



ROADSHOW

in Poland 

With the participation of



27-28 May 2024



Warsaw, Poland



interoperable
europe
innovation ∞ govtech ∞ community



NIFO roadshow in Poland – Day 1

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Opening of the event

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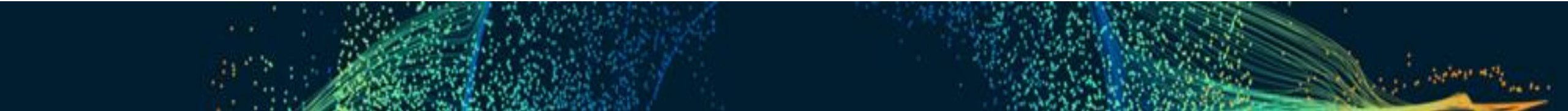


Introduction and agenda

interoperable
europe

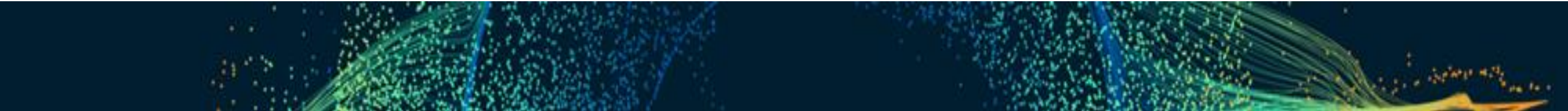
Day 1 – Agenda (morning)

09.30 – 09.45	Opening of the event
09.45 – 10.00	Introduction and agenda
10.00 – 10.45	NIFO Activities
10.45 – 10.55	Short break
10.55 – 11.55	Interoperability in Poland and presentation of the State Information Structure
11.55 – 12.40	SEMIC Service Offering
12.40 – 13.40	Lunch break



Day 1 – Agenda (afternoon)

- | | |
|---------------|---|
| 13.40 – 14.30 | Policy context and the Interoperable Europe Act |
| 14.30 – 15.30 | From the EIF towards a new Interoperability Monitoring Mechanism |
| 15.30 – 15.45 | Short break |
| 15.45 – 17.15 | Workshop: Core Vocabularies & Application Profiles (& Style Guide) for Base Registries with a focus on ABR |
| 17.15 – 17.30 | Closing of the day |





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NIFO Activities

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National Interoperability Framework Observatory (NIFO)



NIFO publishes the **most up-to-date information** on the state-of-play of digital public administration and interoperability.



NIFO provides support and guidance to European national administrations to **facilitate the alignment** of their National Interoperability Framework (NIF) with the European one (EIF).



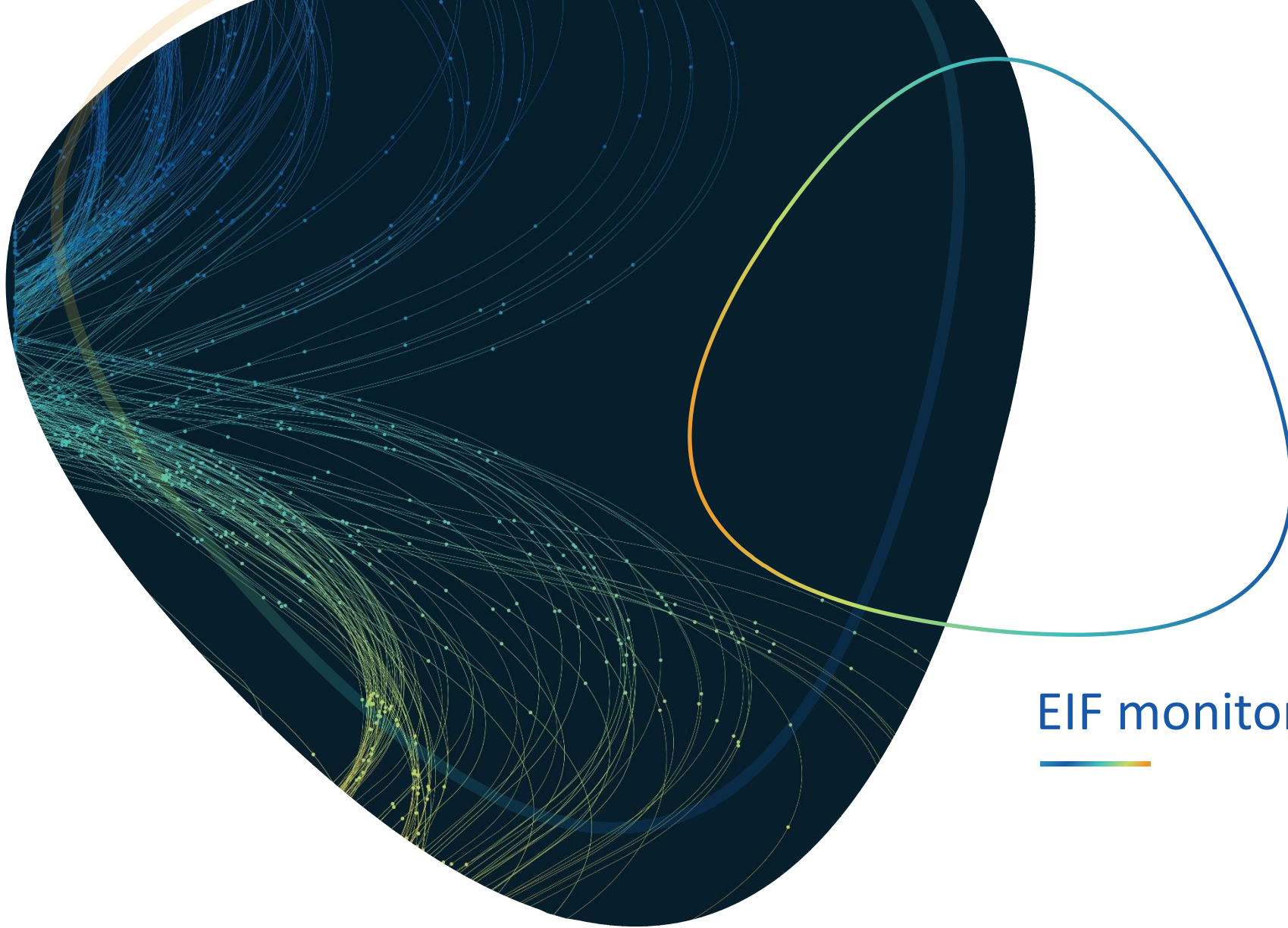
NIFO fosters **engagement activities** with European public administrations such as workshops and webinars, so as to create a community of practice.



The main mission of NIFO is to monitor the implementation of the revised version of the European Interoperability Framework (EIF) and to help foster the capacity-building policy and modernisation of public administrations. By doing so, it aims at becoming an online community of practice and the prime source of information regarding digital public administration and interoperability matters within Europe.

Overview of NIFO activities





EIF monitoring mechanism



Introduction to the European Interoperability Framework (EIF)

Published in 2017, the EIF is a commonly agreed approach for the delivery of European public services in an interoperable manner. It defines basic interoperability guidelines in the form of common principles, models and recommendations.



The EIF is principally promoted and maintained by the **Interoperable Europe programme** in close cooperation between the Member States and the Commission in the spirit of Articles 26, 170 and 171 of the Treaty on the Functioning of the European Union calling for the establishment of interoperable trans-European networks that will enable citizens to derive full benefit from a European internal market.

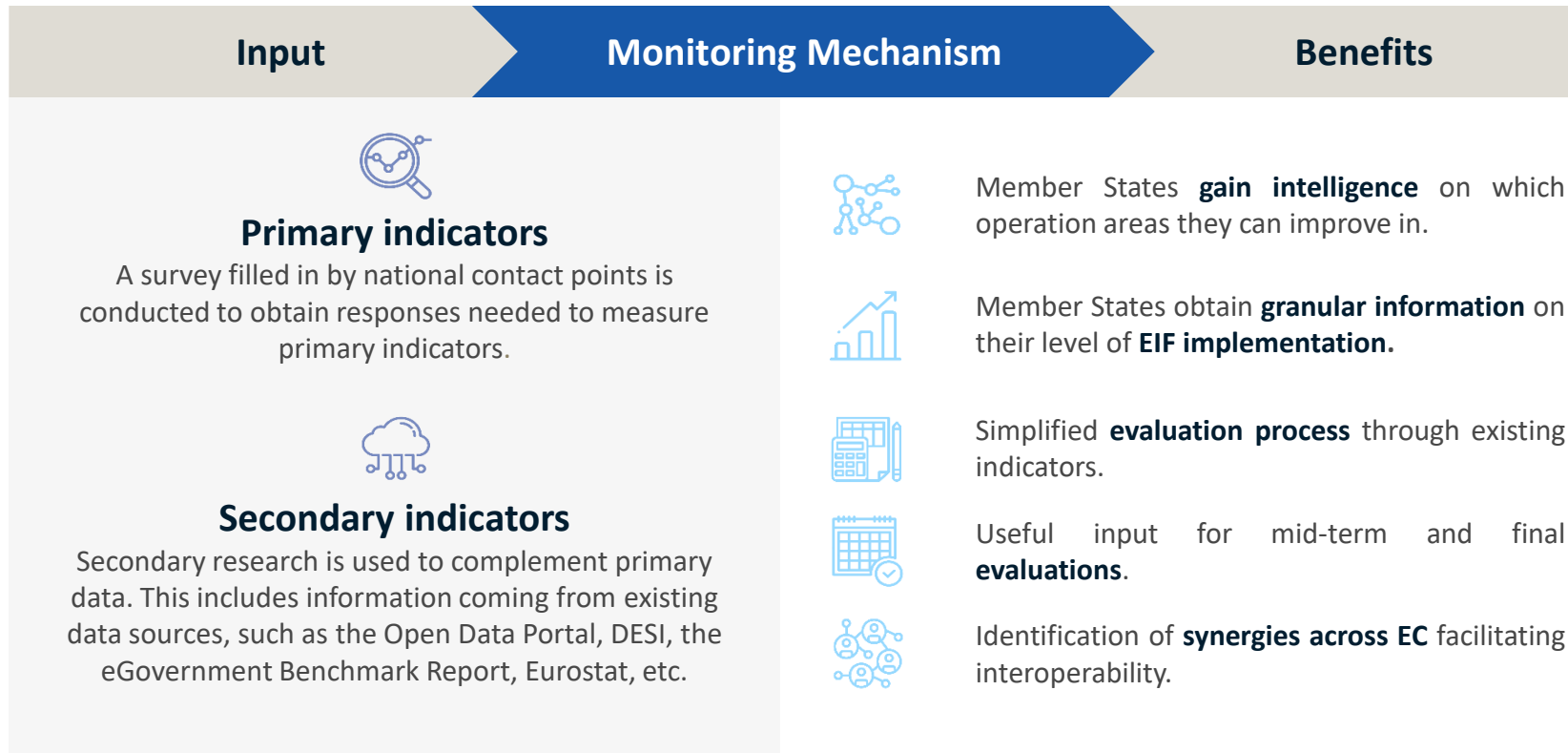


- Support European public administrations in their efforts to **design and deliver seamless European public services** which are to the degree possible, digital-by-default, cross-border by-default and open-by-default;
- Provide guidance to support **design and update of their national interoperability frameworks** (NIFs), policies, strategies and guidelines; and
- Contribute to the establishment of the **digital single market by fostering cross-border and cross-sectoral interoperability**.



The EIF is meant to be a **generic framework applicable to all public administrations in the EU**. It lays out the basic conditions for achieving interoperability, acting as the common denominator for relevant initiatives at all levels including European, national, regional and local, embracing public administrations, citizens and businesses.

Introduction to the EIF Monitoring Mechanism



THE EIF MONITORING MECHANISM (EIF MM)

Has for goal to provide each MS with its level of implementation of the EIF based on a recommendation-by-recommendation measurement as defined by the Article 1.2 of the ISA² Decision.

EIF scoreboards



The **interoperability principles** are fundamental behavioural aspects to drive interoperability actions. They describe the context in which European public services are designed and implemented.

	Recommendation(s) n°
Principle 1 - Subsidiarity and Proportionality	1
Principle 2 - Openness	2-4
Principle 3 - Transparency	5
Principle 4 - Reusability	6-7
Principle 5 - Technological neutrality and data portability	8-9
Principle 6 - User-centricity	10-13
Principle 7 - Inclusion and accessibility	14
Principle 8 - Security and privacy	15
Principle 9 - Multilingualism	16
Principle 10 - Administrative simplification	17
Principle 11 - Preservation of information	18
Principle 12 - Assessment of Effectiveness and Efficiency	19



The **4 layers of interoperability**: legal, organisational, semantic and technical are complemented by cross-cutting governance components.

	Recommendation(s) n°
Interoperability Governance	20-24
Integrated Public Service Governance	25-26
Legal Interoperability	27
Organisational Interoperability	28-29
Semantic Interoperability	30-32
Technical Interoperability	33



The **conceptual model** is modular and comprises loosely coupled service interconnected components. Guides the planning, development, operation and maintenance of public services by Member States.

	Recommendation(s) n°
Conceptual Model	34-35
Internal information sources and services	36
Basic Registries	37-40
Open Data	41-43
Catalogues	44
External information sources and services	45
Security and Privacy	46-47



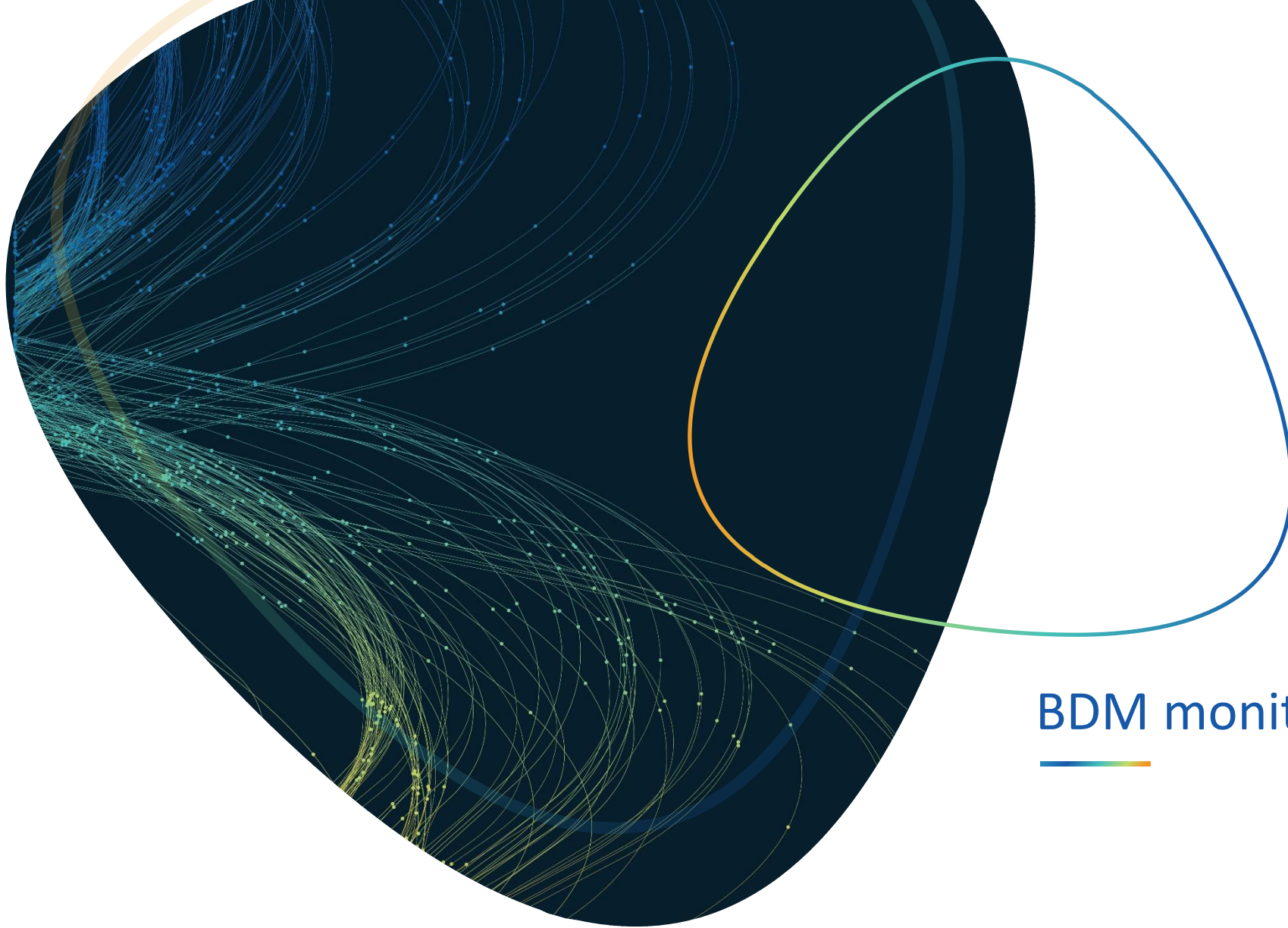
Cross-border interoperability scoreboard

In 2022, the EIF MM has been revised with the inclusion of a **cross-border transversal scoreboard**, encompassing the Interoperability Principles, the Interoperability layers and the Conceptual model.

The fourth scoreboard mirrors the thematic areas and recommendations described by the EIF framework thematic areas and recommendations described by the EIF framework.

Scoreboard 1 Interoperability Principles		Scoreboard 2 Interoperability Layers		Scoreboard 3 Conceptual Model	
	Recommendation(s) n°		Recommendation(s) n°		Recommendation(s) n°
Principle 1 - Subsidiarity and Proportionality	1	Interoperability Governance	20-24	Conceptual Model	34-35
Principle 2 - Openness	2-4	Integrated Public Service Governance	25-26	Internal information sources and services	36
Principle 3 - Transparency	5	Legal Interoperability	27	Basic Registries	37-40
Principle 4 - Reusability	6-7	Organisational Interoperability	28-29	Open Data	41-43
Principle 5 - Technological neutrality and data portability	8-9	Semantic Interoperability	30-32	Catalogues	44
Principle 6 - User-centricity	10-13	Technical Interoperability	33	External information sources and services	45
Principle 7 - Inclusion and accessibility	14			Security and Privacy	46-47
Principle 8 - Security and privacy	15				
Principle 9 - Multilingualism	16				
Principle 10 - Administrative simplification	17				
Principle 11 - Preservation of information	18				
Principle 12 - Assessment of Effectiveness and Efficiency	19				
Scoreboard 4 Cross-border Interoperability					

*The thematic areas and recommendations affected by the addition of the cross-border dimension are the ones highlighted in dark blue.



BDM monitoring mechanism



Introduction to the Berlin Declaration and its monitoring mechanism (BDM)



With the aim of more actively shaping the strategic direction of the digital transformation, the 27 EU Member States signed the **Berlin Declaration on Digital Society and Value-based Digital Government** in December 2020. In practice, Member States committed to a set of **seven principles/objectives to be implemented in their national frameworks by 2024**, which are meant to emphasise that digital transformation in Europe should be based on democratic values and principles ensuring that everyone can navigate the digital world safely and can be digitally recognised within the EU.



To support Member States in **identifying their progress** made over time in implementing the objectives enshrined in the Declaration and **to share good practices**, the Berlin Declaration monitoring mechanism (BDM) was developed in 2021. The BDM was created following a **co-creative approach**, involving the Presidency of the Council of the European Union, held by France at the time, and members of the Chief Information Officers.

BDM Benefits



For Member States....

Highlighting measures taken by each one to reach the Policy Actions.

Identifying good practices and lessons learnt along the way.

Supporting decision-makers at EU and national levels in setting their budgetary priorities and goals in the digital domain.



For Academia...

Leveraging the results of the BDM published as open data for further reuse.

Understanding the good practices and lessons learnt shading light on the ongoing initiatives of the Member States.

Developing intelligence on Member States' state-of-play in digital government.

BDM Assessment Framework

Level 1 Policy Areas aligned with the Declaration's 7 key principles	Policy Area 1 Promote fundamental rights and democratic values in the digital sphere			Policy Area 2 Enhance social participation and inclusion			Policy Area 3 Foster digital empowerment and digital literacy			Policy Area 4 Strengthen trust through security in the digital sphere			Policy Area 5 Strengthen Europe's digital sovereignty and interoperability			Policy Area 6 Create value-based, human-centred AI systems for use in the public sector			Policy Area 7 Foster resilience and sustainability			
Level 2 Policy Actions that the Member States have committed to achieve in their respective countries by 2024	1.1 Include and translate fundamental rights into policies and technology procurement rules	1.2 Raise awareness on value-based digital transformation	1.3 Establish ethical and technological expert councils	2.1 Encourage the use of digital tools to foster citizen participation in policy decision making	2.2 Ensure inclusiveness and accessibility for all to fully digital public services and information	2.3 Provide easy access to services from mobiles	3.1 Launch and promote initiatives for citizens' digital literacy	3.2 Provide easily accessible, user-friendly and seamless digital services	3.3 Initiate workshops/trainings to promote digital skills in the public sector	4.1 Promote the rollout and use of notified eID in the public and private sectors	4.2 Promote responsible and legally compliant re-use of data	4.3 Consider ways to foster agreement on ICT security requirements	5.1 Jointly work towards agreements on requirements for technology providers	5.2 Implement common standards and modular architectures in cross border digital solutions	5.3 Work with the EC to provide suitable online public services for EU cross-border use	6.1 Foster transparency and accountability when designing digital public services	6.2 Share best practices on the development of human-centric AI systems	6.3 Stimulate knowledge sharing on human centric technologies	7.1 Assess and make transparent energy consumption of digital tools and infrastructures	7.2 Evaluate the environmental impacts of ICT and extend the lifespan of digital equipment	7.3 Initiate expert consultations on appropriate use of digital technologies	7.4 Foster the exchange of crisis management data
Level 3 KPIs split as: 27 Primary indicators 17 Secondary indicators [eGov Benchmark (4), DESI (3), CEF Dashboard (2), EIF MM (4), Open Data Portal (3), Electricity Directive 2019/944]	1-2	3-5	6	7-8	9	10-12	13-14	15-18	19	20-22	23-27	28	29	30	31	32-33	34	35-36	37-39	40-42	43	44

Berlin Declaration Monitoring Results: the BDM Report

Objective

The third and last edition of the BDM report, which will be published under the **Hungarian Presidency of the Council of the EU**, aims to provide an **overview of the progress** made by the Member States in implementing the Policy Actions of the Declaration both compared to last year and since the deployment of the exercise. It will also bring together a set of **good practices** to inspire Member States and to present a state-of-play of the road towards a value-based digital society.

Scope

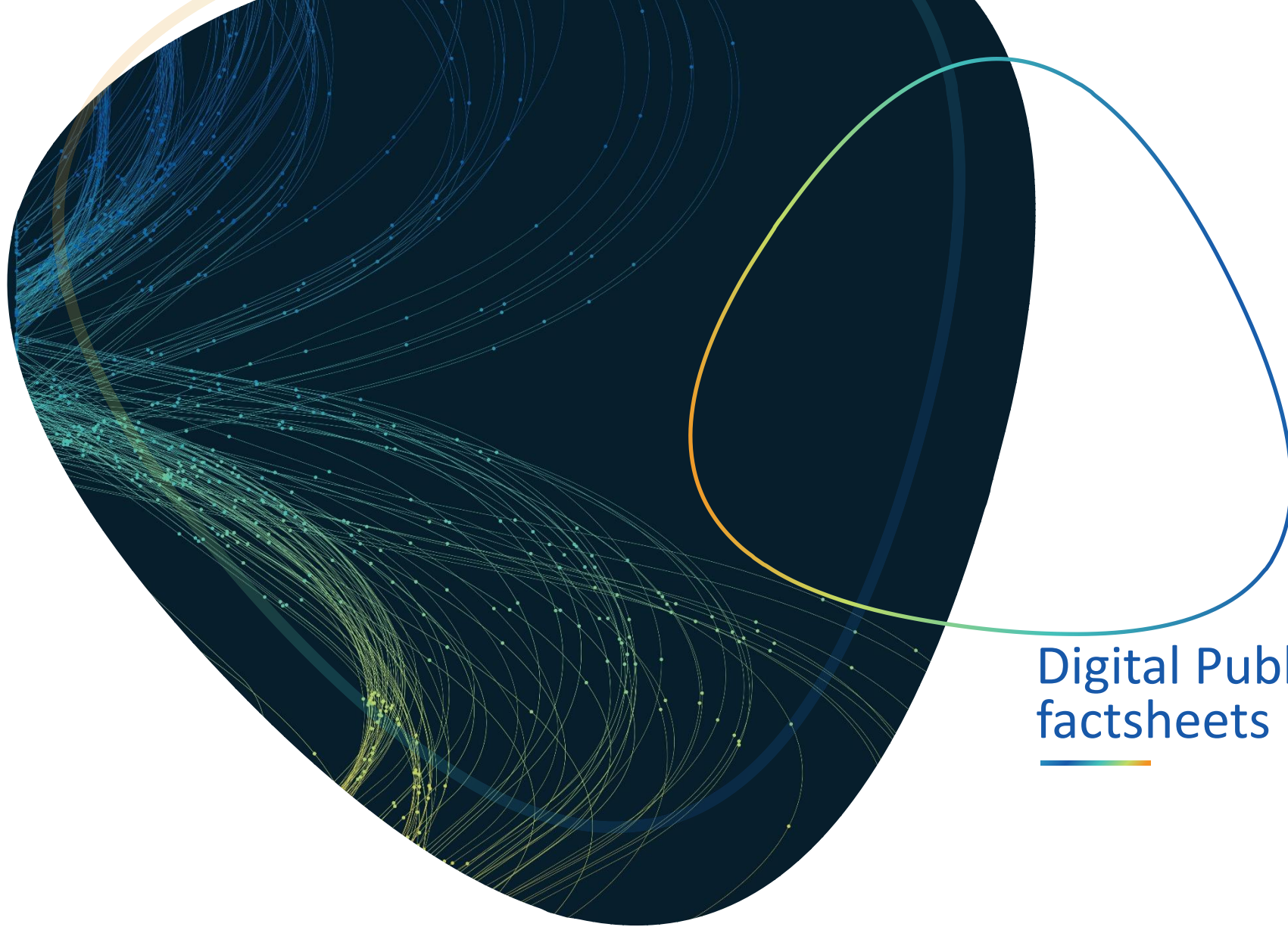
The report analyses **data stemming from the data collection of the BDM exercise**, which reports and highlights, on a yearly basis, the measures taken by each Member State to reach the Policy Actions, and identifies good practices and lessons learnt from each of them.

Novelties

Being the last year of the monitoring exercise, the report will provide **key highlights** of the BDM results between 2021 and 2023, as well Member States' **feedback on the overall BDM experience** and **insights on their priorities and expectations** for the future.



Source: 2022 BDM Report



Digital Public Administration factsheets

Digital Public Administration factsheets



Provide a country-level, yearly overview on the **latest developments and advancements on digital public administration and interoperability matters** in a selection of European countries. Additionally, each year a factsheet dedicated to the EU is also published.



Updated in collaboration with **national contact points**, as well as through **desk research**.

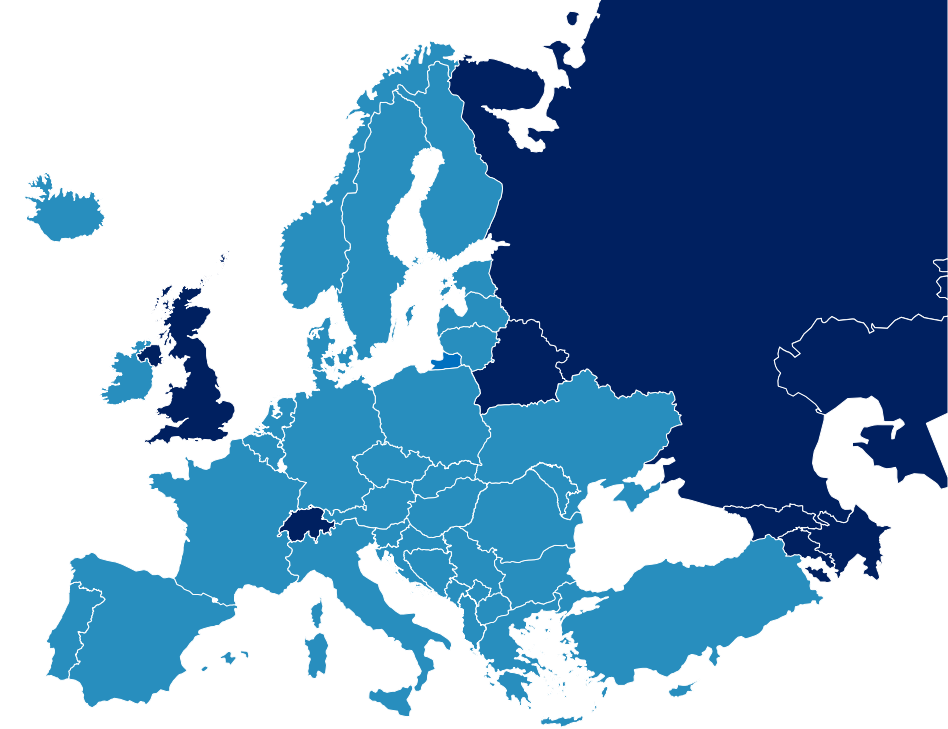


Inclusion of the EIF results (if available) to reinforce the vision of the **interoperability-by-default principle**, as part of the European countries' digital transformation strategy.



Novelties for the 2024 edition: **new templates and inclusion of 8 new countries:**

- **Albania**
- **Montenegro**
- **Türkiye**
- **Kosovo**
- **Serbia**
- **Bosnia and Herzegovina**
- **North Macedonia**
- **Moldova**



**2030
DIGITAL
DECADE**

The production of the DPAF actively **supports** the **objectives and targets** of the **Digital Decade programme**. How?

- **Complement existing data and indicators** included in the Digital Decade reports and related resources.
- **Highlight and promote key initiatives** put in place or planned by EU countries to reach the Digital Decade's targets.

2024 edition of the factsheets (1/2)

Supporting document



- Provide a **comprehensive overview of the state-of-play in digital public administrations and interoperability** within European countries
- Content organised by **main topic**
- Initiatives adopted in **2021-2024** (except relevant legislations or other major initiatives)

1

INTEROPERABILITY STATE-OF-PLAY

Overview of the 2023 European
Interoperability Framework (EIF)
monitoring results
(N/A)

2

DIGITAL TRANSFORMATION OF PUBLIC ADMINISTRATIONS

- Main digital strategies, actions plans and legislations
- Digitalisation of internal processes
- Digitalisation supporting the EU Green Deal

3

INTEROPERABILITY AND DATA

- Interoperability framework
- Data access, management & reuse
 - Open data
 - Base registries
 - Data platforms and portals
 - Cross-border infrastructures

4

DIGITAL TRANSFORMATION OF PUBLIC SERVICES

- Digital public services for citizens
- Digital public services for businesses
- Digital inclusion and digital skills

5

TRUST AND CYBERSECURITY

- eID and trust services
- Cybersecurity

6

INNOVATIVE TECHNOLOGIES

- Artificial Intelligence (AI)
- Cloud and edge computing
- Internet-of-Things
- Gigabit and wireless high-speed networks
- GovTech

7

DIGITAL PUBLIC ADMINISTRATION GOVERNANCE

- National
- Sub-national

8

CROSS-BORDER DIGITAL PUBLIC ADMINISTRATION SERVICES

Overview of the cross-border
digital public services provided on
Your Europe

2024 edition of the factsheets (2/2)

Factsheet

interoperable



POLAND

Digital Public Administration Factsheet 2024

Main developments in digital public administrations and interoperability

JUNE 2024

HIGHLIGHT - KEY PROJECT

- Since early 2023, experts of the Working Group for IoT (part of the Task Team for Breakthrough Technologies) have been working on the **SMART.PL project**, which aims to inspire the development of the market for **digital products and services using intelligent objects** (devices) of the Internet of Things, data, advanced algorithms, and the infrastructure related to these services.

The draft document to be published later in 2024 covers **recommendations for actions** the government should undertake in order to **support modernisation of industries** of significant importance for **sustainable growth**, such as:

- ☐ construction,
- ☐ energy,
- ☐ health,
- ☐ smart communities and
- ☐ agriculture.

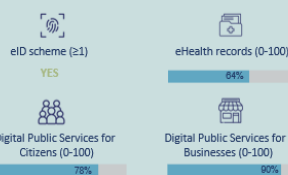
Key figures

6 new initiatives adopted in 2023-2024



Figure 1
Number of initiatives per topic adopted in 2023-2024

Towards the Digital Decade targets set for 2030:
DIGITAL PUBLIC SERVICES



Source: Digital Economy and Society Index (DESI)

DIGITAL TRANSFORMATION OF PUBLIC ADMINISTRATIONS

- Poland has been striving to implement **Directive (EU) 2018/1972** establishing the **European Electronic Communications Code** into the Polish legal system as soon as possible. The implementation of the European Electronic Communications Code in Poland is achieved through the adoption of two legal acts: a new substantive Act the Electronic Communications Law (PKE) and a separate act introducing the Electronic Communications Law (wPKE), which includes in its scope dozens of amendments to other acts.

DIGITAL TRANSFORMATION OF PUBLIC SERVICES

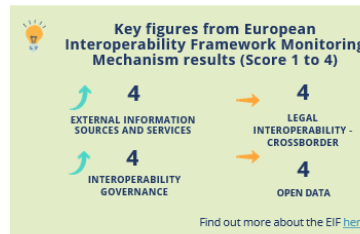
- Ministry of Economic Development and Technology is developing **Assumptions for the Digital Transformation Programme of Enterprises**, which are intended to respond to the main needs and problems of Polish companies in the digital transformation process. The programme will focus on **the digital transformation of companies** as a key factor in the development of the economy and respond to the main barriers to digitalization. It will also be an attempt to respond to the **gaps identified in current support instruments**, both in terms of the **demand approach** and the **thematic scope** (improving digital competences in companies, technologies supporting business in general).
- e-Consultation** is a platform for conducting **remote medical consultations**, developed by National Institute of Telecommunications at the request of the Ministry of Digital Affairs. The **pilot implementation** of the platform was conducted in the fourth quarter of 2023, involving nearly 90 cardiological medical units and 539 medical personnel. As part of the pilot phase, **2360 remote consultations** were conducted (indicating the number of times patients were served using the e-consultation system). The platform was officially launched in December 2023. The e-Consultation platform was primarily created for patients, providing them with **broader access to specialists from major medical centers and equal access** to the latest methods of diagnosis and **treatment regardless** of their place of **residence**.

TRUST AND CYBERSECURITY

- No new initiatives in this field have been reported.

INTEROPERABILITY AND DATA

- No new initiatives in this field have been reported.



INNOVATIVE TECHNOLOGIES

- Poland is one of the **five locations** chosen by **EuroHPC JU** to **host a new classical supercomputer** with "pre-exascale" capabilities. Poland has earmarked 11.2 mln EUR for this project. The mid-range supercomputer planned to be built in Poland will become part of the national PLGrid infrastructure, just like the currently fastest Polish supercomputer - Athena.
- Poland, as a Member State of the EU, is involved in negotiations, and in the trialogue **process to approve** the **Artificial Intelligence Act**. This act will be valid directly in **Polish national law and jurisdiction**. In parallel, Poland is engaged in a negotiation process in the Council of Europe for approving the **new treaty for AI** in the domains of human rights, democracy, and rule of law. After ratification of this treaty, there could be a **need to complete local laws** by specialised measures to ensure that the treaty is properly implemented and enforced.



The Digital Public Administration factsheets are produced by the **National Interoperability Framework Observatory (NIFO)** under **Interoperable Europe (DG DIGIT)** and the **Digital Decade Programme**. More information on the state-of-play on digital public administrations and interoperability in this country can be found in its **supporting document**.

Restricted distribution

- 2 pages
- Short, visual and impactful
- Selection of key highlights



State-of-Play Report on Digital Public Administrations and Interoperability

State-of-play Report on Digital Public Administrations and Interoperability



It provides an overview of the current state-of-play of interoperability across Europe and tries to identify **correlations and commonalities**, as well as potential **areas for improvement and best practices**.



Information is leveraged from the Digital Public Administration factsheets, the EIF monitoring mechanism results, as well as **desk research**.



It offers **highlights on specific topics** linked to interoperability and includes the **main takeaways from interviews conducted with practitioners and academics** working on digital transformation and other relevant fields.





Interoperability for Smart Cities and Communities

Interoperability for Smart Cities and Communities

In order to support the digital transformation of cities and communities, the EC adopted multiple initiatives to help them **take full advantage** of the **benefits** that **digital tools** can bring to our society, and thus meet local and regional challenges. Two of these initiatives have been particularly promoted through NIFO:

European Interoperability Framework for Smart Cities and Communities
(EIF4SCC)

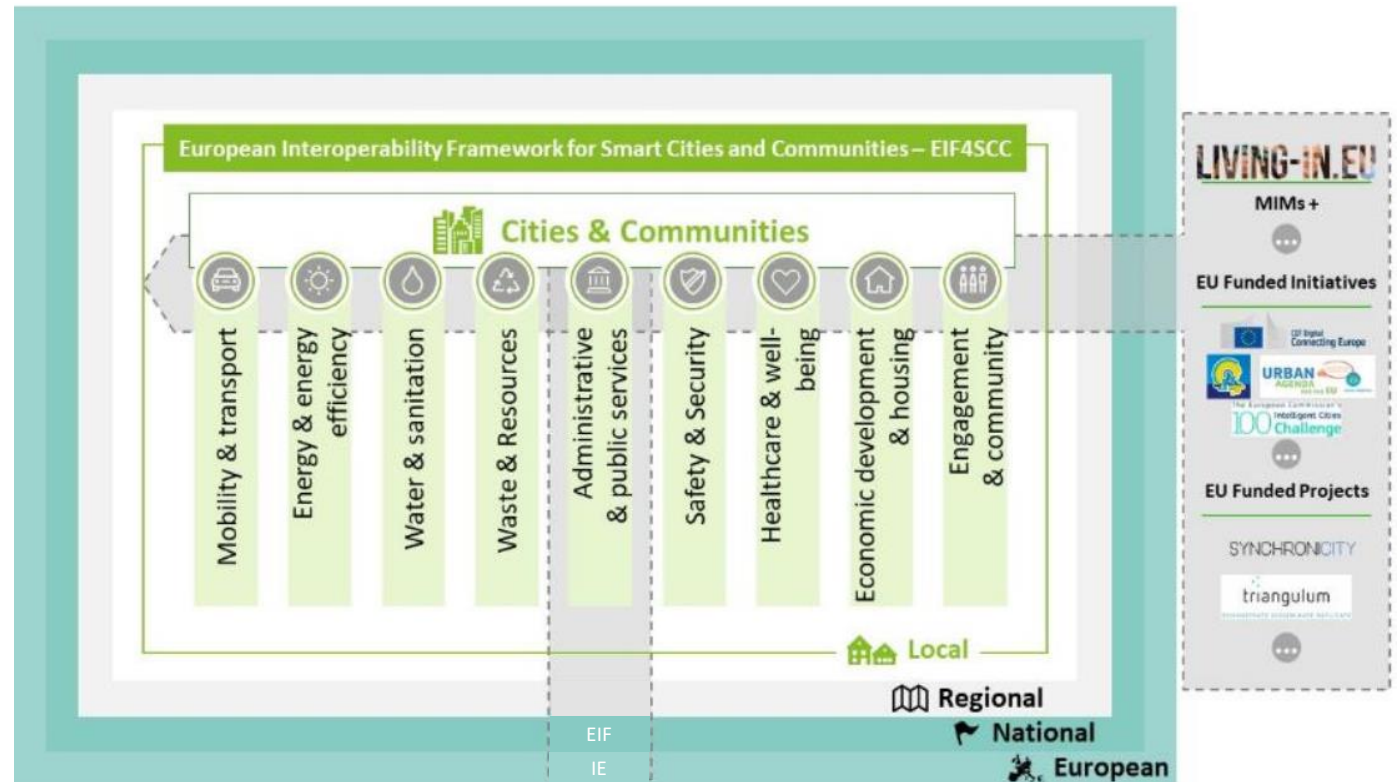
Minimal Interoperability Mechanisms
(MIMs)



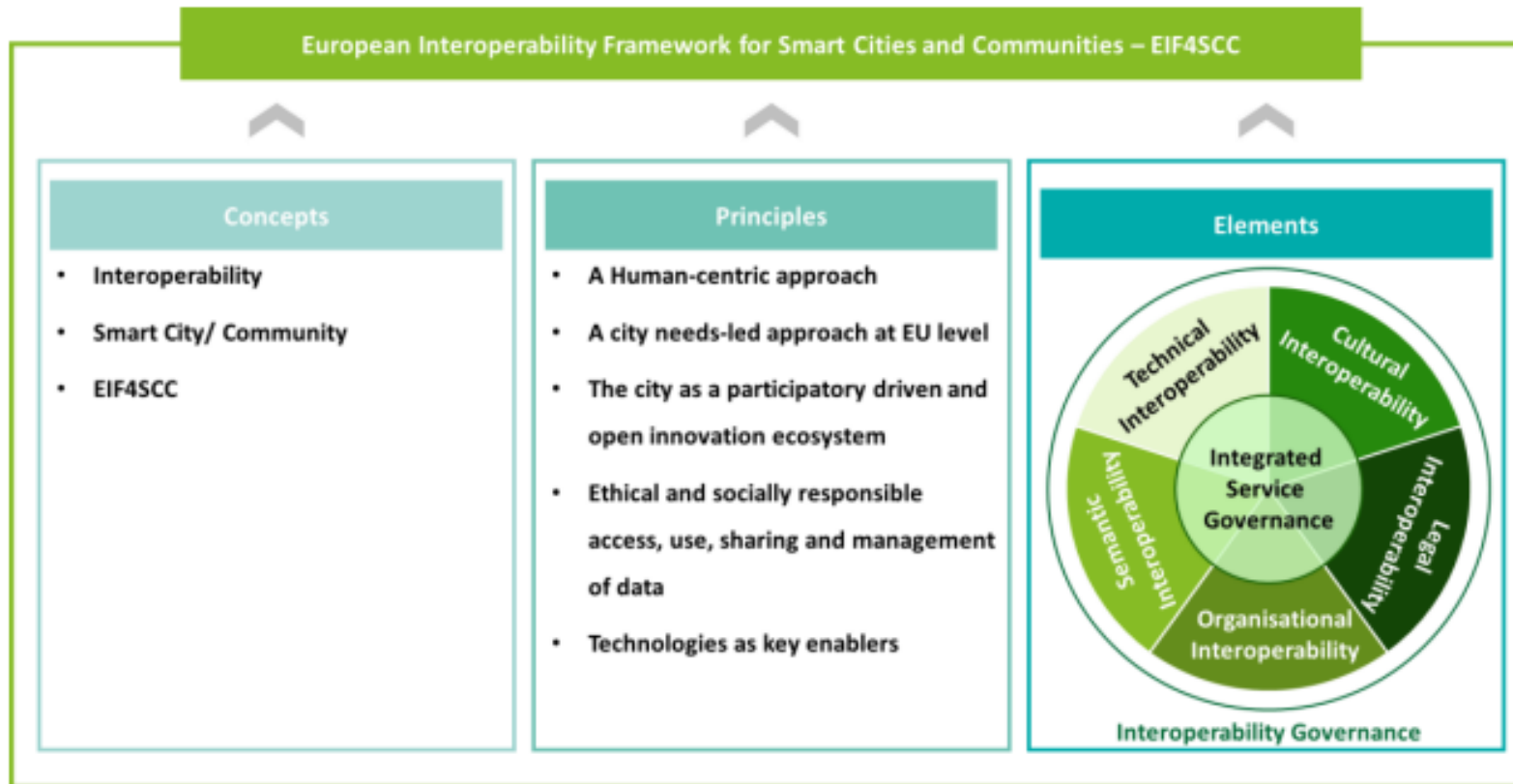
Introduction to the EIF4SCC (1/2)

Adopted in 2022, the European Interoperability Framework for Smart Cities and Communities (EIF4SCC) aims to provide EU local administration leaders with **definitions, principles, recommendations, practical use cases** drawn from cities and communities from around Europe and beyond, and a **common model** to facilitate delivery of services to the public across domains, cities, regions, and borders.

This framework, developed through joint efforts from DG DIGIT and DG CNECT, was built on finding **complementarities with ongoing initiatives**, such as the Living-in.EU movement and EU-funded initiatives, including the Smart Cities Marketplace, and EU-funded smart city projects.



Introduction to the EIF4SCC (2/2)



The framework includes:

- **Three concepts** (interoperability, smart city or community, EIF4SCC);
- **Five principles** (drawing on the Living-in.EU declaration); and
- **Seven elements** (five components, one cross-cutting layer referred as Integrated Service Governance, all built on the foundation of Interoperability Governance).

Introduction to the MIMs

The Minimal Interoperability Mechanisms (MIMs), developed since 2019 by the European Commission and the Open and Agile Smart Cities (OASC), are defined as a method of specifying sets of requirements that will enable minimal but sufficient interoperability for smart and sustainable cities and communities. They describe one or more mechanisms that address those requirements and providing guidance on achieving relevant interoperability between those mechanisms and on conformance and compliance testing.

The MIMs includes **10 individual MIM**, focusing on specific aspects of smart city solutions:



Each MIM provides

- Key principles to be followed (**capabilities**),
- Technical guidance (**requirements**),
- Technical foundation (**specification**) for the procurement, development, and deployment of end-to-end solutions in SCC, and
- Information on the management of the MIM (**governance**).

