

Data Spaces Support Center (DSSC) - Technical Results and Outlook -



Thursday, 28 May (10:40 – 11:00)

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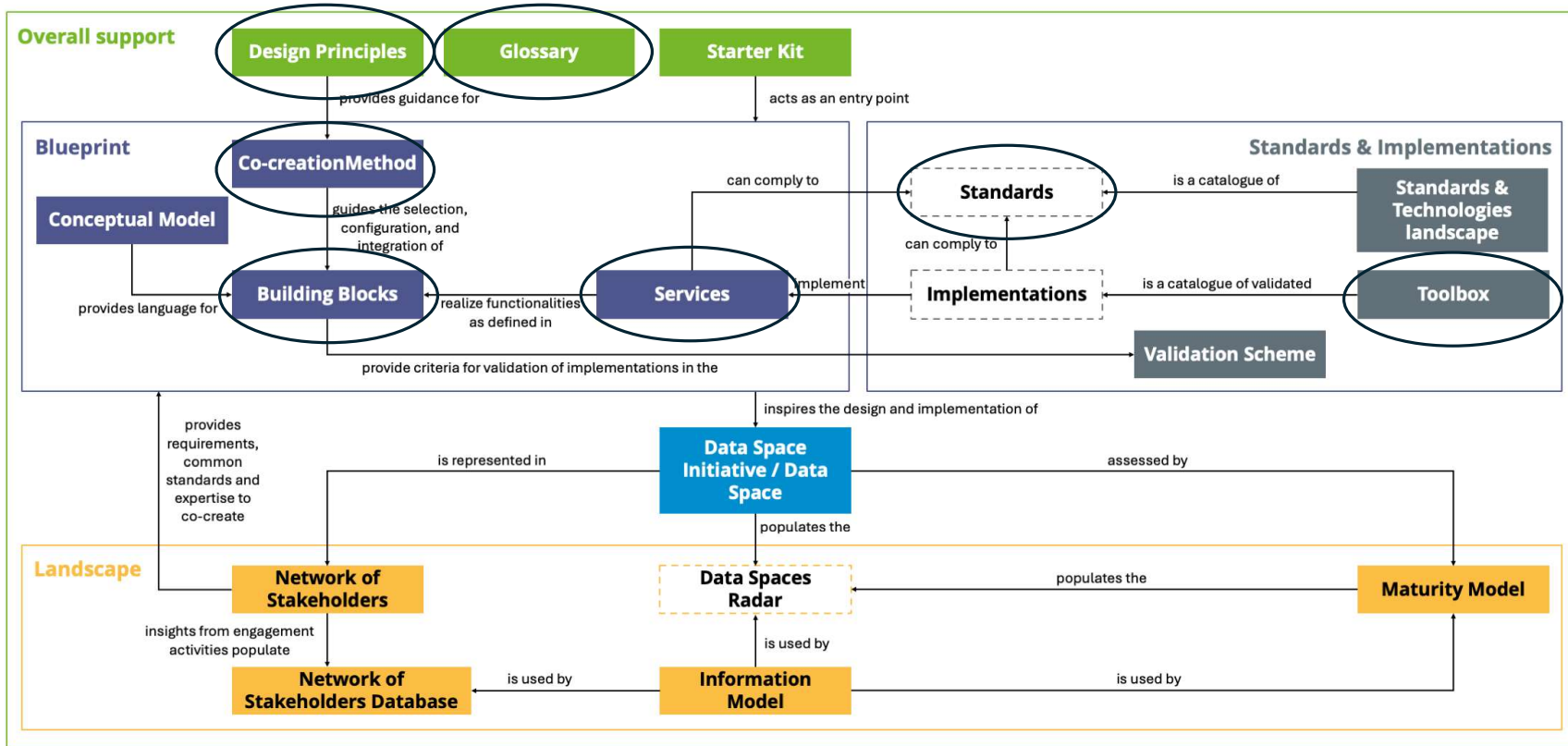


DATA SPACES
SUPPORT CENTRE

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DSSC assets based approach



Legend: Assets owned by the DSSC (solid box), Assets not owned by DSSC (dashed box)

Note: this figure represents the DSSC asset model. It shows relationships between assets, without adhering to a strict UML language. The conceptual model defines further concepts and language.

