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Data Spaces Interoperability Compass (DSIC) Ceremony

4 February, 2025 – Data Sharing Festival

Access the full DSIC report here:
DSIC-Living-Document-2024-initial-public-first-version.pdf

Explore DSIC Tools here:
https://coe-dsc.nl/get-involved/

Stay in touch via:
info@coe-dsc.nl

Content

- DSIC Ceremony

- Walk through DSIC insights & tools

- Next Steps & Q&A

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The next step in the development of data spaces is realising cross-domain data sharing which requires practical navigation

In this ceremony we present & share the first version of DSIC

It has been a great journey co-creating DSIC with you!

We want to give special thanks to all organisations who provided insights and aided in the creation of DSIC:
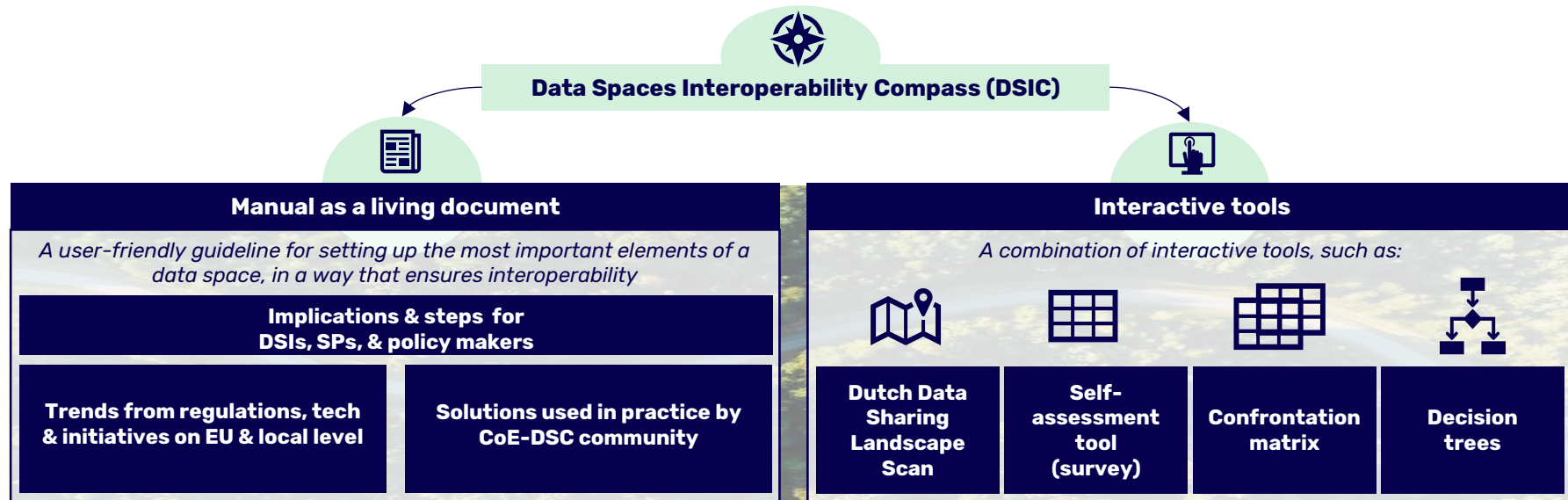
- To all who participated in the research interviews throughout the year

- To all data sharing initiatives and service providers who attended DSIC sessions in 2024

- To all architects from various initiatives who participated in the working sessions of the CoE-DSC Working Community of the Data Spaces Architects

- To all organisations participating in the use cases this year

- To all who participated in the review of the DSIC & shared their feedback

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Walkthrough DSIC – Living Document & Tools

Data Spaces Interoperability Compass (DSIC)

Manual as a living document

A user-friendly guideline for setting up the most important elements of a data space, in a way that ensures interoperability

Implications & steps for DSIs, SPs, & policy makers

Trends from regulations, tech & initiatives on EU & local level

Solutions used in practice by CoE-DSC community

Interactive tools

A combination of interactive tools, such as:

Dutch Data Sharing Landscape Scan

Self-assessment tool (survey)

Confrontation matrix

Decision trees

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DSIC Living Document – Key Insights & Reflections

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Cross-sectoral and cross-border data sharing is foundational for many valuable use cases

Non-exhaustive examples

Type	Healthcare	Supply chain & logistics	Environmental monitoring	Financial fraud detection
Cross-sector	Healthcare providers, municipalities, insurers and regulators share patient/client data for administrative and policy purposes	Retailers, manufacturers, and transportation companies share data on inventory levels, demand forecasts, and shipping schedules to enhance supply chain efficiency and responsiveness.	Agricultural and environmental organizations share climate and agricultural data to improve crop yields and develop strategies for climate change adaptation.	Banks, insurers, regulators, notaries and security companies share data on fraud and (cyber)threat scenario's to fight financial crime
Cross-border	Researchers and healthcare providers from different countries collaborate to share patient data and research findings to advance medical research and improve patient outcomes	OEM's exchange data with suppliers and logistics providers across different countries to optimize supply chain operations, reduce costs, and improve delivery times.	Government agencies share sensor data on water or air pollution internationally to find polluters and create better descriptive and predictive models.	Financial institutions and national regulators share data on fraudulent transactions to fight international organized crime

Source: CoE-DSC analysis (desk research & interviews)

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Holistic view on cross sectoral interoperability is important to create value and prevent complexity, cost and legal uncertainty

Technical Interoperability

Technical interoperability is fundamental because it ensures that diverse systems can work together efficiently without requiring extensive custom integration efforts. This reduces costs, minimizes errors, and enhances the scalability and agility of IT systems.

Semantic Interoperability

The value of semantic interoperability is crucial for meaningful data analysis and (automated) decision-making. It reduces misunderstandings and errors that can arise from data being interpreted differently by different systems or stakeholders.

Organisational Interoperability

Fosters collaboration and coordination among different entities, leading to more efficient and effective business operations. It helps organizations leverage shared data to achieve common goals and improves the overall efficiency of inter-organizational processes.

Legal Interoperability

The value of legal interoperability lies in its ability to create trust by facilitating lawful data exchanges across sectors and borders, reducing the risk of legal disputes and ensuring compliance with regulations such as data protection laws.

DSIC reflects on what to do for cross-domain interoperability: Take a holistic view & follow 4 high level principles

Take a holistic view on interoperability:
Interoperability is about more than achieving technical alignment on standards.
Semantic, legal and organizational interoperability are at least equally as important.

+

| **Embrace a development formula: reuse, recycle, reduce** | **Collaborate & share best practices** | **Raise awareness & provide support** | **Ensure regulatory compliance** |

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DSIC observation: cross-domain interoperability is a shared effort in which so DSIs, SPs & policy makers all have their roles to play

Roles of parties for propelling interoperability in the data sharing landscape

	Data Sharing Initiatives	**Service providers**	**Policy makers**
Role in:			
Development	**Discovery of user needs** for cross-domain use cases and interoperability solutions grounded in practical reality	**Creating great products** addressing the demand for interoperable, scalable solutions	**Creating favourable conditions** for a market for interoperability, stimulating demand & supply
Collaboration	**Stimulation of interactions** leading to discovery of needs within a bigger relevant audience	**Co-creating** technical and business solutions, standards and implementations together with the field	**Involving stakeholders** in shaping policy instruments
Awareness & Support	**Create an environment** where participants can generate and share knowledge	**Supporting clients** in creation & exchange of insights	**Promoting awareness** and understanding of standards, regulation and best practices
Compliance	**Monitoring of** relevant changes in **regulatory landscape** for involved stakeholders	**Aiding** clients to achieve compliance	**Enforcing** regulation

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DSIC reflection: the EU employs a 'carrot and stick' approach to promote cross-domain interoperability in data sharing practices

Tools & Support

Data spaces Support Centre (DSSC)

European Data Innovation Board
(part of Data Governance Act)

