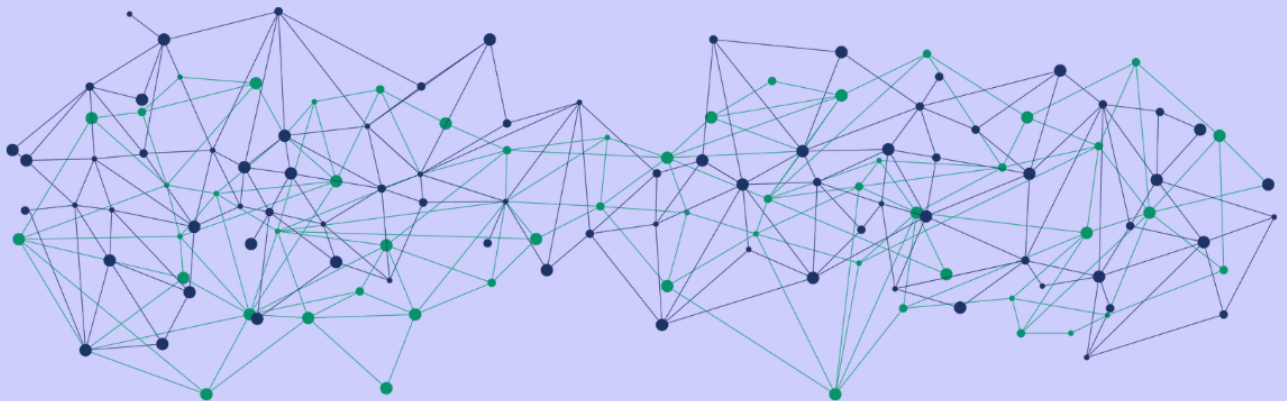Which technologies enable successful collaborative data usage in a decentralized data service ecosystem?

HOW TO DO
DATA SPACES?

The Austrian technical guide to Data Spaces

What is a data service ecosystem?

In a data service ecosystem, business models, products and services are developed and optimized through the collaborativ use of decentralized data.

The basis for this are so-called Data Spaces, as well as technical standards and basic legal definitions such as those developed by the Gaia-X association, IDSA, BDVA, FIWARE etc. at european level (data interfaces, governance, data sovereignty and security, trust).

Technological development towards decentralized systems

1. Centralized data usage   2. Data in the cloud   3. Decentralized data usage

What is a Data Space?

A Data Space is an organizational and technical space where stakeholders and data meet and in which data is made available for joint use in use cases via a decentralized data infrastructure (federated architecture). There is no central data storage. The data stays where it originates and is exchanged as required (acting with choice). This forms the basis for data sovereignty. Data spaces usually focus on higher-level domains/business areas. The Green Data Hub focuses on **energy transition, mobility transition, circular economy and digital climate twin.**

Our collaboration model

Legend:

○ Stakeholder

● Use Case

◆— Sovereign Data Connection
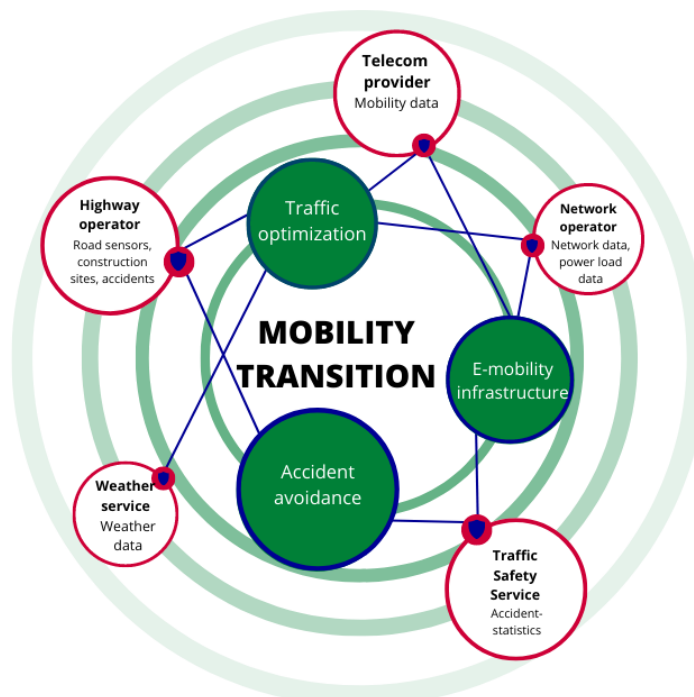
Who meets in a Data Space?

Different stakeholders along the data value chain (data providers, data service providers, data consumers) meet in a Data Space. These are supported by pioneers from the fields of governance, standardization, law, business development and technology.

The aim is to jointly develop sustainable, value-added and technically feasible use cases that also comply with legal standards and governance obligations.

Our methodology

4. **GENERATING** *VALUE*

3. **USING** *DATA*

2. **ENABLING** *USES*

1. **GATHERING** *STAKEHOLDERS*
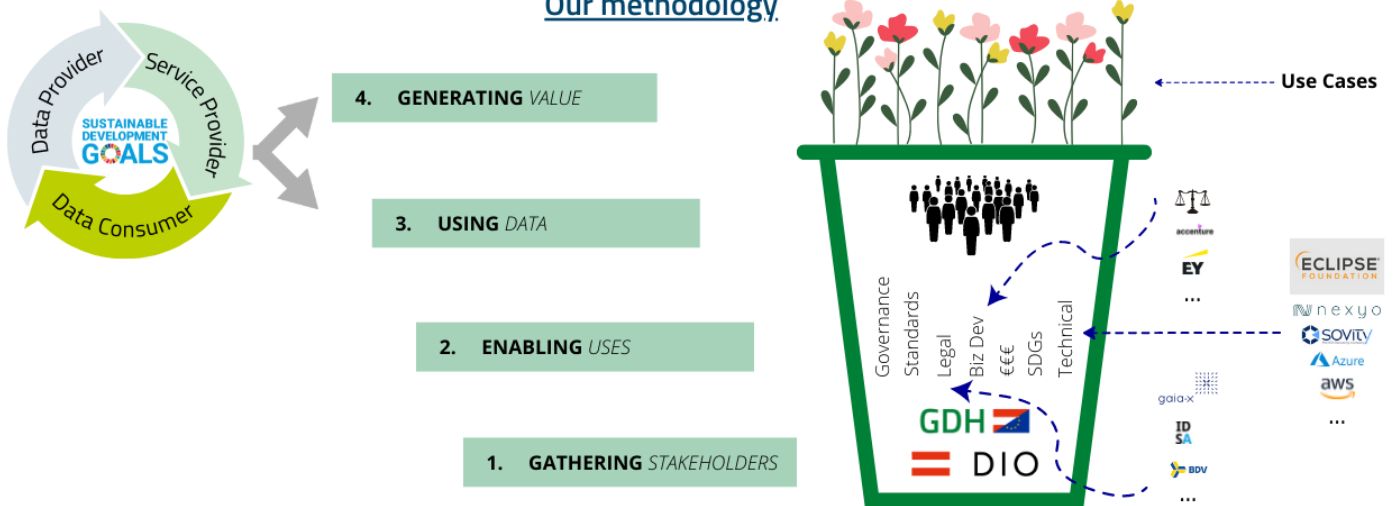
What are the technical requirements for a Data Space?

International organizations, especially in Europe, are promoting the idea of a decentralized data service ecosystem. Leading initiatives such as IDSA, Gaia-X & GXFS, Ocean and the announced smart middleware SIMPL lead the way. The core idea is to create the basis and framework so that data can be shared with each other in a trusted way, even in decentralized systems. This requires solutions for finding the data (catalog / broker), for determining and defining the identities and access options (identity & access management), for traceability (logging) and for standardized data transfer (connectors such as the EDC).
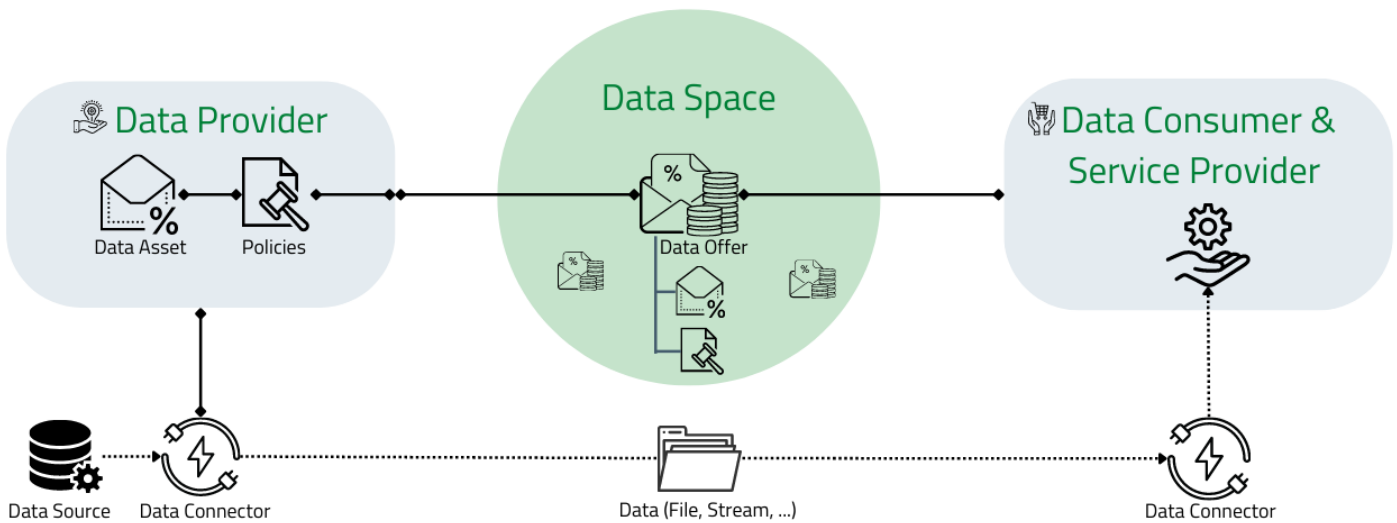
Technical ecosystems
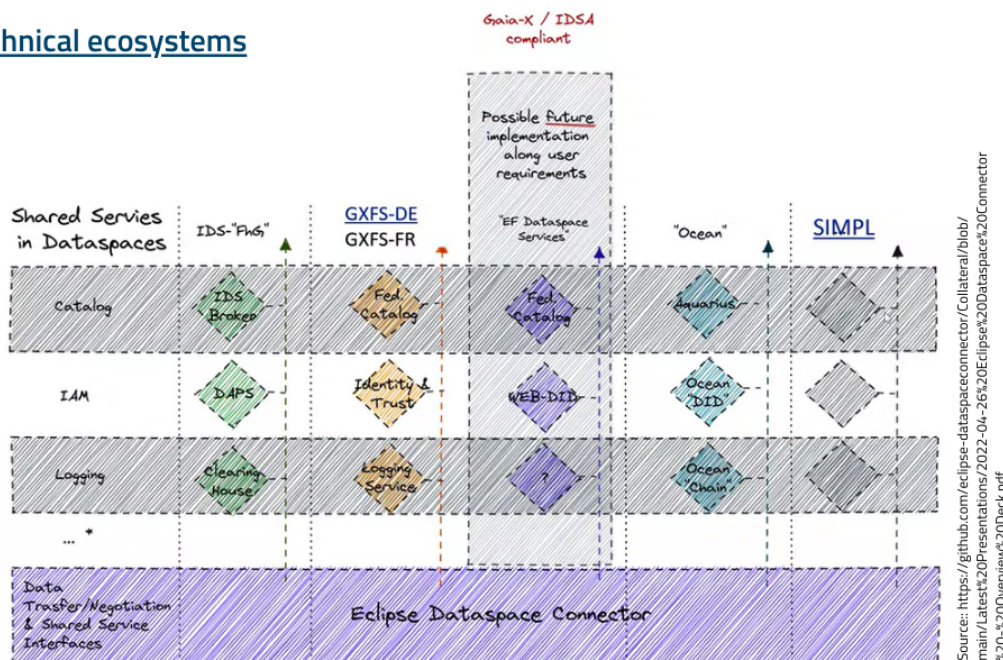
How does data usage work in a Data Space?

In data spaces, data is shared with one another via so-called decentralized data hubs and/or via data connectors. There are various providers on the market (nexyo, sovity, etc.) but also open source solutions that can be implemented (EDC etc.). Data Assets must be created in data hubs/connectors, and verifiable credentials and policies that regulate use and access must be maintained. The resulting Data Offers can be traded. The actual exchange of data takes place via the connectors peer-to-peer outside the data space only for the agreed purpose and based on the defined policies.

Our funtional model

| Data Provider | Data Space | Data Consumer & Service Provider |

Data Asset — Policies

Data Offer

Data Source — Data Connector — Data (File, Stream, ...) — Data Connector
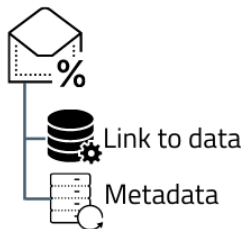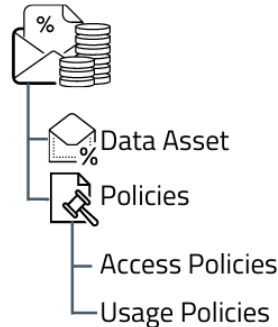
What does a data exchange include?

Data is considered as an asset of a company, which is why it is also referred to as so-called "Data Assets". Data Assets include a link to the data itself as well as metadata. Via "Policies", each "Data Asset" can be offered individually under one's own conditions by creating a "Data Offer". In public, private or restricted data spaces, as decentralized digital spaces, it is then possible for participants to see the "data offers" of other participants, to negotiate and to obtain them while preserving the underlying values.

Our key steps

1.Data Asset
- Link to data
- Metadata

2.Data Offer
- Data Asset
- Policies
  — Access Policies
  — Usage Policies

3.Contracting
Traditional contracts
Smart contracts
Connector contracting

4.Exchange
Identity & Trust
Interoperability
Data Sovereignty
Compliance

Let's work together to enable the collaborative use of data according to European values and actively shape the future!