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COMMISSION STAFF WORKING DOCUMENT
Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

First annual report on interoperability in the Union

{COM(2025) 860 final}

SECTION 1: FROM THE EUROPEAN INTEROPERABILITY FRAMEWORK TOWARDS A NEW INTEROPERABILITY MONITORING MECHANISM

As mandated by Article 20 of the Interoperable Europe Act ('the Act'), the purpose of monitoring and evaluation is to systematically assess the effectiveness, efficiency and impact of the Act's implementation across EU Member States and institutions.

What has changed?

To date, the European Interoperability Framework (EIF) has played a crucial role in guiding public administrations across the EU in developing interoperable digital public services. First adopted in 2004 and revised in 2010 and 2017, the EIF provides structured guidance based on 12 principles such as openness, transparency, reusability and user-centricity. These principles are supported by 47 recommendations aimed at helping public administrations achieve interoperability at all levels – European, national, regional and local - while considering the needs of administrations, individuals and businesses. The EIF Monitoring Mechanism monitors, evaluates and reports on the implementation of the EIF and has helped to identify areas for improvement and examples of best practice.

While the EIF plays a pivotal role in guiding the development of interoperable digital public services across the EU, the study supporting the evaluation of the implementation of the EIF[1] highlighted the need for a more robust, practical and binding monitoring mechanism to better assess the practical implementation of interoperability principles and recommendations. Such a mechanism would address gaps in the current system's focus on high-level, voluntary guidance. It would aim to provide actionable insights, helping public administrations to identify successes and challenges and fostering a more coherent interoperability landscape across the EU. It would also improve transparency and accountability by offering granular data on costs, benefits and progress, enabling stakeholders to evaluate efficiency and make informed investment decisions. This is crucial in view of the disparities observed in digitalisation and resources across Member States. Additionally, by systematically analysing successful implementation, it would facilitate the exchange of best practice and the reuse of tools.

The Interoperable Europe Monitoring Mechanism aims to track, evaluate and report on the implementation of interoperability measures across EU Member States in a structured manner, going beyond voluntary

[1] Study supporting the evaluation of the implementation of the EIF | Publications Office of the EU.

recommendations. A key priority of the new monitoring mechanism is the reuse of existing multi-level monitoring data and the automation of data collection. By providing detailed, data-driven insights, the mechanism helps Member States assess their progress, pinpoint strengths and weaknesses, and drive continuous improvement. The effectiveness of the implementation of the Act has been evaluated from a collective perspective, acknowledging countries when they achieve their best results. This approach aligns with the broader objective of assessing the Act's success based on the EU's collective attainment of a certain level of interoperability.

Interoperability Monitoring Mechanism methodology

The monitoring and evaluation of the Act follows a four-year cycle, complemented by annual reporting to track progress more effectively. The reporting frequency varies depending on the type of indicator described below.

- Output indicators are reported from the outset, as they reflect immediate, measurable results.
- Outcome indicators will generally be reported after a period of at least two years; this will allow sufficient time for meaningful changes to emerge. However, if relevant data becomes available earlier, reporting may take place sooner.

The initial monitoring phase will serve as a transitional period during which only partial data will be collected since the components of the Act will be rolled out gradually. As a result, this phase will not cover a full reference year. For more resource-intensive studies or indicators that evolve at a slower pace, reporting may take place on a biannual basis, depending on the specific needs of each study. This phased approach ensures that progress is continuously monitored, even during the initial stages of implementation.

The Interoperable Europe Portal serves as the authoritative source and central data hub for collecting, managing and publishing monitoring data relevant to Article 20. Users can explore data through an interactive dashboard and access reports, visualisations and key metrics on cross-border interoperability for detailed analysis.

SECTION 2: INTEROPERABILITY MONITORING MECHANISM: DATA COLLECTION ANALYSIS AND METHODOLOGY

The five monitoring elements presented in *Figure 1* below form the foundations of the Interoperable Europe Monitoring Mechanism.

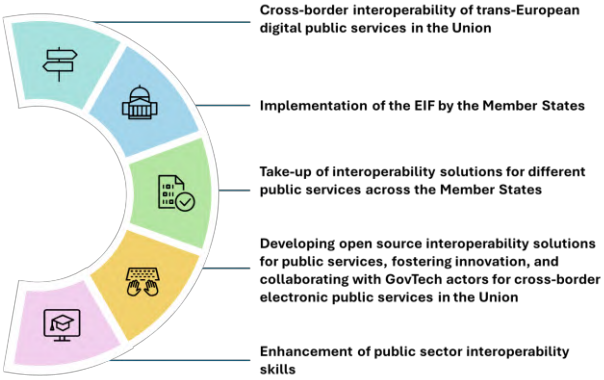


Figure 1 - Monitoring elements of Article 20

These five elements will facilitate the tracking of short- to medium-term progress while also supporting evidence-based evaluation of the Act. By assessing the long-term impact of efforts and actions, these elements will ensure alignment with the multiple reporting requirements outlined in Article 20.

The elements are assessed through indicators, which are further broken down into outputs (short-term) and outcomes (long-term). The indicators were co-designed by the Joint Research Centre (JRC), DG DIGIT and the EU Member States through a two-year co-creation process to ensure effective, efficient and strategic monitoring of progress made on interoperability. The key features are outlined in *Figure 2*.

STREAMLINED AND TARGETED INDICATORS

Ten carefully selected indicators aligned with the requirements of the Act.

EFFICIENCY AND SCALABILITY

Balance of reporting requirements against implementation considerations.

MEASUREMENT OF RESULTS OVER TIME

Paired indicators to measure immediate and intermediate results over time.

USE OF EXISTING DATA SOURCES

Prioritisation of existing internal data sources, alongside relevant studies.

BALANCED QUALITATIVE AND QUANTITATIVE INSIGHTS

Combination of quantitative and qualitative data to track progress and provide nuanced results.

OPTIMISED REPORTING FREQUENCY

Resource-intensive or slow indicators will be monitored on a biannual basis.

BETTER REGULATION GUIDELINES

Adherence to Better Regulation principles.

Figure 2 - Key features of the Interoperability Monitoring Mechanism

Data for the indicators is collected in various formats, as detailed in *Figure 3* below.