Interoperability for Smart Cities and Communities under NIFO

Study on interoperability challenges for SCC

Report on **organisational and cultural interoperability challenges** arising when local, regional and national public administrations establish local or regional data spaces and local digital twins, as well as **practices** in place within public administrations. **Four use cases** have been analysed:

- City of Amsterdam (NL);
- City of Helsinki (FI);
- City of Valencia (ES);
- Flanders Region (BE).

Guidance document

Step-by-step recommendations on the roles, responsibilities, **governance structures, processes and workflows** linked to organisational and cultural interoperability in SCC.

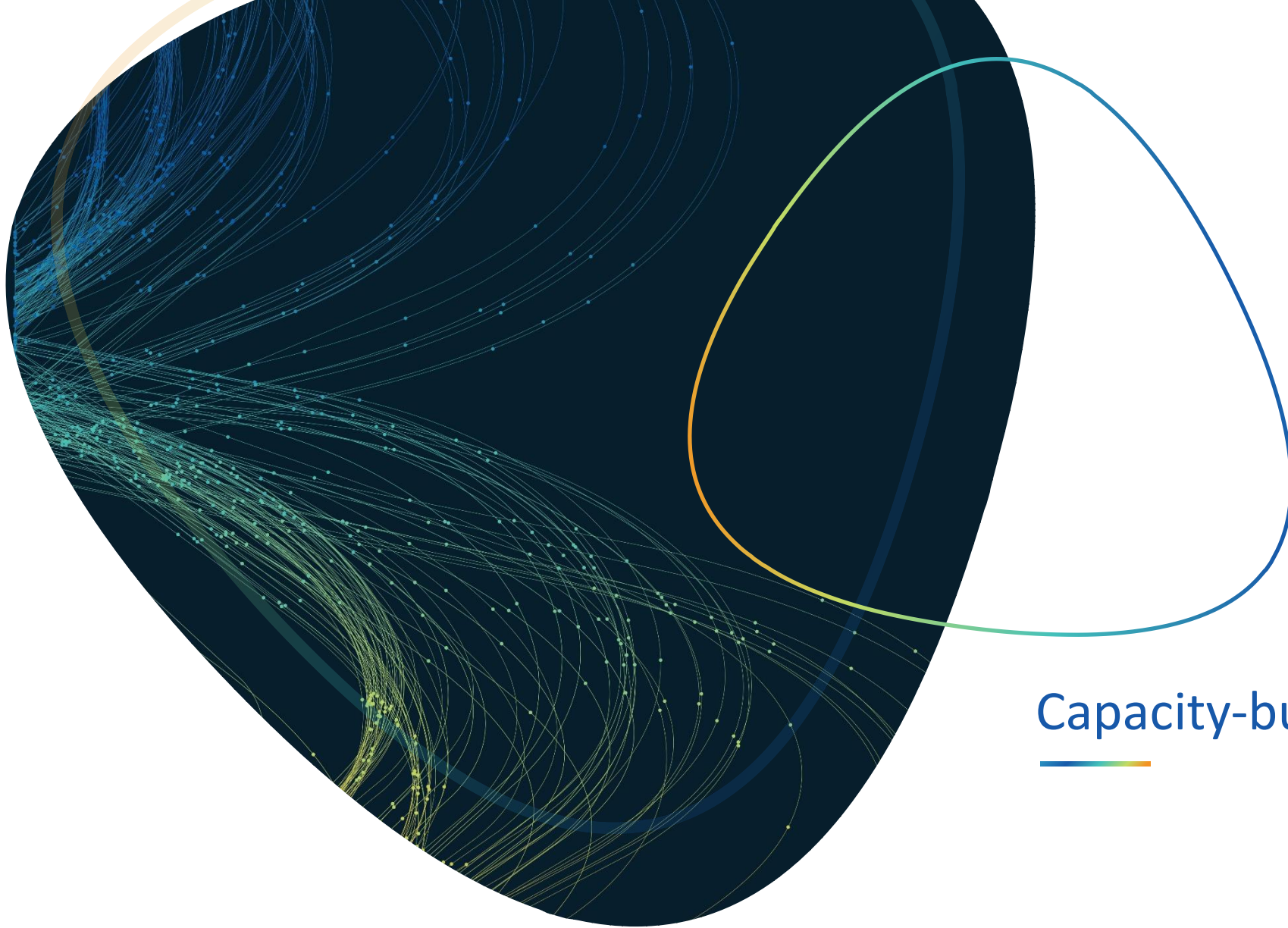
Events and communication

To support interoperability for smart cities and communities, NIFO organised **coffee talks** and published **articles** including good practices. **Use cases** will be published on the NIFO collection in **June/July 2024**.

eLearning modules on the EIF4SCC and the MIMs

Two eLearning modules on the EIF4SCC and the MIMs aimed at promoting their use by public administrations will be published under the **Interoperable Europe Academy** in **June/July 2024**.

A **webinar** to present these two modules will be organised in July 2024.



Capacity-building activities



Twinning exercise



Previous participants



Other supporting activities



Roadshows and online interoperability events

The NIFO team proactively engages with EU Member States to share information about its activities and seek opportunities for further collaboration, thus enabling **knowledge sharing and experience exchange**. Online interoperability events have also been organised with some European countries to share **good practices** and learn more about their **state-of-play of interoperability and digital transformation**.



Interoperability supporting material package

A supporting material package has been created to offer additional **support to public administrations at all levels** to improve their implementation of the EIF. It is available in English as well as French, German, Italian and Spanish.



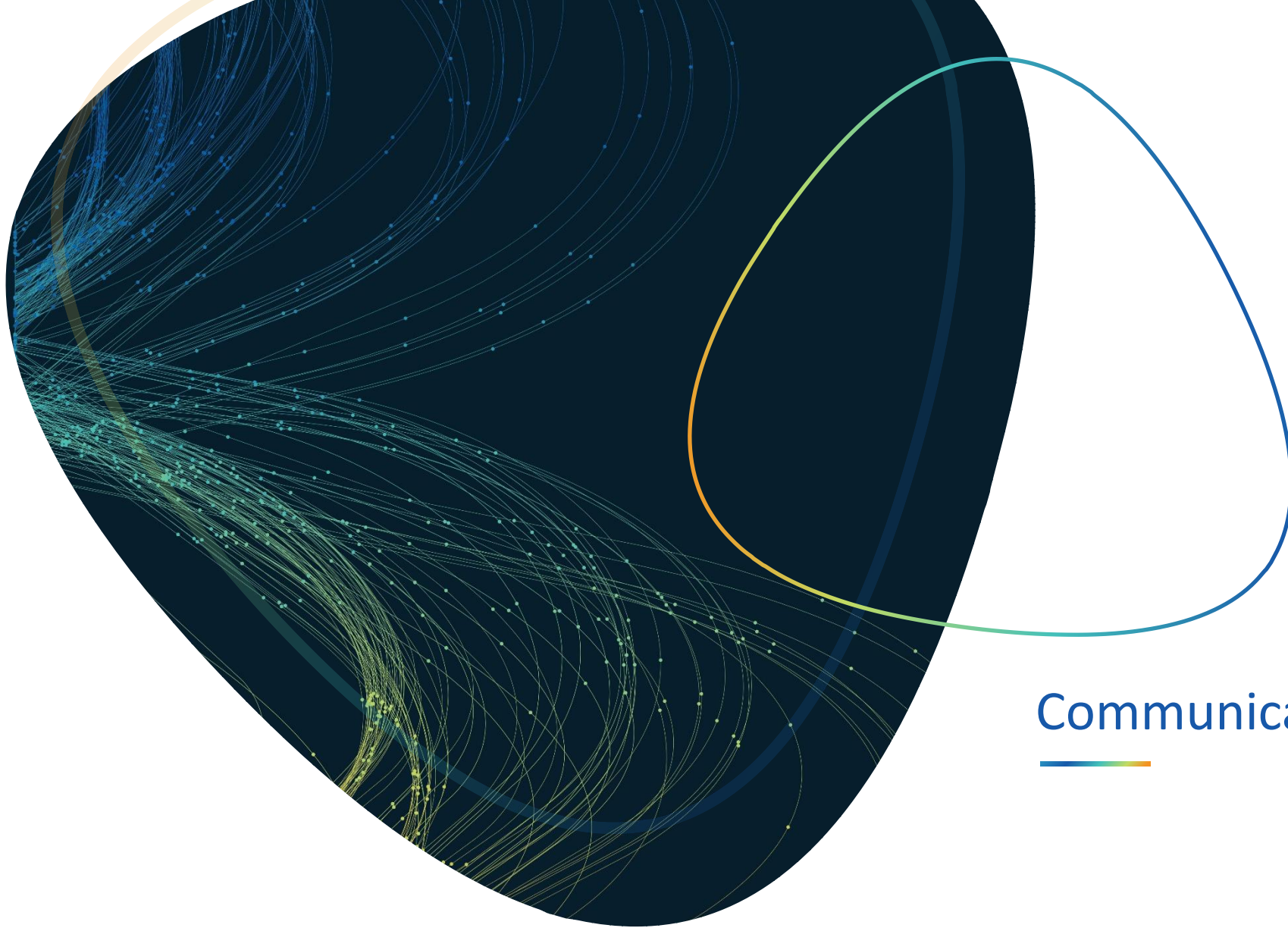
Repository of good practices

Examples from all participating countries to the EIF monitoring mechanism, stemming across **different EIF areas**, have been collected to enable **knowledge sharing** and support all European countries in improving their (sub-)national initiatives linked to interoperability.

Countries in the loop



*An updated page will be available in June 2024.



Communication activities

Communication activities under the NIFO umbrella (1/2)



Communication activities under the NIFO umbrella (2/2)

Promotional articles

Several **promotional articles** have been published over time, tackling different NIFO-related topics:

- *Assessing smart cities and communities' digital maturity: monitoring tools and strategies for improvement;*
- *The Interoperable Europe Act proposal: one year on;*
- *Interoperable Europe Act proposal: an opportunity to enhance the digital transformation of public administrations across Europe?;*
- *Harnessing GovTech solutions for public sector innovation* (to be published in June 2024).

Papers

Papers deep-diving into NIFO-specific topics have been presented at **international conferences**, including **dg.O** and **ICEGOV**.

Events

To **animate the NIFO community** and further display activities and results achieved, NIFO will organise several events. A **high-level event to present the 2023 BDM results** will be done together with the **Hungarian Presidency of the Council of the EU in July 2024**.

Webinars and coffee talks

Webinars and coffee talks are organised to **promote the work done under NIFO** and the link with different activities. In the loop:

- **3 June 2024:** Coffee talk on the **implementation status of the Single Digital Gateway Regulation** in Europe;
- **Late-June 2024:** webinar to present the **2023 EIF results**;
- **Mid-July 2024:** webinar to present the **2023 BDM results**.



Thank you!



nifO



COFFEE BREAK

interoperable
europe



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Interoperability in Poland and presentation of the State Information Structure

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SEMIC Service Offering

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What is SEMIC?

Introduction to SEMIC



The objectives of the SEMIC action are to promote Semantic Interoperability amongst the EU Member States by:



Promoting the share and reuse of semantic assets, experience and tools and facilitating agreements in key areas.



Identifying opportunities for alignment on semantic definitions, metadata and reference data sources with special focus on identification and definitions of Core Concepts / Vocabularies.



Raising awareness on the importance of data and metadata management.

SEMIC – Key figures

Over the years, SEMIC has managed to bring together a high number of experts in their fields to discuss diverse topics and bring semantic interoperability to the next level.



1000

COMMUNITY
MEMBERS

AND COUNTING...

25

EVENTS & WEBINARS
IN 2023

1200

ATTENDEES TO
SEMIC2023
IN MADRID

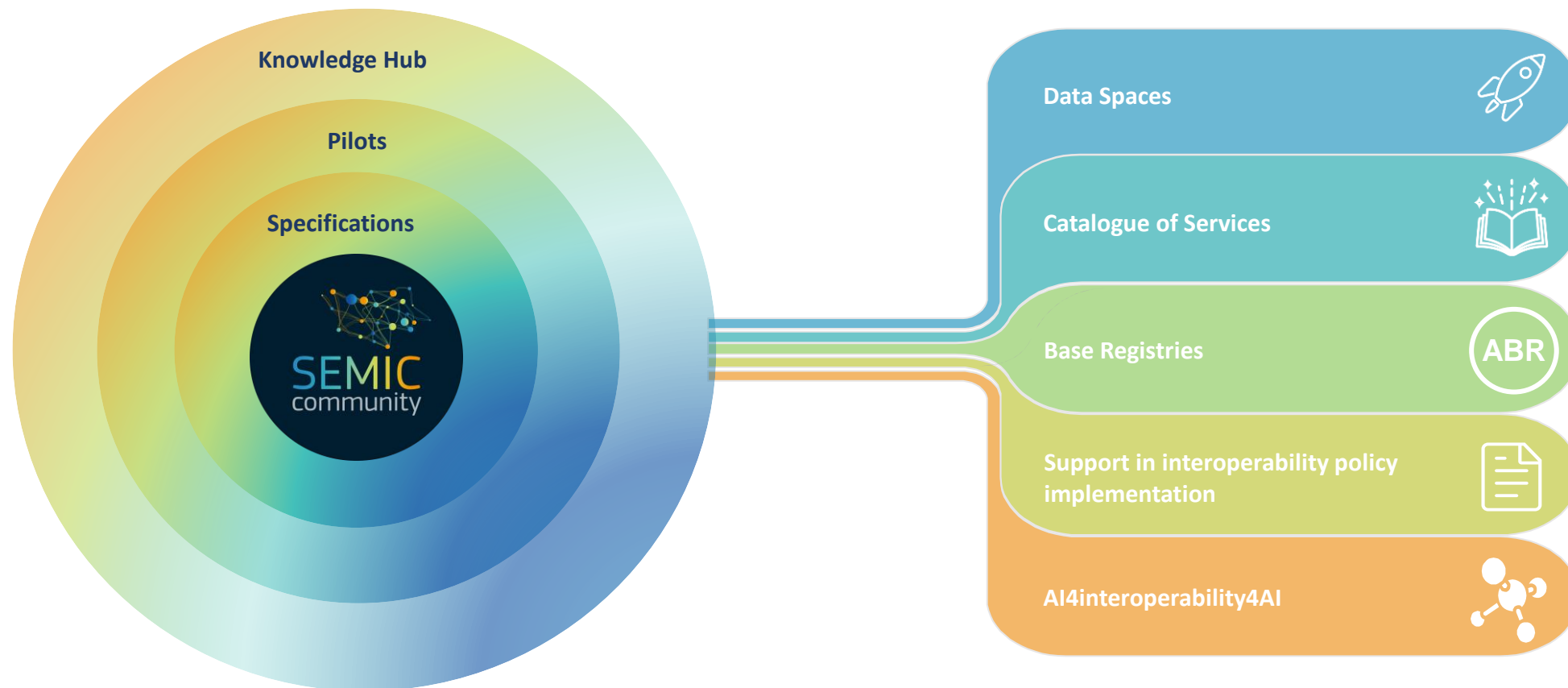
15

CONTINUOUSLY
MAINTAINED
SPECIFICATIONS

95

SOCIAL MEDIA POSTS
IN 2023

SEMIC Focus Areas



SEMIC Service offering

SEMIC's goal is to deliver pragmatic support to help build an interoperable Europe.



Specifications

Publication and maintenance of open and free-to-reuse data models, with regular updates



Pilots

Developing specific solutions for public administrations to scale up their interoperability maturity



Toolkit

Provision of an accessible European Toolchain for data extraction, transformation and loading



Knowledge Hub

Training materials, guidelines and events to foster interoperability and share knowledge of its benefits



Specifications

SEMIC specifications enable interoperability:

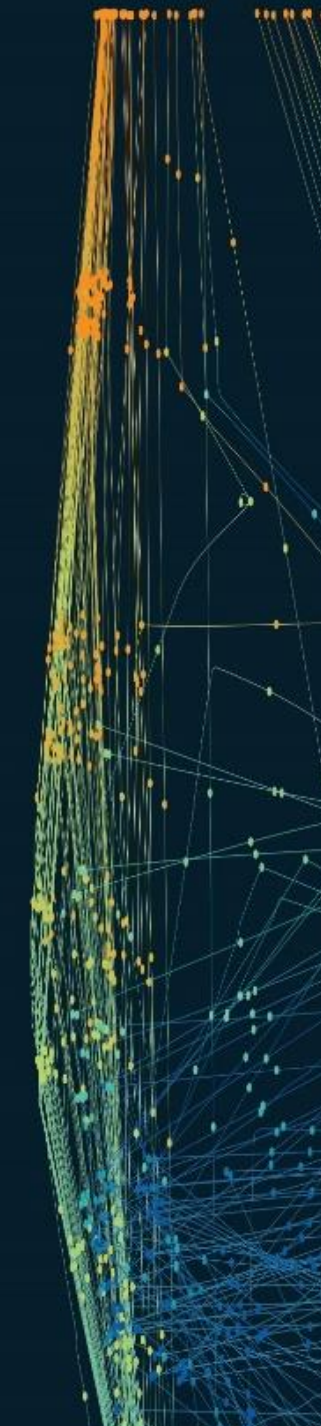
- They make data **transparent** and **available**
- They support the **coherent** implementation of laws and policies
- They help implement **cost efficiencies**
- They help **digitalisation** and **harmonising** processes

Core Vocabularies

Core Vocabularies are a cornerstone element of semantic interoperability. They provide a standardised approach for describing key concepts such as locations, businesses, organisations and natural persons.

Application Profiles

Application Profiles make use of vocabularies for a detailed set of use cases to define mandatory relations, constraints and relationships.





Pilots

SEMIC sets up pilots to showcase the value of **new approaches and ecosystems**, which can be leveraged across public administrations to **scale up their interoperability maturity**. Pilots usually involve participants from several Member States and sector-specific DGs co-creating solutions with SEMIC's support.



Linked Data
Event Streams



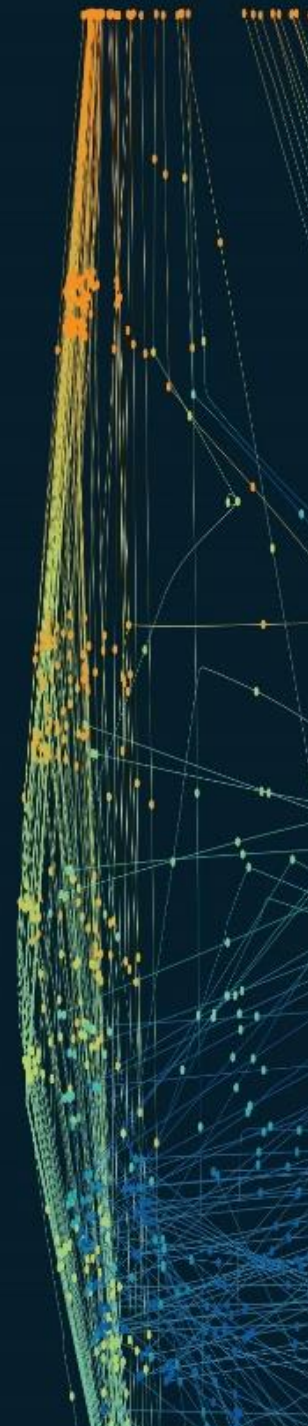
Artificial
Intelligence



Modelling
Support



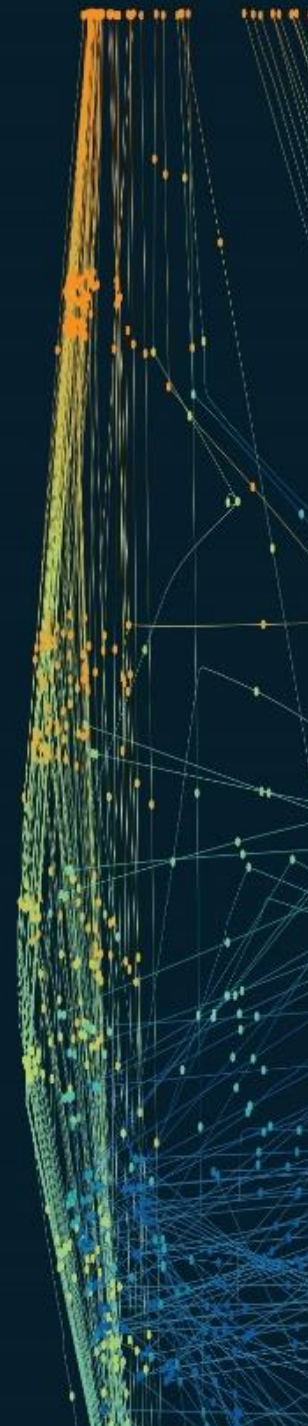
Personal Data
Spaces





Toolkit

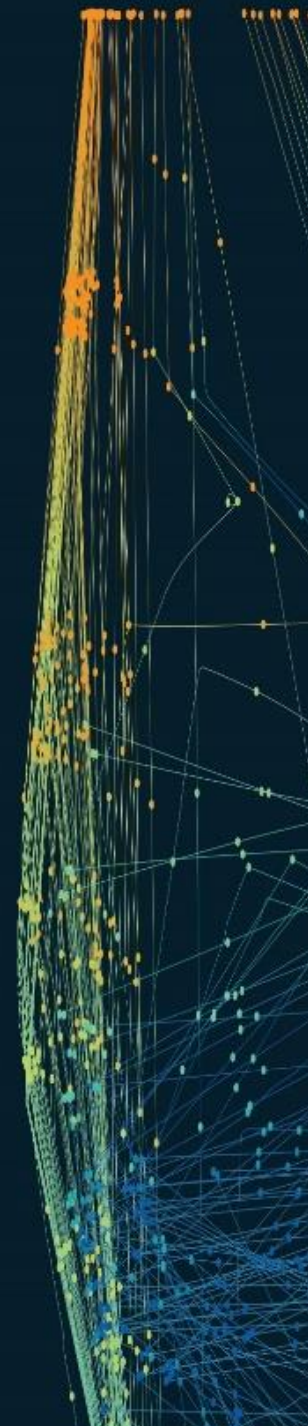
SEMIC Action has built up a set of tools and the practices to **generate and update data specifications**, as well as **propagating the changes** to models, documentation and the relevant serialisation formats.



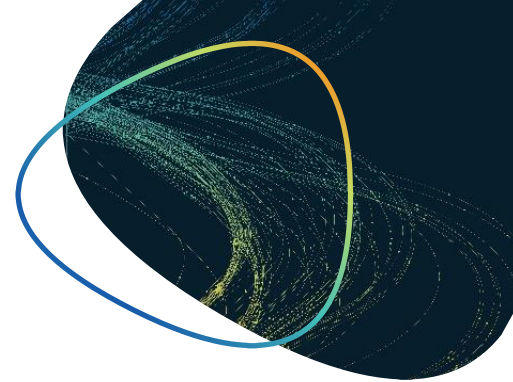


Knowledge Hub

Provides a collection of resources to tackle **interoperability challenges**, from reports, studies and guidelines to knowledge-sharing sessions and webinar recordings.



Studies, Reports & Guidelines



INTEROPERABILITY



DATA & TECHNOLOGY



MODELLING



CATALOGUE OF SERVICES



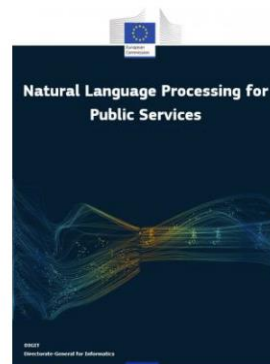
ACCESS TO BASE REGISTRIES



APPLICATION PROGRAMMING INTERFACES (APIs)

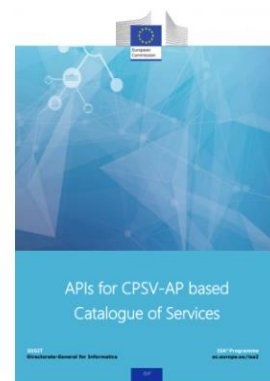


CASE STUDIES & PILOTS



March 2022

Natural Language Processing for public



September 2019



September 2019



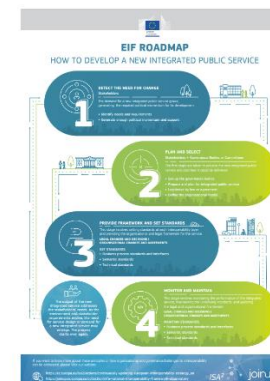
May 2022

Report on the monitoring of the Berlin Declaration



December 2019

EIF Implementation: Recommendations for organising interoperable digital public services



December 2019

EIF Roadmap: How to develop a new integrated public service



Go to Joinup page [here](#)

Online trainings



CORE SEMANTICS

Core Semantics

Introduction to Core Vocabularies

Beginner

Public administrations, Semantic experts & IT architects

Core Semantics

Introduction to the Core Public Service Vocabulary Application Profile (CPSV-AP)

Intermediate

Analysts who are interested in expanding their CPSV-AP knowledge

Core Semantics

Access to Base Registries eLearning course

Intermediate

People who describe data assets in the base registries, public administrations and data stewards



DCAT AND DCAT-AP

DCAT and DCAT-AP

DCAT and DCAT-AP training: General introduction

Beginner

People who describe data assets in internal catalogues and/or on EU ODP, and data stewards in EU institutions

DCAT and DCAT-AP

DCAT and DCAT-AP training: Basic user

Beginner

Users with basic DCAT knowledge, and participants of the 'DCAT and DCAT-AP training: General introduction'

DCAT and DCAT-AP

DCAT and DCAT-AP training: Advanced user

Proficient

Advanced users with working experience in DCAT/DCAT-AP, and users with substantial knowledge



LATEST SEMANTIC SOLUTIONS FOR PUBLIC ADMINISTRATIONS

Semantic solutions

Introduction to SOLID

Intermediate

People interested in expanding their knowledge of SOLID, SOLID implementers, and computer science students

Semantic solutions

Wikibase and Semantic MediaWiki for data driven semantics

Intermediate

Data maintainers and IT professionals, public administrations and policy makers

Semantic solutions

Publishing data with Linked Data Event Streams: why and how

Beginner

Managers, data maintainers and developers thoroughly interested on their Linked Data's life cycle

Semantic solutions

Enabling the Twin Digital and Green Transition via Solid and Internet of Things

Intermediate

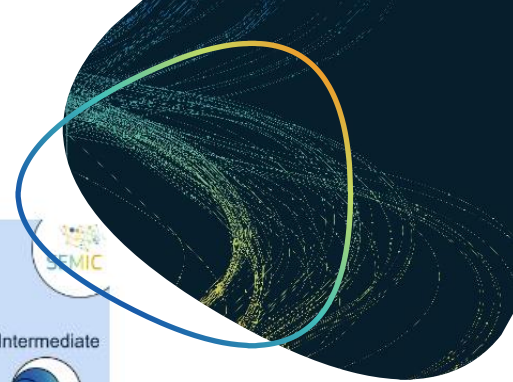
Solid practitioners, computer science students, policy makers and administration staff

Semantic solutions

Introduction to Artificial Intelligence for Public Service Interoperability

Beginner

Policy makers, members of EU public administrations who want to learn about basic aspects of AI and Interoperability and approaches to support interoperability through AI and vice-versa.



Webinars & info sessions



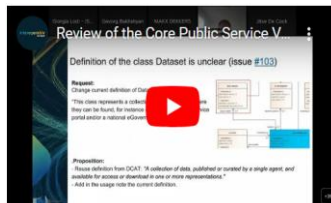
DATA MODELS

DCAT-AP | Catalogue of Services | Core Vocabularies | Wikidata and Wikibase | Other



Introductory webinar on MLDCAT-AP
21 March 2024

[Learn more](#)



Review of the Core Public Service Vocabulary Application Profile
7 November 2022

[Latest update on GitHub](#)



Webinar on the review of the Core Vocabularies and the Style Guide Blog post
9 April 2024

[Learn more](#)



Third workshop on Wikidata and Wikibase
28 March 2023

[Learn more](#)



Webinar: Enabling the Twin Digital and Green Transition via personal IoT data - The Case of Electric Vehicles
8 June 2023



DATA INTEROPERABILITY SERVICES

Natural Language Processing (NLP) | Data Spaces



Knowledge sharing session on Natural Language Processing (NLP) for Public Services
28 April 2022

[Learn more](#)



DCAT-AP for Data Spaces
4 October 2023

[Learn more](#)





SEMIC TALKS



Makx Dekkers – October
2023



Raf Buyle – October 2023



Jose Luis Calvo – October
2023



Pedro Tavares – October
2023



Clara Pezuela – October
2023



Silvia Castellvi – October
2023



SEMIC Support Centre

Your one-stop-shop for all digital interoperability challenges



What is it?

- Concrete and direct support to all stakeholders through our helpdesk and GitHub
- Collects good practices and serves as a knowledge hub on interoperability issues



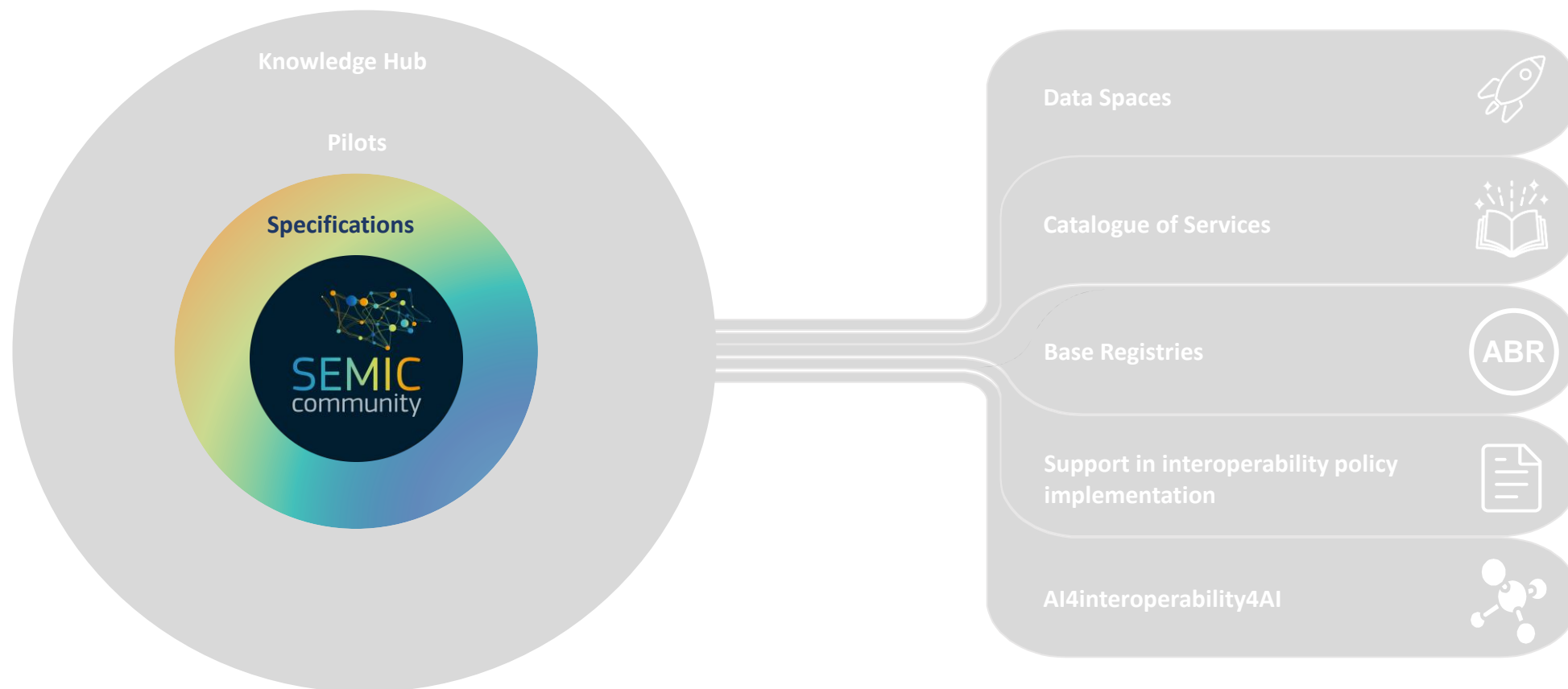
Who is it for?

- Public officers and technical experts
- Any public organisation in its interoperable journey



Core Vocabularies & Application Profiles

SEMIC Focus Areas



SEMIC specifications



A person's name(s), date and place of birth/death, identifier, addresses, citizenship, etc.



The legal name, address, identifier, company type, and activities of a legal entity.



The different ways of describing a location, e.g. via an address, a geographic name, or a geometry, in alignment with INSPIRE.



The requirements and evidence of a procedure or formal process.



The administrative information, hierarchy, identifiers, events and classification of a public organisation.



A public event, its time, audience, location, etc.

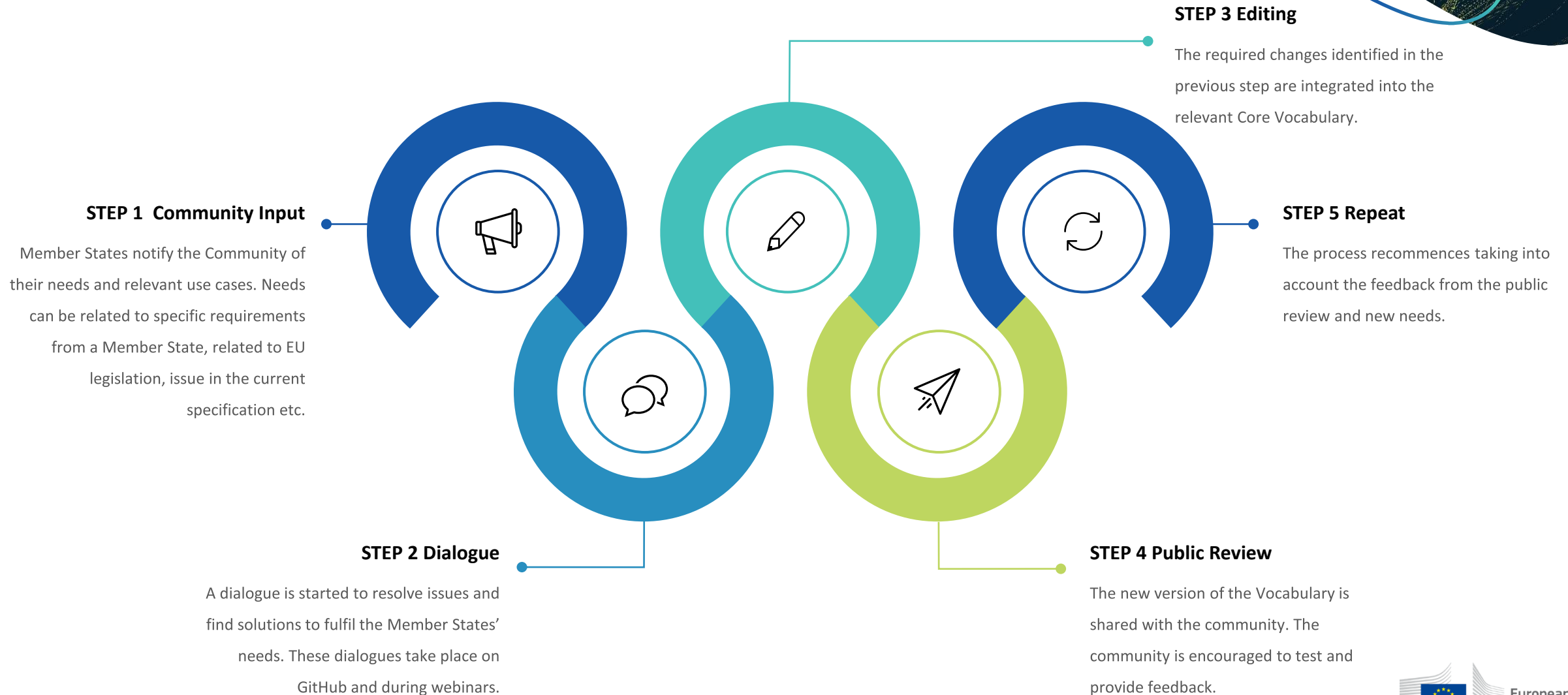
Vocabularies

Application Profiles



How are Core Vocabularies created and maintained?

<https://github.com/SEMICEu>

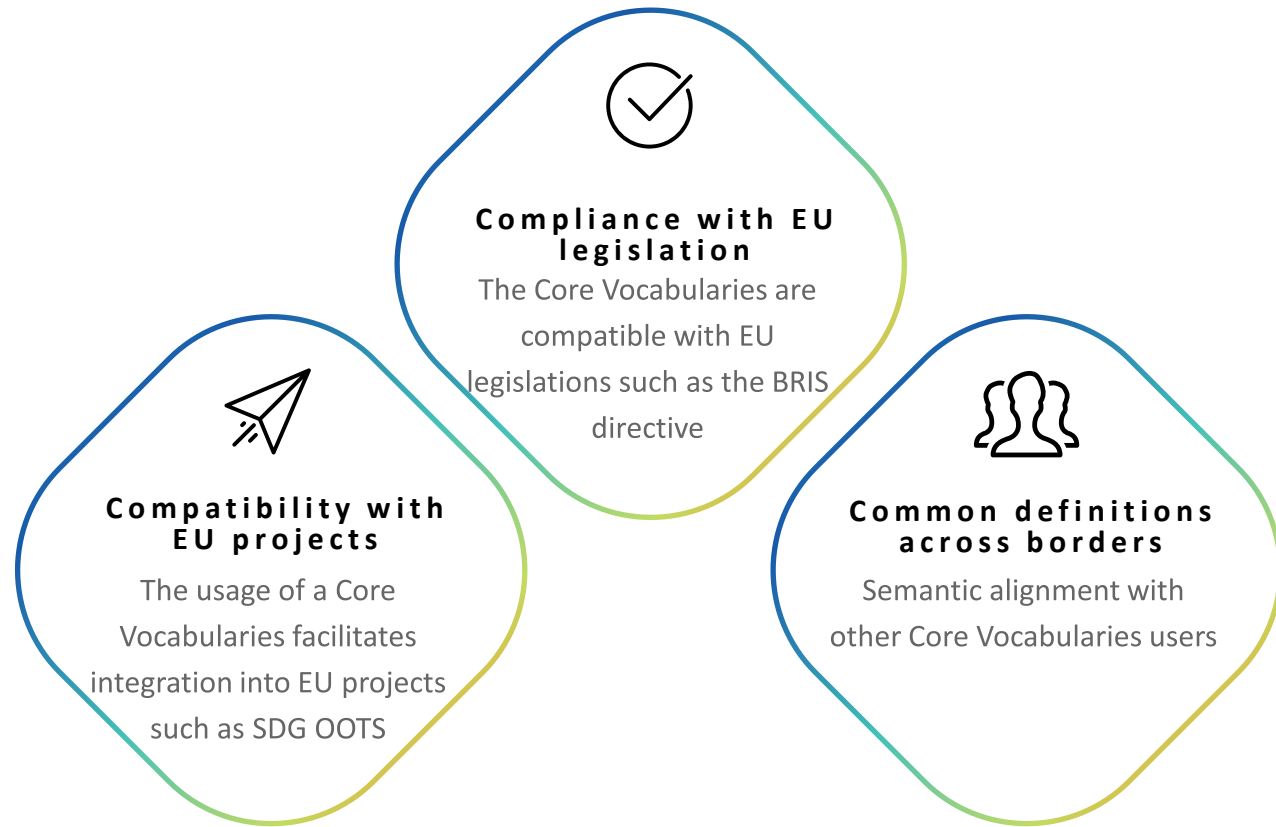


Core Vocabularies

A decorative graphic on the right side of the slide. It consists of several overlapping circles in various shades of blue, teal, and yellow. Inside these circles, there are intricate network patterns of thin lines and small dots, resembling a complex web or data visualization. The overall aesthetic is modern and technological.

Benefits of using Core Vocabularies

Public administrations and service providers can use Core Vocabularies to describe Core Concepts and **guarantee a level of cross-domain and cross-border interoperability** at European, national and local level.



Core Person Vocabulary

A Data model capturing the fundamental characteristics of a person.



01

SCOPE



It can be used for any Person:

- Domestic
 - EU
- Non-EU

02

USE CASES



- Citizen Registers
- Any context requiring the description of a person

03

ADVANTAGES



- Simple
- Can be extended to suit **national needs** without losing wider interoperability
- Reusable across **several domains**
- Reuses Concepts from the **foaf** ontology

Application Profiles

A decorative graphic in the top right corner of the slide. It consists of several overlapping circles of varying sizes. The circles are filled with a dark blue or black color, and within them, there are intricate, glowing network patterns of thin lines and small dots, resembling a complex web or data structure. The colors of the circles and the network patterns transition from dark blue to a lighter teal and then to a bright yellow-green at the edges.

What is an Application Profile?

A data model tailored to specific use cases or applications built on a Core Vocabulary or other standard.



01

DCAT-AP

For Data Portals in Europe

02

CPSV-AP

For the provision and
description of
public services

03

ADMS-AP

For the description of
interoperability assets

Extensions:

- Statistical (StatDCAT-AP)
- Geospatial (GeoDCAT-AP)
- Base registries (BRegDCAT-AP)
- Short-term rental (STR-AP)
- Machine learning (MLDCAT-AP)
- Data spaces (Mobility, Health, etc.)

Objectives of DCAT-AP



Supporting the discovery of/access to (open) data in a cross-border and cross-domain environment, by describing metadata to be harvested across a distributed network of portals.



In the form of an application profile of W3C DCAT, by

- expressing constraints and usages on DCAT properties and classes, and
- including additional properties and usages of controlled vocabularies

Domains of applications



Open data portals
with an extension
for statistics and
geospatial data.



Base registries
metadata
descriptions



Data spaces

- MobilityDCAT-AP
- HealthDCAT-AP
- ...



Machine Learning with
MLDCAT-AP



Short term rentals (tourism)
with STR-AP

Benefits of DCAT-AP



Strategic benefits

- Able to base yourself on best practice
- Less time/effort spent on the development of your own semantic assets
- Possibility to make your own national or domain specific extensions
- Supports intra-domain and cross-domain interoperability
- Create common understanding of core elements

Technical benefits

- Fully aligned with semantic technologies (semantic web, linked data, ...)
- Expressions in RDF & JSON-LD context
- Validation service based on SHACL
- Automated processing of data

SEMIC Specification: CPSV-AP



The **Core Public Service Vocabulary** is:

- A simplified, reusable and extensible data model;
- that captures the fundamental characteristics of a public service.



It aims to be:

- Technology-independent and generic
- the common denominator of existing national, regional and local public service models
- a lingua franca that will enable the seamless exchange of services and information across different e-Government systems

**Increase findability of
public services**

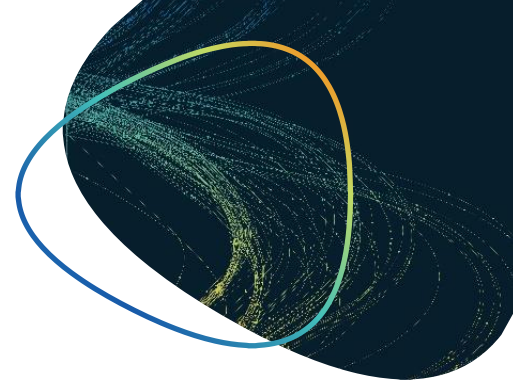
**Building user-centric
catalogues of services**

**Managing portfolios of
public services**

**Publishing descriptions
of life and business
events**

How did Member States benefit from using CPSV-AP and tools?

Qualitative interviews and a quantitative survey with Members reusing the CPSV-AP and tool highlighted the following key perceived benefits:



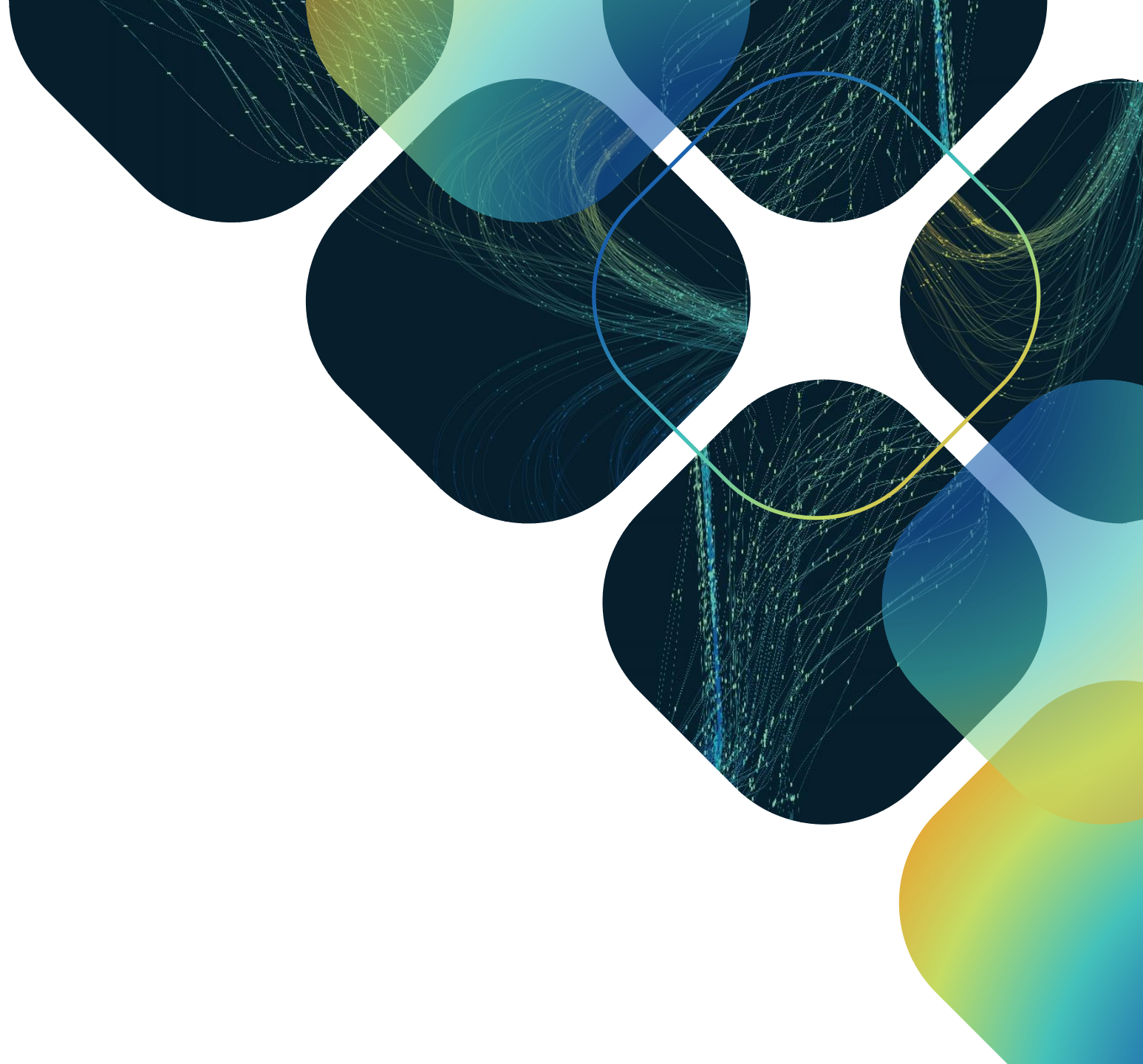
Cost-efficient and easy way to improve data accessibility and interoperability at a global level - **Spain**

Global network to tackle a global issue by sharing knowledge, best practices and resources - **Trentino**

Providing Member States with a strong basis to create integrated and centralised Catalogues of public services - **Italy**

Harmonisation and centralisation of data coming from different sources, especially in Member States having a complex administrative structure – **Greece (Epirus)**

Style Guide



What is a Style Guide?



