beyond civic

Data Space Playbook

Introduction

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Version: *v0.9 / 28.03.2025*

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1 Introduction

The Data Space Playbook by Beyond Civic AG provides a structured guide to building trustworthy and interoperable data spaces in Switzerland. It is rooted in digital self-determination and is aligned with European frameworks. It addresses key challenges such as fragmented infrastructures, legal uncertainties, and a lack of standardized governance.

The Playbook commences with a comprehensive overview of pertinent Swiss and international publications, meticulously adapting European models—particularly those from the Data Spaces Support Centre (DSSC)—to the specific context of Switzerland. It outlines business requirements, underscores the necessity for cross-sector collaboration, and delineates the scope around governance, compliance, and data access.

Key stakeholders, legal and technical constraints, and foundational assumptions such as regulatory clarity and infrastructure needs are clearly identified. The document concludes with references that reflect its grounding in current policy and research. Overall, the framework offers a practical approach to accelerating data space implementation in Switzerland.

2 Publications overview

2.1 Publications by publisher sorted by date

#	Name	Author / Publisher	Focus	Publication year
1	European Interoperability Framework	European Commission	EU	2017
2	IDSA rulebook	IDSA	EU	2020
3	Design Principles for data spaces	Open DEI	EU	2021
4	Rulebook for a fair data economy	SITRA	EU	2022
5	GAIA-X Trust Framework	GAIA-X	EU	2022
6	Technical Convergence	Data Spaces Business Alliance	EU	2023
7	JRC Science for policy report - European Data Spaces	EU Joint Research Centre	EU	2023
8	Data Spaces Synergies discussion paper	DSSC	EU	2024
9	Data Space Design Principles	DSSC	EU	2024
10	Trusted Data Transactions	CENELEC	EU	2024
11	Data Interoperability	High level forum on European standardisation	EU	2024
12	State of Finish data spaces	SITRA	EU	2024
13	Starter Kit For Data Space Designers Version 1.5	DSSC	EU	2024
14	Blueprint of the Common European Energy Data Space	Interoperability Network for the Energy Transition (int:net) c/o Fraunhofer	EU	2024
15	iSHARE Trust Framework	iSHARE	EU	2024
16	DSSC Glossary	DSSC	EU	2024
17	Schaffung von vertrauenswürdigen Datenräumen basierend auf der digitalen Selbstbestimmung	UVEK, EDA	CH	2022
18	Verhaltenskodex	EDA, Netzwerk Digitale Selbstbestimmung	CH	2023
19	Der europäische Datenraum aus Schweizer Sicht	Swiss Data Alliance	CH	2023
20	Datenökosystem Schweiz - Vision und Ziele	Bundeskanzlei	CH	2024
21	Bausteine von Datenräumen	Bundeskanzlei	CH	2024
22	agridata.ch - Vorstudie zur Entwicklung eines vertrauenswürdigen und florierenden Datenraumes für den Schweizer Agrar- und Ernährungssektor	BLW, Beyond Civic (TrustRelay) AG	CH	2024

2.2 Publication summaries

2.2.1 European Interoperability Framework

This document provides guidance on how to improve the governance of interoperability activities, establish relationships across organizations, streamline processes supporting end-to-end digital services, and ensure new and existing legislation does not compromise interoperability efforts. It seeks to achieve interoperability through four layers: legal, organizational, semantic, and technical.

2.2.2 IDSA Rulebook

The document describes the functional, technical, operational, and legal agreements necessary for the smooth functioning of the data economy.

2.2.3 Design principles for data spaces

The document proposes four design principles for European data spaces, including a decentralized soft infrastructure, data sovereignty, a level playing field, and public-private governance

2.2.4 Rulebook for a fair data economy

This document provides a comprehensive guide and a set of customizable templates for establishing and governing data networks based on fairness, trust, and ethical principles. It emphasizes the importance of balancing data use with individual data control, outlining legal, business, technical, and ethical considerations for data sharing, including data security and the identification of risks and vulnerabilities.

2.2.5 GAIA-X Trust Framework

The Gaia-X Trust Framework is the set of rules that define the minimum baseline to be part of the Gaia-X Ecosystem. Those rules provide a common governance and the basic level of interoperability across individual ecosystems while letting the users in full control of their choices. Unfortunately, this document is poorly structured, relies heavily on advanced technical terms without explaining the reasoning behind.