European Interoperability Framework (EIF)

Rolling Plan for IT Standardisation

SIMPL (Labs, Open, Live)

Data spaces development

EU Level:
Common European Data Spaces:
- European data space for agriculture
- European data space for cultural heritage
European data space for energy
- European data space for finance
- European Green Deal data space (incl. for smart cities & communities)
- European data space for health
- European data space for research & innovation
- European data space for language
- European data space for manufacturing
- European data space for media
- European data space for mobility
- European data space for public administration
- European data space for Skills
- European data space for tourism

Local level:
- Public & private data sharing initiatives

Regulatory frameworks

Non-exhaustive

Universal:
- Data Act
- Data Governance Act
- Interoperable Europe Act
- AI Act
- Digital Services Act
- Digital Markets Act
- GDPR

Sector Specific:
- FIDA
- PSD&PSR
- eFTI
- EHDS
- Open Data Directive

Facilitation of interop. tools:
- EUDI regulation (eIDAS2)
- DPPs via ESPR

Carrot

Stick

 Source: European Commission

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DSIC reflection: observed convergence between EU & local interoperability developments, but more alignments are needed

Non-exhaustive

3 drivers steering interoperability: (carrots & sticks)

|	Top down trends– EU level	Bottom up trends– national & sectoral level
Regulatory Drivers	**EU Regulation:** • Aims to establish a single market for data in the EU, but the data rights holder is still put first and protected • Aims to create a uniform framework for data access, control, and use • Points out interoperability as a crucial aspect	**Local regulation**: • NL government adopting EU regulations. • NL government enforcing data sharing in various sectors, such as Gegevens Uitwisselings Entiteit (GUE) in the energy sector, patient data sharing regulations (EPD, WGBO) • In other sectors NL is harmonizing its regulation with EU regulation, such as new EU regulations for data sharing in Anti-Money Laundering
Technological Drivers	**EU driven solutions**: • Data Spaces Protocols • SIMPL middleware • eIDAS Wallets & Trust Services • Digital Product Passports	**Locally driven solutions*:** • Trust frameworks such as iSHARE expanding into EU • Local wallets such as Yivi or ITSME adopting eIDAS • NL government spearheading standardisation, like FSC, the connectivity standard promoted by FDS & IBDS

Business Drivers	**EU projects & budget**:
	• Investments into development of different standards but convergence is seen
	• EU Data spaces and projects like Catena-X are gradually moving out of R&D funding phase and into market funding. This will be a make-or-break moment for many.
	• Creation of EDICs
		Local projects:
		• Growth of local initiatives (see Landscape scan) & cooperations between them
		• Vendors coming available with solutions:
		  • NL vendor solutions such as SureSync (Visma), KPN offering dataspace-as-a-service
		  • PET solutions by NL scale-ups such as Linksight and Roseman Labs are adopting parts of data spaces thinking
		  • Foreign players are entering the NL market such as Raidiam, not necessary with Data Spaces thinking/architecture yet

Note: * CoE-DSC aims to dive deeper into this emerging landscape and cross-fertilization options in 2025
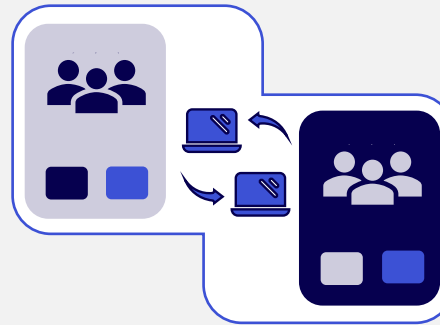
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DSIC observation: a hybrid landscape for arranging interoperability is emerging, with a spectrum of 3 distinctive approaches

