European Data Space for Smart Communities

Data Space Ecosystem - EDIC

Sophie Meszaros (OASC)

11.06.2026

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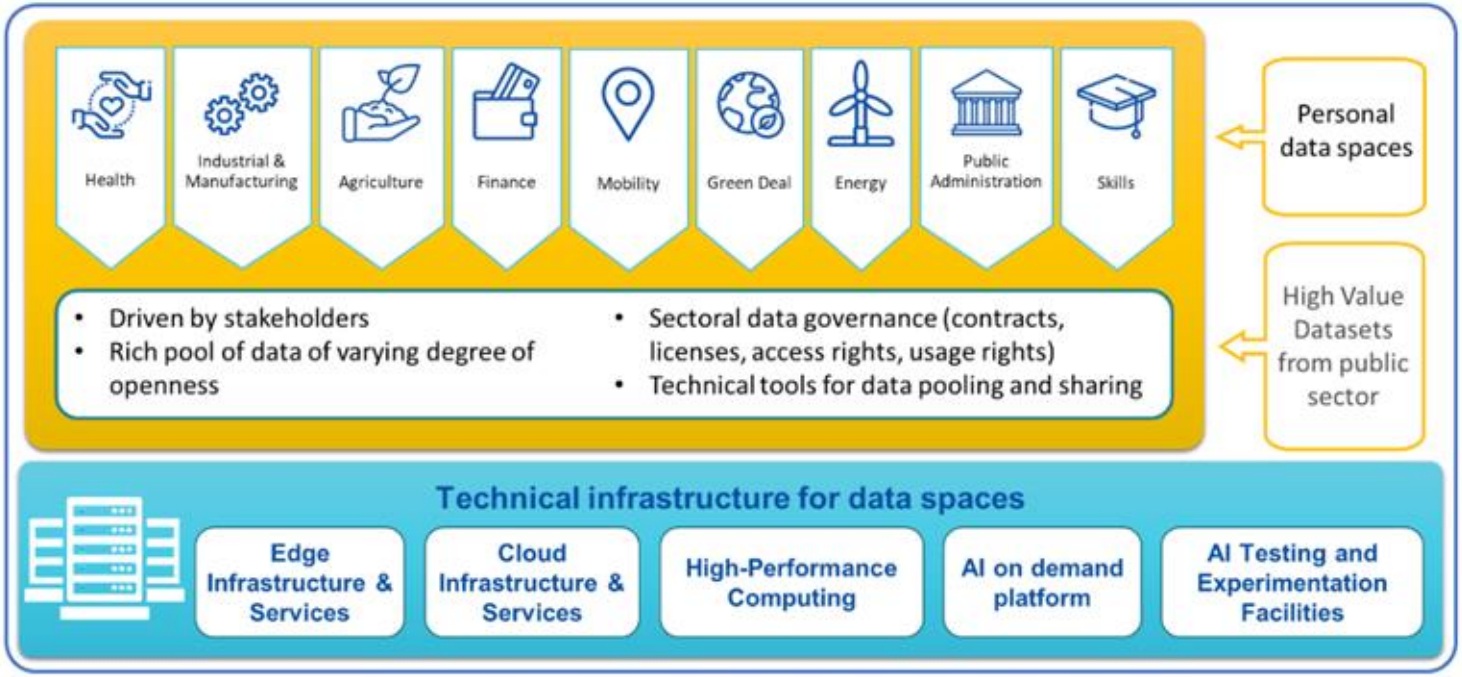
The EC goal – Common European Data Spaces (CEDS)



Source: https://digital-strategy.ec.europa.eu/en/library/building-data-economy-brochure