2.2.6 Technical Convergence

This document proposes a common technology framework for Data Spaces, aiming for interoperability and portability across different data spaces. Unfortunately, the “so-called framework” is only a compendium of potential technologies to use, no prescriptive recommendation or clear reasoning behind.

2.2.7 JRC Science for policy report – European Data Spaces

This document presents technical and organizational observations to inform the implementation of common European data spaces as envisioned by the European strategy for data.

2.2.8 Data Spaces Synergies – Discussion paper

This document examines the significance of synergies, or mutual benefits, across data spaces and emphasizes the need to consider these synergies throughout the development process.

2.2.9 Data Space Design Principles

This document outlines 13 design principles intended to guide the development of data spaces and position Europe as a leader in the data economy.

2.2.10 Trusted Data Transactions

This document defines terminology and concepts to support standardization. It emphasizes the importance of trust in data transactions, particularly in data spaces, to enable secure and interoperable data exchanges

2.2.11 Data Interoperability

This report investigates the role of standards in implementing the European data strategy. It highlights the increasing importance of data in the EU and the need for seamless and trustworthy data sharing, advocating for the use of data spaces to facilitate this goal.

2.2.12 State of Finish Data Spaces

This report provides an overview of Finnish data spaces and their business opportunities. The report examines data space development from the perspectives of users, creators, and supporters and highlights the economic, operational, and innovative benefits of data spaces.

2.2.13 Starter Kit for Data Space Designers – Version 1.5

This document covers a comprehensive overview of the DSSC asset model, which includes building blocks, conceptual models, co-creation methods, and components

2.2.14 Blueprint of the Common European Energy Data Space

The blueprint for the Common European Energy Data Space (CEEDS) emphasizes the importance of data space solutions for the transformation of the energy industry. CEEDS is built upon existing data infrastructures. It highlights five business use cases that cover: electromobility, energy communities, and TSO-DSO interactions.

2.2.15 ISHARE Trust Framework

The iSHARE Trust Framework is a collaborative effort to improve the exchange of data between organisations in and across data spaces. The Framework results in a set of agreements which improve circumstances for data exchange.

2.2.16 DSSC Glossary

A list of terms chosen by the DSSC considered as relevant in the data space circle.

2.2.17 Schaffung von vertrauenswürdigen Datenräumen basierend auf der digitalen Selbstbestimmung

This document outlines the importance of trustworthy data spaces for harnessing data's potential while upholding digital self-determination, the concept that individuals, companies, and society should control their data.

2.2.18 Verhaltenkodex

This document describes a voluntary code of conduct that promotes trustworthy data spaces in Switzerland, built upon four principles: transparency, control, fairness, and effectiveness.

2.2.19 Der europäische Datenraum aus Schweizer Sicht

The Swiss Data Alliance's white paper analyses the European Union's data space strategy and its implications for Switzerland. The paper examines sectoral data, discussing potential challenges and opportunities. The report concludes that Switzerland should actively participate in the development of the European data space to avoid becoming isolated and to leverage its potential as a trustworthy and neutral data intermediary.

2.2.20 Datenökosystem Schweiz – Vision und Ziele

This publication aims to provide solutions for potential users who want to utilize data for various purposes in Switzerland, including providing services and products to their customers. However, users face problems like data unavailability, legal barriers, and the difficulty in discovering suitable data. The ecosystem seeks to address these problems by creating a framework that promotes data access, interoperability, and trust.

2.2.21 Bausteine von Datenräumen

This document outlines the modular building blocks that constitute data spaces within the Swiss Data Ecosystem, promoting a standardized and interoperable approach for data sharing across various sectors.

2.2.22 agridata.ch - Vorstudie zur Entwicklung eines vertrauenswürdigen und florierenden Datenraumes für den Schweizer Agrar- und Ernährungssektor

This document discusses the creation of "agridata.ch," a data space designed to facilitate secure and efficient data sharing within Switzerland's agricultural and food sectors. The initiative aims to promote digital self-determination for data producers, primarily farmers, by providing a platform for data exchange while adhering to data protection and privacy regulations.