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DSCS Glossary

<https://blueprint.dssc.eu/?pane=glossary>

Consistent and coherent terminology for DSSC communication and publications

- Context, scope, alignment
- Legal definitions
- Criteria and explanatory text
- Modular and interlinked
- Roles and instances

Data Space: interoperable framework, based on common governance principles, standards, practices and enabling services, that enables trusted data transactions between participants

Design principles



Guidelines that assist data space initiatives in making informed decisions while minimizing the risks of data space design and development flaws

S#	Description
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

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Building on Top of Foundational Technical Standards



- **W3C ODRL (Open Digital Rights Language):** policy expression language to provide a flexible and interoperable framework for representing statements about the usage of content and services. Express access and usage policies to a dataset.
 - **W3C Verifiable Credentials:** enable the creation, sharing, and verification of digital credentials in a secure and privacy-respecting manner. Tamper-evident and cryptographically verifiable. Issued for identification and to indicate that a participant is compliant with something
 - **W3C DCAT (Data Catalogue) v3:** facilitate the interoperability of data catalogues published on the web. Framework for describing datasets in a way that makes them easily discoverable and accessible. Facilitate data integration and reuse across different platforms and domains
-
- **Data Space Protocol (DSP):** explains (i) how datasets are deployed as DCAT Catalogs and usage control is expressed as ODRL Policies, (ii) how agreements that govern data usage are syntactically expressed and electronically negotiated, (iii) how datasets are accessed using Transfer Process Protocols
 - **OpenID for Verifiable Credentials**
 - **Eclipse Dataspace Decentralized Claims Protocol**

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DSSC technical building blocks

Semantics, technical interfaces
(APIs), observability

Identification, trust, access
& usage policies

Publication, discovery,
value-added services

Technical

Data interoperability

Data models

Data exchange

Provenance & traceability

Data sovereignty & trust

Identity & attestation management

Trust framework

Access & usage policies
enforcement

Date value creation enablers

Data, services
& offering descriptions

Publication & discovery

Value creation services

DSSC building block: description of related functionalities and/or capabilities that can be realised and combined with other building blocks to achieve the overall functionality of a data space

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Data interoperability

Data models

Data exchange

Provenance & traceability

- Monitor for better compliance, business, trustworthiness purposes
- Actual exchange of data (provenance)
- Other aspects of the transaction (observability -> states of the DSP machine / 3 protocols)
- Part of the data product -> data models, e.g. W3C PROV-O

- Ontologies, application profiles, data schemas
- Vocabulary services
- Data model development
- Data model governance
- Data model integration
- Data model abstraction
- Data models across data space

- Transfer process -> in the “data plane” (linked to the “control plane”)
- Dataspace Protocol (state machine: REQUESTED, STARTED, COMPLETED, SUSPENDED, and TERMINATED)
- To be implemented into a transmission protocol (e.g. REST-APIs, or similar)
- Connected to the data model through the data schemas



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Data sovereignty & trust

Identity & attestation management

Trust framework

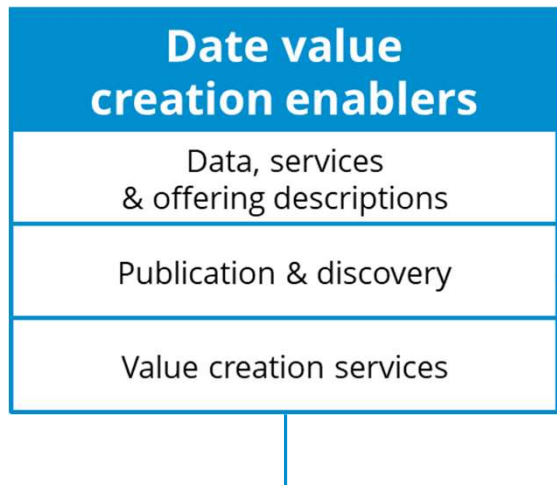
Access & usage policies enforcement

- Who can access data, how data access is granted and controlled, what actions can (not) be performed, how usage is controlled
- Policy Creation and Validation
- Enforcement of policies during the various stages of a data transaction
- W3C ODRL, DSP
- Best practice: policy administration, information, decision and enforcement