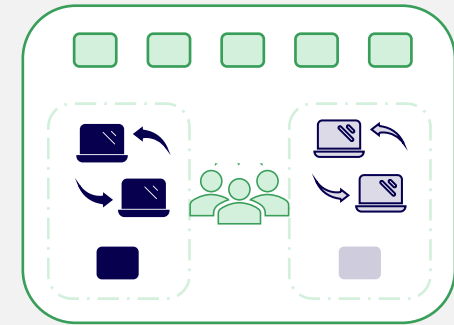## Interoperability-by-proxy
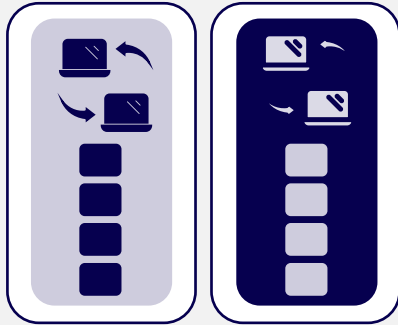
Each DSI implements a proxy that translates specific specifications into harmonized specifications, enabling data exchange between DSIs.
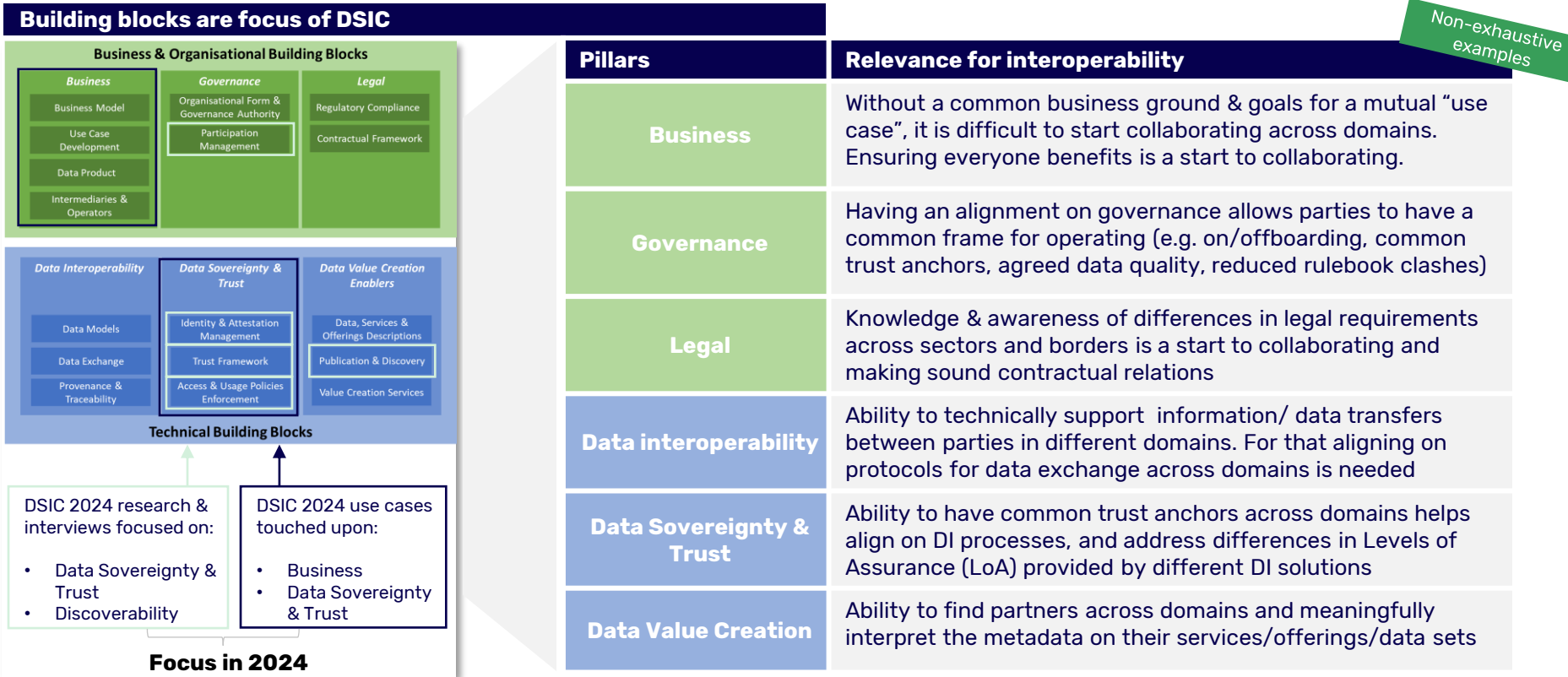
Federation-of-Federations

Flexible architecture, with some common pre-established components, & some modular ones. Sector specific but use case agnostic

Interoperability-by-design

Systems and frameworks inherently allow seamless data exchange and integration across different platforms and domains without the need for additional intermediary processes.

