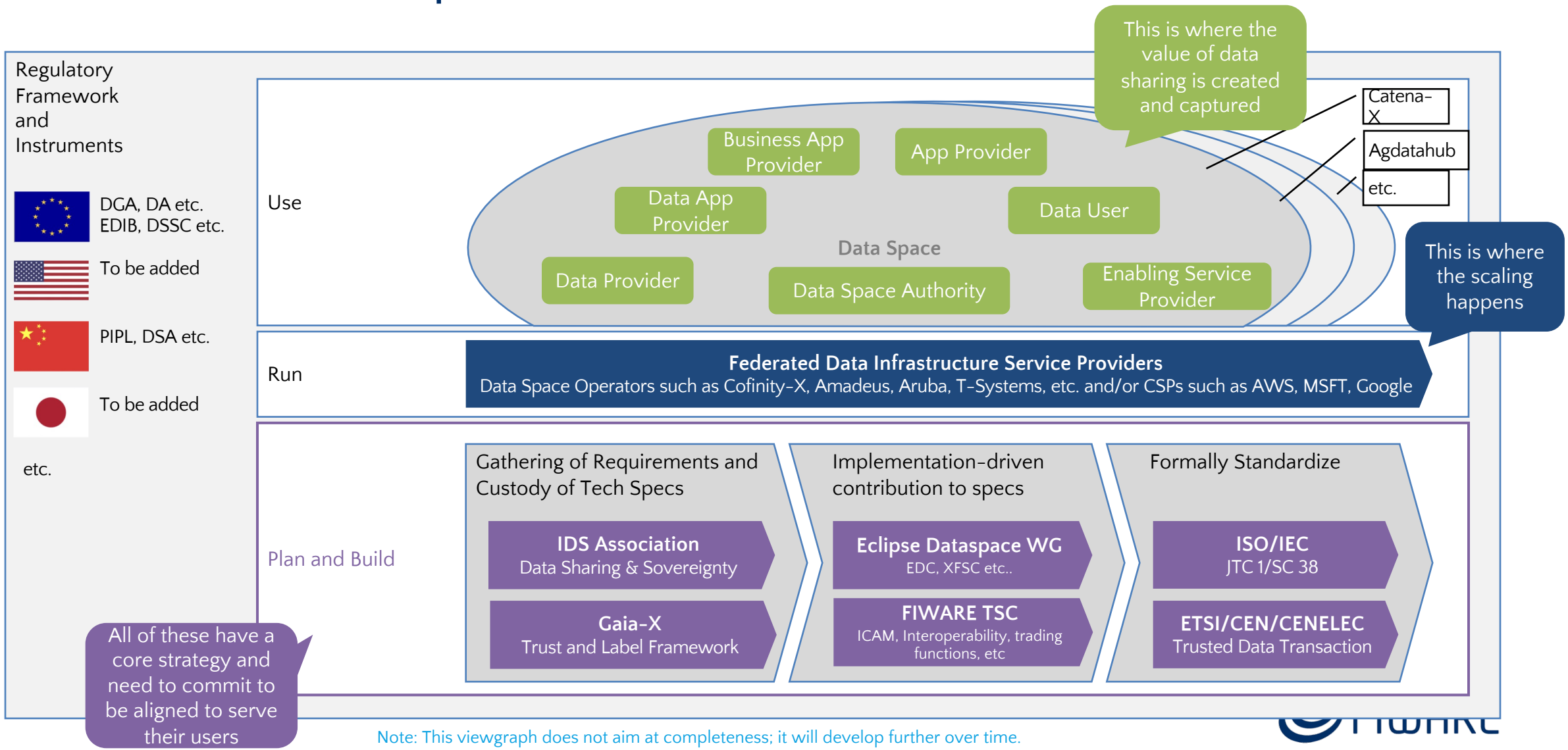
A data space is implemented by one or more **infrastructures** and supports one or more **use cases**.

One Example: a Smart Cities domain use case might entail traffic management in smart cities, end-to-end intermodal mobility services as well as detailed traffic infrastructure monitoring.

In data spaces, compliance to legal provisions regarding the management and use of data is ensured.

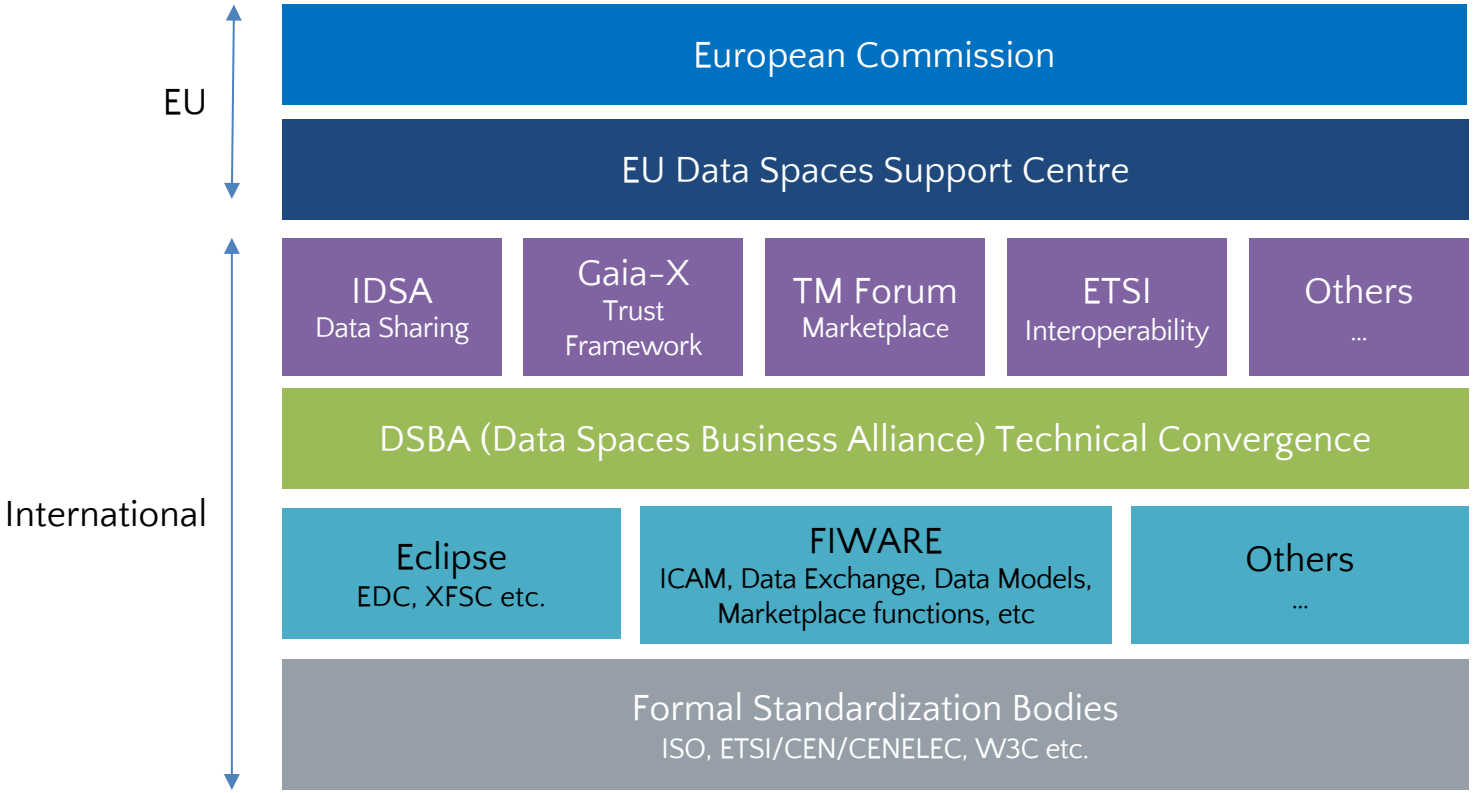
Data subjects and holders can control their data and its subsequent use.

Data Spaces - The big picture
Cloud-based Data Spaces



Note: This viewgraph does not aim at completeness; it will develop further over time.

Data Spaces: Based on the Core - The Swim Lanes
Cloud-based Data Spaces



Legal framework for the European Digital Single Market

Official mandate for EU data space blueprints and building blocks, data spaces support

Voice of the communities, coordinate technical specs and business requirements, support to "business design"

Alignment in technical specifications and standards to adopt

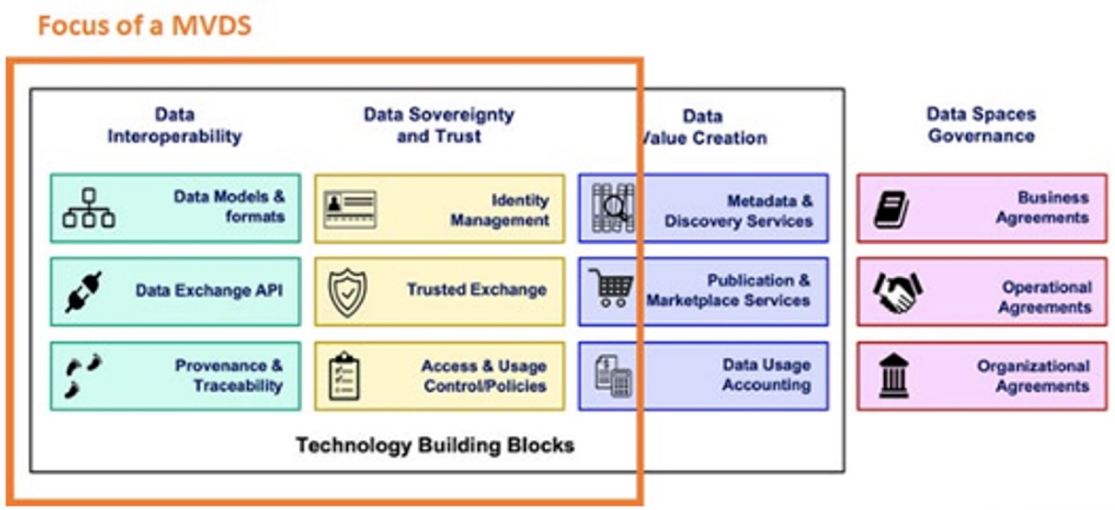
Contribution to Technical specs driven by OSS implementation, place for the developer communities

Long-term investment security, adoption support etc. through norms and standards

Note: This viewgraph does not aim at completeness; it will develop further over time.

Open Source technologies in Data Spaces
FIWARE contributing to a wide set of Building Blocks

Minimum Viable Data Space (MVDS)



Credit: FIWARE

The set of building blocks for the **creation of interoperable data spaces** in different application domains, to which FIWARE is contributing its technology, is providing exactly the functionality to enable interoperability by **defined interfaces and data models.** This is finally the basis to be able to monetise data and to create value out of data.

Set of Building Blocks

Data spaces provide significant benefits to cities, including

- improved resource efficiency and better decision-making, and thus
- meet, for example, **sustainability goals** through the implementation of a comprehensive data strategy that expands the frontiers of the organisation.
- To trial this, cities can **implement a minimum viable data space (MVDS)** using diverse kinds of defined Data Space Connectors, and the FIWARE data space technology building blocks.

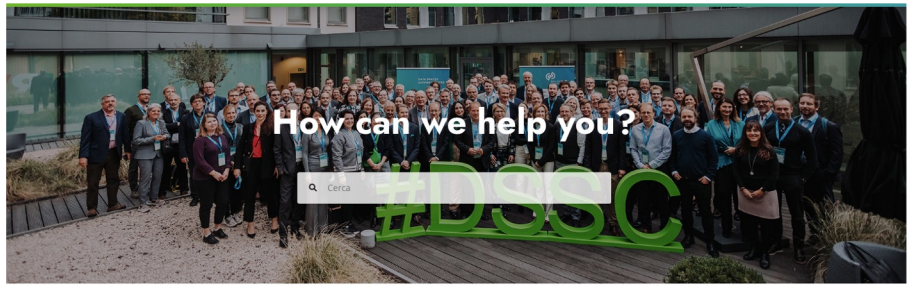
Data Space Business Alliance (DSBA) - Technical Convergence Paper

Data Spaces Business Alliance's mission…

- to drive the adoption of data spaces across Europe and beyond through joining forces by BDVA, FIWARE, Gaia-X, and IDSA formed the Data Spaces Business Alliance (DSBA).
- Mid 2023, the DSBA has published the 'Technical Convergence Discussion Document', an agile paper that defines a common reference technology framework.
- It's based on the technical convergence of existing architectures and models, which leverages mutual infrastructure and implementation efforts.

The goal of this paper is to achieve interoperability and portability of solutions across Data Spaces by harmonizing technological components.

Data Spaces Support Centre: Giving a real helping hand! Blueprint vs 0.5 is out!



Data Spaces Support Centre

- contributes to the creation of common data spaces,
- that collectively create a data sovereign, interoperable and trustworthy data sharing environment,
- to enable data reuse within and across sectors,
- fully respecting EU values, and supporting the European economy and society.

Funded by the European Commission as part of the Digital Europe Program, the Data Spaces Support Centre is aimed at the public sector and companies that want to create sovereign data spaces.