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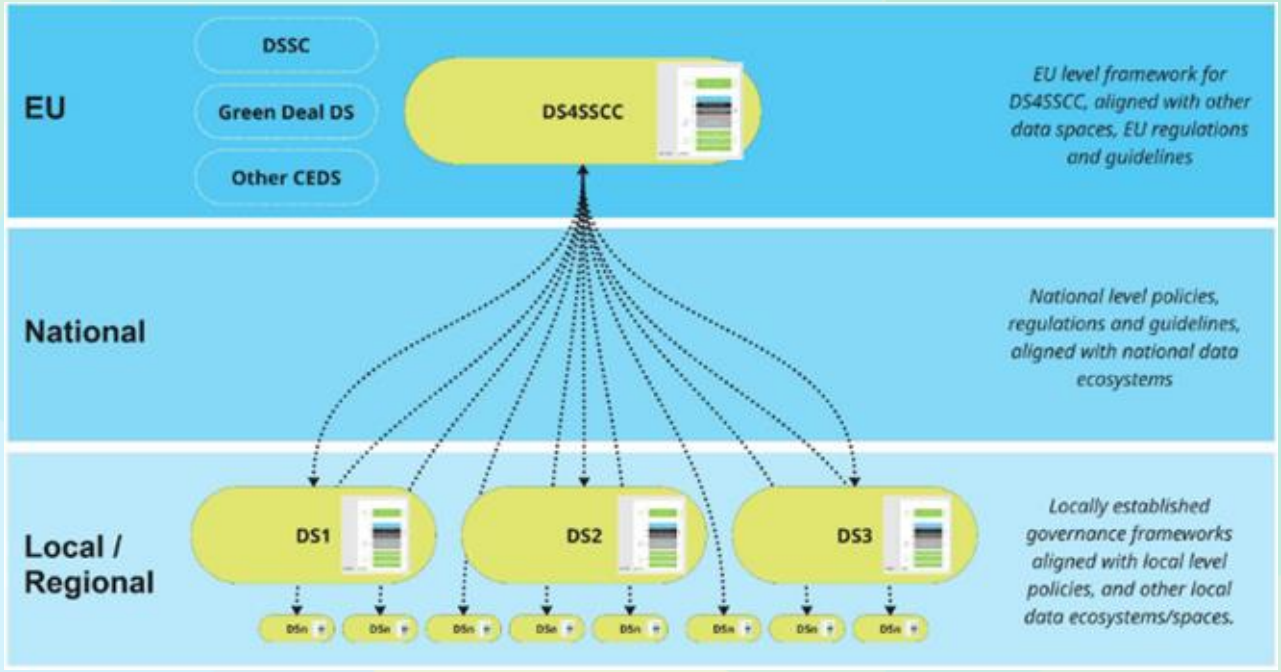
Starting with domain focused data spaces



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European Data Space for **Smart Communities**

- cross-sectorial
- cross-border
- public-private partnerships
- quadruple helix considerations
- social, economic, technical value
- …..complex scenarios

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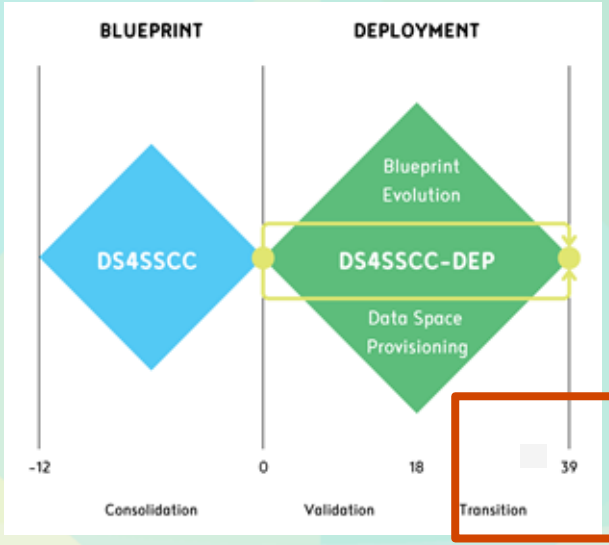
Blueprint

