

DATA SPACES IN EU

SYNERGIES BETWEEN DATA PROTECTION AND DATA SPACES

EU CHALLENGES AND EXPERIENCES OF SPAIN

2 October 2023 | Madrid

#dataspaces #EUchallenges



Data Spaces at a national level through Europe

Moderator: **Alberto Palomo**, Chief of the Spanish Data Office, **Secretary of State of Digitalisation and Artificial Intelligence**

3 speakers:

- **Eimear Farrell**, Scientific expert, EU data spaces and data governance, Digital Economy Unit, **EC Joint Research Centre**
- **Rocío Báguena Rodríguez**, Head of Transport Technology and Studies Division, **Spanish Ministry of Transport**
- **Maite Ambrós**, Deputy Director General of Innovation and Digitalisation, **Spanish Ministry of Agriculture, Fishing and Food**

Presentation of the Speakers



Eimear Farrell
Scientific expert, EU
data spaces and data
governance, Digital
Economy Unit, JRC EU.



Rocío Báguena
Head of Transport
Technology and
Studies Division,
Spanish MITMA.



Maite Ambrós
Deputy Director
General of
Innovation and
Digitalisation,
Spanish MAPA.



Alberto Palomo
Chief Data Officer
Spanish
Government, State
Secretariat for
Digitalisation and AI

An isometric illustration of a digital cityscape. The central focus is a tall, white server tower with a blue and white striped top section. A person in a blue shirt is running on top of this tower. To the left, there are several smaller, similar server towers of varying heights. A person in a white shirt is standing on one of these smaller towers. The background is a deep purple with abstract, glowing shapes and dotted lines, suggesting a digital or data environment.

EUROPEAN DATA SPACES

Scientific evidence supporting
the establishment of common
European data spaces

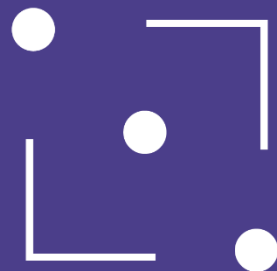
Eimear Farrell

Digital Economy Unit,
Joint Research Centre (JRC)

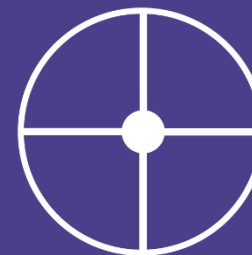
AEPD-ENISA event on Data Spaces in EU
Madrid, 2 October 2023



Anticipate



Integrate



Impact

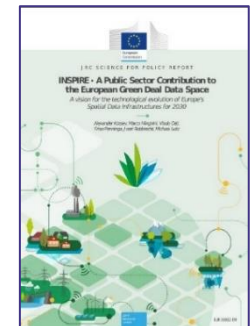
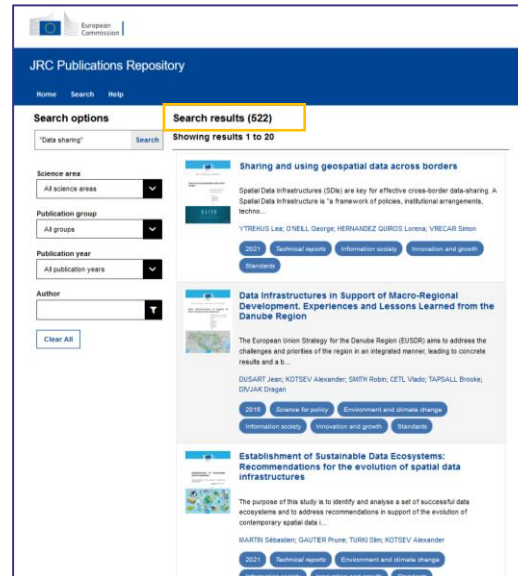
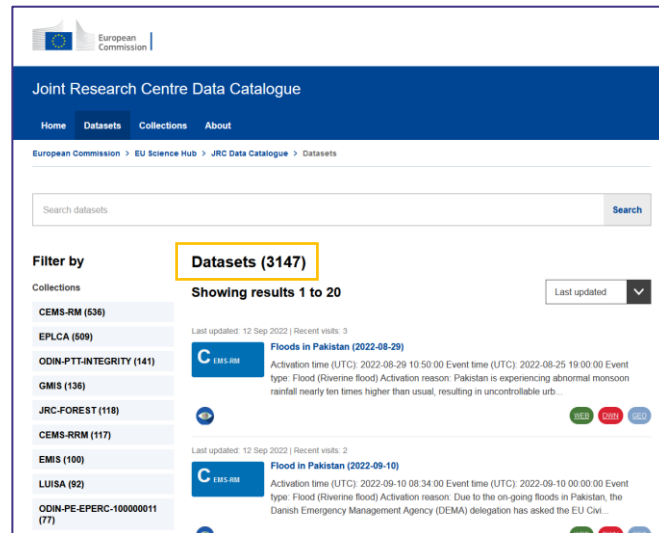
JRC mission

As the science and knowledge service of the European Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle.

We are **independent, policy neutral** + work for **30 EC policy departments**.

Why the JRC?

- JRC is a **provider** and **consumer** of data space data
- Own **data assets**
 - Science for policy mandate
 - 3000+ datasets
 - 500+ publications on data sharing
 - Own Big Data infrastructure (BDAP)
 - Corporate data-sharing culture incl. dedicated DG data strategy
 - Prominent role in standardisation initiatives
 - Coordinating Member State working groups



JRC reports on data sharing

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Journals / Data / Special Issues / A European Approach to the Establishment of Data Spaces

data

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Special Issue "A European Approach to the Establishment of Data Spaces"

- Print Special Issue Flyer
- Special Issue Editors
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A special issue of Data (ISSN 2306-5729). This special issue belongs to the section "Information Systems and Data Management".

Deadline for manuscript submissions: closed (31 January 2023) / Viewed by 26377

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Interests: environmental data infrastructures; interoperability; geographic information science; geospatial data sharing; geospatial data infrastructures; data science

Special Issues, Collections and Topics in MDPI journals

Forthcoming Issue

Current Issue

Vol. 8 (2023) Vol. 4 (2019)
Vol. 7 (2022) Vol. 3 (2018)
Vol. 6 (2021) Vol. 2 (2017)
Vol. 5 (2020) Vol. 1 (2016)

SCIENCE FOR POLICY BRIEF

Beyond INSPIRE. Perspectives on the legal foundation of the European Green Deal Data Space

HIGHLIGHTS

- This brief provides an initial reflection of the Joint Research Centre of the European Commission on the possible legal framework that could facilitate the establishment of the centrally European Green Deal Data Space and support environmental data sharing provided in the EU beyond the implementation of the INSPIRE Directive.
- It is compiled to feed into the debate around the possible scenarios of environmental data sharing that is inclusive and well aligned with the objectives of the European Union for the Digital Age and the European Green Deal 2019–2024 European Commission priorities.
- The views expressed here represent the perspective of the authors and are not to be considered as an official position of the European Commission.

What is the problem?

Data about the environment are **needed** in support of a broad spectrum of use cases and applications, ultimately benefiting citizens, business and environmental policymaking. Multiple **obstacles** shall be overcome to effectively leverage available data, which are currently underused due to a complex set of intertwined reasons as described in [1]. These include:

- Outdated provider-centric legal frameworks with a strong focus on the public sector as the main user and provider of the data.
- Complex technical requirements that are enforced without an equally supporting qualitative benefit.
- Different trends and infrastructures being used on the national level in parallel to the one and in place for complying to the requirements on the EU level.
- Novel technological developments and inclusion of new actors in the data economy both in data intermediaries that are not fully utilized.

At the same time, **rapidly emerging technologies** [2] and **new legal instruments** that will have a strong impact on data sharing, in particular the **Green Deal Governance Act**

SCIENCE FOR POLICY BRIEF

[nature](#) > [humanities and social sciences communications](#) > [articles](#) > [article](#)

Article | [Open Access](#) | [Published: 13 July 2021](#)

Collaboration matters: capacity building, up-scaling, spreading, and sustainability in citizen-generated data projects

[Mara Balestrini](#), [Alexander Kotsev](#), [Marisa Ponti](#) & [Sven Schade](#)

[Humanities and Social Sciences Communications](#) **8**, Article number: 169 (2021) | [Cite this article](#)

2633 Accesses | **3** Citations | **11** Altmetric | [Metrics](#)

Abstract

Projects producing citizen-generating data (CGD) to provide evidence and to drive change have increased considerably in the last decade. Many of these initiatives build on multi-actor collaboration and are often supported by non-governmental organisations (NGOs), the public sector, businesses or community-based organisations. The joint efforts of these actors are often necessary to provide the resources and the support that citizens need to produce data. In return, organisations can harness the data to support their objectives. The recent growth (or up-scaling) of CGD projects has created opportunities, as well as challenges for capacity building and sustainability. These challenges can affect the continuity and effectiveness of these initiatives and, in turn, the quality and utility of collected data. This paper analyses two CGD projects to consider their social implications and the measures necessary to increase their capacity, up-scaling, spreading, and sustainability. The case studies on noise monitoring and invasive alien species describe, respectively, a bottom-up approach at city level and a top-down approach at the European level. Regardless of the approach, capacity building requires a process of infrastructuring that engages different actors, responds to matters of concern, assesses community capacities and needs, and develops a vision and action plan. Further, the appropriation and repurposing of

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City data ecosystems between theory and practice: A qualitative exploratory study in seven European cities

Published online by Cambridge University Press: **22 May 2023**

[Giovanni Liva](#) , [Marina Micheli](#) , [Sven Schade](#) , [Alexander Kotsev](#), [Matteo Gori](#) and [Cristiano Codagnone](#) Show author details

Article Figures Correction Comments Metrics

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Abstract

The exponential growth of data collection opens possibilities for analyzing data to address political and societal challenges. Still, European cities are not utilizing the potential of data generated by its citizens, industries, academia, and public authorities for their public service mission. The reasons are complex and relate to an intertwined set of organizational, technological, and legal barriers, although good practices exist that could be scaled, sustained, and further developed. The article contributes to research on data-driven innovation in the public sector comparing high-level expectations on data ecosystems with actual practices of data sharing and innovation at the local and regional level. Our approach consists in

European Commission

JRC TECHNICAL REPORT

Technological Enablers for Privacy Preserving Data Sharing and Analysis

A comparative study

2023



2023

Daniel Hurtado Ramirez, Luis Porras Diaz, Serdar Rahmani, Juan Miguel Audin Garcia, Borja Ingoyen Peña, Yusef Al-Khatib, Angel J. Gavin Alarcon, Pablo Gonzalez Ramirez, Josep Sator Gualles, Alexander Kotsev


European Commission

JRC SCIENCE FOR POLICY REPORT

Mapping the landscape of data intermediaries

Emerging models for more inclusive data governance

2023



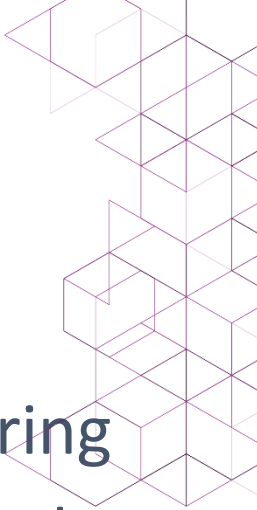
Micheli, M., Farrell, E., Carballa-Smichowski, E., Posada-Sánchez, M., Signorelli, S., Vespe, M.