PROGRESS OF TRANS-EUROPEAN DIGITAL PUBLIC SERVICES CROSS-BORDER INTEROPERABILITY

INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Total number of trans-European digital public services (TDPS) having undergone interoperability assessments	Measures the uptake of mandatory interoperability assessment mechanisms, providing insight into how extensively and rapidly Member States and EU entities are embedding interoperability assessments into their digital processes.	Primary | IOPA reports
OUTCOME - Percentage of TDPS with resolved interoperability barriers	Measures the percentage of TDPS that have their identified interoperability barriers from the interoperability assessments reports either resolved or mitigated.	Primary | Study and IOPA reports

PROGRESS TOWARDS THE IMPLEMENTATION OF THE EIF BY MEMBER STATES

INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Percentage of Member States adopting the latest EIF version	Measures the percentage of EU Member States that have officially adopted the latest version of the EIF.	Primary | Study based on NIFO corpus
OUTCOME - Percentage of TDPS reporting no interoperability barriers to implementation	Measures the percentage of TDPS undergoing interoperability assessments that confirm the absence of interoperability barriers in the legal, organisational, semantic, technical and governance dimensions for the implementation of binding requirements.	Primary | Study and IOPA reports

TAKE-UP OF INTEROPERABILITY SOLUTIONS

INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Total number of solutions in the Interoperable Europe Portal	Measures the aggregate count of interoperability solutions that are published or connected to the Interoperable Europe Portal.	Primary | IOP Portal - Solution catalogue
OUTCOME - IOP solution take-up index	Quantifies the extent to which IOP solutions, whether published or connected to the Interoperable Europe Portal, are 'utilised' or intended for use in supporting the development of interoperable TDPS.	Primary | IOP Portal - Solution catalogue, IOPA reports

DEVELOPING OPEN SOURCE INTEROPERABILITY SOLUTIONS FOR PUBLIC SERVICES, FOSTERING INNOVATION, AND COLLABORATING WITH GOVTECH ACTORS FOR CROSS-BORDER ELECTRONIC PUBLIC SERVICES IN THE UNION

INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Percentage of IOP innovation measures involving GovTech cooperation	Measures the percentage of Interoperable Europe Support Measures for innovation that involve GovTech cooperation.	Primary | IOP Portal - Interoperability regulatory sandboxes information
OUTCOME – Percentage of IOP innovation measures resulting in open source solutions	Measures the percentage of Interoperable Europe Innovation Measures that contributed to creating new open source interoperability solutions or significantly enhanced existing ones, supporting the assessment of the effectiveness of Innovation Measures.	Primary | IOP Portal - Interoperability regulatory sandboxes information

ENHANCED PUBLIC SECTOR INTEROPERABILITY SKILLS

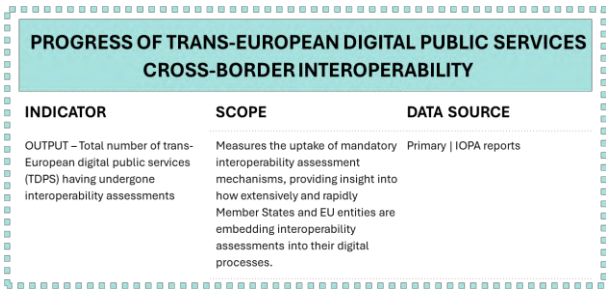
INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Percentage of Interoperable Europe Academy enrolled participants who received training certification	Measures the engagement and educational enhancement of participants within the Interoperable Europe Academy, by it assessing the proportion of participants who complete their training and achieve certification.	Primary | IOP Europe Academy
OUTCOME – Percentage of Interoperable Europe Academy certified participants perceiving significant enhancement in interoperability skills	Measures the percentage of certified participants who report a significant improvement in their cross-border interoperability skills, rating their enhancement as 'moderate' to 'extensive' after completing training at the Interoperable Europe Academy.	Primary | Survey

Figure 3 - Overview of elements and indicators

This structured approach ensures that monitoring efforts remain effective, proportionate and aligned with regulatory objectives while fostering a data-driven evaluation of interoperability progress.

ELEMENT 1: PROGRESS OF TRANS-EUROPEAN DIGITAL PUBLIC SERVICES CROSS-BORDER INTEROPERABILITY

The Element 1 output indicator captures the cumulative count of Trans-European Digital Public Services (TDPS) that have undergone interoperability assessments.



PROGRESS OF TRANS-EUROPEAN DIGITAL PUBLIC SERVICES CROSS-BORDER INTEROPERABILITY		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTPUT – Total number of trans-European digital public services (TDPS) having undergone interoperability assessments	Measures the uptake of mandatory interoperability assessment mechanisms, providing insight into how extensively and rapidly Member States and EU entities are embedding interoperability assessments into their digital processes.	Primary | IOPA reports

The data collection and analysis methodology involve several key steps and considerations to ensure accurate and comprehensive results. The primary unit of analysis is the number of TDPS that have undergone interoperability assessments. The data is sourced from the assessment questionnaires in which Member States and EU public sector bodies provided answers to various aspects of TDPS.

The essential metadata includes the variables described below that are used for the analysis.

- TDPS ID: this identifies the TDPS affected by the binding requirements.
- Interoperability assessment report publishing year: indicates the year the interoperability assessment report was published.
- Public sector body type: identifies the type of public sector body submitting the interoperability assessment report.
- Public sector body geographical origin: identifies the country of the public sector body.

Additional metadata is categorised into the following four main areas.

- Interoperability assessment reports: includes variables such as interoperability assessment report ID and the number of TDPS affected by the binding requirements.
- TDPS: classifies TDPS based on the function of government (COFOG)[2] they concern and the life event they address.
- Binding requirements: details the type of initiative, project or action containing the binding requirements, the quantity of binding requirements and the type of legal reference.
- Effects on interoperability: classified into four types – legal, organisational, semantic and technical.

It is important to note that the analysis is based on a limited dataset – only three interoperability assessment reports, covering five TDPS – which restricts meaningful comparative or aggregated insights. The findings should be viewed as a pilot exercise to test the feasibility of the indicator and to guide its future refinement. Several data limitations affect the robustness of the results, including the absence of standardised classifications for legal references, types of initiative, and

[2] Classification of the functions of government (COFOG) | Eurostat.

TDPS naming, as well as the inability to classify services by life event. Additionally, unstructured data fields and a lack of translation from national languages hinder automation and comparability.