Roadmap to deploy

Capacity Building

Community



Open Calls

↓

Pilot Deployment

↓

- Finalised Blueprint
- SCDS Ecosystem

2022 October

2023 October

2026 December

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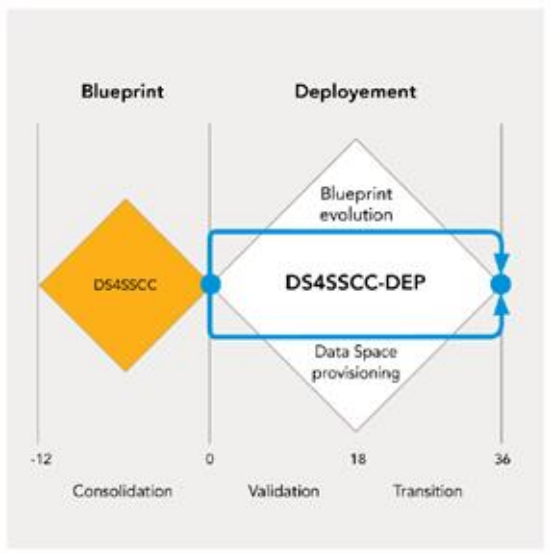
European Data Space for Smart Communities Deployment

AIM:

1. Validate Blueprint
2. Towards a European Data Space for Smart Communities

11 Cross-sectorial co-funded pilots



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European Data Space for Smart Communities Deployment

AIM:

1. Validate Blueprint
   => Implement Blueprint
2. Towards a European Data Space for Smart Communities
   => Bootstrap First truly federated European Data Space

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Having the results from the preparatory action - 2023

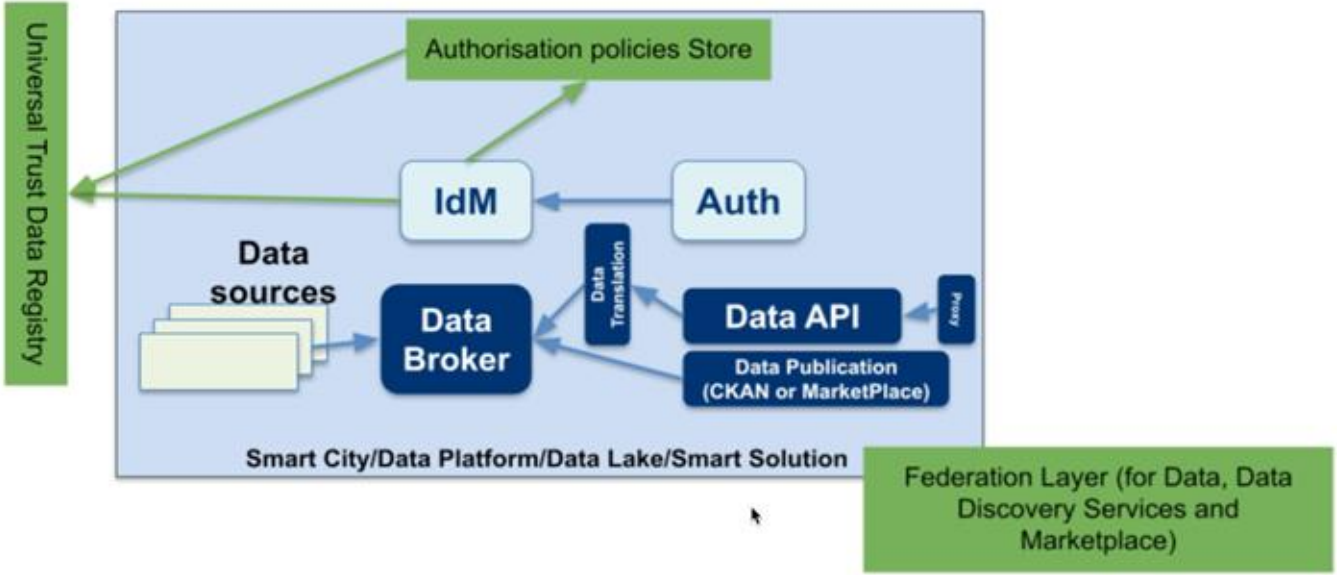

Figure 13: Initial smart city data platform architecture for data spaces

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Evolving into the Blueprint version 2.0 – mid 2025