The SEMIC Style Guide defines the principles to be applied to the SEMIC's semantic data specifications.

It contains conventions on

- Methodology
- General
- Modelling
- Semantic
- Data shape
- Publication

Why create a Style Guide?



To share the existing experience and current practices in a document to

- Improve the **quality** of the SEMIC assets
- Improve the **coherency** of the SEMIC assets
- **Streamline and support extension** of Core Vocabularies and Application Profiles by MS
- And, address the challenges of a growing need for data specifications through the **data spaces** initiative

Study and training materials for your implementation



STYLE GUIDE

SEMIC style guide for
semantic engineers

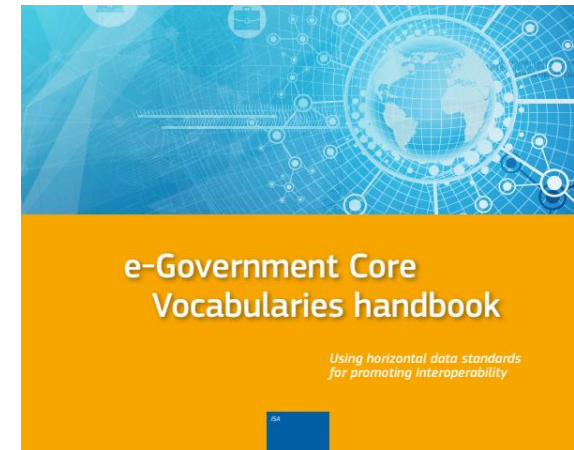
[Go to Style Guide](#)



TRAININGS

Core Vocabularies:
Introduction

[Go to course](#)

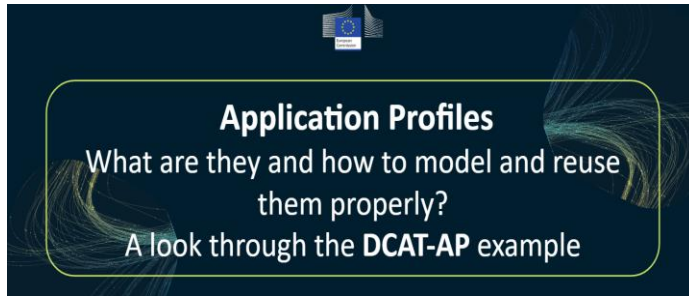


CORE VOCABULARIES HANDBOOK

Will be revised before the
summer.

[Go to the handbook](#)

Style Guide Blog Articles



Blog Article I

Application Profiles: What are they and how to model and reuse them properly? A look through the DCAT-AP example.

[Link](#)



Blog Article II

Mapping a graph to a tree data structure: a case study using the Core Vocabularies

[Link](#)

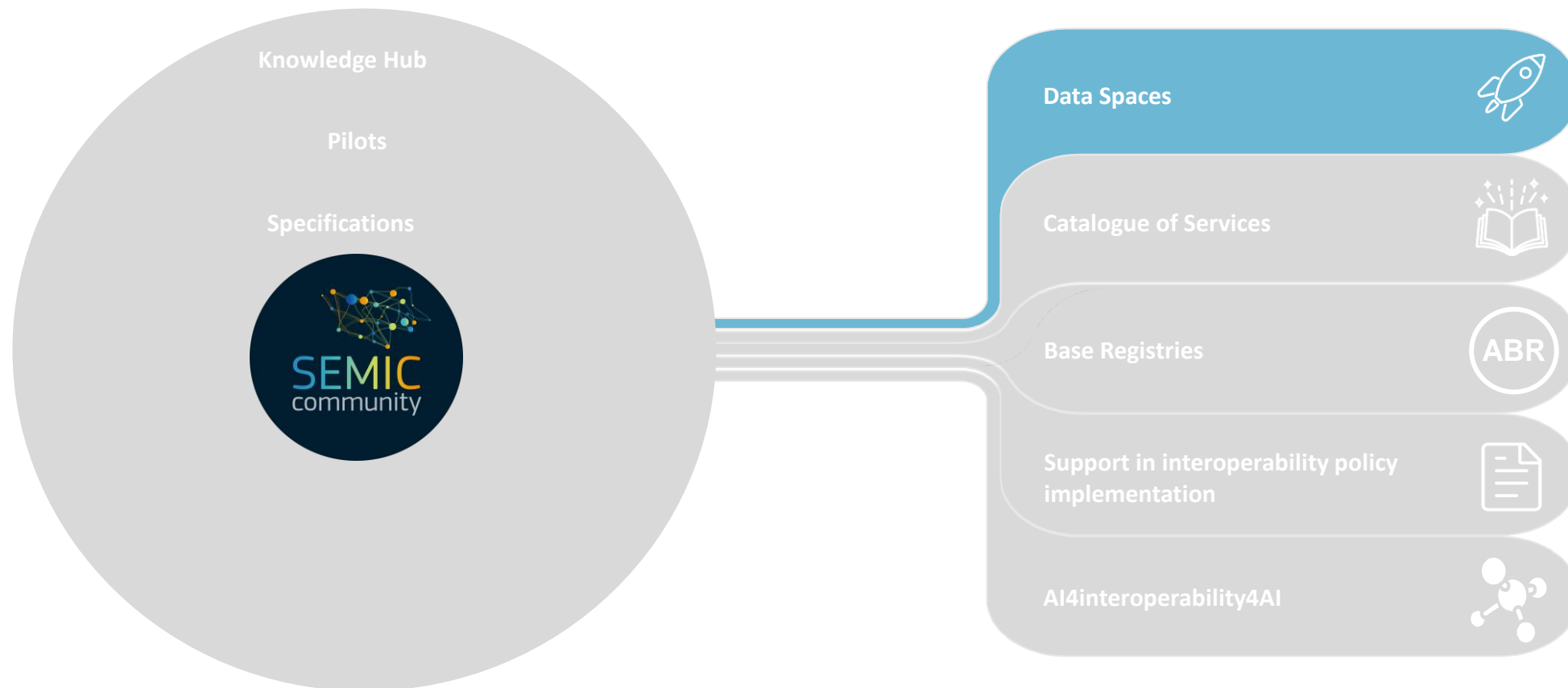
Blog Article III

On RDF based conceptual modelling
Work in progress

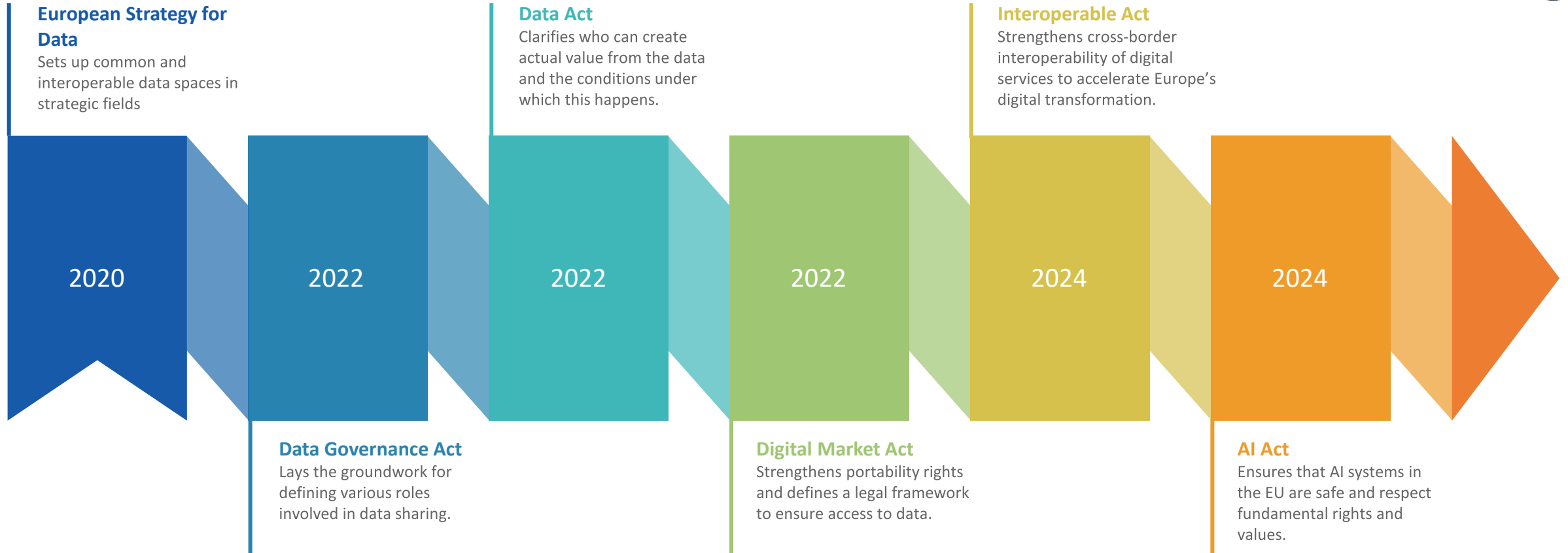
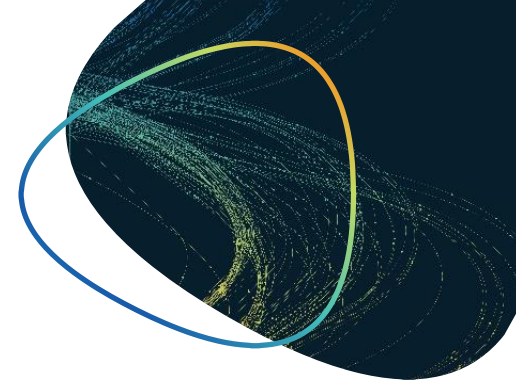


Data spaces

SEMIC Focus Areas

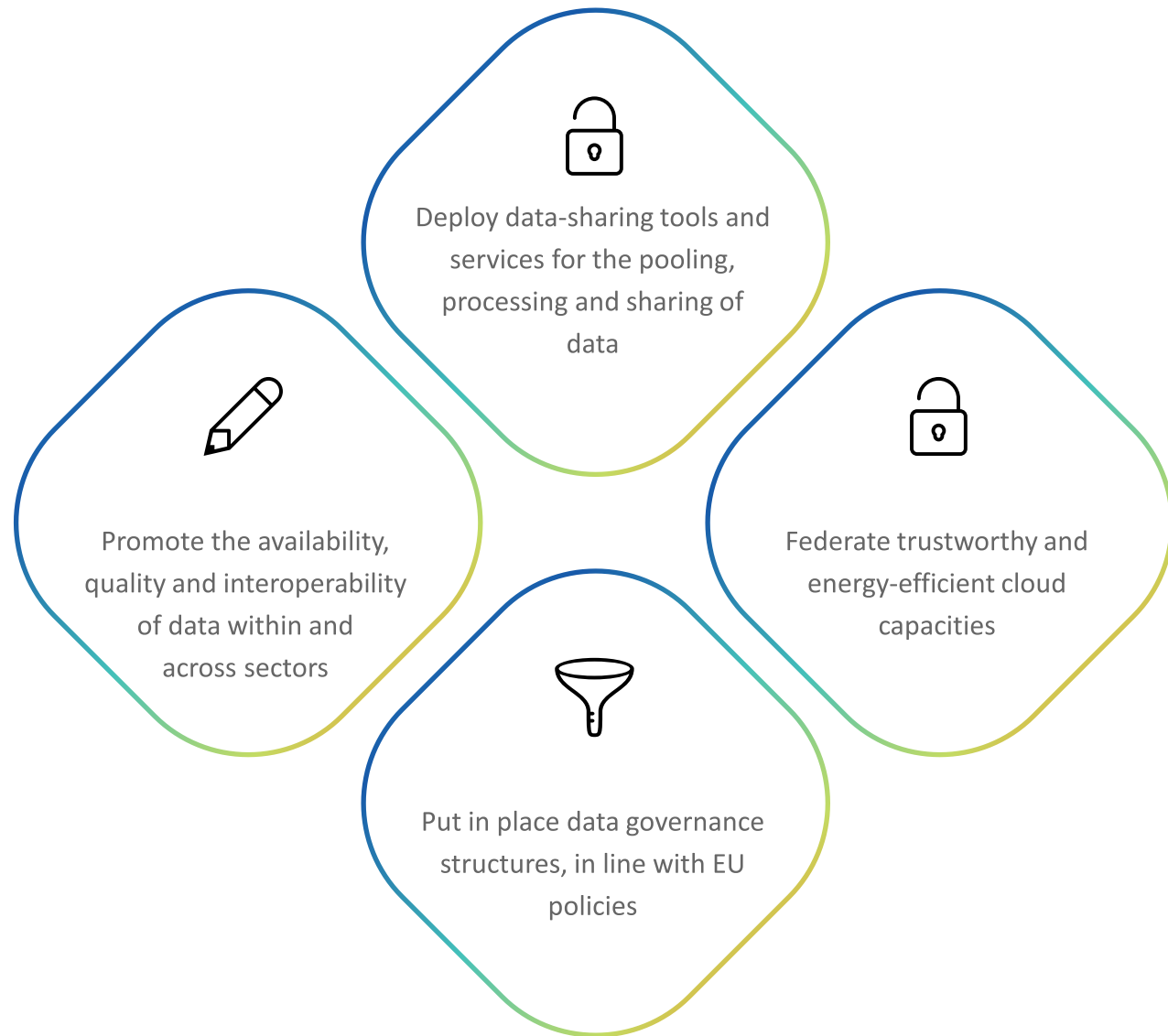


About data spaces: legal framework



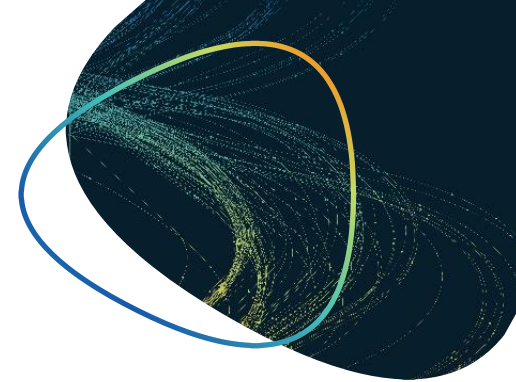
About data spaces

Facilitate **data pooling, sharing and reuse** for all actors by bringing together relevant data infrastructures and governance frameworks. Data spaces will:



DG DIGIT's role and services

DG Informatics is ready to support data spaces with existing assets and services, as well as to establish synergies with stakeholders active in this field to provide a more comprehensive support.



European Commission DG Informatics

Interoperability

Analytics

Trust & Identity

Interoperable Europe

Support to data spaces



Data spaces



Data Spaces Support Centre



DATA SPACES
SUPPORT CENTRE



BIG DATA VALUE
ASSOCIATION



FIWARE



INTERNATIONAL DATA
SPACES ASSOCIATION

KU LEUVEN



gaia-x



European
Commission

Data spaces

Data spaces aim to create a single market for data that will ensure Europe's global competitiveness and data sovereignty.

Data Spaces



Catalogue of Services



Base Registries

ABR

Support the implementation of legislation



AI4interoperability4AI



DCAT-AP

DCAT-AP is the standard solution to ensure metadata is exchanged smoothly across all data spaces.

LDES

A publishing strategy by which a data provider allows multiple third parties to stay in sync with the latest or historical versions of the data source in a cost-effective manner.

Learning materials

Some of the training developed are particularly relevant to data spaces:

- DCAT-AP: [Introduction](#), [Basic user](#), [Advanced user](#)
- [Publishing data with Linked Data Event Streams: why and how](#)

Semantic registry

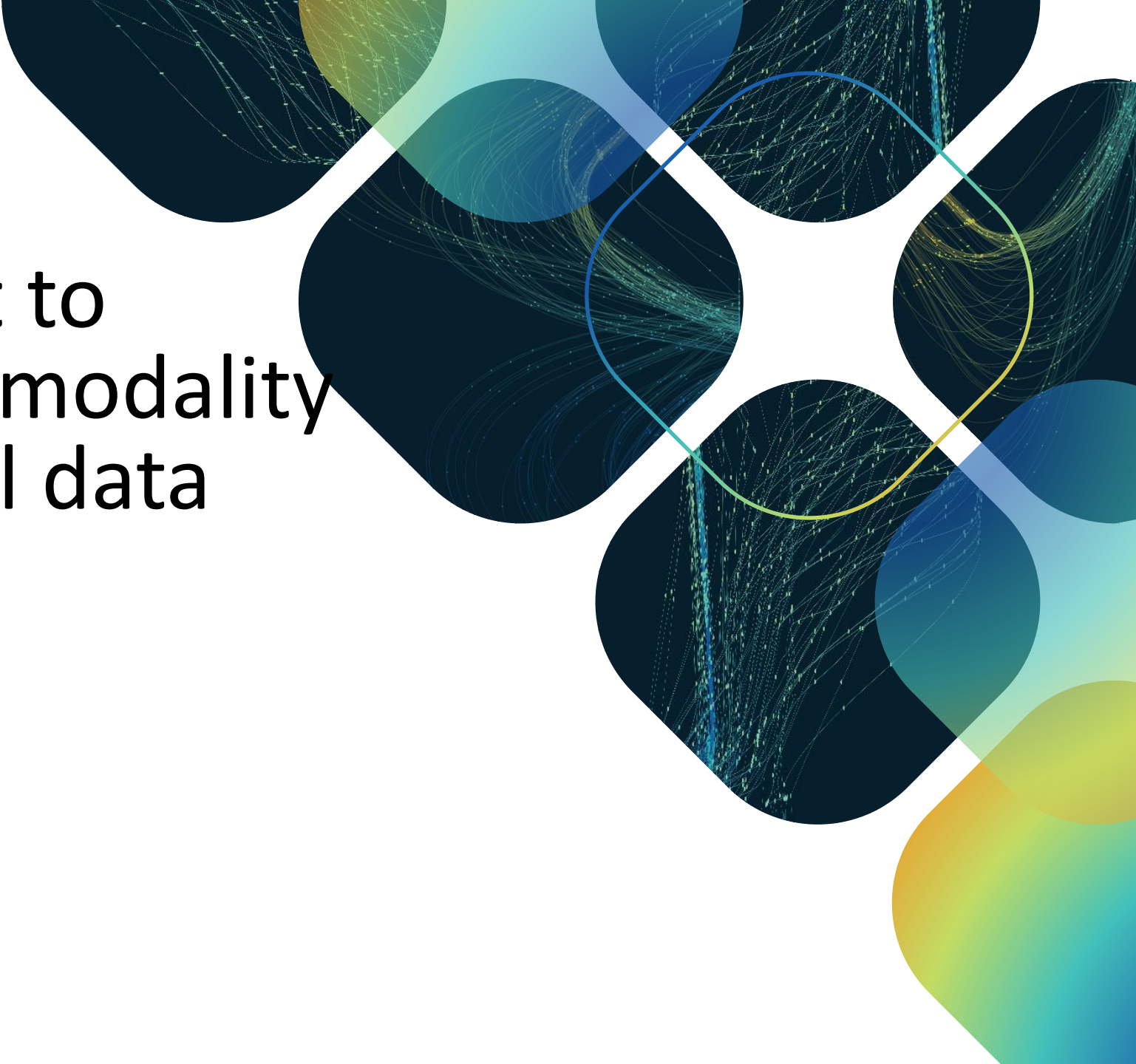
SEMIC paves the way for increased reusability and discoverability of semantic assets throughout Europe.

Solid

Solid is a decentralised Web technology based on Linked Data and an interesting solution to the personal data management within the data spaces.



PoC relevant to
EMDS, multimodality
and personal data

The background features a series of overlapping circles in various shades of blue, teal, and yellow. Within these circles, there are intricate network-like patterns consisting of numerous small dots connected by thin, light-colored lines, resembling a complex web or data structure. A single, prominent curved line in a light blue and yellow gradient arcs across the right side of the image.

PoC: Multimodal Mobility using Personal Data



Provide **personalised commuting recommendations** based on personal data, mixed with data on road works, accidents, strikes, weather conditions, transport interruptions, location of charging stations etc.



Mobility and infrastructure actors (PTA/PTO/TIM/IO/SP) access valuable **insights** on traffic patterns, use of services and bottlenecks.

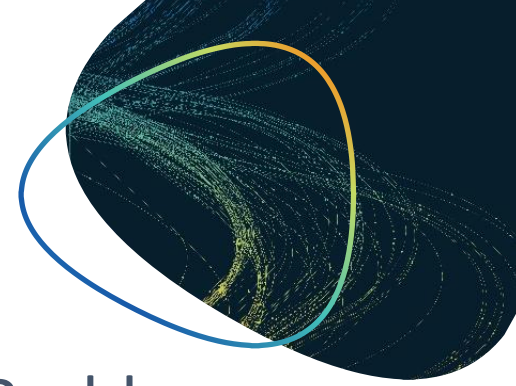


Data sovereignty is demonstrated by implementing **IDSA** roles on the SOLID protocol.



The building block designed for this PoC fits into the DSSC reference architecture and therefore into the **deployEMDS**

PoC: Multimodal Mobility using Personal Data



PoC Scenario

Provide **personalised commuting recommendations** based on commuters' personal data, mixed with data on road works, accidents, strikes, weather conditions, transport interruptions, location of charging stations etc.

Mobility Data Space Actors:

- 1) Commuters
- 2) Public Transport Authority
- 3) Public Transport Operator
- 4) Transport Infrastructure Manager
- 5) Infrastructure Operators
- 6) Service providers (SP)

PoC Objective

Build a Data Space infrastructure component with the ability to transact personal data, among mobility actors, implementing data sovereignty

Data sovereignty refers to the European laws and regulations around how personal data is accessed, processed or stored.

Problem

- Find a technology that allows to systematize access and exchange of Personal Data inside the **common European mobility data space** with a level of control that reflects the EU regulatory framework (e.g. The Data Governance Act, The Data Act, GDPR) to the highest level of detail.
- Support data access and exchange by increasing interoperability among the actors in the **data space**.

Pillars of the Multimodal Mobility PoC



Interoperability

Semantic Interoperability: open the space for the mobility operators to apply **shared semantics** when sharing data inside the EMDS.



Data Sovereignty & Trust

Data Sovereignty & Trust orchestrator: implements **decentralized data access** event as the data owner keeps complete control over his/her own data. The authorization agent is represented as main technical building block and increases trust from all users.

General Use cases

The use case can be viewed out of the perspective of the commuter and service providers. In the following, we highlight the needs of both actors in the use cases.

Commuter View

As a commuter, I want to:

- Be informed by my service providers about a disruption/change that might interrupt my modes of transport
- Receive personalised travel recommendations (e.g., alternative modes of transport)
- Be able to share data of my mobility patterns for altruistic use while keeping control on how it is used.

Mobility / Infrastructure actor View

As a Mobility / Infrastructure actor, I want to:

- Inform specific commuters for relevant disruptions and changes on the transport network according to their commuting patterns (e.g., road works, strikes, dynamic LEZ, schedule changes, availability of charging points)
- Be informed about the **patterns of my commuters** to adapt the mobility and transport offer (e.g., number or frequency of trams or buses) and make infrastructure adaptations (e.g., car or cycling lanes opening/closing, further installation of charging points)

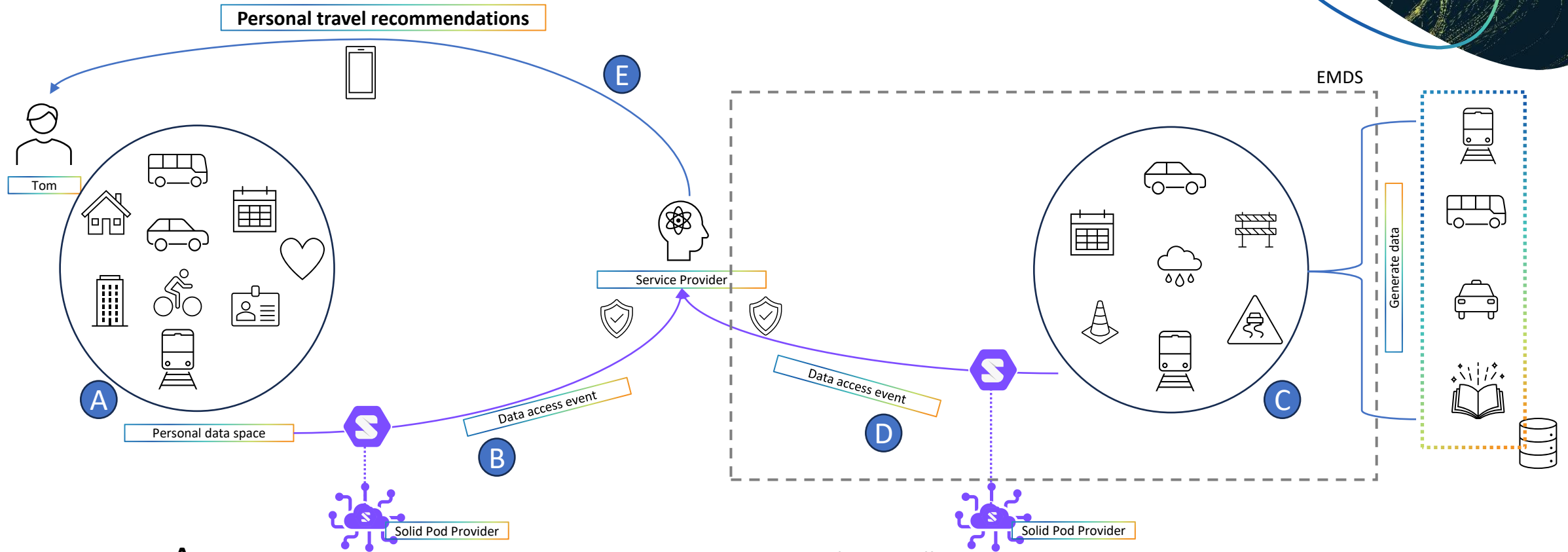
Use case 1: As a commuter, I want to...

Receive **personalized travel recommendations** for an optimal journey, based on my personal preferences and input from multimodal transportation facilitators, while retaining ownership and control of my personal data.



- Tom lives in Antwerp and commutes 2x/day to BXL office by **train**.
- Tom takes the **bus** to work in a local office 2x/day.
- When **sun** is shining, Tom also likes to take his **bike**.
- Tom takes his **car** for client visits 1x/week.
- Tom uses an **app** that helps him optimize his daily commute.
- Tom is aware what data is used by the app that uses the **Solid protocol** as he gave permission through the app to use the data of his commuting habits.
- The **SP** matches EMDS data with Tom's commute data and personal preferences.
- Tom receives a **personal travel recommendation** to take his bike to work since a demonstration in the city is disturbing the bus and tram network.

Use case 1: How does it works



- A.** Tom generates personal data, which contains his commuting habits, personal preferences, office locations, ...
- B.** Thanks to the SOLID protocol, Tom's personal data is safely made available to the Service Provider (SP) and has only access to the information Tom grants access to.
- C.** Mobility Operators, infrastructure actors, government, NAP's provide input to the EMDS.
- D.** The SOLID protocol ensures a safe way of data sharing from the EMDS to the SP.
- E.** SP combines the two data streams as input and provides most suitable, personal travel recommendations based on multimodal mobility options for Tom.



Ongoing and Next Steps

Data Sovereignty in an SDK

We are packing the capabilities of implementing data sovereignty via SOLID in an SDK that can be integrated for personalized travel recommendation as well as other scenario that involve accessing personal mobility data.

PoC demo and webinar


We are preparing a webinar to demonstrate how the SDK enables personalized multimodal travel recommendations through mechanism of consent and data control achieved using SOLID protocol within the SDK

Alignement with EMDS/Local MDS use cases

We are investigating how the experience of the PoC can be replicated in existing use cases [whether inside the common European mobility data space or other local/national mobility data spaces](#)

Portability of the solution

We intend to investigate how the SDK can be portable in other [data spaces beyond mobility and where there is a need to govern personal data access.](#)





Thank you!



nifO



LUNCH BREAK

interoperable
europe



Policy context and the Interoperable Europe Act

interoperable
europe

Overview



1

Introduction

2

Interoperable Europe Act in a nutshell

3

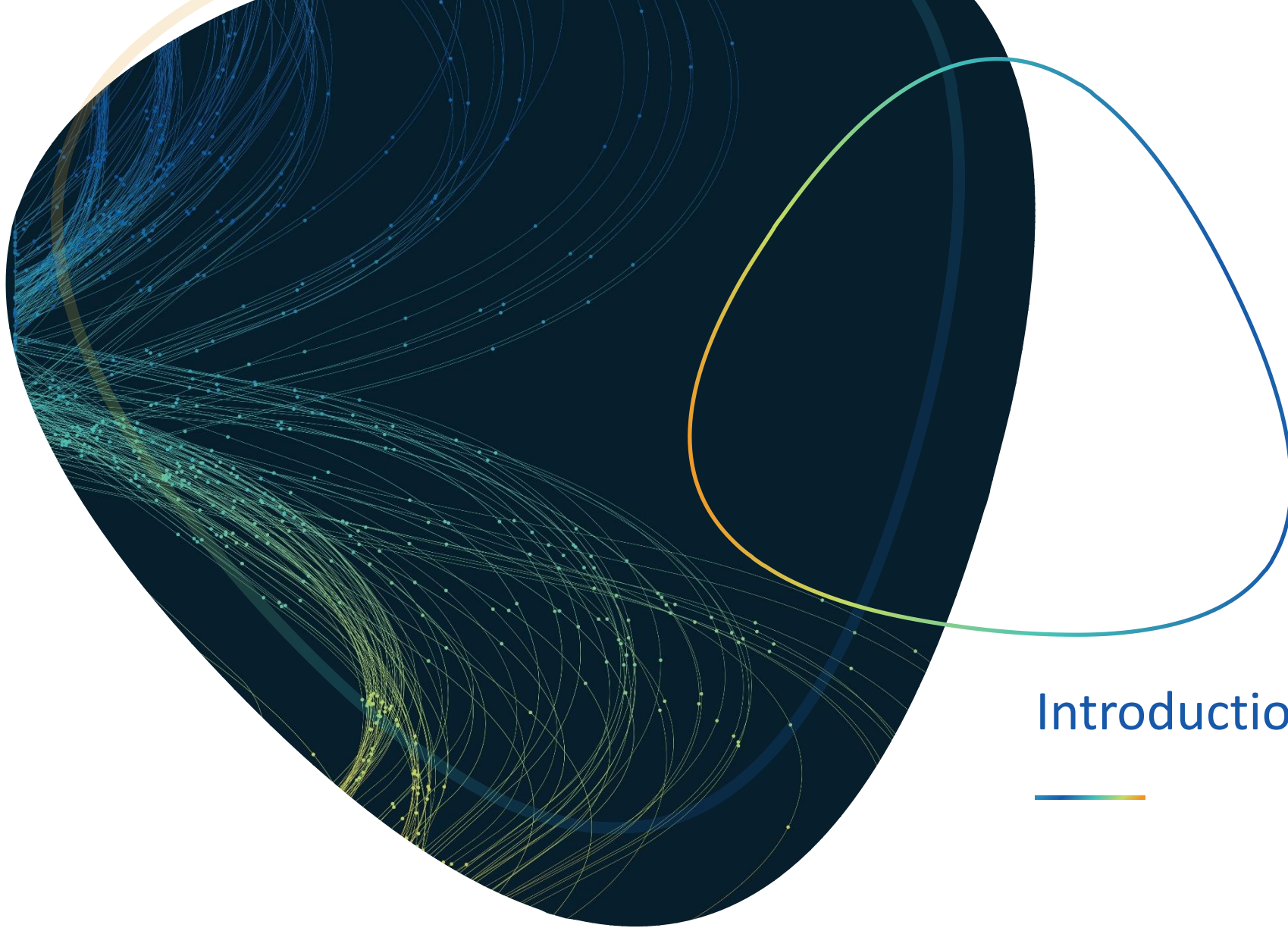
Novelties introduced by the Interoperable Europe Act

4

Provisions linked to semantic interoperability

5


Synergies with EU legislation



Introduction



What is interoperability?



The ability of diverse systems and organisations to interact effectively by exchanging data and...

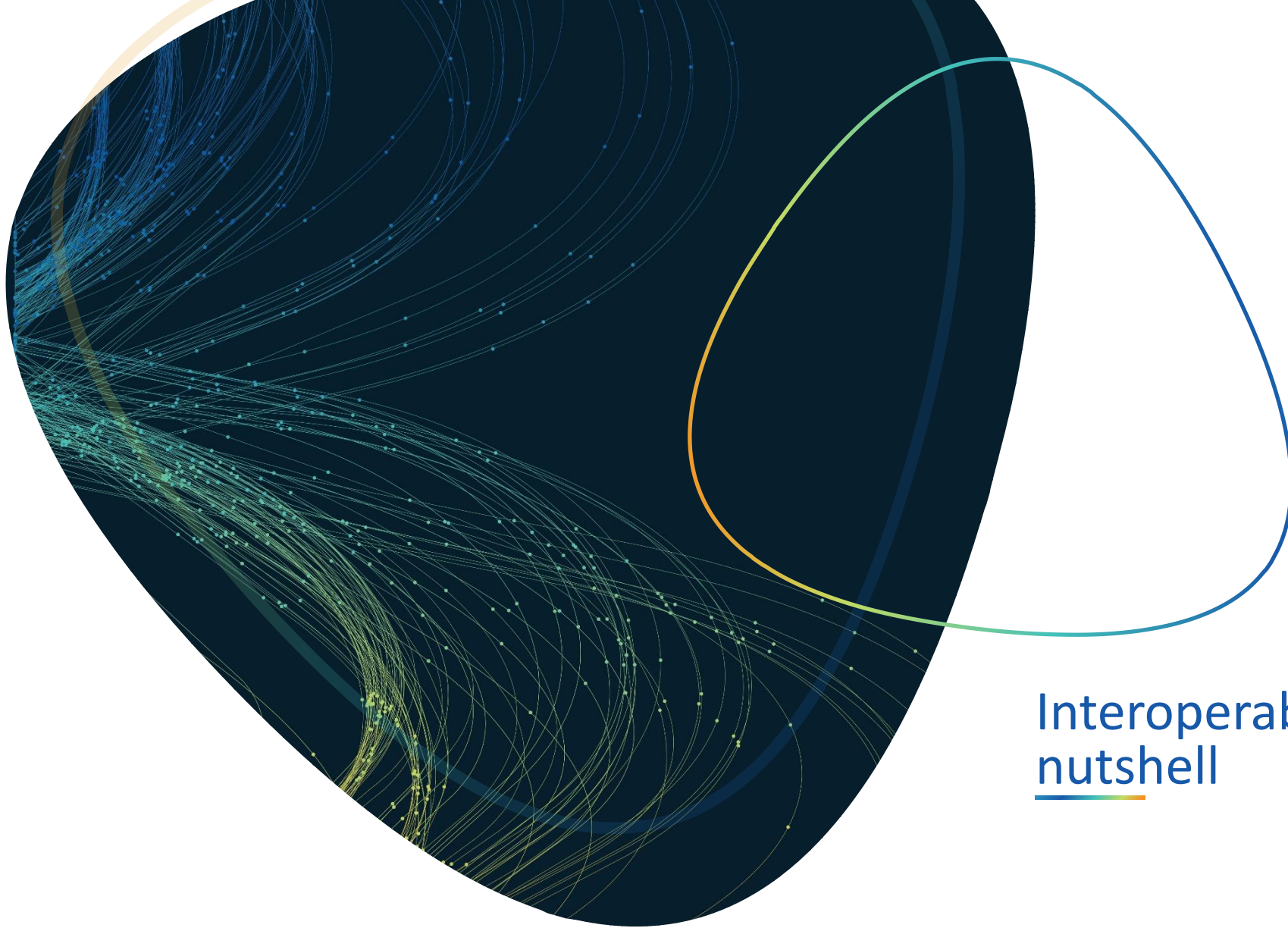
...ensuring that public services are not only technologically advanced but also accessible and user-centric.

Cross-border interoperability saves money

€5.5 - €6.3
million for citizens



€5.7 - €19.2
billion for businesses



Interoperable Europe Act in a nutshell

Interoperable Europe Act in a nutshell

What? Digital public services and their systems

All services requiring interaction across Member States' borders by means of their network and information systems.

Who? Union entities and public sector bodies

All entities that provide or manage digital public services.

Why? Better public services

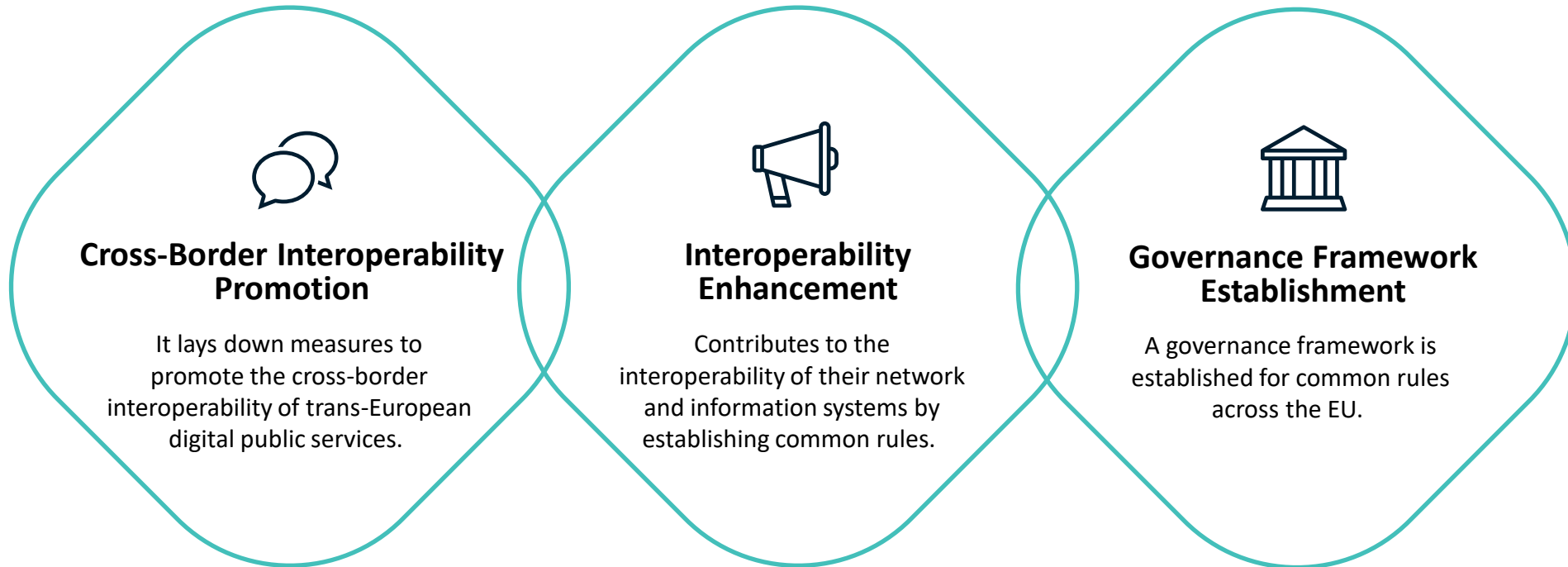
By making people think about interoperability before they take decisions having impact on it.

When? Entry into force on 11 April 2024

Application after 3 months, except for Article 3 and 17 where application is after 9 months.

The Act helps EU and Member State administrations to deliver connected digital services to citizens and businesses across Europe.

Interoperable Europe Act: vision



In a fast-moving digital world, our goal is clear:
to ensure seamless cross-border data flows for better digital public services in the EU.

The Interoperable Europe Act helps to make it happen. It helps to create a future where public administrations, citizens, and businesses can easily access and interact with public services, overcoming borders and bureaucracy seamlessly, without discrimination.

Who is concerned?

Governments

Co-owned EU-level governance to help build a secure cross-border exchange of data and agree on shared interoperability solutions.

Businesses

Enabling businesses to seamlessly operate in the Digital Single Market.

Catalyst for innovation ecosystem actors to engage in technology based GovTech cooperation to modernise and transform service delivery.



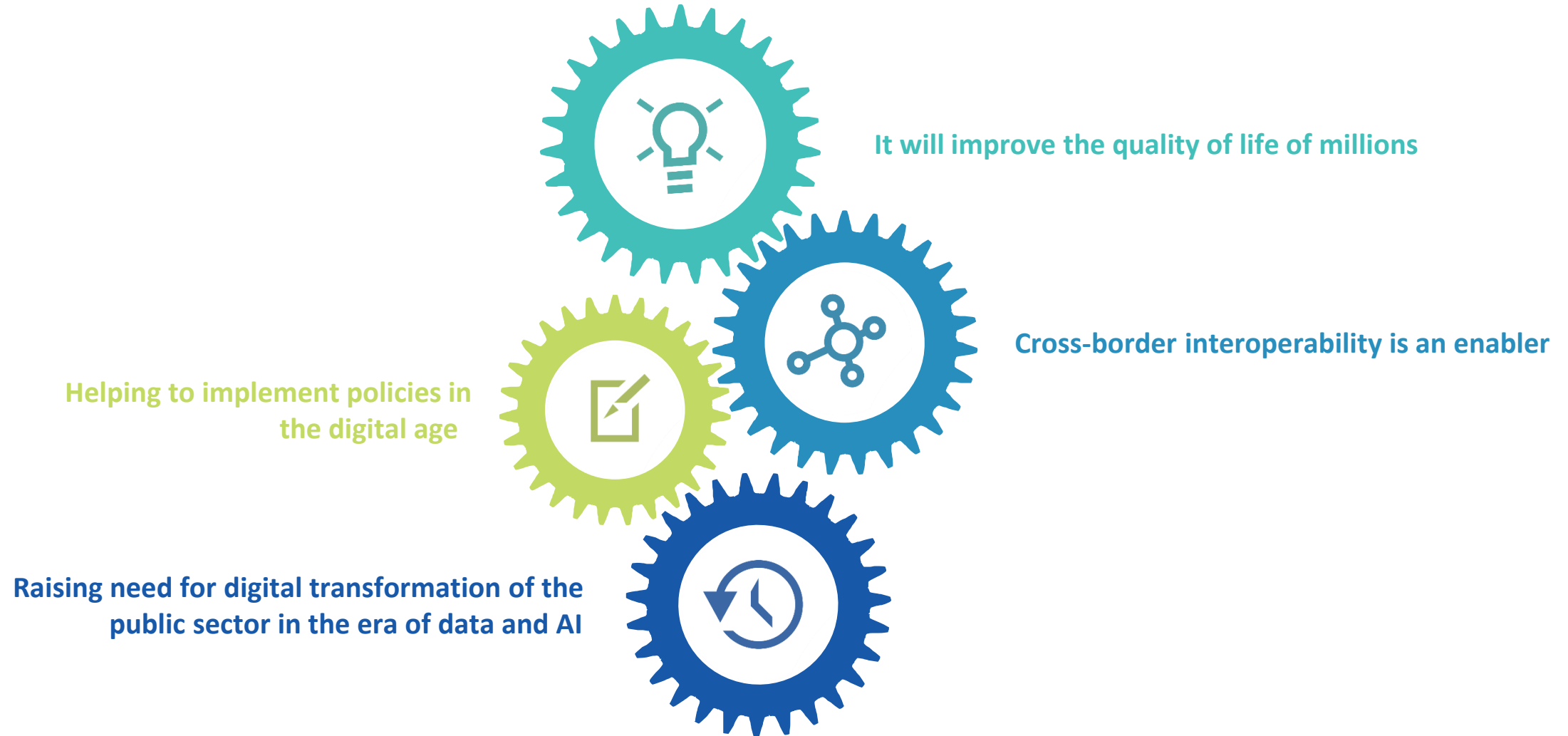
Citizens

Ensuring that every European, regardless of their location, has access to digital public services without discrimination.