3 Literature review

The following sections summarize the existing publications relevant to define functional requirements for data spaces in Switzerland.

3.1 Architecting Data Spaces in EU

3.1.1 DSSC Building Blocks

Building blocks, according to (Data Spaces Support Centre 2024), are basic units or components that can be implemented and combined with other building blocks to achieve the functionality of a data space.

Business and organisational building blocks Version 1.5

The business building blocks are the starting point for stakeholders interested in developing a business plan for their data space.

Figure 1. Business and Organisational Building Blocks. Adapted from (Data Spaces Support Centre 2024)

Technical building blocks Version 1.5

The objective of the technical building blocks is to identify these capabilities and to provide standard specifications for each of them.

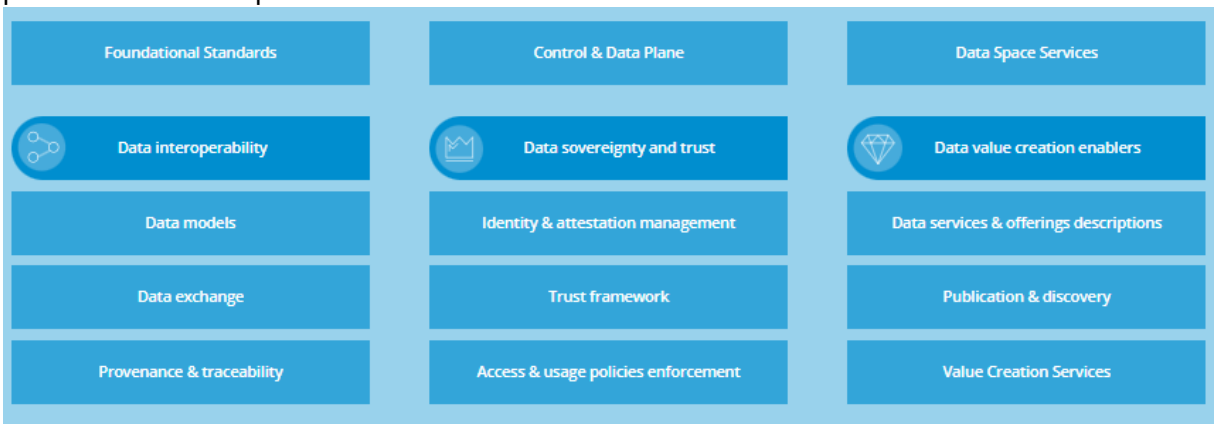

Figure 2. Technical Building Blocks. Adapted from (Data Spaces Support Centre 2024)

3.1.2 DSSC Data Space Design Principles Version 1.5

The DSSC has identified thirteen design principles:

#	DATA SPACE DESIGN PRINCIPLE
1	Incentives and synergies between data space participants
2	Discoverability, Availability, and Accessibility of Data
3	Transparency
4	Establishing Trust and Security in Data Spaces
5	Ensure compliance with EU legal framework and norms
6	Ensure Participants Rights in Data Sovereignty
7	Promote Participation Through Inclusivity
8	Promote Environmental sustainability
9	Reusability of Data
10	Establish a fit-for-purpose contractual framework
11	Adaptable data space governance framework
12	Pursuit Quality by Design
13	Ensure Data Interoperability in data spaces

Table 1. Data Space Design principles. Adapted from (Data Spaces Support Centre c/o Fraunhofer 2024)

3.1.3 Key dimensions of data space design according to DSSC

According to DSSC, the following are key dimensions of data space design: Business, Legal, Operational, Functional and Technical (Data Spaces Support Centre (DSSC) c/o Fraunhofer 2024)