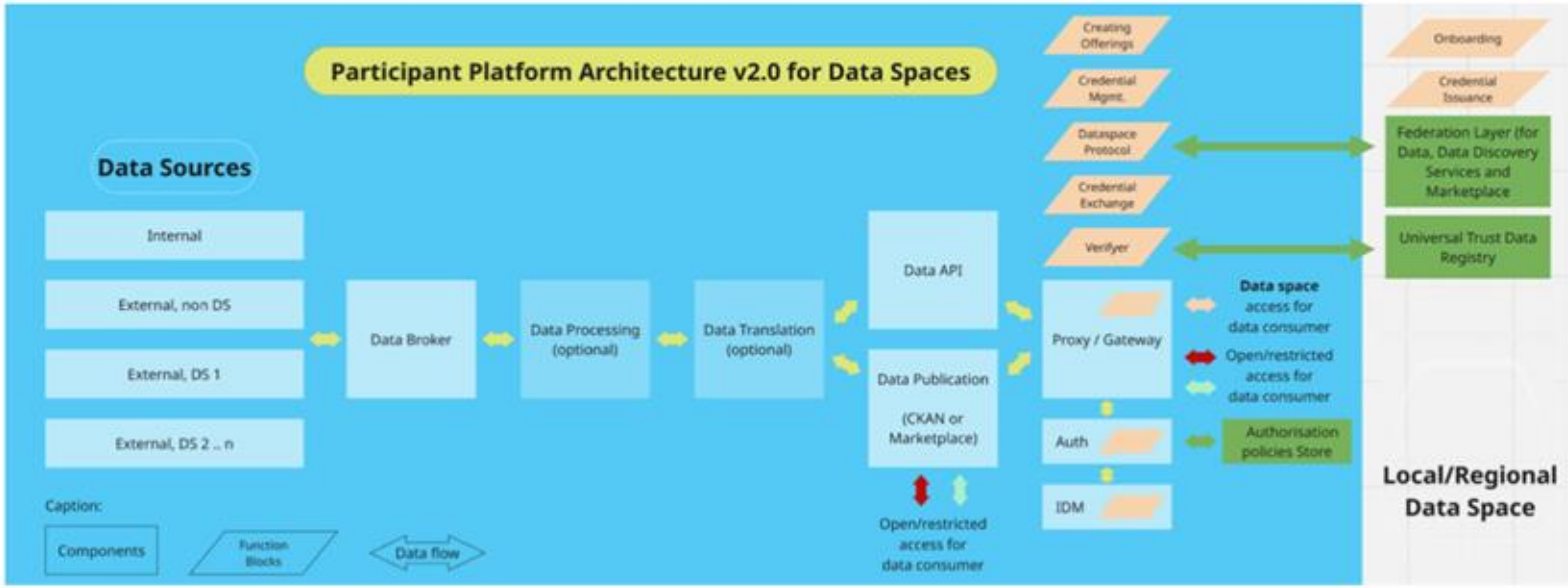

Figure 14: Evolved participant platform architecture for data spaces v2.0

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The pre-standards period (standardisation request, July 2025)

Table 1: List of new European standards and European standardisation deliverables to be drafted and deadlines for their adoption

	Reference information	Deadline for the adoption by the ESOs
1.	Harmonised standards on Trusted Data Transactions Part 1: Terminology, concepts and mechanisms	1 June 2026
2.	Harmonised standards on Trusted Data Transactions Part 2: Trustworthiness requirements	1 November 2026
3.	Harmonised standards on Trusted Data Transactions Part 3: Interoperability requirements	1 May 2027
4.	Technical specification(s) on a data catalogue implementation framework	1 March 2026
5.	Technical specification(s) on an implementation framework for semantic assets	1 September 2026
6.	European standard on a quality framework for internal data governance	1 March 2027
7.	Technical specification(s) on a maturity model for Common European Data Spaces	1 September 2026

EU

global

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Fragmented connector landscape (not fully interoperable)

+ FDSC
+ Pontus-X
+ Simpl
+ proprietary
+ ...