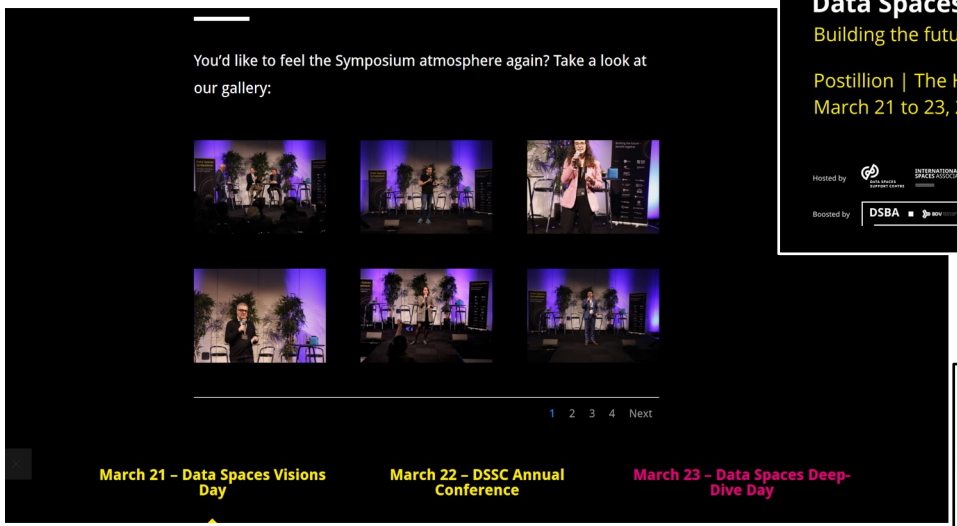
The **' Data Space Blueprint'** (version 0.5) provides

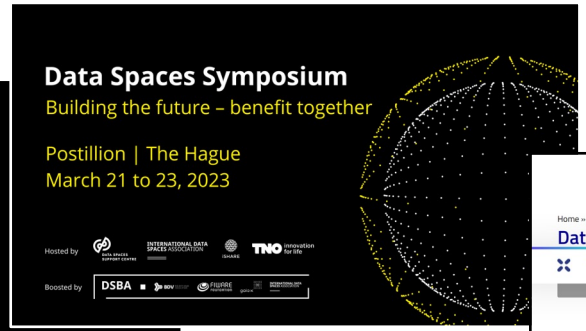
- a set of guidelines DSSC is developing to support the creation of data spaces.
- including
  - a **glossary**
  - a **conceptual model** for data spaces
  - a collection of **building blocks**
  - along with the recommended **selection of standards**, specifications, and reference implementations.

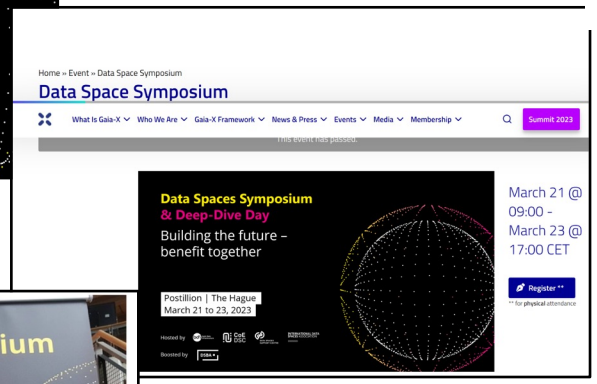
Visit Data Spaces Support Centre www.dssc.eu to download your free copy!

DATA SPACES SYMPOSIUM (DSS) is back in 2024: March 12-14 in Germany with 1,000+ visitors

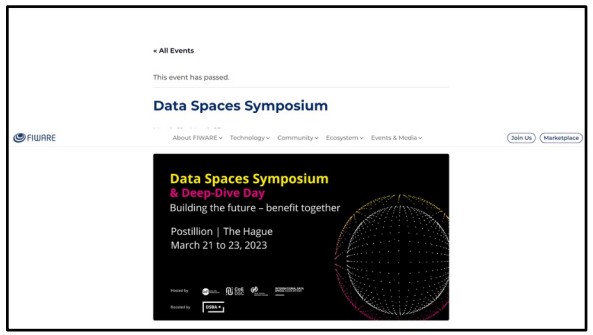
Save the Date

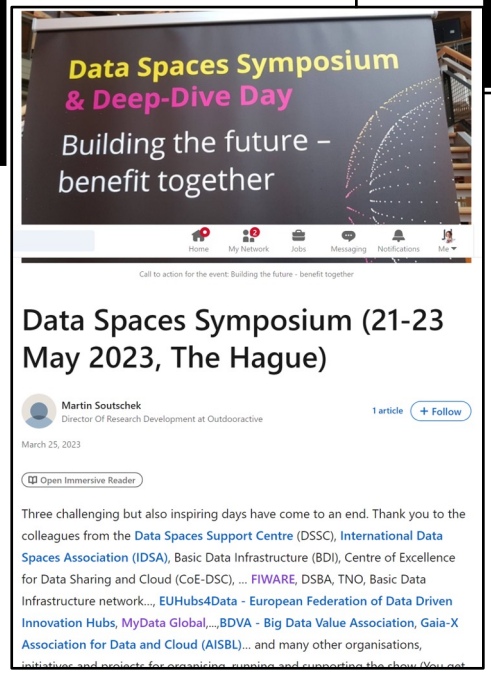


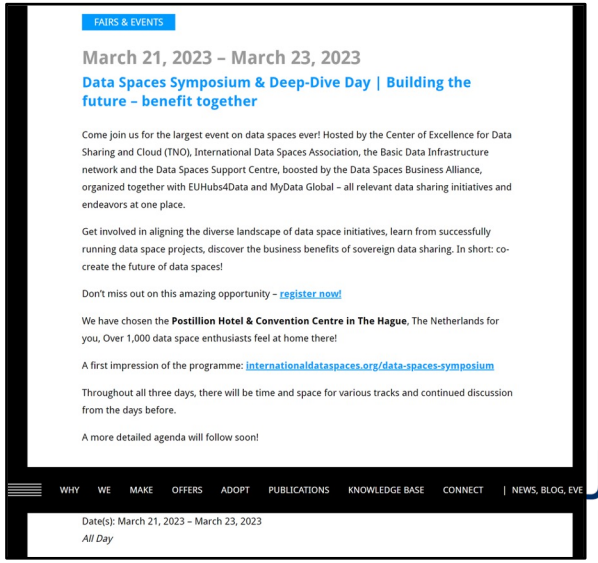




Data Spaces Symposium - International Data Spaces







INTERNATIONAL DATA SPACES ASSOCIATION

The IDSA Rulebook

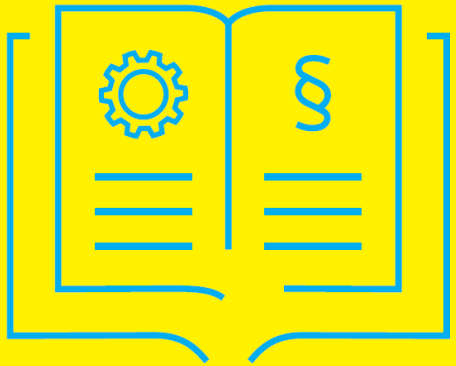
DSSC Insight Series Webinar – How to build data paces

Julien Adelberger (IDSA)

INTERNATIONAL DATA SPACES ASSOCIATION

White Paper | Version 1.0 | December 2020

IDSA Rule Book



- ○ Position Paper of members of the IDS Association
- ○ Position Paper of bodies of the IDS Association
- ○ Position Paper of the IDS Association
- ● White Paper of the IDS Association

1 Introduction

1.1 Who should read this rule book?

It is all about data. If your business has anything to do with generating or exchanging data or building/using data-driven ecosystems and business models, you should be thinking about data sovereignty. This book is for you.

This rulebook addresses:

- Peer-to-peer data sharing
- Data sharing ecosystems
- Data marketplaces
- Data-driven platforms
- Data-driven business models
- GAIA-X participants

1.2 Goals and scope

1.2.1 Goals of the IDSA

The IDSA aims to unlock the data economy of the future by providing the blueprint for secure, self-determined data exchange among trusted partners. This is what's referred to as "data sovereignty," and it is vitally important, in light of the fact that data access and exchange are rapidly becoming critical success factors for both companies and entire economies.

Until now, companies have held vast amounts of valuable data that they have been unable to control, share or monetize on their own terms. The IDSA has defined a reference architecture and a set of agreements that can be used to create virtual data spaces which establish trust among partners and a basis for innovative, new business models, products and services.

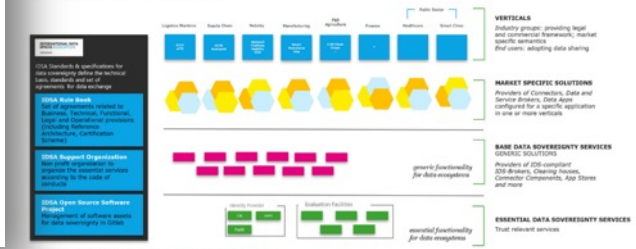


Figure 1 Overview IDS enabled ecosystems

The IDS protocol is based on commonly accepted data governance models so that it can facilitate secure data exchange and easy linkage across disparate systems, industries and geographies.

1.2.2 The purpose and scope of the rule book

In order for the future data economy to function smoothly and deliver on its value proposition, all players need to abide by a common governance framework that specifies the functional, technical, operational and legal agreements that structure their roles and interactions within and across the various parts of the ecosystem. This book outlines that framework.

By following these rules and guidance, all players can work together to reach our shared goal of unlocking the full value of the global data economy. For the purposes of this book, the key roles in the IDS ecosystem are as follows:

1. **The IDSA Support Organization**: Responsible for maintaining the rule book and for supporting its application. The IDSA support organization helps coordinate key processes and as general governance instance a foundation for the realization of internal structures and interfaces to other parties.

2. **The essential service providers**: Responsible for providing the essential services needed by all participants. They build the source of common agreements.

3. **All users of IDS:** Users will need guidance on how to proceed within this framework to realize use cases on the foundation of a trustworthy infrastructure and governance.

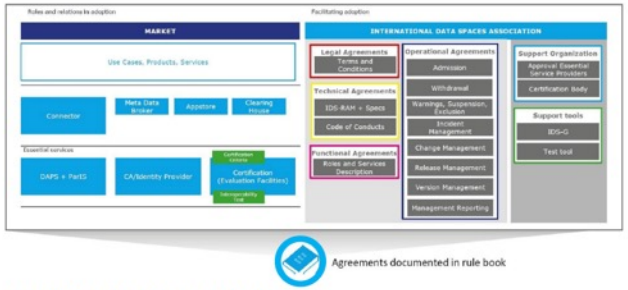


Figure 2 Overview Rule Book scope and goals

IDSA Rulebook

Success factor for data spaces

INTERNATIONAL DATA SPACES ASSOCIATION

- defines **functional requirements** for data spaces.
- describes the **technical, operational, and legal agreements** to enable the IDS ecosystem to be fully working in a real-world scenario.
- outlines **a common governance framework** that all players need to abide to, for a smoothly running future data economy.
- is **industry-agnostic**, and applicable in all verticals as a **horizontal standard**.

IDSA Rulebook

What is it about?

INTERNATIONAL DATA SPACES ASSOCIATION

1 *Functional requirements*

Separation of duties
- Roles of participants in data spaces
- Definition of mandatory and optional requirements for data spaces
- How to implement data sovereignty?

2 *Legal agreements*

What technology can't fix
- Legal agreements
- Usage policy enforcement

3 *Technical agreements*

Specifications for the Standard
- IDS-RAM (Reference Architecture Model)
- IDS-G specifications, open-Source contributions for IDSA
- IDS Certification
- IDS Testbed for interoperability testing and compliance proof

4 *Operational agreements*

Towards reliable developments
- Comprehensive Life Cycle of IDS
- Policies for essential services

Running data space instances
- Developing and operating an IDS compatible data space
- How to achieve interoperability?

IDS-RAM	Specifications	Lifecycle	Certification	Operations
The core of data spaces	Binding details	Reliable planning	Proof of compliance	Use in practice

IDSA Rulebook Working Group

Catching up!

INTERNATIONAL DATA SPACES ASSOCIATION

Rulebook Working Group

- In 2022 IDSA has set up a Rulebook Working Group
- Rulebook development process is aligned with the IDSA operational handbook process
- The Rulebook Working Group is open for every IDSA member
- The group meets on a monthly basis, the first Tuesday of the month, 12:30 – 14:00 CET.

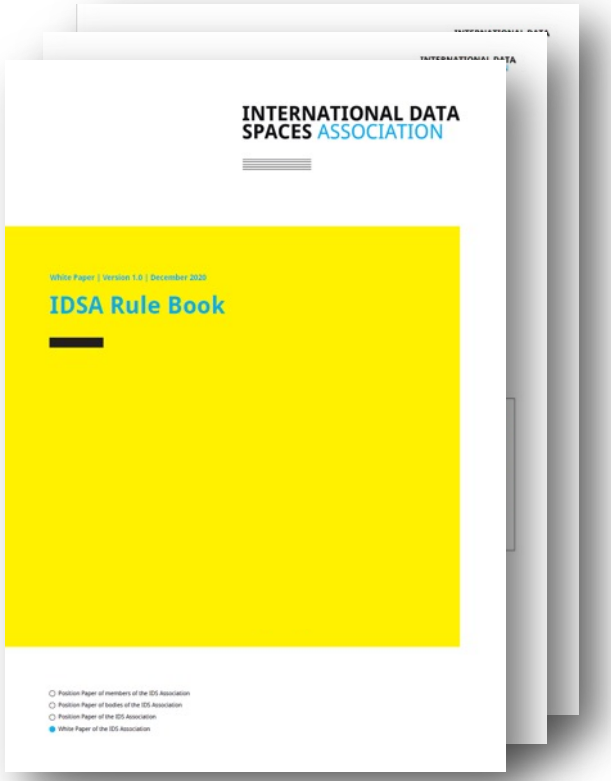
What is the Rulebook?