- Manage and exchange of credentials
- Attestation -> verifiable credentials and presentation
 - Identity Attestations
 - Membership Attestations (also referred to as attestations of participation in a data space)
 - Compliance Attestations according to the data space governance
- W3C VC, DiDs, OIDC4VC, DCP
- Rulebook and compliance criteria
- Processes and technical means for validation
- Accredited sources of trust: trust anchors and trust service providers
- ISO/IEC 17000:2020 - Conformity assessment, ETSI TS 119 612 (Trusted Lists), W3C SHACL (automated compliance verification)
- Use and extension of existing FWs: Gaia-X



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- Data Space offering: data product + services
- Creating, validating, updating, managing metadata
- DCAT & DCAT-AP
- Sectorial metadata

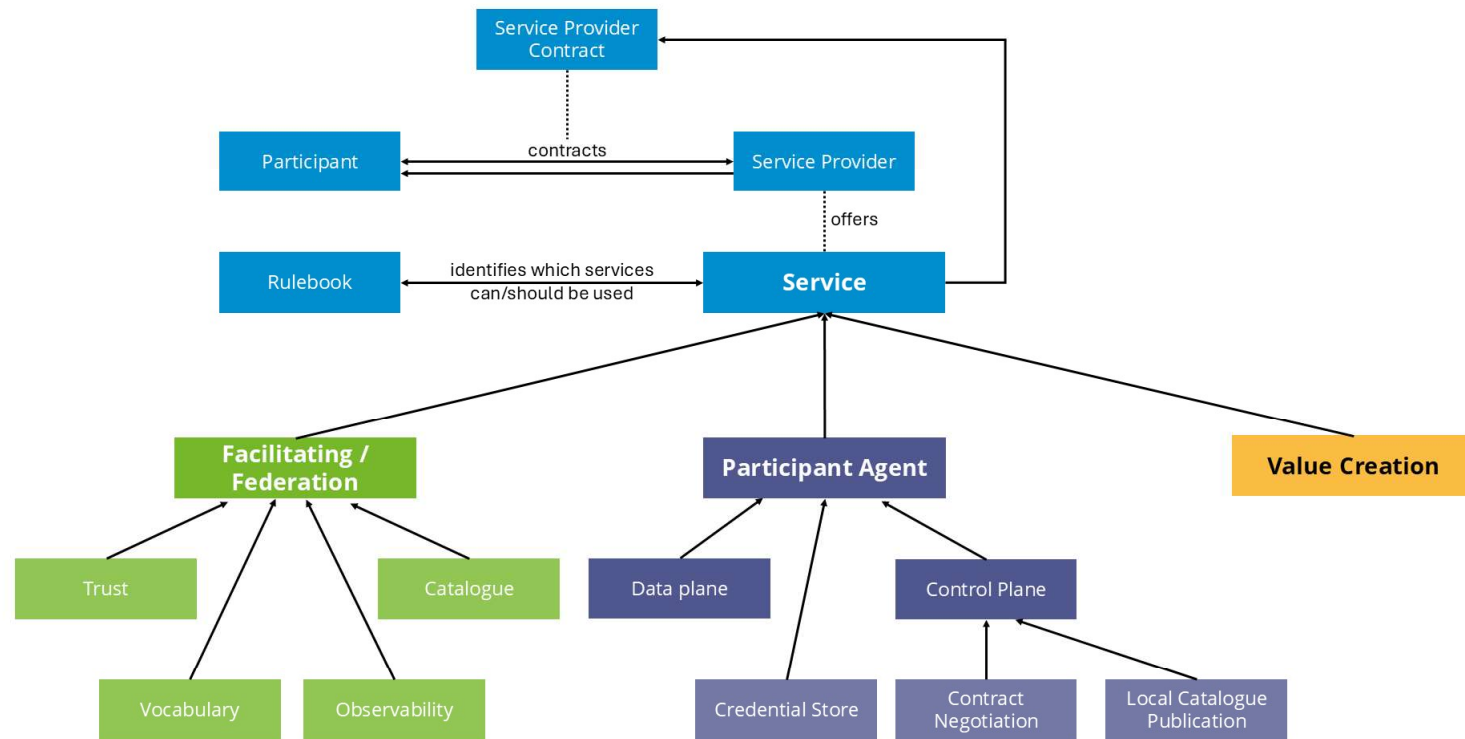
- Unlock, generate and maximize the value of data shared within a data space, providing additional functionalities on top of the core process of data sharing or data transaction
- Taxonomy
- Composition of services
- Information model -> description
- Services management framework