all have Pros/Cons

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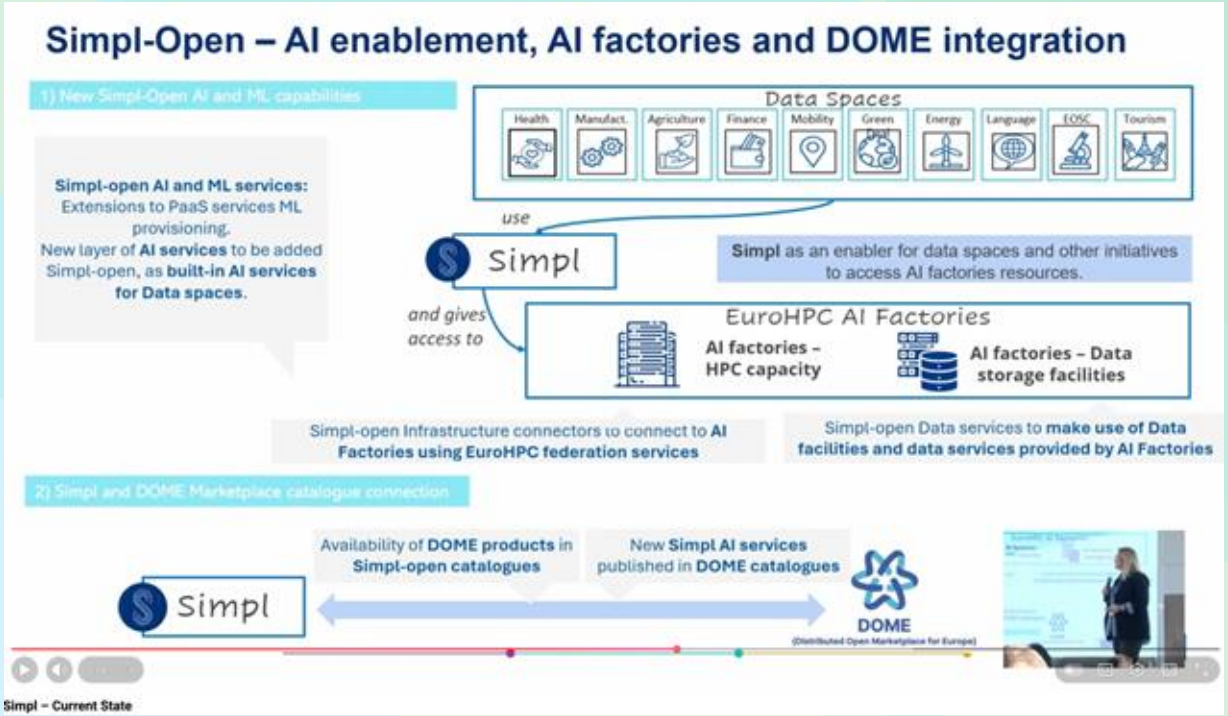
The Simpl approach – presentation from last Gaia-X summit



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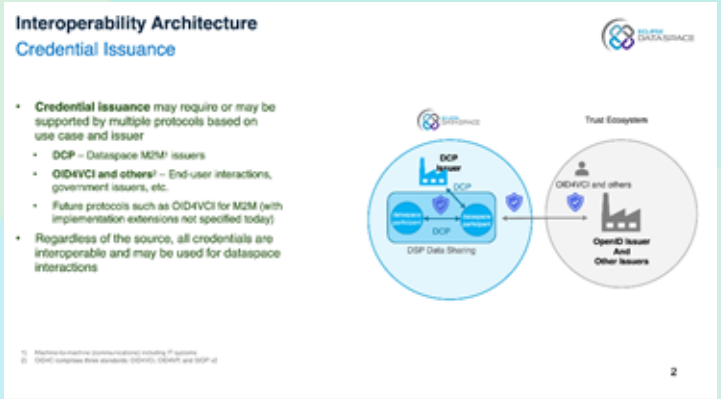
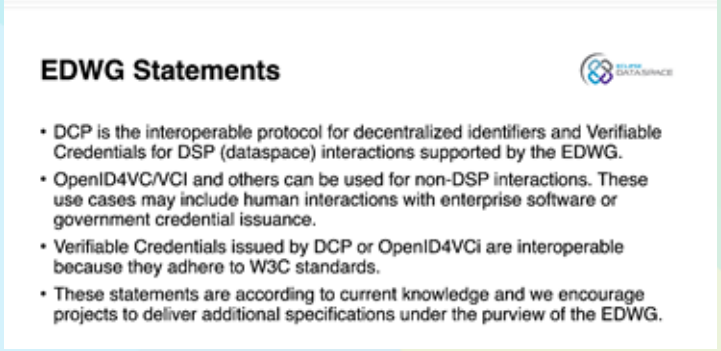
The Eclipse approach (presentation Link)





> If Dataspaces are built properly by adhering to ISO/IEC 20151 and implementing the Dataspace Protocol as well as the Decentralized Claims Protocol they are already technically interoperable by default.
>
> For semantic interoperability I would strongly suggest joining the Eclipse Dataspace Working Group and it's associated specification projects as there is already foundational work being done in a proven organization to build semantic interoperability for Dataspaces.
>
> There is still more work needed, so it would be nice if everyone could contribute to existing specification projects instead of fragmenting the community.