For cross-domain interoperability, parties need to consider align-ment in all building blocks; DSIC focuses on enabling that

Building blocks are focus of DSIC

Business & Organisational Building Blocks

Business
- Business Model
- Use Case Development
- Data Product
- Intermediaries & Operators

Governance
- Organisational Form & Governance Authority
- Participation Management

Legal
- Regulatory Compliance
- Contractual Framework

Data Interoperability
- Data Models
- Data Exchange
- Provenance & Traceability

Data Sovereignty & Trust
- Identity & Attestation Management
- Trust Framework
- Access & Usage Policies Enforcement

Data Value Creation Enablers
- Data, Services & Offerings Descriptions
- Publication & Discovery
- Value Creation Services

Technical Building Blocks

DSIC 2024 research & interviews focused on:
- Data Sovereignty & Trust
- Discoverability

DSIC 2024 use cases touched upon:
- Business
- Data Sovereignty & Trust

Focus in 2024

Non-exhaustive examples

Pillars	Relevance for interoperability
Business	Without a common business ground & goals for a mutual "use case", it is difficult to start collaborating across domains. Ensuring everyone benefits is a start to collaborating.
Governance	Having an alignment on governance allows parties to have a common frame for operating (e.g. on/offboarding, common trust anchors, agreed data quality, reduced rulebook clashes)
Legal	Knowledge & awareness of differences in legal requirements across sectors and borders is a start to collaborating and making sound contractual relations
Data interoperability	Ability to technically support information/ data transfers between parties in different domains. For that aligning on protocols for data exchange across domains is needed
Data Sovereignty & Trust	Ability to have common trust anchors across domains helps align on DI processes, and address differences in Levels of Assurance (LoA) provided by different DI solutions
Data Value Creation	Ability to find partners across domains and meaningfully interpret the metadata on their services/offerings/data sets

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Insights per Building Block: Trust & Discoverability

Business & Organisational Building Blocks

Business	Governance	Legal
Business Model	Organisational Form & Governance Authority	Regulatory Compliance
Use Case Development	Participation Management	Contractual Framework
Data Product		
Intermediaries & Operators		

Data Interoperability	Data Sovereignty & Trust	Data Value Creation Enablers
Data Models	Identity & Attestation Management	Data, Services & Offerings Descriptions
Data Exchange	Trust Framework	Publication & Discovery
Provenance & Traceability	Access & Usage Policies Enforcement	Value Creation Services

Technical Building Blocks

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Reflections on Trust: initiatives tend to outsource IAA, do in house participation management & agreements, and explore eIDAS2

3 Trust related trends we observed in practice

Often outsourced

IAA arranged by IDPs:
- Can be generic or domain specific

- Can be of a higher or lower LoA (Level of Assurance) depending on cost/sensitivity appetite

Often built in house

Arranged by initiatives:
- Participation management (on/off boarding)

- Agreements Frameworks

Often being explored

eIDAS2 impact

Practical usage scenarios

- eIDAS2 Trust services increase interoperability (e.g., QESeals, QWACs)

- Wallets & verifiable credentials potential use cases

- Balance between costs vs. high LoA & interoperability

Mandating

Attention on identities triad:
- of a person
- of a legal entity
- of an object

Attention to new details:
- Service- vs. role-based mandating
- Scheme aggregator role
- Revocation mechanisms