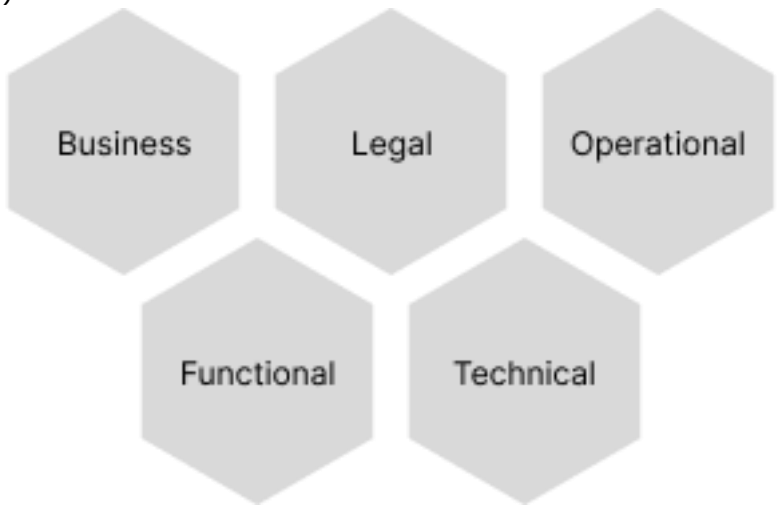

Figure 3. Key dimensions of Data Space Design. Adapted from (Data Spaces Support Centre (DSSC) c/o Fraunhofer 2024)

Note: For purposes of this document, the functional requirements described here also encompass business, legal and operational dimensions.

3.2 Requirements in the context of Swiss Data Ecosystems

3.2.1 Overview of the Swiss Data Ecosystem

The goal of the Swiss data ecosystem is to encourage the multiple use of data by stakeholders from business, science, administration, and the public to better harness the potential of data. To facilitate the exchange and reuse of data, national and international data spaces must be not only interoperable but also trustworthy. The project on the Swiss data ecosystem, adopted by the Federal Council, establishes governance and architectural foundations that support the development of trustworthy and interoperable data spaces. (Bundeskanzlei – Digitale Transformation und IKT Lenkung 2024)

Figure 4. Swiss Data Ecosystem. (Bundeskanzlei – Digitale Transformation und IKT Lenkung 2024)

3.2.2 Swiss Digital Self Determination

DETEC (OFCOM), FDFA (DIL), SATW, and the Swiss Data Alliance founded the Swiss Digital Self-Determination Network (SSDN) to elaborate how to make digital self-determination a reality in Switzerland.
Digital self-determination aims to empower individuals, companies and society as a whole to actively participate in the digital ecosystem they participate in. It provides participants with the ability to determine the relevance and value of data that is important to them, to have access to and control over this data, and to determine how said data is used.

The following are challenges identified by the SSDN:

#	CHALLENGE
1	Concentration of data and lack of transparent decision-making structures
2	Lack of organisation among users
3	Insufficient decision-making context for users
4	Lack of incentives for data sharing

Table 2. Challenges identified by the Swiss DSDN (Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK; Eidgenössisches Departement für auswärtige Angelegenheiten EDA 2022)

At the same time, the SDSDN acknowledges that sharing (using data) is frequently juxtaposed with the principle of protecting data, therefore Digital Self-Determination must conceal a common ground for both principles.