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2. What is Federation?

Data Federation

Access Management

Consolidated Services

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2. What is Federation?

Data Federation

- Publication & Discovery (DCAT)
- Discovery requires semantic Interoperability
- Identifiers
- Linked Data

MIM2 Representing Data

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2. What is Federation?

Access Management

- Identity and Attestation Management
- =>Identify and Individual
  - Identity Providers
  - Verifiable Credentials
  - Personal Data
- Users can have different Roles & Rights
  - RBAC, ODRL,
  - Governance Framework

MIM³ Sharing Data

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2. What is Federation?

Consolidated Services

- How can a service in one pilot be re-used in another?
- Transferability
- Application Discovery
- Marketplace

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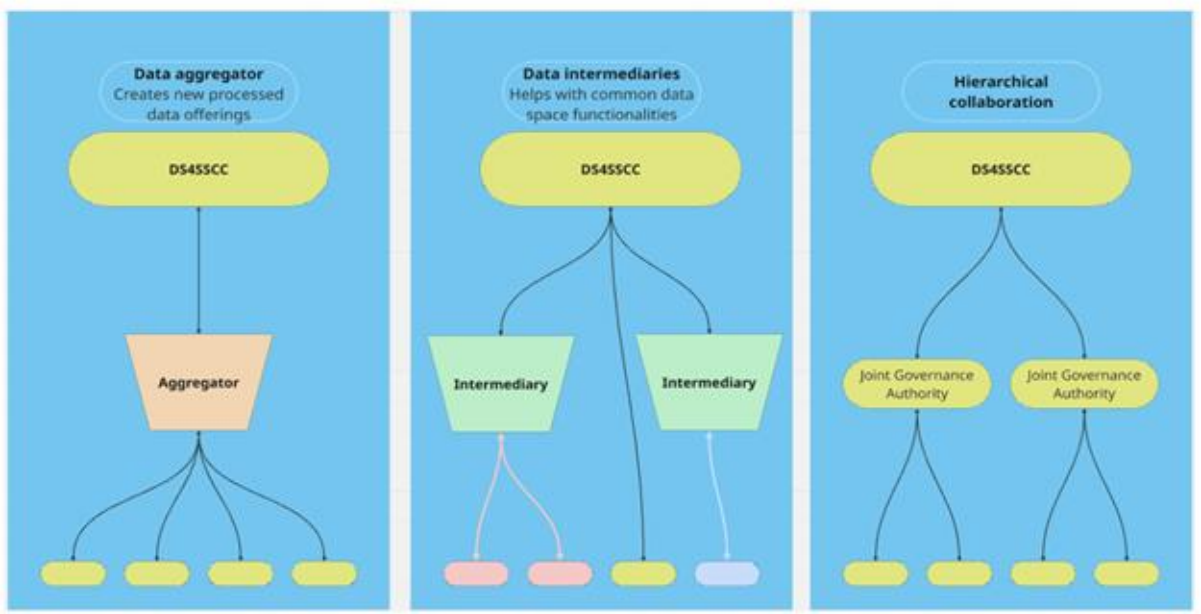
Federation scenarios as potential solutions for DS4SSCC varieties

Aggregation: Common service layer provides shared basic functionalities through collaboratively managed infrastructure.

Intermediary: Specific entities (e.g., data brokers) facilitate interactions and provide selected functionalities (e.g., consent management, access control) across data spaces.

Hierarchical Collaboration: A common Governance Authority oversees the federation, establishing and enforcing unified rules for cross-data space interoperability.