2023

EUR 31376 EN

Data sharing in JRC Work programme 2023-4

- Scientific support for EU legal and policy instruments on data sharing
- Multifaceted approach covering organisational and technical aspects
- Dedicated support to CION policy DGs, e.g.
 - **Green Deal data space** and its legal instruments
 - **Experimentation and testing** of technical building blocks
 - **Inclusive Data Governance** approaches
 - **Foresight** studies



JRC knowledge base on data sharing and use

Objectives

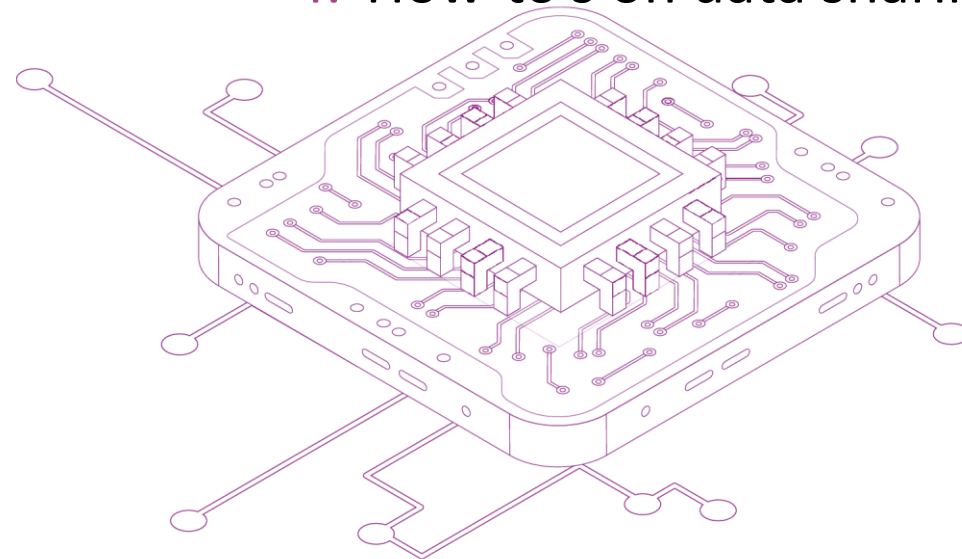
- **Identify, map and expose JRC resources** relevant to common European data spaces
- **Complement** other data space resources and activities

Intended audience

1. Policy **DGs**
2. Data space **stakeholders**
 - Data providers, standardisation bodies, early adopters of technology, user communities

Components

1. Science for Policy report
2. Interactive dashboard
3. Wiki
4. How-to's on data sharing





JRC SCIENCE FOR POLICY REPORT

EUROPEAN DATA SPACES

Scientific insights into data
sharing and utilisation at scale

2023

Farrell, Elmeier, Minghini, Marco;
Kotsev, Alexander; Soler-Garrido, Josep;
Tapscott, Brooke; Micheli, Marina;
Posada, Monica; Signorelli, Serene;
Tartaro, Alessio; Bernal, Jaime;
Vespe, Michele; Di Leo, Margherita;
Cerbello-Smilchowski, Bruno;
Smith, Robin; Schade, Sver;
Katarzyna Pogorzelska;
Gabrielli, Lorenzo; De Marchi, Davide

Joint
Research
Center

JRC Science for Policy report



<https://europa.eu/!RBQXm>

[x](#)

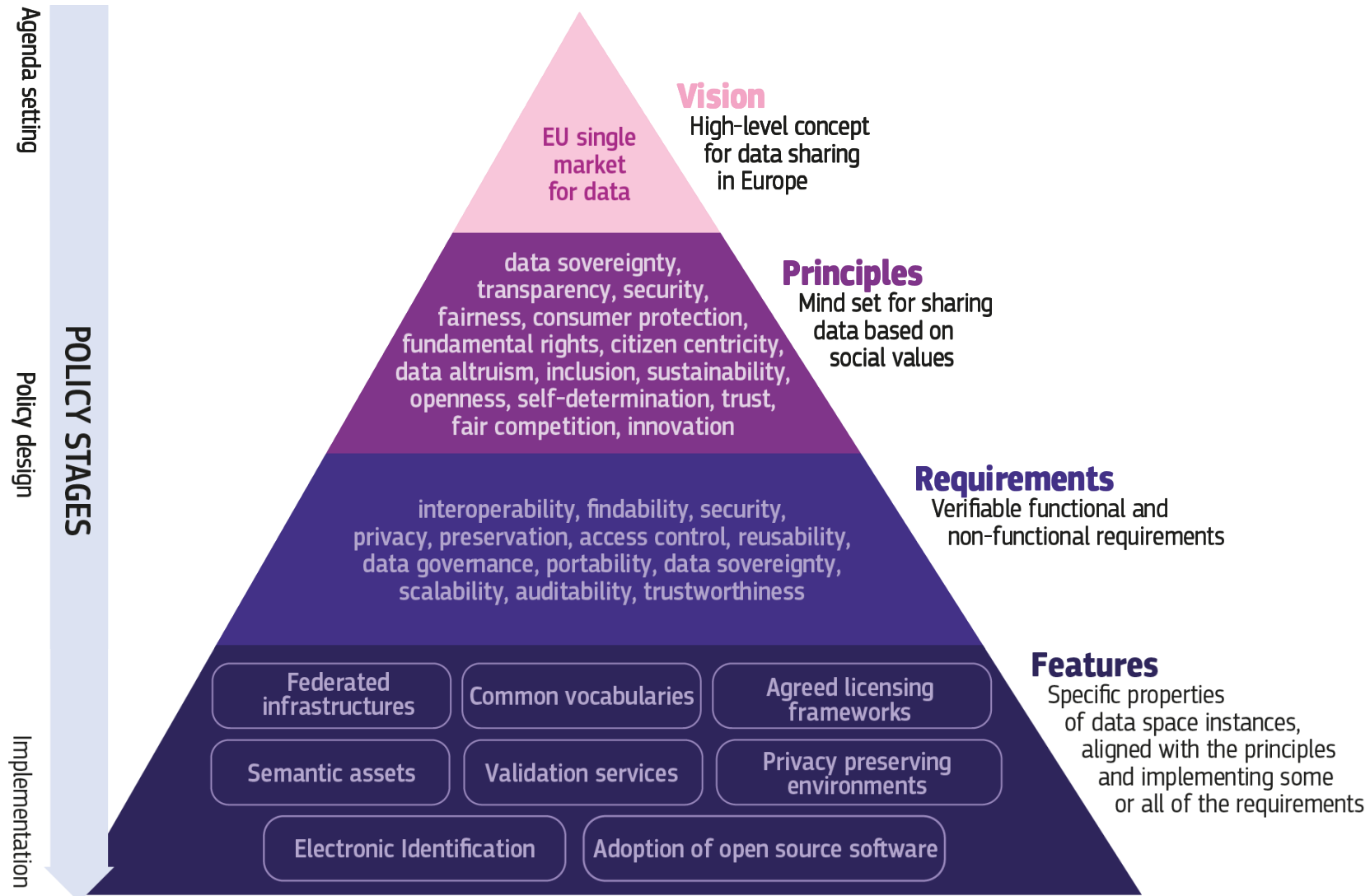
What?

- Scientific **techno-socio-economic perspective**
- Non-binding **recommendations/good practices**
- **Complementary** to other data space resources

How?

- Input by **18 co-authors**
- **Co-creation and validation**
 - Within JRC
 - With policy DGs
 - Other stakeholders

JRC analytical lens



Dashboard: JRC resources mapped to requirements for European data spaces

JRC Resources Relevant to Data Spaces

Created by S.4, T.1, T.4 BDAP

Data Transfer & Exchange

Data Interoperability

Data Processing & Analytics

Identity, Authentication, Access Control

Usage Control Policies

Data Pooling and Collaboration

Data Publication & Discovery

Data Compliance and Auditing

Data Governance

Privacy preserving mechanisms / Data protection

Data Federation, Orchestration and Portability

Data Storage

Retrieve publications

Related terms

data governance

fair data

private sector data

public sector data

data protection impact ...

dpla

data policy

data governance

data management

data security

data sharing

risk governance

INDEX	TITLE	YEAR
1	Event-specific Method for the Quantification of Maize Line MON 88017 Using Real-time PCR - Validation Report, Validated Method and DNA Extraction	2017
2	Forest Fires and Adaptation Options in Europe	2016
3	Assessment of Mixtures - Review of Regulatory Requirements and Guidance	2017
4	Integrating Network Analysis with the Production Function Approach to Study the Spillover Effects of Transport Infrastructure	2016
5	An indicator framework for assessing ecosystem services in support of the EU Biodiversity Strategy to 2020	2016
6	Smart Cities Governance: the need for a holistic approach to assessing urban participatory policy making	2016
7	Urban public transport	2016
8	A knowledge-based approach to estimating the magnitude and spatial patterns of potential threats to soil biodiversity	2016
9	The global Landsat archive: Status, consolidation, and direction	2016
10	Future Internet technologies for environmental applications	2016
11	NORMAN interlaboratory study (ILS) on passive sampling of emerging pollutants;	2016
12	The role of forest certification for biodiversity conservation: Lithuania as a case study	2016
13	Reply to "The new assessment of soil loss by water erosion in Europe. Panagos P. et al., 2015 Environ. Sci. Policy 54, 438–447—A response" by Evans and Boardman [Environ. Sci. Policy 58, 11–15]	2016
14	Behavioural Insights Applied to Policy - European Report 2016	2016
15	Nanomaterials as a potential environmental pollutant: Overview of existing risk assessment methodologies	2016
16	Mapping regional patterns of large forest fires in the Wildland-Urban Interface areas in Europe	2016
17	Stakeholders' engagement beyond the EDP: The working-groups on governance and human resources in Eastern Macedonia and Thrace	2016
18	Institutions on the verge: Working at the science policy interface	2016
19	Covenant of Mayors: Monitoring Indicators	2016
20	Reports of the Scientific, Technical and Economic Committee for Fisheries (STECF) – Merging of the BT1 and BT2 gear categories in the North Sea (STECF-16-02).	2016
21	Next Generation Air Quality Platform: Openness and Interoperability for the Internet of Things	2016

Publications: 1435

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Title

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Abstract

2016

2023

Occurrences per year:

2019

2020

2022

2017

2016

2018

2021

1 236

<https://jeodpp.jrc.ec.europa.eu/eu/dashboard/voila/render/DataSpaces/JRCResourcesData.ipynb>

nb

Wiki

European Commission > JRC Data Spaces Knowledge Base

1. Introduction

- > 1. Introduction
- > 2. Technical Requirements
- > 3. Governance
- > 4. How To's - Information Sheets
- > 5. JRC Knowledge Base
- > Contact Us

The screenshot shows the top part of a web browser window. The address bar displays "European Commission > JRC Data Spaces Knowledge Base". Below it is a dark blue header with the title "1. Introduction" in large white font. A navigation menu on the left lists several items, with "1. Introduction" being the active one. The main content area has a purple background with abstract circular patterns. It features a small icon at the top center, followed by the heading "The Foundation of European Data Spaces" in large white text. At the bottom, there is a subtitle "Understand the elements which underlay building a common European data space" also in white.

The Foundation of European Data Spaces

Understand the elements which underlay building a common European data space

Key Actors

Who are stakeholders with data spaces

STAKEHOLDERS OF THE DATA VALUE CHAIN

Under the vision for common European data spaces, relevant stakeholders of the data value chain should be engaged in their creation, maintenance and governance. **These stakeholders may include actors from the private sector, public sector, academia and civil society, as well as individuals.** They may play different roles in the ecosystem, such as **data producers, data users or consumers, data service providers and data intermediaries**, as well as **technology partners and standardisation bodies**.