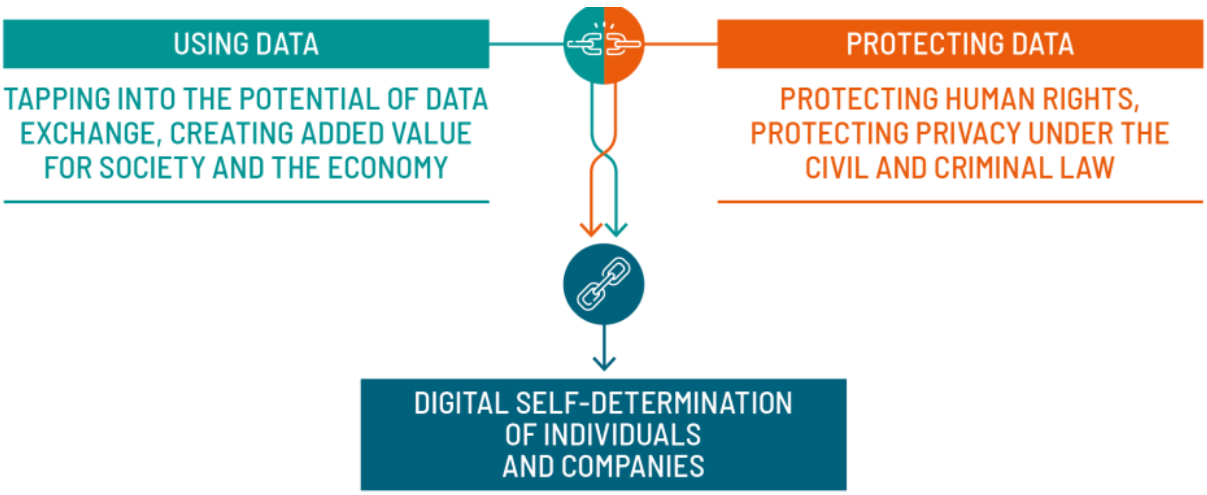

Figure 5. Tension between using data and protecting data. (Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK; Eidgenössisches Departement für auswärtige Angelegenheiten EDA 2022)

3.2.3 Data Spaces from a Swiss Perspective

In a somewhat simple and pragmatic view, the report from OFCOM and FDFA describes the basic anatomy of a dataspace as the interrelationship between data users, data providers meeting transacting in a neutral technical infrastructure that enforces agreed governance and standards. Infrastructure operators are also identified as key participants that help to level-up all participants regardless of their technical prowess.

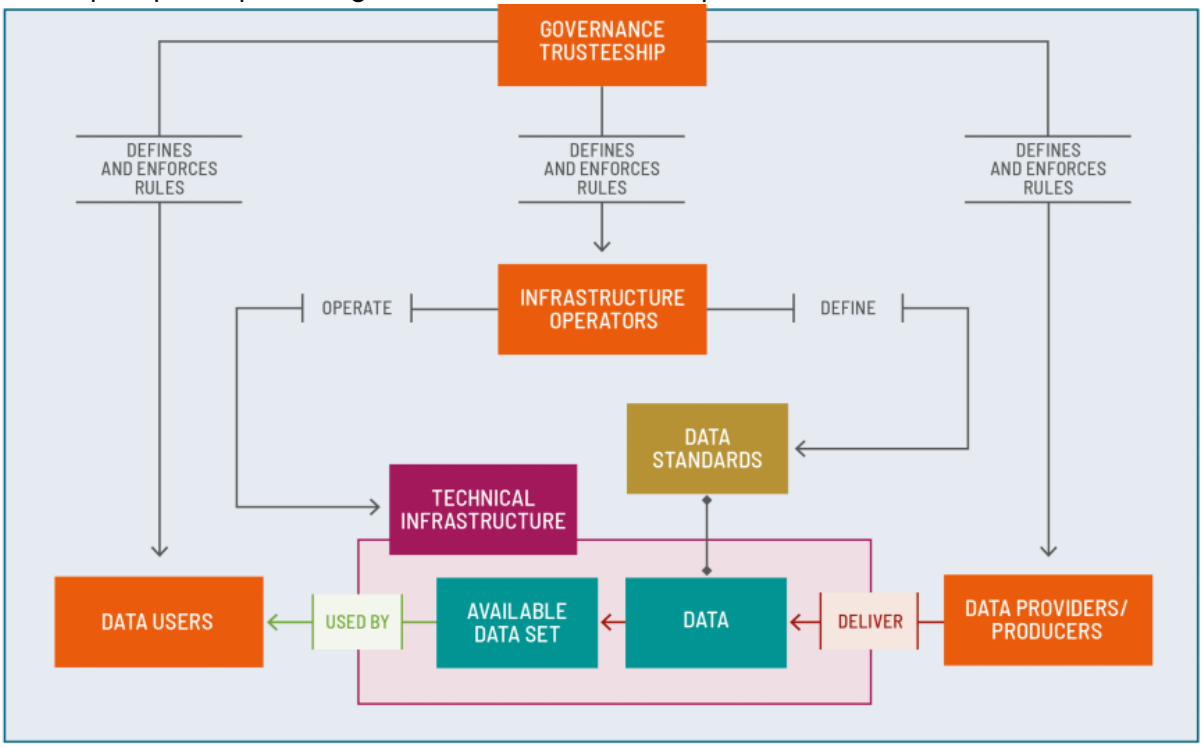

Figure 6. Basic Model of a data space. (Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK; Eidgenössisches Departement für auswärtige Angelegenheiten EDA 2022)

Agridata, a preliminary study, carried out by the Swiss Federal Department of Agriculture, on the development of a trustworthy data space for the Swiss Agri-food sector extended the roles in a data space as follows: Data Producer, Data Provider, Data Intermediary, Data Space Coordinator, Data Recipient and Data Beneficiary.