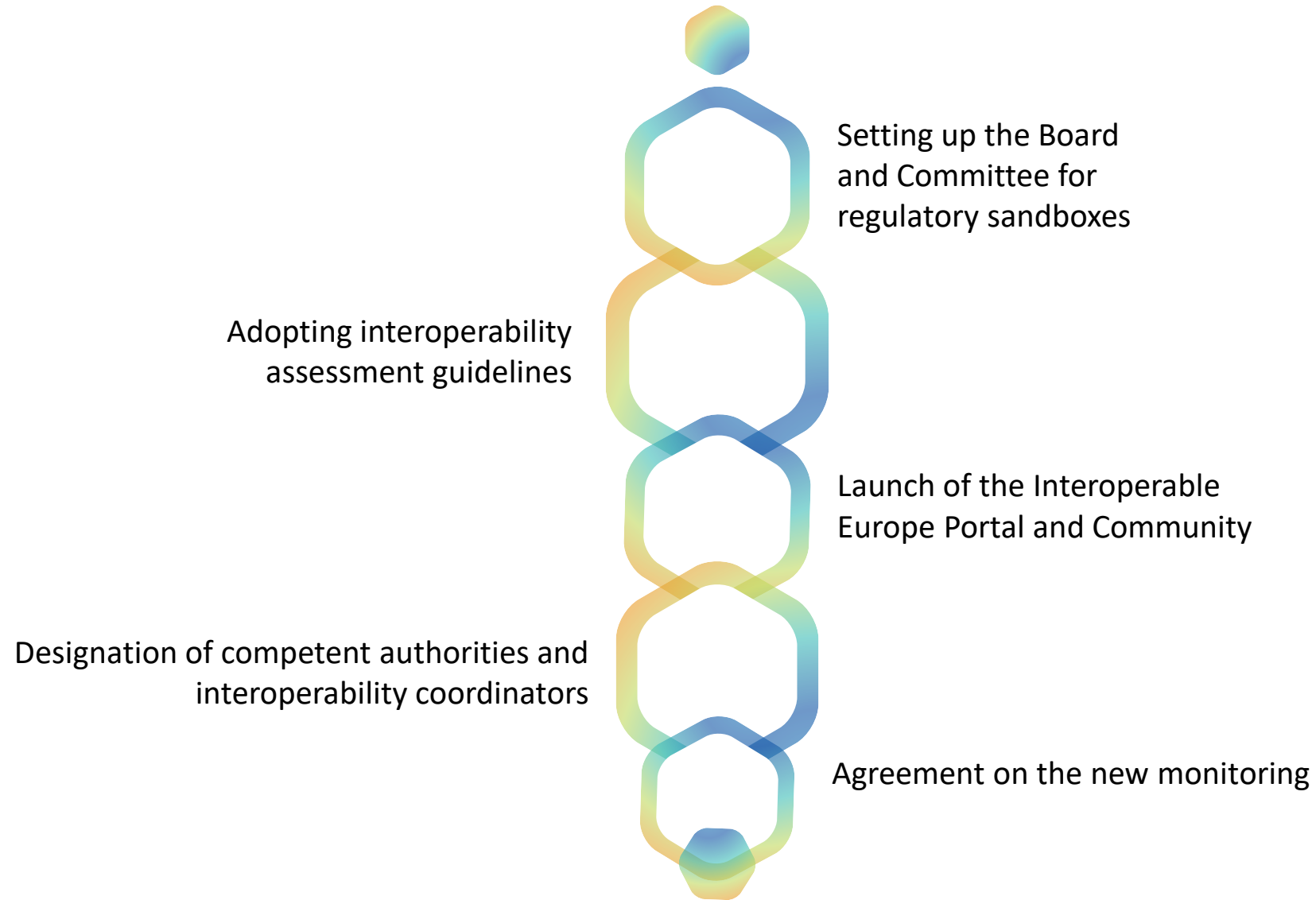
Innovation Ecosystem (GovTech Focus)

Enabling stakeholders from across the EU to contribute to enhanced cross-border interoperability and the related solutions through the Interoperable Europe Community.

Importance of the Interoperable Europe Act



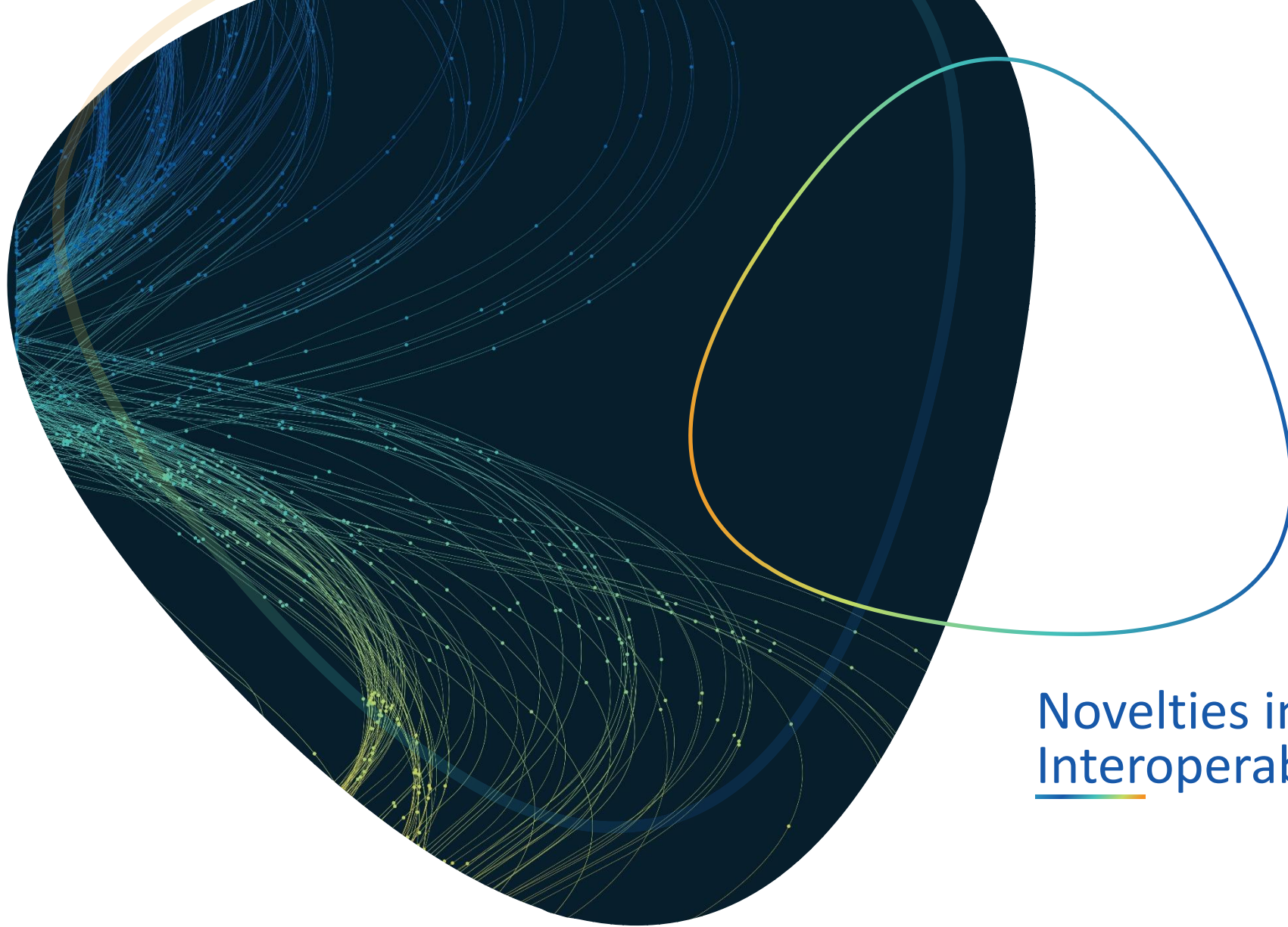
2024 milestones



In addition, the launch of preparatory actions on several other topics, such as the EIF, the Agenda, recommended solutions, etc.

What changes for EU institutions and Member States?

- Institutions shall designate **interoperability coordinators** to help implement the interoperability assessments and oversee interoperability activities *(by three months after entry into force)*
- Member States shall designate one or more **competent authorities** as responsible for the application of this Regulation and supporting the public sector *(by nine months after entry into force)*
- **Interoperability assessments** will become mandatory *(by nine months after entry into force)*
- Obligation to **share interoperability assets**, when requested *(by three months after entry into force)*



Novelties introduced by the Interoperable Europe Act

Overview of the main elements



Mandatory interoperability assessment

- Interoperability assessments



Strengthened interoperability support

- GovTech and interoperability regulatory sandboxes
- Policy implementation support projects
- Trainings
- Peer reviews



Structured and co-owned EU cooperation

- Governance (Board, Community, competent authorities, coordinators)
- Interoperable Europe Agenda
- Monitoring



Recognised reusable interoperability solutions

- European Interoperability Framework
- Interoperable Europe solutions
- Mandatory share and reuse
- Interoperable Europe Portal





Interoperability assessments

Interoperability assessments: overview

Who?

Union entities and public sector bodies

When?

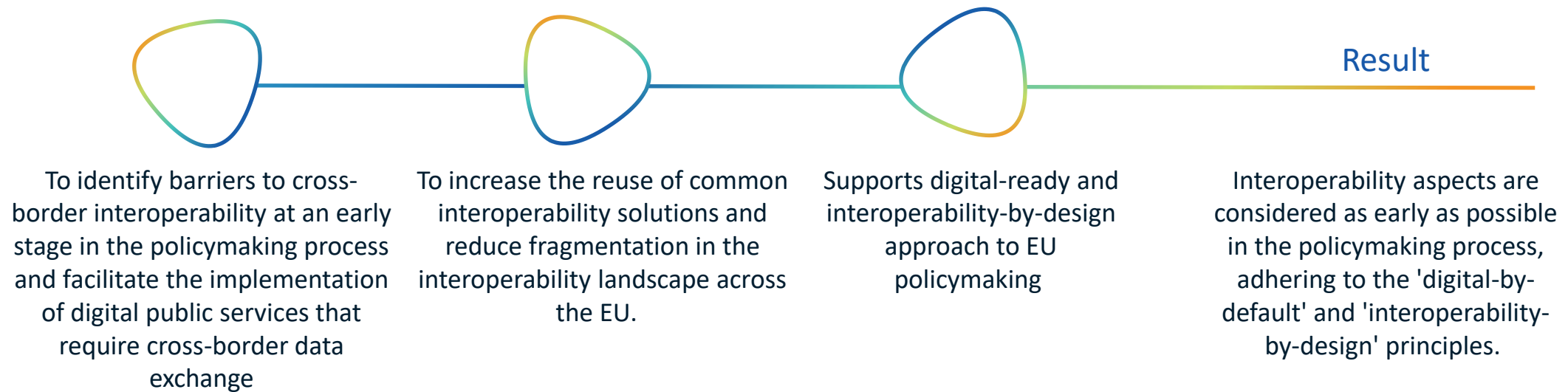
Before taking a decision on new or substantially modified binding requirements



What?

An interoperability assessment is a journey to discover opportunities for more cross-border interoperability, making the outcome of this discovery transparent in a report

Interoperability assessments: why is it needed?



Interoperability Assessment triggers



A TRANS-EUROPEAN DIGITAL PUBLIC SERVICE

Digital services [...] requiring interaction across Member State borders, among Union entities or between Union entities and public sector bodies, [...]



ANY BINDING REQUIREMENT

An obligation, prohibition, condition, criterion or limit* set by a Union entity [...] concerning one or more trans-European digital public services [...] has an effect on cross-border interoperability



THE ARTICLE 3 OBLIGATION

Before taking a decision on new or substantially modified binding requirements, a Union entity or a public sector body shall carry out an interoperability assessment

** within a law, regulation, administrative provision, contract, call for tender, or other official document*

Key considerations



Solutions

the Interoperable Europe solutions that support the implementation



Timing

as early as possible.



Entity responsible for the assessment

the one making the binding decision.



"Once only"

if an assessment has already been conducted, it does not need to be repeated



Consultation with stakeholders

directly affected service recipients



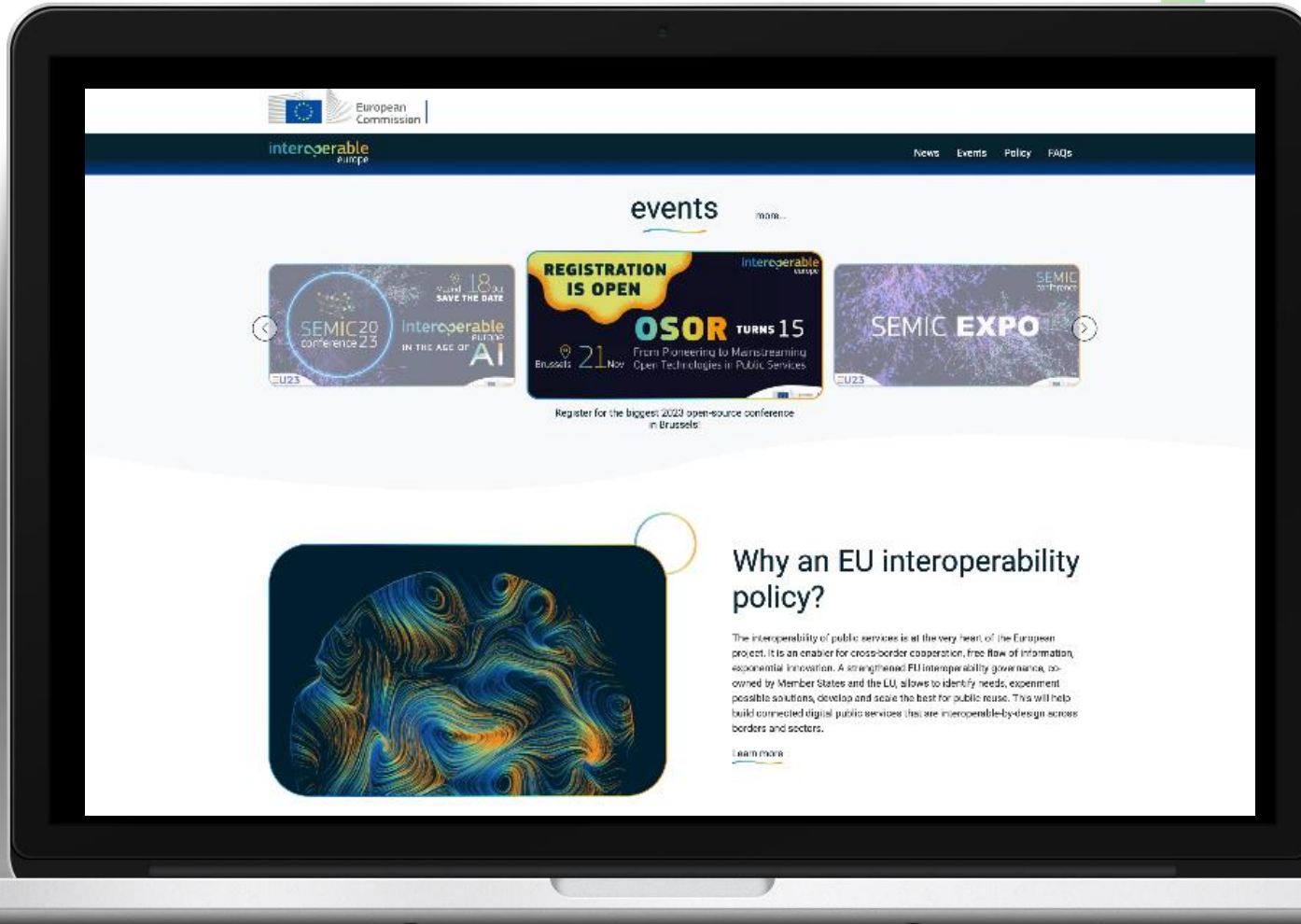
Support

Board's guidelines, technical tools provided by the Commission, national-level guidance



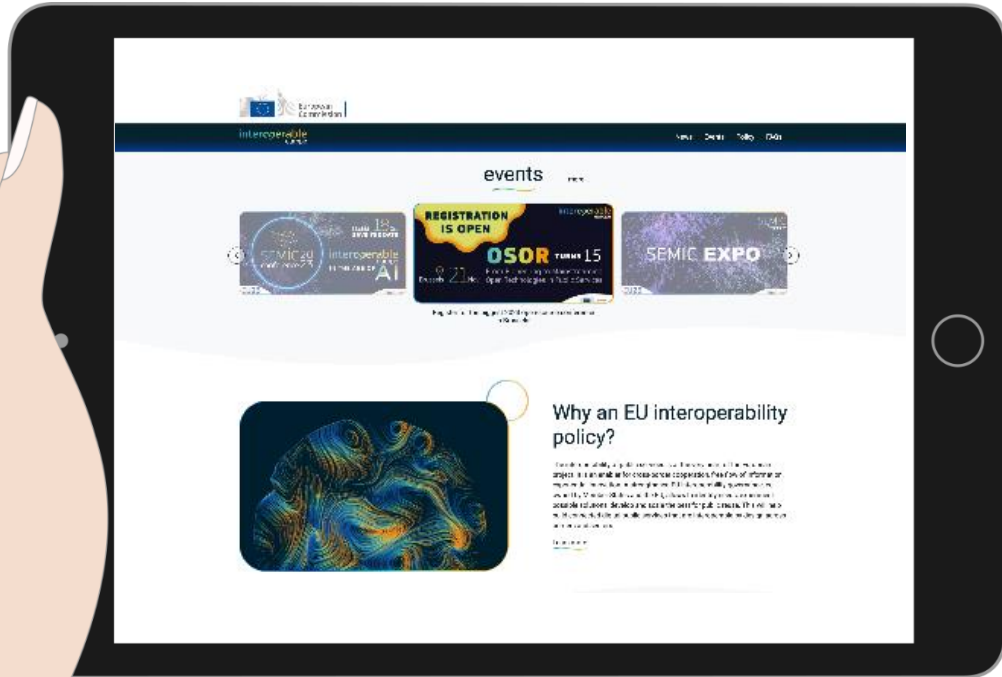
Interoperable Europe portal

Interoperable Europe portal



The Interoperable Europe Portal (now Joinup) is the “Single Point of Entry” for information related to the cross-border interoperability of trans-European digital public services.

Key functions and features



- User-friendly access to Interoperable Europe solutions, searchable by Member State and public service, highlighting the distinction from other solutions
- Access to interoperability solutions
- Interoperability with other portals or catalogues with similar functions
- Home for the Interoperable Europe Community
- Information on regulatory sandboxes
- Best practices, knowledge sharing, and guidance
- Interoperability-related monitoring data
- A feedback system for citizens, businesses, SMEs, and civil society organisations to comment on published content
- Promotes Openness and Reusability
- Encourages the development of new interoperability solutions or further development of existing ones, prioritising those without restrictive licensing terms



Mandatory share and reuse

Share and reuse

WHY?

Enabler for effective digital transformation

New paradigm for shared innovation and implementation

Union entities and public sector bodies are required to share interoperability solutions (article 4), including technical documentation, source code, and standards references, upon request from other entities.

HOW?

Sharing on request or by publication on the Interoperable Europe Portal or a linked Portal

Sharing entities must outline any conditions for reuse

Adapting to specific needs allowed (unless IP restrictions)

Open source prioritisation

Promotes the use of open source licenses (EUPL)

Board's guidelines on the sharing of interoperability solutions



Interoperable Europe solutions

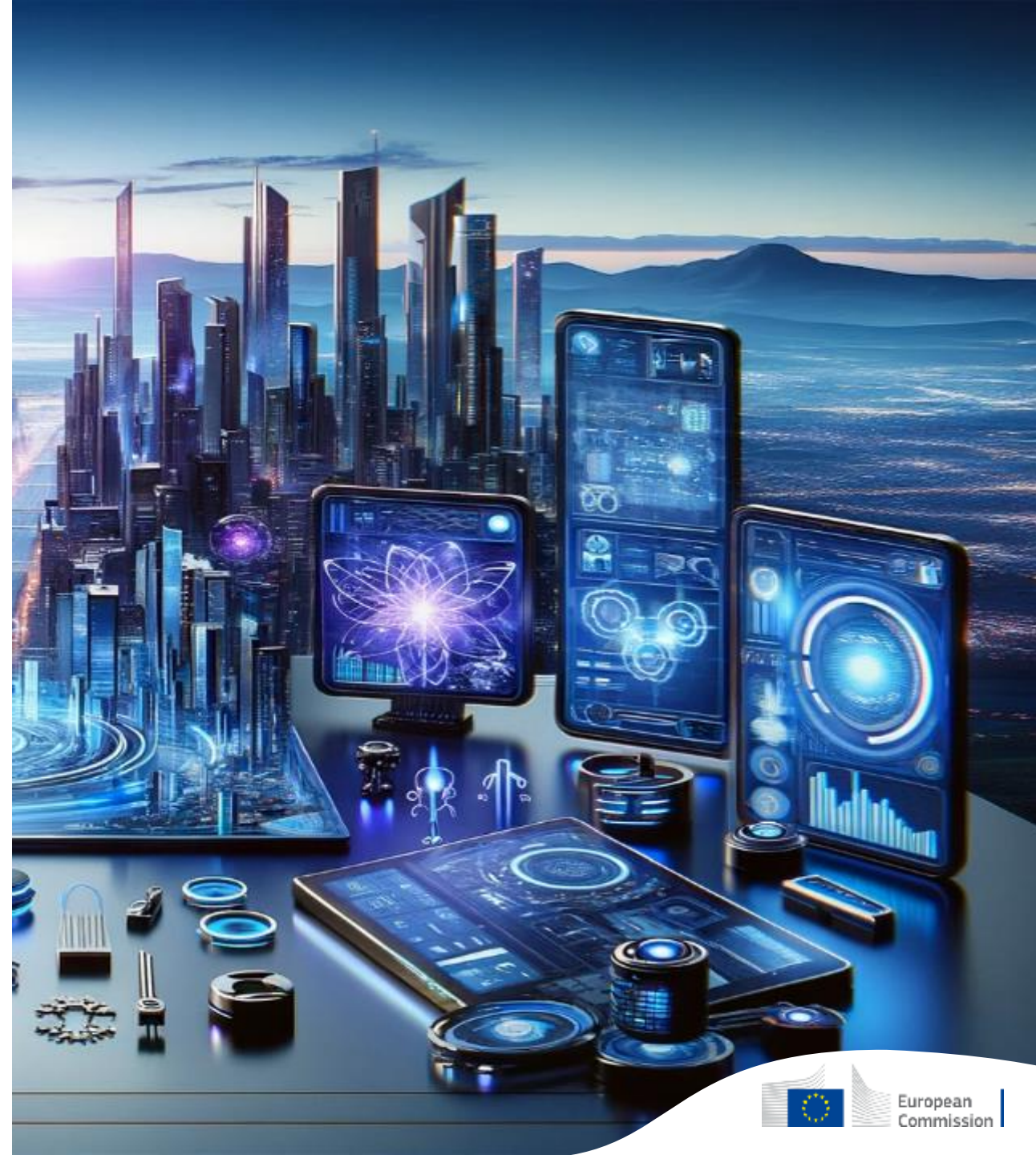
Interoperability solution

Means a reusable asset concerning legal, organisational, semantic or technical requirements to enable cross-border interoperability, such as conceptual frameworks, guidelines, reference architectures, technical specifications, standards, services and applications, as well as documented technical components, such as source code.

Recommendation by Interoperable Europe Board to reuse solution, based on agreed criteria (article 7)

Gets label 'Interoperable Europe Solutions' (article 7)

Published on Interoperable Europe Portal (searchable per public service and Member State)





Strengthened interoperability support

Support measures

To enhance the capacity-building of public sector bodies and assist digital implementation of Union policies. These measures can include developing missing interoperability solutions and providing additional support, such as trainings.

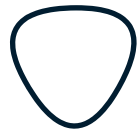
Vehicles:



Policy implementation
support projects
(article 9)



Training
(article 13)



Peer review
(article 14)



Innovation measures

To support the development, testing and uptake of innovative interoperability solutions within the EU, involving GovTech actors. Creates a European framework for regulatory dialogues to increase legal certainty for cross-border interoperability solutions.

Vehicles:



GovTech (article 10)



Interoperability regulatory sandboxes (article 11)





Interoperable Europe Board

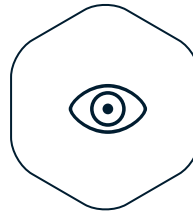
Interoperable Europe Board: overview

The Interoperable Europe Board – a new governance structure to foster strategic cooperation and provide guidance on the Act's application (article 15)



Membership

The Board consists of one representative from each Member State and the European Commission, ensuring a comprehensive representation of EU interests and perspectives.



Observers

Experts designated by the Committee of the Regions, the EU Cybersecurity Agency (ENISA), and the European Cybersecurity Competence Centre (ECCC) are invited to participate as observers.



Chair

The Board is chaired by the European Commission

Roles and functions





Interoperable Europe Community

Roles and functions



Contributes to the activities of the Board with advice and expertise upon request from the Board.

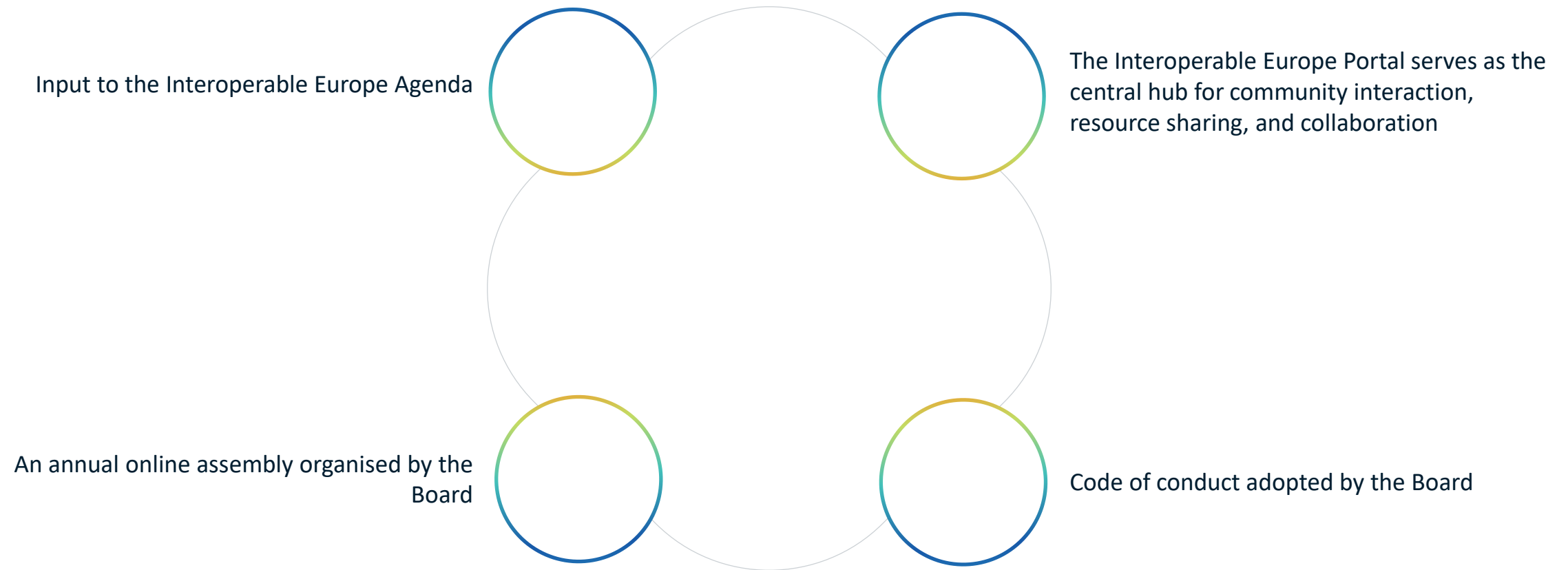


Broad Membership - includes EU institutions, public administrations from Member States, sectoral initiatives, businesses, particularly SMEs, civil society organisations, and individuals with an interest in interoperability.



Diverse Expertise - brings together experts, practitioners, users, and the interested public across various domains to collaboratively address interoperability challenges and opportunities.

Main vehicles





Monitoring and evaluation

Monitoring and evaluation

The purpose of Monitoring and Evaluation is to systematically assess the effectiveness, efficiency, and impact of the Interoperable Europe Act's implementation across EU Member States and institutions.

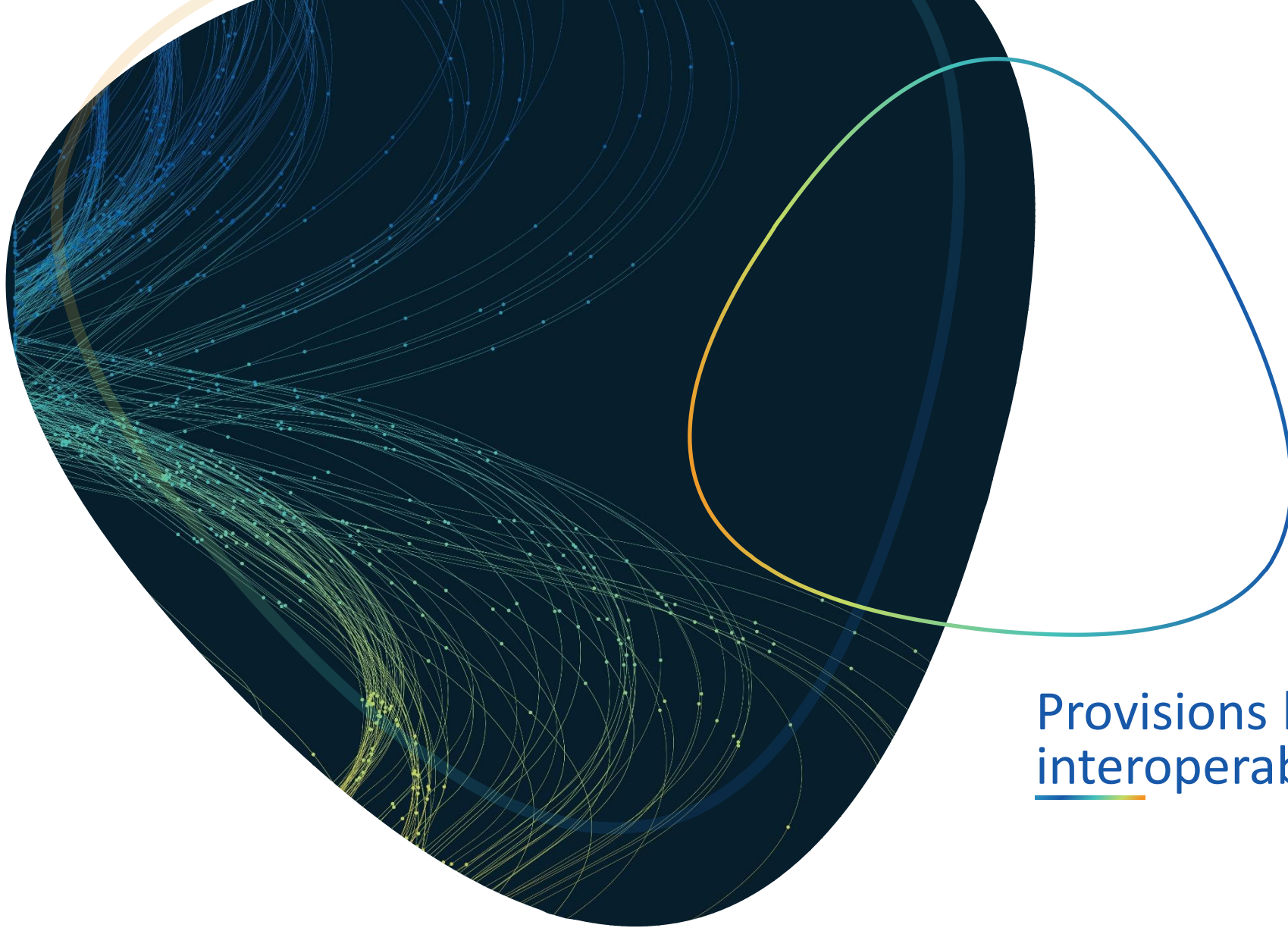
Areas for monitoring

- 
- 1) progress on cross-border interoperability
 - 2) the adoption of the EIF
 - 3) the deployment of solutions
 - 4) Open source solutions and GovTech
 - 5) Skills

These feed into the annual report on interoperability in the Union

In addition, periodic evaluations to ensure up-to-date insights into the Act's implementation status and its outcomes.

Interoperable Europe Portal serves as the central hub for publishing monitoring data, evaluation reports, sharing findings.



Provisions linked to semantic
interoperability

Definition and importance

Semantic interoperability is the ability of computer systems to exchange data with unambiguous, shared meaning.



Allows for seamless communication and data exchange among various information systems, even if they are built on different technologies or platforms



The precise meaning of exchanged information is understandable by any other system or application not initially developed for this purpose



Enables different systems to interpret and use the data accurately, thereby enhancing the efficiency and effectiveness of data exchange and communication

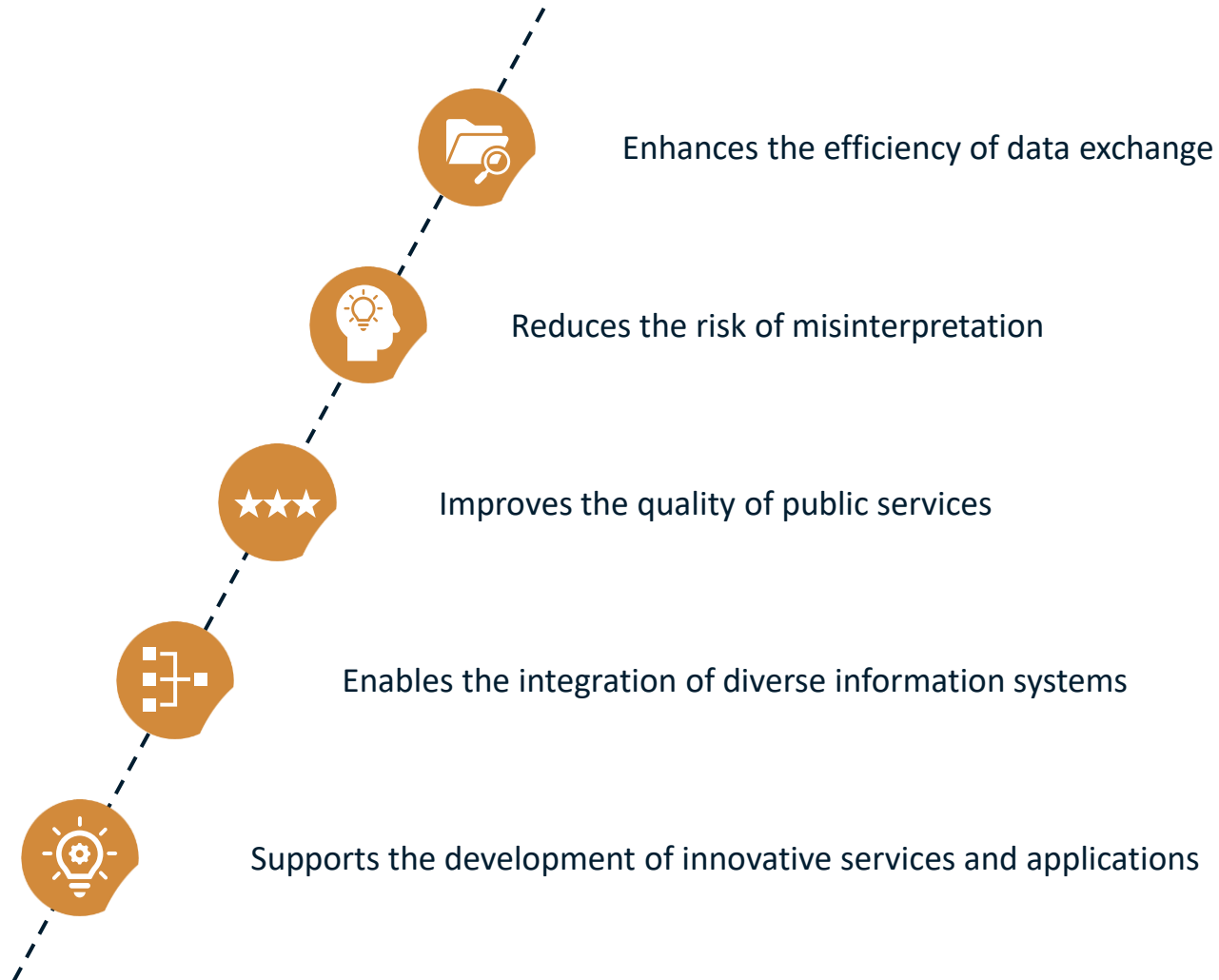
Role of semantic interoperability in the Interoperable Europe Act

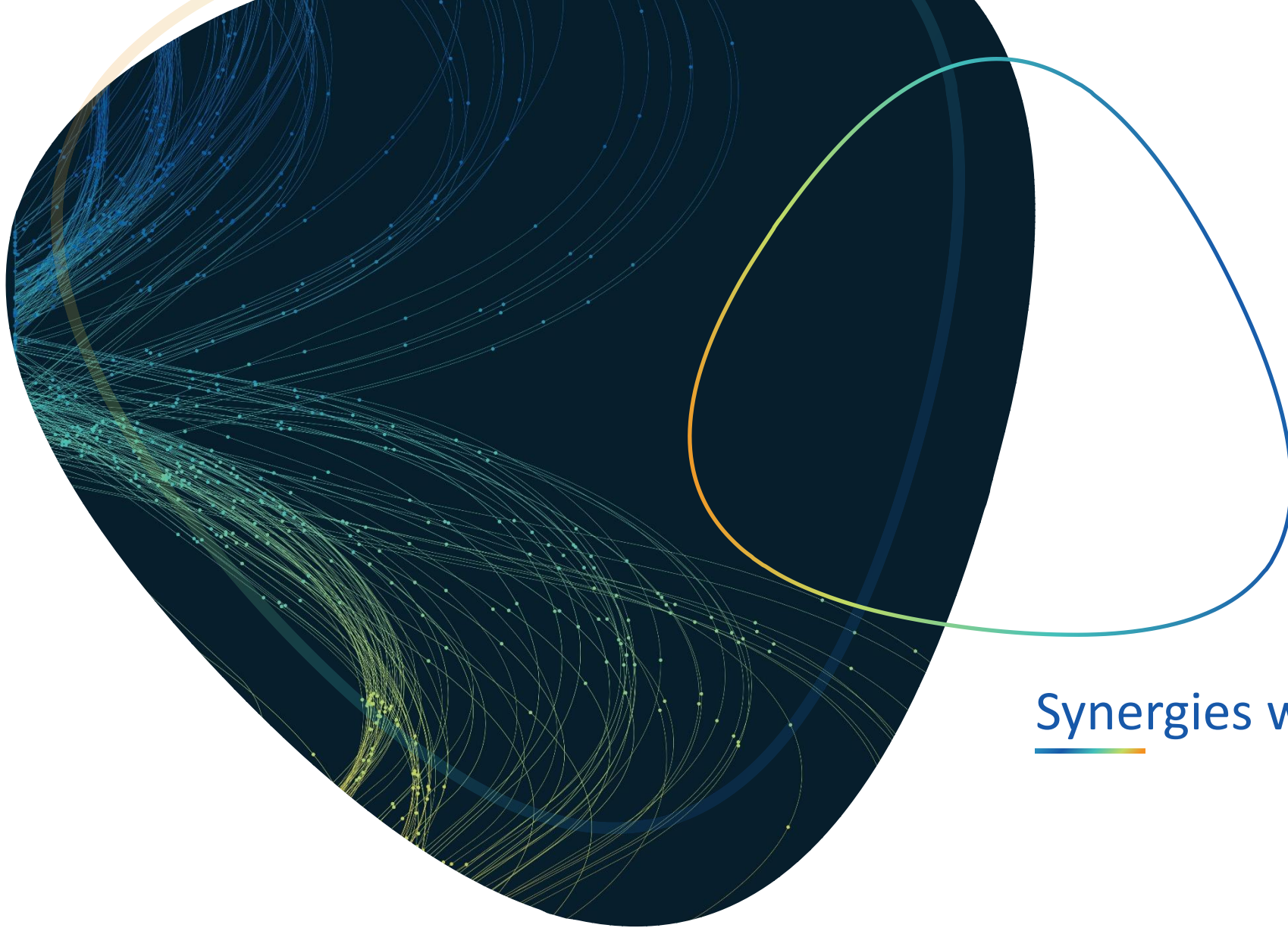
Provisions that promote the use of common data models and vocabularies

Provisions that aim to facilitate semantic interoperability and ensure that public administrations, businesses, and citizens can seamlessly exchange information and access public services across borders

Semantic interoperability is key to facilitating effective communication in diverse multi-linguistic environments, including at regional and local levels

Impact on data exchange and public services





Synergies with EU legislation

Key synergies within the EU digital legislation landscape

01

Digital Decade Policy Programme

Contributes to the target of having 100% key public services available online by 2030, and the related monitoring.

02

Data Governance and Sharing

Aligns with the European Data Strategy to facilitate secure and efficient data sharing and use between public administrations, businesses, and citizens, including coordination with the European Data Innovation Board and support to data spaces.

03

Innovation and technology

Supports the EU's digital innovation goals, including the Digital Europe Programme, by supporting GovTech cooperation and interoperability regulatory sandboxes.

04

EU sectorial policies and digital identity

Making available reusable interoperability assets, trainings and support measures to support the implementation and uptake of common interoperability solutions.

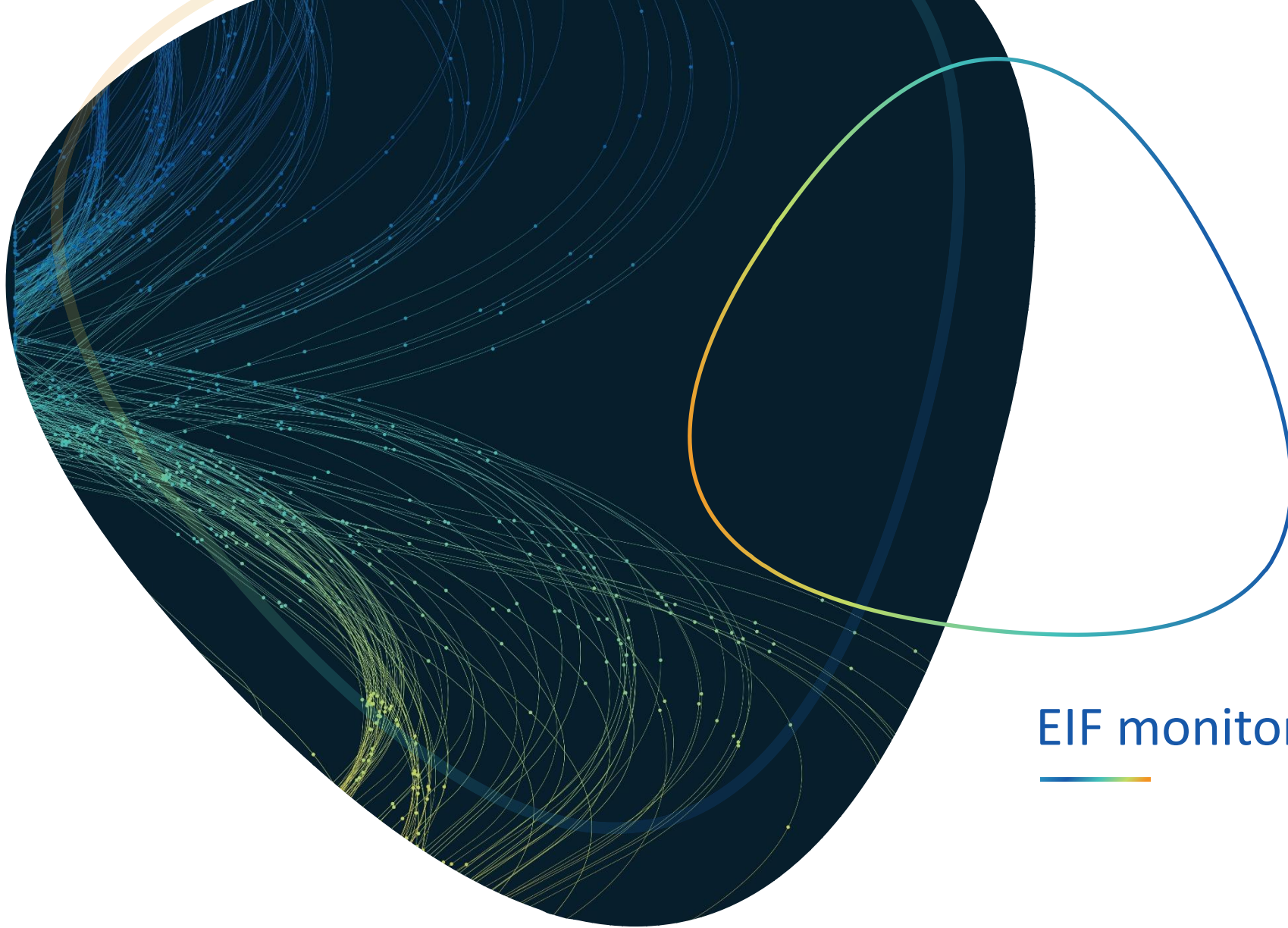
The background features two large, mirrored, abstract structures that resemble stylized wings or flowing liquid. These structures are composed of numerous fine, overlapping lines and a dense cloud of small, glowing particles. The color palette is dominated by deep blues and purples, with vibrant streaks of orange, yellow, and green that create a sense of movement and energy. The overall effect is ethereal and futuristic.

Thank you!