*Keeping this balance is
a road to interoperability-by-design*

*Be aware of eIDAS2 developments and
explore usage scenarios*

Note: IAA – Identification, Authorisation, Authentication; IDPs – Identity Providers; LoA (Level of Assurance)

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Reflections on Discoverability: initiatives tend to use DCAT and adjust discovery of participants & datasets based on the context

2 Discoverability related trends we observed in practice

Often implemented

Most used protocol for datasets discovery:
- Variations of DCAT relevant to the specific sector
- Note, DCAT is a solution for data publication & discovery, not participants discovery (aka it is used for publishing data/dataset offerings in a specific format, and is not used as a protocol for listing participants)

For participants discovery: for most DSIs, this is not a priority, as parties first build relations/connections in a physical world prior to engaging digitally

Look into DCAT

Often seen discovery patterns are context-driven

- Identify the sensitivity of your context
- Choose methods for finding right participants and right data sets based on that
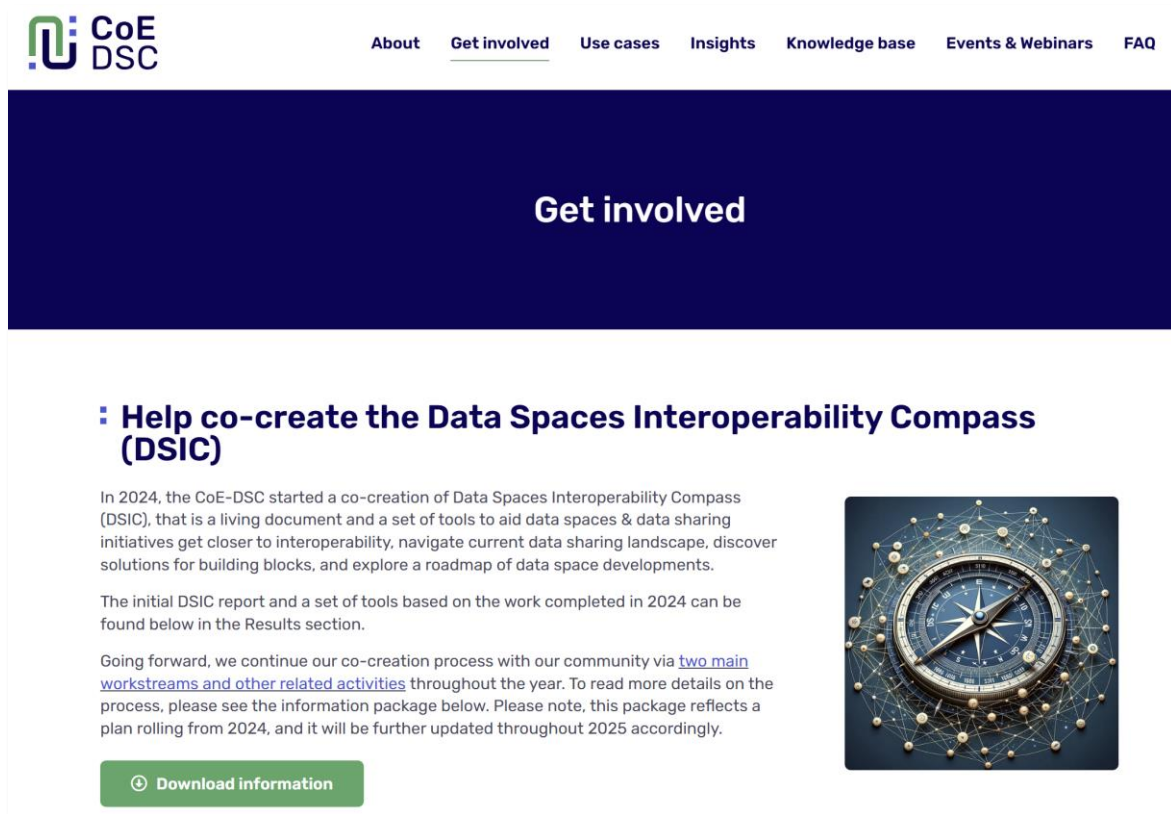
	Finding right participants	Finding right datasets
Open to all	Open marketplace tool for discovery	Look into relevant metadata standards for open data of your domain
Sensitive many-to-many	External address book/ yellow pages	Align on ontologies & semantics for data/datasets among your group(s)
Sensitive Exclusive groups	Internal address book/ yellow pages	

Be aware that the data sharing context matters in discoverability approach

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DSIC Tools – Walkthrough of what is available

Demonstration of where you can find the materials

Explore at
https://coe-dsc.nl/get-
involved/

Dutch Data Sharing Landscape Scan is live on the CoE-DSC website!
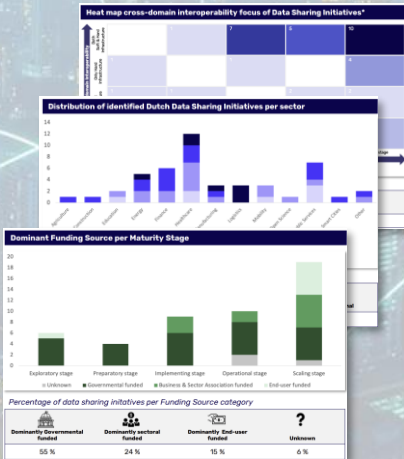
Do you want your organisation/initiative to be on it?

Then scan the QR to email us!

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DSIC aligns with the CoE-DSC vision by supporting the development of the Dutch Data Sharing Landscape

DSIC brings insights to stimulate development of the 3-fold goals of CoE-DSC

Mature Data Spaces (Data Sharing Initiatives)

Interoperable Data Spaces across domains

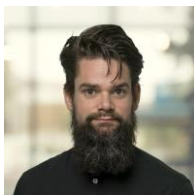**Mature landscape of intermediaries (SPs)**

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In 2025 with new team members, we continue building DSIC Living Document & Tools, join us on March 25 for next steps

New team members

DSIC

Pieter Verhagen

Gijs van Houwelingen

Yekaterina Travkina

Kristiina Sau

Use cases

Ewout Bouwman

Fabian Haijenga

Koen van Nistelrooij

Architects

Bernadette Farias Loscio

Continued effort

We will continue building & updating the DSIC Living Document & Tools

Starting with:
- Landscape scan update
- Regulatory scan update
- Business Pillar: Research on business models for sustainable growth for data sharing initiatives

Continued sessions

Save the date: March 25, Tuesday

Next session, where we will go deeper into plans for the year and opportunities for you to be involved!

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We are open to your feedback and suggestions for any topics & tooling that would help you on your interoperability journey


Please share your thoughts!

Getting to know what would you like to see further is vital to us.
Any thoughts, feedback, wishes, directions are welcome!

Feel free to reach out to us after the session if you have any feedback on the existing tools, or if you have ideas about new tools we could develop to benefit the CoE-DSC community members.

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Mentimeter

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Join at menti.com | use code 7918 7246

Mentimeter
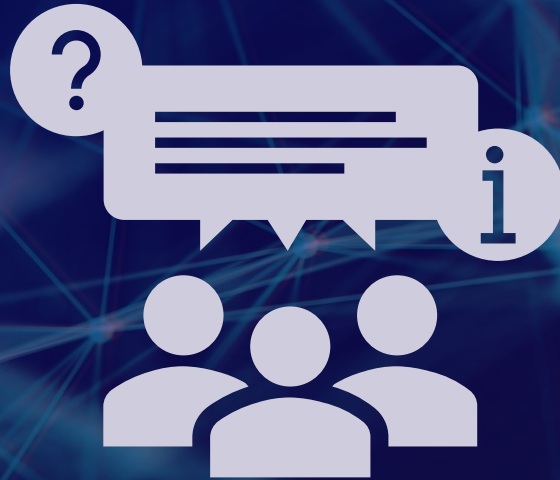
Instructions

Go to

www.menti.com

Enter the code

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Or use QR code

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Data Spaces Interoperability Compass Ceremony – Thank you for joining us!

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