- technical
- non-technical
- mixed

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Intermediaries

3. Concepts and key elements

3.1. Services and service providers

Data spaces are built on several **technical** and **business and organisational** services that enable trusted data sharing. A data space does not need service providers to implement federation services, but it may choose to do so. For example, all data space participants may be expected to self-host a technical connector, or data space participant may use a service provider and acquire a connector as-a-service.

A **service provider** is a business entity that provides these services. A DSGA may define whether the providers are also participants of the data space. For example, a catalogue service (SAAS, software-as-a-service) provider will usually be a data space participant, but a provider of simple cloud hosting (IAAS, infrastructure-as-a-service) services will not. Cloud service provider may provide a connector as-a-service (SAAS or PAAS), but a DSGA may require that connector providers are also participants, and because of this cloud service provider needs to make decision do they want to commit to the data space rulebook and become also data space participant.

Services may also be procured by one party to be used by another party. For example, a DSGA may procure (and pay for) vocabulary services from a provider who then provides these services for all data space participants to use (free of charge).

Finally, different kinds of requirements, limitations, and responsibilities for provisioning services in a data space can be set in the data space governance framework (rulebook). For example, service providers may be required to have certain technical or legal certifications, commit to certain business arrangements, or undergo special audits.

3.2. Intermediaries and operators

Within the broader category of service providers in data spaces, intermediaries and operators enable data sharing and trusted data transactions to take place. These can be technical services (federation, participant agent, or occasionally value creation services) or business and organisational services.

When a single service provider provides all or most of the enabling services for a data space, that provider is often called the operator of the data space. When different enabling services are provided by different specialised providers, these providers can be called intermediaries. Collectively, the intermediaries provide the enabling services that the operator provides single-handedly. Intermediary and operator labels are not always mutually exclusive and for this reason we address often both of these concepts.

The most common roles of intermediaries and operators is to provide neutral and trusted federation and participant agent services, but intermediaries and operators may also facilitate growth through increased accessibility to the data space, enable cross-data space interoperability, and offer business and organisational services to the data space.

There might also be cases in which an enabling service provider also provides value creation services or acts as a data source or data provider providers within the data space. Data space governance framework (rulebook) or legal frameworks may limit how enabling services may be bundled with value creation services, and there might be reasons why such bundles are not favourable for the neutral and scalable operations of intermediaries.

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Core Assets of DS4SSCC

Data Space Ecosystem

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Fledgling European Data Space for Smart Communities

Community

- 11 Pilots
- 25 Local Governments
- Stakeholder Forum
- (500+ Active Members)
- Living-in.eu

Blueprint

- Technical & Non-tech resources
- Concrete Action Plans, Business Cases
- Proof of applicability

Infrastructure

- Federation infrastructure
- Partner infrastructure (DSSC, SIMPL)
- Open Components