By bringing together different stakeholders, common European data spaces will ensure that more data becomes available for use in the economy and society, while data control is retained by those businesses, organisations and

```
graph TD; subgraph Stakeholders; direction TB; A[standardisation bodies] --- B[users or consumers]; B --- C[data service providers]; C --- D[data]; D --- E[technology partners]; E --- A; end; subgraph CentralActors; direction TB; F[Citizens] --- G[Private sector]; G --- H[Public sector]; H --- I[Civil society]; I --- F; end; A --- B; B --- C; C --- D; D --- E; E --- A; F --- G; G --- H; H --- I; I --- F;
```

Space tools

Edit Save for later Watch Share ...

KEY ACTORS

Find out who are the key actors within data spaces from civil society to citizens...

Who are they?

PRINCIPLES

Find out what the key principles for sharing data in Europe through the data value chain

Discover more

DEFINITIONS

What is the definition of a data space gathered from the supporting policies

Read more

POLICY

Policy and actions serving as input for determining the requirements for data spaces

Learn more

<https://wikis.ec.europa.eu/display/jrcdataspaceswiki/JRC+Data+Spaces+Knowledge+Base>

Technical requirements for European data spaces



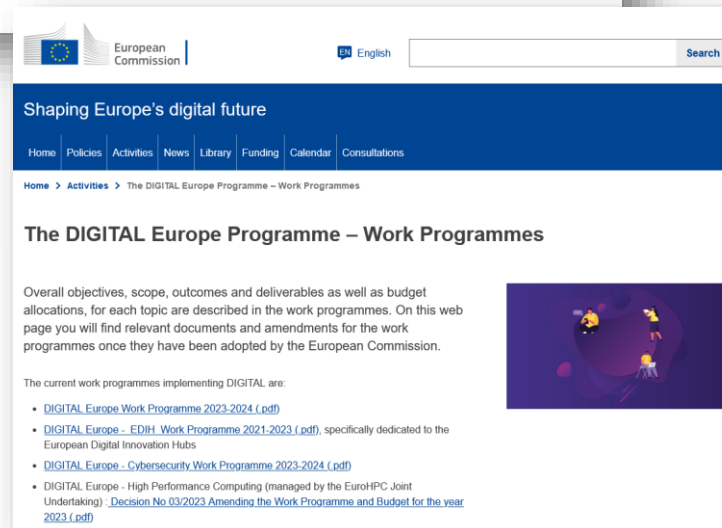
Requirements elicitation

- **Input**



- **Requirements**

- functional and non-functional



Requirements elicitation

→ **Table 1: Selected list of EU policy provisions translated into functional and non-functional requirements for common European data spaces**

Policy provision	Functional requirements	Non-functional requirements
A secure and privacy-preserving IT infrastructure to pool, access, process, use and share data	Data transfer and exchange Data storage Data processing and analytics Data pooling and collaboration	Security Confidentiality
Data holders will have the possibility, in the data space, to grant access to or share certain personal or non-personal data under their control	Identity, authentication and access control Usage control policies	Confidentiality
... promote the development of tools to pool, access, use and share all types of data favouring the development of common open standards and findable, accessible, interoperable and reusable (FAIR) principles ... data holders could use these tools to ease the uploading of data into data spaces, to give or revoke their authorisation to data and to change access rights and specify new conditions of how their data can be accessed and reused over time	Data transfer and exchange Identity, authentication and access control Usage control policies	Interoperability Auditability
Data that is made available can be reused against compensation, including remuneration, or for free	Transaction metering and billing	
Participants [...] use the common technical infrastructure and building blocks which will allow the data spaces to be built in an efficient and coordinated manner	—	Maintainability Variability
The common technical infrastructure will have to [...] integrate the cybersecurity-by-design principle	—	Security
Participation of an open number of organisations/ individuals	Identity, authentication and access control	Scalability
Common European data spaces could be developed on international standards, INSPIRE (for spatial data) and FAIR principles to favour interoperability, ...exploitation of data on EU computing infrastructures (e.g., cloud and HPC) and be interconnected and progressively made interoperable	Data interoperability features Data processing and analytics	Interoperability Performance
European rules and values, in particular personal data protection, consumer protection legislation and competition law, are fully respected	Compliance monitoring and auditing Data protection	Auditability
Enhance the development of new data-driven products and services in the EU and thereby create the core tissue of an interconnected and competitive European data economy	Data processing and analytics	Sovereignty

Data spaces middleware: provide a full cloud stack with basic services that can also be operated at the edge, while foreseeing the subsequent integration of high-performance computing and far edge computing	Multi-tier support, federation, orchestration	Portability Performance
Data spaces middleware: provide a technical baseline to be used by all EU common data spaces to avoid duplication of effort and overlaps and to ensure a proper alignment of the various implementation approaches	—	Maintainability Variability
Data spaces middleware: allow state-of-the-art data management between cloud and edge, enabling seamless ultra-fast data workload balancing between them, and intelligent data porting between centralised and decentralised data infrastructures Ensure performance and quality of service in the execution of applications across multiple cloud and edge providers Provide a multi-cloud orchestration solution, with built-in identification and security management services	Data transfer and exchange Multi-tier support, federation, orchestration Identity, authentication and access control	Portability Performance Security Maintainability
Data spaces middleware: provide data mapping services, data anonymisation and masking services	Privacy-preserving mechanisms Data interoperability features	Confidentiality Interoperability
Data spaces middleware: embed business intelligence services for multi-uses based on crosscutting, low power and software-enabled services	Data processing and analytics	—
Data spaces middleware: integrate an environmental tracking performance system to ensure services operate in a low power mode	—	Energy efficiency
Data spaces middleware: provide secure resource efficient data storage services	Data storage	—
Data spaces middleware: provide an "High Performance Computing as a service" connector to enable High Performance Computing resources to be accessible to users of the Cloud Federation	Multi-tier support, federation, orchestration	Performance Portability
Data spaces middleware: ensure that AI solutions [...] can operate over the middleware platform Support sustainable and ultra-low latency digital twins' business applications Allow the hosting of highly specialised tools for complex business activities simulation, forecasting and modelling	Data processing and analytics	Performance
Data spaces middleware: provide secured communication, productivity and collaboration services Provide workflow management services Facilitate the integration with [cloud-to-edge] services and [their] marketplace	Data pooling and collaboration	Portability
A common European data space brings together relevant data infrastructures and governance frameworks in order to facilitate data pooling and sharing A clear and practical structure for access to and use of data in a fair, transparent, proportionate and/non-discriminatory manner and clear and trustworthy data governance mechanisms	Data pooling and collaboration Usage control policies Privacy-preserving mechanisms Data protection Data governance	Inclusivity Fairness Sustainability Trustworthiness Transparency



Context

- We live in the era of data! Vis-a-vis, **data-powered AI**
- Data can be reused without detriment (**non-rival resource**) → High degree of **scalability**
- Thus making it a digital priority: **EU Data Strategy**
- An essential building block for the **European single digital market**

Projected figures 2025



530%

increase of global data volume



€829 billion

value of data economy in the EU27



10.9 million

data professionals in the EU27



65%

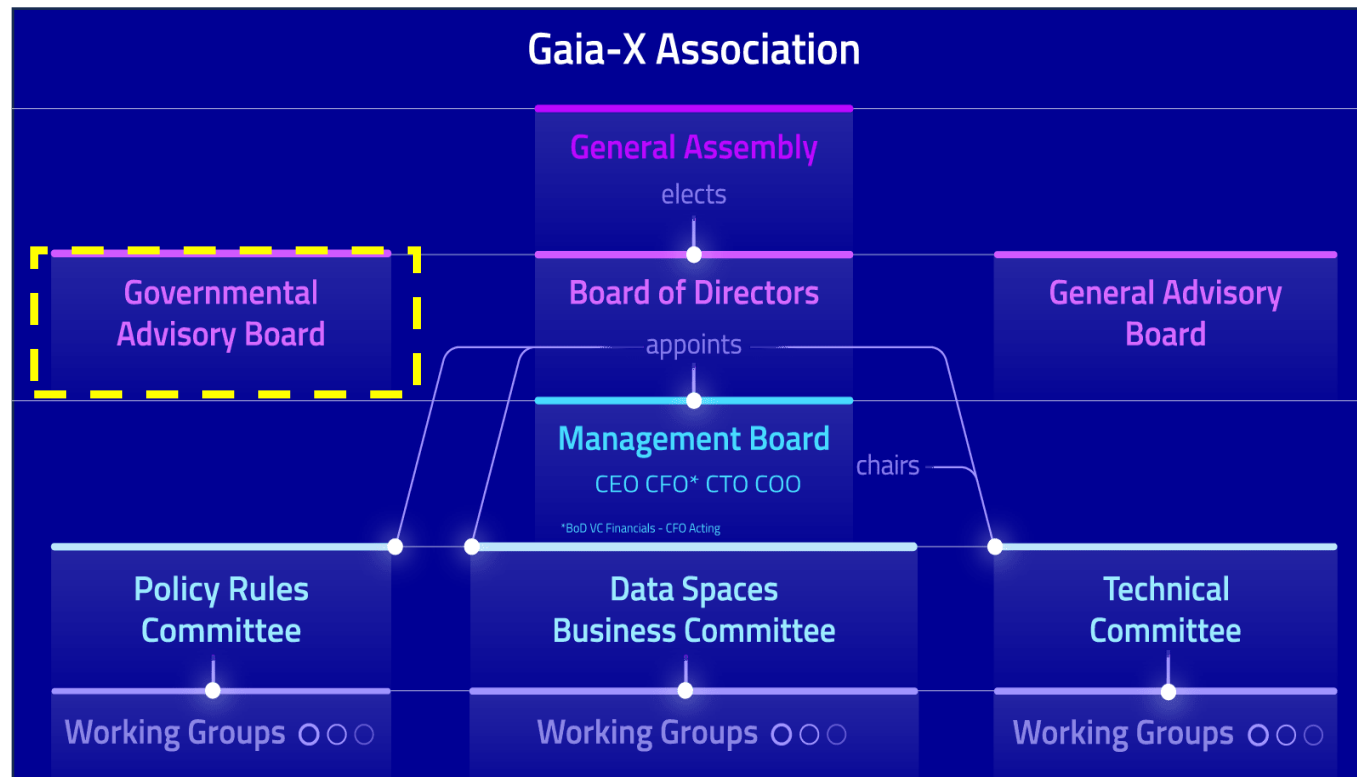
Percentage of EU population with basic digital skills

[European data strategy \(europa.eu\)](https://european-council.europa.eu/media/eu-data-strategy)

Definition

- **A data space is a development framework** that enables the creation of a complete data ecosystem by providing an organisational, regulatory, technical and governance structure with the objective of facilitating the reliable and secure exchange of different data assets for the benefit of all actors involved, and ensuring compliance with all applicable laws and regulations
- A data space is nothing more than the modelling of the general conditions under which to deploy a voluntary, sovereign and secure sharing of data. A data space makes such **data-sharing tangible based on peer-to-peer interactions**, which collectively shape federated ecosystems (datasets + related services)

Gaia-X's mission: To create an open, transparent, and secure federated digital ecosystem, where data and services respond to common rules and can securely built, composed, and re-utilised



Objectives:

- To ensure the **creation of synergies** between public policies and private industrial strategies
- To achieve **effective coordination** between governmental officials, accelerating the development of common data spaces

- Lighthouses aim to create **data platforms built on Gaia-X values**
- This will help create a **coherent data infrastructure ecosystem** (*matching supply & demand*)
- A great way of **build momentum**, with each project being an early adopter of Gaia-X technology

✓ Agriculture



Agdatahub

✓ Automotive Supply Chain




Catena-X
Automotive Network

✓ Smart Cities & Urban Data



ELINOR-X
THE URBAN DATA COOPERATIVE

✓ Mobility, Transport & Tourism



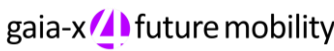
EONA-X

✓ Manufacturing, Industry 4.0




EuProGigant

✓ Mobility, Transport



GAIA-X4 Future Mobility

✓ Mobility



Mobility Data Space (MDS)

✓ Energy




Omega-X

✓ Electronics Supply Chain

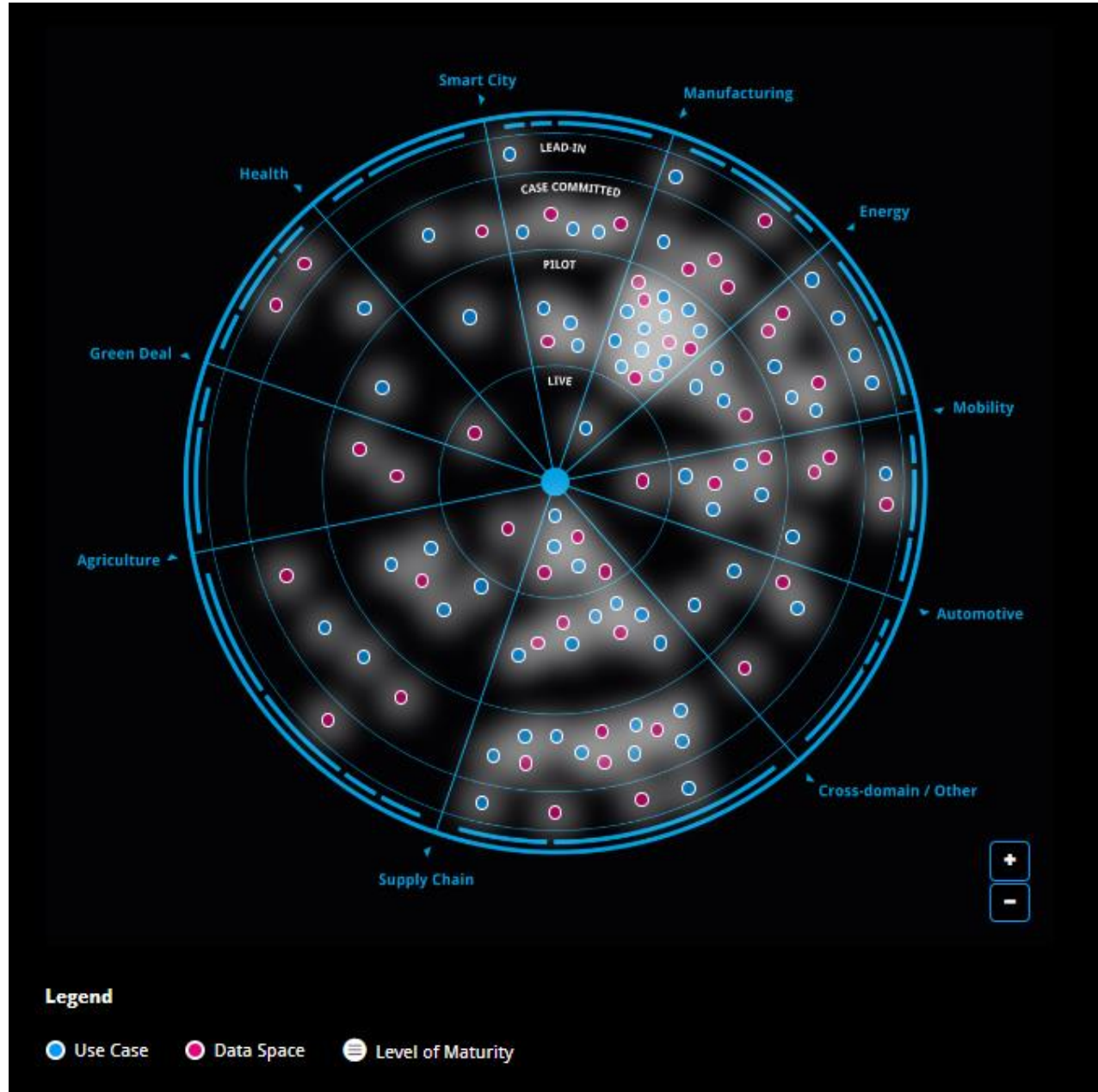


SCSN
smart connected supplier network

✓ Cloud Services



Structura-X



- A platform for **finding use-cases** to help organizations bring data spaces to life
- A tool **mapping data spaces** in a customer-friendly way
- Covering use cases ranging **different degrees of maturity** (from the phase of creating a business case, ..., to operating data spaces)



GOBIERNO
DE ESPAÑA

MINISTERIO
DE TRANSPORTES, MOVILIDAD
Y AGENDA URBANA

Main data initiatives and projects in the Ministry of Transport of Spain

Rocío Báguena.

Director of Division of Transport Studies and Technology
Ministry of Transport, Mobility and the Urban Agenda

MADRID, 2nd October 2023



Estrategia de Movilidad
segura · sostenible · conectada · 2030



Pillar 5 Smart Mobility



Pillar 6 Smart Intermodal Logistics Chains

**MEASURE 5.1.1. PROMOTE THE PUBLICATION OF OPEN DATA
AND THE DEVELOPMENT OF MOBILITY APPLICATIONS**



Observatorio
del Transporte y la Logística en ESPAÑA



**MEASURE 5.1.3. ANALYSIS OF MOBILITY FLOWS AT NATIONAL LEVEL
AND DEVELOPMENT OF NATIONAL TRANSPORTATION MODEL**



**MEASURE 6.4.3. DESIGN AND IMPLEMENTATION OF THE
TECHNOLOGICAL PLATFORM "SIMPLE"**



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Punto de Acceso Nacional de datos del transporte

Q Buscar datos de un medio de transporte, organización, región....

Buscar

Ver los últimos conjuntos de datos actualizados



Autobús

85 conjuntos de datos



Ferroviario

28 conjuntos de datos



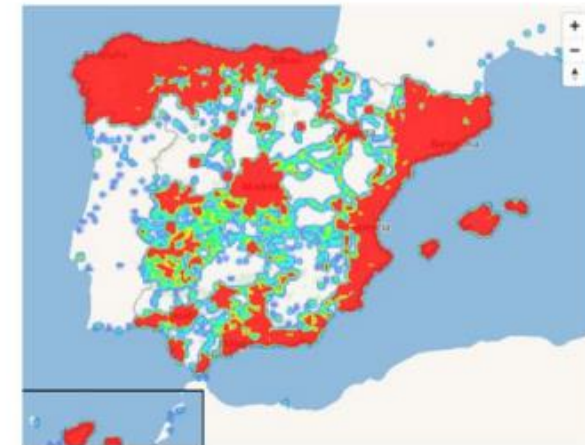
Marítimo

3 conjuntos de datos



Aéreo

1 conjuntos de datos



Densidad de paradas de
transporte colectivo incorporadas
al NAP

121.768 Paradas

4.521 Municipios
cubiertos de
8131

- National information about **transport offer** available in one portal which is official. Available since **june 2021**
- Objective: gather data from public and private agents and make it public to **apps developers** (and others)
- **117 data sets** available

Access Node to the National Transport System

It includes:

- 
- A large banner image for the HERMES website. It features a night-time photograph of a large cable-stayed bridge with its lights reflecting on the water. In the top left corner, there is a yellow box with the Spanish coat of arms and the text 'Ministerio de Transportes y Movilidad Sostenible'. In the top right corner, there is a blue box with the text 'España Plus' and the European Union flag. The word 'HERMES' is prominently displayed in the center in a large, white, bold, sans-serif font. Below it, in a smaller font, is 'Ministerio de Transportes y Movilidad Sostenible'. At the bottom of the banner, there is a blue bar with the text '¿Quieres conocer nuestro Sistema Nacional de Transporte?' in white.



www.mitma.gob.es/ministerio/proyectos-singulares/estudio-de-movilidad-con-big-data

Estudio de la movilidad con Big Data

Hoy en día, las nuevas tecnologías de Big Data e inteligencia artificial ofrecen unas posibilidades para la medida de la movilidad que eran inimaginables hace solo unos años. El MITMA utiliza desde 2017 estas tecnologías para el estudio de la movilidad a nivel nacional, compartiéndolos como **datos abiertos** para su reutilización.

Los estudios de demanda son una de las piedras angulares del MITMA para la monitorización, evaluación y planificación de mejoras en el Sistema Nacional de Transportes en favor de una **movilidad sostenible**.

Desde el 1 de enero de 2022, se está llevando a cabo un estudio de movilidad diario continuo, mediante la aplicación de tecnologías Big Data y de inteligencia artificial a los registros generados por los terminales de **telefonía móvil**, con el fin de conocer a fondo la movilidad en nuestro país.

Estudios básicos

Se analiza diariamente la movilidad de los residentes en España.

Estudios completos

Se analiza mensualmente la movilidad de la población presente en España (residentes y visitantes extranjeros) obteniendo indicadores de movilidad por modo de transporte y otros indicadores de interés.

Rutas por carretera

Se analiza para dos periodos temporales del año las rutas seguidas en los desplazamientos por carreteras.

- ✓ Mobility data inferred from mobile phones
- ✓ Two previous studies
- ✓ 2022-2023 current study:
 - Basic studies: hourly mobility at national level since January 2022
 - Complete studies
 - Road routes
- ✓ Open data