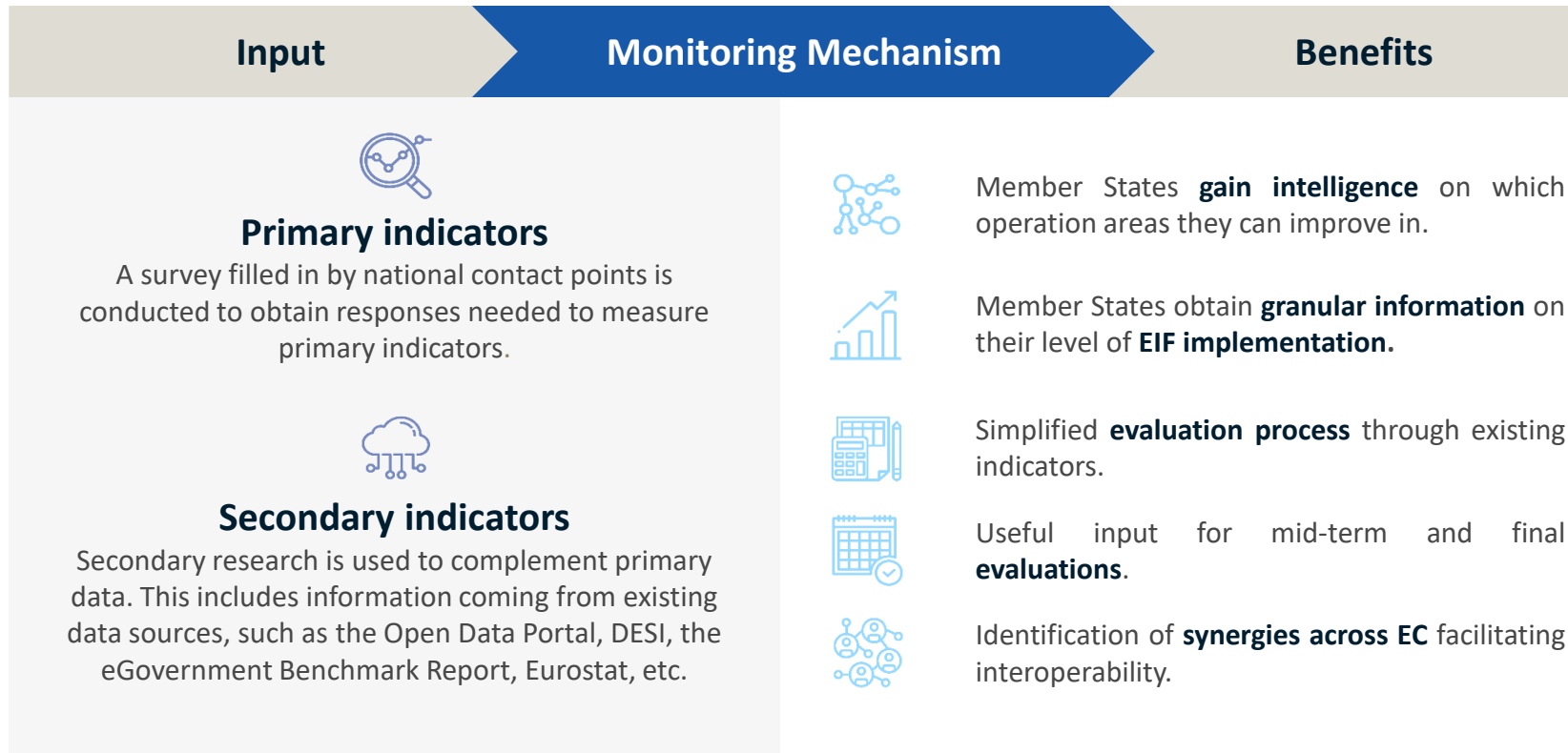
From the EIF towards a new Interoperability Monitoring Mechanism

interoperable
europe



EIF monitoring mechanism

EIF Monitoring Mechanism



THE EIF MONITORING MECHANISM (EIF MM)

Has for goal to provide each MS with its level of implementation of the EIF based on a recommendation-by-recommendation measurement as defined by the Article 1.2 of the ISA² Decision.

EIF scoreboards



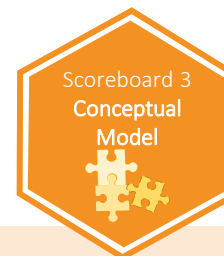
The **interoperability principles** are fundamental behavioural aspects to drive interoperability actions. They describe the context in which European public services are designed and implemented.

	Recommendation(s) n°
Principle 1 - Subsidiarity and Proportionality	1
Principle 2 - Openness	2-4
Principle 3 - Transparency	5
Principle 4 - Reusability	6-7
Principle 5 - Technological neutrality and data portability	8-9
Principle 6 - User-centricity	10-13
Principle 7 - Inclusion and accessibility	14
Principle 8 - Security and privacy	15
Principle 9 - Multilingualism	16
Principle 10 - Administrative simplification	17
Principle 11 - Preservation of information	18
Principle 12 - Assessment of Effectiveness and Efficiency	19



The **4 layers of interoperability**: legal, organisational, semantic and technical are complemented by cross-cutting governance components.

	Recommendation(s) n°
Interoperability Governance	20-24
Integrated Public Service Governance	25-26
Legal Interoperability	27
Organisational Interoperability	28-29
Semantic Interoperability	30-32
Technical Interoperability	33



The **conceptual model** is modular and comprises loosely coupled service interconnected components. Guides the planning, development, operation and maintenance of public services by Member States.

	Recommendation(s) n°
Conceptual Model	34-35
Internal information sources and services	36
Basic Registries	37-40
Open Data	41-43
Catalogues	44
External information sources and services	45
Security and Privacy	46-47



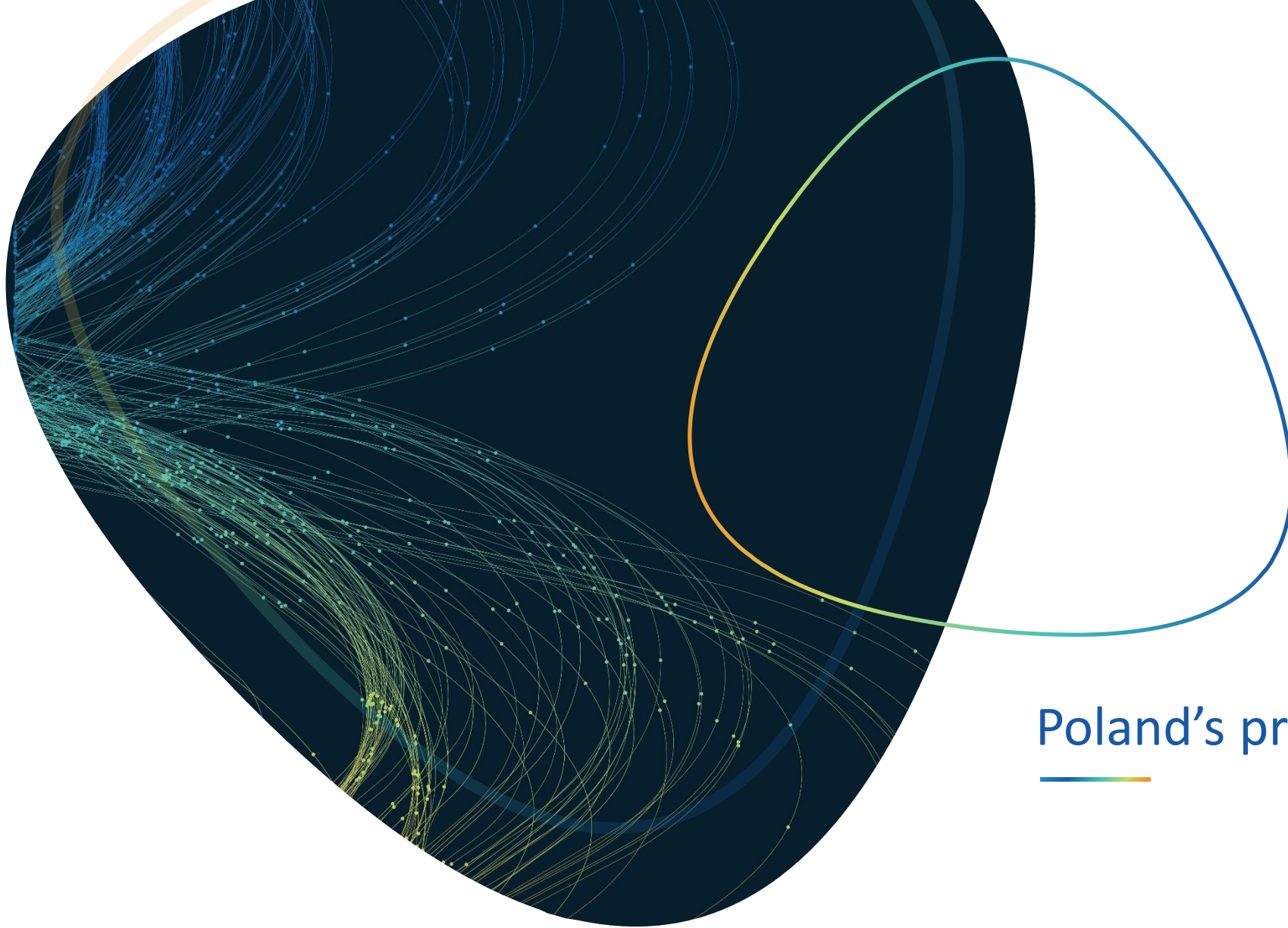
Cross-border interoperability scoreboard

In 2022, the EIF MM has been revised with the inclusion of a cross-border transversal scoreboard, encompassing the Interoperability Principles, the Interoperability layers and the Conceptual model.

The fourth scoreboard mirrors the thematic areas and recommendations described by the EIF framework thematic areas and recommendations described by the EIF framework.

Scoreboard 1 Interoperability Principles		Scoreboard 2 Interoperability Layers		Scoreboard 3 Conceptual Model	
	Recommendation(s) n°		Recommendation(s) n°		Recommendation(s) n°
Principle 1 - Subsidiarity and Proportionality	1	Interoperability Governance	20-24	Conceptual Model	34-35
Principle 2 - Openness	2-4	Integrated Public Service Governance	25-26	Internal information sources and services	36
Principle 3 - Transparency	5	Legal Interoperability	27	Basic Registries	37-40
Principle 4 - Reusability	6-7	Organisational Interoperability	28-29	Open Data	41-43
Principle 5 - Technological neutrality and data portability	8-9	Semantic Interoperability	30-32	Catalogues	44
Principle 6 - User-centricity	10-13	Technical Interoperability	33	External information sources and services	45
Principle 7 - Inclusion and accessibility	14			Security and Privacy	46-47
Principle 8 - Security and privacy	15				
Principle 9 - Multilingualism	16				
Principle 10 - Administrative simplification	17				
Principle 11 - Preservation of information	18				
Principle 12 - Assessment of Effectiveness and Efficiency	19				
Scoreboard 4 Cross-border Interoperability					

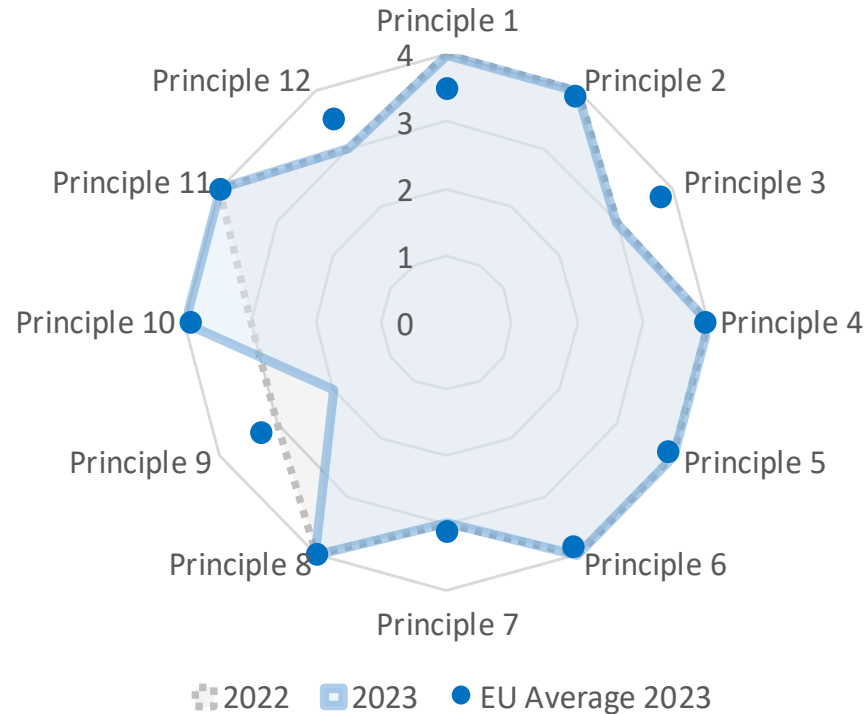
*The thematic areas and recommendations affected by the addition of the cross-border dimension are the ones highlighted in dark blue.



Poland's progress on Scoreboard 1

Poland's progress on Scoreboard 1: EIF Principles (1/2)

SCOREBOARD 1 - TWELVE PRINCIPLES



Overall good level of implementation of the 12 Principles of the EIF, with **8 out of 12** reaching the highest score of 4 and scoring at the European average for almost all principles.



Poland **matched** the EU average on **8 principles** and scored **above the EU average** for the implementation of **Subsidiarity and Proportionality** (Principle 1).



Main potential areas of improvement are related to the principles of **Transparency** (Principle 3), **Inclusion and Accessibility** (Principle 7), **Multilingualism** (Principle 9), and **Assessment of Effectiveness and Efficiency** (Principle 12).

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Poland's progress on Scoreboard 1: EIF Principles (2/2)

	2023		2023		2023	2022	EU Average
Principle 1 - Subsidiarity and Proportionality	4	Recommendation 01	4	KPI 01	4	4	3
Principle 2 - Openness	4	Recommendation 2	4	KPI 02	4	4	4
				KPI 91	4	4	4
				KPI 05	4	4	4
				KPI 72	4	4	4
		Recommendation 03	4	KPI 06	4	4	4
		Recommendation 4	4	KPI 07	4	4	4
Principle 3 - Transparency	3	Recommendation 05	3	KPI 08	3	3	4
Principle 4 - Reusability	4	Recommendation 06	4	KPI 09	3	3	3
				KPI 10	4	4	4
		Recommendation 07	4	KPI 11	4	4	4
				KPI 92	4	4	4
				KPI 93	4	4	4
				KPI 94	4	4	4
				KPI 95	4	4	4
				KPI 96	4	4	4
				KPI 97	4	4	4
				KPI 98	4	4	4
Principle 5 - Technological neutrality and data portability	4	Recommendation 08	4	KPI 19	4	4	4
		Recommendation 09	3	KPI 20	3	4	3
Principle 6 - User-centricity	4	Recommendation 10	3	KPI 99	3	3	3
				KPI 22	3	3	3
				KPI 23	4	4	4
		Recommendation 11	4	KPI 24	4	4	4
		Recommendation 12	4	KPI 25	4	4	4
		Recommendation 13	4	KPI 26	4	4	4
				KPI 27	4	4	3

Principle 7 - Inclusion and accessibility	3	Recommendation 14	3	KPI 28	3	3	3
Principle 8 - Security and privacy	4	Recommendation 15	4	KPI 29	4	4	4
Principle 9 - Multilingualism	3	Recommendation 16	3	KPI 30	2	2	3
				KPI 31	3	2	3
				KPI 32	2	3	3
				KPI 33	3	4	3
Principle 10 - Administrative simplification	4	Recommendation 17	4	KPI 34	4	4	4
				KPI 35	4	4	4
				KPI 36	2	2	3
				KPI 37	3	2	4
Principle 11 - Preservation of information	4	Recommendation 18	4	KPI 38	4	4	4
Principle 12 - Assessment of Effectiveness and Efficiency	3	Recommendation 19	3	KPI 39	3	3	4

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Potential area of improvement: Principle 9 – Multilingualism

A balance needs to be found between the expectations of citizens and businesses to be served in their own language(s) or their preferred language(s) and the ability of Member States' public administrations to offer services in all official EU languages. A suitable balance could be that European public services are available in the languages of the expected end-users.

Recommendation 16

- ✓ Use information systems and technical architectures that cater for multilingualism when establishing a European public service. Decide on the level of multilingualism support based on the needs of the expected users.

Solutions*



eTranslation can be integrated into your information systems to make digital public services and content multilingual.

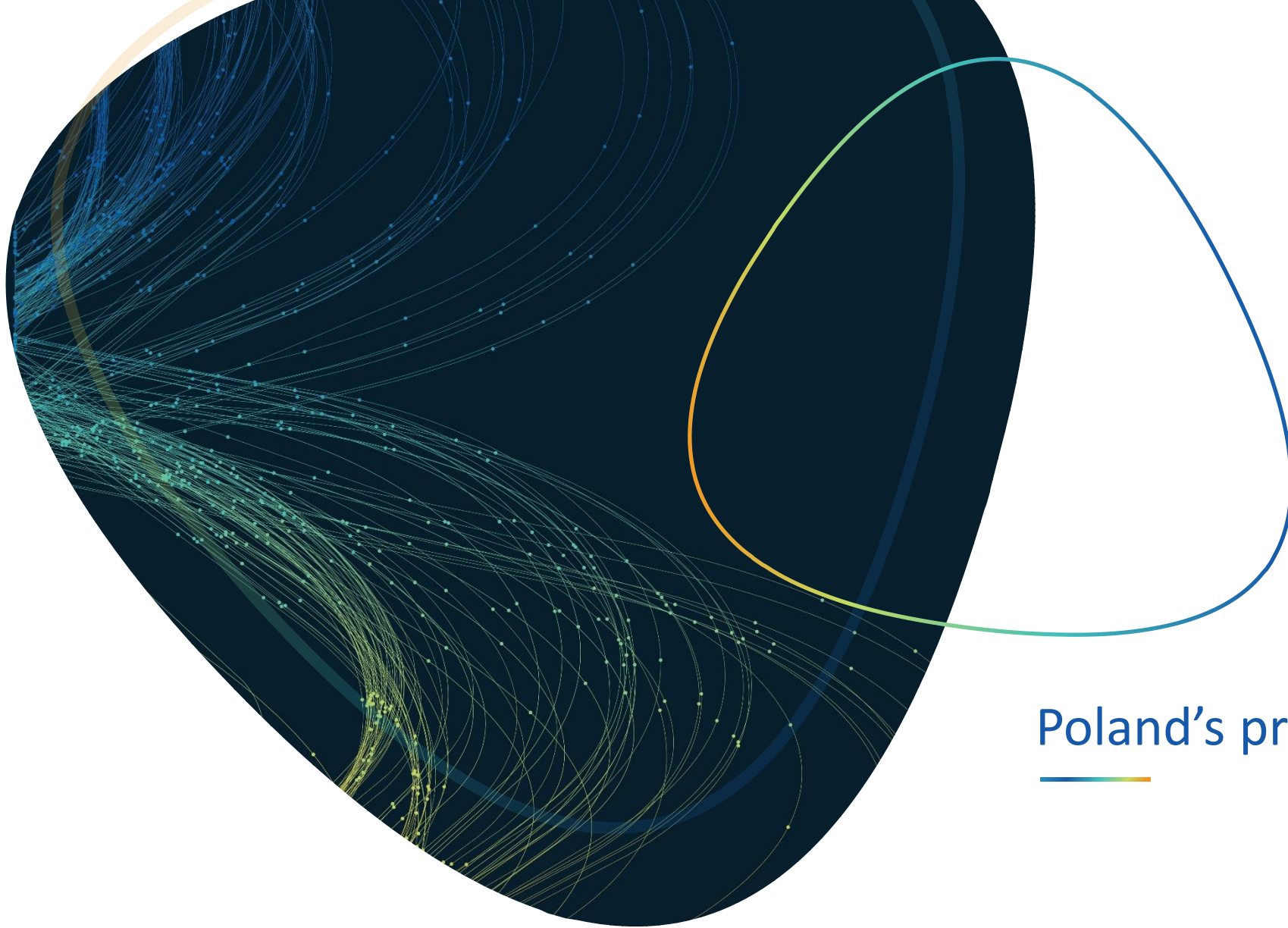


PMKI datasets will support localisation of digital services (for example the reuse of PMKI product taxonomies for the implementation of an eCommerce solution).

Good practice

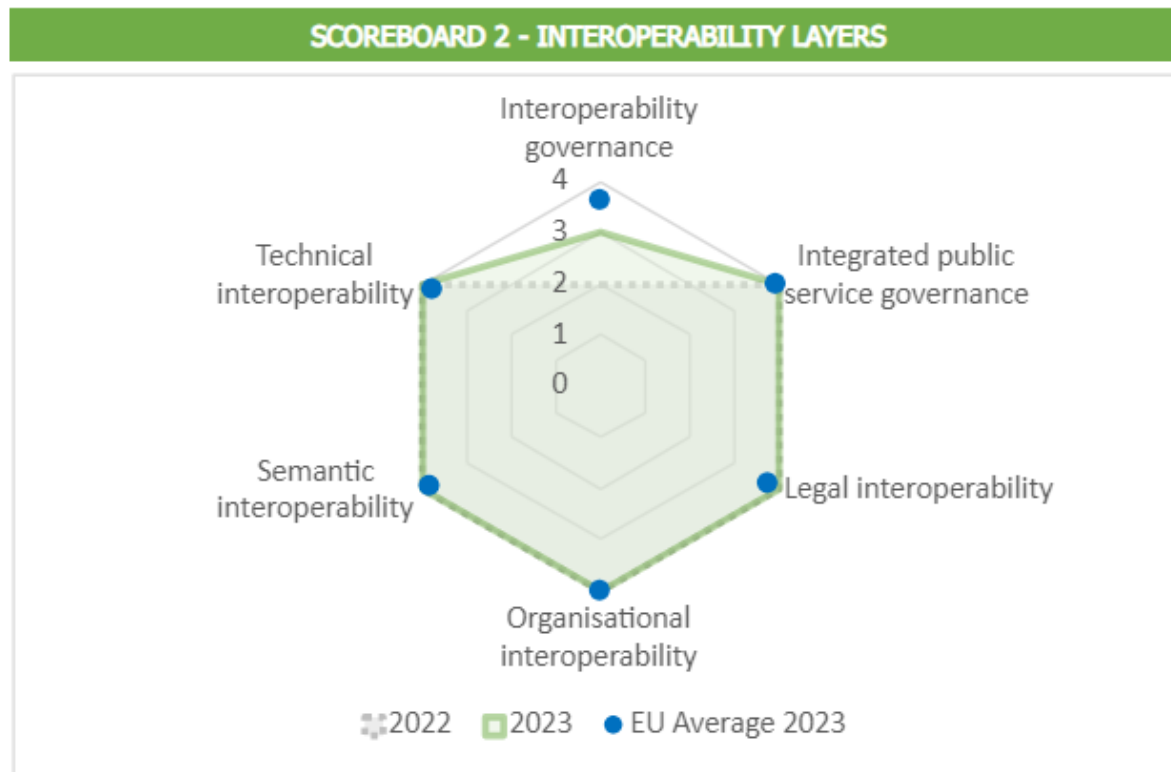
- ✓ The use of law and the provision of multilingualism to foster the EIF implementation in Finland demonstrates that legislation is the most effective tool to foster interoperability at the national and sectorial levels. It also provides an overview of the challenges linked to the provision, by central government authorities and large cities, of services in English as well as, less frequently, in additional languages. These challenges, which concern in particular small municipalities, include the cost of maintaining websites in different languages, in terms of capacity, skills and time, and the direct translations of the public information displayed on these websites appear not to be as useful as expected for foreigners and would require some broader tailoring or explanation.





Poland's progress on Scoreboard 2

Poland's progress on Scoreboard 2: Interoperability layers (1/2)



Overall very good level of implementation of the Interoperability layers of the EIF, with **5 out of 6** reaching the highest score of 4.



Poland **matched** the EU average on **5 layers** and scored 3 on Interoperability governance. Compared to 2022, Poland increased its score related to **Interoperability governance**.



Main potential areas of improvement are linked to the layer of **Interoperability governance**, as well as to some KPIs on **Integrated public service governance** and **Organisational interoperability**.

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Poland's progress on Scoreboard 2: Interoperability layers (2/2)

	2023		2023		2023	2022	EU Average
Interoperability governance	3	Recommendation 20	4	KPI 40	4	4	4
		Recommendation 21	4	KPI 41	4	4	4
		Recommendation 22	2	KPI 42	3	2	4
		Recommendation 23	1	KPI 43	1	1	1
		Recommendation 24	3	KPI 44	1	1	3
				KPI 45	3	2	4
Integrated public service governance	4	Recommendation 25	3	KPI 46	3	3	4
		Recommendation 26	4	KPI 47	4	4	4
Legal interoperability	4	Recommendation 27	4	KPI 48	4	4	4
Organisational interoperability	4	Recommendation 28	4	KPI 49	4	4	4
		Recommendation 29	3	KPI 50	3	3	3
Semantic interoperability	4	Recommendation 30	4	KPI 92	4	4	4
		Recommendation 31	4	KPI 51	4	2	4
		Recommendation 32	4	KPI 52	4	No data	4
				KPI 53	4	4	4
Technical interoperability	4	Recommendation 33	4	KPI 07	4	4	4

*Please note that the EU average encompasses the 31 countries falling under the scope of the EIF.

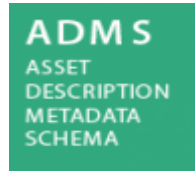
Interoperability governance

Interoperability governance refers to decisions on interoperability frameworks, institutional arrangements, organisational structures, roles and responsibilities, policies, agreements and other aspects of ensuring and monitoring interoperability at national and EU levels.

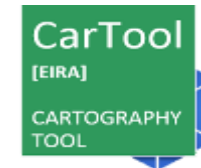
Recommendation 23

- ✓ Consult relevant catalogues of standards, specifications and guidelines at national and EU level, in accordance with your NIF and relevant DIFs, when procuring and developing ICT solutions.

Solutions*



The ADMS data standard can be used by public administrations with the need for a structure approach to metadata management.



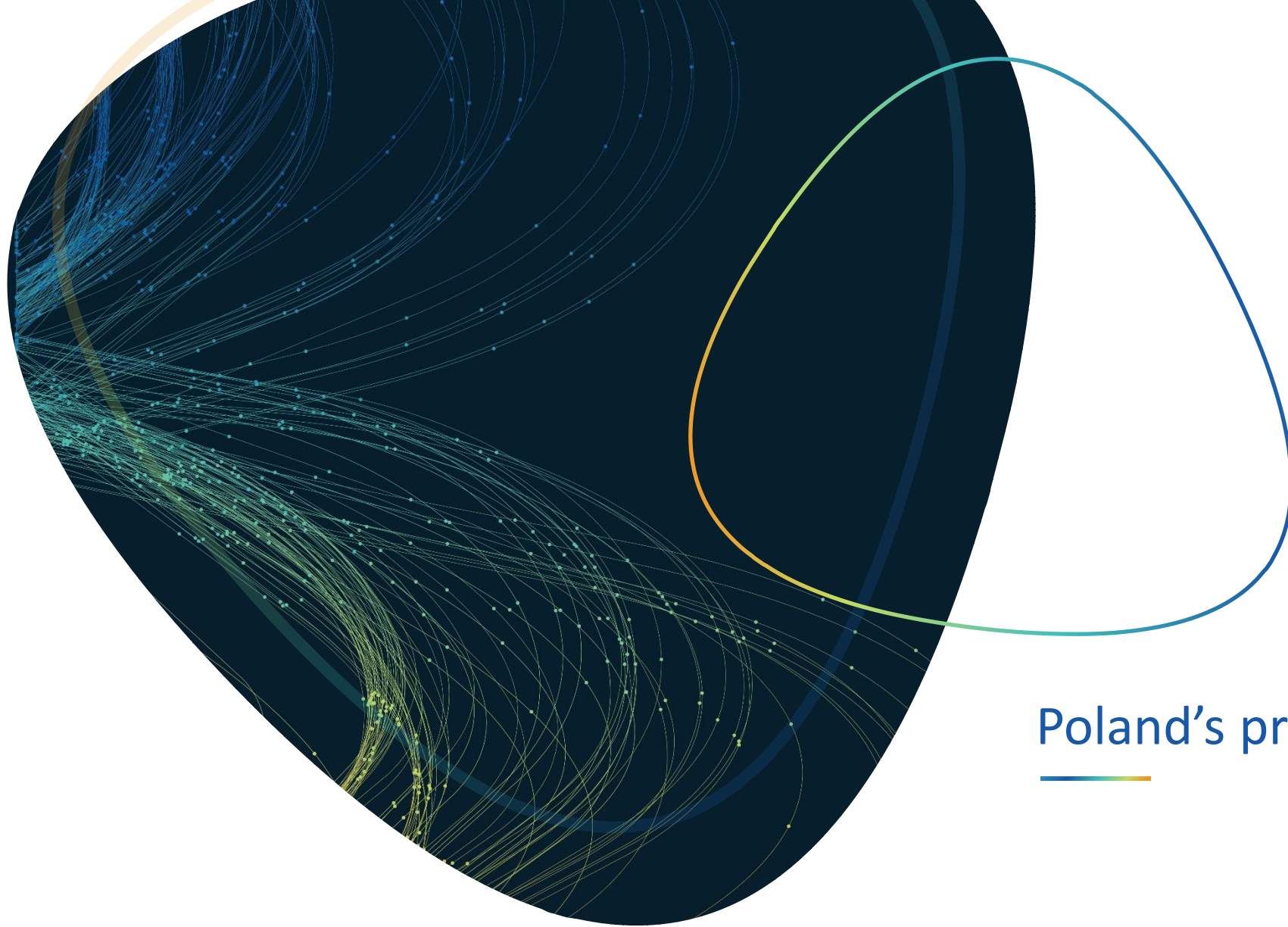
CarTool aids its users in the selection process of standards by giving them access to the list of proposed interoperability standards and specifications.

Good practice

- ✓ Any information system acquired or developed by public bodies must comply with the NIF and, in particular, the mandatory use of standards prescribed in its Catalogue of standards and the Technical Standards of Interoperability, as well as other open or commonly used standards justifiably and communicated to the Secretariat Executive of the Sectorial Committee of Electronic Administration. These include ICT catalogues from the EU Catalogue of ICT Standards, the National Catalogues of ICT Standards, the European Interoperability Cartography, and Joinup's catalogue of solutions. Moreover, according to the Spanish NIF and the Law 40/2015 on the Legal Regime of the Public Sector, every Spanish public administration must publish their administrative procedure in the National Catalogue of Public Services (SIA), and their public units and organisations in the national Directory of Public Organisations (DIR3). In Spain, catalogues from international organisations are used as well, including those coming from the World Wide Web Consortium (W3C), the Internet Engineering Task Force (IETF), and the Institute of Electrical and Electronics Engineers (IEEE).

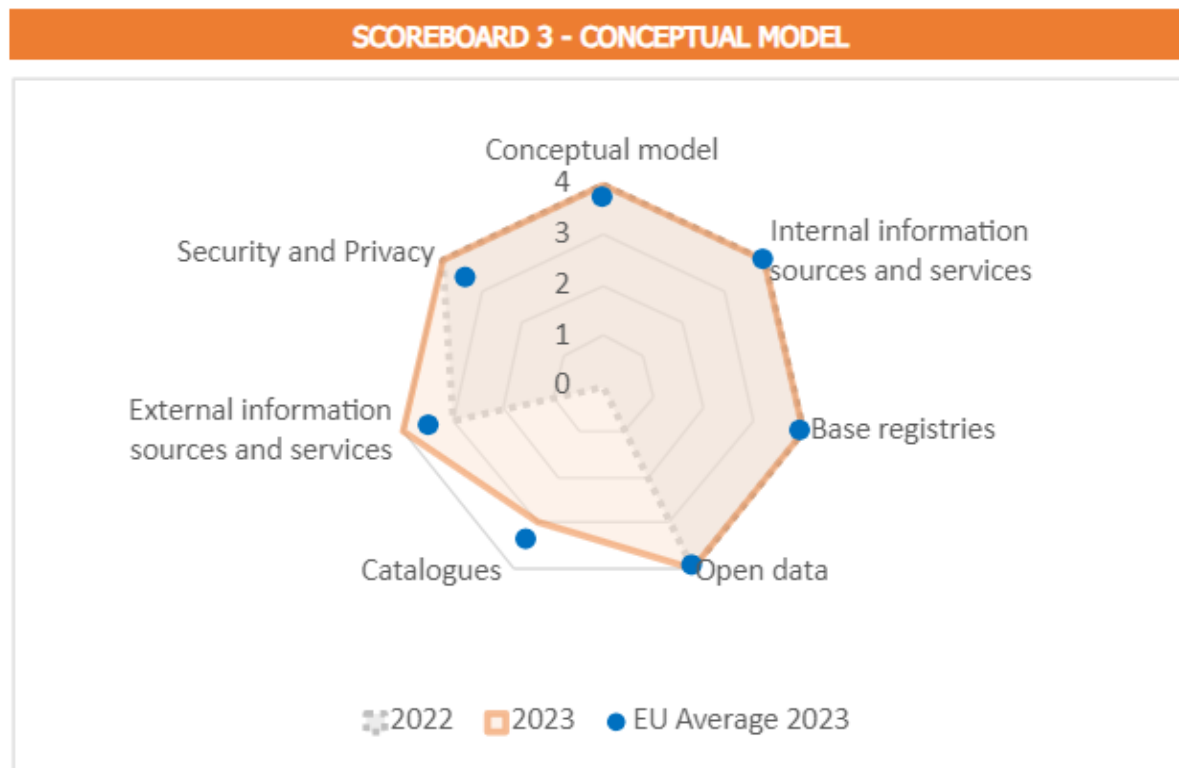


*Please note that this is only a selection of available solutions.



Poland's progress on Scoreboard 3

Poland's progress on Scoreboard 3: Conceptual model (1/2)



Overall very good level of implementation of the Conceptual model of the EIF, with **6 out of 7** components reaching the highest score of 4.



Poland **matched** the EU average on **all components**. Compared to 2022, it increased its score related to **Base registries**, **Catalogues** and **External information sources and services**.



Main potential areas of improvement are related to the components of **Catalogues**, as well as some KPIs linked to **Base registries**.

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Poland's progress on Scoreboard 3: Conceptual model (2/2)

	2023		2023		2023	2022	EU Average
Conceptual Model	4	Recommendation 34	4	KPI 54	4	4	4
		Recommendation 35	4	KPI 55	4	4	4
Internal information sources and services	4	Recommendation 36	4	KPI 56	4	4	4
Base Registries	4	Recommendation 37	4	KPI 26	4	4	4
		Recommendation 38	3	KPI 57	4	4	4
		Recommendation 39	3	KPI 26	4	4	4
		Recommendation 40	4	KPI 58	1	1	4
				KPI 59	1	1	4
Open Data	4			KPI 51	2	2	4
		Recommendation 41	4	KPI 51	2	2	4
		Recommendation 42	4	KPI 51	2	2	4
		Recommendation 43	4	KPI 61	4	4	4
				KPI 62	4	4	4
				KPI 63	4	4	4
				KPI 100	4	4	4
Catalogues	3	Recommendation 44	3	KPI 101	3	4	4
				KPI 91	4	4	4
External information sources and services	4	Recommendation 45	4	KPI 92	4	4	4
Security and Privacy	4	Recommendation 46	4	KPI 69	4	4	4
		Recommendation 47	4	KPI 70	3	2	3
				KPI 71	3	No data	3
				KPI 66	4	3	4
				KPI 67	4	4	4
				KPI 68	4	4	2

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Catalogues

*Please note that this is only a selection of solutions. The full list is available [here](#).

Catalogues help others to find reusable resources. Various types of catalogue exist, e.g. directories of services, libraries of software components, open data portals, registries of base registries, metadata catalogues, catalogues of standards, specifications and guidelines.

Commonly agreed descriptions of the services, data and interoperable solutions published in catalogues are needed to enable **interoperability between catalogues**.

Recommendation 44

- ✓ Put in place catalogues of public services, public data, and interoperability solutions and use common models for describing them.

Solutions*



The CAMSS Ontology defines the conceptual model that helps ensuring the common and standardised way for the assessment as well as identification of Interoperable Specifications.

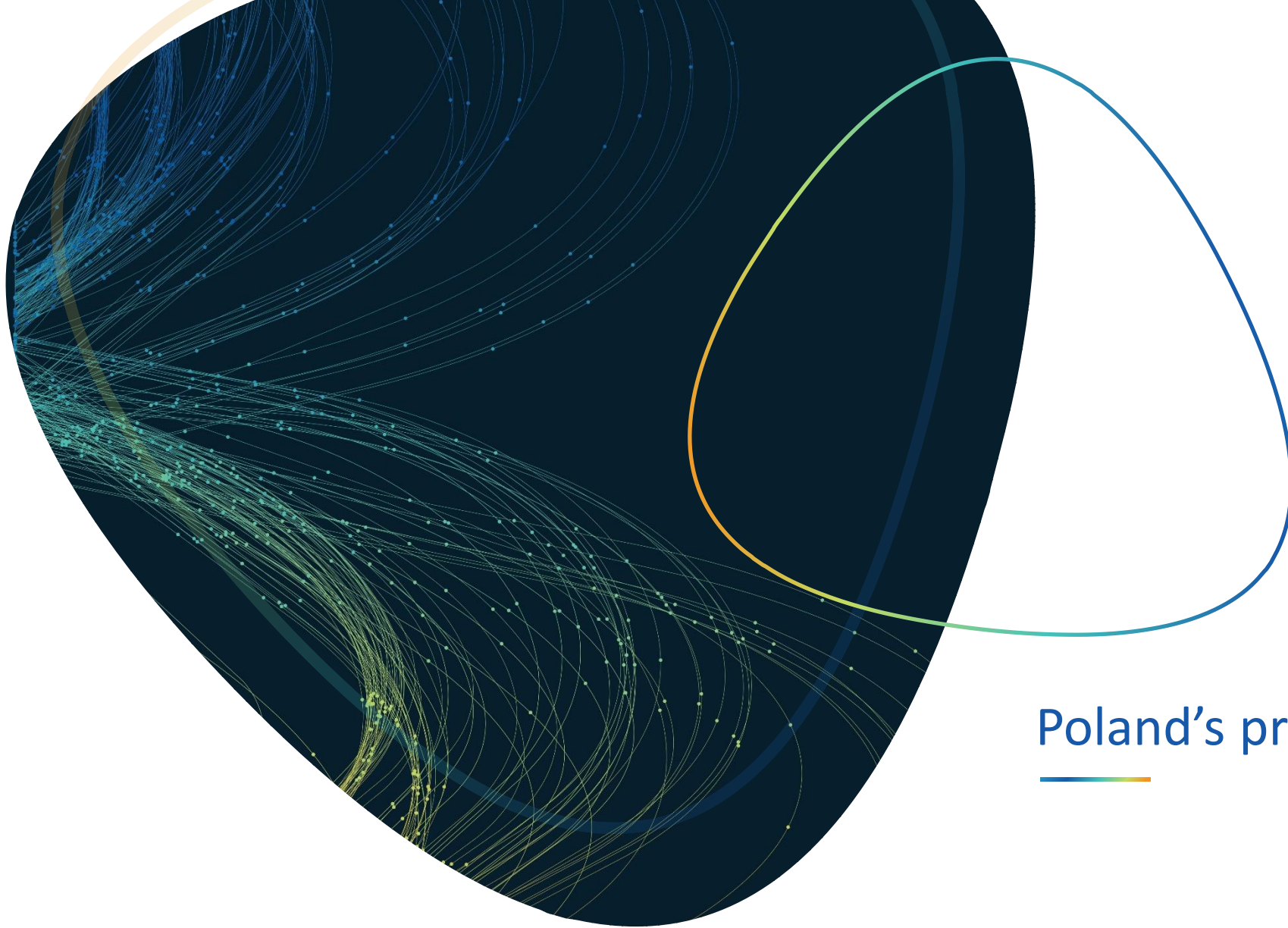


PMKI will provide a publicly available infrastructure for public linguistic resources to facilitate the implementation of interoperability solutions and use common models for describing them.

Good practice

- ✓ Spain and Portugal are piloting a project aiming at creating a federated catalogue of public services, including a catalogue of guidelines and metadata, and a user-centric website to visualise the data. In this context, the two countries are notably using the Core Public Service Vocabulary Application Profile (CPSV-AP), a reusable and extensible data specification used for harmonising the way public services are described in a machine-readable format.

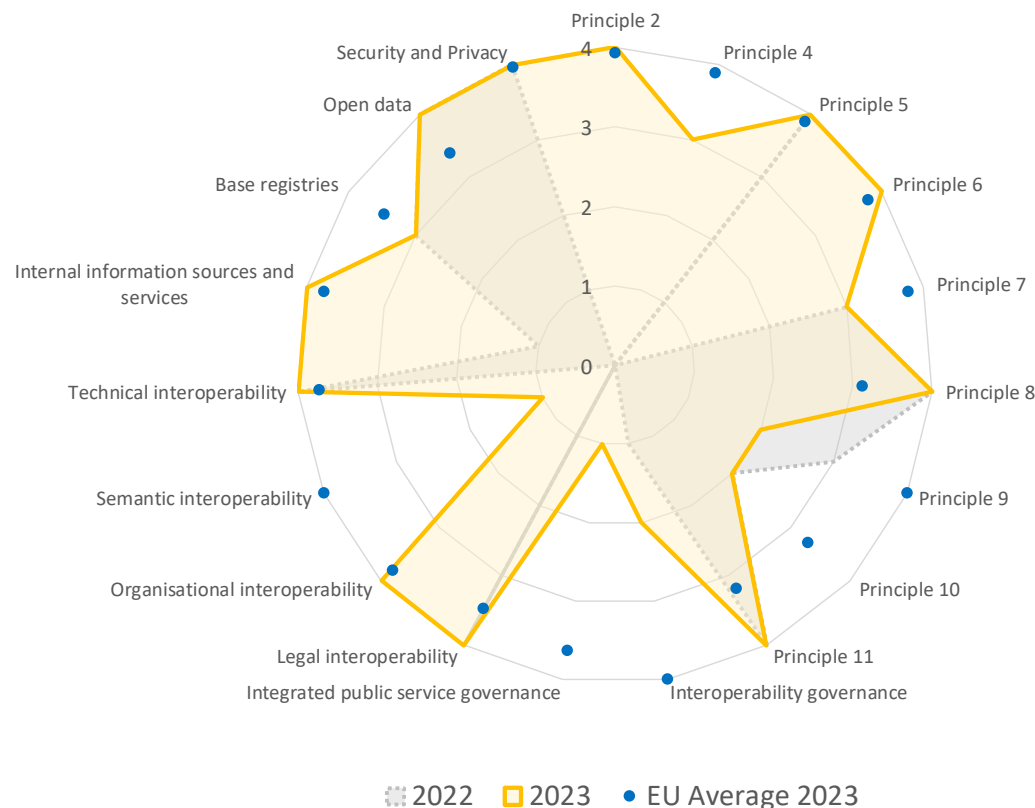




Poland's progress on Scoreboard 4

Poland's progress on Scoreboard 4: Cross-border interoperability (1/3)

SCOREBOARD 4 - CROSS-BORDER INTEROPERABILITY



Overall good implementation on Scoreboard 4, with **12 out of 19 components** reaching the highest score of 4.



The 2023 results demonstrated a high level of implementation for **Principle 2, 5, 6, 8, 11, Legal, Organisational and Technical Interoperability, as well as Open data, Internal information sources and services, and Security and Privacy**, with the maximum score of 4. In addition,



To increase its score on this scoreboard, Poland could improve its level of cross-border interoperability by focusing particularly on initiatives related to **Multilingualism** (Principle 9) and **Administrative Simplification** (Principle 10), as well as **Interoperability Governance, Integrated Public Service Governance and Semantic Interoperability**.

*Please note that the EU average encompasses the **31 countries** falling under the scope of the EIF.