Results

In total, eight TDPS underwent interoperability assessments, resulting in three reports. Three of these services originated from Czechia and focused on the implementation of:

- the Single Digital Gateway
- the Once-Only Technical System
- the eID

Five services originated in the EU and were submitted by the European Commission:

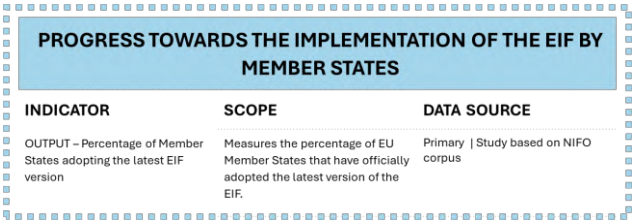
- vehicle registration
- roadworthiness of vehicles, including roadside inspection
- cross-border public services
- provision of cross-border infrastructure
- collection and publication of information.

The services assessed pertain to education, general public services and public order and safety, reflecting an early focus on core citizen-facing functions. Across these assessments, all the binding requirements identified affected 'data' and 'system' assets. Stakeholders affected by the binding requirements within one of the interoperability assessments span from local and regional authorities to national bodies and EU institutions and agencies. In contrast, requirements in the other interoperability assessments only concerned national public sector bodies.

The interoperability effects are almost uniformly beneficial across interoperability categories, with only cross-border organisational interoperability impacts marked as negligible for the binding requirements assessed within one of the interoperability assessments. All assessments conclude that no enduring interoperability barriers remain.

ELEMENT 2: PROGRESS TOWARDS THE IMPLEMENTATION OF THE EIF BY MEMBER STATES

The Element 2 output indicator measures the percentage of Member States that have formally adopted the latest version of the EIF, reflecting their readiness to implement interoperability across the EU.



PROGRESS TOWARDS THE IMPLEMENTATION OF THE EIF BY MEMBER STATES		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTPUT – Percentage of Member States adopting the latest EIF version	Measures the percentage of EU Member States that have officially adopted the latest version of the EIF.	Primary | Study based on NIFO corpus

This indicator has been constructed to ensure both continuity with past results of the EIF Monitoring Mechanism and the new Interoperability Monitoring Mechanism, as well as future EIF developments. It states the percentage of Member States that have formally adopted the 2017 version of the EIF. In addition, a breakdown of the data uses more recent Member State documents relating to EIF adoption. This ensures that national interoperability-related documentation published after 2023 is also considered. The methodology to construct this indicator incorporates three key considerations, as follows.

Robust foundations

First, a strong baseline has been established using the most recent EIF

Monitoring Mechanism results (from 2023), particularly those from key performance indicator 1 regarding the extent to which strategies or frameworks take the EIF into account. This involves using self-reported data from Member States on their alignment with the 2017 version of the EIF. This survey data provides the foundation for a 2025 baseline derived from Member State declarations, enabling a comparative analysis of progress over time.

Consideration of additional data sources

Second, the methodology captures policy updates while transitioning to a new monitoring mechanism. This is important since all Member States report that they have formally adopted the 2017 version of the EIF. This means that a simple adoption-based measurement can appear saturated. To mitigate this, relevant policy updates and additional breakdown data have been considered. Furthermore, as the monitoring mechanism evolves, this indicator will make a transition: from using only Member States' self-reported data under the EIF Monitoring Mechanism, to using official Member State documentation as the key data source – without disregarding the self-reported data from the EIF data collection exercise.

For the 2025 data-collection exercise, a desk review of Member State policy documents has been carried out. These updates have been included as additional breakdown data without affecting the overall percentage for this indicator. By examining such policy updates it is possible to understand the way in which EIF adoption has been achieved by the Member States in question, including elements such as the implementation of broad-ranging national policies, national interoperability mechanisms, specialised or domain-specific interoperability frameworks, or other interoperability policies and initiatives.

Future-proofing

Lastly, this methodology aims to be future-proof, in view of the planned release of a new version of the EIF. The indicator can be adapted in the future to be based exclusively on official Member State documentation updates, potentially incentivising them to provide policy updates on Interoperable Europe (IOPEU). Additionally, the validation of other identified documentation can be carried out through the Digital Public Administration factsheets consultation exercise, thus making best use of evidence-sharing within the wider activities of the Act.

In summary, the units of analysis comprise self-reported Member State adoption of the EIF based on the 2023 survey results and the total number of Member States that have adopted the 2017 version of the EIF, which is then expressed as a percentage. The data sources include the count of Member States that have reported alignment with the latest EIF version, alongside formal adoption and policy updates by document type from 2023 to 2025.

Results

The indicators for the EIF offer significant insights into the adoption and implementation of the latest EIF version across Member States, providing a comprehensive overview of the current state of interoperability efforts within the EU.

As mentioned above, all Member States have formally adopted the 2017

version of the EIF, resulting in a 100% adoption rate across the EU. This indicates a strong commitment to interoperability principles and a unified approach to improving digital public administration. It is also an important common baseline for comparison as both the EIF and this indicator change through time.

The adoption of the EIF occurs through three non-mutually exclusive pathways: national interoperability frameworks, domain-specific interoperability frameworks, and broader national digital strategies. Additionally, other interoperability initiatives contribute to the formal adoption of the EIF. As of 2025, domain-specific interoperability frameworks and broader national digital strategies are the most frequently published categories. For example, Greece and Spain have incorporated EIF principles into their national policies in this manner. Greece's contributions primarily consist of domain-specific interoperability frameworks, showcasing a focus on sectoral interoperability governance, while Spain favours broader national strategies[3].

Certain Member States generate a high volume of updated documentation, indicative of deliberate efforts to progressively align interoperability strategies with the latest EIF version following the EIF Monitoring Mechanism 2023 survey.

Austria, Denmark, and France report a greater than average share of reviewed or updated interoperability policies, reflecting a proactive commitment to ensuring that national policies remain both relevant and consistent with the principles outlined in the latest version of the EIF.

Within the broader EU context, most interoperability policy updates published between 2023 and 2025 were domain-specific interoperability frameworks (41.7%).

ELEMENT 3: TAKE-UP OF INTEROPERABILITY SOLUTIONS

The Element 3 output indicator encompasses the aggregate count of interoperability solutions that are published on or connected to the Portal.

TAKE-UP OF INTEROPERABILITY SOLUTIONS		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTPUT – Total number of solutions in the Interoperable Europe Portal	Measures the aggregate count of interoperability solutions that are published or connected to the Interoperable Europe Portal.	Primary | IOP Portal - Solution catalogue

The analysis focuses on the output indicator for interoperability solutions accessible via the Portal. The nature of the solution is also explored in terms of the year of analysis, solution origin, type of solution, licence, public sector category, compliance with standards, language availability, and additional metadata provided by the interoperability solutions catalogue[4]. It is important to highlight that this indicator offers a specific but limited view of the supply of solutions in the Portal in the short-term. This view will then serve as a means to understand

[3] Digital Public Administration factsheets - 2024 | Interoperable Europe Portal.