- Brings together providers and potential consumers
- Providers expose descriptions as offerings, consumers search among offerings to determine whether the characteristics and terms and conditions meet their needs and requirement
- Catalogues in the DSP (catalogue protocol)
- Implementation through a connector (that displays the offering of this participant), or through a catalogue

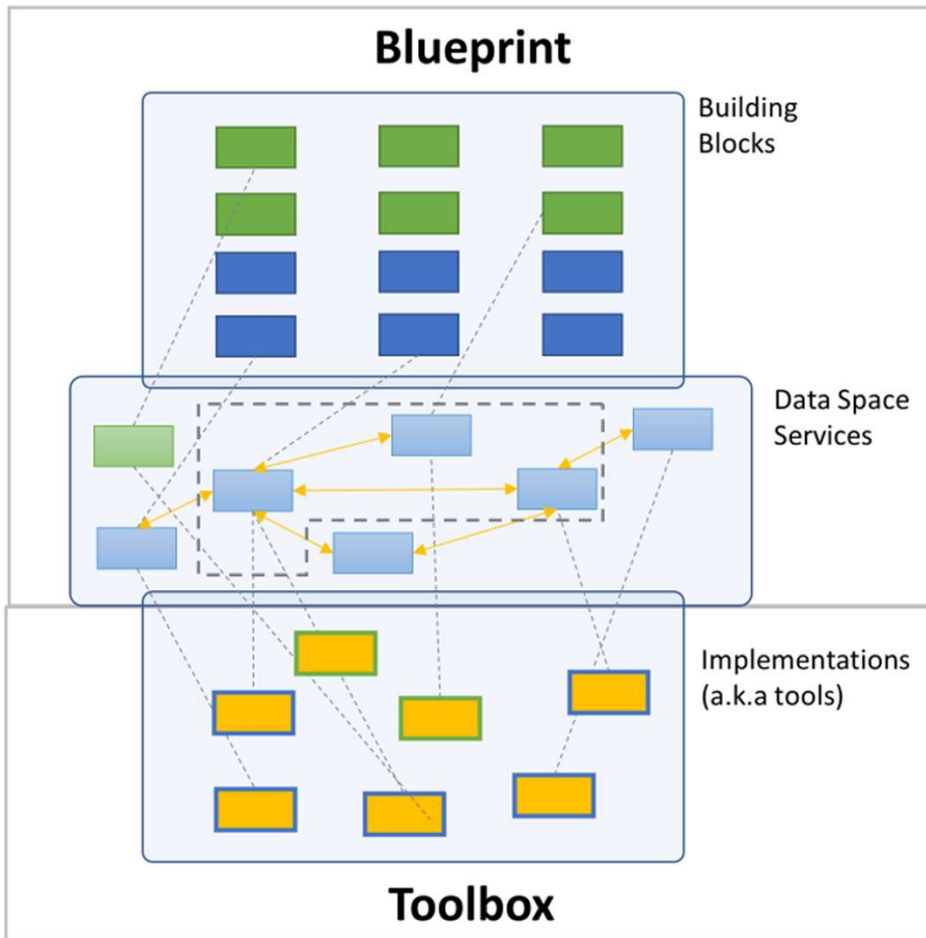
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From building block capabilities to services