SIMPLE

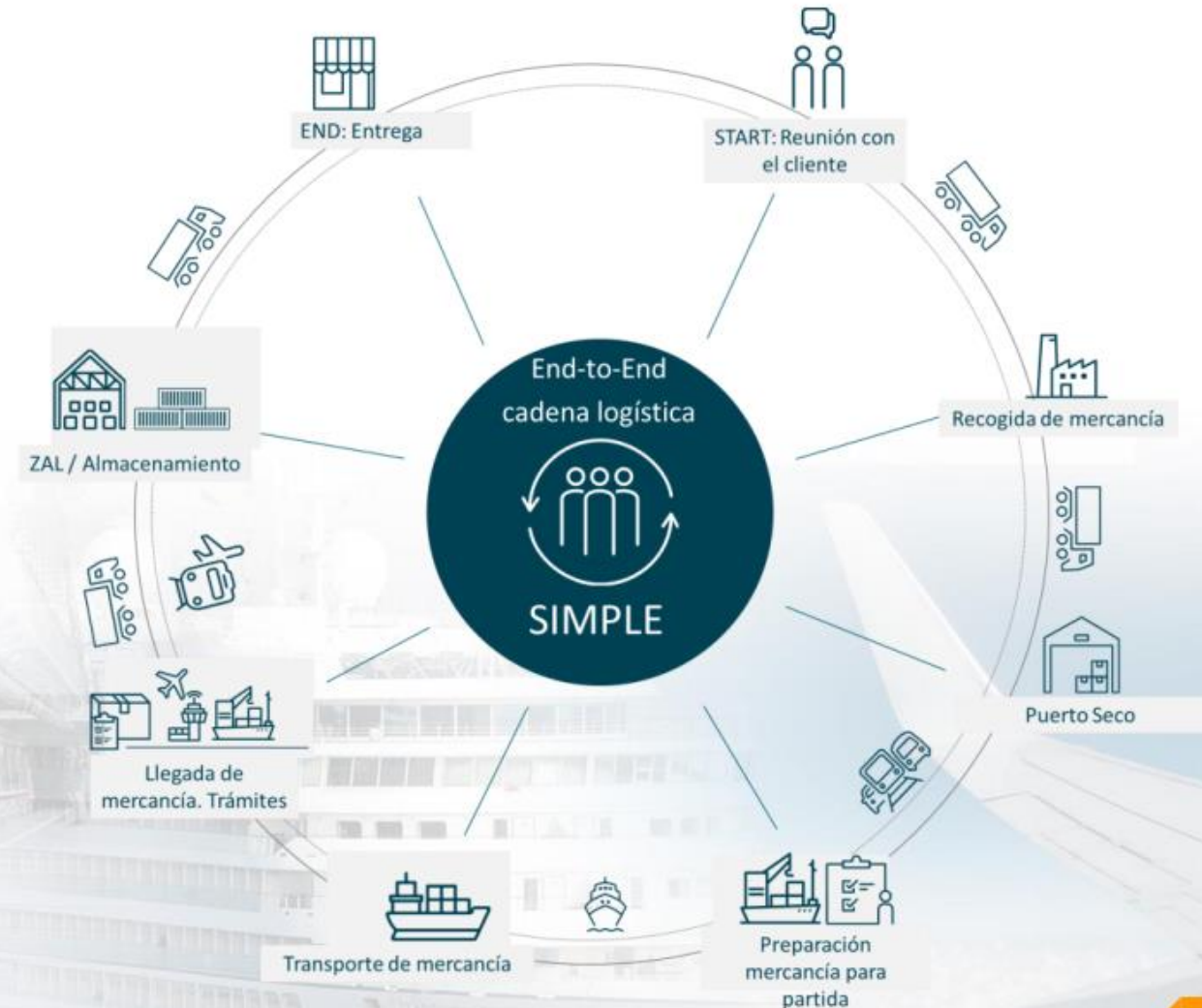
Simplificar | Digitalizar | Colaborar

SIMPLE is a federated platform for integrated and digital management of freight transport related data (road, maritime and railway), in all different nodes of logistic chain



GOBIERNO
DE ESPAÑA

MINISTERIO
DE TRANSPORTES, MOVILIDAD
Y AGENDA URBANA



AgriFood Sector on Data Spaces



Maite Ambros Mendioroz

Head of the Unit of Innovation and Digitalization.
General Directorate of Rural Development, Innovation and
AgriFood Training.
Ministry of Agriculture, Fisheries and Food
2nd October 2023



General Context...at a glance.

- **914.000 holdings, 30.000 industries** (90% SME, 23% industrial sector – ranks 1st) 23,9 million ha utilized agricultural area (half country)... 85% RA
- **650,000 producers can receive Common Agricultural Policy grants.**
Subsidies year 2022 = 4.037 million euros aid (20% agr. income)
- **Many asymmetries in the value chains** (agricultural machinery industry, Agrochemical, Pharmaceutical and Veterinary Industries are big corporates, the same applies to food retail sector)
- **Inflation: 14.1% increase in food shopping basket in the last year**



AgriFood Data context.



MINISTRY... OBSERVATORY
OF DIGITALIZATION OF THE
AGRIFOOD SECTOR.

- Uptake of digitalization is increasing
- Too much emphasis on data for control and monitoring of the C. A. P. recipients of subsidies
- Long term concern about privacy and property of data. 2018 Code of Conduct on agr. Data sharing by contractual agreement.
- Relevant OPEN DATA policies, and **e-government policies for the C.A.P.**
- Widespread lack of knowledge about what a data space is.
- Horizon Europe CSA  inventory on data sharing in...



Los datos en agricultura

Diferentes fuentes y diferente naturaleza



Imágenes



Meteorología



Fotografías geo-etiquetadas



Información de Parcelas



Cuadernos de Explotación



Medioambiente

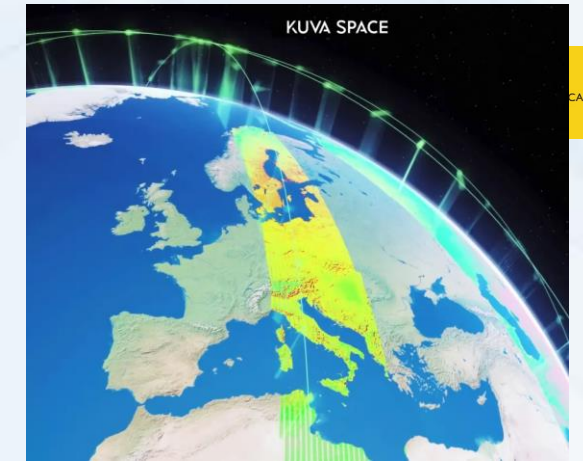


Mucho más...



Datos heterogéneos en cuanto a precisión, formato, completitud...

Juan Peralta Malvar



PLUS + official controls (maximum residues MRL's, pathogens ...), plant and veterinary health alert networks (ONE HEALTH), certifications (organic, geographic denominations...), agri-food consumption data, traceability along the food chain.



2030 Targets for sustainable food production

PESTICIDES



Reduce the overall use and risk of chemical and hazardous pesticides

NUTRIENT LOSSES



Reduce nutrient losses by 50% whilst retaining soil fertility, resulting in 20% less fertilisers

ANTIMICROBIALS



Reduce sales of antimicrobials for farmed animals and aquaculture

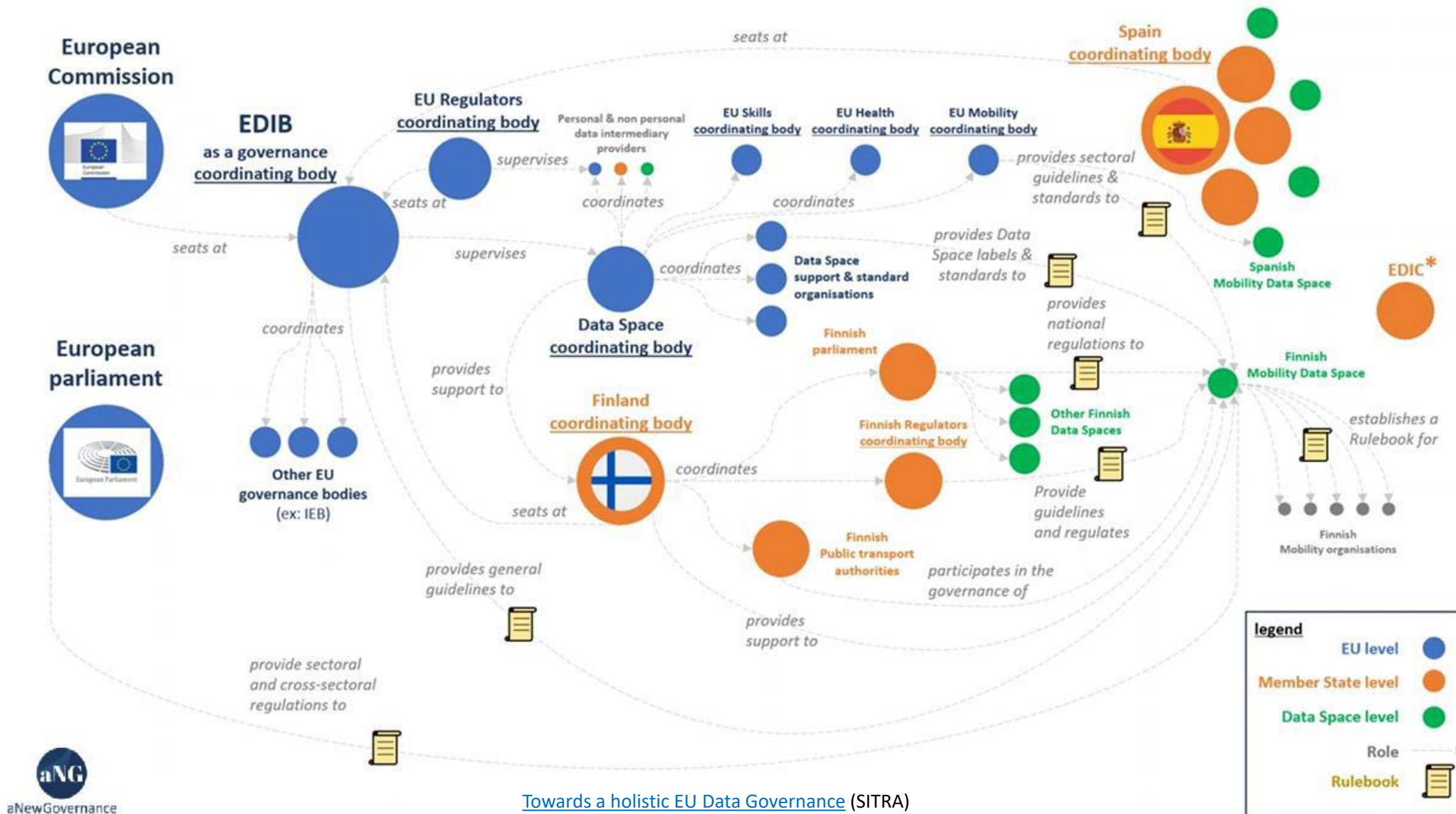
ORGANIC FARMING



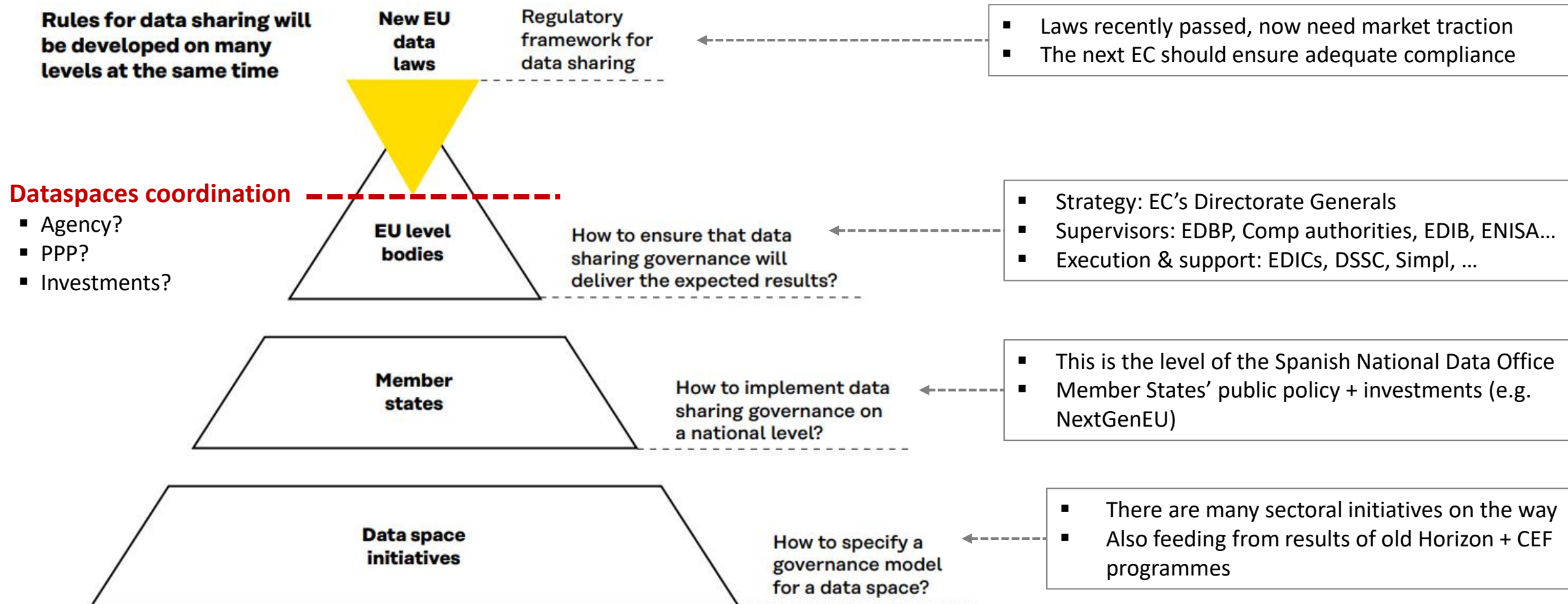
Increase the percentage of organically farmed land in the EU



The criticality of governance in data spaces



The criticality of governance in data spaces



Governance of European data spaces



SURE WE'RE DOING DATA GOVERNANCE.
WHAT IS IT?
WELL... YOU KNOW... THAT THING YOU DO
WITH YOUR DATA TO, UHM, ...