[4] Solutions | Interoperable Europe Portal.

the eventual take-up of such solutions over the medium to long term.

This indicator involves counting the active solutions present in the Portal's solutions catalogue. The methodology includes assessing compatibility between data fields in the catalogue and indicator variables, recoding raw data fields, and harmonising data. Two types of variable are involved: those automatically retrieved from the raw dataset, and recoded variables resulting from manual or semi-automated data processing.

The indicator overview includes geographical origin, organisation type, solution source, language availability, targeted interoperability aspect, publication and latest update year. The majority of solutions originate at EU level, with significant contributions from individual EU countries.

Results

An analysis of the geographical origin of active solutions within the Portal indicates that the majority (58.5%) originate at EU level. A significant proportion (38.9%) are attributed to individual EU countries, while a smaller share (2.1%) stem from multi-country collaborations. Only 0.6% of the solutions could not be classified due to incomplete or unavailable information. In total, as of July 2025, there are 670 published and non-archived active solutions recorded in the Portal[5].

The ownership of solutions is primarily attributed to EU entities, which own 57.7% of the total available solutions. Public sector bodies own 34.5% of the solutions, while NGOs, the private sector and other organisations account for the remaining 7.8%. Spain holds a considerably higher number of solutions compared with other nations. Within the EU, the majority of solutions are owned by EU institutions (47.2%) and interinstitutional services (47.1%). Decentralised agencies and other EU bodies account for smaller shares. The European Commission is the primary owner within the EU institutions, holding 91.8% of the total EU-owned solutions. Within the Commission, DG DIGIT owns 92.8% of the solutions. These numbers are illustrated in *Figure 4* and *Figure 5*.

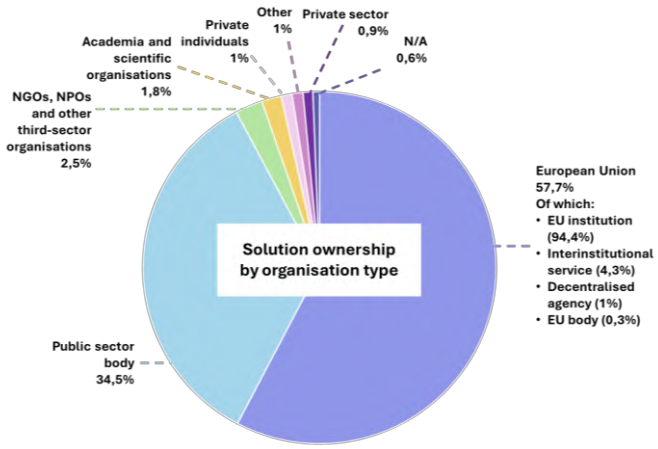


Figure 4 – Solution ownership by organisation type

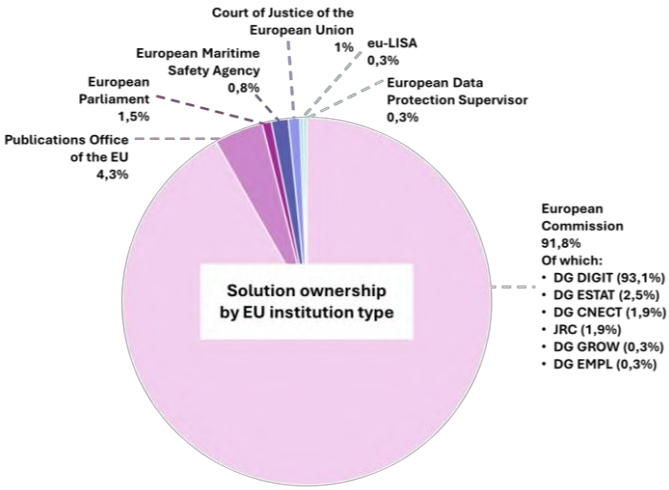


Figure 5 – Solution ownership by EU institution type

The majority of currently available solutions were published in the last eight years, with a peak in 2019 (37.1%), followed by a high level of

[5] Solutions | Interoperable Europe Portal.

activity in 2020 (13.7%). Most solutions have been updated in 2025, indicating strong recent and ongoing data maintenance activity. This analysis focused on non-archived solutions on the IOPEU Portal.

The distribution of non-archived solutions shows a strong emphasis on organisational interoperability (305 solutions) and semantic interoperability (239 solutions). This is followed by solutions supporting technical interoperability (109), cross-cutting aspects[6] (92), legal interoperability (28) and governance (25).

ELEMENT 4: DEVELOPING OPEN SOURCE INTEROPERABILITY SOLUTIONS FOR PUBLIC SERVICES, FOSTERING INNOVATION AND COLLABORATING WITH GOVTECH ACTORS FOR CROSS-BORDER ELECTRONIC PUBLIC SERVICES IN THE UNION

The Element 4 output indicator measures the percentage of Interoperable Europe support measures for innovation that involve GovTech cooperation, including regulatory sandboxes.

DEVELOPING OPEN SOURCE INTEROPERABILITY SOLUTIONS FOR PUBLIC SERVICES, FOSTERING INNOVATION, AND COLLABORATING WITH GOVTECH ACTORS FOR CROSS-BORDER ELECTRONIC PUBLIC SERVICES IN THE UNION

INDICATOR	SCOPE	DATA SOURCE
OUTPUT – Percentage of IOP innovation measures involving GovTech cooperation	Measures the percentage of Interoperable Europe Support Measures for innovation that involve GovTech cooperation.	Primary | IOP Portal - Interoperability regulatory sandboxes information

It is important to note that, at the time of writing, the Interoperable Europe Board has not yet proposed any innovation measures for implementation by the European Commission; this means Element 4 cannot be operationalised. In the absence of such measures, the data-collection exercise described below serves to enrich our understanding of the state-of-play of the European GovTech ecosystem, with the output indicator focusing on GovTech cooperation and the outcome indicator focusing on open source solutions. The methodology for Element 4 is designed to provide a comprehensive understanding of the European GovTech ecosystem, with a particular focus on interoperability and cross-border considerations.

Mapping focus

The mapping of the GovTech landscape focuses on identifying initiatives and companies with explicit interoperability and cross-border objectives. It also examines Commission-funded projects that address GovTech collaboration in these areas, as well as relevant EU legislation and scientific research. Particular attention is given to data from the World Bank's GovTech Enablers Index (GTEI), specifically to indicators relating to policies supporting GovTech start-ups, government-provided financing for innovation, and procurement policies prioritising bids from start-ups and small and medium-sized enterprises (SMEs).

Innovation measures

The 2025 data collection exercise focuses on conducting an in-depth analysis of existing GovTech innovation initiatives. This approach aims to provide a state-of-the-art understanding of the GovTech landscape as it relates to the

[6] The 'cross cutting solutions' category is applied to solutions that operate across multiple EIF dimensions or do not fall neatly into a single layer – for example, foundational enablers, registries or methodologies that support interoperability system-wide.

interoperability of digital public services. The analysis seeks to construct contextual information on initiatives that promote GovTech collaboration, particularly those with cross-border and interoperability considerations. This contextual information is also intended to support the Commission and the Board in considering potential future innovation measures.

Data sources

The mapping process is based on publicly available information and involves the selection of initiatives, legislation, Commission-funded projects, companies, and World Bank data that are relevant to the interoperability of digital public services and cross-border aspects. To maintain a clear focus, the selection process is not exhaustive and deliberately excludes GovTech initiatives that are unrelated to interoperability and the cross-border dimensions of public services.

At the time of data collection, no formal taxonomy for analysing GovTech initiatives had been adopted at Commission level. As a result, the project team developed an ad hoc taxonomy tailored to the objectives of the context information mapping. This taxonomy builds on the ongoing work of the Public Sector Tech Watch (PSTW)[7] project, particularly the GovTech Catalogue of Initiatives[8], and was further adapted based on the structure and availability of existing datasets.

The analysis draws on a variety of data sources to ensure a robust and well-rounded perspective, including the IOPEU Portal[9] and the Interoperable Europe Solutions Catalogue[10], which offer insights into interoperability initiatives and solutions. Additionally, the Interoperable Europe Academy[11] provides valuable training materials and courses on GovTech[12], while the JRC contributes scientific studies on the GovTech ecosystem[13]. Further data is derived from the Public Sector Tech Watch[14] and GovTech Connect[15] collections, which catalogue start-ups and initiatives, as well as the World Bank's GTEI[16], under the broader GovTech Maturity Index (GTMI)[17], which highlights policies, financing and procurement practices supporting GovTech start-ups.

[7] Public Sector Tech Watch | Interoperable Europe Portal.

[8] Catalogue of GovTech initiatives | Interoperable Europe Portal.

[9] Interoperable Europe Portal.

[10] Solutions | Interoperable Europe Portal.

[11] Interoperable Europe Academy | Interoperable Europe Portal.

[12] Introduction to GovTech and the GovTech Connect Community | Interoperable Europe Portal.

[13] JRC Publications Repository | European Commission.

[14] Public Sector Tech Watch | Interoperable Europe Portal.

[15] GovTech Connect | Interoperable Europe Portal.

[16] GovTech Enablers | World Bank Group.

[17] Open Knowledge Repository | World Bank Group.

Results

The analysis of GovTech efforts across Europe highlights promising developments in integrating technological innovation within interoperability objectives. While these efforts have gained momentum in recent years, driven by the COVID-19 pandemic and the growing need for digital sovereignty, it is important to emphasise that the GovTech ecosystem is still in its formative stages. The Act's support helps to establish GovTech as a concept and to ensure its sustained growth. These initial strides provide a strong foundation for further integration with interoperability initiatives, but continued efforts and robust data will be essential to fully realise its potential.

Digital sovereignty means the EU's ability to act independently in the digital world. It can be understood in terms of both protective mechanisms and tools to foster digital innovation.

Since 2011, the European Commission has actively focused on interoperability, with support for GovTech projects increasingly featuring in its objectives. Among the initiatives promoted by the Commission, over half (52.9%) are structured as platforms, networks or communities. These initiatives primarily address challenges related to the GovTech marketplace – 10 of the initiatives are in this area – followed by public sector digital transformation and innovation.

The mapping consolidated publicly available information as of March 2025. The findings highlight notable activity in certain countries, with the Netherlands and Estonia leading the way, each registering four documented initiatives. Denmark, Spain and the UK follow with two initiatives each, while Austria, Finland, Ireland, Lithuania, Luxembourg, Poland and Portugal each have one initiative. It is important to note that the absence of recorded initiatives in other countries does not necessarily indicate inactivity; rather, it reflects a lack of sufficient publicly available information at this stage of the mapping.

In addition to nationally-focused efforts, several initiatives operate across multiple countries, demonstrating the collaborative nature of GovTech efforts. These include the following:

- Open & Agile Smart Cities (OASC)[18], active in 40 countries across Europe, North and South America, Asia and Oceania;
- Open Government Partnership Standards[19], spanning 75 countries across Europe, Africa, Asia, the Americas and Oceania;
- the International Data Spaces Association[20], the geographic spread of which is not specified.

Among the identified initiatives promoted by European countries, GovTech hubs or labs account for the largest share by type (40%), followed by European Digital Innovation Hubs, accelerators and incubators (28%), as shown in *Figure 6* below.

[18] Open & Agile Smart Cities.

[19] Open Government Partnership.

[20] International Data Spaces.

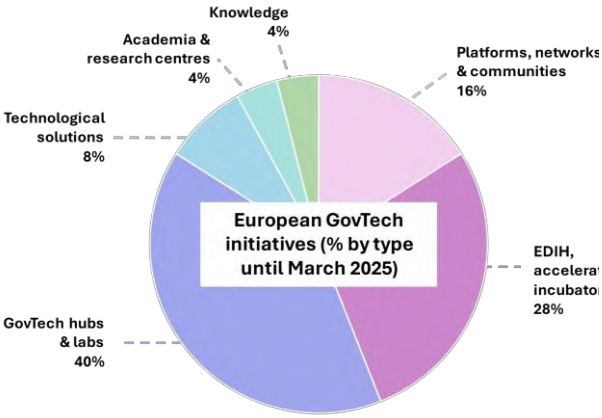


Figure 6 - European countries' GovTech initiatives by type

In terms of target challenges, the most common focus areas are public sector digital transformation and innovation, addressed by 12 initiatives, followed by efforts targeting the GovTech marketplace (seven initiatives) and start-up and scale-up growth (six initiatives).

The selected indicators from the World Bank's GTEI provide further insights into the extent to which the EU Member States support the GovTech ecosystem through government-led enabling actions. The results are described below.

- Indicator I-48, which assesses the existence of government policies to support GovTech start-ups and private sector investments, shows that more than 80% of EU Member States implement policies in support of the GovTech ecosystem.
- Sub-indicator I-48.4, which explores the existence of funds for start-up and SME innovation, reveals that more than 76% of EU Member States actively support start-up innovation through financing.
- Sub-indicator I-48.6, which describes the presence of procurement policies to incentivise bids from start-ups and SMEs, indicates that less than 20% of EU Member States implement specific procurement policies aimed at prioritising start-up and SME bids.

These findings show how GovTech development that can help support public sector innovation and interoperability is being fostered in many parts of the EU. While significant progress has been made in some cases, the results also highlight areas where further efforts are needed, particularly in terms of public procurement policies that may need to be adapted to yield the benefits of cooperation with GovTech. These initial insights also provide a valuable foundation for understanding the current state of the GovTech ecosystem and its role in advancing interoperability across Europe that can also be tracked to offer context regarding the future monitoring efforts.

ELEMENT 5: ENHANCED PUBLIC SECTOR INTEROPERABILITY SKILLS

The Element 5 output indicator measures the percentage of participants who successfully obtain certification upon completing a training course from the Interoperable Europe Academy, relative to the total number of participants enrolled.

ENHANCED PUBLIC SECTOR INTEROPERABILITY SKILLS		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTPUT – Percentage of Interoperable Europe Academy enrolled participants who received training certification	Measures the engagement and educational enhancement of participants within the Interoperable Europe Academy, by it assessing the proportion of participants who complete their training and achieve certification.	Primary | IOP Europe Academy

The methodology involves assessing the availability and reliability of data from the Interoperable Europe Academy, harmonising data categories across reports and operationalising the indicator. The certification rate is the proportion of participants who have downloaded a course certificate relative to the total number of active users enrolled in the course.

The data analysis covers the period from April 2024 to February 2025, with September 2024 selected as the baseline month based on an assessment of data availability and reliability. This decision ensures the reliability of data and the accuracy of the analysis.

The units used to measure the success of the training programmes include:

- the total number of users who engaged with the course;
- the proportion of users who have downloaded a course certificate.

Results

The courses that attracted the highest number of users between September 2024 and June 2025 were in the 'Interoperability Enablers, Assessment, Best Practices' category, with 18 693 users in total, 3 235 of which completed all course activities. In contrast, the 'Technical Interoperability' category recorded the lowest engagement, with only 77 total users and 18 completions.

Most curriculum categories showed stable total learner numbers through the months analysed. However, the 'Interoperability Enablers, Assessment, Best Practices' category saw a significant change from October 2024 (11 416 users) to November 2024 (13 054 users). Another big change was observed in the 'Semantic Interoperability' category, which saw an increase in total users from 1 154 in September 2024 to 2 332 in October 2024.

The completion rates across curriculum categories also showed stable trends, with some exceptions. Between October 2024 and November 2024, the 'Concept of Interoperability' category saw a significant increase in the number of users who completed all activities (from 234 to 459 users). Similarly, the 'Interoperability Enablers, Assessment, Best Practices' category saw an increase in users completing all activities, from 1 451 in September 2024 to 1 618 in October 2024.

Between September 2024 and February 2025, the average certification rate across all courses was 19.6%. However, there was a steady decline in the certification rate over this period, as illustrated in *Figure 7*. This decline can be attributed to a procedural modification implemented in January 2025, which required users to complete all course activities to obtain a certificate. Before this change users could download certificates without completing all activities. As of April 2025, downloading certificates remains voluntary.

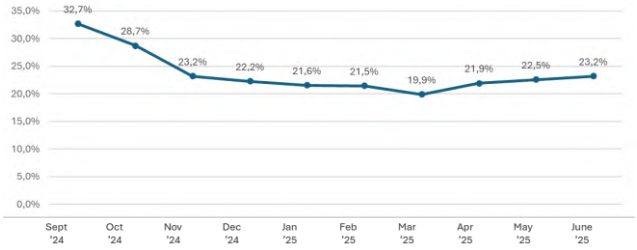


Figure 7 - Certification rate by month

Despite significant differences in the absolute number of certificates downloaded across curriculum categories, the number of downloaded certificates remained relatively stable across the months analysed. The curriculum category 'Interoperability Enablers, Assessment, Best Practices' was an outlier: it saw slightly more variation in the number of downloaded certificates, particularly from October 2024 (2 329 certificates) to November 2024 (2 414 certificates).

The preliminary results indicate that while there are stable trends in certification rates and user engagement, certain curriculum

categories exhibit notable degrees of variation.

SECTION 3: THE FUTURE OF MONITORING

The integration of medium-term and long-term insights into the annual monitoring mechanism aims to provide a comprehensive understanding of the level of interoperability in the EU, thus supporting effective policymaking and targeted interventions that drive continuous improvement in European digital public services.

This section considers the future development of the Annual Report on Interoperability in the EU, presenting the planned monitoring of mid- to long-term indicators and trends across the Member States, as more data is made available for analysis.

OUTCOME INDICATORS

For each monitoring element, two indicators - short-term and mid-to-long-term - are envisaged. The short-term indicators are presented above. The long-term indicators (outcome indicators) have not been initiated in this year's monitoring activities in order to allow evidence to become available and to mature sufficiently to provide a meaningful analysis. The longer-term effects and changes are expected to be covered in the next edition of the Annual Report on Interoperability in the EU. The following chapter provides a brief overview of the purpose of each outcome indicator, the frequency of data collection and the expected data sources. It is important to note that this chapter is not supported by empirical evidence but rather presents the expected vision for the medium- and long-term monitoring of outcomes that follow on directly from the outcome indicators, raising awareness of how progress will be tracked and where community and governance priorities may lie.

ELEMENT 1: PROGRESS OF TRANS-EUROPEAN DIGITAL PUBLIC SERVICES IN THE UNION

The outcome indicator for Element 1 focuses on the percentage of TDPS that have resolved interoperability barriers. This metric serves as a key means to gauge progress in overcoming technical, semantic, organisation or legal barriers that hinder seamless digital cooperation across Member States and EU entities.

PROGRESS OF TRANS-EUROPEAN DIGITAL PUBLIC SERVICES CROSS-BORDER INTEROPERABILITY

INDICATOR	SCOPE	DATA SOURCE
OUTCOME - Percentage of TDPS with resolved interoperability barriers	Measures the percentage of TDPS that have their identified interoperability barriers from the interoperability assessments reports either resolved or mitigated.	Primary | Study and IOPA reports

The purpose of this indicator is to evaluate how effectively interoperability challenges are being addressed and to what extent practical, sustainable solutions are being implemented. A growing percentage over time would reflect successful collaboration and alignment among public sector stakeholders, as well as the effectiveness of EU-level interoperability policies and initiatives.

Data for this indicator will be collected on a biannual basis starting in 2026, providing a regular progress check on ongoing efforts. The primary data source will be interoperability assessment reports, which include key details such as the publication year of each assessment, the reporting public body or EU entity and the resolution status of identified interoperability issues.

By tracking this metric over time, this indicator aims to identify:

- which areas of the digital public service ecosystem can be improved;
- the pace at which interoperability issues are being resolved; and
- variations in performance between Member States and EU entities.

Once the data collection begins, initial reporting is expected to highlight both persistent barriers and early success cases, offering valuable insights to help shape future action plans and skills development efforts.

ELEMENT 2: PROGRESS TOWARDS THE IMPLEMENTATION OF THE EIF BY MEMBER STATES

The outcome indicator for Element 2 examines the percentage of TDPS that have reported no interoperability barriers to implementation, offering a direct measure of how effectively the EIF is being applied in practice across Member States.

PROGRESS TOWARDS THE IMPLEMENTATION OF THE EIF BY MEMBER STATES		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTCOME - Percentage of TDPS reporting no interoperability barriers to implementation	Measures the percentage of TDPS undergoing interoperability assessments that confirm the absence of interoperability barriers in the legal, organisational, semantic, technical and governance dimensions for the implementation of binding requirements.	Primary | IOPA reports

The purpose of this indicator is to assess whether the EIF is serving its intended function, which is to anticipate and mitigate interoperability barriers before they impede the delivery or scaling of digital public services. Given that the interoperability assessment process uses the EIF as a reference point, services that report no barriers suggest successful alignment with the framework's principles and guidelines.

This data will be collected annually from 2026 and will be taken from interoperability assessment reports. Each report captures details such as the year of the analysis and the Member State of origin, allowing for a comparative view of progress across jurisdictions.

By tracking this indicator over time, it is expected that it will be possible to:

- identify Member States that have effectively integrated the EIF into national digital governance practices;
- highlight areas where further support or guidance may be needed; and
- reveal patterns across services that report no barriers and those that do report barriers.

In theory, a growing percentage of TDPS with no reported cases of interoperability barriers would reflect not only maturity in digital service design but also the widespread institutionalisation of the EIF as a strategic tool for cross-border cooperation. Wide and appropriate application of the interoperability assessments and the creation of these reports with cases facing no barriers will be essential for this indicator to be of high quality.

ELEMENT 3: TAKE-UP OF INTEROPERABILITY SOLUTIONS FOR DIFFERENT PUBLIC SERVICES ACROSS MEMBER STATES

The outcome indicator for Element 3 is the Interoperable Europe Solution take-up index, expressed as a percentage. This index provides a quantitative measure of the extent to which Member State public administrations are adopting and integrating available interoperability solutions into their digital public services.

TAKE-UP OF INTEROPERABILITY SOLUTIONS		
INDICATOR	**SCOPE**	**DATA SOURCE**
OUTCOME - IOP solution take-up index	Quantifies the extent to which IOP solutions, whether published or connected to the Interoperable Europe Portal, are 'utilised' or intended for use in supporting the development of interoperable TDPS.	Primary | IOP Portal - Solution catalogue, IOPA reports

The purpose of this indicator is to generate insights into the real-world use and practical implementation of existing solutions catalogued under the Interoperable Europe initiative. By categorising and analysing levels of uptake, the index helps to assess whether public bodies are fully leveraging shared tools, frameworks and services – or whether additional promotion, guidance or adaptation may be necessary to improve adoption rates.

To minimise additional reporting burdens on stakeholders, the indicator relies primarily on data that can be extracted from existing processes and resources. In particular, insights derived from user behaviour within the Portal will be incorporated, giving an opportunity to monitor solution usage patterns with minimal manual input.

Data collection will occur annually from 2026, drawing on two primary sources:

- the Interoperability Solutions Catalogue, which will document availability, downloads and reuse claims; and
- the interoperability assessment reports, which provide context and qualitative evidence of the implementation of solutions, including reuse documentation and references to specific interoperability assessments identifiers.

The index reflects multiple dimensions of take-up, such as:

- frequency of downloads;
- number and distribution of declared reuse cases; and
- depth and quality of supporting documentation provided by adopting entities.

Monitoring this indicator will support several goals:

- recognising high-performing solutions that are widely reused across the EU;
- detecting underused solutions with potential for broader application; and
- informing targeted outreach or technical adjustments to improve accessibility and integration.

Over time, an upward trend in the take-up index will signal increasing digital coherence and efficiency within the EU public sector, as well as growing trust and reliance on shared interoperability assets.

ELEMENT 4: DEVELOPMENT OF OPEN SOURCE INTEROPERABILITY SOLUTIONS FOR PUBLIC SERVICES, PUBLIC SECTOR INNOVATION AND COOPERATION WITH GOVTECH ACTORS

The outcome indicator for Element 4 measures the percentage of interoperability innovation measures that result in open source solutions. This indicator captures the extent to which innovation efforts within the public sector may lead to transparent, reusable and collaborative digital tools – a key enabler of cross-border service interoperability, public sector modernisation and GovTech engagement.

DEVELOPING OPEN SOURCE INTEROPERABILITY SOLUTIONS FOR PUBLIC SERVICES, FOSTERING INNOVATION, AND COLLABORATING WITH GOVTECH ACTORS FOR CROSS-BORDER ELECTRONIC PUBLIC SERVICES IN THE UNION

INDICATOR	SCOPE	DATA SOURCE
OUTCOME – Percentage of IOP innovation measures resulting in open source solutions	Measures the percentage of Interoperable Europe Innovation Measures that contributed to creating new open source interoperability solutions or significantly enhanced existing ones, supporting the assessment of the effectiveness of Innovation Measures.	Primary | IOP Portal - Interoperability regulatory sandboxes information

The purpose of this indicator is to evaluate the tangible outcomes of investments aimed at improving cross-

border interoperability and fostering innovation within the public sector. It provides insights into how these efforts contribute to the development of open source solutions, which are essential for improving service design, delivery and performance. Additionally, the indicator reflects the extent to which public administrations engage in collaborative innovation, including partnerships with GovTech actors, to address interoperability challenges through transparent and reusable digital tools.

Data for this indicator will be collected annually from 2026, using information available via the IOPEU Portal. This includes data points such as:

- year of analysis;
- the nature and scope of each innovation measure;
- the type of development (e.g. tool, platform, module); and
- participants involved, including the presence of GovTech actors.

This indicator aims to shed light on:

- the degree to which interoperability innovation is shared openly and widely;
- how often open source approaches are chosen over closed models; and
- the level of external collaboration with start-ups, SMEs and other GovTech actors.

An increase in the proportion of innovation measures leading to open source solutions would indicate a growing commitment to transparent, scalable and adaptable public service delivery. It also reflects alignment with EU values around openness, trust and digital sovereignty.

By tracking this indicator, policymakers and public sector leaders will gain valuable insights into how innovation translates into shared digital infrastructure – and whether ecosystems are effective in fostering public-private cooperation to build future-ready solutions.

ELEMENT 5: ENHANCEMENT OF PUBLIC SECTOR INTEROPERABILITY SKILLS

The outcome indicator for Element 5 measures the percentage of IOPEU Academy-certified participants who perceive a significant enhancement in their interoperability skills. This metric is crucial for understanding the effectiveness of training programmes designed to build capacity within the public sector workforce through stakeholder feedback. Without understanding training outcomes, it is not possible to track the extent to which skills are developing.

ENHANCED PUBLIC SECTOR INTEROPERABILITY SKILLS

INDICATOR	SCOPE	DATA SOURCE
OUTCOME – Percentage of Interoperable Europe Academy certified participants perceiving significant enhancement in interoperability skills	Measures the percentage of certified participants who report a significant improvement in their cross-border interoperability skills, rating their enhancement as 'moderate' to 'extensive' after completing training at the Interoperable Europe Academy.	Primary | Survey

The purpose of this indicator is to inform decisions on whether improvements to education and training initiatives are needed, with the aim of strengthening the workforce's ability to anticipate, tackle and prevent interoperability problems. By gauging the development in the perceived skills of participants and collecting qualitative feedback, policymakers can better tailor learning opportunities to meet changing needs.

Data collection for this indicator will take place annually from 2026, using surveys conducted with certified participants of IOPEU Academy courses. These surveys capture both quantitative measures of skill enhancement and

qualitative insights into the learning experience.

The monitoring of this indicator over time will aim to help ensure that public sector professionals are equipped with the skills required for effective interoperability governance and implementation. Ultimately this will contribute to more resilient and connected digital public services across the EU. It could also help us understand the extent to which a shared understanding of interoperability is emerging across public administrations in the EU.

LOOKING TO THE FUTURE

The present edition of the Annual Report on Monitoring in the Union focuses on describing outcome indicators, including their purpose, frequency and data sources. This work represents an early stage in the policy process. While short-term output indicators provide valuable insights into initial achievements and activities, they lay the groundwork for understanding the implementation of the Act across the EU. By contrast, outcome indicators aim to measure deeper, sustained impacts, such as resolving barriers, adopting solutions, fostering innovation and improving workforce skills. As data collection for these outcome indicators is scheduled to begin in 2026, this report does not yet provide empirical results or identified trends for them.

Methodological refinement will be essential to operationalise monitoring indicators. Current limitations, such as gaps in publicly available sources, may result in the underreporting of policy updates. Future iterations of the report will aim to address these challenges. A phased approach to the development of indicators and the review of the monitoring framework is planned, with a revision of the data model in 2025 enabling the collection of more structured datasets from 2026 onwards. Improvements, including new variables, controlled vocabularies and interoperability scores, will improve data granularity, quality and comparability while reducing the need for manual data handling. Based on the output from this first data collection exercise and a discussion with the Board scheduled for December 2025, the indicators could be improved by revising or even replacing them.

The data collection exercises conducted to date remain a valuable source of insight into the European GovTech ecosystem, particularly during the initial stages when formally adopted innovation measures are limited in scope. As the Board introduces such measures, the methodology will be adapted to capture their impact on the development and evolution of the EU's GovTech landscape. Monitoring the development of open source interoperability solutions for public services will require alignment with the Act's innovation activities, ensuring that solutions developed or tested through sandboxes are fully reflected in future reporting.

Efforts to monitor public sector interoperability skills will benefit from a more systematic and data-driven approach. Streamlining data formats and metrics, automating reporting elements and introducing cumulative participation indicators will provide robust insights into training uptake and outcomes while reducing the reporting burden on stakeholders. Participant feedback will complement numerical data, offering contextual information for deeper evaluation and engagement. The expansion of courses offered through the Interoperable Europe Academy and the reuse of training materials by Member States will strengthen public sector skills. Increased engagement within the Interoperable Europe Community will further contribute to building a skilled and interoperable public sector, enriching the evidence base for future monitoring activities.

Addressing current data limitations, such as the lack of standardised classifications, structured reporting fields and multilingual consistency, will be critical for reliable operationalisation and automation of indicators. Future data collection rounds should aim to improve comparability and reduce manual

processing through improvements to the interoperability assessments questionnaire and data model. Additional data sources, including metadata such as links to previous assessments, identified Interoperable Europe solutions, and documented interoperability barriers, could support a more comprehensive and interconnected approach to indicator development and analysis.

The monitoring will also continue to evolve in alignment with emerging policy developments and digital trends, including data spaces and artificial intelligence. Synergies with other European Commission initiatives, such as the Open Source Observatory, the EU Open Source Solutions Catalogue, the European Data Portal, and the European data spaces, will enrich monitoring activities and provide a more complete overview of the adoption of interoperability solutions across the EU.

The Act and its monitoring framework contribute to broader initiatives, such as the Digital Decade and Single Digital Gateway Once-Only Technical System, and reviews in that policy context may be informed by Article 20. This Annual Report will form part of the baseline for the evaluation of the Act, scheduled for January 2028, which will provide a foundation for assessing its impact and effectiveness. As the dataset grows and outcome indicators begin to yield empirical results, future editions of the Annual Report will include detailed analyses of trends. These analyses will examine the barriers and drivers influencing both output and outcome indicators, offering a comprehensive understanding of interoperability dynamics. By integrating insights on factors that facilitate or hinder progress, future reports will support more effective policymaking and targeted measures that drive continuous improvement in European digital public services.

Ultimately, this work underscores the importance of interoperability efforts to the European project, contributing to the modernisation, simplification and digital transformation of public services and fostering a more connected, innovative and efficient EU.