DSSC Toolbox: a collection of real implementations

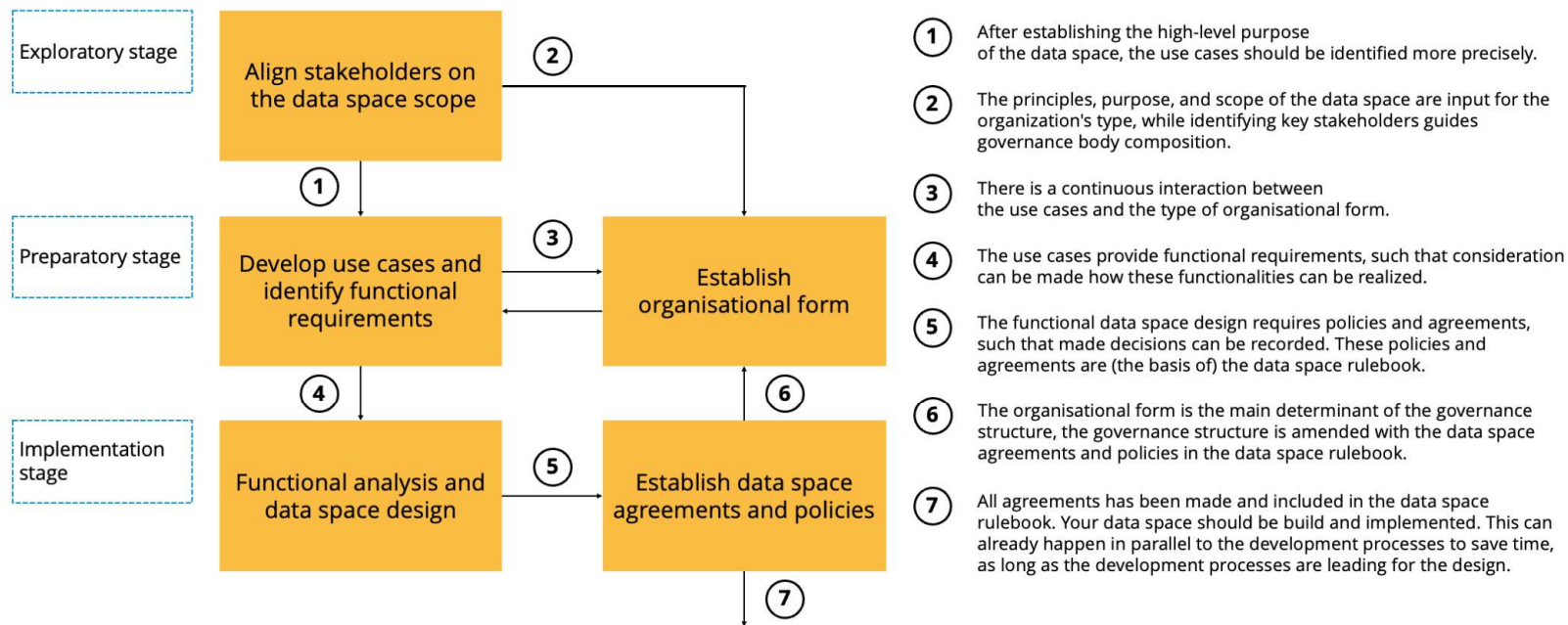


Name	Service type	Building blocks	Maintainer	Assessment information	Blueprint version
Ocean Enterprise Provider	Participant Agent service	PM OGA CF RC UCD DM DSI	Ocean Enterprise Collective (OEC)	 	v1.5
Ocean Enterprise Market	Value Creation service	BMD	Ocean Enterprise Collective (OEC), deltaDAO AG	 	v1.5
Nautilus Participant Agent	Participant Agent service	PM OGA CF RC UCD DM DSI	deltaDAO AG	 	v1.5
Ocean Enterprise Catalogue and Aquarius Catalogue Cache	Catalogue service	DPD UCD DSI DM CF RC BMD	Ocean Enterprise Collective (OEC), deltaDAO AG	 	v1.5

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DSSC co-creation method

Increase the speed of development by guiding participants through a sequence of questions directly connected to the building blocks. In this way, the Co-Creation Method aims to quickly determine the most appropriate implementation, aiming to increase the success chances of a data space



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DSSC forward looking (research agenda)



- Standards, Data Act (article 33)
- Machine interpretable rulebooks (comparable, improving interoperability, automation), Machine-Readable Trust as a Foundation for Cross-Space Federation
- Expanding Claim-Based Participation Models
- AI for data spaces at large
- AI driven data annotation and structuring, AI-Enabled Interoperability
- End-to-End Lineage and Transparency
- Advancing the development of technical services
- Metadata for Algorithmic Assets and AI-Driven Services
- Federated Catalogs for Scalable, Distributed Discovery
- Convergence Between Participant Services and Value-Added Capabilities

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Data Spaces Support Center 2



- Focused on adoption and impact
- Contribute to AI Continent Action Plan and European Data Union Strategy (AI Factories, Data Labs, AI readiness of data)
- Maturity and extension of building blocks and blueprint
- Further standardization
- AI & data spaces
- Connection / interoperability between data spaces

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Thank you!

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