- The Rulebook is the document containing all functional requirements and technical, operational and legal agreements to set-up and operate data spaces based on IDS.
- It connects the IDS-RAM, IDS-G and IDS Certification to the operational viewpoint.
- Provides basis for maintenance and reliability of the IDS as an industry standard.

Ongoing work

IDSA Rulebook

INTERNATIONAL DATA SPACES ASSOCIATION



Published

- IDS Rulebook will be updated continuously by the working group
- Find the current version in the IDSA docs https://docs.internationaldataspaces.org/idsa-rulebook-v2/
- And on GitHub https://github.com/International-Data-Spaces-Association/IDSA-Rulebook

INTERNATIONAL DATA SPACES ASSOCIATION

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Senior Project Coordinator

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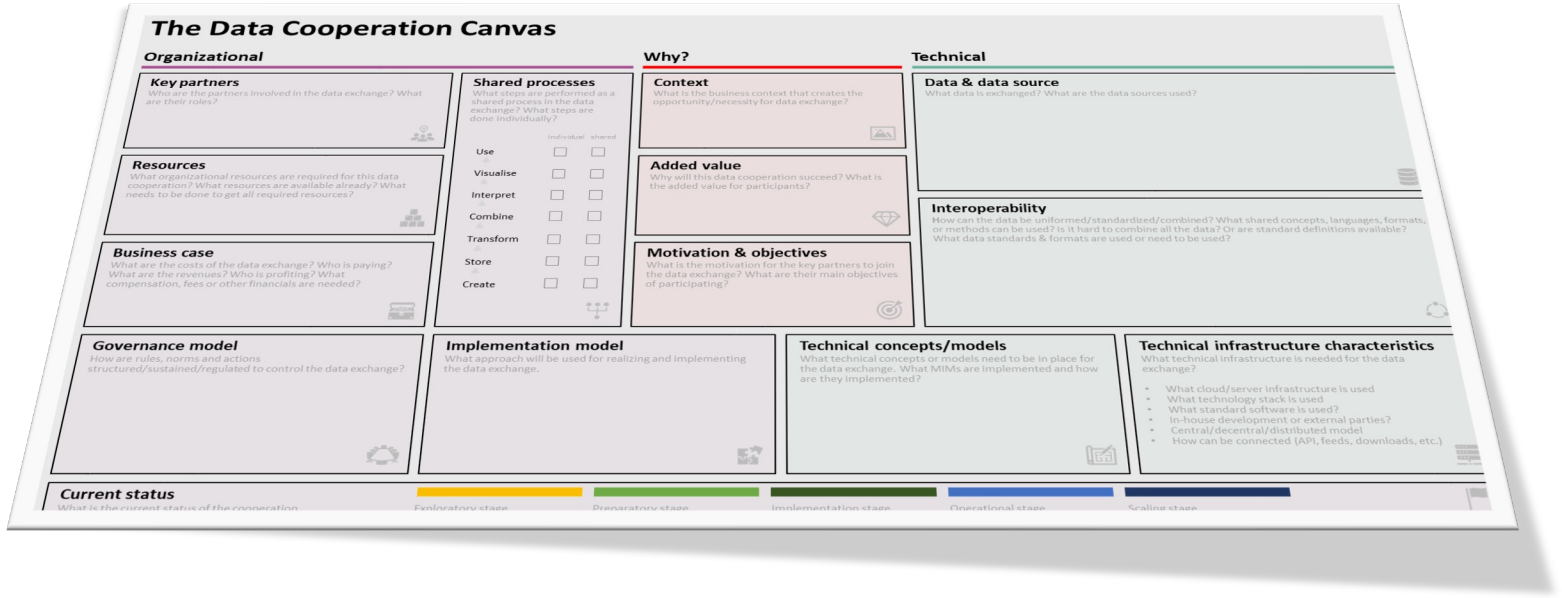
International Data Spaces Association

The Data Cooperation Canvas

Describing and exploring data cooperations

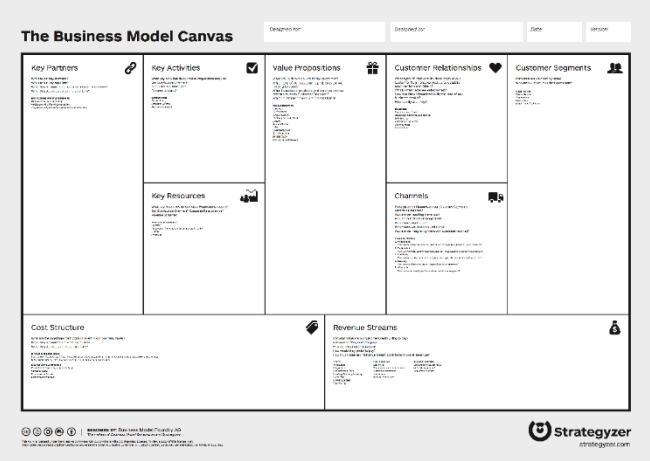
Ron van der Lans & Jasper Soetendal



What is the Data Cooperation Canvas?

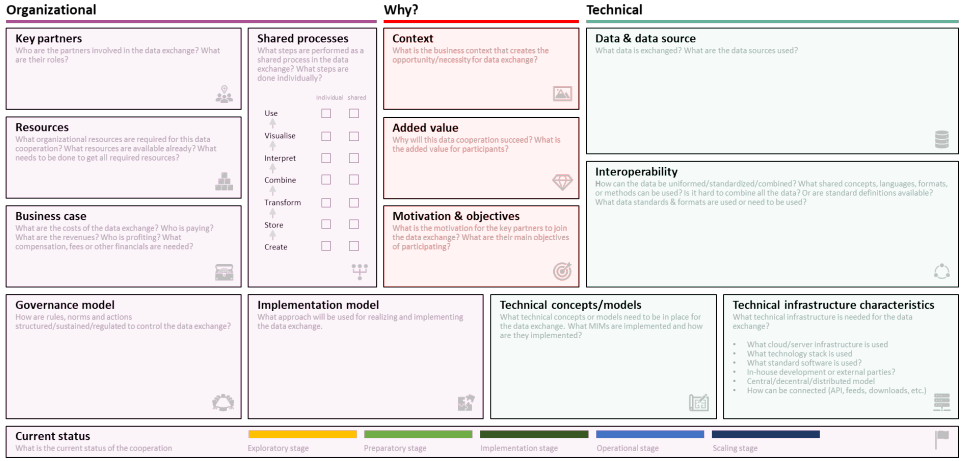
The Data Cooperation Canvas is much like the well-known ‘Business Model Canvas’.

Business Model Canvas



- Describe/compare existing business models
- Explore new business models

The Data Cooperation Canvas



- Describe/compare existing data cooperations
- Explore new data cooperations

The Data Cooperation Canvas has been conceived as part of the preparatory actions for the Data Space for Smart and Sustainable Cities and Communities (DS4SSCC). The canvas was developed by Ron van der Lans and Jasper Soetendal of Braxwell.com in the role of external experts strategic data partnerships of the Directorate Digitalization & Innovation of the City of Amsterdam and has been added by other participants of DS4SSCC working groups.

Why the Data Cooperation Canvas?

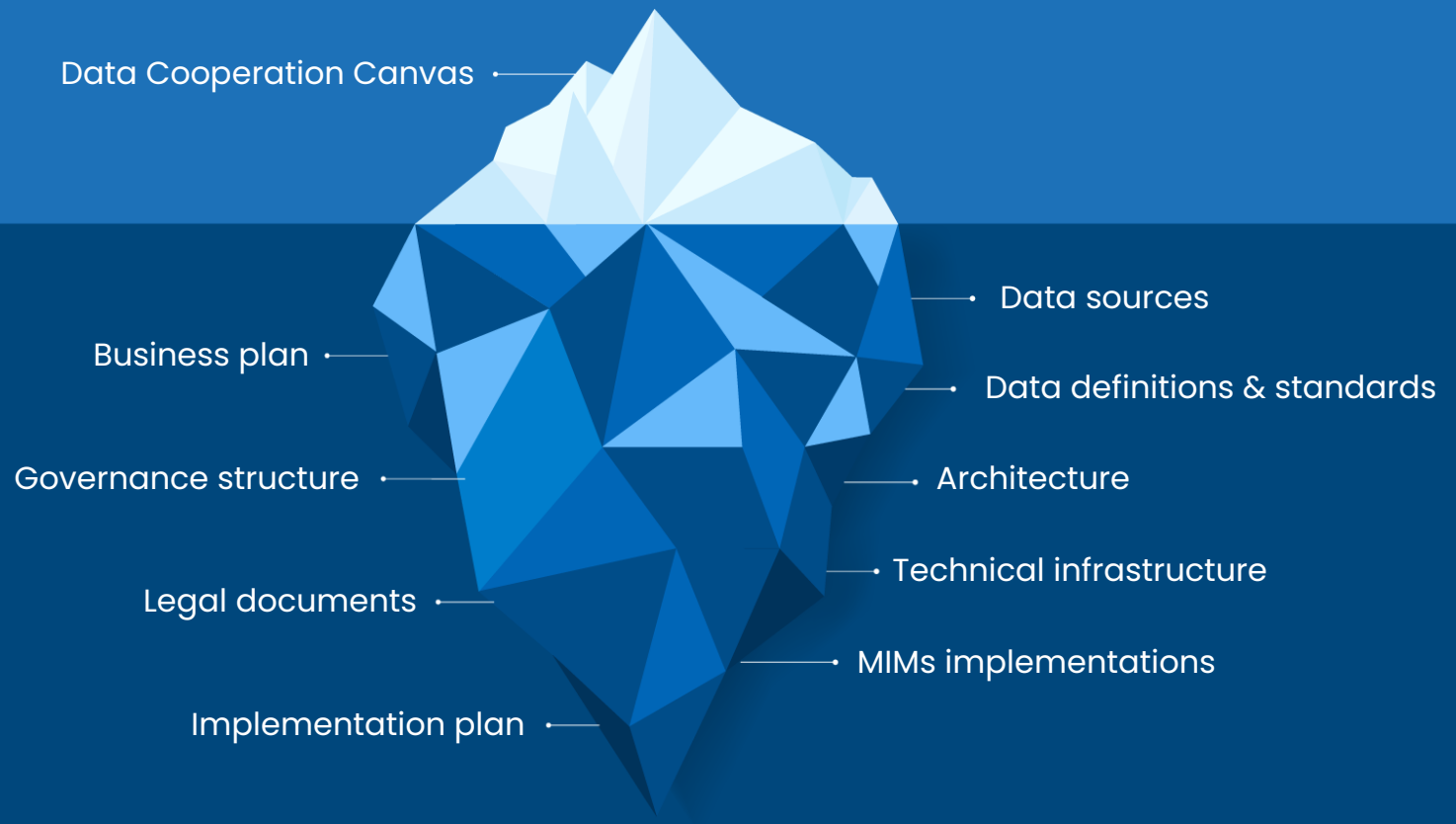
DATA SPACE FOR SMART AND SUSTAINABLE CITIES AND COMMUNITIES

Gemeente Amsterdam

braxwell

Share a common picture

Cover all important aspects



The Data Cooperation Canvas

DATA SPACE FOR SMART AND SUSTAINABLE CITIES AND COMMUNITIES

Gemeente Amsterdam

braxwell

Organizational

Key partners
Who are the partners involved in the data exchange? What are their roles?

Resources
What organizational resources are required for this data cooperation? What resources are available already? What needs to be done to get all required resources?

Business case
What are the costs of the data exchange? Who is paying? What are the revenues? Who is profiting? What compensation, fees or other financials are needed?

Shared processes
What steps are performed as a shared process in the data exchange? What steps are done individually?

	Individual	shared
Use	☐	☐
Visualise	☐	☐
Interpret	☐	☐
Combine	☐	☐
Transform	☐	☐
Store	☐	☐
Create	☐	☐

Why?

Context
What is the business context that creates the opportunity/necessity for data exchange?

Added value
Why will this data cooperation succeed? What is the added value for participants?

Motivation & objectives
What is the motivation for the key partners to join the data exchange? What are their main objectives of participating?

Technical

Data & data sources
What data is exchanged? What are the data sources used?

Interoperability
How can the data be uniformed/standardized/combined? What shared concepts, languages, formats, or methods can be used? Is it hard to combine all the data? Or are standard definitions available? What data standards & formats are used or need to be used?

Governance model
How are rules, norms and actions structured/sustained/regulated to control the data exchange?

Implementation roadmap
What approach will be used for realizing and implementing the data exchange?

Technical concepts/models
What technical concepts or models need to be in place for the data exchange. What MIMs are implemented and how are they implemented?

Technical infrastructure characteristics
What technical infrastructure is needed for the data exchange?

- What cloud/server infrastructure is used
- What technology stack is used
- What standard software is used?
- In-house development or external parties?
- Central/decentral/distributed model
- How can be connected (API, feeds, downloads, etc.)

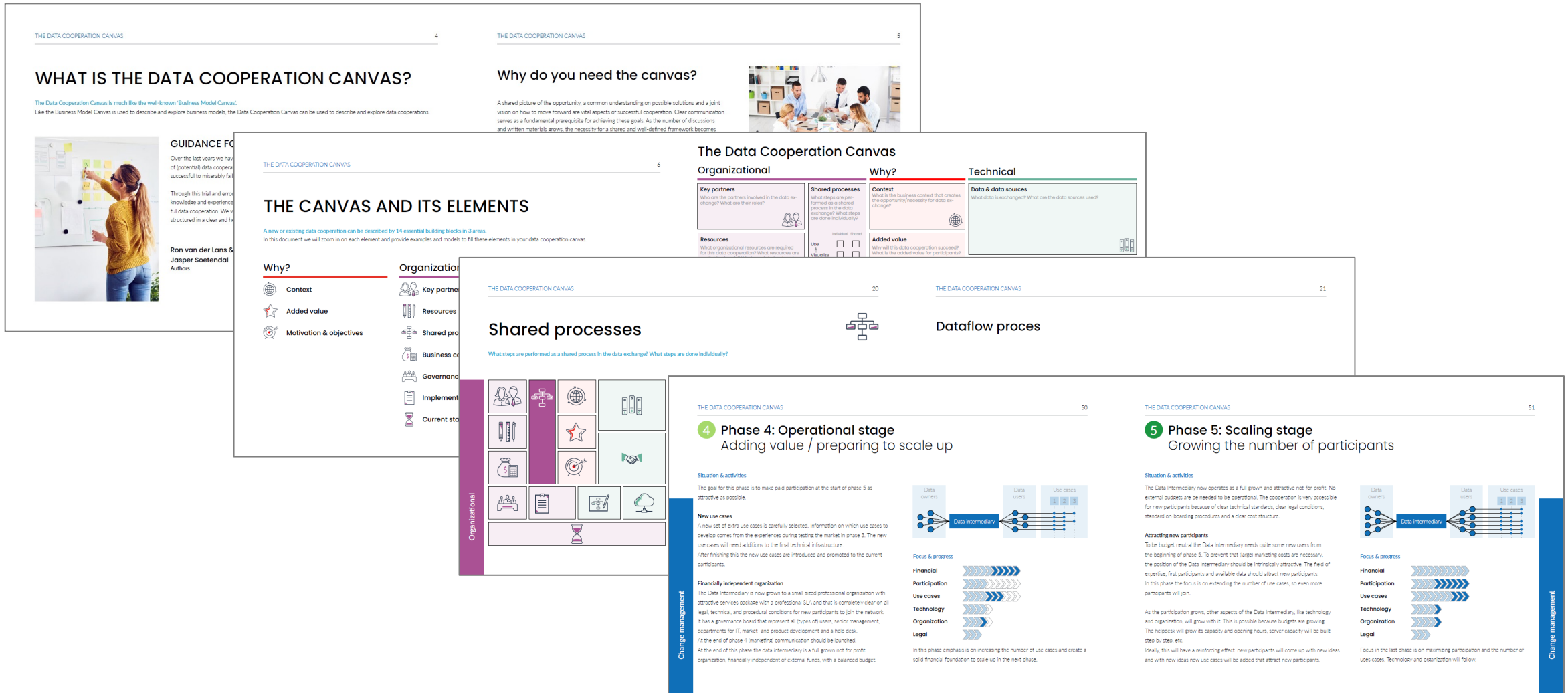
Current status
What is the current status of the cooperation?

Exploratory stage | Preparatory stage | Implementation stage | Operational stage | Scaling stage

The Data Cooperation Canvas Book/PDF

Complete PDF available at www.datacooperationcanvas.eu

Currently a detailed Powerpoint. Soon this will be in the form of an actual book.



The Data Cooperation Canvas

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Transform	☐	☐
Store	☐	☐
Create	☐	☐

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ORGANIZATIONAL

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Current status
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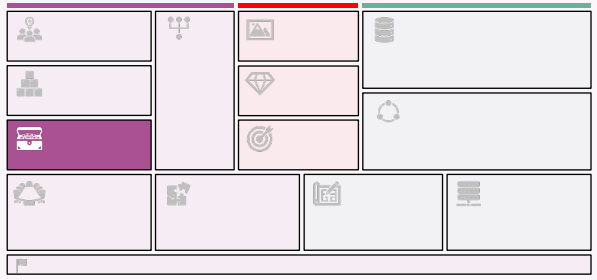
Exploratory stage | Implementation stage | Operational stage | Scaling stage

CURRENT STATUS

Business Case

What are the costs of the data exchange? Who is paying? What are the revenues? Who is profiting? What compensation, fees or other financials are needed?

Books can be written about business models and business cases. For the data cooperation canvas, we limit this to a high-level summary of the business model, using the typical business models and business model components from these two pages.



Typical business models for data cooperations

Sharing costs
- Participants share their data to meet a shared requirements (e.g., service, process efficiency, transparency)
- Every member saves money and time by sharing the burden

Shared compliance
- Participants share their data to meet shared compliancy
- Every member saves money and time by sharing the burden

Sharing profit
- Participants share their data to create a shared opportunity
- Every members shares in the profit created from sharing the data

Shared access
- Participants team up to provide quality-assured, easy access to data of a domain of common interest (open data, business partner data etc.)
- Transaction costs go down for all ecosystem members

Joint Innovation
- A customer innovation can only be realized by participants working together
- No single ecosystem member has all the necessary means/data to do it by themselves

Combining Forces
- Participants agree that joining forces creates a opportunity to team up against existing/emerging competitors/threads
- No single ecosystem member has the necessary resources and commitment to do this alone

Greater Common Good
- Public and private sector share data for a greater common, societal goal (e.g., climate protection)

Based on:
Starter Kit for Data Space Designers, Data Spaces Support Center
https://dssc.eu/wp-content/uploads/2023/01/Starterkit-Interim-Version-Release-19-Dec-2022.pdf

Organizational

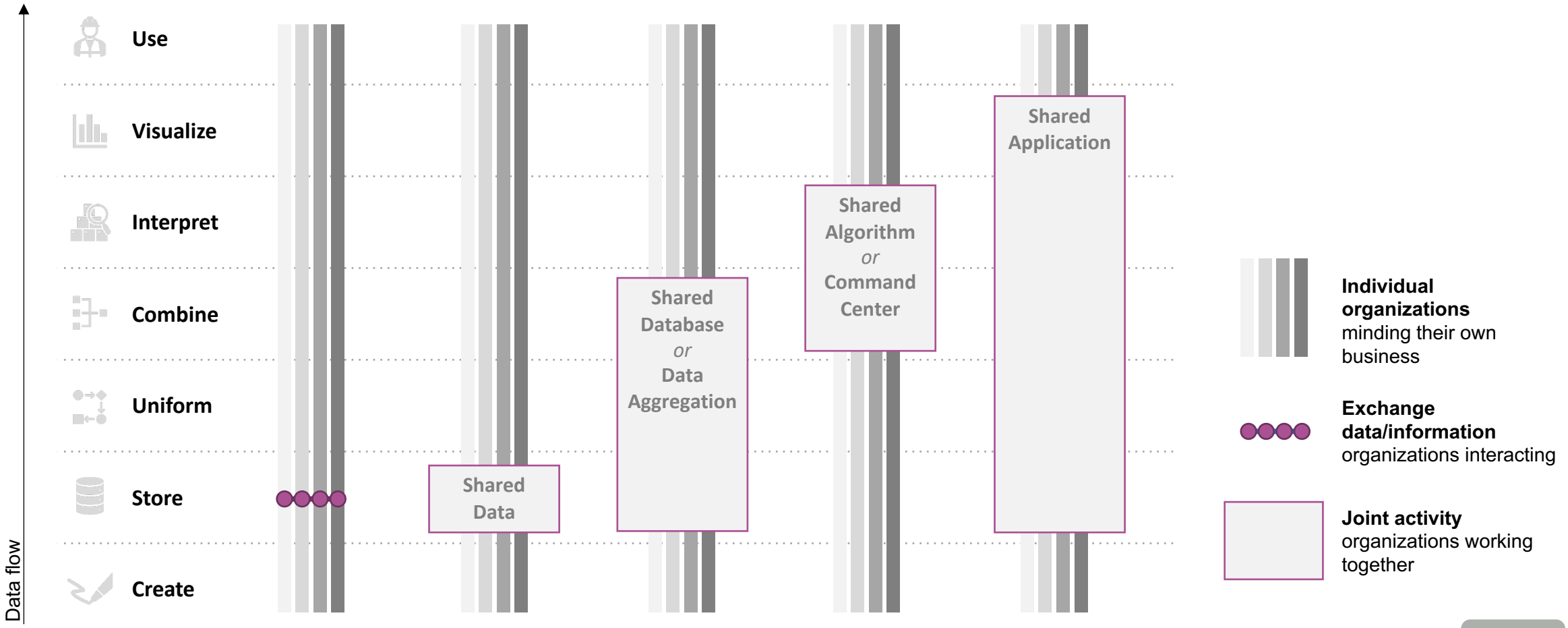
Shared Processes

Organizational

Typical shared processes

Below are five different examples of what parts of the data flow process are performed individually and what is done in cooperation.

On the next page we will provide an example for each cooperation.

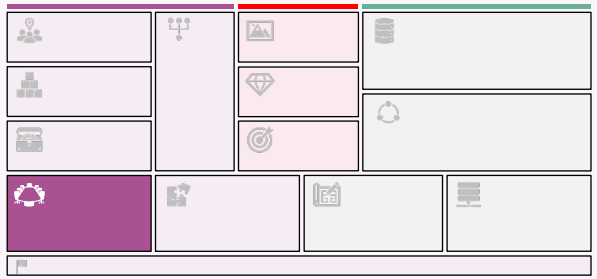


Governance model

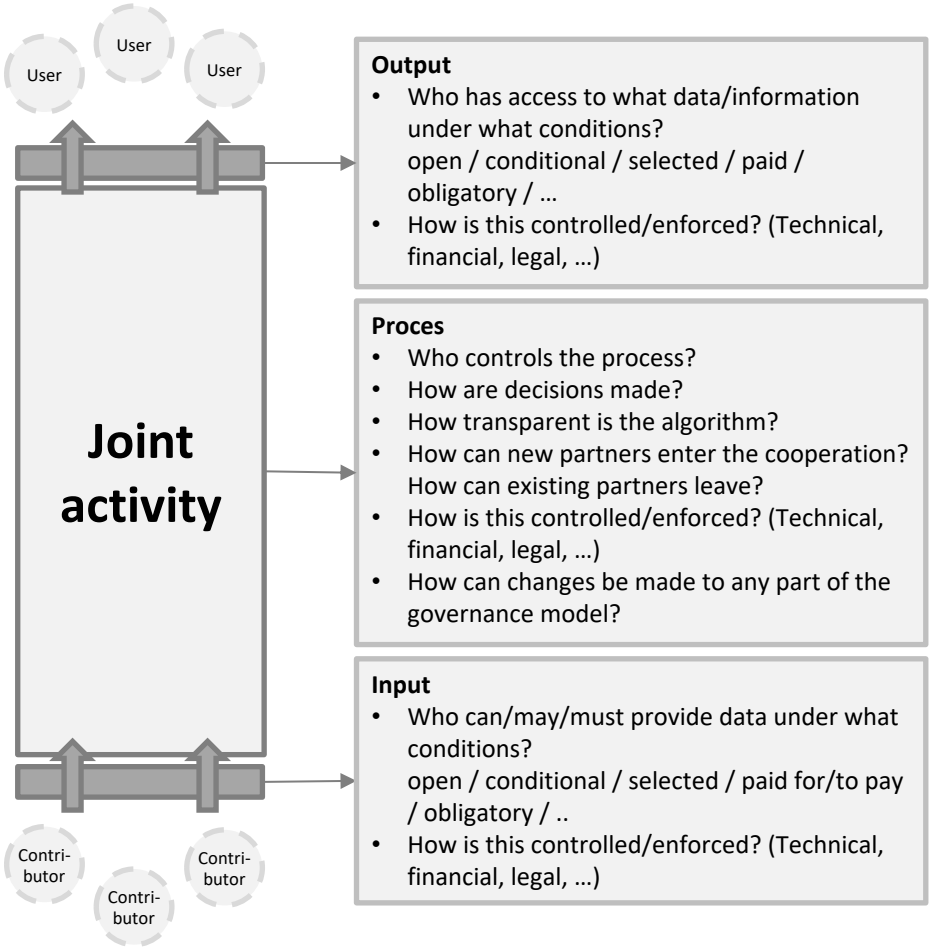
How are rules, norms and actions structured/sustained/regulated to control the data exchange?

A governance model specifies the way the data flow process is controlled. It is a set of agreements, policies, structures and operational procedures to specify who can take what decisions in the data cooperation.

On this page you'll find the typical parts and power structures of a governance model. On the four next pages you'll find a set of typical governance models.



Typical parts of a governance model



Output
- Who has access to what data/information under what conditions?
  open / conditional / selected / paid / obligatory / …
- How is this controlled/enforced? (Technical, financial, legal, …)

Proces
- Who controls the process?
- How are decisions made?
- How transparent is the algorithm?
- How can new partners enter the cooperation? How can existing partners leave?
- How is this controlled/enforced? (Technical, financial, legal, …)
- How can changes be made to any part of the governance model?

Input
- Who can/may/must provide data under what conditions?
  open / conditional / selected / paid for/to pay / obligatory / ..
- How is this controlled/enforced? (Technical, financial, legal, …)

Typical power structures

Single
One single entity controls the 'cooperation'.
(Which isn't a cooperation then, is it?)

Hierarchical
One entity is in control and coordinates most parts of the cooperation.

Coordinated
One entity initiates and manages the corporation, but all decisions are made by consensus.

Joint
All entities are equal. All decisions are made by consensus.

Organizational

Governance model

Typical governance models (overview)

11 typical governance models are described in the next pages, divided into four groups, based on their main objective:

Objective	Enabling re-use and innovation	Cooperate and share cost or profit	Protecting valuable data	Earn money / Commercialize data
Governance models	• Open Data/Transparency • Governance As A Platform • Data Marketplace • Data Repository	• Shared Data • Conditional Access • Data Trust	• Personal Control • Data Common	• Commercial Data • As-A-Service

Organizational

Governance model

Typical governance models (overview)

11 typical governance models are described in the next p

Objective	**Enabling re-use and innovation**
Governance models	• Open Data/Transparency • Governance As A Platform • Data Marketplace • Data Repository

Organizational

Typical governance models

Main objective: Enabling re-use and innovation

	Open data / Transparency	Government As A Platform	Data Marketplace	Data Repository
When to use	When one or more entities (governement, non-profit or business) want to provide their data to enable re-use and innovation.	When a government or organization wants its (digital) services to be open to anyone, so that users/civil servants, businesses and others can deliver radically better services to the ecosystem/public, more safely, efficiently and accountably.	When data is available, but is spread all over the internet and hard to find. Demand and supply of data are inefficiently matched.	When data is available, but is spread all over the internet and hard to find. Demand and supply of data are inefficiently matched.
How it works	The data is published on a website or portal, is well-documented with metadata and has a license (mostly creative commons or public domain) that allows for a broad use of the data.	The work of an organization/ government is reorganized around a network of shared APIs and components, open-standards and canonical datasets.	A market place provides a platform for data providers to offer their data to potential users. It enables the monetization or brokerage of data for both discovery and transactions between buyers and providers.	A repository provides a listing of available data, offering data providers a way to publish their data and offering data users an efficient way to search for the data they need. The repository provides meta data and a link to the actual data.
Control on input	●●● High. The initiator decides for itself what data will be published.	●●● High. The initiator defines the services and components itself.	●○○ Low: if marketplace is open ●●● High: if marketplace is curated	●○○ Low: if repository is open ●●● High: if repository is curated
Control on use	●○○ Low. Re-use and innovation for unforseen applications are welcomed	●○○ Low. Re-use and innovation for unforseen applications are welcomed	●○○ Low. Re-use and innovation for unforseen applications are welcomed	●○○ Low. Re-use and innovation for unforseen applications are welcomed
Examples	• data.europe.eu • data.gov • data.overheid.nl	• e-Estonia • Jeff Bezos' API Mandate (Amazon)	• Microsoft Azure Data Share • AWS Data Exchange • Databricks Marketplace	• Kaggle • Various science data repositories

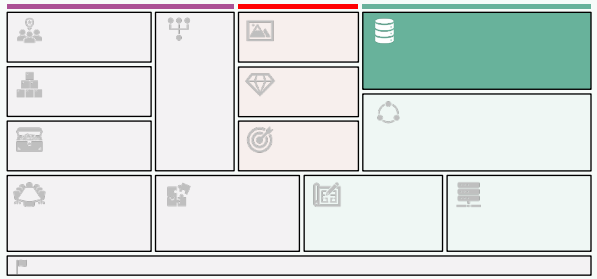
Organizational

Data & Data Sources

What data is exchanged? What are the data sources used?

A Data Demand & Supply Matrix can be used to describe what data is required/demanded by each participant, and what the current availability is for this data set.

By using a priority (demand) and a current status (supply) datasets can be prioritized for the data cooperation, starting with the high priory, green data sets.



Example Data Demand & Supply Matrix

Participant	Data demand	Priority	Data supply / availability	Current status
Participant A	Data on Road network	✪✪✪	Data available as open data by Participant B	🟢 Available. Use api.road.network/2.0
Participant A	Data on actual speeds on road	✪✪	Data available from Participant B as soon as contract is signed	🟢 Available if contract is signed
Participant A	Real-time floating car data	✪	Participant C can provide FCD with 1-day delay. Real time data requires expensive contract	🟡 Start using historic data. Assess expensive contract later
Participant B	Feedback from service providers	✪✪✪	We will need to convince service providers to join or data cooperation	🟡 Requires effort to convince service providers
Participant B	Personal data of road users	✪✪	Data can no be shared because of GDPR. Maybe it can be aggregated, but this requires major effort from ParticipantD	🔴 Will never be available.
Etc.				

- 🔴 Not (yet) available. Will never be available or requires major effort
- 🟡 Not yet available, requires medium effort
- 🟢 Available or available soon with minor effort

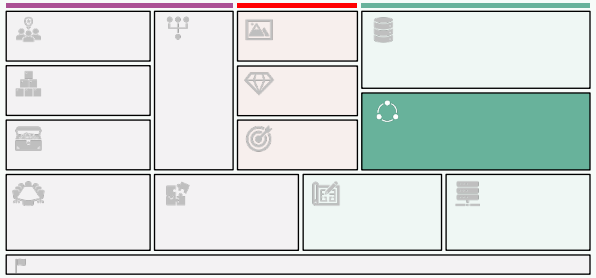
Technical

Interoperability

How can the data be uniformed/standardized/combined? What shared concepts, languages, formats, or methods can be used? Is it hard to combine all the data? Or are standard definitions available? What data standards & formats are used or need to be used?

For interoperability, specify the current level of interoperability, the available standards and methods and what effort is required to reach a satisfying level.

This can be done in general, or for each dataset from the data demand & supply matrix.



Typical elements of interoperability

- **Current level of interoperability:**
  1. No standards or shared understanding
  2. Shared understanding
  3. Ad-hoc standards/definitions that can be mapped
  4. Local standards that are defined and need to be mapped
  5. Standard definitions available (worldwide)
- **Available standards, concepts, languages, methods**
- **Effort required to reach a satisfying level**

Technical

Data Cooperation Canvas

Organizational

Key partners

Resources

Business case

Governance model

Why?

Shared processes

	Individual	Shared
Use	☐	☐
Visualise	☐	☐
Interpret	☐	☐
Combine	☐	☐
Transform	☐	☐
Store	☐	☐
Create	☐	☐

Context

Added value

.

Motivation & objectives

Implementation model

Technical

Data & data sources

Interoperability

Technical concepts/models

Technical infrastructure characteristics

Current status

What is the current status of the cooperation?

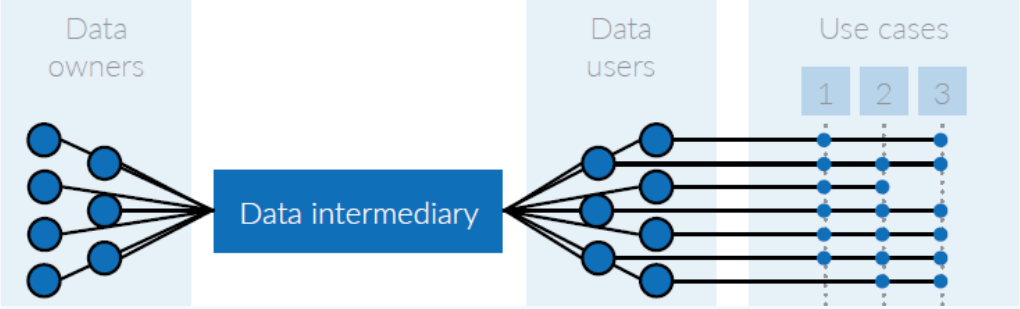
☐ Exploratory stage ☐ Preparatory stage ☐ Implementation stage ☐ Operational stage ☐ Scaling stage

The 5-phase development & implementation method

Change Management

Result after 5 phases

- Data cooperation with full participation
- Supported by a professional data intermediary



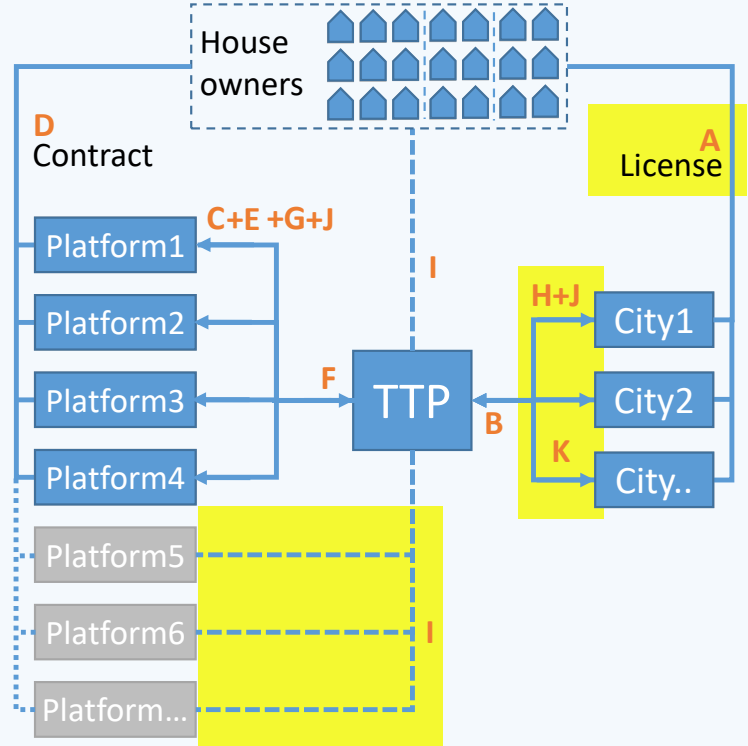
Professional data intermediary

- Mid-sized not-for-profit (see DGA) organization
  - Management, market development, product development, IT-department, helpdesk
- Professional service proposition
  - Attractive data availability / participation
  - State-of-the-art technology
  - Guarantees for availability (SLA)
  - Clear rules for participation
  - Clear costs for onboarding and participation
- Balanced governance board

Case: short time holiday rentals (“work with AirBnB”)

- Renting platforms disrupt touristic areas in cities
- Cities: support sharing economy
- Investors: every house ➔ bad monitored hotel
- USA Platforms can not share real time data (SEC)

Data intermediary: trusted third party

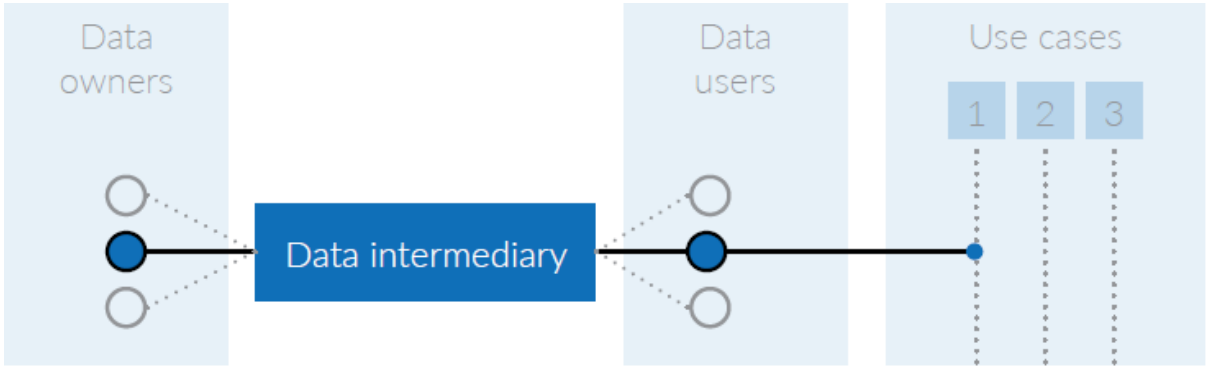


1 Phase 1: Exploratory stage
Developing the concept

Concept: Data Cooperation Canvas

“Design” phase 1:

- Financial: very small (local) budget
- Use case: solve real problem, “no” legal issues
- Participation:
  - 3 platforms (for instance AirBnB, Booking, FairBnB)
  - 3 cities (for instance Amsterdam, Barcelona, Florence)
  - Realize 1-on-1, prepare 3-on3
  - Prepare cities for applying data
- IT: MVP
- Organization: practical
- Legal: B2G non disclose agreements + data sharing agreements



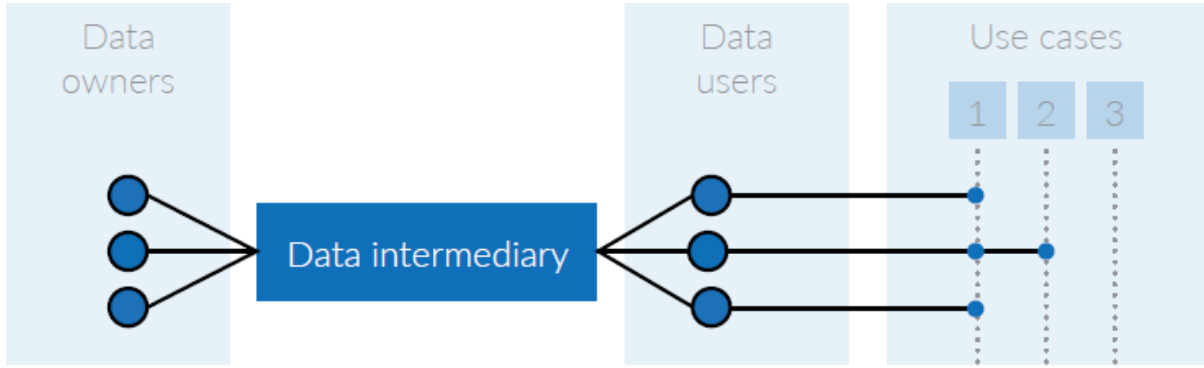
Focus & progress

Change Management

2 Phase 2: Preparatory stage
Proving the concept

“Design” phase 2:

- Financial
  - Very small extra (local) budget
  - Prepare for investors phase 3
- Use cases:
  - Add new use cases that will convince investors phase 3
- Participation:
  - Realize 3-on-3
  - Proof: concept works for more situations
- IT: MVP+
- Organization: practical
- Legal: B2G non disclose agreements + data sharing agreements



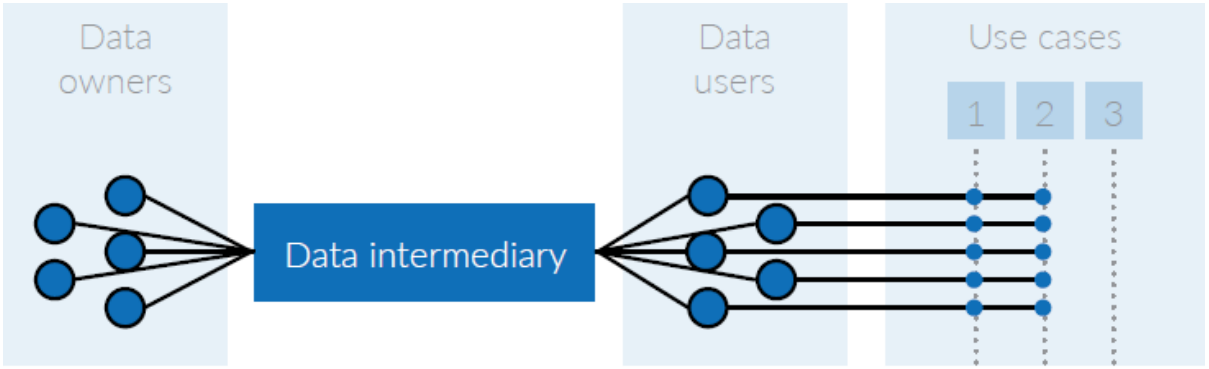
Focus & progress

Change Management

3 Phase 3: Implementation stage
Testing the market / organizing level playing field

“Design” phase 3:

- Financial: big EU / multi-national budget
- Use cases: implementing existing
- Participation:
  - Adding few extra networks (and cities)
  - Proof: concept also works here / create level playing field
- IT:
  - Start state-of-the-art technology
  - “100%” independent
- Organization:
  - Start formal and professional not-for-profit start up
  - Start governance board, representing all users
- Legal: final B2G NDA’s + DSA’s + SLA’s



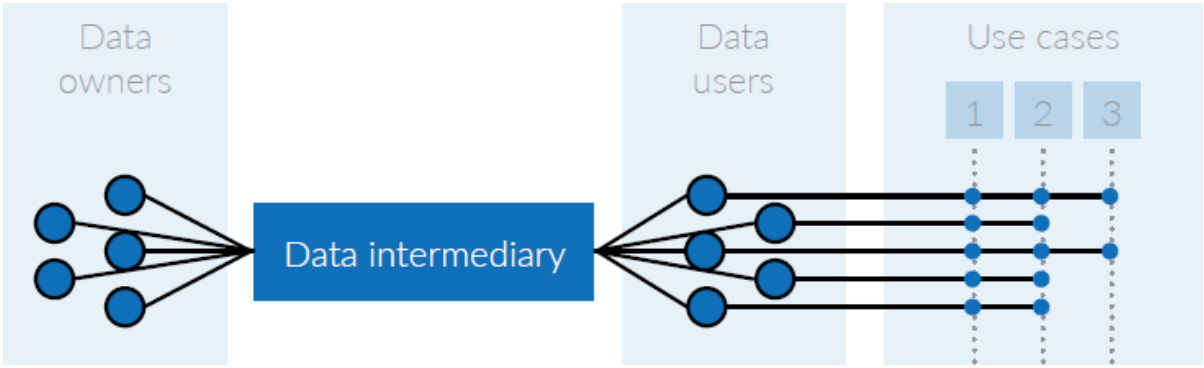
Focus & progress

Change Management

4 Phase 4: Operational stage
Adding value / preparing to scale up

“Design” phase 4:

- Financial: last (EU) budget before becoming independent
- Use cases: new use cases to attract paying patricians in phase 5
- Participation: work with existing
- IT:
  - Develop and implement extra use cases
  - Streamline IT-organization / procedures
- Organization:
  - “Finalize” professional organization
  - Standard procedures for onboarding and participation
- Legal: final B2G NDA’s + DSA’s + SLA’s



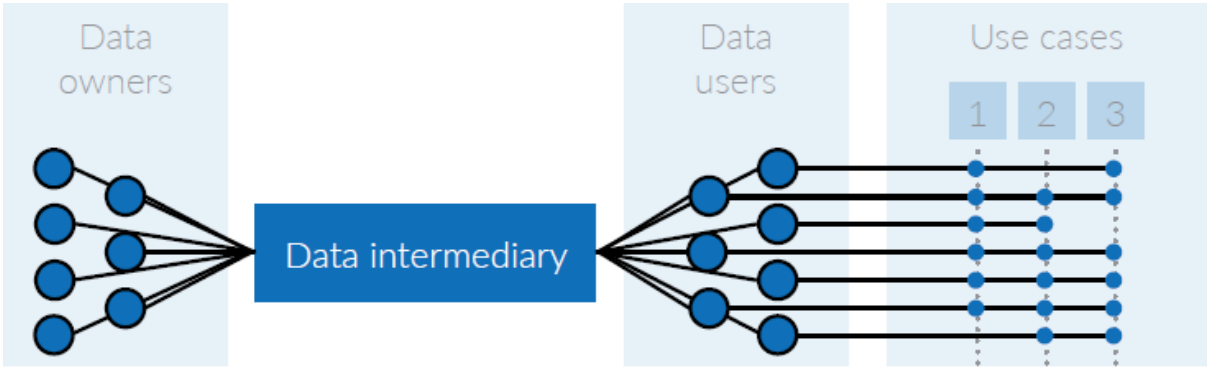
Focus & progress

Change Management

5 Phase 5: Scaling stage
Growing the number of participants

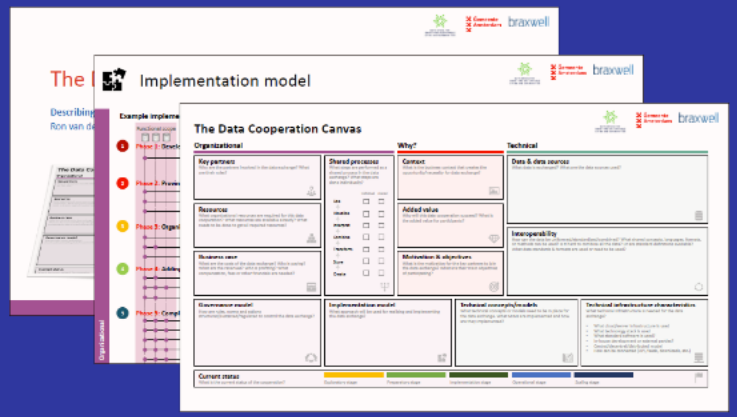
“Design” phase 5:

- Financial: no extra budget (not-for-profit!)
- Use cases:
  - Start: existing use cases
  - Later: extra use cases based on needs users + budgets
- Participation:
  - Open for paid participation
  - Clear rules and costs for onboarding and participation
- IT:
  - Develop and implement new use cases
  - Expanding capacity based on usage
- Organization: grow with activities and budget
- Legal: final B2G NDA’s + DSA’s + SLA’s



Change Management

The Data Cooperation Canvas



Use the Data Cooperation Canvas to describe an existing data cooperation. Or to explore potential new cooperations.

The Data Cooperation Canvas is designed as part of the preparatory actions for the Data Space for Smart and Sustainable Cities and Communities (DS4SSCC) of the European Commission. It is free to use for all companies, organisations and cooperations.

DATA SPACE FOR SMART AND SUSTAINABLE CITIES AND COMMUNITIES

Gemeente Amsterdam

braxwell

Free download

Read the free e-book to learn about setting up a succesfull data cooperation using the Canvas, including lots of examples and models.
Fill in your e-mail address and you'll receive the PDF immediately:

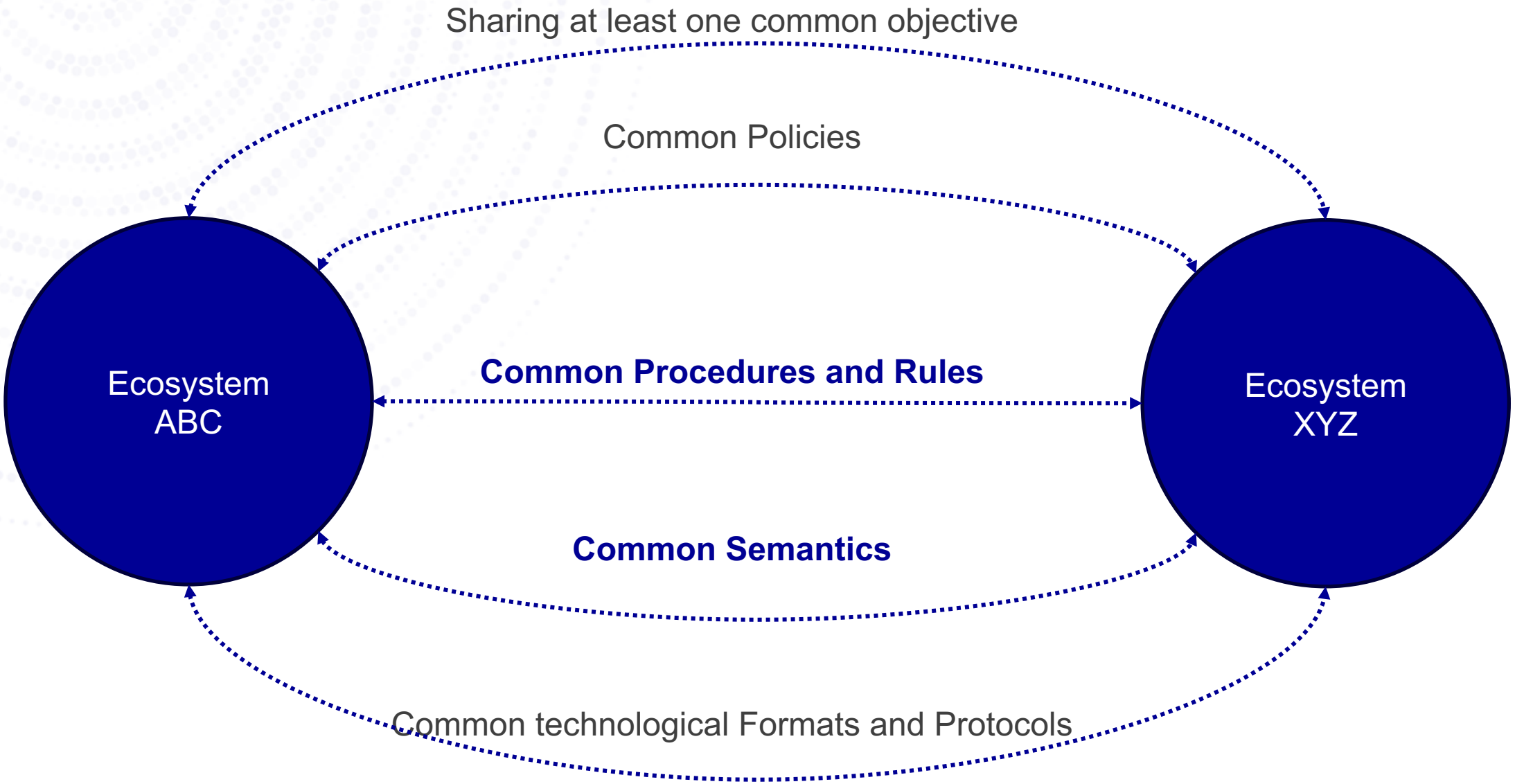
Enter E-mail Address

Download

Building Interoperable Data Spaces With Gaia-X Standards

Pierre Gronlier – CTO, Gaia-X

Interoperable ecosystems



Interoperable ecosystems

Sharing at least one common objective

Common Policies

Ecosystem ABC

Common Procedures and Rules

Common Semantics

operationalised by

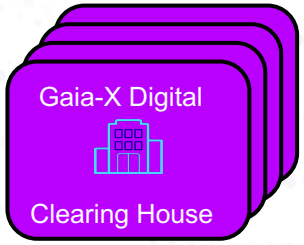
Gaia-X Digital

Clearing House

Common technological Formats and Protocols

Gaia-X Digital Clearing House

We are here
Live & Running



	GXDCH Services** (**Mandatory** / Optional)
TAGUS v1 (22.10)	**Registry service**
	Compliance & **Notary services**
	Wallet & Wizard
LOIRE v2 (23.xx)	**Credential Event Service***
	Catalogues
	Policy Decision and Enforcement Points
	Trust Indexes*
	Data Exchange services
	⋮

Gaia-X Framework

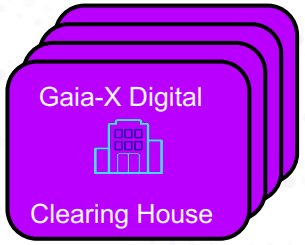
- Specifications
- Code
- Label

More in the Gaia-X Academy!

* Already included in TAGUS as optional.
** Not all future services are listed here.

Based on standards

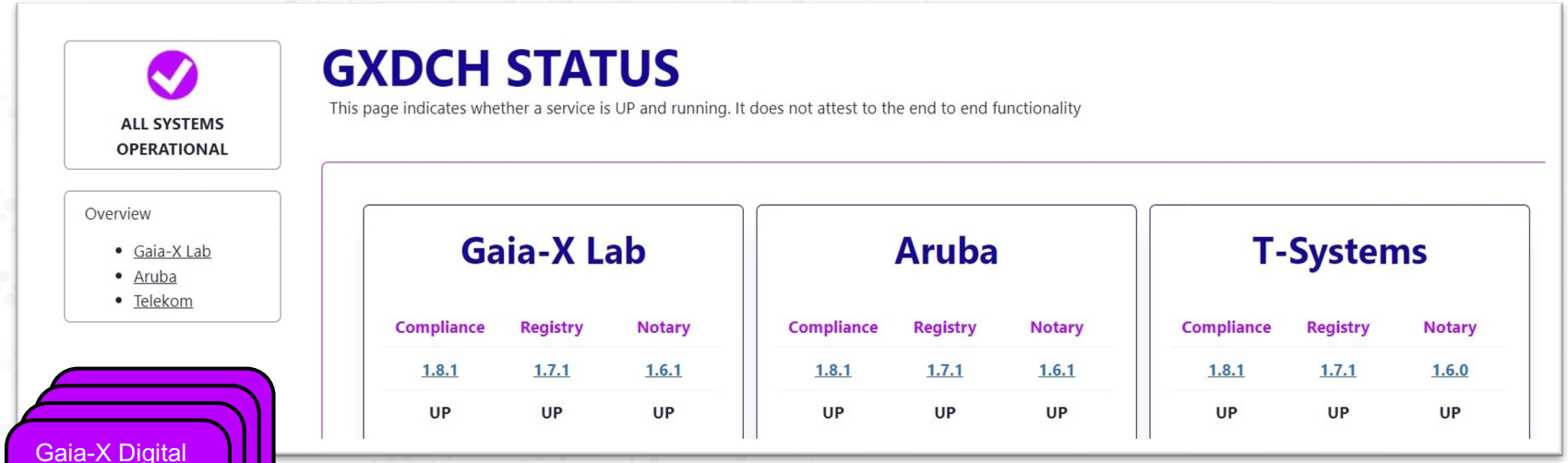
We are here
Live & Running



	GXDCH Services** (**Mandatory** / Optional)	Technical stack
TAGUS v1 (22.10)	**Registry service** (Ontology, Trust Anchors, Terms&Conditions)	JSON-LD, RDF, W3C VC, W3C SHACL, Trust Anchors, EBSI
	Compliance & **Notary services** (incl. Gaia-X Conformity & Gaia-X Label)	W3C SHACL engine, Trusted Data Sources
	Wallet & Wizard	WebAuthn, WebCrypto, Presentation Exchange, OIDC
LOIRE v2 (23.xx)	**Credential Event Service*** Catalogues	Cloud Event + storage
	Registry service (ODRL Profile) Policy Decision and Enforcement Points.	W3C ODRL model & W3C ODRL vocab SEMIC, …
	Trust Indexes*	X509, maths
	Data Exchange services	

* Already included in TAGUS as optional.
** Not all future services are listed here.

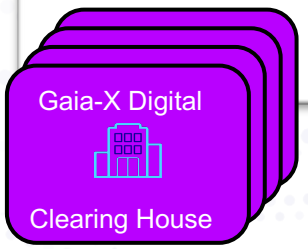
Status Gaia-X Digital Clearing Houses



GXDCH

Orange, Gaia-X Spain, TIM (Telecom Italia)

accreditation in progress



https://docs.gaia-x.eu/framework/?tab=clearing-house

Non-exhaustive list of **candidates**:

- A1 Digital
- Arsys Internet S.L.U.
- Exaion (EDF)
- Fundacion Tecnalia Research and Innovation
- Gigas Hosting S.A.
- Ionos SE
- iShare
- K-BusinessCom
- LHC – LuxConnect
- MBR
- NRB
- OSISM
- OVHCloud
- Proximus,
- Tieto Evry
- Uniserver B.V.

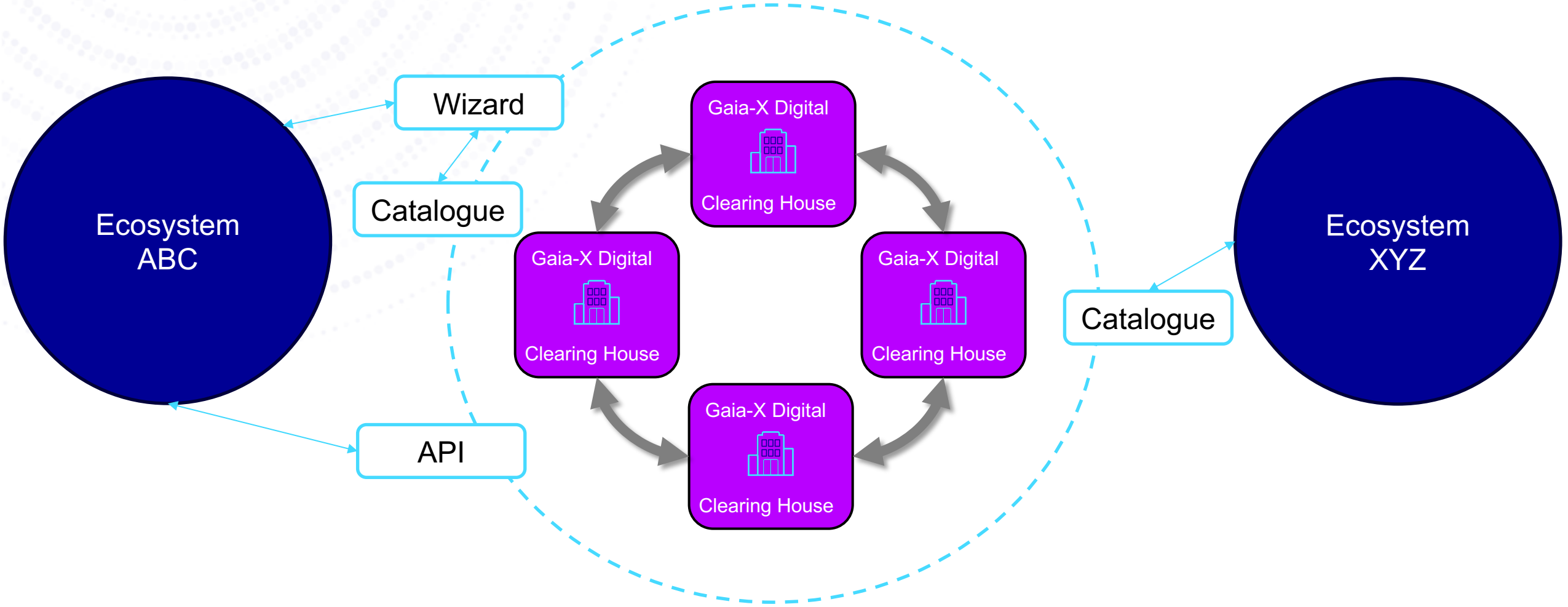
List of deployed GXDCH **under evaluation** for accreditation:

- Orange
- Gaia-X Spain
- Telecom Italia (TIM)

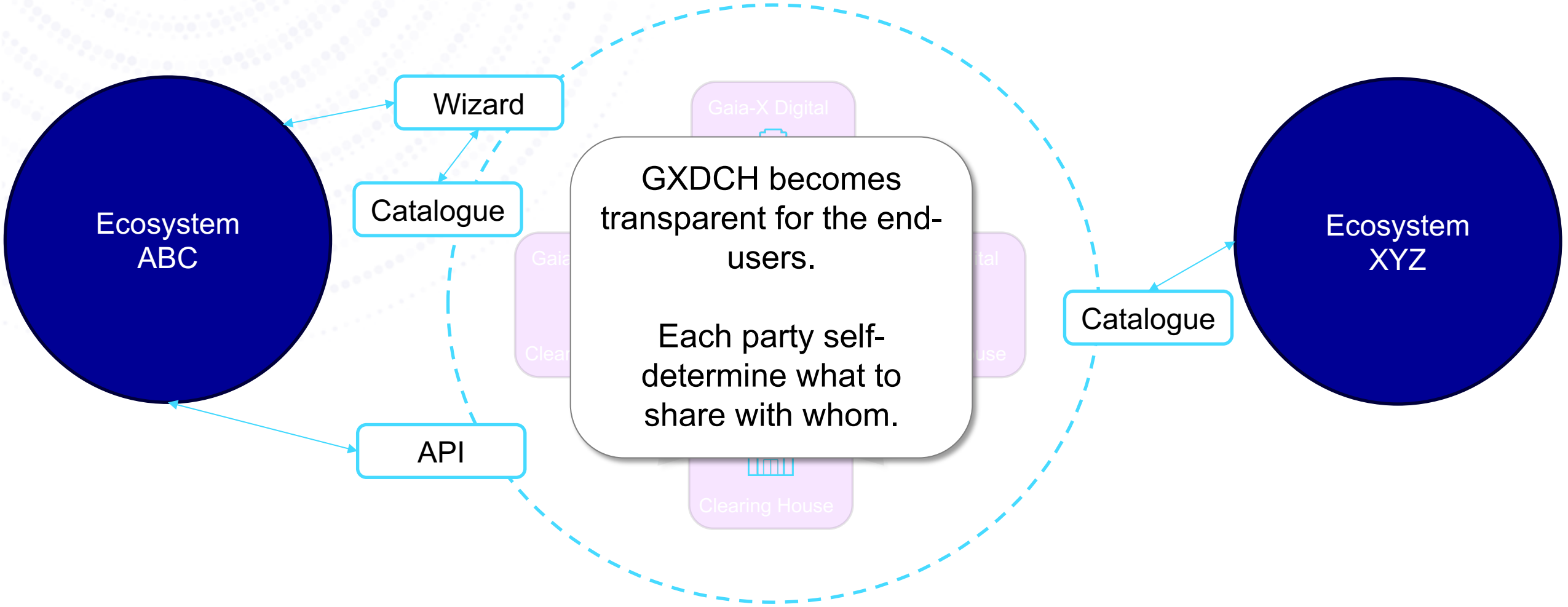
List of **accredited** GXDCH:

- Aruba,
- T-Systems

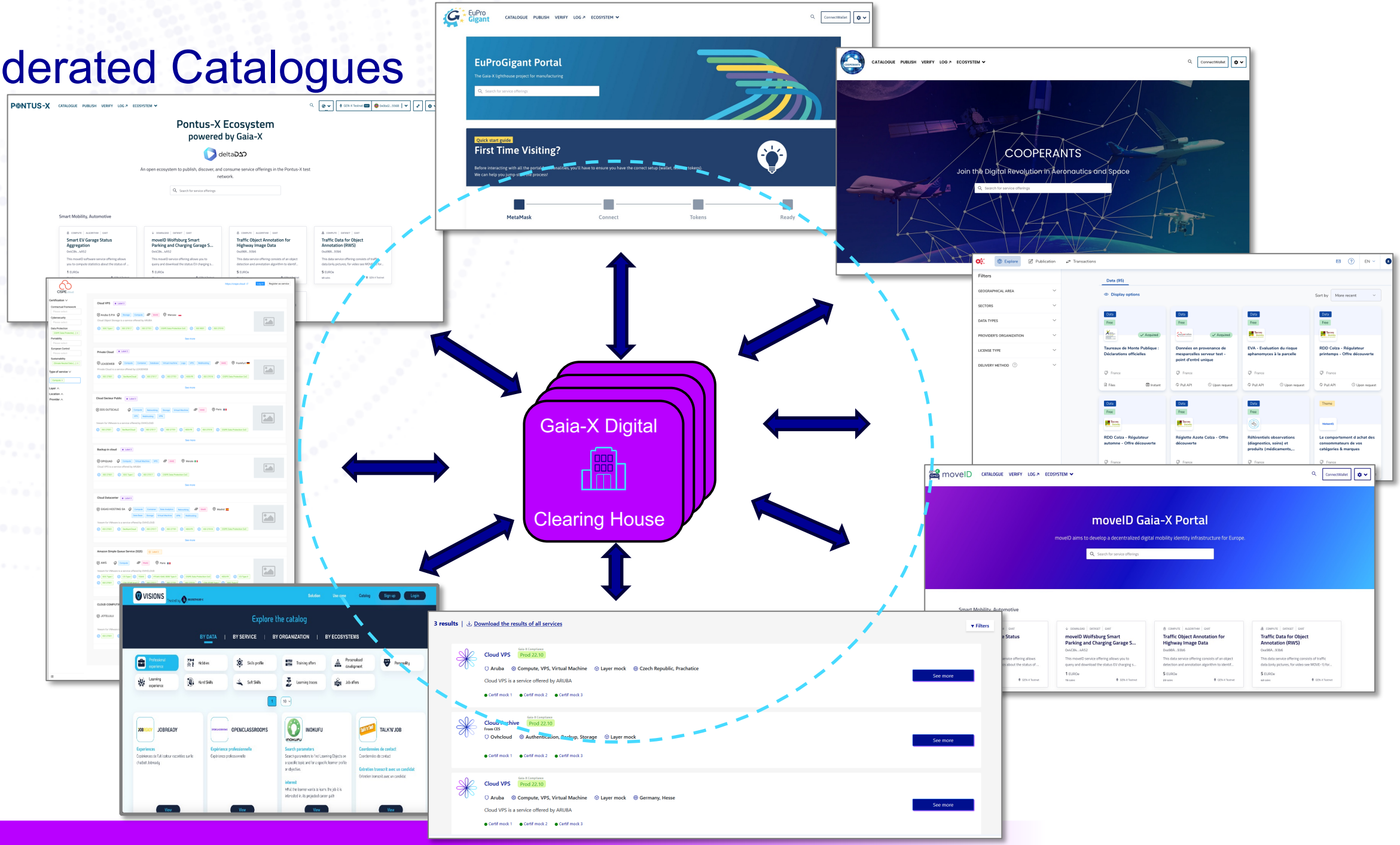
Interoperable ecosystems



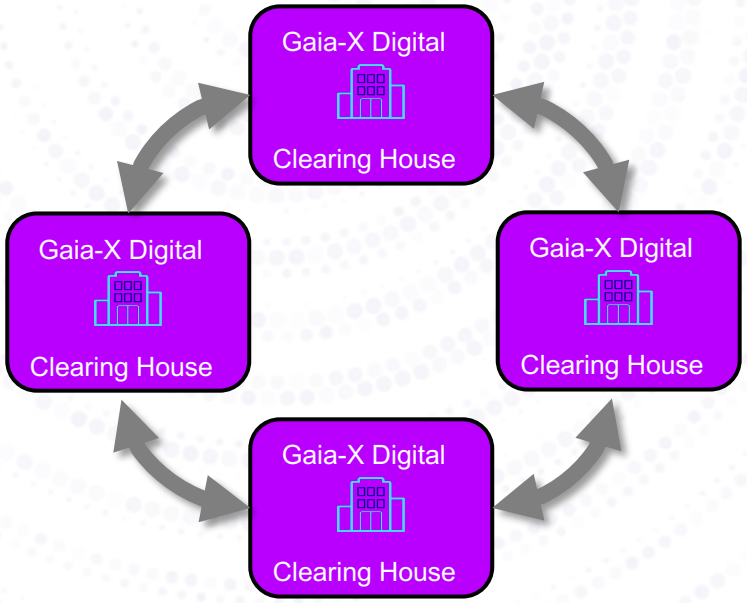
Interoperable ecosystems

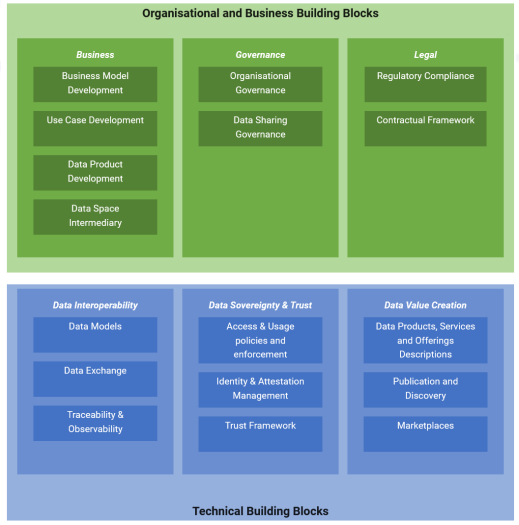


Federated Catalogues



Interoperable ecosystems: Building Blocks





DSSC v1.0 preview - draft

GXDCH v1 (**current version**) implements:

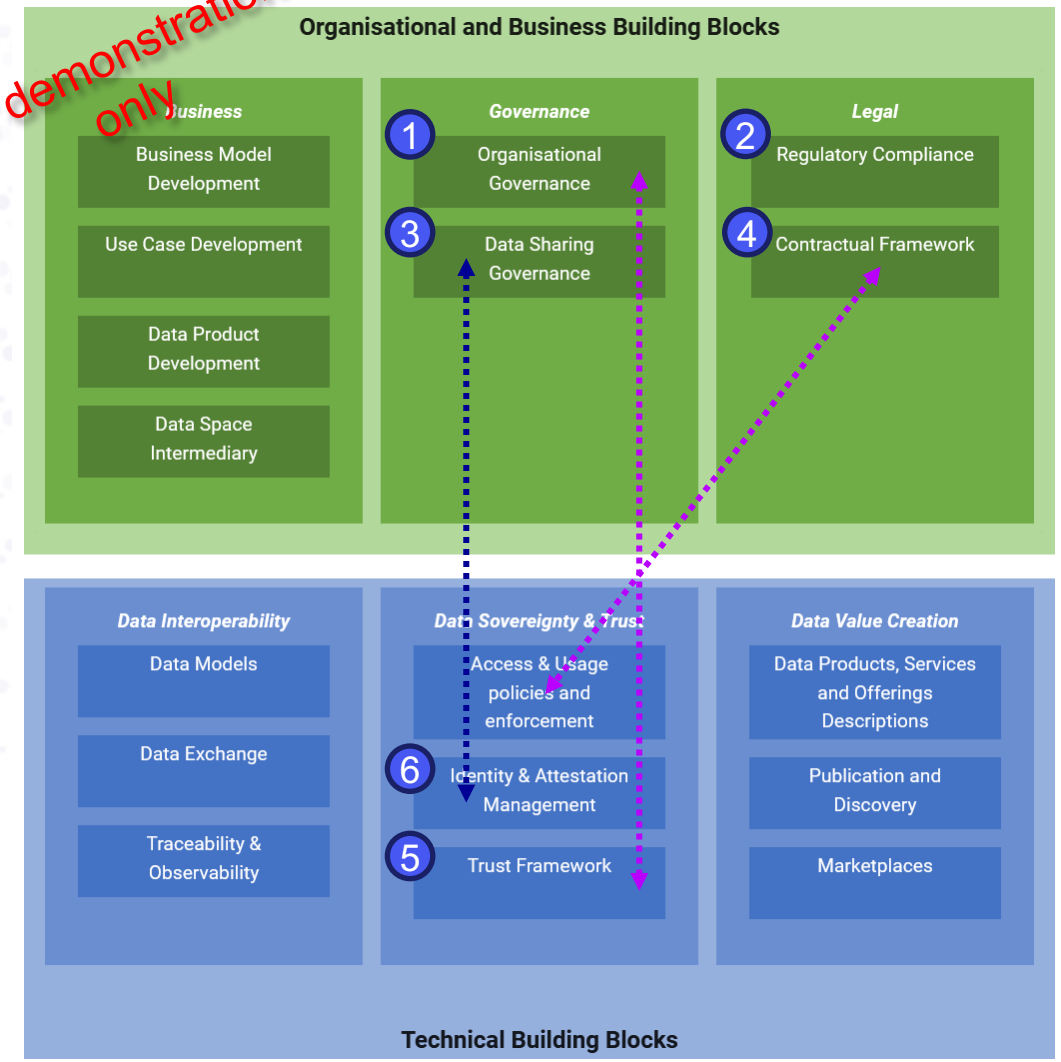
- Data Products, Services, Participants and Offerings descriptions
- Publication and discovery
- Trust Framework with Conformity & Label
- Identity & Attestation management

GXDCH v2 and more adds the support of

- Access & Usage policy and enforcement
- Contractual Framework
- Data Sharing Governance
- Trust Indexes*
- Identity for workloads*
- Service Composition and workload roaming*

* Not (yet?) covered by the DSSC

Interoperable ecosystems: Building Blocks



DSSC v1.0 preview - draft

#1 Identify relations and dependencies between the top and bottom building blocks

#2 Recommend a development scheme prioritizing the building blocks for various use-cases:

- Creating a data space
- Joining a data space
- Merging two data spaces
- …

Policy example

- As a provider, I want my customer to be located in Alicante, Spain or Brussels, Belgium.

```
{"@type": "Policy",
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       "operator": "http://www.w3.org/ns/odrl/2/in",
       "rightOperand": ["ES-A", "BE-BRU"],
       "rightOperandReference": "gx:LegalParticipant"
      } ]
...} ]
}
```

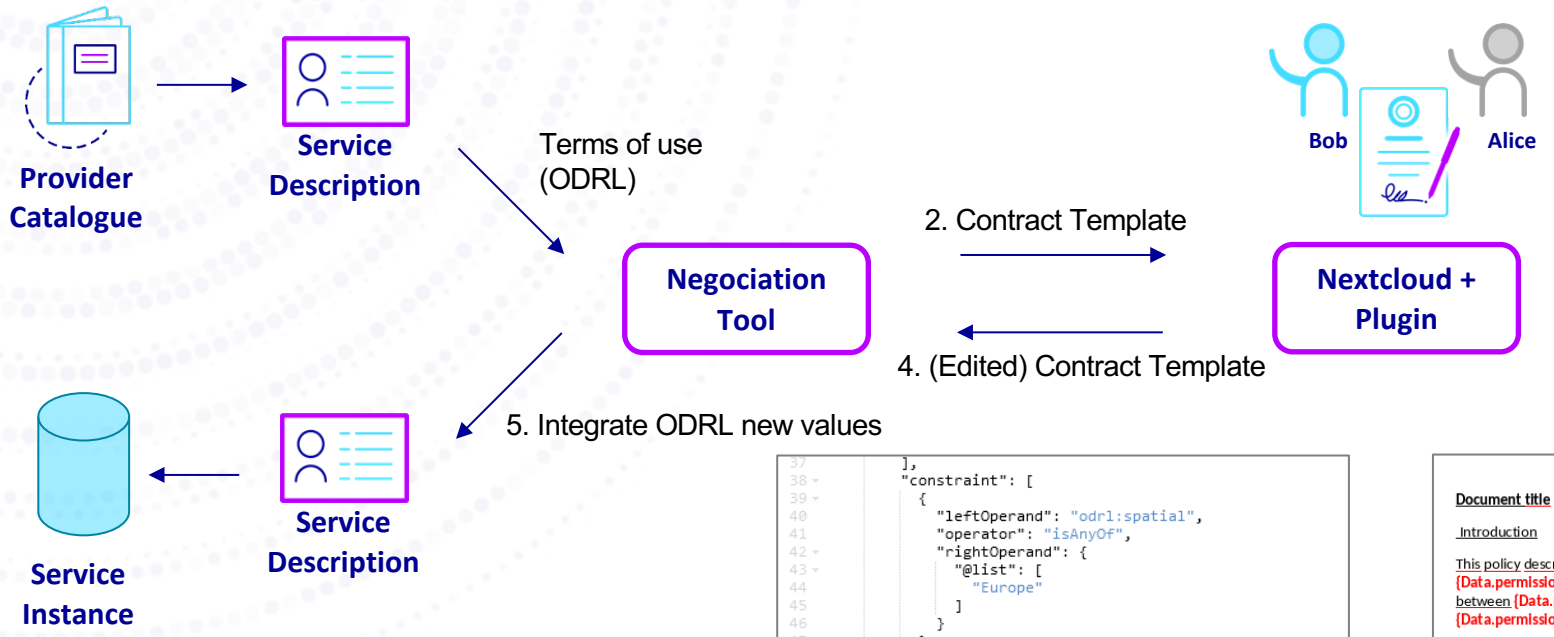
Ontology

- It's the *franca lingua*
- Information model
- Credential format
- Grammar and Vocabularies

More in the Gaia-X Academy!

Aster-X Supervised Contracting

Aster-X
powered by Gaia-X




```
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          ]
        }
      },
      {
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          ]
        }
      },
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          "@type": "xsd:date"
        }
      }
    ]
```


Document title : Terms and conditions of use for the {Data.nomService} service.

Introduction

This policy describes the terms and conditions for the use of {Data.nomService} Data provided by {Data.permission[0].duty[0].assigner}. This policy is issued under the terms of the licence agreement between {Data.permission[0].duty[0].assigner} as Data Provider and {Data.permission[0].duty[0].assignee} as Data Consumer.

Clause 1 : Permission to use

1.1. Data usage : {Data.permission[0].duty[0].assignee} is authorised to use the data from the dataset {Data.nomService}.

1.2. Payment Terms: {Data.permission[0].duty[0].assignee} agrees to pay a sum of {Data.permission[0].duty[0].action[0].refinement[0].rightOperand.@value} Euros to {Data.permission[0].duty[0].assigner} for the use of the data. This payment is due in accordance with the terms specified in this agreement.

1.3. Policy Renewal: {Data.permission[0].duty[0].assignee} agrees to comply with the next applicable policy, which will be specified in the following policy, accessible at: {Data.permission[0].duty[1].target}.

Clause 2 : Usage constraints

2.1. Geographical location : {Data.permission[0].duty[0].assignee} may only use the data in the following regions: {Data.permission[0].constraint[0].rightOperand.@list[0]}.

2.2. Allowed sector of industry: {Data.permission[0].duty[0].assignee} is allowed to use the data only in the industrial sector of {Data.permission[0].constraint[1].rightOperand.@list[0]}.

2.3. Authorised context: {Data.permission[0].duty[0].assignee} is authorised to use the data only in the context of {Data.permission[0].constraint[2].rightOperand.@list[0]}.

2.4. Date limit: Use of the data is authorised until {Data.permission[0].constraint[3].rightOperand.@value}.

DATA SPACES
SUPPORT CENTRE

Q&A

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