Poland's progress on Scoreboard 4: Cross-border interoperability (2/3)

	2023		2023		2023	2022	EU Average
Principle 2 - Openness	4	Recommendation 2	4	KPI 91	4	4	4
		Recommendation 4	4	KPI 73	4	No data	4
Principle 4 - Resusability	3	Recommendation 6	1	KPI 74	1	No data	4
		Recommendation 7	4	KPI 11	4	4	4
				KPI 92	4	4	4
				KPI 93	4	4	4
				KPI 94	4	4	4
				KPI 95	4	4	4
				KPI 96	4	4	4
				KPI 97	4	4	4
Principle 5 - Technological neutrality and data portability	4	Recommendation 8	4	KPI 75	4	4	4
		Recommendation 9	3	KPI 76	3	3	3
Principle 6 - User-centrity	4	Recommendation 10	3	KPI 99	3	3	3
		Recommendation 11	4	KPI 22	3	3	3
		Recommendation 12	4	KPI 23	4	4	4
		Recommendation 13	3	KPI 24	4	4	4
				KPI 77	No data	4	4
				KPI 78	No data	3	3
				KPI 27	4	4	3
Principle 7 - Inclusion and accessibility	3	Recommendation 14	3	KPI 28	3	3	3
Security and privacy	4	Recommendation 15	4	KPI 29	4	4	4
Principle 9 - Multilingualism	3	Recommendation 16	3	KPI 30	2	2	3
				KPI 31	2	3	3
				KPI 32	3	3	3
				KPI 33	4	3	3

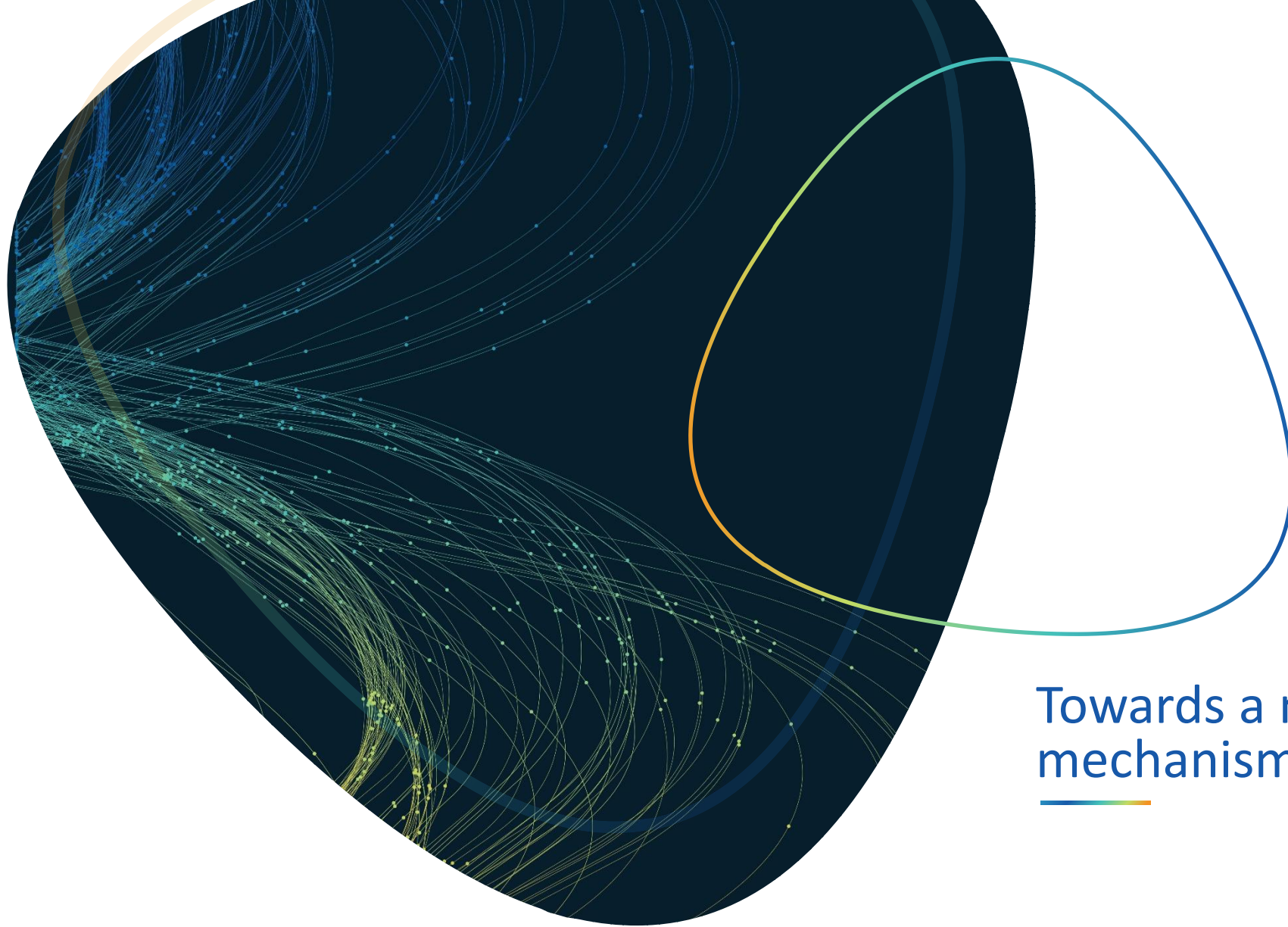
Principle 10 - Administrative simplification	2	Recommendation 17	2	KPI 79	2	2	4
				KPI 80	1	1	1
				KPI 81	3	1	3
				KPI 82	2	2	3
Principle 11 - Preservation of information	4	Recommendation 18	4	KPI 38	4	4	4
Interoperability governance	3	Recommendation 21	4	KPI 83	No data	4	4
		Recommendation 22	1	KPI 84	1	4	4
		Recommendation 23	2	KPI 43	1	1	1
		Recommendation 24	3	KPI 44	1	3	3
				KPI 45	2	4	4
Integrated public service governance	1	Recommendation 26	1	KPI 85	No data	4	4
erability	4	Recommendation 27	4	KPI 48	4	4	4
Organisational interoperability	4	Recommendation 28	4	KPI 49	4	4	4
		Recommendation 29	3	KPI 86	No data	3	3
roperability	1	Recommendation 31	1	KPI 87	No data	4	4
roperability	4	Recommendation 33	4	KPI 07	4	4	4

*Please note that the EU average encompasses the 31 countries falling under the scope of the EIF.

Poland's progress on Scoreboard 4: Cross-border interoperability (3/3)

Internal information sources and services	4	Recommendation 36	4	KPI 88	4	1	4
Base Registries	4	Recommendation 37	4	KPI 89	4	3	3
		Recommendation 38	2	KPI 90	2	No data	2
		Recommendation 39	3	KPI 59	1	1	4
		Recommendation 40	4	KPI 61	4	4	4
Open Data	4	Recommendation 41	4	KPI 62	4	4	4
		Recommendation 42	4	KPI 63	4	4	4
		Recommendation 43	4	KPI 100	4	4	4
				KPI 101	4	3	4
Security and Privacy	4			KPI 91	4	4	4
				KPI 92	4	4	4
				KPI 69	4	4	4
		Recommendation 46	4	KPI 67	4	4	4
		Recommendation 47	4	KPI 68	4	4	2

*Please note that the EU average encompasses the 31 countries falling under the scope of the EIF.



Towards a new interoperability mechanism

Interoperable Europe Act: Article 20 – Monitoring and evaluation

“The Commission shall monitor the progress of the development of trans-European digital public services to support **evidence-based policymaking** and actions needed in the Union at national, regional and local levels. The monitoring shall give priority to the reuse of existing international, Union and national monitoring data and to automated data collection.[...]”. (Article 20, paragraph 1, Interoperable Europe Act)

What is changing with Article 20 of the Interoperable Europe Act?

01

DATA COLLECTION

Priority to the **reuse of existing** multi-level monitoring **data** and to **automate data collection**

02

SCOPE

Monitoring of :

- Progress on **cross-border interoperability**
- **EIF Implementation**
- **Interoperability Solutions Uptake**
- **Open-Source Solutions and GovTech Cooperation**
- **Skills**

03

REPORTING

Introduction of a new report to:

- Assess the **cross-border interoperability progress**
- Identify cross-border interoperable public services **barriers and drivers**
- Cover the **results achieved over time**

Comparing the EIF and the new monitoring mechanism



TARGET



SCOPE

EIF VS the new
Interoperability
Monitoring
Mechanism
foreseen under
the IEA

EIF

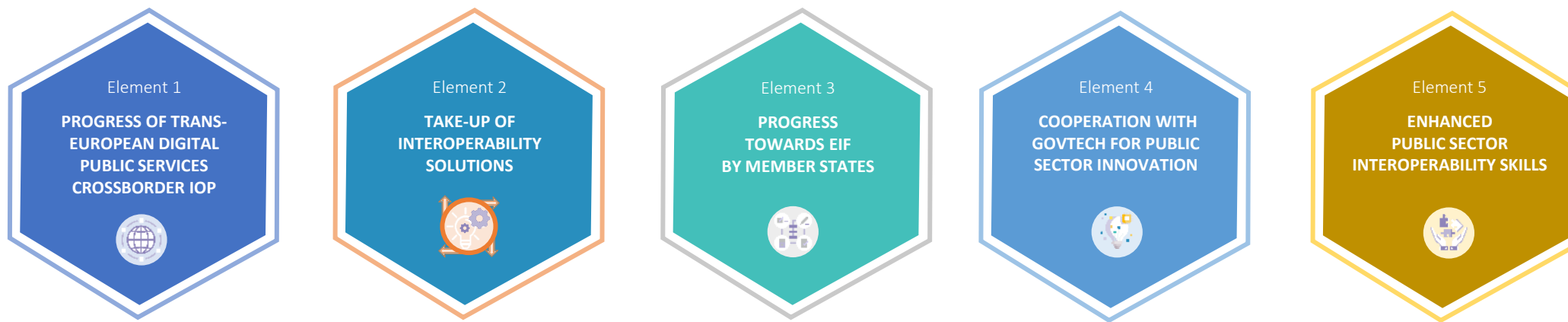
- National public administrations (mainly).
- Interoperability and the framework's principles.

New IoP MM

- Member States' public administrations and their public services at **different levels** of government.
- EU Entities that also need to apply the Act, including their TDPS and solutions.
- **Going beyond the EIF**, considering topics such as **public sector innovation**, GovTech and **public sector skills related to interoperability**, taking into account the **private sector and academia**.

Developing the new Interoperability Monitoring Mechanism (IoP MM)

In alignment with the Act, the new **IoP MM** will be divided into **five** elements:



- In order to design this new IoP MM, the JRC has been conducting work, based on a **co-creation approach** and the organisation of **Implementation and Design workshops** with relevant stakeholders. During these events, stakeholders noted the value of monitoring and pointed to knowledge-based approaches, automation and data-reuse.
- Following these consultations, the JRC is currently discussing the indicator proposal for Article 20 with experts from the Member States.



Based on the work conducted by the JRC, a selection of indicators will be tested under NIFO, either as part of a **pilot exercise** (for the more mature indicators) or as part of a **feasibility assessment** to determine if and how these indicators could be piloted/monitored in the future.

The background features two symmetrical, mirrored structures on a dark blue background. These structures are composed of numerous small, glowing particles in shades of green, yellow, and orange, which are arranged to form a central, diamond-like shape. The particles are more densely packed in the center and become more sparse towards the edges, creating a sense of depth and movement. The overall effect is a vibrant, abstract composition that resembles a stylized butterfly or a pair of wings.

Thank you!



nifO



COFFEE BREAK

interoperable
europe



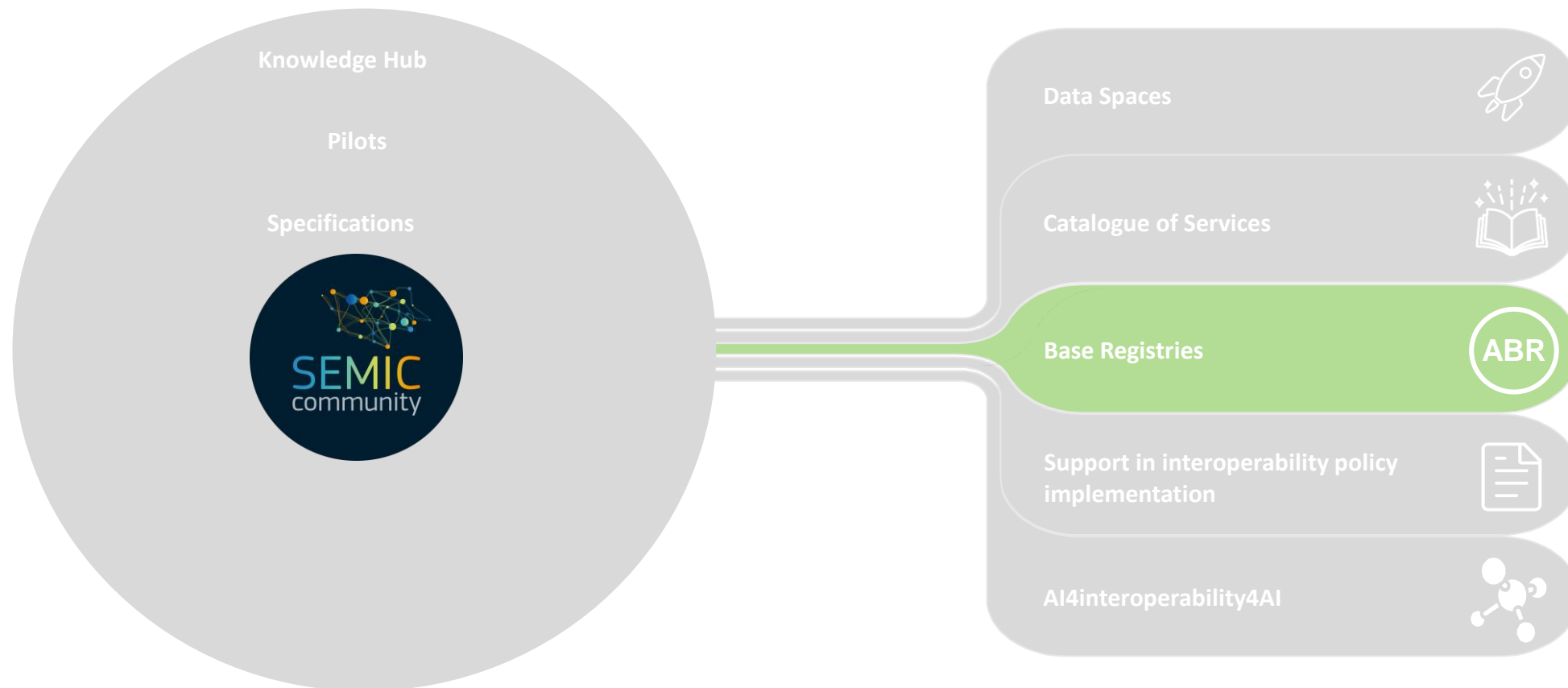
Workshop: Core Vocabularies & Application Profiles (& Style Guide) for Base Registries with a focus on ABR

interoperable
europe



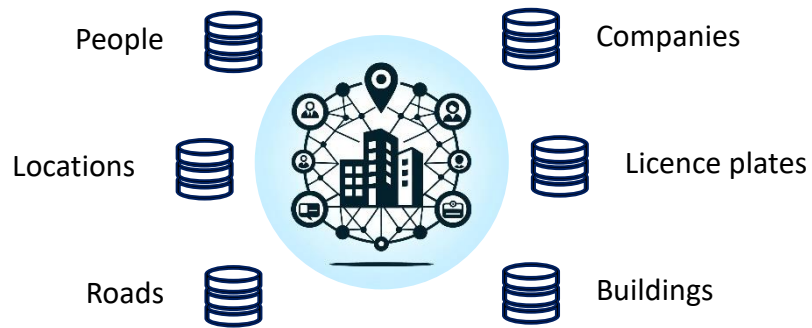
Access to Base Registries

SEMIC Focus Areas



What is a Base Registry?

A Base Registry is a trusted and authoritative source of basic information, the "master data" of public administration



Core to the **operations of a public administration**



Highly/tightly **connected** with other systems



Across boundaries of agencies, departments,... but also jurisdictions (regional > national > EU)



Continuously evolving because data is in constant flux



Challenges of BRs:

- Information models change
- History has to be maintained

Access to Base Registries

SEMIC supports public administrations in making national and cross-border access to base registries more efficient



Specifications

Your standard data models for base registries access and interconnection, **DCAT-AP**, **Core Vocs**



Guidelines

We foster common approaches to Base Registries interconnection



Tools

Open-source tools that facilitate creating, validating, harvesting and exchanging BR descriptions



Catalogue of solutions

We inspire public administrations willing to adopt new approaches for base registries interconnection



Pilots

We collect use cases and implement two proofs of concept in Norway and Malta



Specifications

- ✓ A Base Registry entity can be modelled with **Core Vocabularies**

EX| Core person: familyName, dateofBirth

- ✓ Base Registry datasets can be modelled with **DCAT-AP**

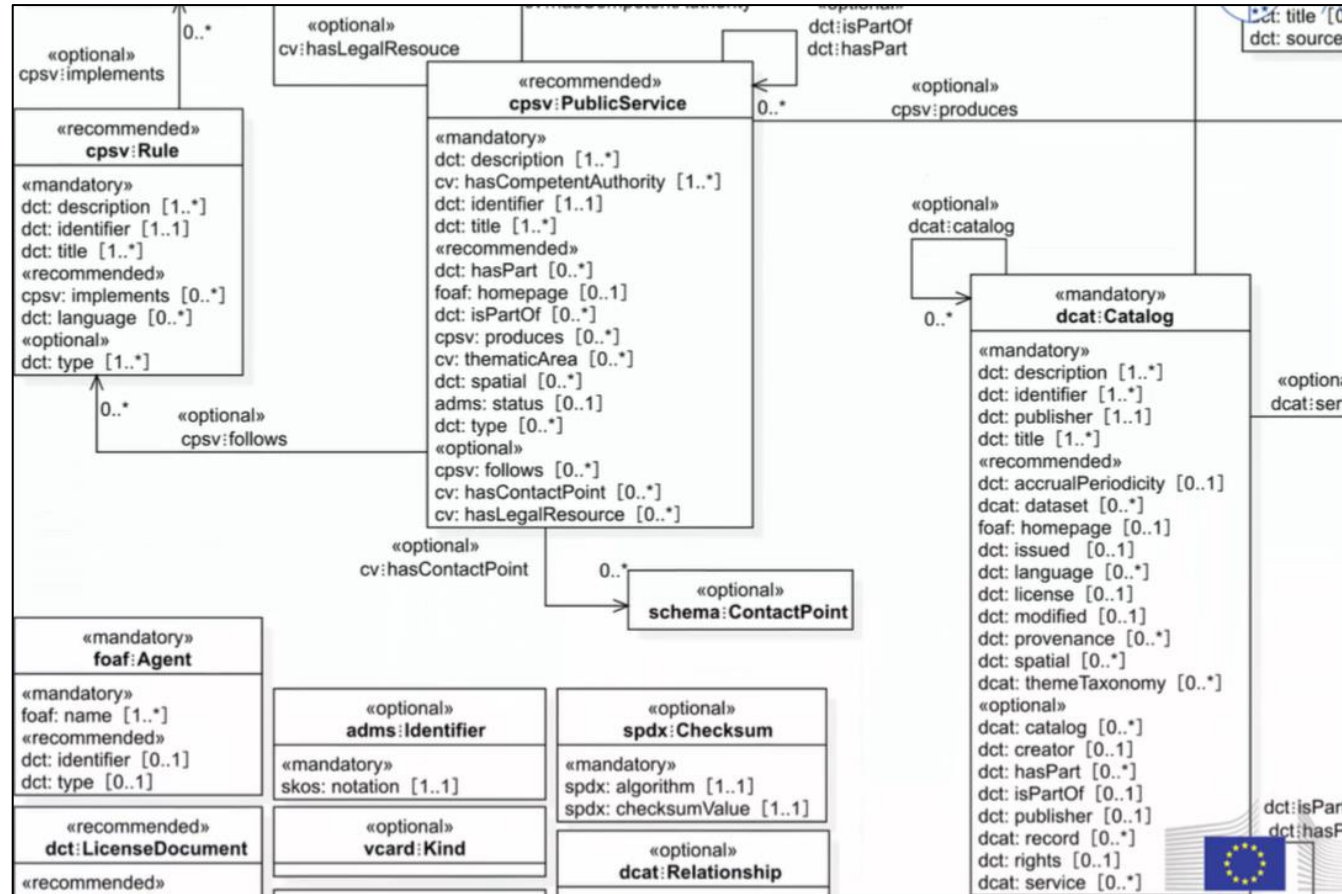
EX| Dataset: title, description, contactPoint

- ✓ Public services serving or using data from Base Registries can be expressed with the
Application Profile of the Core Public Service Vocabulary (**CPSV-AP**)

EX| Public Service: name, description, identifier



BRegDCAT-AP and its advantages



BRegDCAT-AP specification

BRegDCAT-AP is an extension of DCAT-AP for base registries, aiming to provide a standard data model / specification for base registries access and interconnection



BRegDCAT-AP allows the modelling of the dataset and the services accessing the data.



All Base Registries can be modelled using the same standard.



Using one standard allows an easy integration of Base Registries into a Registry of Registries

- **Data descriptions**

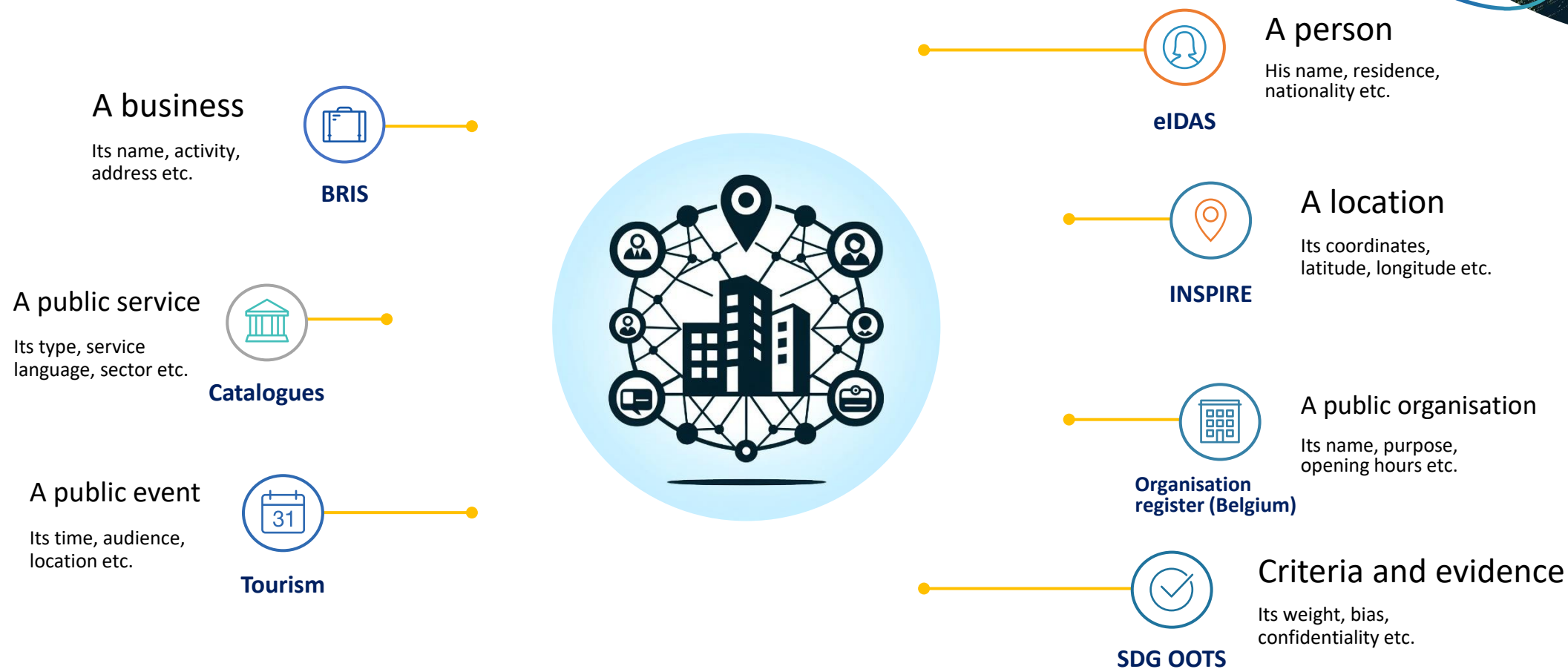
Describe their data assets for their BRs starting from DCAT-AP

- **Base Registries**

Use their BRs as authentic sources to support public administrations to provide services. These services are discoverable in catalogues using CPSV-AP

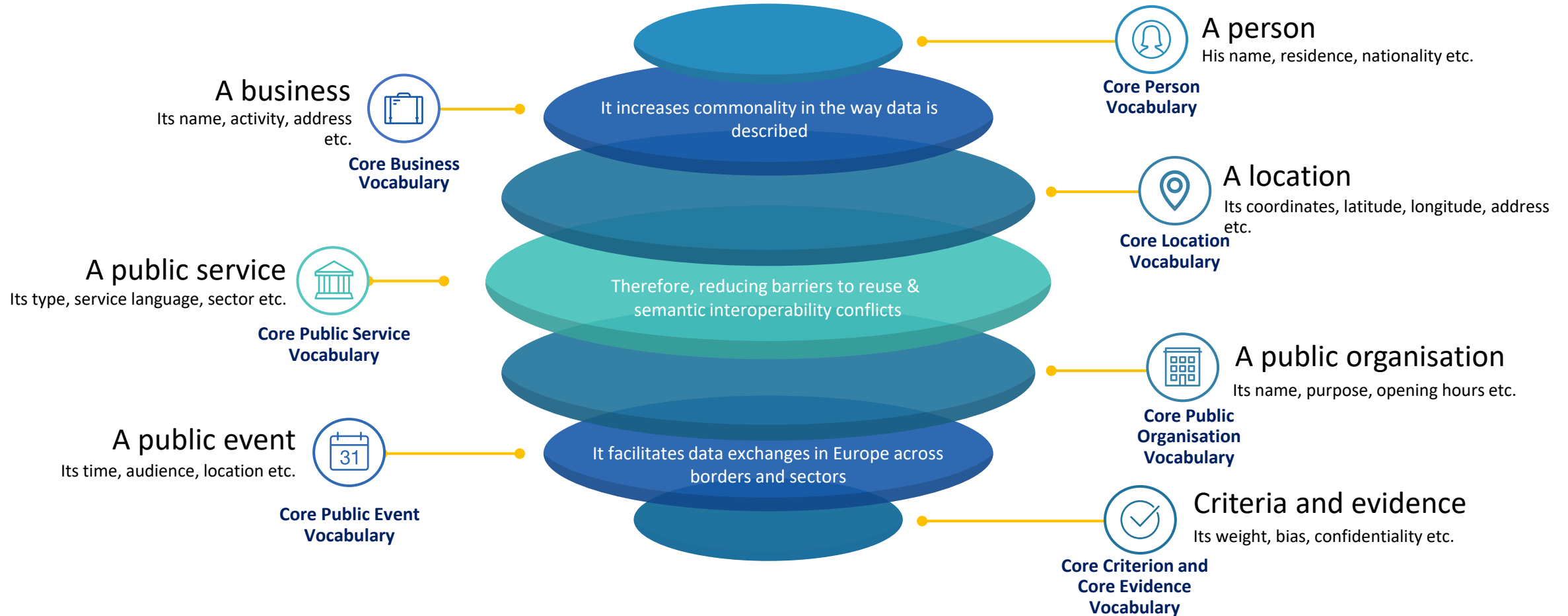
- **Catalogue of Services**

A Base Registry entity can be modelled with Core Vocabularies



Core Vocabularies

A reusable, simplified and extensible data model capturing fundamental characteristics of an entity.



Going from the SEMIC assets to assets tailored to your needs



Mapping & information needs

Map your information requirements onto the existing specifications such as (Breg)DCAT-AP and Core Person and Core Business Vocabulary.

→ If all information requirements are met by reusing the SEMIC assets as-is, you can start creating an implementation model for your base registries.



Identify gaps

Identify the gaps and missing information requirements



Extend

Extend the existing SEMIC assets with your own classes and attributes following the principles & guidelines listed in:

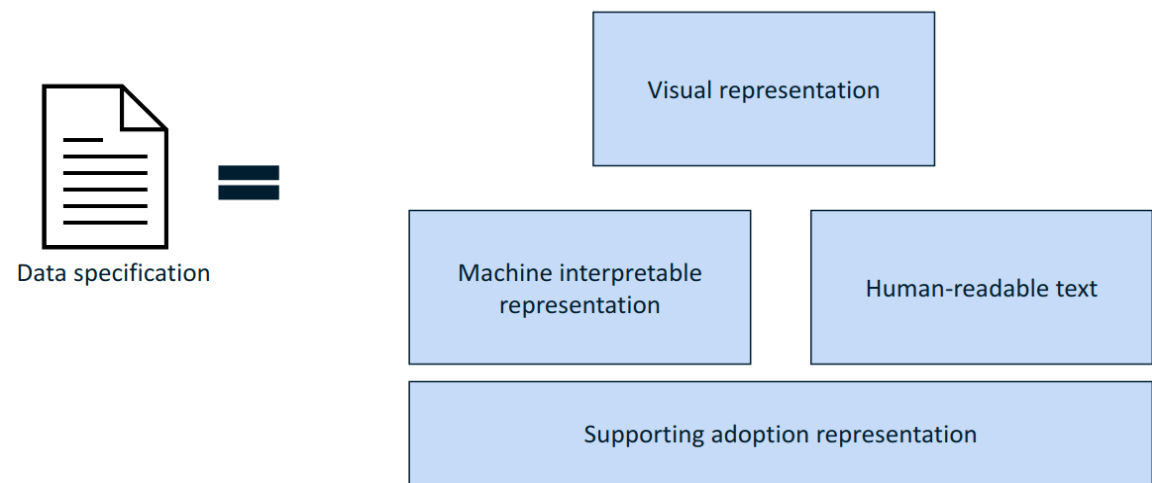
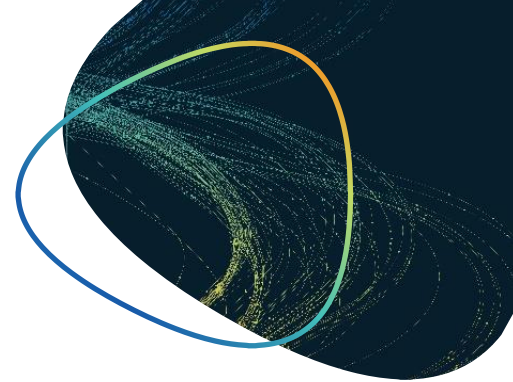
1. The Style Guide
2. Our blog article on application profiles



Validation

Validate your own extended model with the [Style Guide validator](#)

Essentials of the Style Guide



PURPOSE

Data specifications serve a purpose:
Define a common vocabulary, and/or
Specify data-shape constraints

ARTEFACTS

Data specifications comprise artefacts

NEEDS

Artefacts address various concerns (use cases)

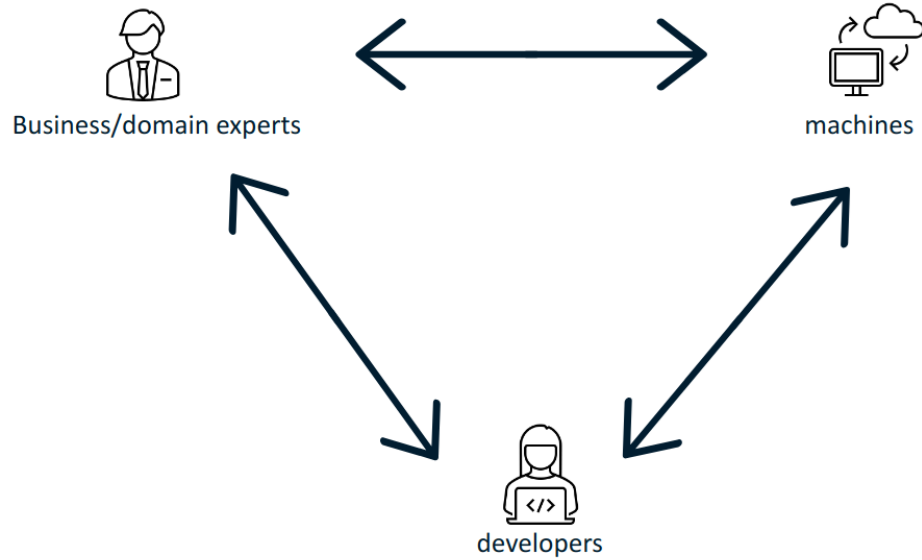
COHERENCY

Artefacts must be coherent among each other

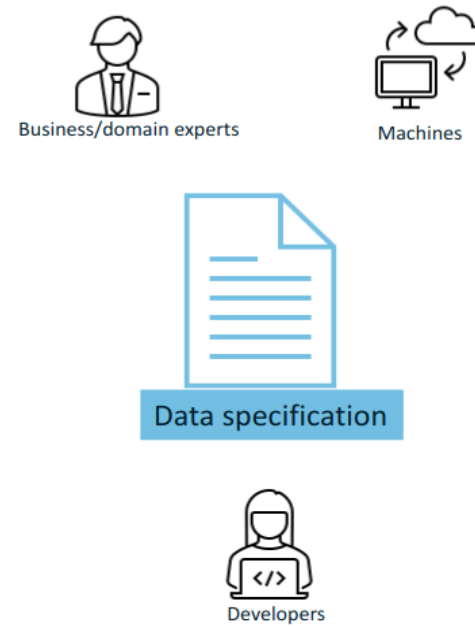
When creating semantic assets different needs to be taken in mind



Needs



Solutions



Consumer concerns



Semantic Layer

- Visual representation of the domain model
(people understand visually)
- Conceptual model of the domain
- Terminology definition
(formal and informal)
- Model instantiation constraints
(formal data shape definitions)
- Human-readable documentation
(clear, complete and precise)



Technical Layer

- Data presentation and exchange
(XML, JSON, RDF, etc.)
- Interface specifications (API)
- Interconnection services
- Data integration services
- Secure communication protocols
- Access boundaries
- Information boundaries

Editorial needs



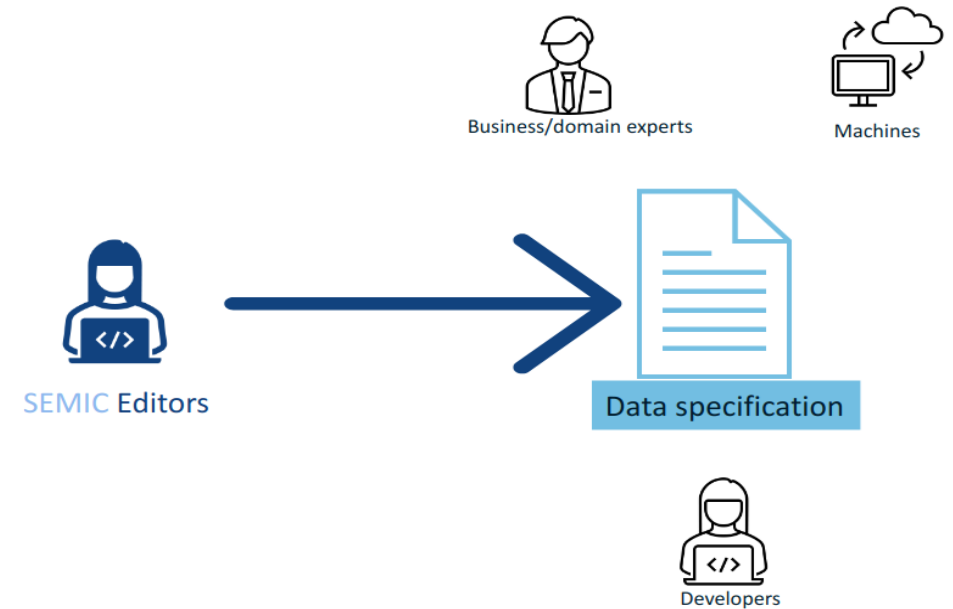
Needs

- Ensure the creation of coherent data specifications that can be read and used by domain experts, developers, and machines
- Easy maintenance across all artefacts
- High-quality artefacts



Solution

- Maintain a conceptual model as SSoT (UML)
- Automatically generate publishable artefacts (OWL+RDFS, SHACL, HTML, JSON-LD, XSD, RDBMS schemas, etc.)





Guidelines

Base registries access and interconnection framework (BRAIF)

The BRAIF aims at guiding the creation of an ecosystem of interconnected base registries which exchange data and, therefore, facilitate the set-up of integrated public services.

Guidelines on Base registries interconnection

The Guidelines aim at complementing the BRAIF with more practical information on good practice examples and recommendations.

⬇ Go to BRAIF [here](#)

⬇ Go to Guidelines [here](#)



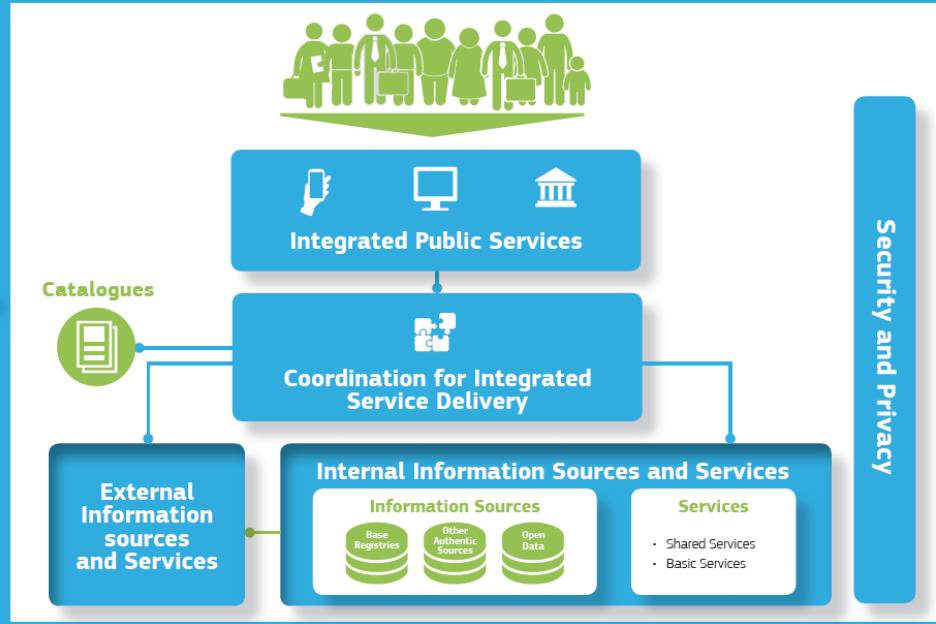
The European Interoperability Framework

EIF Conceptual Model

Interoperability Governance

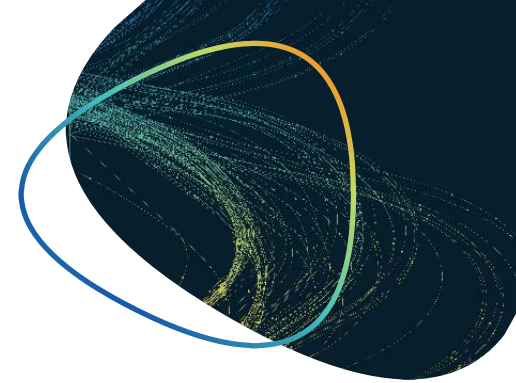


Integrated Public Service Governance



Interoperability Principles

What are the Guidelines on Access to Base Registries?



G1	Establish the overall Governance
G2	Define the hierarchy of norms and regulations
G3	Define and prerequisites
G4	Delimitate the scope
G5	G10 Ensure the right users access original and authentic data
G6	G11 Ensure the security of the data access and its communication
G7	G12 Ensure and control the quality of the data by all means
G8	G13 Envision the global (holistic) organisational picture
G9	G14 Establish interoperability agreements to ensure base registries and public services sustainability
G15	G19 Define an MDM style
G16	G20 Define data types and their management approach
G17	G21 Identify unique and unambiguous instances of your master data
G18	G22 Define the data domain
	G23 Distinguish scope and use of metadata
	G24 Define semantic assets of (master) data
	G25 Reuse semantic assets: Ontologies and taxonomies
G26	G29 Choose a data architecture model adapted to your organisational model
G27	G30 Reuse data architectural approaches on data exchange platforms
G28	G31 Use common testing tools to ensure for interoperability conformance
	G32 Enable data access supported by APIs
	G33 Develop specific strategies to steer APIs implementation

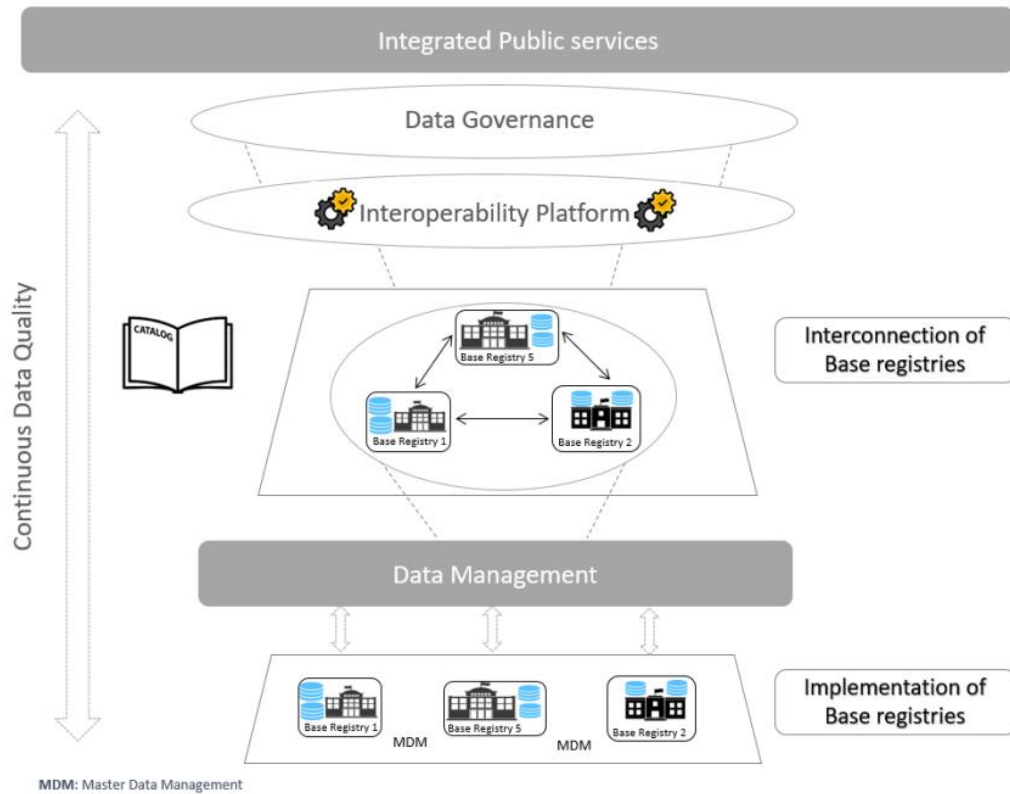


The Guidelines on Access to Base Registries Interconnection provide **recommendations and good practice** examples collected from Member States and EU Institutions.



The Guidelines aim at complementing the Base Registries Access and Interconnection Framework (BRAIF) with more practical information **on how to overcome challenges** that member states (MS) face, serving as guidance to MS on different aspects **in the creation of base registries** and registries of registries and on how to interconnect them.

What is the BRAIF Conceptual model?

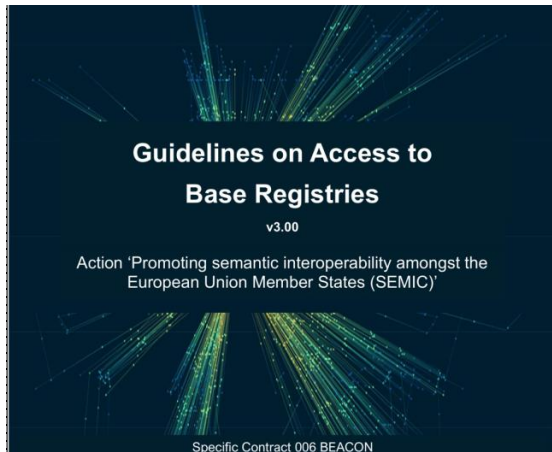


The BRAIF (Base Registries Access and Interconnection Framework) conceptual model defines a **series of steps** to take in order to establish **structure-based Base Registries** that enable the delivery of **cross-border integrated public services**.



Integrated public services are services which are delivered **under different legal frameworks, policies and strategies**.

Study and training materials for your ABR implementation



GUIDELINES

Guidelines on Access to Base Registries

[Go to guidelines](#)



TRAININGS

Access to Base Registries eLearning course

[Go to course](#)



TRAININGS

Publishing data with Linked Data Event Streams: why and how

[Go to course](#)



Tools

SEMIC has developed guidelines around the compliance against BRegDCAT-AP. These guidelines are complemented with tools to inspire public administrations and support them in the operational delivery of their Base Registries.



Tooling Assistant to identify the best tool for your BR implementation



Open-source code and prototypes covering standard features of Base Registries



BRegDCAT-AP Data Validator to verify compliance with BRegDCAT-AP



Find more tools [here](#)





Pilots

SEMIC collaborated with Member States to collect use cases and implement two proofs of concept in Norway and Malta.



Implementation of DCAT-AP-NO in Norway (by the Norwegian Digitalisation Agency - Digdir)



Reduce interoperability barriers for ID validation in Malta (by the Malta Information Technology Agency - Mita)



Find out more about pilots [here](#)



Success Story - Norway



In terms of information standards, the **Norwegian Digitalisation Agency** (Digdir) provides standards for descriptions of data sets and data directories in the public sector for both open and non-open data.

Digdir is responsible for the national application profile, namely **DCAT-AP-NO**, and the national data catalogue. <https://data.norge.no/>

Digdir started to **revise their application profile and considered that BRegDCAT-AP** fits into their scope to be used as a standard and basis for DCAT-AP-NO.

The main outcome of the pilot was the Norwegian DCAT Application Profile **DCAT-AP-NO v.2.0 that is based on BRegDCAT-AP v.2.0**.

Another outcome of the pilot was a **website where the harvested data was visualised in a user-centric way**. This provides a proof of concept for harmonising information based on the BRegDCAT-AP as common vocabulary.

Success Story - Malta



Malta Information Technology Agency (MITA) is in charge of most interoperability activities. MITA is interested in using BRegDCAT to reduce interoperability barriers for identity validation processes.

Use-case: Vehicles area

This case was proposed in order to improve existing and create new services for fighting against vehicle theft and trafficking, automatic vehicle monitoring and other possible applications to be explored. <https://open.data.gov.mt/dashboard.html>

Use-case: Citizens domain

This case was proposed for the identification of persons that live in the same household, for the purpose of quarantine control due to COVID-19.

The BRegDCAT-AP Validator and Harvester tools proved to be valuable for automating the processing, validation and merging of the generated RDF sources into the triple store.