What is Governance of European data spaces?

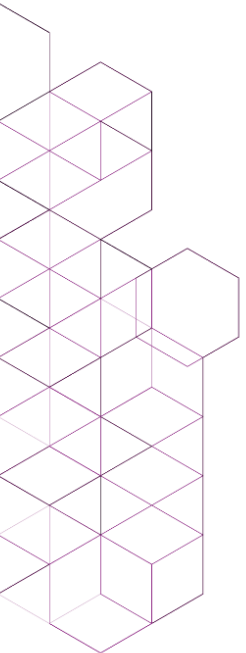
European Commission SWD, 2022

[Data spaces should]:

- *Bring[ing] together relevant data infrastructures and **governance frameworks** in order to facilitate data pooling and sharing;*
- *include **data governance structures**, compatible with relevant EU legislation, which determine, in a transparent and fair way, the rights concerning access to and processing of data.*

DSSC

- *[A data space is] An infrastructure that enables data transactions between different data ecosystem parties based on the **governance framework** of that data space (Glossary); A data space is a distributed system defined by a **governance framework**, that enables trustworthy data transactions between participants while supporting trust and data sovereignty (Blueprint v.0.5)*
- ***Governance** is the creation, development, maintenance and enforcement of a **governance framework**.*
- ***Governance framework**: a set of principles, standards, policies (rules/regulations) and practices that define how a data space is governed and how decisions are made, created, and enforced by the Data Space Governing Authority (Glossary).*





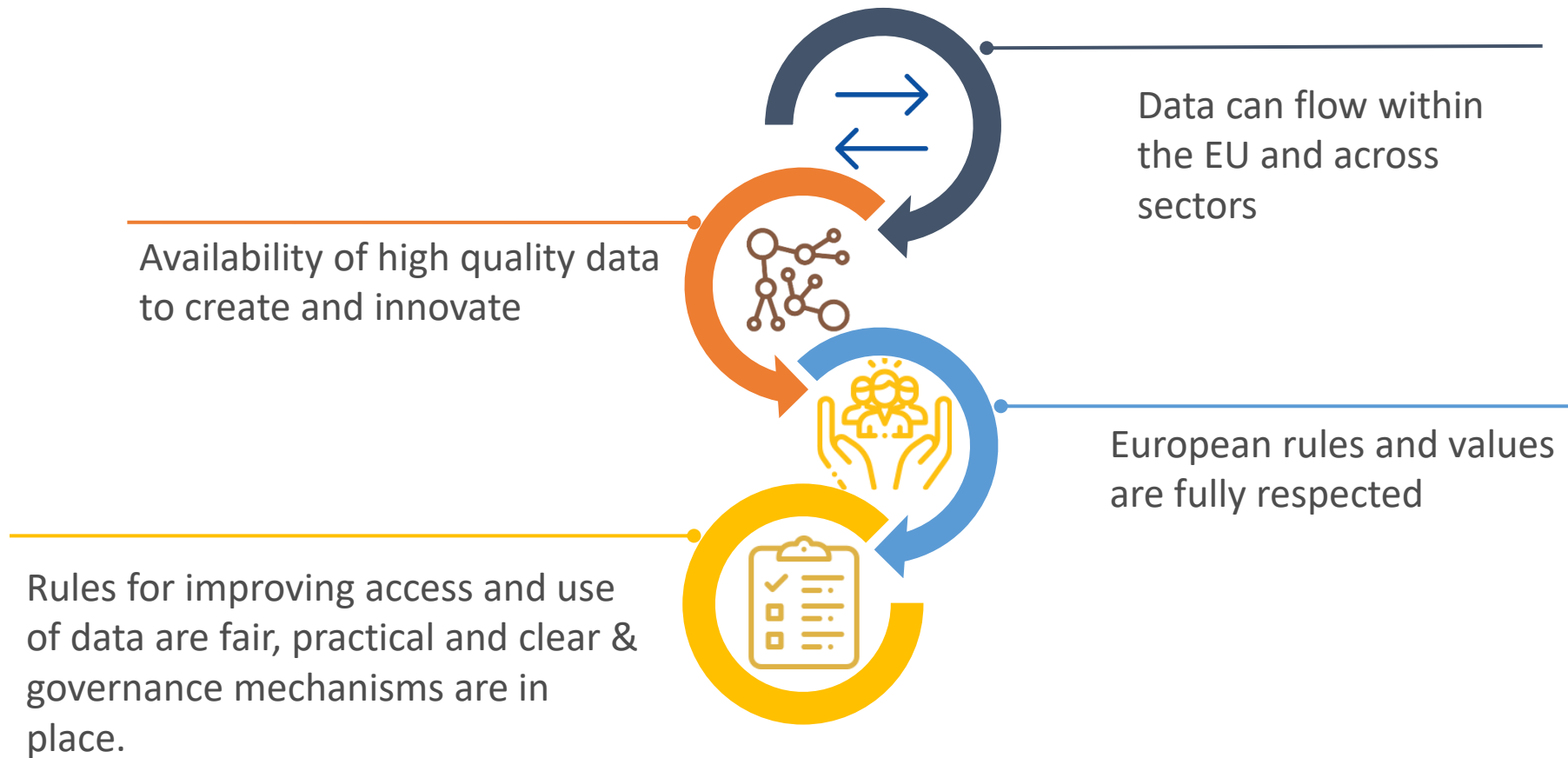
Thank you DSSC!



Generated from input received in
DSSC Governance Thematic Group

Governance context: European strategy for data

Creating a common European data space, a single market for data



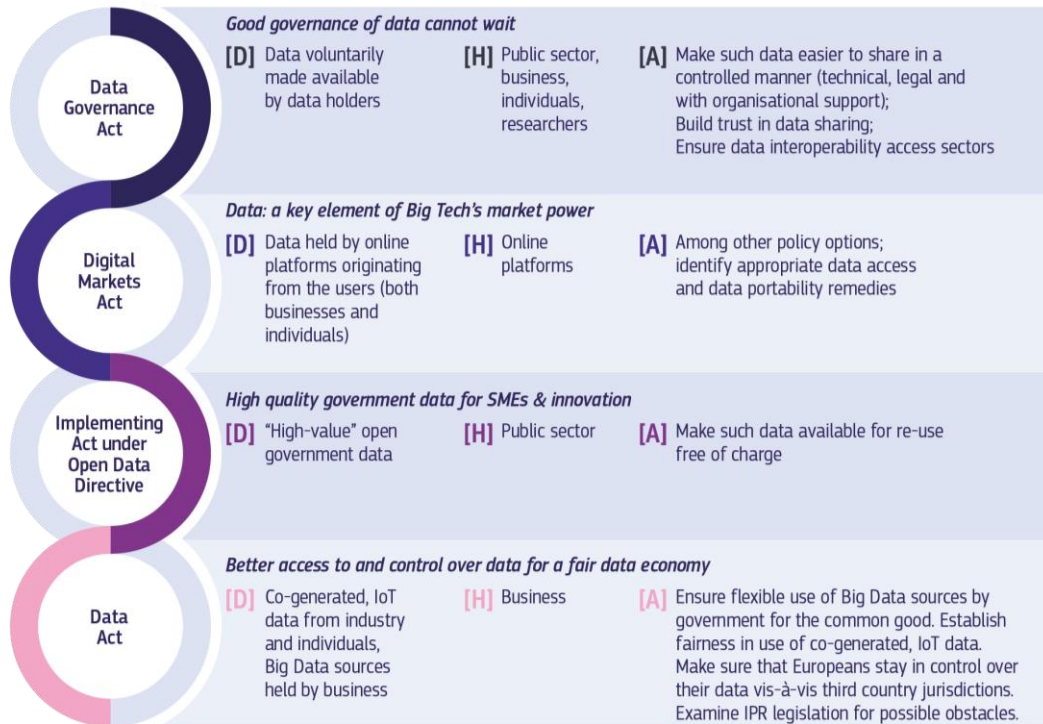
Legal + policy context for EU data spaces

01

Horizontal Legal framework

Overview of data actions

[D] What data are we talking about? [H] Who holds such data? [A] What policy intervention?



02

Investment in data spaces

Digital Europe Programme



HORIZON EUROPE



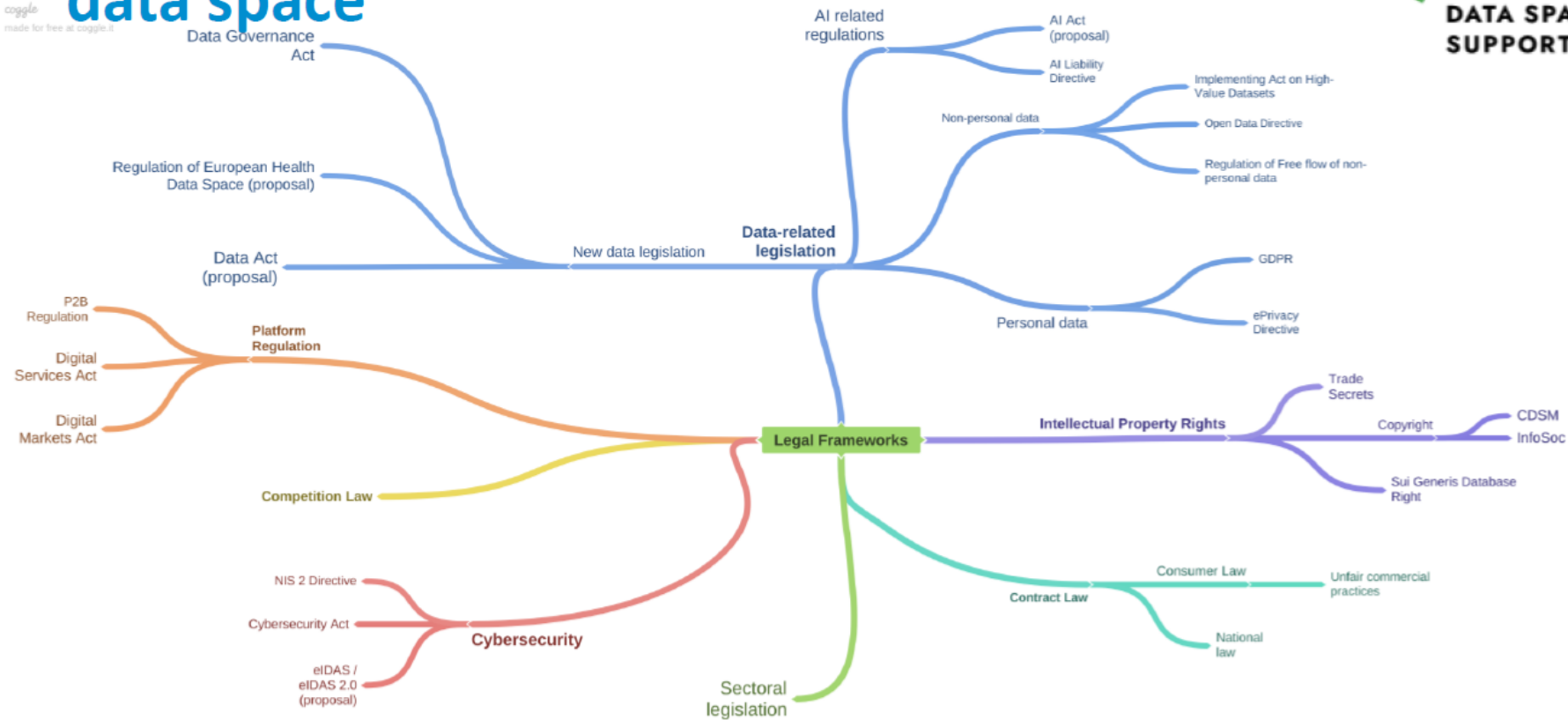
03

Governance

- Data Spaces Support Centre
 - Stakeholder engagement
 - Interlinking different data spaces
- European Data Innovation Board
 - Governance of data spaces
 - Technical, incl. approval of standards, building blocks

Legal frameworks with (potential) link to data space

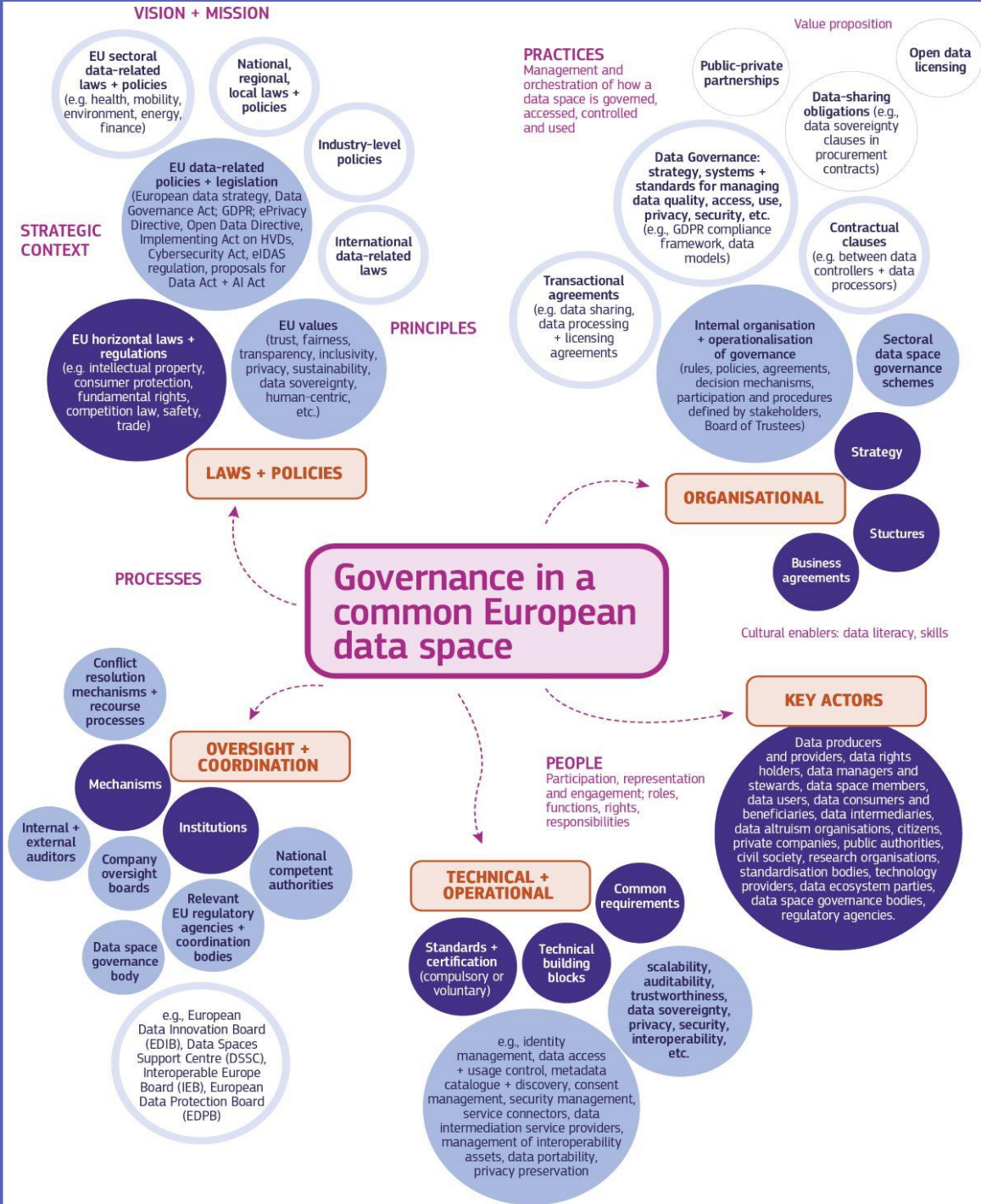
coggle
made for free at coggle.it



The Data Spaces Support Center receives funding from the European Union Digital Europe Programme under grant agreement n° 101083412.



→ Focus on 'major' horizontal frameworks



Multi-level governance considerations

- Horizontal legal frameworks (*EU, international, national, regional*)
- Sectoral legislation
- Sectoral data space-related legislation
- Data-related legislation, data governance models
- Principles and requirements (*elicited from EU policy documents*)
- Standards and protocols
- Individual data space governance schemes
- Institutional mechanisms
- Business, organisational aspects
- Roles, rights, responsibilities

How-to information sheets

How-to's on technical and organisational aspects of data sharing

How-to Information Sheets		Data Space Theme
TECHNICAL	1 How can stakeholders benefit from synthetic data in a data space?	Synthetic data
	2 How to choose the best software stack for a data space?	Software stacks
	3 How to ensure clear access and use conditions for a dataset in a data space?	Licensing
	4 How to ensure that datasets shared by different actors in a data space can be used together?	Interoperability
	5 How to ensure that technical requirements and standards are being followed?	Data validation
	6 How to facilitate the discovery of data in a data space?	Data discoverability
	7 How to select the most appropriate standards for a data space?	Data standards
	8 How to ensure that digital resources and data are uniquely referenced in a data space?	Data registers
	9 How to provide access to data in a data space?	APIs for data access
	10 How to preserve privacy and protect personal data and sensitive business data in a data space?	Privacy enhancing technologies
ORGANISATIONAL	1 Which actors are providing what types of data in scope of a data space?	Data Actors
	2 How to foster a people-centred approach to data in a data space?	Citizen data
	3 How can business benefit from sharing data in a data space?	Benefits to business in data spaces
	4 How can governments access private sector data of public interest?	Accessing data (B2G)
	5 How can data transparency for AI systems be increased in a data space?	Transparency – AI data in data spaces
	6 How to leverage voluntary data sharing in a data space?	Voluntary data sharing
	7 Which legal aspects should be considered when creating, providing or using novel data-driven solutions in data spaces?	Legal



Example 1: How to foster a people-centred approach to data in a data space?



What is the problem?

1

- Existence of large power **asymmetries** between who collect data and who create data
- Importance to **build a trustworthy environment** for sharing data in a data space.

Scenario

A city district innovates public services and engages in greater data collection about the movements and activities of its residents. The city council establishes a partnership with a private company that run the digital infrastructure. Yet, it fails to adequately inform citizens, who are neither involved nor consulted. As a result, people feel powerless and lose trust in the city council.



Proposed solution(s)

2

- Ensure **people's voices and interests** are represented
- Promote **digital literacy and skills** amongst the general public
- Enable **people to control** how **their data** are accessed, shared, used
- Provide **people** with opportunities **to collect data** for public good and to influence decision-making

Recommendations

- Adopt transparency measures
- Rely on trustworthy data intermediaries
- Implement privacy by design

Additional Resources

Craglia, M., et al. 2021. **Digitranscope: The governance of digitally-transformed society**, Publications Office of the European Union, Luxembourg
Ponti, M. and Craglia, M., 2021. **Citizen-generated data for public policy**, Publications Office of the European Union, Luxembourg
Micheli, M., Ponti, M., Craglia, M. and Berti Suman, A., 2020. **Emerging models of data governance in the age of datafication**. *Big Data & Society*, 7, 2.
Micheli, M., Delipetrev, B., Hupont, I. and Soler Garrido, J., **The landscape of data and AI documentation approaches in the context of new EU policies**, TBC.
Ethics and Information Technology

3

Example 2: How to select the most appropriate standards for a data space?



What is the problem?

- Standards are enablers of interoperability
- Often they are chosen blindly without the necessary considerations
- Poor/immature standards that are not supported by clients and communities can do more harm than good

Scenario

- A business company needs to perform machine-learning analyses to evaluate the accessibility of green areas located across districts within a city.
- Collected data show a high degree of fragmentation:
 - data encodings are different, including non-standard formats & standard formats historically used by different communities and following different data models
 - ETL conversion is hard or impossible
 - some standards are new and software tools to retrieve and consume the data do not exist yet

1



Proposed solution(s)

- Prioritise well-known standards adopted by global communities
- Give preference to standards developed by international SDOs
- Consider the existence of a community behind standards
- Prioritise standards developed in a participative, agile and collaborative way
- Choose mature standards, avoiding standards in draft or not yet published

Recommendations

- Data providers
- Data Users
- Intermediaries

2

Additional Resources



Open
Geospatial
Consortium



W3C®



3

Example 3: How to provide access to data on a data space?



What is the problem?

- Quick and effective access to datasets is crucial
- Often this represents a challenge due to the heterogeneity of technologies, standards and architectures

Scenario

- A developer needs to build an application to monitor citizens' exposure to air pollutants in a city, by using data from all air pollution sensors, traffic and road infrastructure.
- Data are made available by different data providers in a fragmented way:
 - some only provide static access to old measurements
 - some provide dynamic access to measurements in non-standardised, non-open and non machine-readable formats
- The application cannot only be implemented without simultaneous access to all the data sources.

1



Proposed solution(s)

- Use Application Programming Interfaces (APIs) as an effective way to provide access to data in modern digital environments
- Rely on industry standards to describe APIs, such as OpenAPI specifications

Recommendations

- Digital service providers
- Intermediate service providers & users
- Data providers
- Data space orchestrators

2

Additional Resources



3



Estrategia de Movilidad
segura · sostenible · conectada · 2030

Pillars 5 and 6



**Plan de Recuperación,
Transformación y Resiliencia**



**Ley de
Movilidad
Sostenible**

Aids for digitalization of transport

**Project law which approval was
interrupted due to elections. EDIM was
included**

EDIM

- The Project law on sustainable mobility included a **National Mobility System**, being one of its pillars to implement a **Integrated Mobility Data Space (EDIM)**, digital and real time, between Administrations
- **Objective:** to guarantee availability of information for **better design of public policies**, facilitate **decisión-making process**, offer **sustainable and efficient mobility solutions**, and improve **crisis and emergency response capacity**
- **Data to be included:** transport offer, transport demand, costs of transport services, investments, transport infrastructures and terminals inventory,...
- Available to: administrations, management companies and professionals, organizations, associations and citizens (according to access levels)
- **Thought to be modular, scalable and distributed** (to be developed in several years)



**European
Union**



European Digital Decade Policy Programme (in force since January 2023) established a novel co-operation mechanism: **multi-country projects** (MCP)

- ❑ To facilitate the implementation of MCPs, the European Digital Decade Policy Programme has empowered the Commission to establish **European Digital Infrastructure Consortia (EDIC)**, upon the **application of interested Member States**.
- ❑ Several countries (Spain included) are working to establish a **European Digital Infrastructure Consortium on Mobility and Logistics Data**

Primary goal: bridging the gap between project-based experimentation and the development and long-term availability and sustainability of a common data infrastructure, including data sharing and utilization

AgriFood Cooperatives of Spain



3.669

Empresas
cooperativas
agrarias

38.428

Millones de
Euros
facturados
en 2021

+1
Millón

de socios en
todo el
territorio
nacional

+123.700

Empleos
directos
generados
por las
cooperativas
asociadas



AgriFood Cooperatives of Spain



¿Qué ofrece exactamente Cooperativas Agro-alimentarias de España?



C3: Cuaderno de Campo Cooperativo (digital)=Cuaderno de explotación digital

- Captura de datos (normativa RD SIEX) por agricultores y/o técnic@s.
- Aplicativo 'off-line' para smartphones/tablets (agricultores).
- Aplicativo de escritorio (técnicos).
- Generación de recetas/recomendaciones.
- Conexión con la administración según plazos.
- Conexión con SIGCEX en tiempo real.
- Alertas.

SIGCEX: Sistema de Información Geográfica Cooperativa de las Explotaciones

- Análisis de la información, en tiempo real, procedente de C3.
- Monitorización de indicadores y sistema de alertas mediante cuadros de mando.
- Integración con fuentes de datos externas (AEMET, SENTINEL, etc.)
- Capacidad de creación de aplicativos propios adaptados a mis necesidades.
- Sólo requiere trabajo de análisis, aunque permite mucho más.

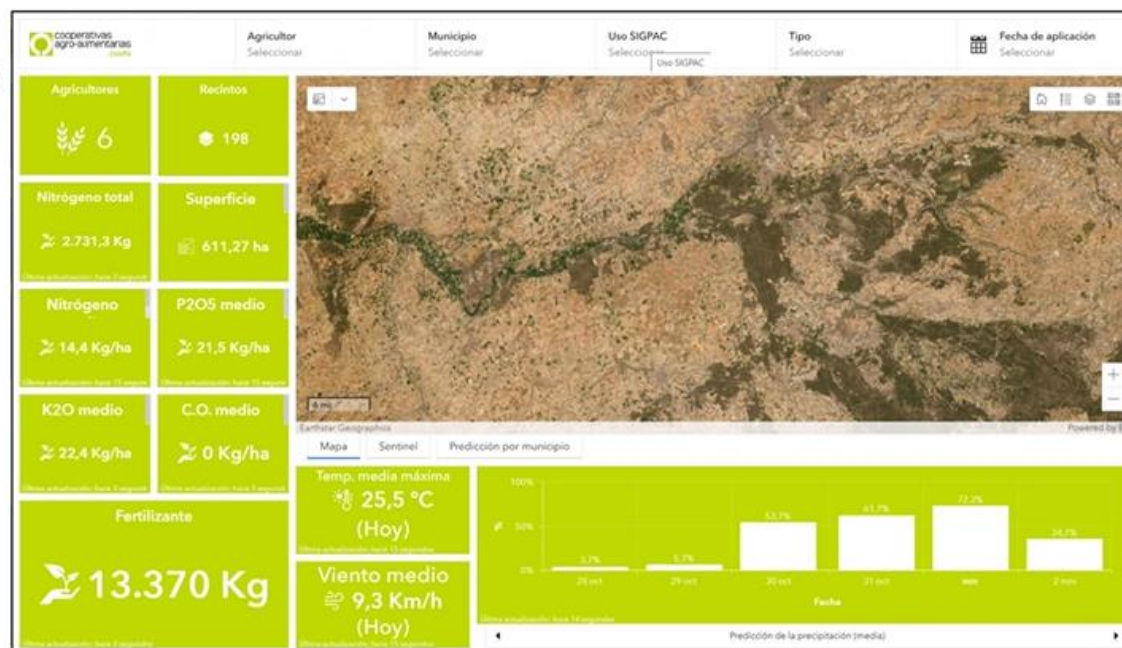


AgriFood Cooperatives of Spain



¿Cómo se implementará el sistema?

1. Formación en SIGCEX, despliegue de licencias y firma de acuerdos a tres partes entre cooperativa, federación y confederación.
2. Integración C3-SIGCEX-SIEX (una vez C3 y CUE estén habilitados).
3. Formación en C3 y despliegue del software. Firma de contratos entre cooperativa y soci@s en base al código de conducta sobre datos UE y COPA-COGECA.
4. 2023: Año de puesta en marcha para administración, C3 y SIGCEX → PRUEBAS



Data Sharing Initiatives incipient D.S.:



- Livestock farming sharing data initiatives:



The European Agricultural Fund for Rural Development

Europe investing in rural areas

<https://gc4sheep.com/> Federated Data Cloud Platform with Artificial Intelligence Layer for the Genetic and Reproductive Improvement of the National Dairy Sheep (AI for AI)

<https://www.gesvac.org/> animal welfare+health dairy cattle Friesian breed

- RuralTech. Recovery and Resilience Funds.

- Eno-data lake La Rioja public procurement of innovative technology





Data Sharing Initiatives Agri Data S.:



Dairy Sheep + Spanish AgriFood Cooperatives.

DIXITEGA DIGITALIZATION OF THE VALUE CHAIN OF IXP TERNERA GALLEGA . RDP EAFRD GALICIA.

<https://juanadevega.org/es/proyectos/grupo-operativo-digitalizacion-de-la-cadena-de-valor-de-la-igp-ternera-gallega/>



NEXTGENDATA

<https://www.dihdatalife.com/en/edih/>



I4DATA

<https://data4food2030.eu/project/i4data/>



Fiware Platform, in La Vega Innova. DIH of Ministry

<https://lavegainnova.es/>

Maite Ambros Mendioroz

Head of the Unit of Innovation and Digitalization.

General Directorate of Rural Development, Innovation and AgriFood Training.

Ministry of Agriculture, Fisheries and Food

Bzn-sgid@mapa.es

2nd October 2023





EU Code of conduct on agricultural data sharing by contractual agreement

Full text available at: https://fefac.eu/wp-content/uploads/2020/07/eu_code_of_conduct_on_agricultural_data_sharing-1.pdf

This code of conduct (Code) is a tool to ensure that data-sharing leads to a prosperous agri-food chain bringing benefits for all by:

- Setting transparent principles
- Clarifying responsibilities
- Creating trust among partners



E-government, revulsive for data spaces. LEGAL FRAMEWORK

REGULATION (EU) 2021/2116 of 2 December 2021 on the financing, management and monitoring of the common agricultural policy.

Article 69 Geospatial animal based application system = Automatic application for CAP aid based on area and/or animals.

Royal Decree 1054/2022, of December 27, which establishes and regulates the Information System for agricultural and livestock farms and agricultural production (SIEX), as well as the Autonomous Registry of agricultural farms and the **Digital Agricultural Holding Notebook**.

Order APA/204/2023, of February 28... **minimum content of the ... Digital Agricultural Holding Notebook**



1. As regards the aid for the area-based interventions referred to in Article 65(2) and implemented under their CAP Strategic Plans, Member States shall require the submission of an application by means of the geo-spatial application form provided by the competent authority.
2. As regards the aid for the animal-based interventions referred to in Article 65(2) and implemented under their CAP Strategic Plans, Member States shall require the submission of an application.
3. Member States shall pre-fill the applications referred to in paragraphs 1 and 2 of this Article with information from the systems referred to in Article 66(1), point (g), and in Articles 68, 70, 71 and 73 or from any other relevant public database.
4. Member States may set up an automatic claim system and decide which applications referred to in paragraphs 1 and 2 it shall cover.
5. If a Member State decides to use an automatic claim system, it shall set up a system which enables the administration to make the payments to the beneficiaries on the basis of the existing information in the official computerised databases. Where there has been a change, that existing information shall be supplemented with additional information, where necessary, to cover that change. The existing information and additional information available through the automatic claim system shall be confirmed by the beneficiary.
6. Member States shall annually assess the quality of the geo-spatial application system in accordance with the methodology set up at Union level.

Where the assessment reveals deficiencies in the system, Member States shall adopt appropriate remedial actions or, failing that, shall be requested by the Commission to set up an action plan in accordance with Article 42.

An assessment report and, where appropriate, the remedial actions and the timetable for their implementation shall be submitted to the Commission by 15 February following the calendar year concerned.





PERTE AGROALIMENTARIO. CITA SIEX. 20 millones de euros.

Hasta
2023 o ...
más



Eje 1: Fortalecimiento
industrial. MINCOTUR

Eje 2: Digitalización
del sector
agroalimentario
Presupuesto: 454,35
M€ Gestor:
MAPA Y MINECO

Eje 3: I+D+i
Presupuesto: 143 M€
Gestor: **MAPA** Y MICIN

AGROALNEXT

Plan complementario de
Agroalimentación

DETALLE DE ACTUACIONES DEL EJE 2

GESTOR

PRESUPUESTO

2.1. Impulso a la Estrategia de Digitalización del Sector Agroalimentario y del medio rural (C3.I5)

- Línea AgroImpulso de préstamos participativos con ENISA
- Hub de Innovación Digital
- Plataforma AKIS
- Observatorio de Digitalización del Sector Agroalimentario

MAPA Y ENISA

33 M€

MAPA

5,15 M€

3 M€

1 M€

12,2 M€

3 M€

1 M€

20 M€

2.2. Proyectos innovadores AEI-Agri

2.3. Ayudas del PNDR para apoyar la formación y el asesoramiento digital en el sector agroalimentario

2.4. Desarrollo del Centro de Competencias Digitales

2.5. Desarrollo de una lanzadera de proyectos tractores en el sector agroalimentario español: Sistema de Explotaciones Agrarias (SIEX)

2.6. Programa de Espacios de Datos Sectoriales (C12.I1)

MINECO

50 M€

2.7. Programa de Kit Digital (C13.I3)

MINECO

275 M€

2.8. Programa de Agentes del Cambio (C13.I3)

MINECO

27 M€

2.9. Medidas transformadoras en marco de conectividad digital (C15.I6)

MINECO

15 M€

2.10. Programa de Formación para expertos en transformación digital de las PYMES (C19.I3)

MINECO

9 M€

Total

454,35 M€



Thanks!

DATA SPACES IN EU

SYNERGIES BETWEEN DATA
PROTECTION AND DATA SPACES
EU CHALLENGES AND
EXPERIENCES OF SPAIN

2 October 2023 | Madrid

#dataspaces #EUchallenges