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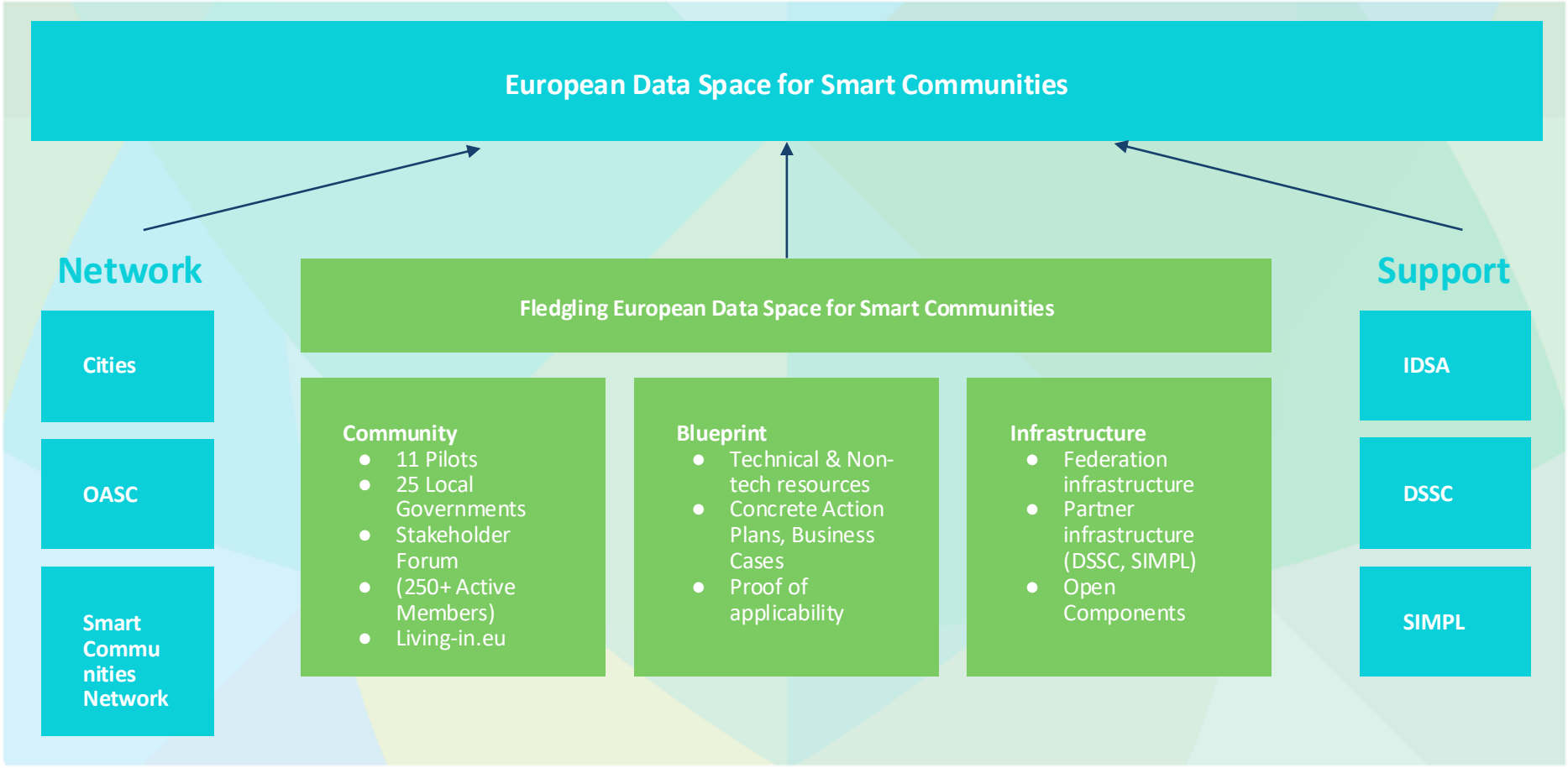

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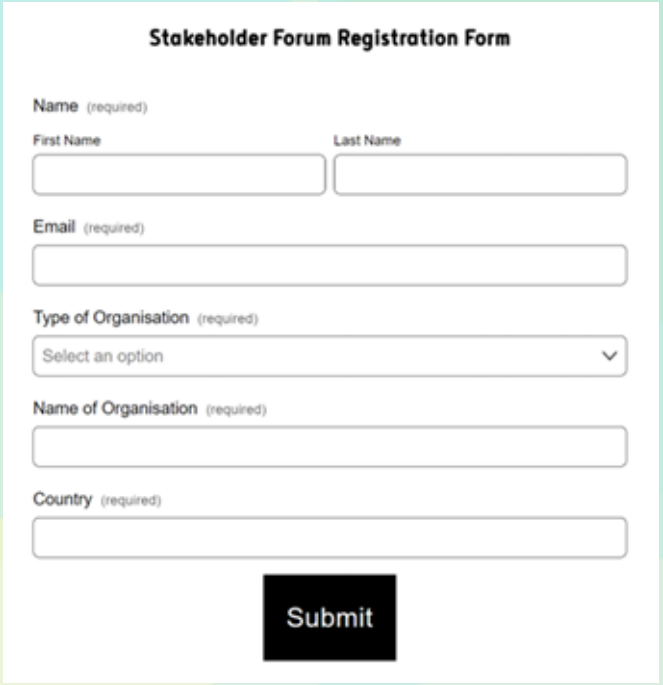
Website - ds4sscc.eu/stakeholderforum

- Quadruple Helix
- 500+ Individuals
- 28 countries covered



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Questions?

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