The final outcome of the pilot was **a website where the harvested data was visualised in a user-centric way.**

Registry of registries implementations



Czechia



Four main base registries:

- Natural Persons
- Economic Entities
- Rights and Duties
- Territorial Identification



7000 public administrations
6000 information systems



6000 public services



Connected in registry of registers
using BRegDCAT-AP



Spain



Thousands of base registries



Multiple / fragmented administrative
layers:

22 Ministries
139 Autonomous Bodies
17 Autonomous Regions
8116 Municipalities



Heterogeneity:
Legal, Organisational, semantic and
technological

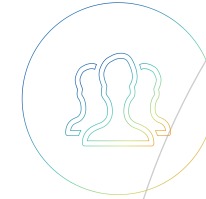
Success Story – Finland and Estonia



Cross-border data exchange across public administrations of different countries, such as FI and EE

ORGANISATIONAL

In each ecosystem, roles and responsibilities are clearly defined: Operator, Member organisations, Trust Service Providers



LEGAL

Primary sources are e.g. GDPR, Implementing Act on HVDs and national legislation on public data



SEMANTIC

Master data alignment: Business registries, Tax Registries, Deaths, Name changes, Changes of address, Information on dependent children.



TECHNICAL

Agreement on joint data exchange platform:
Reuse national infrastructure
Base registries mutually accessible



Finland: <https://www.suomi.fi/frontpage>

Base Registries: open discussion



What is your experience with base registries ?



What are the overall challenges for managing Base Registries ?
Political will, resources, access to data, semantic mapping, data quality, data exchange...



What type of resources or support would you need to enhance Base Registries access and interoperability ?



The background features two large, symmetrical, abstract structures that resemble stylized wings or flowing liquid. These structures are composed of numerous fine, overlapping lines and a dense cloud of small, glowing particles. The color palette is vibrant, transitioning from deep blue at the edges to bright green and yellow in the center of the structures. The overall effect is one of dynamic energy and complex, organic form.

Thank you!



nifO



Closing of the day

interoperable
europe



ROADSHOW

in Poland 

With the participation of



27-28 May 2024



Warsaw, Poland



interoperable
europe
innovation ∞ govtech ∞ community



Interoperability roadshow in Poland – Day 2

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Summary of Day 1

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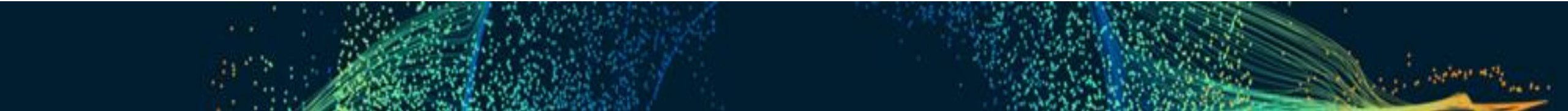


Introduction and agenda

interoperable
europe

Day 2 – Agenda

09.00 – 09.15	Summary of Day 1
09.15 – 09.30	Introduction and agenda
09.30 – 10.30	Public sector innovation solutions: focus on AI
10.30 – 10.45	Short break
10.45 – 11.55	Supporting knowledge sharing and capacity-building in the framework of the Interoperable Europe Act
11.55 – 12.15	Upcoming events under the Polish Presidency of the Council of the EU
12.15 – 13.00	Conclusion and wrap-up

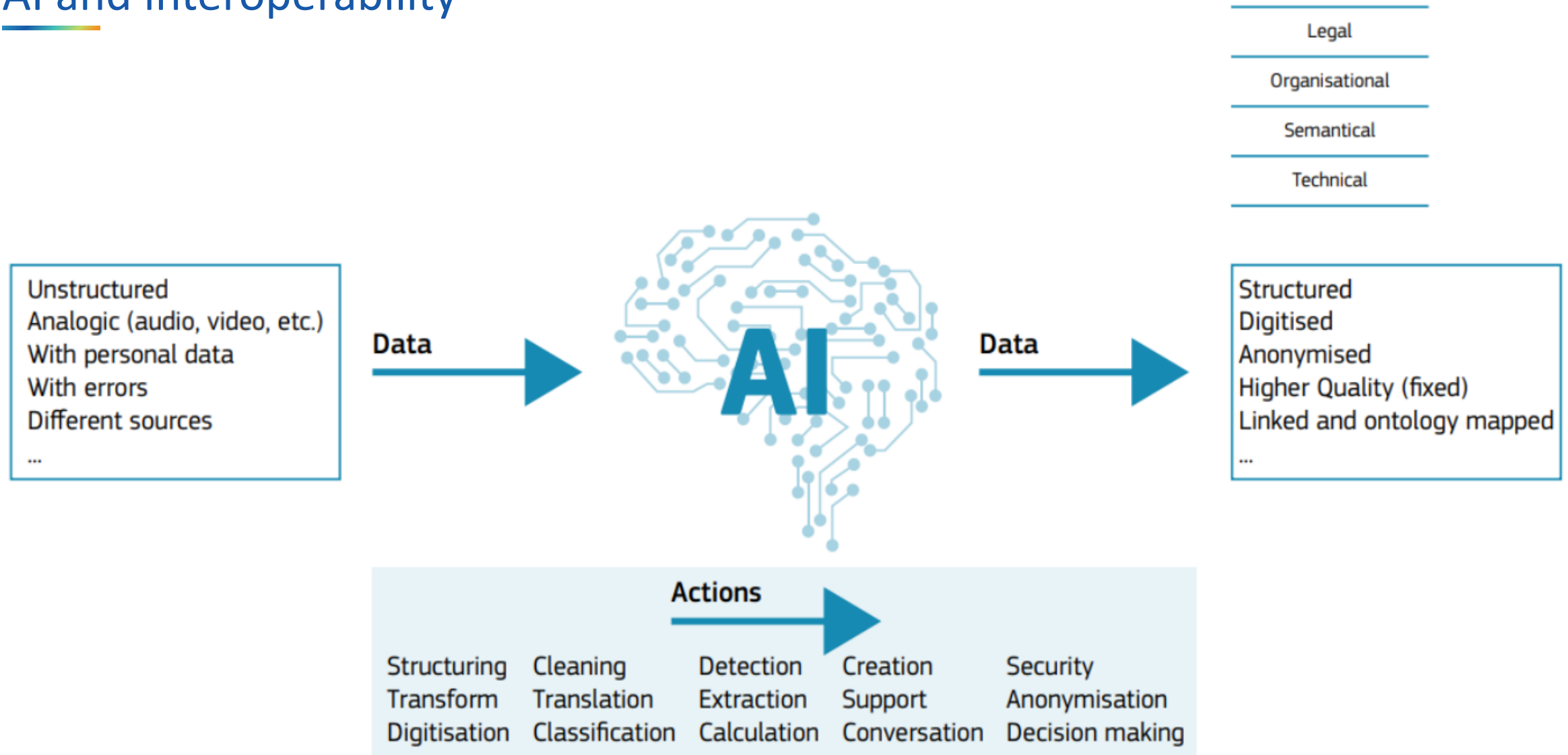




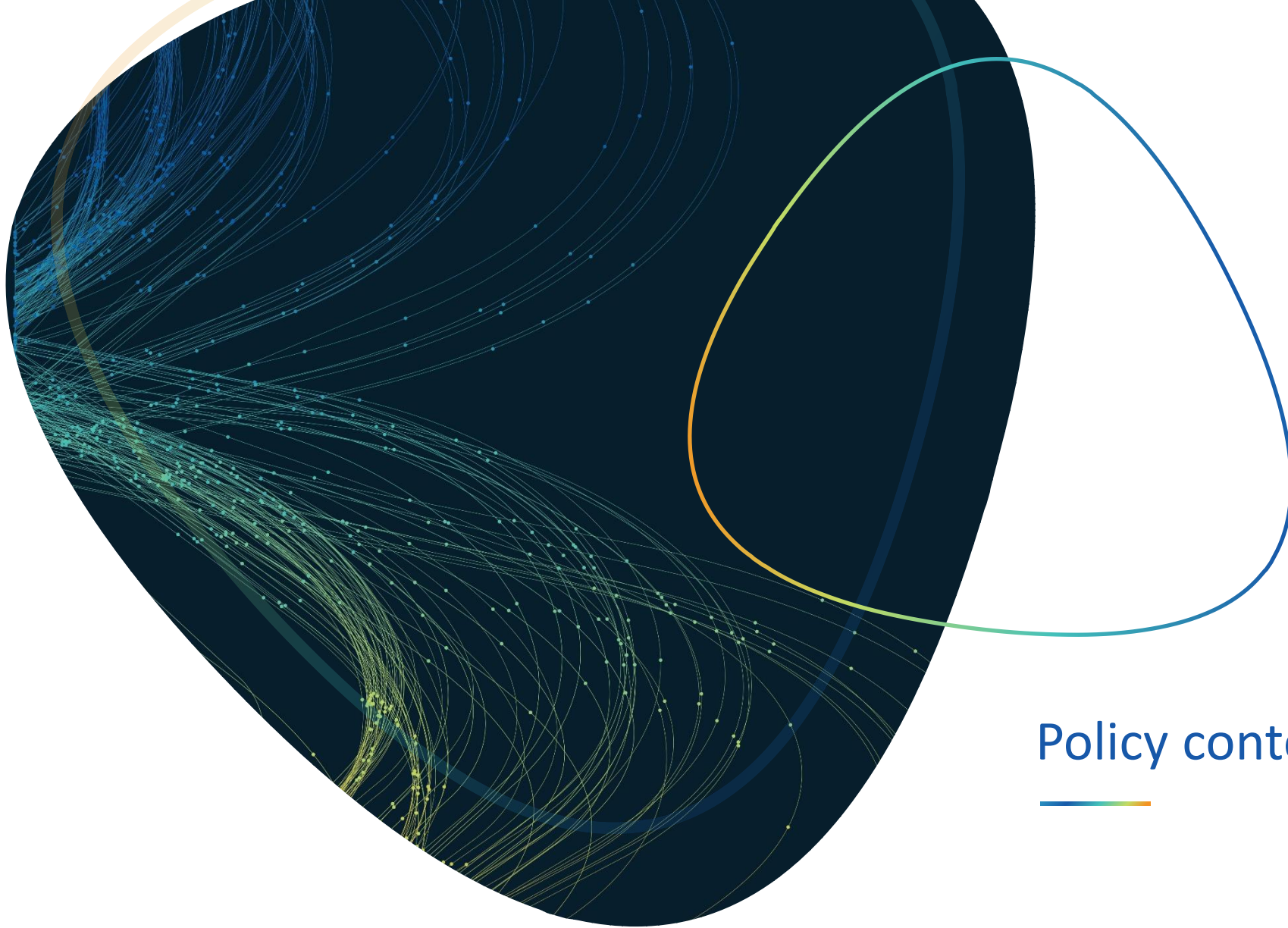
Public sector innovation solutions: focus on AI

interoperable
europe

AI and interoperability



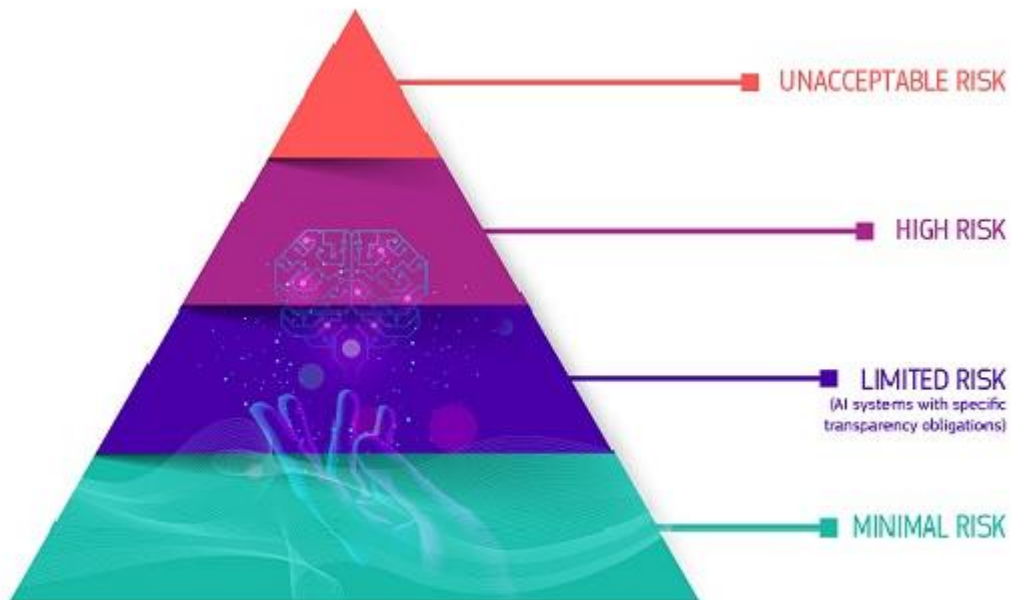
AI as a tool for doing “**actions**” over data



Policy context and EU initiatives



AI Act in a nutshell



What? the first-ever legal framework on AI
which addresses the risks of AI and positions Europe to play a leading role globally

For who? Union entities and public sector bodies
Fundamental rights impact assessments prior deploying high-risk AI systems

Why? Trustworthy AI systems
Assess challenges AI systems may bring

When? Entry into force in Q4 2024

Accompanied by the **AI Innovation Package** (incl. GenAI4EU)

the GovTech ecosystem

AI Act & AI
innovation package

Public Sector Tech Watch

a central **observatory** for citizens, policy makers etc. to gain visibility of the use cases on emerging technologies, and to share and promote their own cases.

interoperable Act europe

the IOP Act supports the investment in innovative measures (Article 10) with the creation of a GovTech community and a platform for presenting related activities and promoting use cases and best practices. At the same time encourages the experimentation and the participation in innovative sandboxes (Article 12) for piloting GovTech solutions.

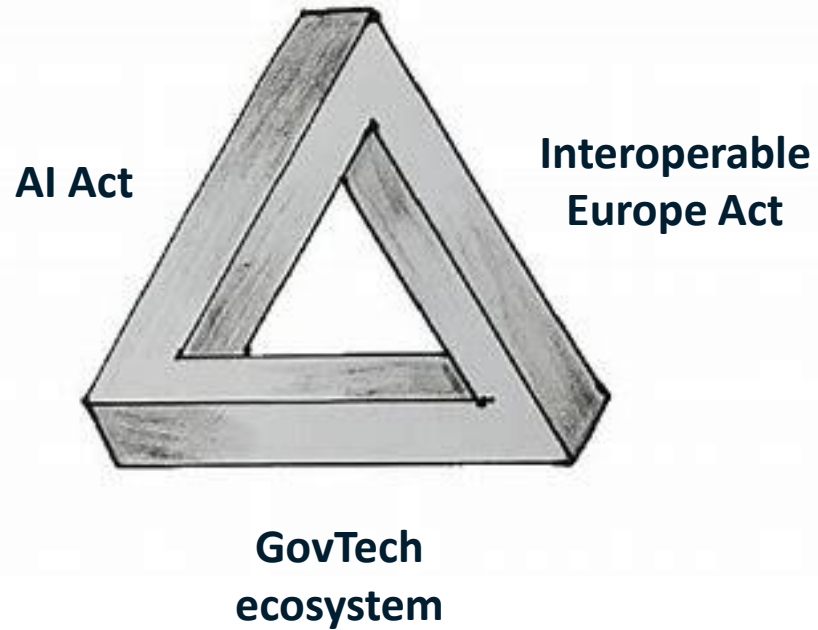
GovTech Connect

a community that brings together GovTech actors for seizing opportunities, mitigate risks and share experiences. The community provides further support by creating guidelines and studies to further support the GovTech actors.

GovTech4all Incubator

a testing arena that provides the opportunity to public administrations to experiment, test and pilot GovTech solution in safe environments and sandboxes

AI-enabled, interoperable, cross-border pilots with GovTech actors



How?

- Raising awareness on AI
- Piloting with AI also for cross-border interoperability
- Creating collaborative environments between public agencies
- Using innovative procurement processes
- New governance practices
- Upskilling staff on AI and interoperability

GovTech: The Public Sector Tech Watch



What? EC observatory on the use of emerging technologies (AI, blockchain, etc.) in the EU Public Sector



For whom? Public sector officials, policy makers, companies, and academia, interested in the latest public innovation trends



Why? To establish a community for discussing opportunities on the use of emerging technologies for the public sector, to pool and disseminate knowledge about it

Join the community

To access the [case viewer](#). To suggest content to be showcased (related news, reports, etc.), receive notifications and be directly invited to events.

Report your Cases

As service providers and public sector official you can submit your own use case of emerging technologies to inspire others.



Compete for “Best Cases Award”

The most innovative and impactful cases will be recognised with the “Best Cases Award” in the Summer 2024.

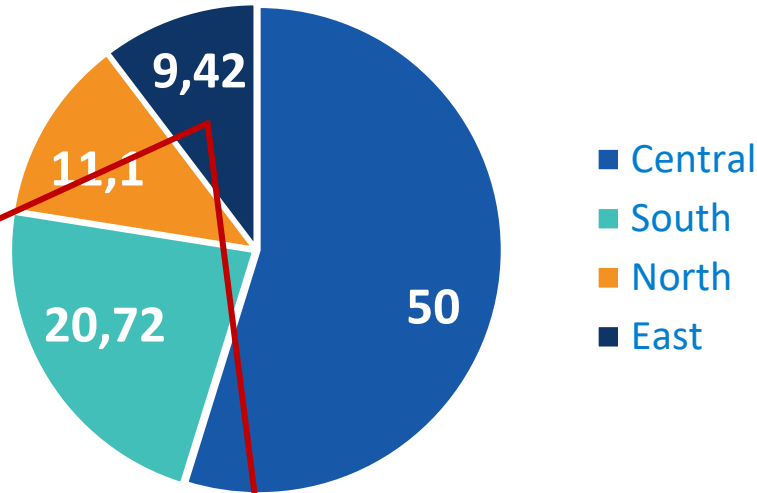


Learn more here: <https://joinup.ec.europa.eu/collection/public-sector-tech-watch>

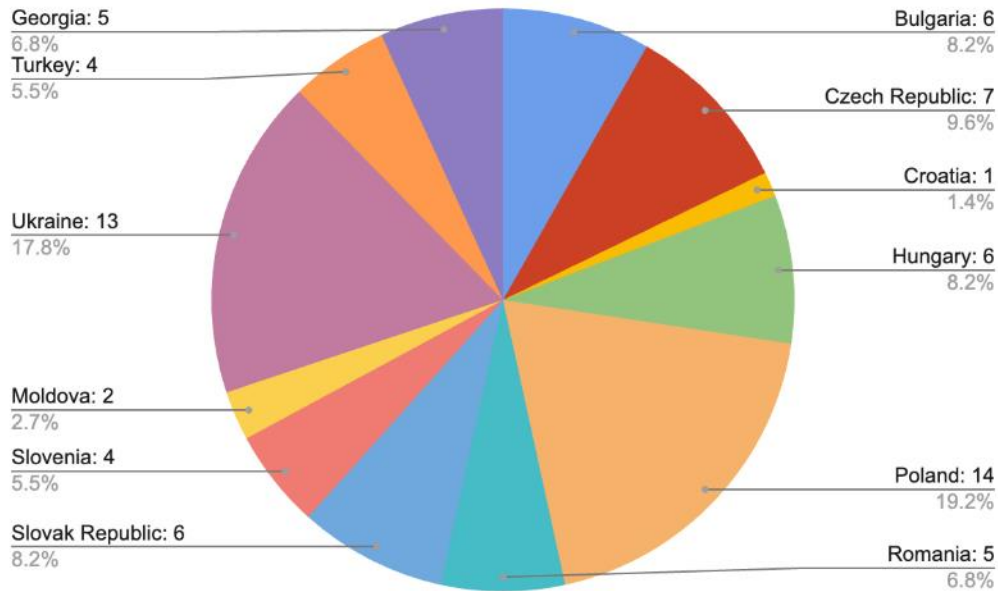
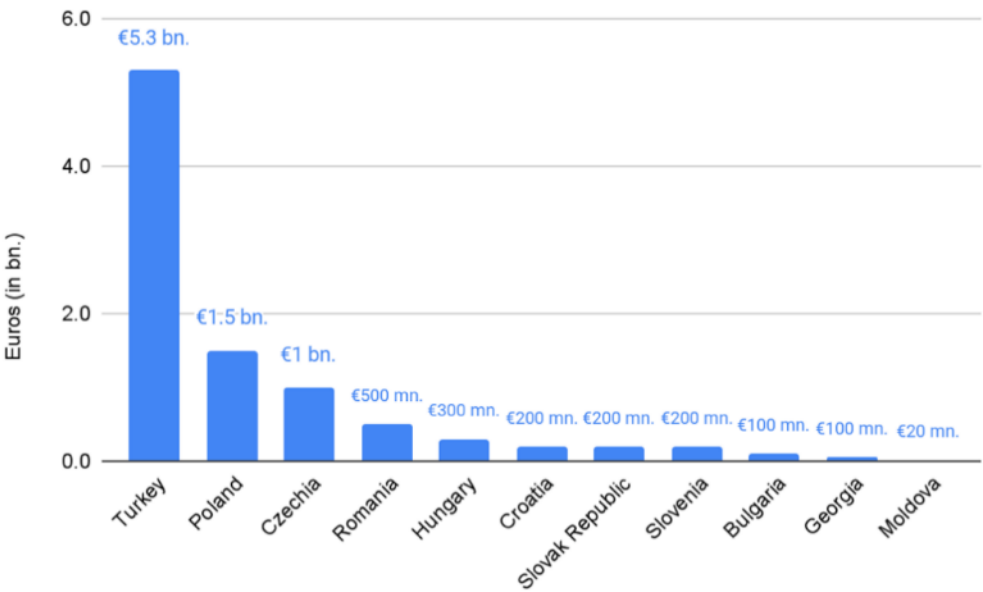
GovTech: GovTech Connect and StartUps' market size

Europe as a whole

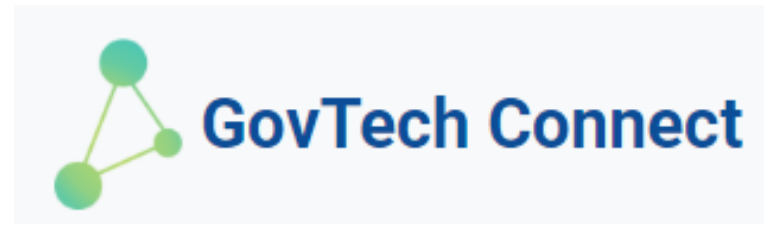
The GovTech market size exceeds 90 billion euro based on contracts and budget estimates.



Eastern Europe



GovTech: GovTech Connect and the bootcamps



Vision



Examples

tucuvi

Safe and Clinically Validated Voice
Conversational AI for Healthcare

vialytics

Intelligent Road Management System

Findable⁺

AI-powered platform
for property management,
sustainability & compliance

Objectives



- Study GovTech market trends in Europe
- Develop a catalogue of European GovTech initiatives
- Organise four European bootcamps for GovTech startups acceleration and methodology test
- **Eastern Europe bootcamp starts on 2 September 2024!**

Learn more here: <https://joinup.ec.europa.eu/collection/govtechconnect>

GovTech: GovTech4all Incubator



On-going

- Framework Partnership Agreement supported by the Digital Europe Programme (EUR 7 million, 4 years)
- Consortium: national GovTech initiatives from 21 digital agencies / 14 European countries
- First phase: 3 pilots with 14 partners from 9 countries (over 2 years)
- **StartUp challenge is currently looking for groundbreaking solutions in energy efficiency, to help revolutionise energy management in European municipalities**

Future

- Second phase (starting November 2024) with EUR 4 million funding for 5-7 pilots using emerging technologies (e.g., AI, virtual worlds)
- **National agencies interested to join, should contact the Lisbon Council, coordinator of the initiative, at the email govtech4all@lisboncouncil.net**

Learn more on how to access this opportunity: <https://joinup.ec.europa.eu/collection/govtechconnect/govtech4all>

AI-related content on NIFO

AI initiatives in the DPAFs

Collection of AI initiatives put in place in EU countries (e.g. projects, legislations, strategies)

AI in the Berlin Declaration Monitoring Mechanism

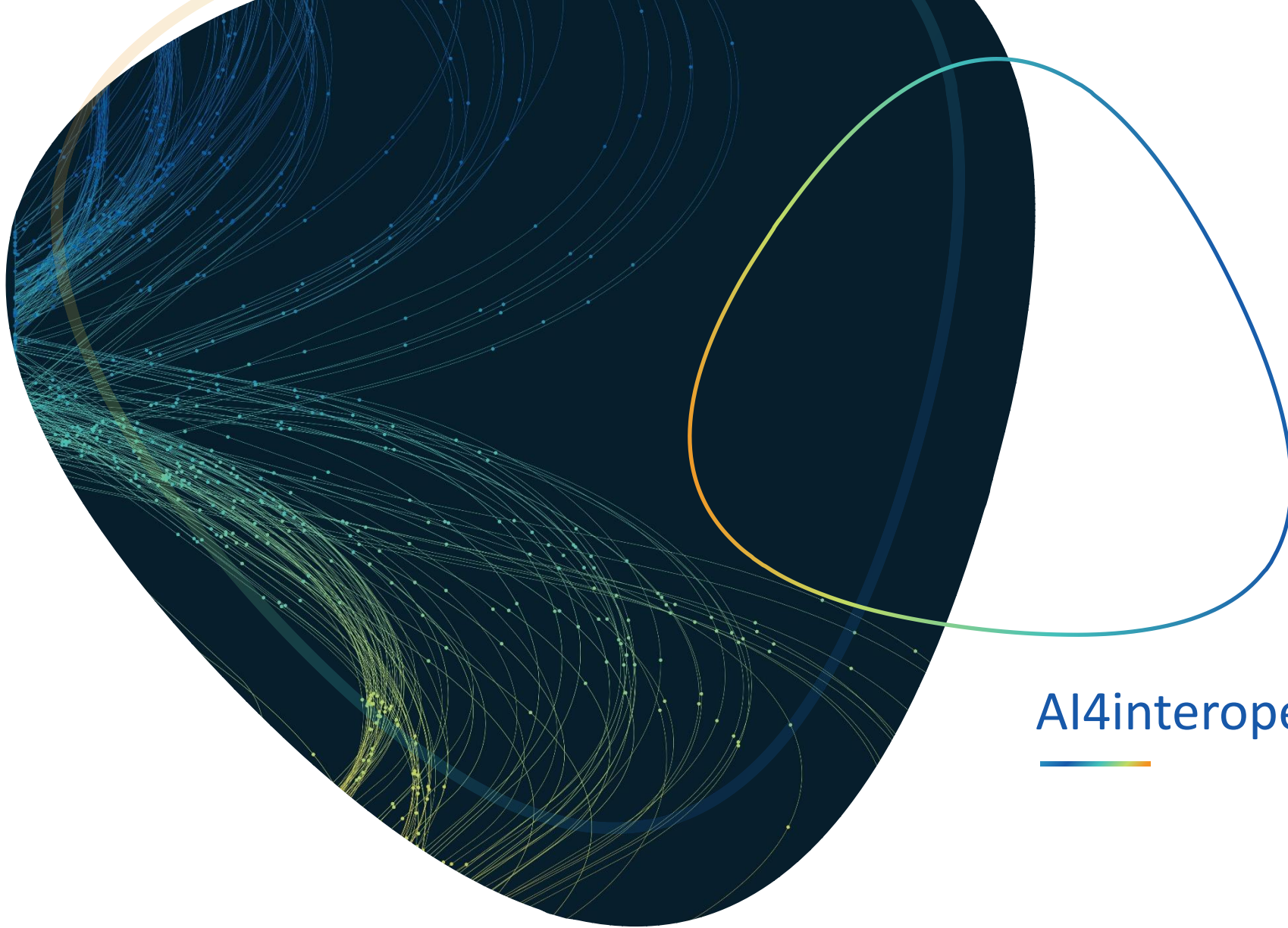
Data collection assessing the progress in the three Policy Actions linked to the promotion of human-centred systems and innovative technologies in Europe (Policy Area 6), collection of good practices and lessons learned

State-of-Play Report

Highlight key AI-related initiatives adopted by European countries and established by European Institutions and other international organisations (e.g. UN, OECD, World Bank)

Paper on “Citizen-centric and trustworthy AI in the public sector: Cases of Finland and Hungary”

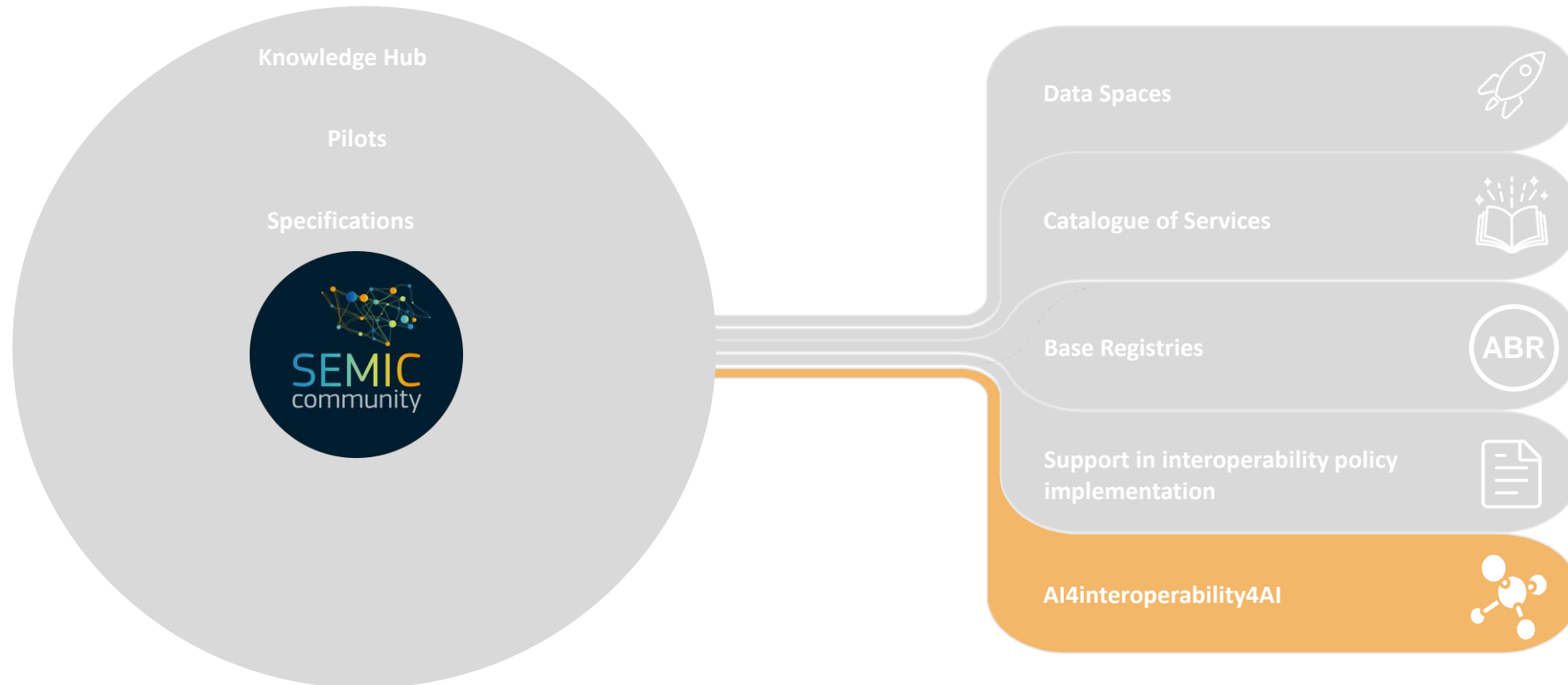
By providing examples of national good practices linked to this topic, this short paper aims to explore how human-centric systems and a trustworthy approach to AI are fostered within Member States in the EU. It also offers insights on the importance of developing interoperable AI solutions.



AI4interoperability4AI



SEMIC Focus Areas



AI 4 interoperability

Empower interoperability through AI-driven solutions. Leverage advanced AI models to bridge data silos, foster collaboration, and drive innovation.



Knowledge Extraction

Example of how AI can complement and automate knowledge extraction



Domain Adaptation

Research about the impact of retraining LLM on domain specific data for clustering



Semantic model

Development of a semantic model in the Machine Learning field (MLDCAT-AP)



Data Modelling Chatbot

Example of how GenAI can support the data modelling process with RAG



Semantic tagging

Exploration of how AI can automate the semantic tagging process



Knowledge Extraction

To harness the potential of AI at supporting interoperability (through automatic semantic alignment, vocabulary extraction, ontology extension, data modelling, ...), SEMIC has worked on building a proof-of-concept with DG GROW on the Transition Pathway for Tourism.

The objective was to see how to:

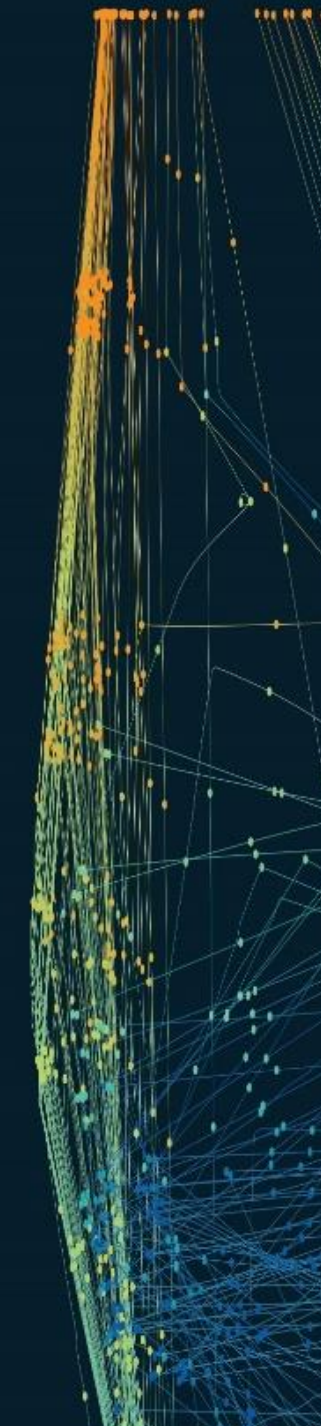
Extract topics from pledges

- **Identify new topics** emerging from the pledges
- **Assign each pledge** to its topic
- **Analyse the coherence** of existing topics

Extract results and implementation dates

- **Identify results** mentioned in the pledges
- **Identify implementation dates**
- **Build timeline** of results

Find out more about the study [here](#)





Studies & research

To stay at the forefront of AI development, SEMIC has worked on developing analysis and research in the field of Generative AI. A study on the impact of domain adaptation was carried out on two state-of-the-art models:



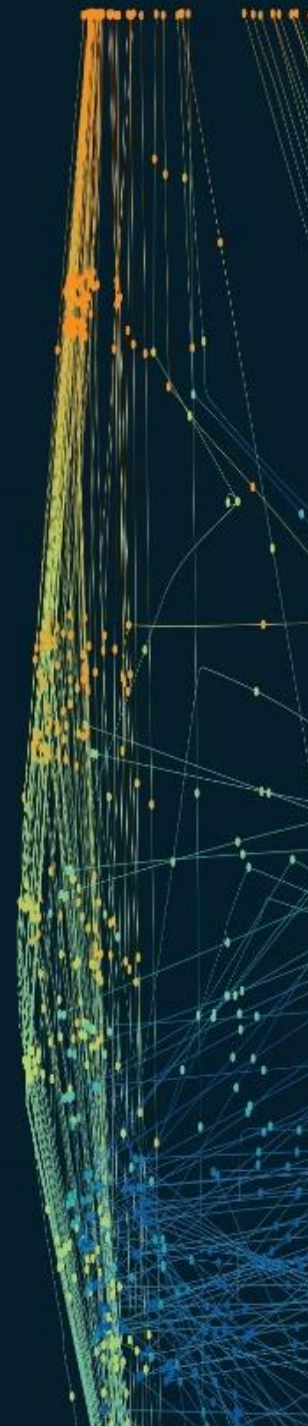
How does the retraining of BERT on tourism data impacts the quality of pledge clustering?

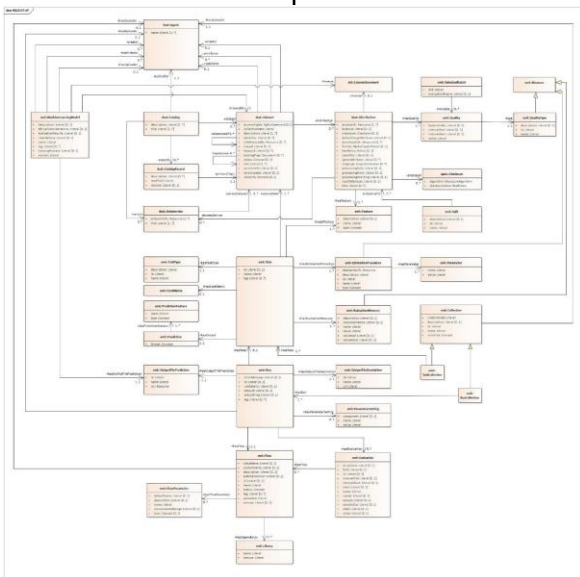


How does the retraining of RoBERTa on tourism data impacts the quality of pledge clustering?



Find out more about the study [here](#)





Semantic interoperability

MLDCAT-AP is a data model developed in collaboration with OpenML to enhance the interoperability of machine learning datasets. It aligns with DCAT-AP, providing a standard framework for describing machine learning models and datasets.

- MLDCAT-AP incorporates customizations, including classes on **quality, measures**, and a '**Machine Learning Model**' class.
- MLDCAT-AP facilitates **interoperability** and **exchangeability** of machine learning dataset descriptions.
- **OpenML**, an open platform for sharing machine learning datasets, partnered with SEMIC to pilot the model.





Data modelling Chatbot

To support the work of data modellers, SEMIC has developed a prototype of chatbot that can **suggest classes, relations, and properties** to be added to a data model based on **existing concepts**.

Suggest a possible name for a class (CPSV-AP):

"a requirement fulfill a ____" => autocomplete with "Rule"

Suggest a relation (Core Person):

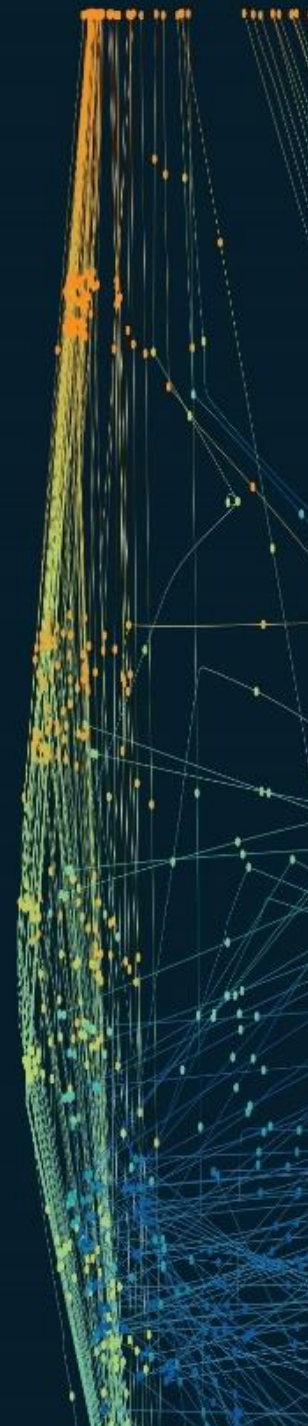
"a person is ____ at this address" = (living, domiciliated, etc.)

Suggest properties (Core Business):

"by what a legal entity can be uniquely identified ?"

Examples of what the
prototype could do

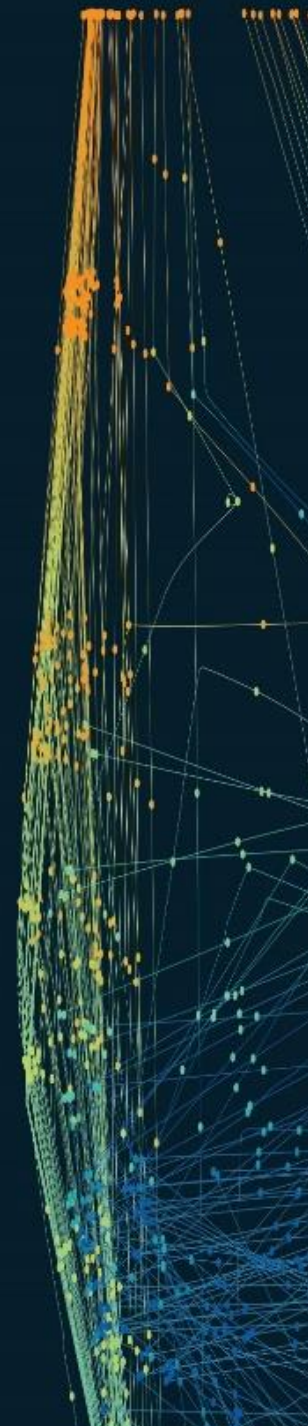
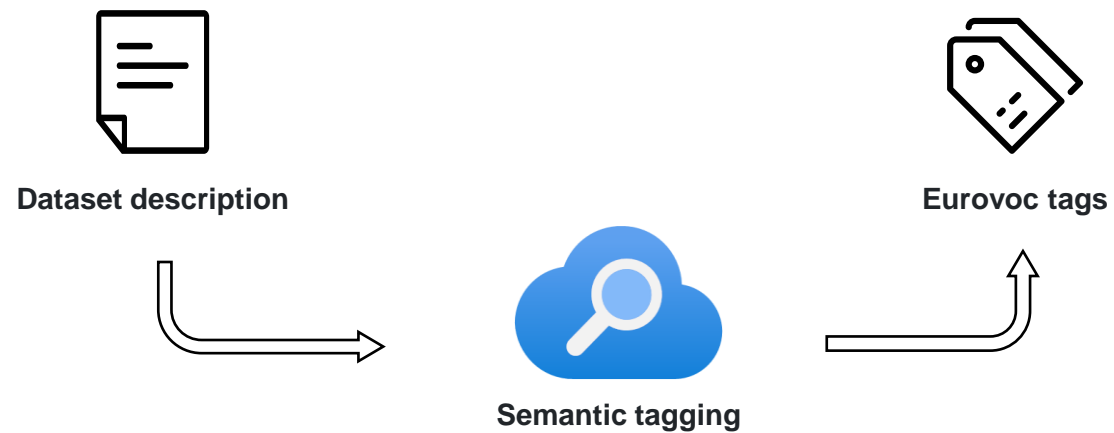
Find out more about the chatbot [here](#)





Semantic tagging

To facilitate the research and retrieval of documents on the European open data portal, SEMIC has explored how semantic tagging could be used to **suggest tags from the Eurovoc thesaurus** for a dataset:





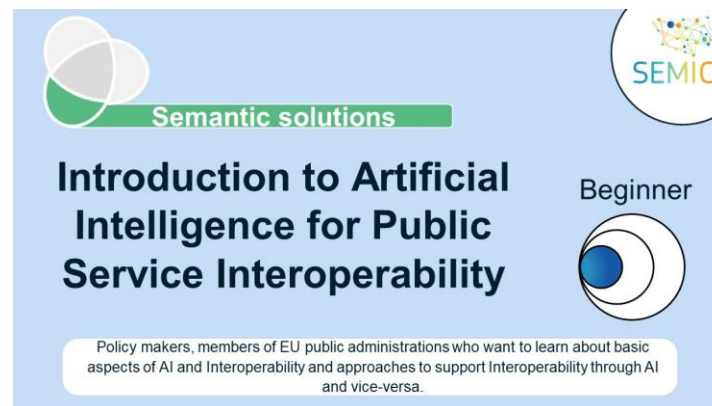
Learning materials

With the increasing role that AI plays in extracting, grouping, aligning and linking information, SEMIC created a training dedicated to AI4IOP to :

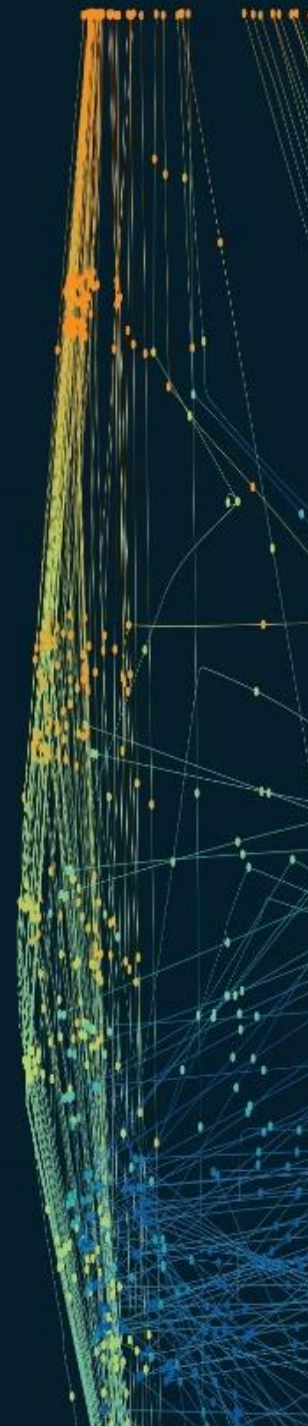
Learn the **definition of an AI system** and the challenges related to data quality.

Understand **how AI supports Interoperability** in each of its four layers

Learn about **already developed AI applications** supporting interoperability in the public sector



Access the training [here](#)



The background features two symmetrical, mirrored structures on a dark blue background. These structures are composed of numerous small, glowing particles in shades of green, yellow, and orange, which are connected by thin, flowing lines. The overall effect is reminiscent of a nebula or a complex network of data points.