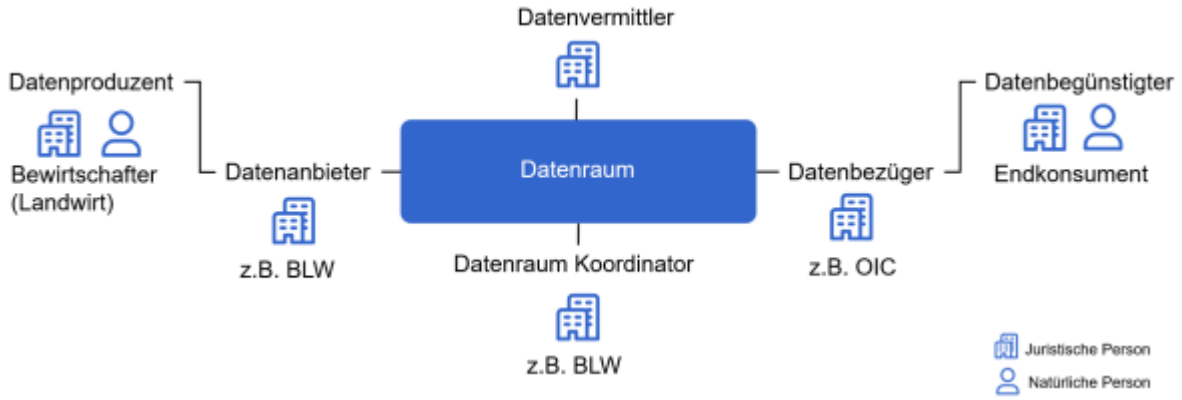

Figure 7. Data space roles in Agridata. (Bundesamt für Landwirtschaf; Beyond Civic AG (TrustRelay AG); 2024)

Note: Infrastructure Operators are not the same as Data Space coordinator, both roles are complementary. Infrastructure operators are considered "Service Providers" with the role to maintain the technical infrastructure. Data Space coordinators are "Neutral" parties (often Government offices) that oversee and kickstart the data ecosystem, they balance the powers between the participants. A Data Space Coordinator may hire an Infrastructure Provider to take care of the daily operations, or it may decide to maintain the technical infrastructure on its own.

3.2.4 Basic Principles of Trustworthy data spaces

For the Swiss Federal Government, the aim is to encourage mostly Trustworthy Data Spaces. Specifically, its trustworthiness is based on the ability of participants to maintain the necessary level of control over their data and to freely consent to sharing it for economic and social purposes.

To create this kind of data space, there are certain fundamental requirements or principles that need to be observed, and these principles should serve to increase trust among all participants. Those principles are Transparency, Control, Fairness, and Effectiveness.

4 Business Requirements of Trustworthy Data Spaces in Switzerland

4.1 Problem statement

Current Swiss Data Ecosystem are siloed and rely on bespoke technical solutions in an uncertain regulatory context where cybersecurity risks put participants into reputational, legal and financial risk. Additionally, Swiss private and public organizations run the risk of being isolated from the single digital marketplace in Europe provided it doesn't ensure interoperability with its European counterparty.

4.2 Opportunity statement

Data Spaces offer a solution to existent data sharing challenges by providing a secure, scalable, affordable and trustworthy framework. Being active participants in the development of the single digital marketplace in Europe will enable the realization of a Swiss Digital Sovereignty and Digital Self-determination.

4.3 Goal: To accelerate the concretisation of Data Spaces in Switzerland

This document aims to accelerate the establishment of operational data spaces in Switzerland within one year across any strategic sectors, including energy, mobility, and education, guided by the principles of digital self-determination, as outlined in the Federal Council's report on (Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK; Eidgenössisches Departement für auswärtige Angelegenheiten EDA 2022).

5 Scope and Limitations of Trustworthy Data Spaces in Switzerland

5.1 In-scope

- Integration and implementation the Technical Building Blocks by DSSC.
- Establishment of Governance Framework
- Defining rules, policies and procedures for data access, sharing, usage and verifiable compliance within the data space.
- Supporting legal, regulatory and administrative processes.
- Identifying roles and responsibilities of data space participants.
- Supporting Data Value Creation
- Data, Services and new offerings creation
- Publication, discoverability and transactionality
- Supporting internationalisation
- Supports Business and Operational Activities
- Participant management including identity verification
- Data Access and Quality control
- Definition and management of data sharing agreements and code of conduct
- Enable visibility of data products through a data catalogue

5.2 Out-of-scope

- Identification of business models
- Identification of incentives for joining a data space
- Internal corporate governance and internal data governance
- Internal corporate governance to select individuals to represent the organisation in a data space
- Internal corporate Processes for data acquisition and classification
- Internal corporate processes for legal basis of data sharing and or participation in a specific data space (European or Swiss).
- Addressing all potential legal and ethical considerations

6 Stakeholders

This section introduces the stakeholders involved in the data space implementation, encompassing both organizations and individuals whose interests and requirements are used as guidelines for the functional requirements.

6.1 Stakeholders as organizations

In this document we distinguish between data space members as **organizations** that actively participate in the sustainability of the data space.

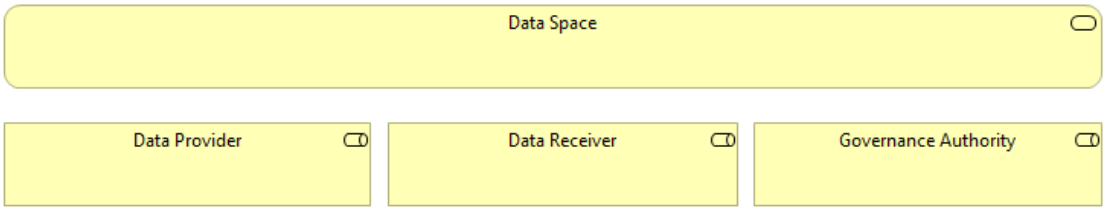

Figure 8. UML Data space members. Own representation

6.2 Stakeholders as individuals

Consequently, we define data space users as individuals that have a user account in the data space's system and whose responsibilities include to act in the benefit of the organization they represent.

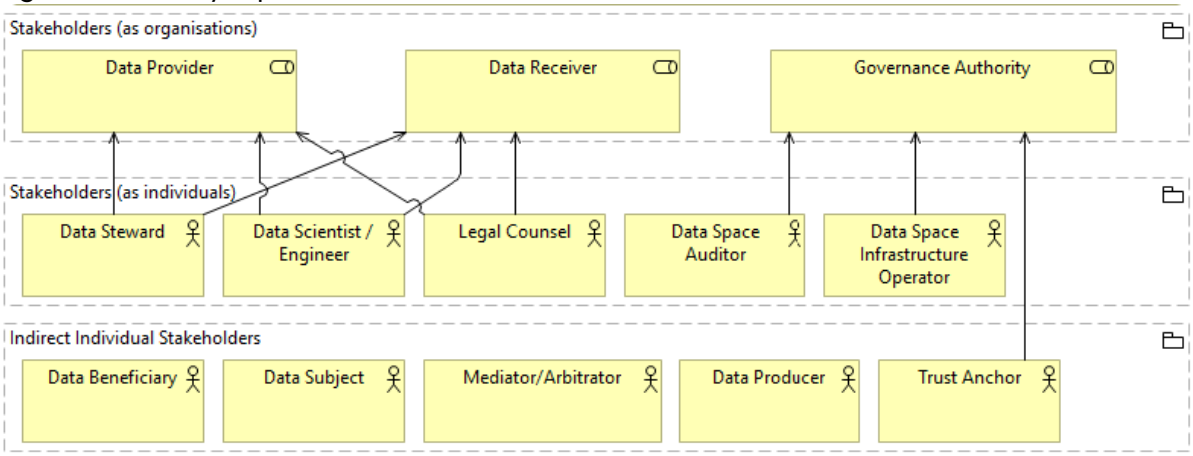

Figure 9. UML Data space users. Own representation

6.3 Role definitions

This section defines each of the roles previously depicted.

Data Subject	An individual whose personal data is collected, processed, or stored by an organization.
Data Producer	An entity or individual that generates or collects data, either actively or passively.
Data Provider	An organization or individual that supplies data to others, often offering commercialization and stewardship.
Data Intermediary	An entity that facilitates the exchange or sharing of data between data producers and data recipient without owning the data.

Data Steward	A person responsible for managing and overseeing organizational data assets to ensure data quality, integrity, and compliance internally and towards other organizations.
Data Recipient	An organization that receives data from a data provider for processing or analysis.
Data User	An entity or individual that accesses and utilizes data for specific purposes like analysis, decision-making, or service delivery.
Data Beneficiary	An individual or group that gains benefits from the use or analysis of data, directly or indirectly.
Mediator / Arbitrator	In the context of online dispute resolution (ODR), the individual, entity or group who presides over, mediates and/or makes a binding decision in an arbitration proceeding.
Data Space Governance Authority	An entity responsible for organizing and managing a data space, ensuring interoperability and governance among all participants.
Data Space Infrastructure Operator	An organization that operates and maintains the technical infrastructure required for the functioning of a data space.
Trust anchors for identity and credentials	A trust anchor in the context of identity verification for legal (organizations) and natural (individuals) persons is a highly trusted entity or authoritative source that serves as the point of trust in an identity verification system. It is the ultimate authority that verifies and authenticates identities, allowing other entities in the system to rely on this verification.

7 Constraints

7.1 Legal

One constraint is the complex and evolving legal landscape surrounding data and digital technologies. The data space in question must comply with established and emerging legislation, including data protection regulations (GDPR, Data Act, Data Governance Act, Swiss Data Privacy Act, Swiss Secondary Data Usage Act), sector-specific regulations, intellectual property law, competition law, cybersecurity and digital identity regulations (eIDAS, ZertES), and contract law.

7.2 Interoperability

The other constraint is interoperability, given that data spaces aim to lower the barrier of entry for all stakeholders in the Swiss economy and additionally to stakeholders in EU, establishing interoperability across diverse stakeholders will impact the implementation.

8 Critical Assumptions

8.1 Regulatory Certainty or Regulatory Sandboxes

A critical assumption is the presence of regulatory certainty or the availability of regulatory sandboxes to reduce the risks (perceived or real) of data providers.

8.2 Clearly Defined Use Cases Incentivizing Data Providers

Another assumption revolves around the existence of clearly defined use cases that incentivize data providers to manufacture and offer quality data products. The literature review emphasizes the importance of demonstrating concrete value and showcasing successful applications of data spaces

8.3 Clear Demand for Data Motivating Data Recipients

The last assumption is the presence of a clear demand for data that motivates data recipients to join the data space, sign agreements, and consume data products. The literature review stresses the need to establish a data-driven marketplace where participants can benefit from sharing data

9 Dependencies

The realization of data spaces is contingent upon several critical dependencies:

9.1 The use and liberalisation of cloud technologies

These technologies allow small and medium enterprises to level-up their resources with bigger counter parties such as multi-national corporations and governments.

9.2 Data literacy of participating organizations.

Organizations need personnel who can effectively understand, manage, and utilize data within the data space.

9.3 The financial sustainability of open-source projects

Such as the Eclipse Data Space Connector.

9.4 Flexibility and agility of IT and corporate governance teams

To enable processes for exporting datasets outside of corporate boundaries.

10 References

Bundesamt für Landwirtschaf; Beyond Civic AG (TrustRelay AG);. 2024. *agridata.ch - Vorstudie zur Entwicklung eines vertrauenswürdigen und florierenden Datenraumes für den Schweizer Agrar- und Ernährungssektor.* Bereich Digitale Transformation und IKT-Lenkung (DTI), Bern: Bundeskanzlei. Accessed 11 13, 2024. https://www.bk.admin.ch/bk/de/home/digitale-transformation-ikt-lenkung/datenoekosystem_schweiz/prototypen/agridata-vorstudie-zur-entwicklung-eines-vertrauenswuerdigen-und-florierenden-datenraumes-fuer-den-schweizer-agrar-und-ernaehrungssektor.html.

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