Thank you!



nifO



COFFEE BREAK

interoperable
europe

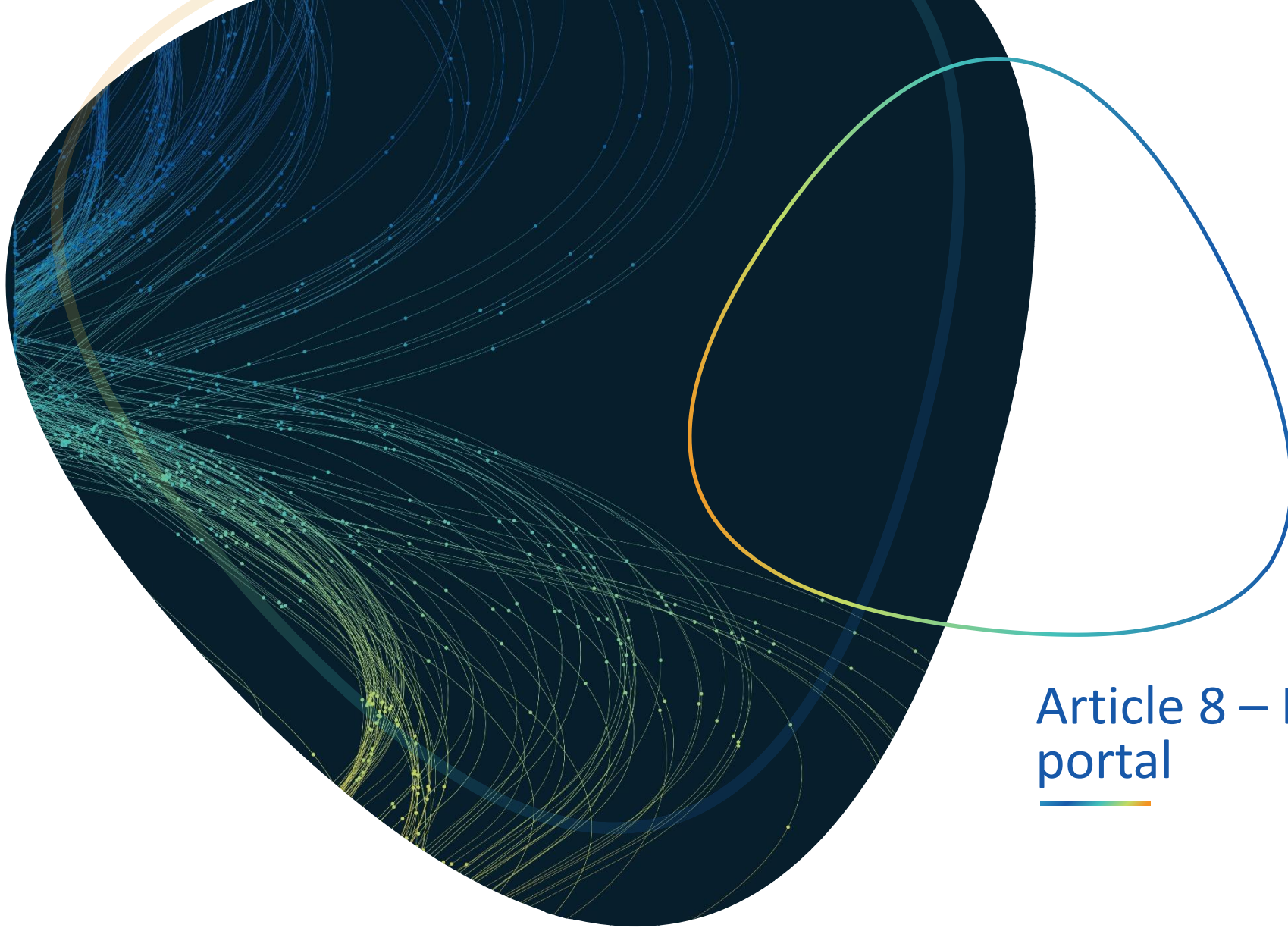


Supporting knowledge sharing and capacity-building in the framework of the Interoperable Europe Act

interoperable
europe

Knowledge sharing and capacity-building linked to the Act





Article 8 – Interoperable Europe portal

Interoperable Europe Act: Article 8 – Interoperable Europe portal

“The Commission shall provide a portal as a single point of entry for information related to cross-border interoperability of trans-European digital public services (the ‘Interoperable Europe portal’). The Interoperable Europe portal shall be electronically accessible to all citizens, including persons with disabilities, and such access shall be free of charge. [...]”. (Article 8, paragraph 1, Interoperable Europe Act)

What are the key functions foreseen by Article 8 of the IEA linked to knowledge sharing?



Providing access to Interoperable Europe solutions in a **user-friendly manner** and at least searchable per Member State and per public service.



Fostering **knowledge exchange** between members of the Interoperable Europe Community.



Listing **best practices and knowledge sharing** supporting interoperability.

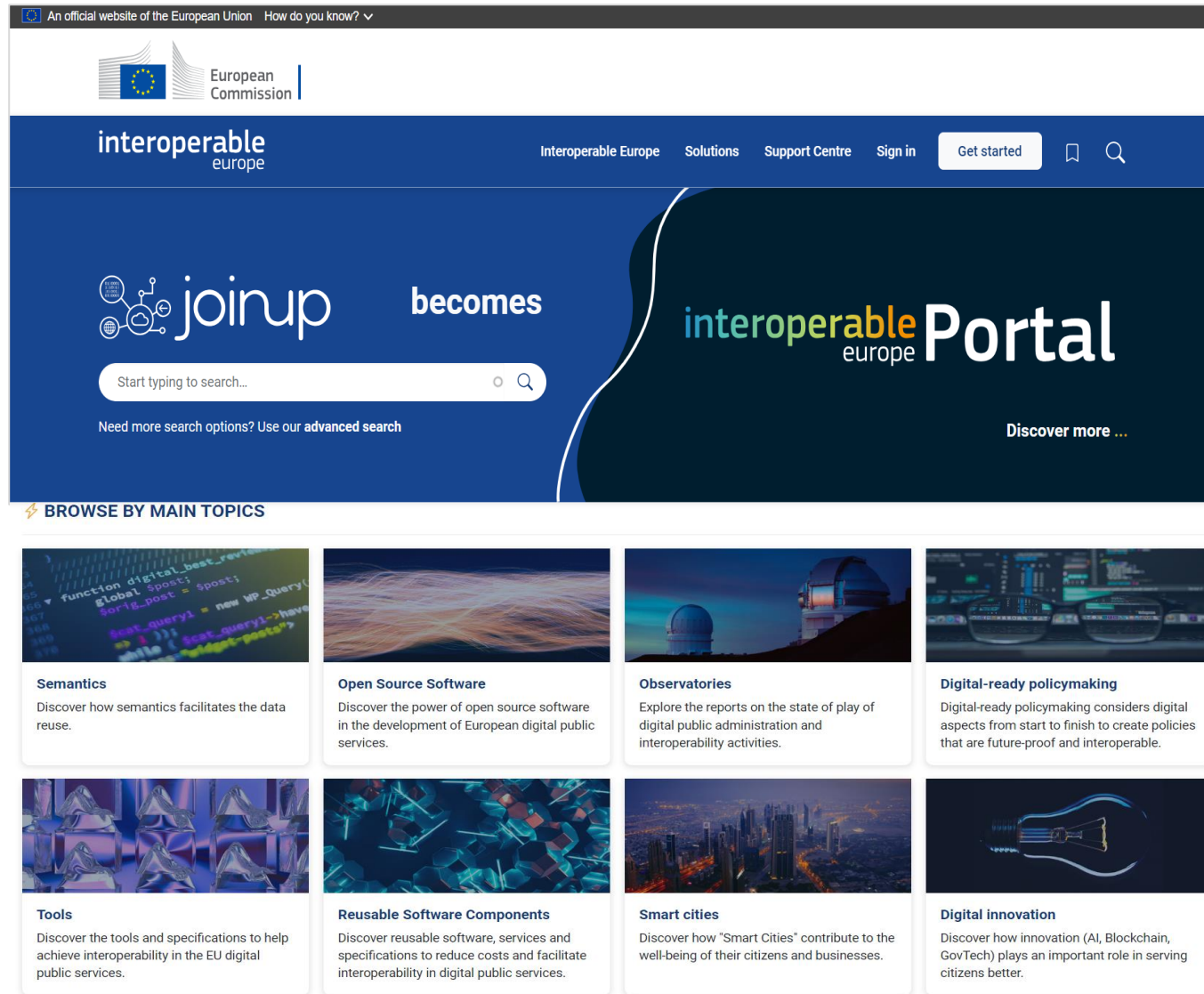


Providing **access to the data** resulting from interoperability-related monitoring.



Allowing citizens, businesses, in particular SMEs, and civil society organisations to **provide feedback** on the published content.

Interoperable Europe portal (1/3)



- Single point of entry
- User-friendly
- Easily accessible and free of charge
- By clicking on 'Get started' you can create your own account and join the different collections

Interoperable Europe portal (2/3)

interoperable europe

Interoperable Europe Solutions Support Centre Sign in Get started

NIFO - National Interoperability Framework Observatory Join this collection

1 Solution 351 members

Topics: Observatories Standardisation

Overview Digital Policy Hub Monitoring Hub Digital Public Administration and Interoperability at national level Discussions

Overview

News in NIFO

Last update: 10/04/2024

Assessing smart cities and communities' digital maturity

Smart cities eGovernment

0 News

Last update: 06/03/2024

NIFO Coffee Talk 2024

European Policies Observatories

+2 topics

0 News

Last update: 10/11/2023

STATE-OF-PLAY REPORT 2023

eGovernment

4 News

Last update: 28/08/2023

Berlin Declaration report 2023

Collaboration


Digital-ready policymaking +3 topics

2 News




1 2 3 4 5 6 7 8 9 ... > >|


- Automatic translation through **eTranslation** to ensure accessibility to all
- Translates from and into **any official EU language** as well as Arabic, Chinese, Icelandic, Japanese, Norwegian, Russian, Turkish and Ukrainian


Interoperable Europe portal (3/3)




interoperable
europe

Interoperable Europe Solutions **Support Centre**   

 Bookmark

 Like (6)

 Translate

Interoperable Europe Support Centre

Welcome to the landing page of the Interoperable Europe Support Centre!

The Centre offers various services on legal, semantic, technical and organisational aspects to improve the interoperability of European digital services.

Via this page, you may find appropriate training courses, frameworks, architectures, core vocabularies and reporting on interoperability for public administrations.

You can also make a support request and we will do our best to help you.

I need support with

select the support type you need

Base Registries

Catalogue of Semantic Services

Data Spaces

Data Models

Digital-ready Policies

Standards and Specifications


Interoperability Architecture Solutions

Conformance Testing

EIF Toolbox

Regulatory Reporting





European Interoperability Framework (EIF) Toolbox

[About](#)[EIF Policy](#)[EIF Solutions](#)[EIF Community](#)[Glossary](#)

Solution category

- Assessment tools
- Common frameworks
- Common services
- Generic tools
- Legal interoperability tools
- Semantic assets
- Catalogue of open standards and specifications

Underlying principles

- Subsidiarity and proportionality
- Openness
- Transparency
- Reusability
- Technological neutrality and data portability
- User centricity
- Inclusion and accessibility
- Security and privacy
- Multilingualism
- Administrative simplification
- Preservation of information
- Assessment of effectiveness and efficiency

Interoperability layers

- Interoperability governance
- Integrated public service governance
- Legal interoperability
- Organisational interoperability
- Semantic interoperability
- Technical interoperability

Conceptual model


- Model
- Coordination function
- Internal information sources and services
- Base registries
- Open data
- Catalogues
- External information sources and services
- Security and privacy

[Subscribe to this solution](#)

Attributes matching the EIF

- Underlying principle** Openness, Transparency, Reusability, Technological neutrality and data portability
- Interoperability layer** Interoperability governance, Semantic interoperability, Technical interoperability
- Conceptual model** Open data
- Solution category** Semantic assets

Asset Description Metadata Schema (ADMS)



The **Asset Description Metadata Schema (ADMS)** is a specification used to describe reusable solutions, such as data models and specifications, reference data, and open source software. It was created with the help of a working group of experts. On 1 August 2013, W3C published ADMS as a W3C Working Group note.


Solution's owner: European Union

[View EIF Perspective](#)[Go to Solution](#)

Attributes matching the EIF

- Underlying principle** Openness, Reusability, Technological neutrality and data portability, User centricity, Security and privacy
- Interoperability layer** Interoperability governance, Organisational interoperability, Semantic interoperability, Technical interoperability
- Conceptual model** Model

Big Data Test Infrastructure (BDTI)



The BDTI is a ready-to-use, free of charge, analytics cloud stack for the public sector offered to all European public administrations to experiment with open-source tools and foster the re-use of public sector data for a data-informed public sector.


Solution's owner: European Commission - DIGIT

[View EIF Perspective](#)[Go to Solution](#)

Monitoring Hub

interoperable
europe

Interoperable EuropeSolutionsSupport CentreSign inGet started

**NIFO - National Interoperability Framework Observatory**

1 Solution351 members

Topics:ObservatoriesStandardisation


Join this collection

OverviewDigital Policy Hub**Monitoring Hub**Digital Public Administration and Interoperability at national levelDiscussions

Supporting Material


BookmarkLike (0)Translate

The **Supporting Material** section gives you access to key information on the [European Interoperability Framework](#), its implementation and monitoring. More specifically, here you can find:




EIF GLOSSARY

[EIF Glossary](#) provides a list of all the relevant terms used in each base registry for information purposes.



EIF GUIDELINE DOCUMENT


[EIF Guideline Document](#) aims to provide a user-friendly guide for Member States on how to read the EIF, explain how to find EIF documentation, understand the logic behind the EIF and how it can contribute to improving and implementing the [interoperability](#) of public administrations in Europe.



TRAINING MODULES


[Training Modules](#) provide useful information on four distinct topics related to the EIF, including a general Introduction to the EIF, a detailed presentation of the EIF, an explanation of the monitoring mechanism and on the EIF Implementation.

Digital Policy Hub

 **NIFO - National Interoperability Framework Observatory**

Join this collection


[Overview](#) [Digital Policy Hub](#) [Monitoring Hub](#) [Digital Public Administration and Interoperability at national level](#) [Discussions](#)



Digital Public Administration factsheets


The Digital Public Administration factsheets provide a country-level, yearly overview on the latest developments and advances on digital public administration and interoperability matters in 35 European countries. Additionally, each year a factsheet dedicated to the EU is also published.

Interested in one specific country? Browse content "per country" by using the interactive map above!



Digital Policy reports


The Digital Policy reports include different types of reports, which aim at capturing the most recent developments and main trends in the field of digital public administration and interoperability at European level.



Country Case Studies

The country case studies developed in collaboration with national administrations, provide in-depth country-level examples and best practices on themes related to digital public administration and interoperability matters.

Interested in one specific country? Browse content "per country" by using the interactive map above!



Interoperability for Smart Cities

The Interoperability for Smart Cities section offers an overview of all available material, including reports and guidance documents, supporting the interoperability uptake for smart and sustainable cities and communities across Europe.



State Information Architecture

Interoperability training and supporting material package

Principle 2 – Openness

Recommendation 4

- ✓ Give preference to open specifications, taking due account of the coverage of functional needs, maturity and market support and innovation.

Solutions*



The CPSV-AP data model is based on open specifications. Hence, by reusing it, public administrations will in turn be giving preference to open specifications.



DCAT-AP is a solution that is based on open specifications, and it is actively maintained by a community of developers.

*Please note that this is only a selection of solutions. The full list is available [here](#).

Good practices

- ✓ In Austria, open-source software and its respective Total Cost of Ownership (TCO) are considered as default when planning new public services. Besides the costs, additional perspectives are taken into consideration in software contracts, such as the confidentiality of secret algorithms, operational security, and legal aspects (e.g., compensation for damages). A number of e-Government applications make use of MOA (Modules for Online Applications) components, like MOA ID for identification, or MOA SP for signature verification.



Semantic interoperability

Recommendation 32

- ✓ Support the establishment of sector-specific and cross-sectoral communities that aim to create open information specifications and encourage relevant communities to share their results on national and European platforms.

Solutions*



The CEF eDelivery building block encourages community driven development and updates of standards, hence involving a wide range of stakeholders in its development.



By extracting legal resources identifiers, Ref2link fosters use of semantic web standards (linked data, URIs...).

*Please note that this is only a selection of solutions. The full list is available [here](#).

Good practices

- ✓ The Belgian Federal Government is using the EU Publication Office's controlled vocabularies and thesauri and started building its own national reference data. Besides, the Flemish Region has published, in a central catalogue of standards, commonly agreed descriptions of data (vocabularies, application profiles and implementation models), which are published in both human- and machine-readable formats. Data standards have been developed in over 40 domains and are managed as a knowledge graph using a fully automated open-source toolchain. Some of these standards have even been formalised in legislation.



External information sources and services

Public administrations need to exploit services delivered outside their organisational boundaries by third parties, such as payment services provided by financial institutions or connectivity services provided by telecommunications providers.

They need also to exploit external information sources such as open data and data from international organisations, chambers of commerce, etc.

Recommendation 45

- ✓ Where useful and feasible to do so, use external information sources and services while developing European public services.

Solutions*



TES Cartography is an external information source of reusable trans-European solutions.




Joinup can be considered as an external information source that can be consulted by public administrations while developing public services.

Good practices

- ✓ Spain has created building blocks such as cloud services to provide access to base registries, digital identification, digital signing and digital payment. It also implemented a shared service to provide connectivity services through a unified and consensual public contract at the central administration level. Moreover, most of the public organisations use social media channels such as Twitter and provide open data, and a building block is available to offer an open-source application to create open data portals. Finally, there are specific programmes to adopt IoT technologies in municipalities in Spain to provide better public services.




Collecting feedback

 **NIFO - National Interoperability Framework Observatory**

Leave this collection

OverviewDigital Policy HubMonitoring HubDigital Public Administration and Interoperability at national levelDiscussions

Have your say on the Latest EIF Toolbox Improvements

 Joinup SupportPublished on: 12/01/2024Discussion

BookmarkLike (1)Translate

We recently **revamped the European Interoperability Framework Toolbox**, introducing a new structure in three sections: EIF Policy, EIF Solutions, and EIF Community, along with a fresh visual identity. We are eager to know:






- What are your *general impressions* of these updates?
- How have the changes impacted *your experience* with the EIF Toolbox?
- What could we *improve further* to better address your needs?

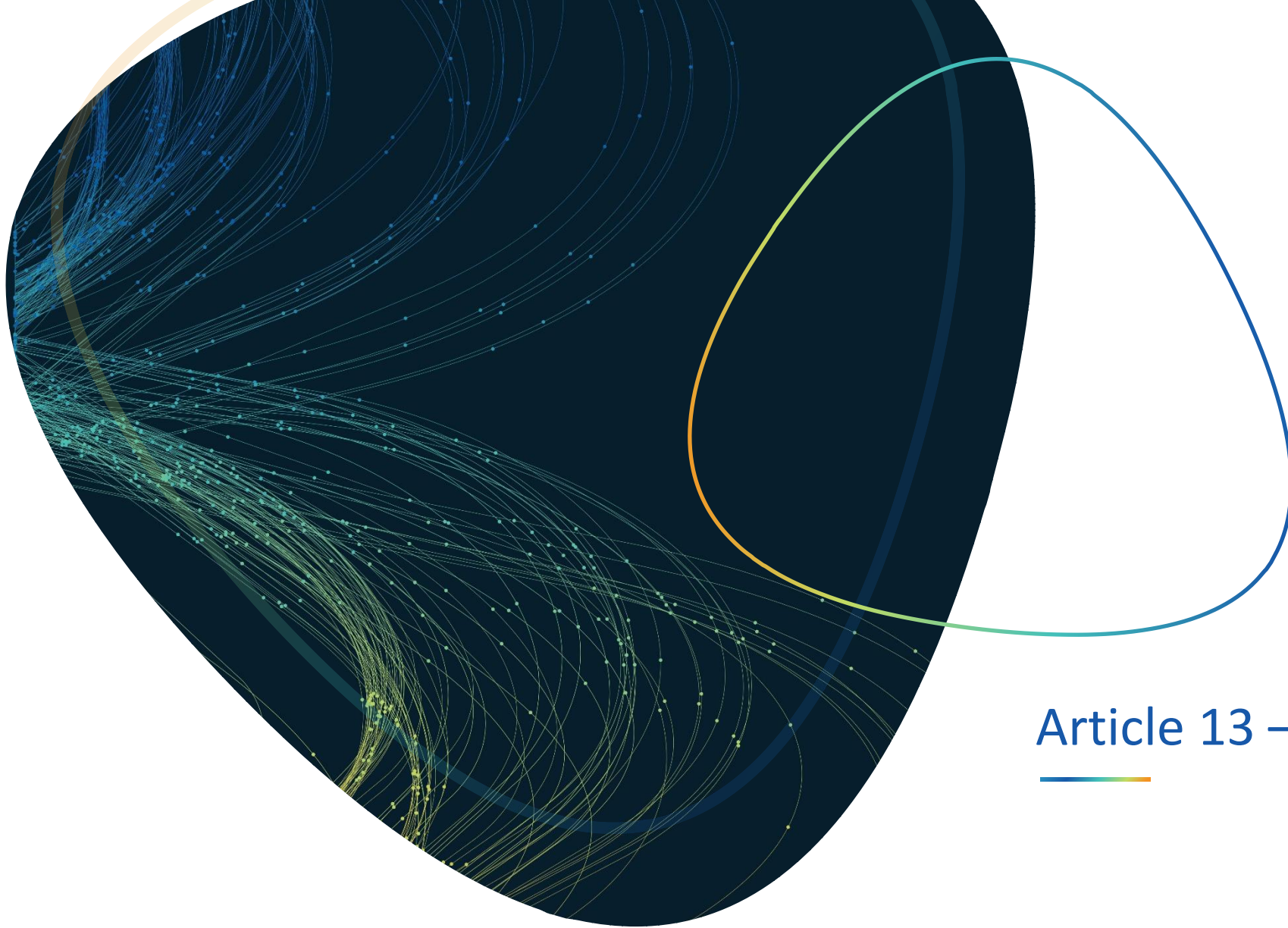
Your feedback is important in guiding further improvements. **We look forward to reading your responses!**

Report abusive contentInvite →Share →Follow

Comments

Create comment *

B*I* Source



Article 13 – Training

Interoperable Europe Act: Article 13 – Training

“The Commission, assisted by the Board, shall provide training material **on the use of the EIF and on Interoperable Europe solutions**, including solutions that are free and open source. Union entities and public sector bodies shall provide their staff entrusted with strategical or operational tasks having an impact on trans-European digital public services with appropriate training programmes concerning interoperability issues.. [...]”. (Article 13, paragraph 1, Interoperable Europe Act)

What are the key functions foreseen by Article 13 of the IEA linked to knowledge sharing?



Training material on the **use of the EIF and on Interoperable Europe solutions**, including solutions that are free and open source, should be made available.



Training courses on interoperability issues at Union level to enhance cooperation and the **exchange of best practices between the staff of Union entities and public sector bodies**, should be organised.



Training courses should target public sector employees in particular at **regional and local level**.



Training courses should be **publicly accessible online and free of charge**.



The development of a **certification programme** on interoperability matters should be promoted.

Interoperable Europe Academy (1/2)

What?

In this context, the Interoperable Europe Academy aims to **improve the level of the advanced digital skills of civil servants, young professionals and academia.**

Why?

To **help modernise public administrations** and to support digital policy and service delivery.

How?

The Academy offers:



Free, available 24/7, self-paced courses



Seasonal schools

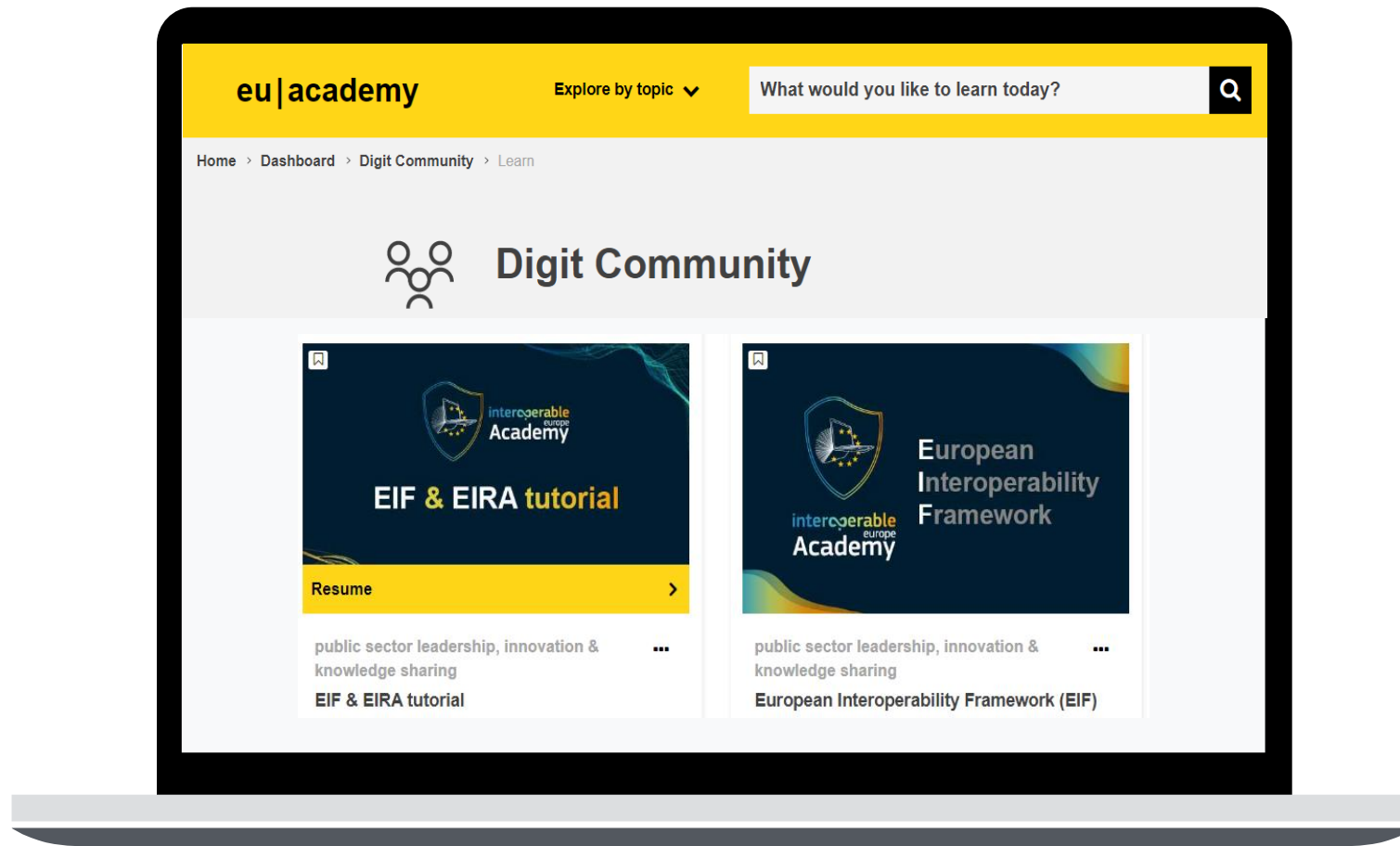


Learning materials

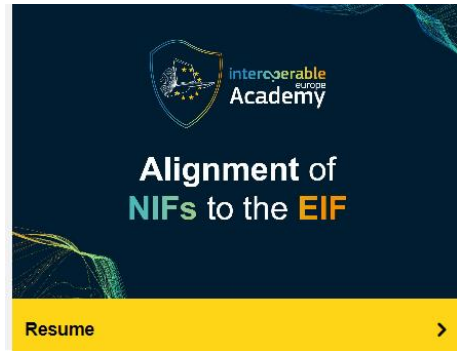


Community & knowledge exchange

Interoperable Europe Academy (2/2)



Courses published in 2023 and 2024



Course on Introduction to interoperability



interoperable
europe
Academy

Introduction to Interoperability course



The first course available in **all EU official languages**

EIF-specific training courses




Interoperability foundation: the first certified learning path



Curriculum(1/3)

1


Interoperable Europe Academy

The Curriculum:


- **provides structure** to the learning provided by the Interoperable Europe Academy;
- **ensures relevancy** of learning activities to real world experiences and form the basis for information architecture and navigational integrity;
- serves as users' first **point of reference** when interacting with the Interoperable Europe Academy;

2


Certification

- The Curriculum will define ways in which formalised curriculum learning paths can be recognised and certificated on the EU Academy platform;
- Currently there is no way of associating a certificate with a learning path: a certificate can only be associated with a defined course;
- Linking courses as pre-requisites in a certificated pathway also means that they will not be visible to users;


3


Gap analysis & Road mapping

The curriculum can be used as a tool to cross-reference:

- existing and planned courses with new learner requirements;
- developments in the legislative and regulatory environment;
- as well as to produce a roadmap for new courses and content.


4


Member States & National Bodies

The curriculum:

- will provide the structure and a central point of reference for Member States and National Bodies who wish to develop and deliver their own interoperability-related training programmes.

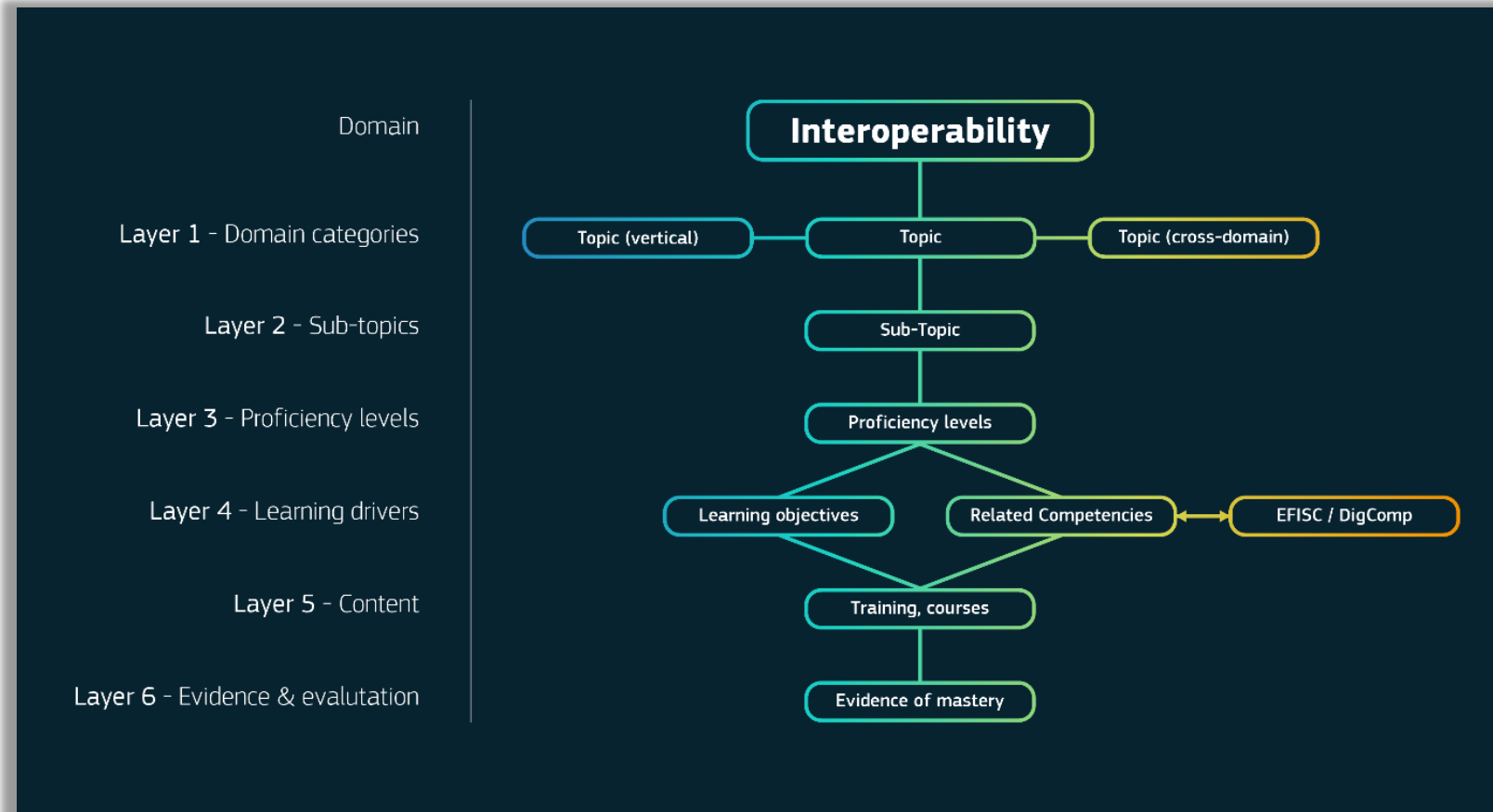
5


Advocacy & Awareness Raising

The curriculum:

- is designed in a way that can be presented graphically, for easy recognition by potential users;
- can be reproduced in digital and print forms, for dissemination through EC communications mechanisms to advocate and raise awareness of the Interoperable Europe Academy;

Curriculum (2/3)



It is structured in **15 high-level domain categories** that range from basic interoperability fundamentals to advanced digital skills.

The learning outcomes focus on **maximising learner's** (mostly public servants) **competencies, knowledge & skills** in the process of design and implementation of the trans-European interoperable public services.

Curriculum (3/3)

Identifier	Category	Identifier	Category
IOP001	The Concept of Interoperability	IOP009	Cross-domain solutions services and tools
IOP002	The European Interoperability Framework	IOP010	Openness
IOP003	Interoperability - governance, strategy and policy	IOP011	GeoSpatial solutions
IOP004	Legal interoperability	IOP012	European Data Spaces
IOP005	Semantic interoperability	IOP013	Once Only Principle
IOP006	Organisational interoperability	IOP014	Identity and trust
IOP007	Technical interoperability	IOP015	Domain Interoperability Issues
IOP008	Interoperability enablers: collaboration, assessment, best practice		

The IOPEU Curriculum Framework is built around **15 top level topic categories** (Domain Categories), mapped to a second layer of sub-topics. The top-level categories have been developed through:



Analysis of existing models and frameworks within the interoperability domain & of existing competency and curriculum frameworks;



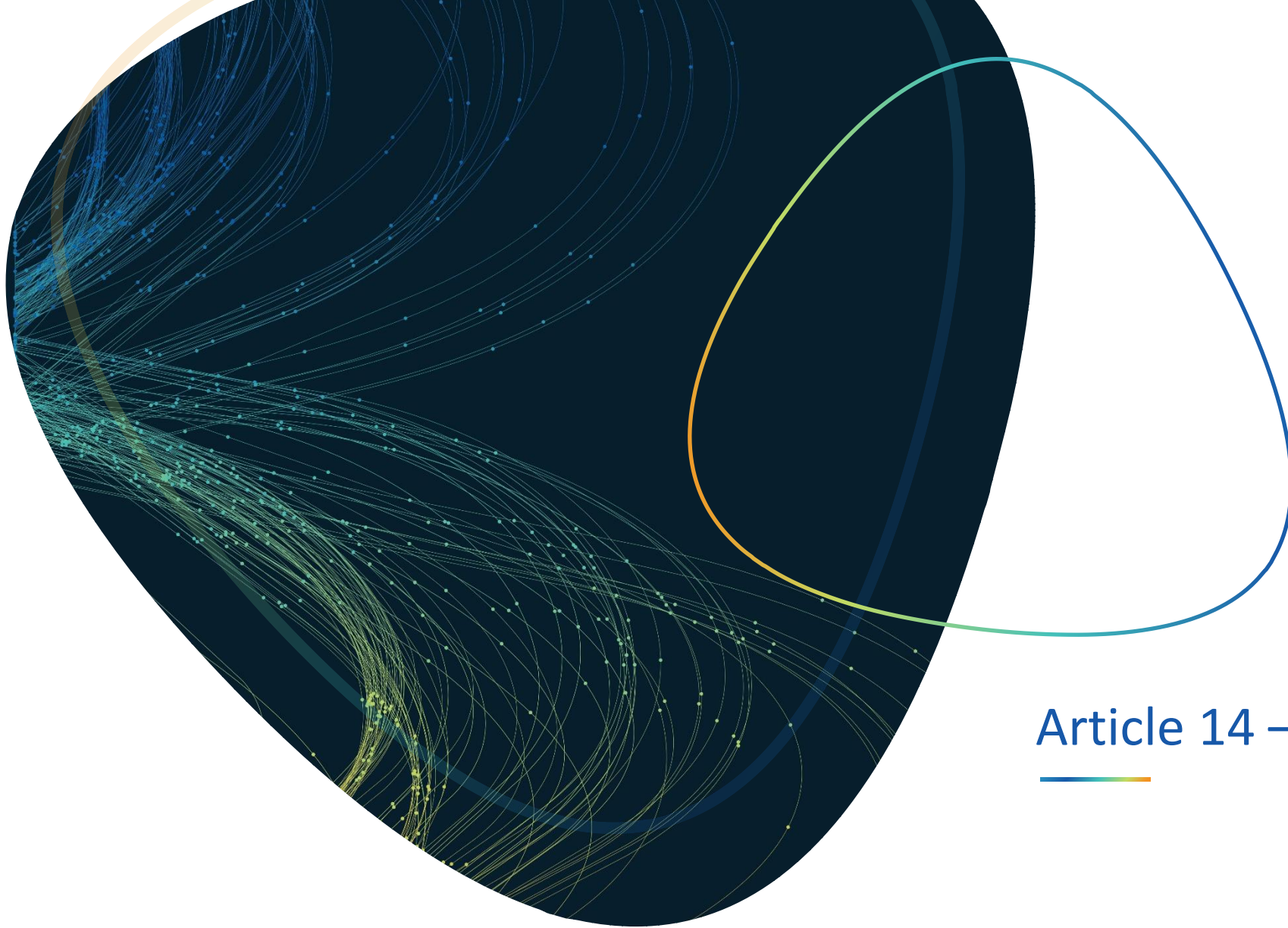
Course and **content evaluation and gap analysis**; and



Subject expert engagement and input.

Interoperable Europe Academy: main achievements





Article 14 – Peer-review

Interoperable Europe Act: Article 14 – Peer-review

“A voluntary mechanism for peer review shall be established for the purpose of facilitating **cooperation between public sector bodies**, designed to support them in implementing Interoperable Europe solutions, to support trans-European digital public services and to help them carry out an interoperability assessments pursuant to Article 3. [...]”. (Article 14, paragraph 1, Interoperable Europe Act)

What are the key functions foreseen by Article 14 of the IEA linked to knowledge sharing?

Cooperation between public sector bodies aims to:



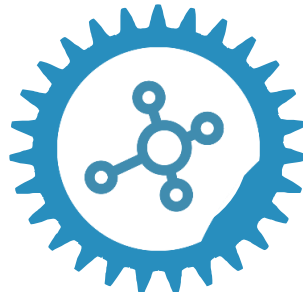
- implement **Interoperable Europe solutions**;
- support **trans-European digital public services**; and
- help in carrying out **interoperability assessments**.



Interoperability experts should be chosen from **any Member State**, except the one where the public sector body is located.



A **final report** will be published on the Interoperable Europe portal.



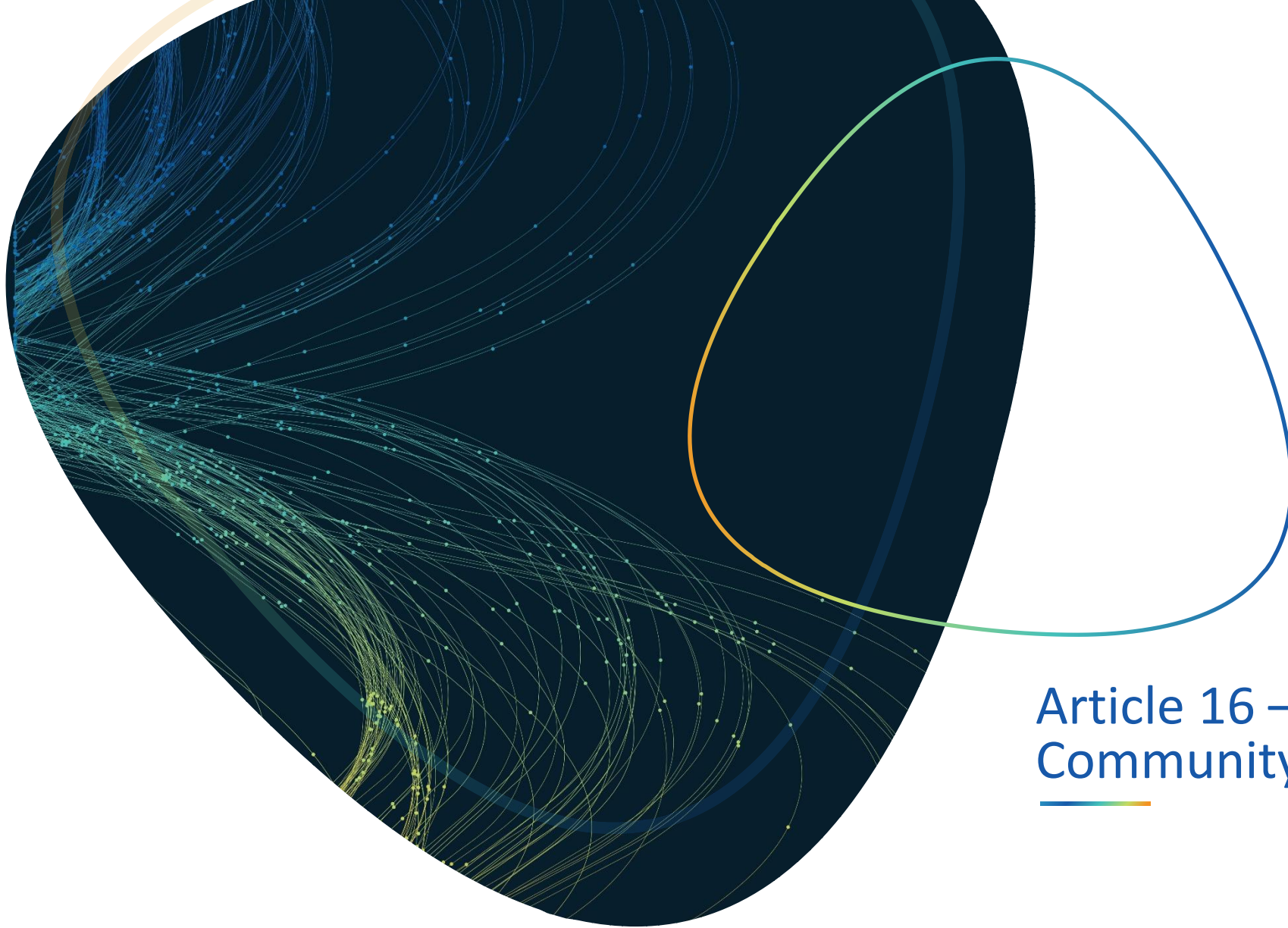
Guidelines yet to be defined

Twinning exercise



Previous participants





Article 16 – Interoperable Europe Community

Interoperable Europe Act: Article 16 – Interoperable Europe Community

“1) An Interoperable Europe Community shall, where so requested by the Board, contribute to the activities of the Board by providing expertise and advice.
2) **Public and private stakeholders as well as civil society organisations and academic contributors** residing or having their registered office in a Member State may register on the Interoperable Europe portal as members of the Interoperable Europe Community. [...]”. (Article 16, paragraphs 1-2, Interoperable Europe Act)

What are the key functions foreseen by Article 16 of the IEA linked to knowledge sharing?



Experts, practitioners, users, and the interested public across various domains will be invited to be part of the Community.



The Community will be responsible for:

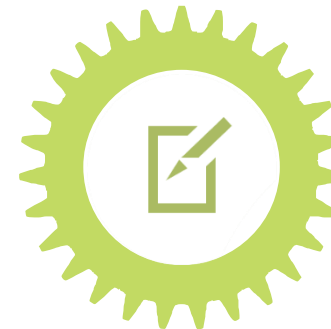
- contributing to the **content of the Interoperable Europe portal**;
- providing expertise on the **development of interoperability solutions**;
- participating in **working groups and other activities**; and
- promoting the **use of interoperability standards and frameworks**.



An **annual online assembly** will be organised.



A **code of conduct** will be adopted.



Guidelines yet to be defined



Thank you!



Upcoming events under the Polish Presidency of the Council of the EU

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Conclusion and wrap-up

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The background features two symmetrical, mirrored structures on a dark blue background. These structures are composed of numerous small, glowing particles in shades of green, yellow, and orange, which form a dense, cloud-like shape. From the center of each cloud, several thin, curved lines of light extend outwards, creating a sense of movement and flow. The overall effect is a dynamic and artistic representation of data or energy.

Thank you!



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innovation ∞ govtech ∞ community

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Stay updated by visiting the NIFO Collection

A Linked Data Event Stream (LDES)



A publication
technology to
share information
with multiple
parties



Allowing
everyone to
replicate and stay
up-to-date
regarding the
unique source of
truth

What is a LDES?



A Linked Data Event Stream (LDES) is a collection of immutable objects whereby you do not change the data itself but simply add new data record to the stream. For business purposes, it is a publication strategy to share your data.

It allows data users to:

Have up to
date data

Be aware of
changes

Access to
historic data

Relate
historic data
to current
data



Event
(Version object)



Main problems | Solution



LDES helps you to structure your data as stream data, enabling you and your users to keep track of what changed at the data level, independently from the data format.

With LDES, users of your Base Registry:

